010001

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

FINAL REPORT

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010002

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Task Order: 051021-6

SRR: 28183

Method: ICP SW846 6010B

Client ID	Lab Sample ID	Potassium Result (mg/L)	Sodium Result (mg/L)
Prep Blank	PBW-K13E2	<2.50	<2.50
Lab Control	LCSW-K13E2	204	204
True Value	-----	200	200
Recovery	-----	102%	102%
Cond-A-100°C-06/21/05	268878	39.1	11.9
Cond-A-150°C-06/17/05	268879	65.8	14.3
Cond-A-150°C-09/08/05	268880	16.2	9.50
Cond-A-150°C-09/26/05	268881	14.7	6.31
Cond-A-150°C-10/17/05	268882	29.7	6.17
Cond-A-160°C-06/13/05	268883	17.2	13.3
Cond-A-170°C-06/16/05	268884	62.6	11.4
Cond-B-100°C-09/08/05	268885	28.0	5.71
Cond-B-130°C-09/26/05	268886	13.1	5.48
Cond-B-160°C-10/17/05	268887	4.06	7.15
Cond-C-170°C-09/13/05	268888	13.2	5.07
Cond-C-170°C-09/07/05	268889	3.37	6.19
Duplicate result	268889D	3.67	5.98
RPD	-----	8.52%	3.45%
Spike result	268889S	207	208
Spike added	-----	200	200
Recovery	-----	102%	101%
Cond-C-170°C-09/26/05	268890	19.4	7.19
Cond-C-170°C-10/15/05	268891	18.3	3.58
Cond-C-180°C-08/22/05	268892	3.28	18.8
Reporting Limit:		2.50 mg/L	2.50 mg/L

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET 010003

Sample ID
Cond-A-100°C -06/21/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268878

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	<1	1
Chloride	43.2	1
Formate	<1	1
Nitrate-N	<0.1	0.1
Sulfate	0.278	0.1
TOC	767	100

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010004

Sample ID
Cond-A-150°C -06/17/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268879

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	9.73	1
Chloride	63.0	1
Formate	2.64	1
Nitrate-N	7.86	0.1
Sulfate	0.100	0.1
TOC	3.71	2

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010005

Sample ID
Cond-A-150°C -09/08/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268880

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	4.66	1
Chloride	14.4	0.1
Formate	3.03	1
Nitrate-N	47.3	1
Sulfate	1.12	0.1
TOC	186	10

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010006

Sample ID
Cond-A-150°C -09/26/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268881

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	12.2	1
Chloride	15.0	0.1
Formate	2.86	1
Nitrate-N	116	1
Sulfate	1.53	0.1
TOC	473	33

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET 010007

Sample ID
Cond-A-150°C -10/17/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268882

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	15.9	1
Chloride	27.8	1
Formate	3.83	1
Nitrate-N	64.5	1
Sulfate	1.71	0.1
TOC	178	20

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010008

Sample ID
Cond-A-160°C -06/13/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268883

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	49.9	2
Chloride	8.07	0.1
Formate	3.89	2
Nitrate-N	18.0	0.1
Sulfate	0.692	0.1
TOC	2853	200

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

DUPLICATE SUMMARY

010009

Sample ID
Cond-A-160°C -06/13/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268883D

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Acetate	49.9	49.5	0.80%
Chloride	-----	-----	-----
Formate	3.89	3.52	9.99%
Nitrate-N	-----	-----	-----
Sulfate	-----	-----	-----
TOC	-----	-----	-----

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

MATRIX SPIKE SUMMARY

010010

Sample ID
Cond-A-160°C -06/13/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268883S

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Acetate	49.9	64.6	40	36.8%
Chloride	-----	-----	-----	-----
Formate	3.89	43.4	40	98.8%
Nitrate-N	-----	-----	-----	-----
Sulfate	-----	-----	-----	-----
TOC	-----	-----	-----	-----

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010011

Sample ID
Cond-A-170°C -06/16/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268884

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	33.5	2
Chloride	51.7	1
Formate	5.64	2
Nitrate-N	21.6	1
Sulfate	0.766	0.1
TOC	1792	200

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET 010012

Sample ID
Cond-B-100°C -09/08/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268885

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	<1	1
Chloride	25.5	1
Formate	<1	1
Nitrate-N	<0.1	0.1
Sulfate	<0.1	0.1
TOC	28.3	10

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET 010013

Sample ID
Cond-B-130°C -09/26/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268886

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	1.19	1
Chloride	14.3	1
Formate	<1	1
Nitrate-N	208	1
Sulfate	9.31	0.1
TOC	54.9	20

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010014

Sample ID
Cond-B-160°C -10/17/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268887

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	2.67	1
Chloride	12.2	1
Formate	<1	1
Nitrate-N	285	2
Sulfate	3.42	0.1
TOC	275	20

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010015

Sample ID
Cond-C-170°C -09/13/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268888

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	<1	1
Chloride	12.7	0.1
Formate	<1	1
Nitrate-N	10.3	0.1
Sulfate	0.473	0.1
TOC	8.36	1

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

DUPLICATE SUMMARY

010016

Sample ID
Cond-C-170°C -09/13/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268888D

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Acetate	-----	-----	-----
Chloride	-----	-----	-----
Formate	-----	-----	-----
Nitrate-N	-----	-----	-----
Sulfate	-----	-----	-----
TOC	8.36	8.32	0.48%

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

MATRIX SPIKE SUMMARY

010017

Sample ID
Cond-C-170°C -09/13/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268888S

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Acetate	-----	-----	-----	-----
Chloride	-----	-----	-----	-----
Formate	-----	-----	-----	-----
Nitrate-N	-----	-----	-----	-----
Sulfate	-----	-----	-----	-----
TOC	8.36	14.6	6.5	95.7%

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010018

Sample ID
Cond-C-170°C -09/07/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268889

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	1.46	1
Chloride	3.95	0.1
Formate	<1	1
Nitrate-N	15.6	0.1
Sulfate	0.283	0.1
TOC	9.01	1

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010019

Sample ID
Cond-C-170°C -09/26/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268890

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	<1	1
Chloride	18.7	0.1
Formate	<1	1
Nitrate-N	20.7	1
Sulfate	0.406	0.1
TOC	6.47	2

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010020

Sample ID
Cond-C-170°C -10/15/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268891

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	<1	1
Chloride	18.1	0.1
Formate	<1	1
Nitrate-N	<0.1	0.1
Sulfate	0.213	0.1
TOC	2.11	2

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

SAMPLE ANALYSIS DATA SHEET

010021

Sample ID
Cond-C-180°C -08/22/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268892

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	<1	1
Chloride	22.0	1
Formate	<1	1
Nitrate-N	33.0	1
Sulfate	0.949	0.1
TOC	27.9	2

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

DUPLICATE SUMMARY

010022

Sample ID
Cond-C-180°C -08/22/05

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: 10/21/05

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: 268892D

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD
Acetate	-----	-----	-----
Chloride	22.0	22.5	2.25%
Formate	-----	-----	-----
Nitrate-N	33.0	33.2	0.60%
Sulfate	0.949	1.03	8.19%
TOC	-----	-----	-----

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

MATRIX SPIKE SUMMARY

010023

Sample ID
Cond-C-180°C -08/22/05

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: 268892S

Client: Division 20

Date Received: 10/21/05

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Spike Result (mg/L)	Spike Added (mg/L)	Recovery
Acetate	-----	-----	-----	-----
Chloride	22.0	40.6	20	93.0%
Formate	-----	-----	-----	-----
Nitrate-N	33.0	41.1	9.04	89.6%
Sulfate	0.949	4.90	4.00	98.8%
TOC	-----	-----	-----	-----

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

LABORATORY CONTROL SAMPLE

010024

Sample ID
LCSW

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: NA

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: NA

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	True Value (mg/L)	Recovery
Acetate	5.03	5	101%
Chloride	192	200	96.0%
Formate	5.00	5	100%
Nitrate-N	84.5	90.4	93.5%
Sulfate	380	400	95.0%
TOC	63.8	65.2	97.9%

NA- Not Applicable.

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

LABORATORY CONTROL SAMPLE

010025

Sample ID

LCSW

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	True Value (mg/L)	Recovery
Acetate	-----	-----	-----
Chloride	198	200	99.0%
Formate	-----	-----	-----
Nitrate-N	87.1	90.4	96.3%
Sulfate	390	400	97.5%
TOC	-----	-----	-----

NA- Not Applicable.

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

BLANK SUMMARY

010026

Sample ID
PBW

Lab Name: Southwest Research Institute

Client: Division 20

Lab Code: SwRI

Date Received: NA

Matrix: Liquid

Project No.: 06002.01.322

Lab System ID: NA

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	<0.2	0.2
Chloride	<0.1	0.1
Formate	<0.2	0.2
Nitrate-N	<0.1	0.1
Sulfate	<0.1	0.1
TOC	<1.0	1.0

NA- Not Applicable.

This report may not be reproduced except in its entirety without the written approval of SwRI.

SOUTHWEST RESEARCH INSTITUTE

BLANK SUMMARY

010027

Sample ID
PBW

Lab Name: Southwest Research Institute

Lab Code: SwRI

Matrix: Liquid

Lab System ID: NA

Client: Division 20

Date Received: NA

Project No.: 06002.01.322

SRR: 28183

Task Order: 051021-6

Analysis	Sample Result (mg/L)	Reporting Limit (mg/L)
Acetate	-----	-----
Chloride	<0.1	0.1
Formate	-----	-----
Nitrate-N	<0.1	0.1
Sulfate	<0.1	0.1
TOC	-----	-----

NA- Not Applicable.

This report may not be reproduced except in its entirety without the written approval of SwRI.

010028

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

Task Orders/01-QPP-015

Southwest Research Institute

Laboratory Task Order

TO #: 051021-6 Revision: 1

010029

SDG: 268878
VTSR: 10/21/05
CASE: CNWRA

SRR #'s: 28183
Client(s): Div. 20

Project(s): 06002.01.322
Manager(s): SPIES, RADONNA
To PM: 11/02/05
To QA: 11/02/05
To Client: 11/03/05

Instructions

DIVISION 20 - CNWRA. 14-day TAT. Using 12-day TAT for PM/preliminary, DRG/QAU; 13-day TAT hardcopy; subject to change.

Work is 10 CFR 50 Appendix B, 10 CFR Part 21, contact MARK EHNSTROM (ext. 3530) or CHARLIE BUTCHER (ext. 5928, pager 271-5172) or JO ANN BOYD (ext. 2169) BEFORE STARTING ANY WORK ON THIS TASK ORDER.

** NOTE ** Somewhere on your data, please make a notation indicating WHO and WHEN Mark Ehnstrom or Charlie Butcher or Jo Ann Boyd were contacted. This will help facilitate the final package to QA.

FIFTEEN samples received for NO3, CL, SO4 by IC-300 and TOC analyses by EPA 415.1. Point of Contact is LIETAI YANG (x2483, lietai.yang@swri.org).

CONTACT PM WITH ANY ADDITIONAL QUESTIONS.

Adding Na, K, acetate and formate per Leitai Yang. rss102705

Documents Related to this task order: 19804 [COC 28183]

Test: IC-300.0 Holding: 28 days from CED
Section: WETCHEM **IC Method 300.0 anions (for Chloride, Nitrate, Sulfate)** Cnt: 15

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
268878		1	Liquid	Cond-A-100°C -06/21/05	21 Jun 05	19 Jul 05
268879		1	Liquid	Cond-A-150°C -06/17/05	17 Jun 05	15 Jul 05
268880		1	Liquid	Cond-A-150°C -09/08/05	08 Sep 05	06 Oct 05
268881		1	Liquid	Cond-A-150°C -09/26/05	26 Sep 05	24 Oct 05
268882		1	Liquid	Cond-A-150°C -10/17/05	17 Oct 05	14 Nov 05
268883		1	Liquid	Cond-A-160°C -06/13/05	13 Jun 05	11 Jul 05
268884		1	Liquid	Cond-A-170°C -06/16/05	16 Jun 05	14 Jul 05
268885		1	Liquid	Cond-B-100°C -09/08/05	08 Sep 05	06 Oct 05
268886		1	Liquid	Cond-B-130°C -09/26/05	26 Sep 05	24 Oct 05
268887		1	Liquid	Cond-B-160°C -10/17/05	17 Oct 05	14 Nov 05
268888		1	Liquid	Cond-C-170°C -09/13/05	13 Sep 05	11 Oct 05
268889		1	Liquid	Cond-C-170°C -09/07/05	07 Sep 05	05 Oct 05
268890		1	Liquid	Cond-C-170°C -09/26/05	26 Sep 05	24 Oct 05
268891		1	Liquid	Cond-C-170°C -10/15/05	15 Oct 05	12 Nov 05
268892		1	Liquid	Cond-C-180°C -08/22/05	22 Aug 05	19 Sep 05

Test: IC-SWRI Holding: 28 days from CED
Section: WETCHEM **Ion Chromatography by SwRI Method for Acetate and Formate** Cnt: 15

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
268878		1	Liquid	Cond-A-100°C -06/21/05	21 Jun 05	19 Jul 05
268879		1	Liquid	Cond-A-150°C -06/17/05	17 Jun 05	15 Jul 05
268880		1	Liquid	Cond-A-150°C -09/08/05	08 Sep 05	06 Oct 05
268881		1	Liquid	Cond-A-150°C -09/26/05	26 Sep 05	24 Oct 05
268882		1	Liquid	Cond-A-150°C -10/17/05	17 Oct 05	14 Nov 05
268883		1	Liquid	Cond-A-160°C -06/13/05	13 Jun 05	11 Jul 05
268884		1	Liquid	Cond-A-170°C -06/16/05	16 Jun 05	14 Jul 05
268885		1	Liquid	Cond-B-100°C -09/08/05	08 Sep 05	06 Oct 05
268886		1	Liquid	Cond-B-130°C -09/26/05	26 Sep 05	24 Oct 05
268887		1	Liquid	Cond-B-160°C -10/17/05	17 Oct 05	14 Nov 05
268888		1	Liquid	Cond-C-170°C -09/13/05	13 Sep 05	11 Oct 05

Southwest Research Institute

Laboratory Task Order

TO #: 051021-6 Revision: 1

010030

SDG: 268878
VTSR: 10/21/05
CASE: CNWRA

SRR #'s: 28183
Client(s): Div. 20

Project(s): 06002.01.322
Manager(s): SPIES, RADONNA
To PM: 11/02/05
To QA: 11/02/05
To Client: 11/03/05

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
268889		1	Liquid	Cond-C-170°C -09/07/05	07 Sep 05	05 Oct 05
268890		1	Liquid	Cond-C-170°C -09/26/05	26 Sep 05	24 Oct 05
268891		1	Liquid	Cond-C-170°C -10/15/05	15 Oct 05	12 Nov 05
268892		1	Liquid	Cond-C-180°C -08/22/05	22 Aug 05	19 Sep 05

Test: ICP-6010B
Section: METALS

Holding: 180 days from CED

ICP Method 6010B Total Metals

Cnt: 15

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
268878		1	Liquid	Cond-A-100°C -06/21/05	21 Jun 05	18 Dec 05
268879		1	Liquid	Cond-A-150°C -06/17/05	17 Jun 05	14 Dec 05
268880		1	Liquid	Cond-A-150°C -09/08/05	08 Sep 05	07 Mar 06
268881		1	Liquid	Cond-A-150°C -09/26/05	26 Sep 05	25 Mar 06
268882		1	Liquid	Cond-A-150°C -10/17/05	17 Oct 05	15 Apr 06
268883		1	Liquid	Cond-A-160°C -06/13/05	13 Jun 05	10 Dec 05
268884		1	Liquid	Cond-A-170°C -06/16/05	16 Jun 05	13 Dec 05
268885		1	Liquid	Cond-B-100°C -09/08/05	08 Sep 05	07 Mar 06
268886		1	Liquid	Cond-B-130°C -09/26/05	26 Sep 05	25 Mar 06
268887		1	Liquid	Cond-B-160°C -10/17/05	17 Oct 05	15 Apr 06
268888		1	Liquid	Cond-C-170°C -09/13/05	13 Sep 05	12 Mar 06
268889		1	Liquid	Cond-C-170°C -09/07/05	07 Sep 05	06 Mar 06
268890		1	Liquid	Cond-C-170°C -09/26/05	26 Sep 05	25 Mar 06
268891		1	Liquid	Cond-C-170°C -10/15/05	15 Oct 05	13 Apr 06
268892		1	Liquid	Cond-C-180°C -08/22/05	22 Aug 05	18 Feb 06

Test: TOC_415.1
Section: WETCHEM

Holding: 28 days from CED

TOC by EPA 415.1

Cnt: 15

System ID	Type	Cont	Matrix	Customer ID	CED	Method Date
268878		1	Liquid	Cond-A-100°C -06/21/05	21 Jun 05	19 Jul 05
268879		1	Liquid	Cond-A-150°C -06/17/05	17 Jun 05	15 Jul 05
268880		1	Liquid	Cond-A-150°C -09/08/05	08 Sep 05	06 Oct 05
268881		1	Liquid	Cond-A-150°C -09/26/05	26 Sep 05	24 Oct 05
268882		1	Liquid	Cond-A-150°C -10/17/05	17 Oct 05	14 Nov 05
268883		1	Liquid	Cond-A-160°C -06/13/05	13 Jun 05	11 Jul 05
268884		1	Liquid	Cond-A-170°C -06/16/05	16 Jun 05	14 Jul 05
268885		1	Liquid	Cond-B-100°C -09/08/05	08 Sep 05	06 Oct 05
268886		1	Liquid	Cond-B-130°C -09/26/05	26 Sep 05	24 Oct 05
268887		1	Liquid	Cond-B-160°C -10/17/05	17 Oct 05	14 Nov 05
268888		1	Liquid	Cond-C-170°C -09/13/05	13 Sep 05	11 Oct 05
268889		1	Liquid	Cond-C-170°C -09/07/05	07 Sep 05	05 Oct 05
268890		1	Liquid	Cond-C-170°C -09/26/05	26 Sep 05	24 Oct 05
268891		1	Liquid	Cond-C-170°C -10/15/05	15 Oct 05	12 Nov 05
268892		1	Liquid	Cond-C-180°C -08/22/05	22 Aug 05	19 Sep 05

ver 12/25/2005

010031

Sample Receipt

Sample Receipt Number: 28183

Southwest Research Institute

VTSR: 10/21/05

Time: 14:00:00

Project: 06002.01.322
Case #: CNWRA
Client: Div. 20

Manager: SPIES, RADONNA
Logged in by: Dino.Roman
Creation Date: 10/21/05

Notes

Samples were received intact at 22.0 °C.

Parameters: Analysis/NO3, Cl, SO4, TOC.

See chain of custody as part of the SRR system for more information. Contact Project Manager for questions.

(TAT) 2 weeks.

Project is Nuclear Safety Related, 10 CFR 50, Part 21, and Appendix B.

For Div 01 contact Joann Boyd @ X2169 or 351-1617.

For Institute QA contact Charlie Butcher X5928 or 271-5172 before starting any work on this project.

Have SPQP (Latest Revision) available at the time of prep or analysis of samples.

All personnel must be QA Nuclear Certified.

POC: Lietai Yang, Div. 20 X2483
*** Dino.Roman Oct 21 2005 3:14PM ***

System ID	Customer ID	CED	Matrix	Containers	Special Reqs.
268878	Cond-A-100°C -06/21/05	06/21/05	Liquid	1	Oth
268879	Cond-A-150°C -06/17/05	06/17/05	Liquid	1	Oth
268880	Cond-A-150°C -09/08/05	09/08/05	Liquid	1	Oth
268881	Cond-A-150°C -09/26/05	09/26/05	Liquid	1	Oth
268882	Cond-A-150°C -10/17/05	10/17/05	Liquid	1	Oth
268883	Cond-A-160°C -06/13/05	06/13/05	Liquid	1	Oth
268884	Cond-A-170°C -06/16/05	06/16/05	Liquid	1	Oth
268885	Cond-B-100°C -09/08/05	09/08/05	Liquid	1	Oth
268886	Cond-B-130°C -09/26/05	09/26/05	Liquid	1	Oth
268887	Cond-B-160°C -10/17/05	10/17/05	Liquid	1	Oth
268888	Cond-C-170°C -09/13/05	09/13/05	Liquid	1	Oth
268889	Cond-C-170°C -09/07/05	09/07/05	Liquid	1	Oth
268890	Cond-C-170°C -09/26/05	09/26/05	Liquid	1	Oth
268891	Cond-C-170°C -10/15/05	10/15/05	Liquid	1	Oth
268892	Cond-C-180°C -08/22/05	08/22/05	Liquid	1	Oth
Containers: 15				**Samples: 15**	

These documents are associated with this receipt: 19804[COC 28183]

Thermometer: 027
Temperature: 22.0

Client: Div. 20

SR#: 28183

FRM-002

Page Printed: 6 Feb 2006 15:24:38
ver (12/25/2005)

CONTROLLED COPY
STAMP IS NOT REQ. THIS DOCUMENT IS UNCONTROLLED

01-QPP-015 010032
Division 01
Revision 5
June 2004

Document No. 3

Division 01

Chemistry and Chemical
Engineering Division

QUALITY PROJECT PLAN FOR

PERFORMANCE OF CHEMICAL ANALYSES FOR COMMERCIAL NUCLEAR POWER PLANTS WITHIN THE DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

SOUTHWEST RESEARCH INSTITUTE
Chemistry and Chemical Engineering Division
6220 CULEBRA ROAD, SAN ANTONIO, TEXAS 78238

010033

QUALITY PROJECT PLAN FOR PERFORMANCE OF CHEMICAL ANALYSES FOR COMMERCIAL NUCLEAR POWER PLANTS WITHIN THE DEPARTMENT OF ANALYTICAL AND ENVIONMENTAL CHEMISTRY

SwRI AUTHORIZATION SIGNATORIES

This is to certify that this Quality Project Plan of Southwest Research Institute (SwRI) has been reviewed and approved by the following personnel:

JO ANN BOYD Quality Assurance Manager	(210) 522-2169	6/4/04 **DATE**
REZA KARIMI Director, Department of Analytical and Environmental Chemistry	(210) 522-2412	6/4/04 **DATE**
MICHAEL G. MACNAUGHTON Vice President, Chemistry and Chemical Engineering Division	(210) 522-5162	6/4/04 **DATE**
CHRISTOPHER HOBSON Quality Assurance Engineer	(210) 522-5838	6/4/2004 **DATE**

TABLE OF CONTENTS

010034

Page

1.0 INTRODUCTION 1

2.0 SCOPE 1

3.0 REFERENCES 1

4.0 APPLICABLE SECTIONS OF SwRI PROGRAM QUALITY PLAN (PQP-NUCLEAR) 1

4.1 Indoctrination and Training 1
4.2 Qualification of Personnel 2
4.3 Design Control 2
4.4 Right of Access 2
4.5 Control of Supplier-Generated Documents 2
4.6 Acceptance of Services Only 3
4.7 Commercial Grade Items 3
4.8 Inspection 5
4.9 Inspection and Testing 5
4.10 Handling, Storage, Packaging, Preservation, and Delivery 5
4.11 Quality Assurance Records 6
4.12 10 CFR, Part 21 6
4.13 Certified Test Report 6
4.14 Valid Documents List 7

5.0 HISTORY OF REVISIONS 7

010035

PERFORMANCE OF CHEMICAL ANALYSES FOR COMMERCIAL NUCLEAR POWER PLANTS WITHIN THE DEPARTMENT OF ANALYTICAL AND ENVIRONMENTAL CHEMISTRY

1.0 INTRODUCTION

This Quality Project Plan (QPP) defines the Quality Assurance (QA) program requirements for personnel providing the chemical analyses for commercial nuclear power plants. Southwest Research Institute (SwRI) ***Program Quality Plan (PQP-Nuclear)***, *Nuclear Services* shall implement the QA requirements. Project activities controlled by the PQP-Nuclear shall be accomplished as specified by the appropriate sections of **01-QAP-004**, *Quality Assurance Plan for Analytical and Environmental Services* and/or nationally recognized testing methods as specified on individual purchase orders. This QPP shall be applied to all projects initiated for nuclear utilities in the Department of Analytical and Environmental Chemistry. If, as a result of complexity, duration, or other factors, it is determined that a unique, project-specific quality plan is required, the project QAE shall notify the Project Manager and a project-specific quality plan shall be generated in accordance with **SOP-01-4.2.1**, *Preparation and Revision of Documented Procedures.*

2.0 SCOPE

This Quality Project Plan shall be applied to the chemical analyses performed for commercial nuclear power plants by the Department of Analytical and Environmental Chemistry within the Chemistry and Chemical Engineering Division. Although the majority of the work performed for nuclear facilities resides within the Department of Analytical and Environmental Chemistry, other departments within the division may utilize this Quality Project Plan as deemed necessary when nuclear projects are conducted.

3.0 REFERENCES

3.1 *SwRI Quality System Manual – 2000*

3.2 *10 CFR 50, Appendix B, ASME NQA-1*

3.3 *SwRI Program Quality Plan (PQP-Nuclear), Nuclear Services*

3.4 01-QAP-004, *Quality Assurance Plan for Analytical and Environmental Services*

4.0 APPLICABLE SECTIONS OF SwRI PROGRAM QUALITY PLAN (PQP-NUCLEAR)

4.1 Indoctrination and Training

4.1.1 Personnel performing duties affecting quality shall receive quality training to the *SwRI Program Quality Plan (PQP-Nuclear), Nuclear Services* prior to performing any work on projects for nuclear utilities. This training will be conducted either by Institute Quality Systems (IQS) or Division 01 Quality Assurance personnel and documentation shall be evident in the personnel training files maintained in Division

010036

01 Quality Assurance.

4.1.2 Indoctrination and training of personnel shall be conducted in accordance with **SOP-01-6.2.1**, *Qualification and Training*.

4.2 Qualification of Personnel

4.2.1 Testing personnel shall be designated as qualified to perform applicable project activities as specified in **SOP-01-6.2.1**, *Qualification and Training*.

4.2.2 During the performance of each testing process, testing personnel shall have access to the necessary documented procedures, i.e., QPP, QAP, Task Order, Division Quality System Standard Operating Procedures (SOPs), and applicable test/analytical procedures (TAPs) available for ready reference.

4.2.3 Any person who has not performed testing activities associated with any particular method being used for nuclear utilities projects for a period of one year shall be reevaluated prior to the conduct of the test.

4.2.4 Quality Assurance personnel witnessing the testing process for nuclear utilities shall have documented evidence of qualifications maintained by Institute Quality Systems or Division 01 Quality Assurance.

4.3 Design Control

Not applicable to activities conducted within the Department of Analytical and Environmental Chemistry.

4.4 Right of Access

4.4.1 Procurement documents shall provide for access to the suppliers' facilities and records for surveillance, inspection, or audit by SwRI and clients.

4.4.2 Where appropriate, quality clause **Q32** shall be noted on the procurement documents to indicate that right of access for inspection and surveillance of activities associated with the order shall be afforded to SwRI and clients.

4.5 Control of Supplier-Generated Documents

4.5.1 Client documents shall be controlled in accordance with **SOP-01-4.2.1**, *Preparation and Revision of Documented Procedures*. These procedures provide the requirements for the preparation, review, approval, issue, distribution, and revision of documents controlled by the Chemistry and Chemical Engineering Division.

4.5.2 Documents may be controlled as Plans or Work Instructions and shall be accessible through the Division Intranet link, ***Contract Requirements*** as PDF files.

4.5.3 Nationally recognized test methods shall be of the most current issue or as specified in the purchase order. Task orders shall identify the applicable test methods to be used on the nuclear project.

4.6 Acceptance of Services Only

Not applicable to activities conducted within the Department of Analytical and Environmental Chemistry.

4.7 Commercial Grade Items

4.7.1 Where an item is to be incorporated into a test or deliverable to a client, and that item is not subject to design or specification requirements that are unique to nuclear facilities, used in applications other then nuclear facilities, and procured from the supplier on the specifications set forth in the manufacturers' published product and description, the item shall be considered "commercial grade".

4.7.2 Chemical reagents and standards used for testing purposes shall be ordered to specific chemical grades and certificates of analysis shall be required with each lot.

4.7.3 Controls for procurement planning, supplier selection, supplier performance evaluation, and acceptance of procured items and services other than chemical reagents and standards shall be as identified in **SOP-01-7.4.1**, *Purchasing*, and any referenced document within that procedure.

4.7.4 Receipt inspection of chemical reagents, standards, and test items for use on nuclear safety-related projects shall be performed by department personnel and documented on the *SwRI Receipt Traveler* or **FRM-109**, *Item Receipt Report*, as specified in **SOP-01-8.2.4**, *Monitoring and Measurement*. Any discrepancy such as a damaged container or container label shall be documented on the form and the client shall be contacted for disposition.

4.7.5 Prior or acceptance of a commercial grade item, the receipt inspection shall determine the following:

(a) Damage was not sustained during shipment;

(b) The item has satisfied the specified acceptance criteria; and

(c) Specified documentation, as applicable to the item, was received and is acceptable.

4.7.6 Receipt inspection of chemical reagents and standards shall also consist of verification of chemical type, grade, container integrity, certificate of analysis, and shelf life, where applicable. Upon acceptance of chemical reagents and standards, the containers shall be labeled with the following:

(a) Chemical name;

(b) Chemical grade;

(c) Lot code;

(d) Date received; and

(e) Shelf life, when applicable.

4.7.7 Expired shelf life items shall not be used for testing purposes.

4.7.8 Lot codes of chemical reagents and standards used during equipment standardization and testing shall be recorded on the individual testing data sheets to provide traceability.

4.7.9 Samples supplied to SwRI for testing shall be received by the Sample Custodian and logged into the laboratory logbook. Sample documentation and sample custody shall be maintained in accordance with **TAP-01-0407-001**, *Sample Receipt Inspection*, and **TAP-01-0407-035**, *Organic and Inorganic Sample Security*.

4.7.10 Samples supplied to SwRI for testing shall be labeled with the following:

(a) Sample control number;

(b) Purchase order number;

(c) Purchase order line item number, as applicable;

(d) Task order number;

(e) Nuclear QA label; and

(f) Sample retention date, when applicable.

4.7.11 In the event that samples are damaged upon receipt, a ***Sample Discrepancy Record*** shall be generated from the Division Intranet.

4.7.12 The testing task order shall list the project number, tests required, test methods required, and shall be labeled *Nuclear Quality*.

4.7.13 Identification and traceability shall be maintained in accordance with **SOP-01-7.5.1**, *Item Identification and Traceability*.

4.8 Inspection

4.8.1 Inspection for acceptance shall be performed by qualified persons other than those who conduct or directly supervise the work being inspected.

4.8.2 Institute Quality System (IQS) personnel shall perform surveillance activities as required to ensure compliance with the contract and this Quality Project Plan. Specific areas in which IQS may perform surveillance activities include, but are not limited to, the following:

(a) Receiving inspection and labeling of chemical reagents, standards, and testing samples;

(b) Testing processes;

(c) Calibration and major equipment;

(d) Sample and record retention; and

(e) Test records.

4.9 Inspection and Testing

4.9.1 Required tests for acceptance shall be conducted under appropriate environmental conditions using the tools and equipment necessary to conduct the test in a manner to fulfill test requirements and acceptance criteria.

4.9.2 Tests shall be conducted, controlled, and verified in accordance with **SOP-01-8.2.4**, *Monitoring and Measurement.*

4.9.3 Controls for measuring and test equipment shall be as specified in **SOP-01-7.6.1**, *Control of Measuring and Test Equipment.*

4.9.4 Controls for identification, segregation, reporting, and resolution of nonconforming items and conditions shall be as specified in **SOP-01-8.3.1**, *Nonconformance Reporting.*

4.10 Handling, Storage, Packaging, Preservation, and Delivery

4.10.1 Controls for handling, storage, packaging, preservation, and delivery of items are identified in **SOP-01-7.5.3**, *Handling, Storage, Packaging, Protection, and Delivery of Items.*

4.10.2 Samples specified on the purchase order to be returned to the client shall be prepared and packaged as specified on the purchase order. Each package shall be marked legibly and indelibly with the purchase order/release number and line item number(s) relevant to the package.

4.11 Quality Assurance Records

4.11.1 Quality assurance records shall furnish documentary evidence that items or activities meet specified quality requirements. Documents that ensure this evidence include **TAP-01-0407-014**, *Inventory of Case File Purges*, and **SOP-01-4.2.4**, *Storage and Maintenance of Quality Records*. These documents and this QPP ensure that QA records shall be legible, identifiable, retrievable, and maintained in dual storage.

4.11.2 Records shall be traceable to associated items and activities and shall accurately reflect the work accomplished or information required.

4.11.3 Documents shall be considered valid records only if stamped, initialed or signed and dated by authorized personnel or otherwise authenticated.

4.11.4 Records of test analyses performed by the Department of Analytical and Environmental Chemistry are classified as *nonpermanent* and shall be retained for a minimum of five years. Nonpermanent records are those required to show evidence that an activity was performed in accordance with the applicable requirements, but need not be retained for the life of the item. Based on the use of the final data, the client shall be responsible for determining and implementing permanent storage requirements.

4.11.5 In order to satisfy duplicate storage requirements, one copy of the QA record shall maintained by the Project Manager in Building 70 and a separate copy shall be maintained in the Division Quality Assurance Archives in Building 201. Storage requirements shall be as stated in **SOP-01-4.2.4**, *Storage and Maintenance of Quality Records*, to ensure protection against the risk of damage or destruction.

4.12 10 CFR, Part 21

4.12.1 SwRI procurement documents shall include requirements for reporting and approving disposition of supplier nonconformances and, when required, compliance to 10 CFR, Part 21.

4.12.2 The Manager of Institute Quality Assurance or Director of Institute Quality Systems shall determine if a nonconforming condition is reportable under 10 CFR, Part 21, and initiate reporting and condition in accordance with the SwRI Operating Policies and Procedures (OPP). Safety hazards or defects that could create a substantial safety hazard shall be reported. Substantial safety hazard means a loss of safety function to the extent that there is a major reduction in the degree of protection provided to public health and safety.

4.13 Certified Test Report

The Project Manager and Institute Quality Assurance Manager as complying with all contractual requirements shall certify test reports. The certified test report shall reference the purchase order/release number, the test methods performed, and the purchase

order/release line item number.

4.14 Valid Documents List

The Department of Analytical and Environmental Chemistry task order shall specify all applicable documents and appropriate document revision level for each document. The task order shall then serve as the Valid Documents List (VDL) for each individual project.

5.0 HISTORY OF REVISIONS

Versions 0 through 3 of this plan are maintained on record in Division 01 Quality Assurance.

Revision 4
Title of document changed from the Standard Project Quality Plan *SPQP-CH/AN* to Quality Project Plan, *QPP-015*
Extensive revision to comply with Project Quality Plan PQP-Nuclear, *Nuclear Services*, which replaces SwRI NQAPM, *Nuclear Quality Assurance Program Manual.*

Revision 5
Revised 4.1.1 to include designated Division 01 QA staff to conduct pertinent nuclear training sessions to the SwRI Program Quality Plan (PQP-Nuclear), *Nuclear Services*
Revised step 4.2.4 to include Division QA as an entity along with IQS, to maintain documented evidence of qualifications

010042

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

Chain of Custody/Login Paperwork

19804 Page 1/2

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Requested Turnaround:
- [x] 2 Weeks
- [ ] 3 Weeks
- [ ] Other:

Shipper Name/Address:

Client: Lietai Yang, Div 20

Client Purchase Order/Other ID: 06002.01.322, 1.20

Site/Zone ID:

SwRI Contact: RSpies

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	NO_3^-	Cl^-	$SO_4^=$	TOC						
Cond-B-130°C-Sept 26,05	9/26/5		L												
Cond-A-150°C-Sept. 26,05	9/26/5		L												
Cond-A-150°C-Oct. 17,05	10/17/5		L												
Cond-C-170°C-Oct. 15,05	10/15/5		L												
Cond-C-170°C-Sept. 26,05	9/26/5		L												
Cond-C-170°C-Sept. 7,05	9/7/5		L												
Cond-A-150°C-Sept. 8,05	9/8/5		L												
Cond-B-160°C-Oct. 17,05	10/17/5		L												
Cond-B-100°C-Sept. 8,05	9/8/5		L												
Cond-C-150°C-Sept. 13,05	9/13/5		L												

REMARKS

Preservation
- **a** = HCl to pH <2
- **b** = HNO_3 to pH <2
- **c** = H_2SO_4 to pH <2
- **d** = NaOH to pH >12
- **e** = Cool (4°C±2°C)
- **f** = Other (specify)

Return to Client. RSpies

Bag states Cond-C-170°C - 9/26/05

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22.0°C

Therm #: 027

Relinquished by (Print/Signature): Lietai Yang — Date: 10/21/05 — Time: 14:00

Received by (Print/Signature): RSpies — Date: 10/21/05 — Time: 14:00

Relinquished by (Print/Signature) — Date — Time

Received by (Print/Signature) — Date — Time

Relinquished by (Print/Signature) — Date — Time

SwRI Project#: 06002.01.322 (~~323~~) OR 10/21/05

Received by SwRI Lab. (Signature): 1400

Date: 10/21/05 — Time: 1400

Samples Disposed: Date — Time

Samples Disposed by:

Seal Intact

QA NUCLEAR

SCL# 28183

010043

19804 Page 2/2

SAMPLE LIST/CHAIN OF CUSTODY

Southwest Research Institute
Chemistry and Chemical Engineering Division
6220 Culebra Road
San Antonio, Texas 78238-5166

Shipper Name/Address:

Client: Lietai Yang, Div 20

Client Purchase Order/Other ID: 06002.01.322, 1.20

Site/Zone ID:

Requested Turnaround:
- ✓ 2 Weeks
- 3 Weeks
- Other:

SwRI Contact: R Spres

Analyses Requested

Sample ID	Sample Collection Date (mm/dd/yy)	Sample Collection Time	Matrix Type	Sample Type	# of Containers	NO_3^-	Cl^-	SO_4^{2-}	TOC						
Cond-A-150°C-June 17,05	6/17/5		L												
Cond-A-170°C-June 16,05	6/16/5		L												
Cond-A-100°C-June 21,05	6/21/5		L												
Cond-C-180°C-Aug. 22,05	8/22/5		L												
Cond-A-160°C-June 13,05	6/13/5		L												

REMARKS
Preservation
- **a** = HCl to pH <2
- **b** = HNO_3 to pH <2
- **c** = H_2SO_4 to pH <2
- **d** = NaOH to pH >12
- **e** = Cool (4°C±2°C)
- **f** = Other (specify)

R Spres
(*) Return to Client

Matrix Types:
- **A** – Air
- **B** – Biota
- **D** - Dust
- **E** – Emission/Stack
- **L** - Liquid
- **P** – Product
- **Sd** - Solid
- **S** – Soil
- **SED** – Sediment
- **T** - Tissue
- **W** - Water
- **WP** - Wipe

Sample Types:
- **D** - Duplicate
- **ER** – Equipment Rinsate
- **ES** – Environmental Sample
- **FB** – Field Blank
- **FD** – Field Duplicate
- **MS** – Matrix Spike
- **MSD** – Matrix Spike Dup
- **TB** – Trip Blank

Temp: 22.0°C

Therm #: 027

Rcvd Intact

Relinquished by (Print/Signature)	Date	Time
Lietai Yang / [signature]	10/21/05	14:00
Received by (Print/Signature)	**Date**	**Time**
R Spres	10/21/05	14:00
Relinquished by (Print/Signature)	**Date**	**Time**
Received by (Print/Signature)	**Date**	**Time**
Relinquished by (Print/Signature)	**Date**	**Time**

SwRI Project#: 06.002.01.322

Received by SwRI Lab: (Signature) [signature]

Date: 10/21/05 Time: 1400

Samples Disposed: Date: Time:

Samples Disposed by:

SWA # 28183

010044

QA NUCLEAR.

SAMPLE LOG-IN SHEET

010045

Lab Name
Southwest Research Institute

Page 1 of 1

Received By (Print Name)
DINO ROMAN

Log-in Date
10/21/2005

Received By (Signature)

Case Number
CNWRA

Sample Delivery Group No.

SAS Number
N/A

Remarks: 06002.01.322

Remarks: Condition of Sample Shipment, etc

			Corresponding			
			EPA Sample #	Sample Tag #	Assigned Lab #	
1.	Custody Seal(s)	Present/Absent* Intact/Broken	Cond-A-100°C -06/21/05	None	268878	Intact
2.	Custody Seal Nos.	N/A	Cond-A-150°C -06/17/05	None	268879	Intact
			Cond-A-150°C -09/08/05	None	268880	Intact
3.	Chain-of Custody Records	Present/Absent*	Cond-A-150°C -09/26/05	None	268881	Intact
4.	Traffic Reports or Packing Lists	Present/Absent*	Cond-A-150°C -10/17/05	None	268882	Intact
5.	Airbill	Airbill/Sticker Present/Absent*	Cond-A-160°C -06/13/05	None	268883	Intact
			Cond-A-170°C -06/16/05	None	268884	Intact
6.	Airbill No.	HAND DELIVERED	Cond-B-100°C -09/08/05	None	268885	Intact
7.	Sample Tags	Present/Absent*	Cond-B-130°C -09/26/05	None	268886	Intact
	Sample Tag Numbers	Listed/Not listed on Chain of Custody	Cond-B-160°C -10/17/05	None	268887	Intact
			Cond-C-170°C -09/13/05	None	268888	Intact
8.	Sample Condition	Intact/Broken*/ Leaking	Cond-C-170°C -09/07/05	None	268889	Intact
9.	Cooler Temperature	22.0C	Cond-C-170°C -09/26/05	None	268890	Intact
10.	Does Information on custody records, traffic reports, and sample tags agree?	Yes/No*	Cond-C-170°C -10/15/05	None	268891	Intact
			Cond-C-180°C -08/22/05	None	268892	Intact
11.	Date Received at Lab	10/21/2005				
12.	Time Received	14:00:00				

Sample Transfer

Fraction	Fraction
Area # Inorg Lab 2	Area #
By DINO ROMAN	By
On 10/21/2005	On

* Contact SMO and attach record of resolution

Reviewed By Art Aguilar

Date 10.27.05

Logbook No. Sample Receipt (28183)

Logbook Page No. 5597 Section 3 of 4

FORM DC-1

OLMO4.2

010046

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

Copies of Login Book

Sample Login Book

Oct 21, 2005

010047

SwRI Login Area
Division 1

Sample Receipt: 28182	Project: 10192.02.10X	Client: Lynx, LTD.
VTSR Date: Oct 21, 2005	VTSR Time: 16:30:00	Manager: SUN, GANG

System ID	Customer Sample ID	Matrix
268874	0510181505	Aqueous
268875	0510191321	Aqueous
268876	0510191323	Aqueous
268877	0510200751	Aqueous

Sample Receipt: 28183	Project: 06002.01.322	Client: Div. 20
VTSR Date: Oct 21, 2005	VTSR Time: 14:00:00	Manager: SPIES, RADONNA

System ID	Customer Sample ID	Matrix
268878	Cond-A-100°C -06/21/05	Liquid
268879	Cond-A-150°C -06/17/05	Liquid
268880	Cond-A-150°C -09/08/05	Liquid
268881	Cond-A-150°C -09/26/05	Liquid
268882	Cond-A-150°C -10/17/05	Liquid
268883	Cond-A-160°C -06/13/05	Liquid
268884	Cond-A-170°C -06/16/05	Liquid
268885	Cond-B-100°C -09/08/05	Liquid
268886	Cond-B-130°C -09/26/05	Liquid
268887	Cond-B-160°C -10/17/05	Liquid
268888	Cond-C-170°C -09/13/05	Liquid
268889	Cond-C-170°C -09/07/05	Liquid
268890	Cond-C-170°C -09/26/05	Liquid
268891	Cond-C-170°C -10/15/05	Liquid
268892	Cond-C-180°C -08/22/05	Liquid

Sample Receipt: 28184	Project: 06685.51.00x	Client: U. S. EPA Region
VTSR Date: Oct 22, 2005	VTSR Time: 10:30:00	Manager: TAN, CK

System ID	Customer Sample ID	Matrix
268893	LDCA_BKG_ SD_1005	Sediment
268894	LDCA_BKG_ SS_1005	Surface Soil

010048

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

RAW DATA

TRACE METALS PREPARATORY LABORATORY DIGESTION LOG

SOUTHWEST RESEARCH INSTITUTE
SAN ANTONIO, TEXAS 78228

BOOK / PAGE: 61 188

CLIENT(S): DIV 20
TASK ORDER(S): 051021-6 SDG(S): 268878 010049
PROJECT NO(S): 06002.01.322
METHOD: 3005A 3050B 3050B-7:5 3010A 3020A 7760A 7740A $HClO_4$ $HClO_4/H_2SO_4$
Microwave Fusion Teflon Rock OTHER dilutions
MATRIX: Water Soil Biota Solid Liquid ✓ TCLP Ext OTHER
INSTRUMENT: GFAA ICP ICP-MS IC FLAA HYDRIDE OTHER
ACID INORG #: HNO_3# 5451 HCl# 5418 H_2SO_4# $HClO_4$# HF# H_2O_2#
INTERNAL STD: Sc @ 10 PPM ✓ Be @ 10 PPM SOURCE: JV INORG# 5404 EXP: 10-1-06 AMT: 50uL
Oven/Hotplate/ Block ID: N/A Temperature (°C): N/A

Sample Identification		df	WT(g)	I.V.(ml)	F.V.(ml)
PBW-K27H1		1		5	5
LCSW-K27H1*		1		5	5
268878		10		0.5	5
268879		10		0.5	5
268880		10		0.5	5
268881		10		0.5	5
268882		10		0.5	5
268883		10		0.5	5
268884		10		0.5	5
268885		10		0.5	5
268886		10		0.5	5
268887		10		0.5	5
268888		10		0.5	5
268889		10		0.5	5
268889d		10		0.5	5
268889s*		10		0.5	5
268890		10		0.5	5
268891		10		0.5	5
268892		10		0.5	5

*20uL ICAL-1 Spex#5288 exp. 06/06
PBW&LCSW are prepared as 5mls 1%HNO_3 / 5% HCL

Contacted:
Charlie Butcher
Mark Enstrom
10-27-05 08:58Am
10-27-05

10-27-05

LOCATION: N/A

PREPARED BY: DL DATE: 10-27-05
REVIEWED BY: Ordiera DATE: 10/27/05
DISPOSAL INT/DATE/LOC:

FRM-191 (Rev 4/Jan 05)

BOOK/ PAGE 19 204

SOUTHWEST RESEARCH INSTITUTE®
6220 Culebra Rd
San Antonio, Texas 78228

010050

SPECTRO ICP DAILY LOG

ANALYST [signature]

DATE 10-27-05

POWER: 1700

FLOWS:
Aux 40
Coolant 60
Mass Flow Controller 687

CURRENT	PROPOSED	
5104	5123	Na
4783	4786	Fe
4948	4960	Sr

QC PREP DATE:	
CCV/ICV	05K03
CRI	05K03
ICSA	05K03
ICSAB	05K18

CLP_STD1_SC	05K03
CLP_STD2_SC	
CLP_STD3_SC	
CLP_STD4_SC	10-27-05
CLP_STD5_SC	
BLK_SC	05K03

FILE	CLIENT	TO#	PROJECT NO.	METHOD	PREP PAGE
051027	DOY. 20	051021-6	06002.01.322	6010B	6010B 61-188
051027A	CH2M	051020-6	11543.14.006	2007	61-185

10-27-05

COMMENTS:

MAINTENANCE:

Cleaned Torch: _____ YES
Changed Pump Tubing: ✓ YES
Cleaned Optics: _____ YES
Polished Optics: _____ YES

OTHER:

REVIEWED BY: Oduña

DATE: 10/27/05

010051

ICP Calibration Blank/ICB/CCB Solution

ID: BLK- 05H31

Date Prepared: 8-31-05 Prepared By: DL

Make up as needed in 1000ml volumetric flask.

Added ✓ 10 ml HNO3 INORG #: 5320

Added ✓ 50 ml HCL INORG #: 5338

Added ✓ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: 5-1-06 INORG #: 5175

ICP Calibration Blank/ICB/CCB Solution

ID: BLK- 05L03

Date Prepared: 10-3-05 Prepared By: DL

Make up as needed in 1000ml volumetric flask.

Added ✓ 10 ml HNO3 INORG #: 5371

Added ✓ 50 ml HCL INORG #: 5397

Added ✓ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: 5-1-06 INORG #: 5175

ICP Calibration Blank/ICB/CCB Solution

ID: BLK- 05L01

Date Prepared: 11-1-05 Prepared By: DL

Make up as needed in 1000ml volumetric flask.

Added ✓ 10 ml HNO3 INORG #: 5451

Added ✓ 50 ml HCL INORG #: 5399

Added ✓ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: 5-1-06 INORG #: 5175

ICP Calibration Blank/ICB/CCB Solution

ID: BLK- 05L21

Date Prepared: 11-21-05 Prepared By: DL

Make up as needed in 1000ml volumetric flask.

Added ✓ 10 ml HNO3 INORG #: 5454

Added ✓ 50 ml HCL INORG #: 5421

Added ✓ 1000ul of 10000ppm Sc (INORG. VENT.) EXP. Date: 5-1-06 INORG #: 5175

ICP ICV/CCV SOLUTION

010052

CCV- 05 L03

Date Prepared: 10-3-05 Prepared By: DL

HNO3 INORG #: 5371 HCl INORG #: 5397

Make up as needed in 1000ml volumetric flask in 1% HNO3 AND 5% HCl.

Element	Std Conc (ppm)	Amt added	Check	Source	Inorg #	Stock Conc (ppm)	Exp Date
Sc	10	1ml	✓	INORGVENT	5175	10000	5-1-06
B	5	5ml	✓	SPEX	4966	1000	1-15-06
Li	5	5ml	✓	SPEX	5327	1000	8-15-06
Mo	5	5ml	✓	SPEX	5326	1000	8-15-06
P	5	5ml	✓	SPEX	5280	1000	6-30-06
Si	5	5ml	✓	SPEX	5038	1000	2-28-06
Ti	5	5ml	✓	SPEX	5040	1000	2-28-06
Sr	5	5ml	✓	SPEX	5246	1000	5-30-06
Sn	5	5ml	✓	SPEX	5037	1000	2-28-06
Bi	5	5ml	✓	SPEX	4912	1000	11-30-05
La	5	5ml	✓	SPEX	5325	1000	~~8-15-05~~ 10-17- 8-15
Y	5	5ml	✓	SPEX	4913	1000	11-30-05
Pd	1	1ml	✓	SPEX	4967	1000	~~1-15-05~~ 10-17- 1-15-
S	1	1ml	✓	SPEX	5296	1000	7-15-06
Th	1	1ml	✓	SPEX	5358	1000	8-30-06
U	1	1ml	✓	SPEX	5279	1000	6-30-06
W	1	1ml	✓	SPEX	5314	1000	7-30-06
Zr	5	5ml	✓	SPEX	5039	1000	2-28-06
Na	10	1ml	✓	SPEX	4998	10000	1-30-06
ICV-2A	vary	10ml	✓	SPEX	4909	mix	11-30-05
ICV-2B	vary	1ml	✓	SPEX	4911	mix	11-30-05
ICV-2C	vary	10ml	✓	SPEX	4910	mix	11-30-05

Expiration Date: 11-30-05

ICP Calibration Standards

010053

Date Prepared: 10-3-05 Prepared By: [illegible]

HNO3 INORG #: 5371 HCl INORG #: 5397

Make up as needed in 500 ml volumetric flasks in 1% HNO3 and 5% HCl.

Prepared	Standard Name	Element	Std Conc (ppm)	Added ml	Check	Source	INORG #	Stock Conc (ppm)	Exp Date
10-3-05	STD1- 05L03	Al	50	2.50	✓	INORVENT	5405	10000	10-1-06
		Ca	50	2.50	✓	INORVENT	4988	10000	2-1-06
		Fe	50	2.50	✓	INORVENT	5048	10000	3-1-06
		K	50	2.50	✓	INORVENT	4907	10000	12-1-05
		Mg	25	1.25	✓	INORVENT	5312	10000	8-1-06
		Na	50	2.50	✓	INORVENT	5310	10000	8-1-06
		Li	10	5.00	✓	INORVENT	5244	1000	6-1-06
		Sc	10	0.500	✓	INORVENT	5175	10000	5-1-06
10-3-05	STD2- 05L03	Ba	10	5.00	✓	INORVENT	5027	1000	3-1-06
		Be	5	2.50	✓	INORVENT	5253	1000	6-1-06
		Cr	10	5.00	✓	INORVENT	4906	1000	12-1-05
		Cu	10	5.00	✓	INORVENT	5049	1000	3-1-06
		Ni	10	5.00	✓	INORVENT	5043	1000	3-1-06
		Sc	10	0.500	✓	INORVENT	5175	10000	5-1-06
10-3-05	STD3- 05L03	Cd	10	5.00	✓	INORVENT	5043 pb 10-25-05	1000	3-1-06
		Co	10	5.00	✓	INORVENT	5044	1000	3-1-06
		Mn	10	5.00	✓	INORVENT	4989	1000	2-1-06
		V	10	5.00	✓	INORVENT	4916	1000	1-1-06
		Zn	10	5.00	✓	INORVENT	4915	1000	1-1-06
		Sc	10	0.500	✓	INORVENT	5175	10000	5-1-06
10-3-05	STD4- 05L03	Ag	2	1.00	✓	INORVENT	5406	1000	10-1-06
		As	10	5.00	✓	INORVENT	4947	1000	2-1-06
		Pb	10	5.00	✓	INORVENT	5255	1000	6-1-06
		Sb	10	5.00	✓	INORVENT	5042	1000	3-1-06
		Se	10	5.00	✓	INORVENT	5313	1000	8-1-06
		TL	10	5.00	✓	INORVENT	4990	1000	2-1-06
		Sc	10	0.500	✓	INORVENT	5-175	10000	5-1-06
10-3-05	STD5- 05L03	B	10	5.00	✓	INORVENT	5047	1000	3-1-06
		Mo	10	5.00	✓	INORVENT	5050	1000	3-1-06
		P	10	5.00	✓	INORVENT	5254	1000	6-1-06
		Si	10	5.00	✓	INORVENT	5046	1000	3-1-06
		Ti	10	5.00	✓	INORVENT	4908	1000	12-1-05
		Sr	10	5.00	✓	INORVENT	5243	1000	6-1-06
		Sn	10	5.00	✓	INORVENT	5174	1000	5-1-06
		Bi	5	2.50	✓	INORVENT	5309	1000	8-1-06
		Sc	10	0.500	✓	INORVENT	5175	10000	5-1-06
10-3-05	STD6- 05L03	La	10	5.00	✓	INORVENT	5407	1000	10-1-06
		Na	1	0.05	✓	INORVENT	5310	10000	8-1-06
		Pd	10	5.00	✓	INORVENT	5045	1000	3-1-06
		S	10	5.00	✓	INORVENT	4917	1000	1-1-06
		Th	10	5.00	✓	INORVENT	4844	1000	12-1-05
		U	10	5.00	✓	INORVENT	5408	1000	10-1-06
		W	5	2.50	✓	INORVENT	5308	1000	8-1-06
		Y	10	5.00	✓	INORVENT	5000	1000	3-1-06
		Zr	10	5.00	✓	INORVENT	5311	1000	8-1-06
		SC	10	0.500	✓	INORVENT	5175	10000	5-1-06

Expiration Dates:

STD1: 12-1-05 **STD4:** 12-1-05

STD2: 12-1-05 **STD5:** 12-1-05

STD3: 12-1-05 **STD6:** 12-1-05

DIV. 20
TO#051021-6
Project No. 06002.01.322
Prep. Page 61-188

11-1-05

Sample ID	Element	Result	Qual (C)	Qual (Q)	Units	RL	%RPD	%Recovery	TV	rl	mg/L	sigwt	Dilution	Calc RL	ug/ml	Date	Time
pbw-K27H1	K_766	2.50	U		mg/L	2.5				0.250	-0.527900844	-0.528	1	2.5	-0.052790084	10/27/05	10:43 AM
pbw-K27H1	Na589	2.50	U		mg/L	2.5				0.250	1.724963493	1.72	1	2.5	0.172496349	10/27/05	10:43 AM
lcsw-K27H1	K_766	204			mg/L	2.5		102.0%	200	0.250	203.7277955	204	1	2.5	20.37277955	10/27/05	10:45 AM
lcsw-K27H1	Na589	204			mg/L	2.5		102.0%	200	0.250	204.1809771	204	1	2.5	20.41809771	10/27/05	10:45 AM
268878	K_766	39.1			mg/L	2.5				0.250	39.07441374	39.1	1	2.5	3.907441374	10/27/05	10:48 AM
268878	Na589	11.9			mg/L	2.5				0.250	11.90771777	11.9	1	2.5	1.190771777	10/27/05	10:48 AM
268879	K_766	65.8			mg/L	2.5				0.250	65.75299741	65.8	1	2.5	6.575299741	10/27/05	10:51 AM
268879	Na589	14.3			mg/L	2.5				0.250	14.32738211	14.3	1	2.5	1.432738211	10/27/05	10:51 AM
268880	K_766	16.2			mg/L	2.5				0.250	16.23775486	16.2	1	2.5	1.623775486	10/27/05	10:53 AM
268880	Na589	9.50			mg/L	2.5				0.250	9.503760172	9.5	1	2.5	0.950376017	10/27/05	10:53 AM
268881	K_766	14.7			mg/L	2.5				0.250	14.71999327	14.7	1	2.5	1.471999327	10/27/05	10:56 AM
268881	Na589	6.31			mg/L	2.5				0.250	6.307089522	6.31	1	2.5	0.630708952	10/27/05	10:56 AM
268882	K_766	29.7			mg/L	2.5				0.250	29.68530242	29.7	1	2.5	2.968530242	10/27/05	10:59 AM
268882	Na589	6.17			mg/L	2.5				0.250	6.166230173	6.17	1	2.5	0.616623017	10/27/05	10:59 AM
268883	K_766	17.2			mg/L	2.5				0.250	17.22390823	17.2	1	2.5	1.722390823	10/27/05	11:02 AM
268883	Na589	13.3			mg/L	2.5				0.250	13.29236937	13.3	1	2.5	1.329236937	10/27/05	11:02 AM
268884	K_766	62.6			mg/L	2.5				0.250	62.56970159	62.6	1	2.5	6.256970159	10/27/05	11:06 AM
268884	Na589	11.4			mg/L	2.5				0.250	11.38734413	11.4	1	2.5	1.138734413	10/27/05	11:06 AM
268885	K_766	28.0			mg/L	2.5				0.250	27.97977212	28	1	2.5	2.797977212	10/27/05	11:08 AM
268885	Na589	5.71			mg/L	2.5				0.250	5.71300951	5.71	1	2.5	0.571300951	10/27/05	11:08 AM
268886	K_766	13.1			mg/L	2.5				0.250	13.08154769	13.1	1	2.5	1.308154769	10/27/05	11:18 AM
268886	Na589	5.48			mg/L	2.5				0.250	5.480131541	5.48	1	2.5	0.548013154	10/27/05	11:18 AM
268887	K_766	4.06			mg/L	2.5				0.250	4.06260567	4.06	1	2.5	0.406260567	10/27/05	11:21 AM
268887	Na589	7.15			mg/L	2.5				0.250	7.145556331	7.15	1	2.5	0.714555633	10/27/05	11:21 AM
268888	K_766	13.2			mg/L	2.5				0.250	13.24947913	13.2	1	2.5	1.324947913	10/27/05	11:24 AM
268888	Na589	5.07			mg/L	2.5				0.250	5.06557501	5.07	1	2.5	0.506557501	10/27/05	11:24 AM
268889	K_766	3.37			mg/L	2.5				0.250	3.373395707	3.37	1	2.5	0.337339571	10/27/05	11:27 AM
268889	Na589	6.19			mg/L	2.5				0.250	6.190283766	6.19	1	2.5	0.619028377	10/27/05	11:27 AM
268889d	K_766	3.67			mg/L	2.5	8.5%			0.250	3.665675731	3.67	1	2.5	0.366567573	10/27/05	11:28 AM
268889d	Na589	5.98			mg/L	2.5	3.5%			0.250	5.980428022	5.98	1	2.5	0.598042802	10/27/05	11:28 AM
268889s	K_766	207			mg/L	2.5		101.8%	200	0.250	206.8481108	207	1	2.5	20.68481108	10/27/05	11:30 AM
268889s	Na589	208			mg/L	2.5		100.9%	200	0.250	207.5869653	208	1	2.5	20.75869653	10/27/05	11:30 AM
268890	K_766	19.4			mg/L	2.5				0.250	19.39954118	19.4	1	2.5	1.939954118	10/27/05	11:33 AM
268890	Na589	7.19			mg/L	2.5				0.250	7.187028579	7.19	1	2.5	0.718702858	10/27/05	11:33 AM
268891	K_766	18.3			mg/L	2.5				0.250	18.27091682	18.3	1	2.5	1.827091682	10/27/05	11:36 AM
268891	Na589	3.58			mg/L	2.5				0.250	3.584965338	3.58	1	2.5	0.358496534	10/27/05	11:36 AM
268892	K_766	3.28			mg/L	2.5				0.250	3.28325529	3.28	1	2.5	0.328325529	10/27/05	11:39 AM
268892	Na589	18.8	✓		mg/L	2.5				0.250	18.79272884	18.8	1	2.5	1.879272884	10/27/05	11:39 AM

11/1/05

268892 for Na

$$\frac{1.879\ ug/ml \times 5ml}{0.5\ ml}$$

18.8 mg/L

010054

010055

QC STD. ID's	
CCV	05K03
CRI	05K03
ICSA	05K03
ICSAB	05K18

ICP CAL.STD ID's	
Std0	05K03
Std1	05K03
Std2	
Std3	
Std4	
Std5	
Std6	

10-27-05

☐ 200.7 TAP No. 01-0406-028 Rev2/Mar02

☑ 6010B TAP No. 01-0406-130 Rev3/Mar05

☐ Other_____

K Na

PROJ. NO.	PROJECT	TO#	DATE	MATRIX	LOGBK PG
06002.01.322	Div 20	051021-6	10-27-05	Liquid	61-148

INSTRUMENT: Spectro FILENAME: 051027

File converted to wsl? ☑

EVOLUTION by Micro-Active Australia Pty Ltd 10:18:02 AM October 27, 2005

010056

Keep last result visible enabled ...
Starting run ...
Creating high priority queue entries ...
BACKGROUND CORRECTED INTENSITIES
Identity 1 : BLK_SC Identity 2 : Type : STD
Weight : 1.0000 Volume : 1.00 Printed : 10:14:30 AM October 27, 2005

	K_766	Na589	Sc361
# 1	39.0	24.0	3840.0
# 2	20.0	13.0	3784.0
Mean	29.5	18.5	3812.0
SD	13.4	7.8	39.6
%RSD	45.5	42.0	1.0

INTENSITIES
Identity 1 : BLK_SC Identity 2 : Type : STD
Weight : 1.0000 Volume : 1.00 Printed : 10:14:30 AM October 27, 2005

	K_766	Na589	Sc361
# 1	0.0	0.0	3840.0
# 2	0.0	0.0	3784.0
Mean	0.0	0.0	3812.0
SD	0.0	0.0	39.6
%RSD	44.6	41.1	1.0

BACKGROUND CORRECTED INTENSITIES
Identity 1 : CLP_STD1_SC Identity 2 : Type : STD
Weight : 1.0000 Volume : 1.00 Printed : 10:17:22 AM October 27, 2005

	K_766	Na589
# 1	3833.0	20539.0
# 2	3814.0	20292.0
Mean	3823.5	20415.5
SD	13.4	174.7
%RSD	0.4	0.9

INTENSITIES
Identity 1 : CLP_STD1_SC Identity 2 : Type : STD
Weight : 1.0000 Volume : 1.00 Printed : 10:17:22 AM October 27, 2005

	K_766	Na589
# 1	1.0	5.4
# 2	1.0	5.3
Mean	1.0	5.3
SD	0.0	0.0
%RSD	0.4	0.1

10-27-05

EVOLUTION by Micro-Active Australia Pty Ltd 10:27:10 AM October 27, 2005

BACKGROUND CORRECTED INTENSITIES
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 10:20:14 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	1526.5	12215.0	3945.0	3945.0
# 2	1525.5	12125.0	3883.0	3883.0
Mean	1526.0	12170.0	3914.0	3914.0
SD	0.7	63.6	43.8	43.8
%RSD	0.0	0.5	1.1	1.1

APPARENT CONCENTRATIONS
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 10:20:14 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	19.0780	28.9300	3945.000 H	103.4945
# 2	19.3759	29.1758	3883.000 H	101.8655
Mean	19.2269	29.0529	3914.000 H	102.6800
SD	0.2106	0.1738	43.841	1.1519
%RSD	1.0955	0.5981	1.120	1.1218

Checking calibration verification ...
Identity 1 : CLP_CCV_SC Identity 2 :

Report name	Low limit	Value	High limit
K_766	18.000	19.227	22.000
Na589	27.000	29.053	33.000

BACKGROUND CORRECTED INTENSITIES
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 10:24:06 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	21.5	64.5	3901.0	3901.0
# 2	29.5	59.5	3873.0	3873.0
Mean	25.5	62.0	3887.0	3887.0
SD	5.7	3.5	19.8	19.8
%RSD	22.2	5.7	0.5	0.5

APPARENT CONCENTRATIONS
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 10:24:06 AM October 27, 2005

		K_766	Na589	Sc	Sc361
		ppm	ppm		ppm
# 1	L	-0.1121	0.1093	3901.000 H	102.3384
# 2	L	-0.0061	0.0983	3873.000 H	101.6027
Mean	L	-0.0591	0.1038	3887.000 H	101.9706
SD		0.0749	0.0078	19.799	0.5202
%RSD		126.7464	7.4656	0.509	0.5102

Checking calibration blank ...
Identity 1 : Calibration blank Identity 2 :

K_766	0.100	-0.059	
Na589	0.050	0.104	Contaminated
Sc361	0.000	101.971	

BACKGROUND CORRECTED INTENSITIES
EVOLUTION by Micro-Active Australia Pty Ltd 10:33:02 AM October 27, 2005 **010057**

Identity 1 : CRI Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 10:26:58 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	26.5	67.0	3863.0	3863.0
# 2	1.5	83.0	3848.0	3848.0
Mean	14.0	75.0	3855.5	3855.5
SD	17.7	11.3	10.6	10.6
%RSD	126.3	15.1	0.3	0.3

APPARENT CONCENTRATIONS
Identity 1 : CRI Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 10:26:58 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc		Sc361 ppm
# 1	L	-0.0442	0.1169	3863.000	H	101.3400
# 2	L	-0.3697	0.1564	3848.000	H	100.9459
Mean	L	-0.2070	0.1367	3855.500	H	101.1429
SD		0.2302	0.0280	10.607		0.2787
%RSD		111.2120	20.4602	0.275		0.2755

Checking calibration verification ...
Identity 1 : CRI Identity 2 :

Report name	Low limit	Value	High limit	
K_766	0.900	-0.207	1.100	Failed
Na589	0.900	0.137	1.100	Failed

BACKGROUND CORRECTED INTENSITIES
Identity 1 : ICSA Identity 2 : Type : INTRF
Weight : 1.0000 Volume : 1.00 Printed : 10:29:50 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	26.0	59.0	3730.5	3730.5
# 2	32.0	57.0	3705.5	3705.5
Mean	29.0	58.0	3718.0	3718.0
SD	4.2	1.4	17.7	17.7
%RSD	14.6	2.4	0.5	0.5

APPARENT CONCENTRATIONS
Identity 1 : ICSA Identity 2 : Type : INTRF
Weight : 1.0000 Volume : 1.00 Printed : 10:29:52 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	L	-0.0387	0.1026	3730.500	97.8586
# 2		0.0451	0.0985	3705.500	97.2018
Mean		0.0032	0.1006	3718.000	97.5302
SD		0.0593	0.0029	17.678	0.4645
%RSD		1841.7099	2.8495	0.475	0.4762

BACKGROUND CORRECTED INTENSITIES
Identity 1 : ICSAB Identity 2 : Type : ICSAB
Weight : 1.0000 Volume : 1.00 Printed : 10:32:44 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	26.0	76.0	3749.0	3749.0
# 2	21.0	56.0	3690.0	3690.0
Mean	23.5	66.0	3719.5	3719.5
SD	3.5	14.1	41.7	41.7
%RSD	15.0	21.4	1.1	1.1

EVOLUTION by Micro-Active Australia Pty Ltd 10:40:40 AM October 27, 2005 **010058**

APPARENT CONCENTRATIONS
Identity 1 : ICSAB Identity 2 : Type : ICSAB
Weight : 1.0000 Volume : 1.00 Printed : 10:32:44 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	L	-0.0404	0.1443	3749.000	98.3447
# 2	L	-0.1030	0.0966	3690.000	96.7945
Mean	L	-0.0717	0.1204	3719.500	97.5696
SD		0.0443	0.0337	41.719	1.0961
%RSD		61.7094	27.9959	1.122	1.1234

Keep last result visible enabled ...

Checking interference check standard ...
Identity 1 : ICSAB Identity 2 :

Report name	Low limit	Value	High limit	
K_766	0.000	-0.072	0.000	Failed
Na589	0.000	0.120	0.000	Failed

BACKGROUND CORRECTED INTENSITIES
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 10:36:36 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	1539.5	12172.0	3951.0	3951.0
# 2	1510.5	12196.0	3923.0	3923.0
Mean	1525.0	12184.0	3937.0	3937.0
SD	20.5	17.0	19.8	19.8
%RSD	1.3	0.1	0.5	0.5

APPARENT CONCENTRATIONS
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 10:36:36 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	19.2140	28.7842	3951.000 H	103.6521
# 2	18.9820	29.0472	3923.000 H	102.9164
Mean	19.0980	28.9157	3937.000 H	103.2843
SD	0.1640	0.1860	19.799	0.5202
%RSD	0.8590	0.6432	0.503	0.5037

Checking calibration verification ...
Identity 1 : CLP_CCV_SC Identity 2 :

Report name	Low limit	Value	High limit
K_766	18.000	19.098	22.000
Na589	27.000	28.916	33.000

BACKGROUND CORRECTED INTENSITIES
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 10:40:30 AM October 27, 2005

	K_766	Na589	Sc	Sc361

# 1	26.0	67.5	3925.0	3925.0
# 2	31.0	80.5	3889.0	3889.0
Mean	28.5	74.0	3907.0	3907.0
SD	3.5	9.2	25.5	25.5

010059

EVOLUTION by Micro-Active Australia Pty Ltd 10:45:32 AM October 27, 2005

%RSD	12.4	12.4	0.7	0.7

APPARENT CONCENTRATIONS
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 10:40:30 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc		Sc361 ppm
# 1	L	-0.0561	0.1155	3925.000	H	102.9690
# 2		0.0117	0.1483	3889.000	H	102.0231
Mean	L	-0.0222	0.1319	3907.000	H	102.4961
SD		0.0479	0.0232	25.456		0.6688
%RSD		215.9712	17.5679	0.652		0.6525

Checking calibration blank ...
Identity 1 : Calibration blank Identity 2 :

Report name	CRDL	Value	
K_766	0.100	-0.022	
Na589	0.050	0.132	Contaminated
Sc361	0.000	102.496	

BACKGROUND CORRECTED INTENSITIES
Identity 1 : pbw-K27H1 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:43:22 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	28.0	92.5	3754.5	3754.5
# 2	22.0	81.5	3715.5	3715.5
Mean	25.0	87.0	3735.0	3735.0
SD	4.2	7.8	27.6	27.6
%RSD	17.0	8.9	0.7	0.7

APPARENT CONCENTRATIONS
Identity 1 : pbw-K27H1 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:43:22 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	L	-0.0141	0.1851	3754.500	98.4892
# 2	L	-0.0914	0.1599	3715.500	97.4645
Mean	L	-0.0528	0.1725	3735.000	97.9769
SD		0.0547	0.0179	27.577	0.7246
%RSD		103.5484	10.3650	0.738	0.7395

BACKGROUND CORRECTED INTENSITIES
Identity 1 : lcsw-K27H1 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:45:06 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	1576.5	8334.0	3800.0	3800.0
# 2	1568.5	8331.0	3821.0	3821.0
Mean	1572.5	8332.5	3810.5	3810.5
SD	5.7	2.1	14.8	14.8
%RSD	0.4	0.0	0.4	0.4

CONCENTRATIONS
Identity 1 : lcsw-K27H1 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:45:06 AM October 27, 2005

	K_766	Na589	Sc	Sc361

EVOLUTION by Micro-Active Australia Pty Ltd 10:54:10 AM October 27, 2005

010060

	ppm	ppm		ppm
# 1	20.4828	20.4782	3800.000	99.6847
# 2	20.2628	20.3580	3821.000 H	100.2365
Mean	20.3728	20.4181	3810.500	99.9606
SD	0.1556	0.0850	14.849	0.3902
%RSD	0.7637	0.4161	0.390	0.3903

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268878 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:48:14 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	323.0	499.5	3772.0	3772.0
# 2	319.0	493.5	3745.0	3745.0
Mean	321.0	496.5	3758.5	3758.5
SD	2.8	4.2	19.1	19.1
%RSD	0.9	0.9	0.5	0.5

APPARENT CONCENTRATIONS
Identity 1 : 268878 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:48:14 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	3.9188	1.1938	3772.000	98.9490
# 2	3.8961	1.1877	3745.000	98.2396
Mean	3.9074	1.1908	3758.500	98.5943
SD	0.0160	0.0043	19.092	0.5016
%RSD	0.4104	0.3598	0.508	0.5088

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268879 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:51:06 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	529.5	590.5	3779.0	3779.0
# 2	513.5	599.5	3755.0	3755.0
Mean	521.5	595.0	3767.0	3767.0
SD	11.3	6.4	17.0	17.0
%RSD	2.2	1.1	0.5	0.5

APPARENT CONCENTRATIONS
Identity 1 : 268879 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:51:06 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	6.6600	1.4169	3779.000	99.1329
# 2	6.4906	1.4486	3755.000	98.5024
Mean	6.5753	1.4327	3767.000	98.8177
SD	0.1197	0.0225	16.971	0.4459
%RSD	1.8208	1.5682	0.451	0.4512

BACKGROUND CORRECTED INTENSITIES

Identity 1 : 268880 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:53:58 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	161.0	412.0	3751.5	3751.5

EVOLUTION by Micro-Active Australia Pty Ltd 11:00:02 AM October 27, 2005

010061

# 2	138.0	383.0	3718.5	3718.5
Mean	149.5	397.5	3735.0	3735.0
SD	16.3	20.5	23.3	23.3
%RSD	10.9	5.2	0.6	0.6

APPARENT CONCENTRATIONS
Identity 1 : 268880 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:53:58 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	1.7698	0.9823	3751.500	98.4104
# 2	1.4778	0.9184	3718.500	97.5434
Mean	1.6238	0.9504	3735.000	97.9769
SD	0.2065	0.0452	23.335	0.6131
%RSD	12.7167	4.7514	0.625	0.6258

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268881 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:56:52 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	137.5	250.5	3738.0	3738.0
# 2	139.5	290.5	3749.0	3749.0
Mean	138.5	270.5	3743.5	3743.5
SD	1.4	28.3	7.8	7.8
%RSD	1.0	10.5	0.2	0.2

APPARENT CONCENTRATIONS
Identity 1 : 268881 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:56:52 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	1.4613	0.5817	3738.000	98.0557
# 2	1.4827	0.6797	3749.000	98.3447
Mean	1.4720	0.6307	3743.500	98.2002
SD	0.0151	0.0693	7.778	0.2044
%RSD	1.0284	10.9877	0.208	0.2081

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268882 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:59:44 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	242.5	272.0	3748.0	3748.0
# 2	256.5	257.0	3729.0	3729.0
Mean	249.5	264.5	3738.5	3738.5
SD	9.9	10.6	13.4	13.4
%RSD	4.0	4.0	0.4	0.4

APPARENT CONCENTRATIONS
Identity 1 : 268882 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 10:59:44 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	2.8658	0.6337	3748.000	98.3184
# 2	3.0713	0.5995	3729.000	97.8192

010062

EVOLUTION by Micro-Active Australia Pty Ltd 11:09:04 AM October 27, 2005

Mean	2.9685	0.6166	3738.500	98.0688
SD	0.1453	0.0242	13.435	0.3530
%RSD	4.8943	3.9198	0.359	0.3599

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268883 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:02:38 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	172.0	564.0	3818.5	3818.5
# 2	147.0	552.0	3778.5	3778.5
Mean	159.5	558.0	3798.5	3798.5
SD	17.7	8.5	28.3	28.3
%RSD	11.1	1.5	0.7	0.7

APPARENT CONCENTRATIONS
Identity 1 : 268883 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:02:38 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	1.8768	1.3368	3818.500 H	100.1708
# 2	1.5679	1.3217	3778.500	99.1198
Mean	1.7224	1.3292	3798.500	99.6453
SD	0.2184	0.0107	28.284	0.7431
%RSD	12.6808	0.8026	0.745	0.7458

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268884 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:06:02 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	499.0	481.0	3785.5	3785.5
# 2	498.0	474.0	3761.5	3761.5
Mean	498.5	477.5	3773.5	3773.5
SD	0.7	4.9	17.0	17.0
%RSD	0.1	1.0	0.4	0.4

APPARENT CONCENTRATIONS
Identity 1 : 268884 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:06:02 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	6.2425	1.1436	3785.500	99.3037
# 2	6.2714	1.1338	3761.500	98.6731
Mean	6.2570	1.1387	3773.500	98.9884
SD	0.0205	0.0069	16.971	0.4459
%RSD	0.3270	0.6103	0.450	0.4504

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268885 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:08:54 AM October 27, 2005

# 1	232.0	238.0	3752.5	3752.5
# 2	241.0	254.0	3714.5	3714.5
Mean	236.5	246.0	3733.5	3733.5

010063

EVOLUTION by Micro-Active Australia Pty Ltd 11:16:02 AM October 27, 2005

SD	6.4	11.3	26.9	26.9
%RSD	2.7	4.6	0.7	0.7

APPARENT CONCENTRATIONS
Identity 1 : 268885 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:08:54 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	2.7211	0.5481	3752.500	98.4367
# 2	2.8748	0.5945	3714.500	97.4383
Mean	2.7980	0.5713	3733.500	97.9375
SD	0.1087	0.0328	26.870	0.7060
%RSD	3.8848	5.7406	0.720	0.7209

BACKGROUND CORRECTED INTENSITIES
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:11:46 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	1485.5	12034.5	3898.5	3898.5
# 2	1473.5	11835.5	3848.5	3848.5
Mean	1479.5	11935.0	3873.5	3873.5
SD	8.5	140.7	35.4	35.4
%RSD	0.6	1.2	0.9	0.9

APPARENT CONCENTRATIONS
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:11:46 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	18.7811	28.8423	3898.500 H	102.2727
# 2	18.8733	28.7338	3848.500 H	100.9590
Mean	18.8272	28.7881	3873.500 H	101.6159
SD	0.0652	0.0768	35.355	0.9289
%RSD	0.3462	0.2667	0.913	0.9142

Checking calibration verification ...
Identity 1 : CLP_CCV_SC Identity 2 :

Report name	Low limit	Value	High limit
K_766	18.000	18.827	22.000
Na589	27.000	28.788	33.000

BACKGROUND CORRECTED INTENSITIES
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 11:15:38 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	21.0	61.0	3932.0	3932.0
# 2	24.0	52.0	3859.0	3859.0
Mean	22.5	56.5	3895.5	3895.5
SD	2.1	6.4	51.6	51.6
%RSD	9.4	11.3	1.3	1.3

Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 11:15:38 AM October 27, 2005

010064

		K_766	Na589	Sc		Sc361
EVOLUTION by Micro-Active Australia Pty Ltd 11:21:34 AM October 27, 2005						
		ppm	ppm			ppm
# 1	L	-0.1206	0.0998	3932.000	H	103.1529
# 2	L	-0.0764	0.0807	3859.000	H	101.2349
Mean	L	-0.0985	0.0902	3895.500	H	102.1939
SD		0.0313	0.0135	51.619		1.3562
%RSD		31.7121	14.9525	1.325		1.3271

Keep last result visible enabled ...

Checking calibration blank ...
Identity 1 : Calibration blank Identity 2 :

Report name	CRDL	Value	
K_766	0.100	-0.099	
Na589	0.050	0.090	Contaminated
Sc361	0.000	102.194	

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268886 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:18:32 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	122.0	239.5	3730.0	3730.0
# 2	128.0	230.5	3681.0	3681.0
Mean	125.0	235.0	3705.5	3705.5
SD	4.2	6.4	34.6	34.6
%RSD	3.4	2.7	0.9	0.9

APPARENT CONCENTRATIONS
Identity 1 : 268886 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:18:32 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	1.2562	0.5555	3730.000	97.8455
# 2	1.3601	0.5406	3681.000	96.5581
Mean	1.3082	0.5480	3705.500	97.2018
SD	0.0735	0.0105	34.648	0.9104
%RSD	5.6167	1.9202	0.935	0.9366

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268887 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:21:24 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	59.0	305.0	3749.0	3749.0
# 2	59.0	301.0	3713.0	3713.0
Mean	59.0	303.0	3731.0	3731.0
SD	0.0	2.8	25.5	25.5
%RSD	0.0	0.9	0.7	0.7

APPARENT CONCENTRATIONS
Identity 1 : 268887 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:21:24 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm

# 2	0.4101	0.7132	3713.000	97.3988
Mean	0.4063	0.7146	3731.000	97.8718
SD	0.0054	0.0019	25.456	0.6688

010065

EVOLUTION by Micro-Active Australia Pty Ltd 11:29:04 AM October 27, 2005

%RSD	1.3361	0.2672	0.682	0.6834

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268888 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:24:16 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	126.0	239.5	3716.5	3716.5
# 2	127.0	198.5	3708.5	3708.5
Mean	126.5	219.0	3712.5	3712.5
SD	0.7	29.0	5.7	5.7
%RSD	0.6	13.2	0.2	0.2

APPARENT CONCENTRATIONS
Identity 1 : 268888 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:24:16 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	1.3163	0.5576	3716.500	97.4908
# 2	1.3336	0.4555	3708.500	97.2806
Mean	1.3249	0.5066	3712.500	97.3857
SD	0.0122	0.0722	5.657	0.1486
%RSD	0.9204	14.2603	0.152	0.1526

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268889 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:27:10 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	53.5	266.5	3711.5	3711.5
# 2	53.5	259.5	3696.5	3696.5
Mean	53.5	263.0	3704.0	3704.0
SD	0.0	4.9	10.6	10.6
%RSD	0.0	1.9	0.3	0.3

APPARENT CONCENTRATIONS
Identity 1 : 268889 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:27:10 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	0.3359	0.6265	3711.500	97.3594
# 2	0.3388	0.6115	3696.500	96.9653
Mean	0.3373	0.6190	3704.000	97.1624
SD	0.0021	0.0106	10.607	0.2787
%RSD	0.6168	1.7128	0.286	0.2868

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268889d Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:28:52 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	42.0	253.5	3694.5	3694.5
# 2	69.0	254.5	3693.5	3693.5

Mean	55.5	254.0	3694.0	3694.0
SD	19.1	0.7	0.7	0.7
%RSD	34.4	0.3	0.0	0.0

EVOLUTION by Micro-Active Australia Pty Ltd 11:36:32 AM October 27, 2005 010066

APPARENT CONCENTRATIONS
Identity 1 : 268889d Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:28:52 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	0.1826	0.5967	3694.500	96.9128
# 2	0.5505	0.5994	3693.500	96.8865
Mean	0.3666	0.5980	3694.000	96.8996
SD	0.2602	0.0019	0.707	0.0186
%RSD	70.9735	0.3201	0.019	0.0192

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268889s Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:30:36 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	1616.0	8546.5	3834.0	3834.0
# 2	1596.0	8500.5	3834.0	3834.0
Mean	1606.0	8523.5	3834.0	3834.0
SD	14.1	32.5	0.0	0.0
%RSD	0.9	0.4	0.0	0.0

APPARENT CONCENTRATIONS
Identity 1 : 268889s Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:30:36 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	20.8160	20.8148	3834.000 H	100.5780
# 2	20.5536	20.7026	3834.000 H	100.5780
Mean	20.6848	20.7587	3834.000 H	100.5780
SD	0.1856	0.0794	0.000	0.0000
%RSD	0.8972	0.3824	0.000	0.0000

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268890 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:33:30 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	168.5	321.0	3787.5	3787.5
# 2	182.5	298.0	3793.5	3793.5
Mean	175.5	309.5	3790.5	3790.5
SD	9.9	16.3	4.2	4.2
%RSD	5.6	5.3	0.1	0.1

APPARENT CONCENTRATIONS
Identity 1 : 268890 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:33:30 AM October 27, 2005

	K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	1.8489	0.7477	3787.500	99.3563
# 2	2.0310	0.6897	3793.500	99.5139

SD	0.1288	0.0410	4.243	0.1115
%RSD	6.6386	5.7056	0.112	0.1121

BACKGROUND CORRECTED INTENSITIES

010067

EVOLUTION by Micro-Active Australia Pty Ltd 11:42:32 AM October 27, 2005

Identity 1 : 268891 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:36:22 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	175.0	146.5	3787.5	3787.5
# 2	157.0	178.5	3746.5	3746.5
Mean	166.0	162.5	3767.0	3767.0
SD	12.7	22.6	29.0	29.0
%RSD	7.7	13.9	0.8	0.8

APPARENT CONCENTRATIONS
Identity 1 : 268891 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:36:22 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	1.9352	0.3166	3787.500	99.3563
# 2	1.7190	0.4004	3746.500	98.2790
Mean	1.8271	0.3585	3767.000	98.8177
SD	0.1529	0.0593	28.991	0.7617
%RSD	8.3701	16.5468	0.770	0.7708

BACKGROUND CORRECTED INTENSITIES
Identity 1 : 268892 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:39:14 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	56.0	805.5	3866.0	3866.0
# 2	54.0	780.5	3845.0	3845.0
Mean	55.0	793.0	3855.5	3855.5
SD	1.4	17.7	14.8	14.8
%RSD	2.6	2.2	0.4	0.4

APPARENT CONCENTRATIONS
Identity 1 : 268892 Identity 2 : pg61-188 Type : SAMPLE
Weight : 1.0000 Volume : 1.00 Printed : 11:39:14 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	0.3394	1.9044	3866.000 H	101.4188
# 2	0.3172	1.8542	3845.000 H	100.8671
Mean	0.3283	1.8793	3855.500 H	101.1429
SD	0.0157	0.0355	14.849	0.3902
%RSD	4.7788	1.8887	0.385	0.3857

BACKGROUND CORRECTED INTENSITIES
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:42:06 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	1472.0	11979.0	3922.5	3922.5
# 2	1473.0	11951.0	3894.5	3894.5
Mean	1472.5	11965.0	3908.5	3908.5
SD	0.7	19.8	19.8	19.8

APPARENT CONCENTRATIONS
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:42:06 AM October 27, 2005 010068
EVOLUTION by Micro-Active Australia Pty Ltd 11:49:02 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	18.4906	28.5332	3922.500 H	102.9033
# 2	18.6393	28.6714	3894.500 H	102.1676
Mean	18.5650	28.6023	3908.500 H	102.5355
SD	0.1051	0.0977	19.799	0.5202
%RSD	0.5662	0.3416	0.507	0.5073

Checking calibration verification ...
Identity 1 : CLP_CCV_SC Identity 2 :

Report name	Low limit	Value	High limit
K_766	18.000	18.565	22.000
Na589	27.000	28.602	33.000

BACKGROUND CORRECTED INTENSITIES
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 11:46:00 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	19.5	61.5	3931.5	3931.5
# 2	30.5	89.5	3862.5	3862.5
Mean	25.0	75.5	3897.0	3897.0
SD	7.8	19.8	48.8	48.8
%RSD	31.1	26.2	1.3	1.3

APPARENT CONCENTRATIONS
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 11:46:00 AM October 27, 2005

		K_766	Na589	Sc	Sc361
		ppm	ppm		ppm
# 1	L	-0.1398	0.1010	3931.500 H	103.1398
# 2		0.0079	0.1714	3862.500 H	101.3269
Mean	L	-0.0659	0.1362	3897.000 H	102.2333
SD		0.1045	0.0498	48.790	1.2819
%RSD		158.4412	36.5776	1.252	1.2539

Checking calibration blank ...
Identity 1 : Calibration blank Identity 2 :

Report name	CRDL	Value	
K_766	0.100	-0.066	
Na589	0.050	0.136	Contaminated
Sc361	0.000	102.233	

BACKGROUND CORRECTED INTENSITIES
Identity 1 : CRI Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:48:52 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	12.0	79.5	3880.0	3880.0
# 2	18.0	72.5	3820.0	3820.0
Mean	15.0	76.0	3850.0	3850.0
SD	4.2	4.9	42.4	42.4
%RSD	28.3	6.5	1.1	1.1

APPARENT CONCENTRATIONS
Identity 1 : CRI Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:48:52 AM October 27, 2005

010069

EVOLUTION by Micro-Active Australia Pty Ltd 11:55:02 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc		Sc361 ppm
# 1	L	-0.2337	0.1463	3880.000	H	101.7867
# 2	L	-0.1523	0.1322	3820.000	H	100.2102
Mean	L	-0.1930	0.1393	3850.000	H	100.9984
SD		0.0576	0.0100	42.426		1.1147
%RSD		29.8461	7.1780	1.102		1.1037

Checking calibration verification ...
Identity 1 : CRI Identity 2 :

Report name	Low limit	Value	High limit	
K_766	0.900	-0.193	1.100	Failed
Na589	0.900	0.139	1.100	Failed

BACKGROUND CORRECTED INTENSITIES
Identity 1 : ICSA Identity 2 : Type : INTRF
Weight : 1.0000 Volume : 1.00 Printed : 11:51:44 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	19.0	55.5	3711.0	3711.0
# 2	26.0	82.5	3672.0	3672.0
Mean	22.5	69.0	3691.5	3691.5
SD	4.9	19.1	27.6	27.6
%RSD	22.0	27.7	0.7	0.7

APPARENT CONCENTRATIONS
Identity 1 : ICSA Identity 2 : Type : INTRF
Weight : 1.0000 Volume : 1.00 Printed : 11:51:44 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	L	-0.1318	0.0945	3711.000	97.3463
# 2	L	-0.0331	0.1648	3672.000	96.3216
Mean	L	-0.0824	0.1297	3691.500	96.8339
SD		0.0698	0.0497	27.577	0.7246
%RSD		84.6175	38.3281	0.747	0.7483

BACKGROUND CORRECTED INTENSITIES
Identity 1 : ICSAB Identity 2 : Type : ICSAB
Weight : 1.0000 Volume : 1.00 Printed : 11:54:36 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	15.0	65.5	3696.0	3696.0
# 2	33.0	77.5	3669.0	3669.0
Mean	24.0	71.5	3682.5	3682.5
SD	12.7	8.5	19.1	19.1
%RSD	53.0	11.9	0.5	0.5

APPARENT CONCENTRATIONS
Identity 1 : ICSAB Identity 2 : Type : ICSAB
Weight : 1.0000 Volume : 1.00 Printed : 11:54:38 AM October 27, 2005

		K_766 ppm	Na589 ppm	Sc	Sc361 ppm
# 1	L	-0.1852	0.1204	3696.000	96.9522

Mean	L	-0.0610	0.1363	3682.500	96.5975
SD		0.1756	0.0225	19.092	0.5016
%RSD		287.8815	16.5067	0.518	0.5193

EVOLUTION by Micro-Active Australia Pty Ltd 12:02:34 PM October 27, 2005

010070

Keep last result visible enabled ...

Checking interference check standard ...
Identity 1 : ICSAB Identity 2 :

Report name	Low limit	Value	High limit	
K_766	0.000	-0.061	0.000	Failed
Na589	0.000	0.136	0.000	Failed

BACKGROUND CORRECTED INTENSITIES
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:58:30 AM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	1493.0	12061.5	3936.0	3936.0
# 2	1516.0	11880.5	3904.0	3904.0
Mean	1504.5	11971.0	3920.0	3920.0
SD	16.3	128.0	22.6	22.6
%RSD	1.1	1.1	0.6	0.6

APPARENT CONCENTRATIONS
Identity 1 : CLP_CCV_SC Identity 2 : Type : CV
Weight : 1.0000 Volume : 1.00 Printed : 11:58:30 AM October 27, 2005

	K_766	Na589	Sc	Sc361
	ppm	ppm		ppm
# 1	18.6943	28.6313	3936.000 H	103.2580
# 2	19.1471	28.4325	3904.000 H	102.4172
Mean	18.9207	28.5319	3920.000 H	102.8376
SD	0.3202	0.1406	22.627	0.5945
%RSD	1.6923	0.4927	0.577	0.5781

Checking calibration verification ...
Identity 1 : CLP_CCV_SC Identity 2 :

Report name	Low limit	Value	High limit
K_766	18.000	18.921	22.000
Na589	27.000	28.532	33.000

BACKGROUND CORRECTED INTENSITIES
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 12:02:24 PM October 27, 2005

	K_766	Na589	Sc	Sc361
# 1	21.0	103.5	3935.0	3935.0
# 2	24.0	80.5	3861.0	3861.0
Mean	22.5	92.0	3898.0	3898.0
SD	2.1	16.3	52.3	52.3
%RSD	9.4	17.7	1.3	1.3

APPARENT CONCENTRATIONS
Identity 1 : Calibration blank Identity 2 : Type : CB
Weight : 1.0000 Volume : 1.00 Printed : 12:02:24 PM October 27, 2005

		K_766	Na589	Sc	Sc361
		ppm	ppm		ppm
# 1	L	-0.1208	0.2007	3935.000 H	103.2317
# 2	L	-0.0766	0.1497	3861.000 H	101.2874

Mean	L	-0.0987	0.1752	3898.000 H	102.2596
SD		0.0313	0.0361	52.326	1.3748
%RSD		31.6838	20.5939	1.342	1.3444

EVOLUTION by Micro-Active Australia Pty Ltd 12:04:10 PM October 27, 2005 **010071**

Checking calibration blank ...
Identity 1 : Calibration blank Identity 2 :

Report name	CRDL	Value	
K_766	0.100	-0.099	
Na589	0.050	0.175	Contaminated
Sc361	0.000	102.260	

Southwest Research Institute

Electronic Bench Sheet

Total Organic Carbon (TOC)

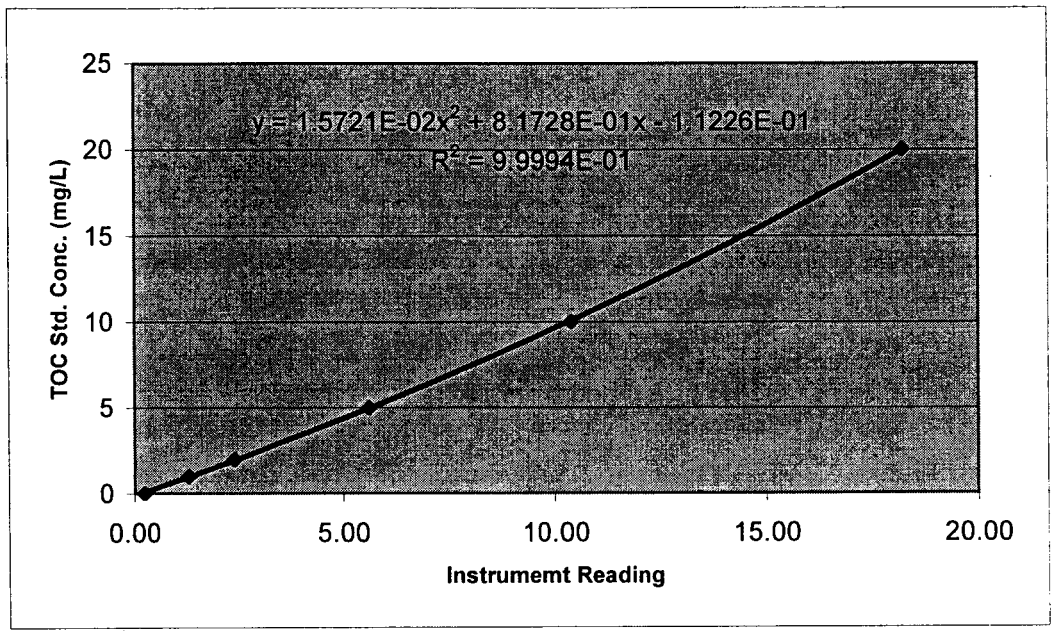
RSpies 11/3/05

Project #	03159.34.006, 06685.51.006, 06002.01.322		Date:	11/03/05 0:00
Client:	M&E, EPA, Div 20		Analyst:	RSpies
Method:	415.2, 415.1		MDL:	1 mg/L
TO#	051027-1, 051024-5, 051021-6			

J Warren G. Naegli 11/07/05

Standardization:

True Value mg/L	Average Instrument Reading	Original Instrument	Duplicate Instrument	Recalc Values (mg/kg)
20	18.21	18.09	18.33	19.98
10	10.380	10.35	10.41	10.065
5	5.608	5.611	5.605	4.965
2	2.391	2.382	2.400	1.932
1	1.295	1.241	1.349	0.972
0	0.237	0.225	0.248	0.082



Quadratic Coefficients:

Ao	-1.1226E-01
A1	8.1728E-01
A2	1.5721E-02
Coff.	0.99994

Conc. (mg/L) from curve = A2 (Reading)2 + [A1 x (Reading)] + A1

P116 RSS 11/15/05

NOTES: Calibration Std from ID # 31-08-WCS2. Prepared at 4000 mg/L on 11/03/05. Expiration: 11/03/06.

ICV ERA Lot ~~P085~~516 Concentrate TV = 13040 mg/L (65.2 X 200); 1:200 dilution TV = 65.2 mg/L

2% Potassium Persulfate prepared 11/02/05, exp. 11/02/06 (TOC p 07 089)

CO2 Check Solution: 31-09-WCS2

268825S, 268901S, 268888S - Spiked at 6.52 mg/L

Injection Vol: 1000 ul

SIG Figs: 3

010072

Conc. mg/L or mg/kg = mg/L from curve x (1000 / (Sample Aliquot))

Southwest Research Institute

Electronic Bench Sheet

Total Organic Carbon (TOC)

Project #	03159.34.006, 06685.51.006, 06002.01.322	Date:	11/03/05 0:00
Client:	M&E, EPA, Div 20	Analyst:	RSpies
Method:	415.2, 415.1	MDL:	1 mg/L
TO#	051027-1, 051024-5, 051021-6		

Seq #	Sample ID	Sample Vol (ul or mg)	%Solids	Instument Reading	Conc.	Units	RL	Comments %Rec	%RPD	Avg
1	ICV	200	100%	12.67	63.8	mg/L	5	97.9% R, TV = 65.2 mg/L		
2	ICB	1000	100%	0.332	<1.0	mg/L	1			
3	LFB	1000	100%	1.341	1.01	mg/L	1	101% R, TV = 1.0 mg/L		
4	CO2 CHECK	1000	100%	0.415	<1.0	mg/L	1			
5	BLK	1000	100%	0.058	<1.0	mg/L	1			
6	268755	1000	100%	4.619	4.00	mg/L	1			
7	268755D	1000	100%	4.293	3.69	mg/L	1		8.12%	
8	268756	1000	100%	14.85	15.5	mg/L	1			
9	268756D	1000	100%	13.41	13.7	mg/L	1		12.5%	
10	268757	100	100%	6.439	58.0	mg/L	10	Void - overcurve		
11	268757	100	100%	6.735	61.1	mg/L	10			
12	CCV	200	100%	12.99	65.8	mg/L	5	101% R, TV = 65.2 mg/L		
13	CCB	1000	100%	0.208	<1.0	mg/L	1			
14	268839	1000	100%	1.504	1.15	mg/L	1			
15	268839D	1000	100%	1.597	1.23	mg/L	1		6.75%	
16	268840	1000	100%	9.597	9.18	mg/L	1			
17	268840D	1000	100%	10.09	9.73	mg/L	1		5.87%	
18	268841	1000	100%	0.977	<1.0	mg/L	1			
19	268841D	1000	100%	1.125	<1.0	mg/L	1		0.00%	
20	268825	1000	100%	2.206	1.77	mg/L	1			
21	268825D	1000	100%	2.295	1.85	mg/L	1		4.37%	
22	268825S	1000	100%	8.159	7.60	mg/L	1	89.5% R, TV = 6.52 mg/L		
23	CCV	200	100%	12.86	65.0	mg/L	5	99.7% R, TV = 65.2 mg/L		
24	CCB	1000	100%	0.173	<1.0	mg/L	1			
25	268826	1000	100%	10.22	9.88	mg/L	1			
26	268826D	1000	100%	9.767	9.37	mg/L	1		5.32%	
27	268827	1000	100%	3.095	2.57	mg/L	1			
28	268827D	1000	100%	3.218	2.68	mg/L	1		4.30%	
29	268828	1000	100%	3.933	3.35	mg/L	1			
30	268828D	1000	100%	3.313	2.77	mg/L	1		18.9%	
31	CCV	200	100%	13.27	67.5	mg/L	5	104% R, TV = 65.2 mg/L		

010073

Conc. mg/L or mg/kg = mg/L from curve x (1000 / (Sample Aliquot))

Southwest Research Institute

Electronic Bench Sheet

Total Organic Carbon (TOC)

Project # 03159.34.006, 06685.51.006, 06002.01.322
Client: M&E, EPA, Div 20
Method: 415.2, 415.1
TO# 051027-1, 051024-5, 051021-6

Date: 11/03/05 0:00
Analyst: RSpies
MDL: 1 mg/L

32	CCB	1000	100%	0.217	<1.0	mg/L	1			
33	VOID	1000	100%	0	<1.0	mg/L	1	printer malfunction		
34	VOID	1000	100%	0	<1.0	mg/L	1	printer malfunction		
35	268901	1000	100%	2.714	2.22	mg/L	1			
36	**268901**	1000	100%	2.926	2.41	mg/L	1		8.29%	**2.32 mg/L**
37	268901D	1000	100%	3.806	3.23	mg/L	1	void - lamp off		
38	268901D	1000	100%	2.838	2.33	mg/L	1			
39	**268901D**	1000	100%	2.853	2.35	mg/L	1		0.58%	**2.34 mg/L**
40	268901S	1000	100%	9.294	8.84	mg/L	1			
41	**268901S**	1000	100%	9.433	9.00	mg/L	1		1.73%	**8.92 mg/L**
42	268902	1000	100%	3.268	2.73	mg/L	1			
43	**268902**	1000	100%	2.957	2.44	mg/L	1		11.0%	**2.58 mg/L**
44	CCV	200	100%	13.20	67.1	mg/L	5	103% R, TV = 65.2 mg/L		
45	CCB	1000	100%	0.146	<1.0	mg/L	1			
46	268909	1000	100%	3.177	2.64	mg/L	1	void - low flow		
47	268909	1000	100%	3.005	2.49	mg/L	1	void - low flow		
48	268909	1000	100%	3.487	2.93	mg/L	1			
49	**268909**	1000	100%	3.116	2.59	mg/L	1		12.4%	**2.76 mg/L**
50	CCV	200	100%	13.36	68.1	mg/L	5	104% R, TV = 65.2 mg/L		
51	CCB	1000	100%	0.318	<1.0	mg/L	1			
52	268892	500	100%	13.60	27.8	mg/L	2			
53	**268892**	500	100%	13.66	28.0	mg/L	2		0.54%	**27.9 mg/L**
54	268880	500	100%	73.59	290	mg/L	2	Void - overcurve		
55	268880	100	100%	17.36	188	mg/L	10			
56	**268880**	100	100%	17.05	184	mg/L	10		2.26%	**186 mg/L**
57	268882	500	100%	78.30	321	mg/L	2	Void - overcurve		
58	VOID	1000	100%	0	<1.0	mg/L	1			
59	268882	300	100%	50.73	273	mg/L	3	Void - overcurve		
60	268882	100	100%	19.28	215	mg/L	10	Void - overcurve		
61	CCV	200	100%	13.48	68.8	mg/L	5	106% R, TV = 65.2 mg/L		
62	CCB	1000	100%	0.323	<1.0	mg/L	1			
63	268882	50	100%	9.521	182	mg/L	20	* 500 uL of 1:10 (1 mL -> 10 mL 0.2% H2SO4)		
64	**268882**	50	100%	9.138	173	mg/L	20	" "	4.79%	**178 mg/L**
65	268881	100	100%	42.45	629	mg/L	10	Void - overcurve		
66	268881	30	100%	13.61	464	mg/L	33	* 300 uL of 1:10 (1 mL -> 10 mL 0.2% H2SO4)		

010074

Conc. mg/L or mg/kg = mg/L from curve x (1000 / (Sample Aliquot))

Southwest Research Institute

Electronic Bench Sheet

Total Organic Carbon (TOC)

Project #	03159.34.006, 06685.51.006, 06002.01.322	Date:	11/03/05 0:00
Client:	M&E, EPA, Div 20	Analyst:	RSpies
Method:	415.2, 415.1	MDL:	1 mg/L
TO#	051027-1, 051024-5, 051021-6		

67	**268881**	30	100%	14.06	483	mg/L	33	" "	3.97%	**473 mg/L**
68	268883	50	100%	70.78	2730	mg/L	20	Void - overcurve		
69	268883	5	100%	14.10	2907	mg/L	200	* 500 uL of 1:100 (0.1 mL -> 10 mL 0.2% H2SO4)		
70	**268883**	5	100%	13.67	2800	mg/L	200	" "	3.78%	**2853 mg/L**
71	268884	50	100%	73.13	2875	mg/L	20	* 500 uL of 1:10 (1 mL -> 10 mL 0.2% H2SO4)		
72	268884	5	100%	9.337	1778	mg/L	200	* 500 uL of 1:100 (0.05 mL -> 5 mL 0.2% H2SO4)		
73	**268884**	5	100%	9.461	1805	mg/L	200	" "	1.54%	**1792 mg/L**
74	CCV	200	100%	12.95	65.5	mg/L	5	101% R, TV = 65.2 mg/L		
75	CCB	1000	100%	0.561	<1.0	mg/L	1			
76	268883R	5	100%	13.84	2842	mg/L	200			
77	268885	50	100%	2.070	32.9	mg/L	20	* 500 uL of 1:10 (1 mL -> 10 mL 0.2% H2SO4)		
78	268885	100	100%	4.192	35.9	mg/L	10	" "	void- hung @ baseline	
79	268885	100	100%	3.452	29.0	mg/L	10	" "		
80	**268885**	100	100%	3.319	27.7	mg/L	10	" "	4.33%	**28.3 mg/L**
81	268886	50	100%	3.194	53.2	mg/L	20	* 500 uL of 1:10 (1 mL -> 10 mL 0.2% H2SO4)		
82	**268886**	50	100%	3.387	56.7	mg/L	20	" "	6.47%	**54.9 mg/L**
83	268886	100	100%	6.248	56.1	mg/L	10	straight		
84	268887	100	100%	25.68	312	mg/L	10	* 500 uL of 1:10 (1 mL -> 10 mL 0.2% H2SO4)		
85	268887	50	100%	12.93	262	mg/L	20			
86	268887	100	100%	24.75	297	mg/L	10	void-overrange		
87	CCV	1000	100%	17.16	18.5	mg/L	1	void - lamp off		
88	CCV	200	100%	13.19	67.0	mg/L	5	103% R, TV = 65.2 mg/L		
89	CCB	1000	100%	0.230	<1.0	mg/L	1			
90	**268887**	50	100%	13.97	287	mg/L	20		9.40%	**275 mg/L**
91	268888	500	100%	4.723	8.20	mg/L	2	void - rerun w/ 1000 ul		
92	268888	1000	100%	8.962	8.47	mg/L	1			
93	**268888**	1000	100%	8.751	8.24	mg/L	1		2.77%	**8.36 mg/L**
94	268888D	1000	100%	8.680	8.17	mg/L	1			
95	**268888D**	1000	100%	8.963	8.48	mg/L	1		3.72%	**8.32 mg/L**
96	268888S	1000	100%	18.64	20.6	mg/L	1	void-overrange		
97	268888S	1000	100%	29.92	38.4	mg/L	1	void-overrange		
98	268888	500	100%	4.285	7.36	mg/L	2			
99	CCV	200	100%	12.77	64.4	mg/L	5	98.8% R, TV = 65.2 mg/L		
100	CCB	1000	100%	0.204	<1.0	mg/L	1			
101	268888S	1000	100%	13.62	13.9	mg/L	1			

010075

Conc. mg/L or mg/kg = mg/L from curve x (1000 / (Sample Aliquot))

Southwest Research Institute

Electronic Bench Sheet

Total Organic Carbon (TOC)

Project # 03159.34.006, 06685.51.006, 06002.01.322
Client: M&E, EPA, Div 20
Method: RSS 415.2, 415.1
TO# 11/8/05 ~~051027-1,~~ 051024-5, 051021-6

Date: 11/03/05 0:00
Analyst: RSpies
MDL: 1 mg/L

102	**268888S** 051118005	1000	100%	14.70	15.3	mg/L	1		9.33%	**14.6 mg/L**
103	268889	1000	100%	9.415	8.98	mg/L	1			
104	**268889**	1000	100%	9.478	9.05	mg/L	1		0.78%	**9.01 mg/L**
105	268890	500	100%	3.883	6.60	mg/L	2			
106	**268890**	500	100%	3.752	6.35	mg/L	2		3.79%	**6.47 mg/L**
107	268891	500	100%	1.447	2.21	mg/L	2			
108	**268891**	500	100%	1.332	2.01	mg/L	2		9.40%	**2.11 mg/L**
109	268890	500	100%	3.648	6.16	mg/L	2			
110	CCV	200	100%	12.72	64.1	mg/L	5	98.4% R, TV = 65.2 mg/L		
111	CCB	1000	100%	0.228	<1.0	mg/L	1			
112	268879	1000	100%	241.5	1114	mg/L	1	void-overrange		
113	268879	5	100%	3.872	658	mg/L	1	* 500 uL of 1:100 (0.1 mL -> 10 mL 0.2% H2SO4)		
114	268879	10	100%	8.320	778	mg/L	200	* 1000 uL of 1:100 (0.1 mL -> 10 mL 0.2% H2SO4)		
115	**268878**	10	100%	8.131	757	mg/L	100	" "	2.65%	**767 mg/L**
116	268879	500	100%	2.391	3.86	mg/L	2			
117	**268879**	500	100%	2.223	3.56	mg/L	2		8.05%	**3.71 mg/L**
118	CCV	200	100%	13.47	68.7	mg/L	5	105% R, TV = 65.2 mg/L		
119	CCB	1000	100%	0.222	<1.0	mg/L	1			

Sample calc 268755 =

$$\left[1.572\times10^{-2}(4.619)^2 + 8.1728\times10^{-1}(4.619) - 1.1226\times10^{-1}\right]\times\frac{1000}{1000} =$$

$$= 4.00 \text{ mg/L}$$

010076

Conc. mg/L or mg/kg = mg/L from curve x (1000 / (Sample Aliquot))

Southwest Research Institute
TOC Logbook

010077

03159-34.006 M+E
06685.51.006 EPA

Method: 415.2, 415.1 Project #: 06002.01.322 DIV20

Client: M+E, EPA, DIV20 Task Order #: 051027-1, 051024-5, 051021-6

STANDARDS:

Standard	LOT #
KHP	31-08-WCS2

QUALITY CONTROL:

Standard ID	LOT #	TV (mg/L)
ERA Inorg 5383 P	116-516	65.2
ERA		

SAMPLES:

Solids: Air Dried? (Yes / No)
Ground? (Yes / No)

Samples requiring Inorganic Carbon Pretreatment:

Waters: Acidified and Sparged samples:
- Sparged samples for 5 mins.
- EPA + M+E were preserved <2.
DIV20 samples. Sparged for 5 min

NOTES: Unimetrics Corp 070-1000

Balance #34

0.1001
0.1005 } 100ul
0.1005

0.5014
0.5003 } 500ul
0.5002

Analyst Signature: R Smir Date: 11/3/05

Reviewed by: Wanda A. Naegli Date: 11/7/05

Logbook# - Page # 07 091

FRM-278 (Rev 1/Mar 03)
Page 1 of 2

010078

Southwest Research Institute
TOC Logbook

03159.34.006 M+E
06685.51.006 EPA

Method: 415.2, 415.1 Project #: 06002.01.322 DIV20

Client: M+E, EPA, DIV20 Task Order #: 051027-1, 051024-5, 051021-6

Used for TOC Printouts/Notes/Instrum

RSpies 11/6/05

CAL -- 1 ML
CAL AVE 4.850
CAL ADJ 9.997

1 TOC 18.09 20
2 TOC 18.37 WAN 11/07/05
3 TOC 18.33 20
4 TOC 9.690
5 TOC 10.35 10
6 TOC 10.41 10
7 TOC 5.611 5
8 TOC 5.605 5
9 TOC 2.382 2
10 TOC 2.400 2
11 TOC 1.241 1
12 TOC 1.349 1
13 TOC 0.343
14 TOC 0.225 0
15 TOC 0.248 0
1 TOC 12.67 ICV
2 TOC 0.332 ICB
3 TOC 1.341 LFB
4 TOC 0.415 CO_2 check
5 TOC 0.058 BLK
6 TOC 4.619 268755
7 TOC 4.293 268755D
8 TOC 14.85 268756
9 TOC 13.41 268756D
10 TOC 6.439 268757
11 TOC 6.735 268757D
12 TOC 12.99 CCV
13 TOC 0.208 CCB
14 TOC 1.504 268839
15 TOC 1.597 268839D
16 TOC 9.597 268840
17 TOC 10.09 268840D
18 TOC 0.977 268841
19 TOC 1.125 268841D
20 TOC 2.206 268825
21 TOC 2.295 268825D
22 TOC 8.159 268825S
23 TOC 12.86 CCV
24 TOC 0.173 CCB
25 TOC 10.22 268826
26 TOC 9.767 268826D
27 TOC 3.095 268827
28 TOC 3.218 268827D
29 TOC 3.933 268828
30 TOC 3.313 268828D

RSpies 11/6/05

cont to p. 07094

Analyst Signature: RSpies Date: 11/3/05

Reviewed by: Warren A. Naegeli Date: 11/7/05

Logbook# - Page # 07 092

010079

Southwest Research Institute
TOC Logbook

Method: 415.2, 415.1

Project #: 03159-34-006 M+E, 06685.51.006 EPA, 06002.01.322 DIV20

Client: M+E, EPA, DIV20

Task Order #: 051027-1, 051024-5, 051021-6

STANDARDS:

Standard	LOT #
KHP	

QUALITY CONTROL:

Standard ID	LOT #	TV (mg/L)
ERA		
ERA		

(See page 07-091)

SAMPLES:

Solids: Air Dried? (Yes / No)
Ground? (Yes / No)

Samples requiring Inorganic Carbon Pretreatment:

Waters: Acidified and Sparged samples:

See pg. 07 091

NOTES: See pg. 07 091

Analyst Signature: [signature] Date: 11/3/05

Reviewed by: [signature] Date: 11/7/05

Logbook# - Page # 07 093

Southwest Research Institute
TOC Logbook

010080

11/4/05 RSS

Method: ~~Sec~~ 415.2, 415.1

Project #: 03159.34.006 M+E; 06685.51.006 EPA; 06002.01.322 DIV20

Client: M+E, EPA, DIV20

Task Order #: 051027-1, 051024-5, 051021-6

cont from p. 07 092

Space provided for TOC Printouts/Notes/Instrument Maintenance:

31 TOC 13.27 CCV
32 TOC 0.217 CCB
33 TOC 1.112 VOID
34 TOC 1.139 VOID
35 TOC 2.714 268901
36 2.926 268901
37 TOC 3.806 268901D
38 TOC 2.838 268901D
39 TOC 2.853 268901D
40 TOC 9.294 268901S
41 TOC 9.433 268901S
42 TOC 3.268 268902
43 TOC 2.957 268902
44 TOC 13.20 CCV
45 TOC 0.146 CCB
46 TOC 3.177 268909
47 TOC 3.005 268909
48 TOC 3.487 268909
49 TOC 3.116 268909
50 TOC 13.36 CCV
51 TOC 0.318 CCB
52 TOC 13.60 268882
53 TOC 13.66 268882
54 TOC 73.59 VOID
55 TOC 17.36 268880
56 TOC 17.05 268880
57 TOC 38.30 VOID
58 TOC 0.000 VOID
59 TOC 50.73 VOID
60 TOC 19.28 VOID
61 TOC 13.48 CCV
62 TOC 0.323 CCB
63 TOC 9.521 268882
64 TOC 9.138 268882
65 TOC 42.45 VOID
66 TOC 13.61 268881
67 TOC 14.06 268881
68 TOC 70.78 VOID
69 TOC 14.10 268883
70 TOC 13.67 268883
71 TOC 73.13 VOID
72 TOC 9.337 268884
73 TOC 9.461 268884
74 TOC 12.95 CCV
75 TOC 0.561 CCB

R Spurs 11/6/05

R Spurs 11/6/05

cont to p. 07 09

Analyst Signature: R Spurs

Date: 11/03/05

Reviewed by: Walter A. Maggi

Date: 11/7/05 RSS 11/3/05

Logbook# - Page # 07 094

010081

Southwest Research Institute
TOC Logbook

Method: 4152, 415.1

Project #: 03159-34-006 M+E; 06685-51-006 EPA; 06002-01-322 DIV 20

Client: M+E, EPA, DIV 20

Task Order #: 051027-1, 051024-5, 051021-6

STANDARDS:

Standard	LOT #
KHP	

QUALITY CONTROL:

Standard ID	LOT #	TV (mg/L)
ERA		
ERA		

(See page 07-091)

SAMPLES:

Solids: Air Dried? (Yes / No)
Ground? (Yes / No)

Samples requiring Inorganic Carbon Pretreatment:

Waters: Acidified and Sparged samples:

See p. 07 091

NOTES: See p. 07 091

Analyst Signature: [signature] Date: 11/3/05

Reviewed by: [signature] Date: 11/7/05

Logbook# - Page # 07 095

FRM-278 (Rev 1/Mar 03)
Page 1 of 2

010082

Southwest Research Institute
TOC Logbook

Method: 415.2, 415.1

Project #: 03159.34.006 M+E; 06685.51.006 EPA; 06002.01.322 DIV20

Client: M+E, EPA, DIV20

Task Order #: 051027-1, 051624-5, 051021-6

Cont from p. 07 094

Space provided for TOC Printouts/Notes/Instrument Maintenance:

76 TOC 13.84 26A883R
77 TOC 2.070 26A885
78 TOC 4.192 26A885
79 TOC 3.452 26A885
80 TOC 3.319 26A885
81 TOC 3.194 26A886
82 TOC 3.387 26A886
83 TOC 6.248 26A886
84 TOC 25.68 26A887
85 TOC 12.93 26A887
86 TOC 24.75 26A887
87 TOC 17.16 ~~CCV~~ VOID WAD 11/7/05
88 TOC 13.19 CCV
89 TOC 0.230 CCB

90 TOC 13.97 26A887
91 TOC 4.723 26A888
92 TOC 8.962 26A888
93 TOC 8.751 26A888
94 TOC 8.680 26A888D
95 TOC 8.963 26A888D
96 TOC 18.64 VOID
97 TOC 29.92 VOID

98 TOC 4.285 26A888
99 TOC 12.77 CCV
100 TOC 0.204 CCB
101 TOC 13.62 26A888S
102 TOC 14.70 26A888S
103 TOC 9.415 26A889
104 TOC 9.478 26A889
105 TOC 3.883 26A890
106 TOC 3.752 26A890
107 TOC 1.447 26A891
108 TOC 1.332 26A891
109 TOC 3.648 26A890
110 TOC 12.72 CCV
111 TOC 0.228 CCB
112 TOC 241.5 VOID
113 TOC 3.872 26A879
114 TOC 8.320 26A879
115 TOC 8.131 26A878
116 TOC 2.391 26A879
117 TOC 2.223 26A879
118 TOC 13.47 CCV
119 TOC 0.222 CCB

RSpies 11/6/05

Analyst Signature: RSpies Date: 11/3/05

Reviewed by: Warren A. Naegeli Date: 11/7/05

Logbook# - Page # 07 096

TITLE Formate & Acetate **PROJECT NO.** — **BOOK NO.** 105 **111**

Work continued from Page

010083

111-01-105 Acetate + Formate - 1000 mg/L

0.151g Formic acid, sodium salt (ACROS Lot 148230010), Inorg #2104 and 0.139g Acetic acid, sodium salt (ACROS Lot # 220890010), Inorg #2349 diluted to 100 mL DI H_2O.

Balance #12.

111-02-105 Acetate + Formate - 5ppm 100/ccu

0.25 mL 111-01-105 diluted to 50mL DI H_2O.

Eppendorfs : 1000J

RSS

www.scientificbindery88yrs.com

Work continued to Page RSS 11/4/05

SIGNATURE RSS

DATE 11/4/05

DISCLOSED TO AND UNDERSTOOD BY H. Tan

DATE 12/01/05

WITNESS

DATE

110 PROJECT NO.
BOOK NO. 1C5

TITLE Formate + Acetate

Work continued from Page

010084

110-01-1C5 10ppm
0.05mL Acetate (1000mg/L), Inorg # 5460
and 0.05mL Formate (1000mg/L), Inorg # 5461
dilute to 5 mL w/ DI H_2O.

110-02-1C5 5ppm
2mL 110-01-1C5 + 2mL DI H_2O.

110-03-1C5 1ppm
1mL 110-02-1C5 + 4mL DI H_2O.

110-04-1C5 0.5ppm
2mL 110-03-1C5 + 2mL DI H_2O.

110-05-1C5 0.1ppm
1.0mL 110-04-1C5 + 4mL DI H_2O.

110-06-1C5 0 ppm
DI H_2O.

110-07-1C5 0.2ppm
0.1mL 110-01-1C5 diluted to 5mL DI H_2O.

Eppendorfs: 1000 J
200 J
5000 L.

RSS

www.scientificbindery88yrs.com

Work continued to Page 4

SIGNATURE

DATE 12/1/05

DISCLOSED TO AND UNDERSTOOD BY

DATE 12 01 05

WITNESS

DATE RSS 11/4/05

Work continued from Page

010085

103-01-IC5 Anions 20ppm

Anion	Std Vol, mL	Std Conc, mg/L	Inorg#	Exp.
Fluoride	0.2mL	1000mg/L	4951	1/15/06
Chloride	↓	↓	4950	1/15/06
NitriteN			5076	3/3/06
Bromide			5275	6/30/06
NitrateN			4952	1/15/06
Phosphate P			4953	1/15/06
Sulfate			5305	7/30/06

Eppendorfs:
200 J
1000 G
5000 K

Diluted to 10 mL DI H_2O

103-02-IC5 Anions ~~10~~ 15 ppm RSS 10/27/05
RSS 10/7/05 2 3mL 103-01-IC5 + 1mL DI H_2O

103-03-IC5 Anions 10ppm
2mL 103-01-IC5 + 2mL DI H_2O

103-04-IC5 Anions 5ppm
2mL 103-03-IC5 + 2mL DI H_2O

103-05-IC5 Anions 1ppm
1mL 103-04-IC5 + 4mL mL DI H_2O

103-06-IC5 Anions 0.5ppm
2mL 103-05-IC5 + 2mL DI H_2O.

103-07-IC5 Anions 0.1ppm
~~1mL~~ 103-06-IC5 + 4mL DI H_2O.

103-08-IC5 Anions 0 ppm
DI H_2O.

www.scientificbindery88yrs.com

Work continued to Page

SIGNATURE R Spres DATE 10/7/05

DISCLOSED TO AND UNDERSTOOD BY Wesley G. Naegeli DATE WITNESS DATE 10/7/05

104 **PROJECT NO.**
BOOK NO. 1C5

TITLE Nitrite-N

010086

Work continued from Page

RSS 10/7/05

104-01-1C5 Nitrite-N ~~100~~ ppm 91.3 mg/L QC

RSS 10/7/05

~~0.150g~~ 0.045g Sodium nitrite (Inorg # 2921) diluted to 100 mL DI H_2O.

Balance #12.

RSS

www.scientificbindery88yrs.com

Work continued to Page

SIGNATURE R Spren **DATE** 10/7/05

DISCLOSED TO AND UNDERSTOOD BY Walter A. Marcelli **DATE** **WITNESS** **DATE** 11/01/05

Div 20
06002.01.322
TO# 051021-6

Johnson A. Naegli 11/07/05

Analyst: RSS RSS
Method: 300
TAP: 01-0406-042 Rev. 4
Sig Fig: 3

010087

Date Analyzed	System ID	Analyte	Conc. mg/L	RESULT mg/L	Qual	DL	TV	%REC %RPD
10/25/05	268878	Chloride	43.224	43.2		1		
10/25/05	268878	Nitrate-N	0.064	0.1	U	0.1		
10/25/05	268878	Sulfate	0.278	0.278		0.1		
10/25/05	268879	Chloride	63.012	63.0		1		
10/25/05	268879	Nitrate-N	7.863	7.86		0.1		
10/25/05	268879	Sulfate	0.100	0.100		0.1		
10/25/05	268880	Chloride	14.401	14.4		0.1		
10/25/05	268880	Nitrate-N	47.344	47.3		1		
10/25/05	268880	Sulfate	1.116	1.12		0.1		
10/25/05	268881	Chloride	14.982	15.0		0.1		
10/25/05	268881	Nitrate-N	115.610	116		1		
10/25/05	268881	Sulfate	1.532	1.53		0.1		
10/25/05	268882	Chloride	27.839	27.8		1		
10/25/05	268882	Nitrate-N	64.526	64.5		1		
10/25/05	268882	Sulfate	1.713	1.71		0.1		
10/25/05	268883	Chloride	8.067	8.07		0.1		
10/25/05	268883	Nitrate-N	17.958	18.0		0.1		
10/25/05	268883	Sulfate	0.692	0.692		0.1		
10/25/05	268884	Chloride	51.687	51.7		1		
10/25/05	268884	Nitrate-N	21.622	21.6		1		
10/25/05	268884	Sulfate	0.766	0.766		0.1		
10/25/05	268885	Chloride	25.460	25.5		1		
10/25/05	268885	Nitrate-N	0.000	0.1	U	0.1		
10/25/05	268885	Sulfate	0.028	0.1	U	0.1		
10/25/05	268886	Chloride	14.306	14.3		1		
10/24/05	268886	Nitrate-N	207.988	208		1		
10/25/05	268886	Sulfate	9.312	9.31		0.1		
10/25/05	268887	Chloride	12.224	12.2		1		
10/24/05	268887	Nitrate-N	284.941	285		2		
10/25/05	268887	Sulfate	3.419	3.42		0.1		
10/25/05	268888	Chloride	12.749	12.7		0.1		
10/25/05	268888	Nitrate-N	10.330	10.3		0.1		
10/25/05	268888	Sulfate	0.473	0.473		0.1		
10/25/05	268889	Chloride	3.947	3.95		0.1		
10/25/05	268889	Nitrate-N	15.628	15.6		0.1		
10/25/05	268889	Sulfate	0.283	0.283		0.1		
10/25/05	268890	Chloride	18.682	18.7		0.1		
10/25/05	268890	Nitrate-N	20.748	20.7		1		
10/25/05	268890	Sulfate	0.406	0.406		0.1		
10/25/05	268891	Chloride	18.123	18.1		0.1		
10/25/05	268891	Nitrate-N	0.071	0.1	U	0.1		
10/25/05	268891	Sulfate	0.213	0.213		0.1		
10/25/05	268892	Chloride	21.976	22.0		1		
10/25/05	268892	Nitrate-N	32.956	33.0		1		
10/25/05	268892	Sulfate	0.949	0.949		0.1		
10/25/05	268892D	Chloride	22.520	22.5		1		2.25%
10/25/05	268892D	Nitrate-N	33.212	33.2		1		0.60%
10/25/05	268892D	Sulfate	1.034	1.03		0.1		8.19%
10/25/05	268892S	Chloride	40.586	40.6		1	20	93.0%
10/25/05	268892S	Nitrate-N	41.058	41.1		1	9.04	89.6%
10/25/05	268892S	Sulfate	4.895	4.90		0.1	4	98.8%

U = Undetected

Div 20
06002.01.322
TO# 051021-6

Analyst: RSS
Method: 300
TAP: 01-0406-042 Rev. 4
Sig Fig: 3

010088

Date Analyzed	System ID	Analyte	Conc. mg/L	RESULT mg/L	Qual	DL	TV	%REC %RPD
10/24/05	ICV (LCS)	Chloride	191.991	192		0.1	200	96.0%
10/24/05	ICV (LCS)	Nitrate-N	84.487	84.5		0.1	90.4	93.5%
10/24/05	ICV (LCS)	Sulfate	380.022	380		0.1	400	95.0%
10/24/05	ICB (PB)	Chloride	0.028	0.1	U	0.1		
10/24/05	ICB (PB)	Nitrate-N	0.000	0.1	U	0.1		
10/24/05	ICB (PB)	Sulfate	0.000	0.1	U	0.1		
10/24/05	CCV	Chloride	195.760	196		0.1	200	98.0%
10/24/05	CCV	Nitrate-N	85.949	85.9		0.1	90.4	95.0%
10/24/05	CCV	Sulfate	385.309	385		0.1	400	96.3%
10/24/05	CCB	Chloride	0.027	0.1	U	0.1		
10/24/05	CCB	Nitrate-N	0.000	0.1	U	0.1		
10/24/05	CCB	Sulfate	0.000	0.1	U	0.1		
10/24/05	CCV	Chloride	196.726	197		0.1	200	98.5%
10/24/05	CCV	Nitrate-N	86.198	86.2		0.1	90.4	95.4%
10/24/05	CCV	Sulfate	385.914	386		0.1	400	96.5%
10/24/05	CCB	Chloride	0.000	0.1	U	0.1		
10/24/05	CCB	Nitrate-N	0.000	0.1	U	0.1		
10/24/05	CCB	Sulfate	0.000	0.1	U	0.1		
10/25/05	ICV (LCS)	Chloride	197.930	198		0.1	200	99.0%
10/25/05	ICV (LCS)	Nitrate-N	87.078	87.1		0.1	90.4	96.3%
10/25/05	ICV (LCS)	Sulfate	389.767	390		0.1	400	97.5%
10/25/05	ICB (PB)	Chloride	0.000	0.1	U	0.1		
10/25/05	ICB (PB)	Nitrate-N	0.000	0.1	U	0.1		
10/25/05	ICB (PB)	Sulfate	0.000	0.1	U	0.1		
10/25/05	CCV	Chloride	197.006	197		0.1	200	98.5%
10/25/05	CCV	Nitrate-N	87.091	87.1		0.1	90.4	96.3%
10/25/05	CCV	Sulfate	389.436	389		0.1	400	97.3%
10/25/05	CCB	Chloride	0.085	0.1	U	0.1		
10/25/05	CCB	Nitrate-N	0.000	0.1	U	0.1		
10/25/05	CCB	Sulfate	0.000	0.1	U	0.1		
10/25/05	CCV	Chloride	200.652	201		0.1	200	101%
10/25/05	CCV	Nitrate-N	88.319	88.3		0.1	90.4	97.7%
10/25/05	CCV	Sulfate	395.137	395		0.1	400	98.8%
10/25/05	CCB	Chloride	0.027	0.1	U	0.1		
10/25/05	CCB	Nitrate-N	0.000	0.1	U	0.1		
10/25/05	CCB	Sulfate	0.000	0.1	U	0.1		
10/25/05	CCV	Chloride	200.630	201		0.1	200	101%
10/25/05	CCV	Nitrate-N	88.305	88.3		0.1	90.4	97.7%
10/25/05	CCV	Sulfate	397.607	398		0.1	400	100%
10/25/05	CCB	Chloride	0.030	0.1	U	0.1		
10/25/05	CCB	Nitrate-N	0.000	0.1	U	0.1		
10/25/05	CCB	Sulfate	0.000	0.1	U	0.1		

U = Undetected

Schedule File: C:\PeakNet\schedule\25OCT05A.sch

Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	ICV	Sample		anions051007.met	051025_001.dxd	20
2	ICB	Sample		anions051007.met	051025_002.dxd	1
3	268878	Sample		anions051007.met	051025_003.dxd	1
4	268879	Sample		anions051007.met	051025_004.dxd	1
5	268880	Sample		anions051007.met	051025_005.dxd	1
6	268881	Sample		anions051007.met	051025_006.dxd	1
7	268882	Sample		anions051007.met	051025_007.dxd	1
8	268883	Sample		anions051007.met	051025_008.dxd	1
9	268884	Sample		anions051007.met	051025_009.dxd	1
10	268885	Sample		anions051007.met	051025_010.dxd	1
11	268886	Sample		anions051007.met	051025_011.dxd	1
12	268887	Sample		anions051007.met	051025_012.dxd	1
13	CCV	Sample		anions051007.met	051025_013.dxd	20
14	CCB	Sample		anions051007.met	051025_014.dxd	1
15	268888	Sample		anions051007.met	051025_015.dxd	1
16	268889	Sample		anions051007.met	051025_016.dxd	1
17	268890	Sample		anions051007.met	051025_017.dxd	1
18	268891	Sample		anions051007.met	051025_018.dxd	1
19	268892	Sample		anions051007.met	051025_019.dxd	1
20	268892D	Sample		anions051007.met	051025_020.dxd	1
21	268892S	Sample		anions051007.met	051025_021.dxd	1
22	CCV	Sample		anions051007.met	051025_022.dxd	20
23	CCB	Sample		anions051007.met	051025_023.dxd	1
24	268878 DF10	Sample		anions051007.met	051025_024.dxd	10
25	268879 DF10	Sample		anions051007.met	051025_025.dxd	10
26	268880 DF10	Sample		anions051007.met	051025_026.dxd	10
27	268881 DF10	Sample		anions051007.met	051025_027.dxd	10
28	268882 DF10	Sample		anions051007.met	051025_028.dxd	10
29	268883 DF10	Sample		anions051007.met	051025_029.dxd	10
30	268884 DF10	Sample		anions051007.met	051025_030.dxd	10
31	268885 DF10	Sample		anions051007.met	051025_031.dxd	10
32	268886 DF10	Sample		anions051007.met	051025_032.dxd	10
33	268887 DF10	Sample		anions051007.met	051025_033.dxd	10
34	CCV	Sample		anions051007.met	051025_034.dxd	20
35	CCB	Sample		anions051007.met	051025_035.dxd	1
36	268888 DF10	Sample		anions051007.met	051025_036.dxd	10
37	268889 DF10	Sample		anions051007.met	051025_037.dxd	10
38	268890 DF10	Sample		anions051007.met	051025_038.dxd	10
39	268891 DF10	Sample		anions051007.met	051025_039.dxd	10
40	268892 DF10	Sample		anions051007.met	051025_040.dxd	10
41	268892D DF10	Sample		anions051007.met	051025_041.dxd	10
42	268892S DF10	Sample		anions051007.met	051025_042.dxd	10
43	CCV	Sample		anions051007.met	051025_043.dxd	20
44	CCB	Sample		anions051007.met	051025_044.dxd	1
45		Sample				1

010089

Default Method Path: C:\PEAKNET\METHOD
Default Data Path: C:\PEAKNET\DATA\051025A
Comment:
DIV 20 TO#051021-6 06002.01.322

ICV Sources: 1604 RSS 11/7/05
1) SPEX LOT#28-~~138~~AS (INORG#5271)
F = 100 mg/L
Cl = 200 mg/L
Br = 400 mg/L
NO3N = 90.4 mg/L
PO4P = 191 mg/L
SO4 = 400 mg/L
2) 104-01-IC5
NO2N 91.3mg/L

11/4/05

Sample Name : ICV
Dilution Factor : 20.00
Injection Number : 1
Data File Name : ...\051025_001.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

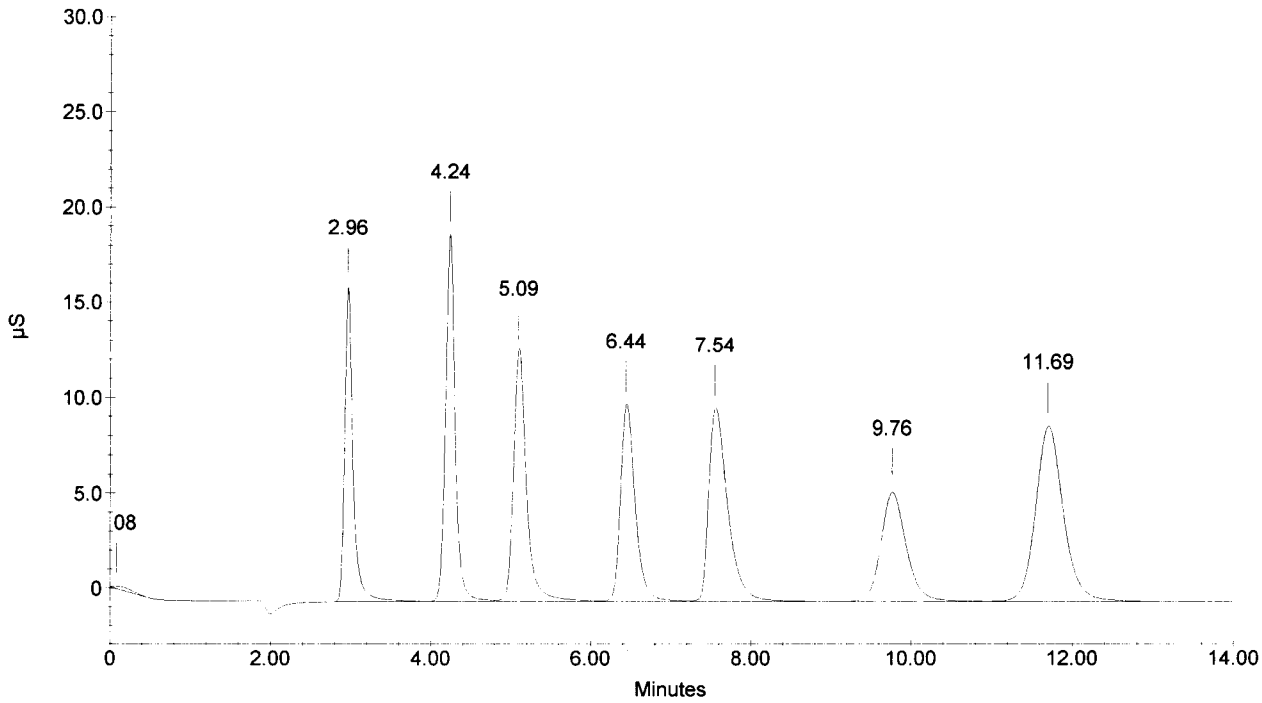
Date Time Collected : 10/25/05 9:10:35 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010090

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
2	2.96	FLUORIDE	97.826	162617	1197629	2	-1.44
3	4.24	CHLORIDE	197.930	192328	1609225	2	-1.24
4	5.09	NITRITE-N	85.355	130741	1509067	2	-1.74
5	6.44	BROMIDE	390.883	102989	1335932	2	-1.28
6	7.54	NITRATE-N	87.078	101026	1693790	2	0.85
7	9.76	PHOSPHATE-P	186.243	57628	1284006	2	-0.64
8	11.69	SULFATE	389.767	91923	2219191	2	-2.58
			---total(s)---				
	0.00		1435.082		10848839		

ICV



Sample Name : ICB
Dilution Factor : 1.00
Injection Number : 2
Data File Name : ...\051025_002.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

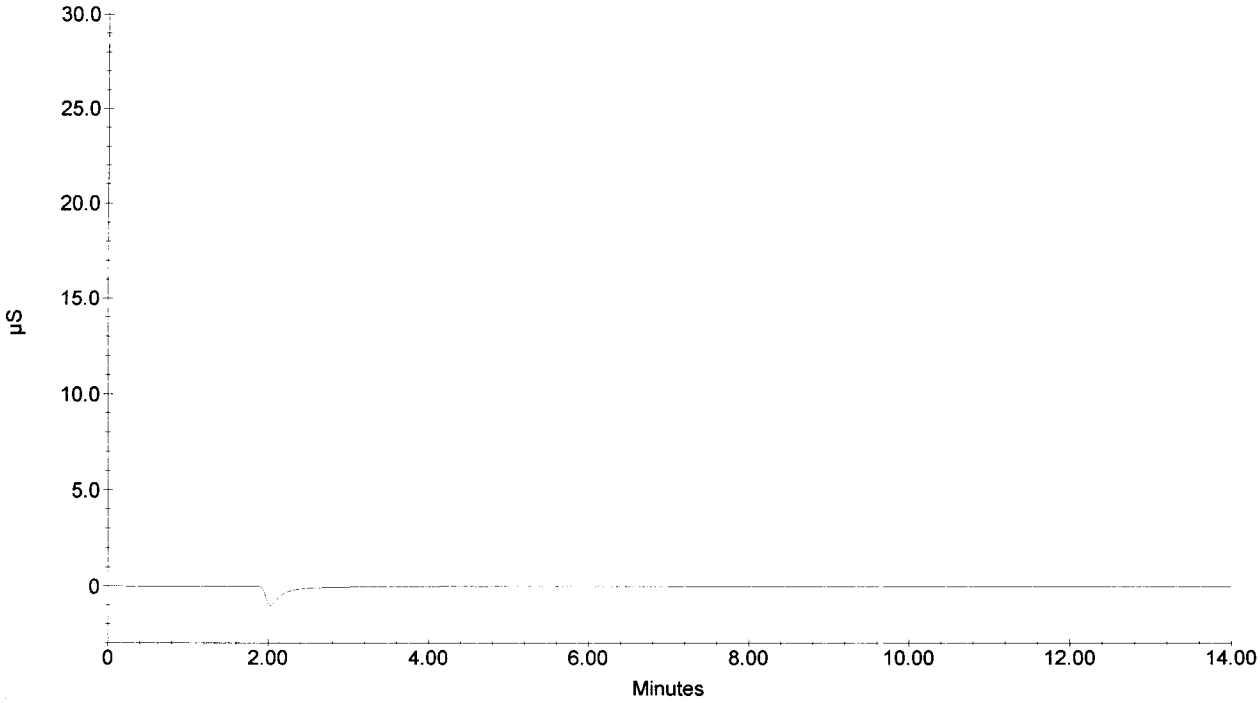
Date Time Collected : 10/25/05 9:27:17 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010091

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
0	0.00	(null)	0.000	0	0	0	0.00
		CHLORIDE					
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.000		0		

ICB



Sample Name : 268878
Dilution Factor : 1.00
Injection Number : 3
Data File Name : ...\051025_003.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

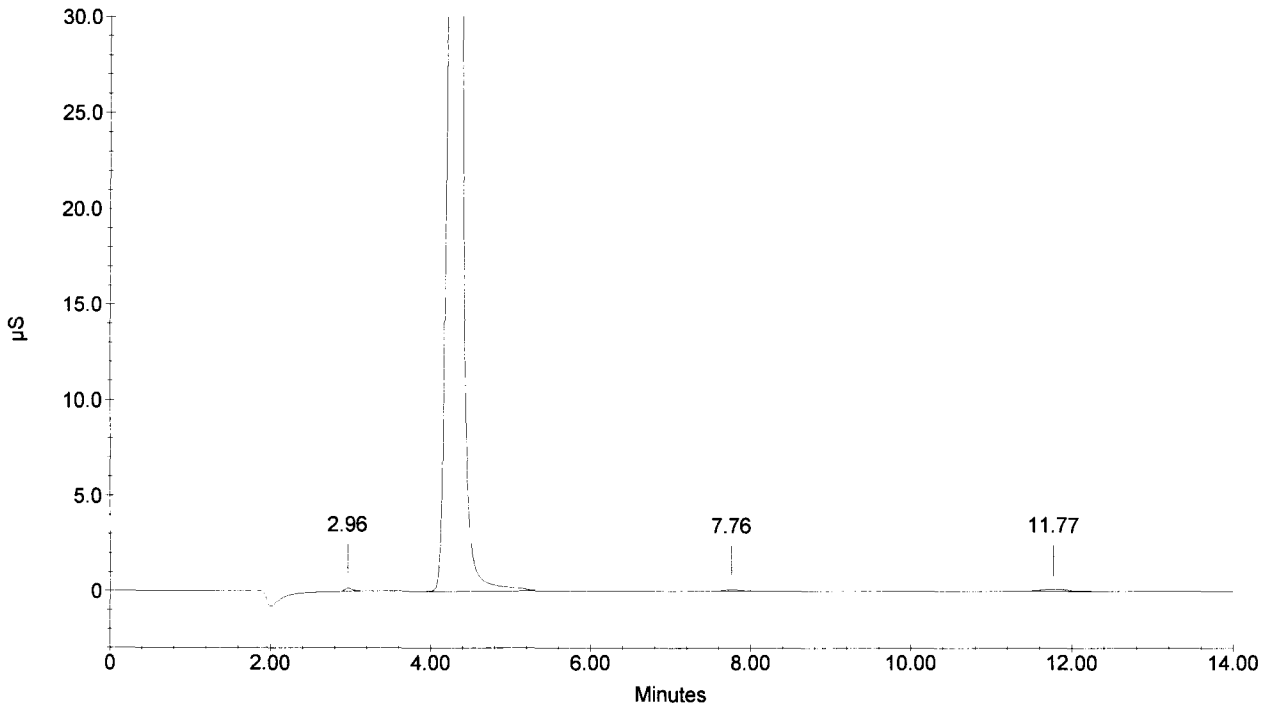
Date Time Collected : 10/25/05 9:43:55 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010092

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.093	1601	10451	1	-1.44
2	4.32	CHLORIDE	35.902	984537	9022402	1	0.62
		NITRITE-N					
		BROMIDE					
3	7.76	NITRATE-N	0.064 ✓	779	12259	1	3.70
		PHOSPHATE-P					
4	11.77	SULFATE	0.278 ✓	1141	27972	1	-1.92
			---total(s)---				
	0.00		36.338		9073084		

268878



Sample Name : 268879
Dilution Factor : 1.00
Injection Number : 4
Data File Name : ...\051025_004.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

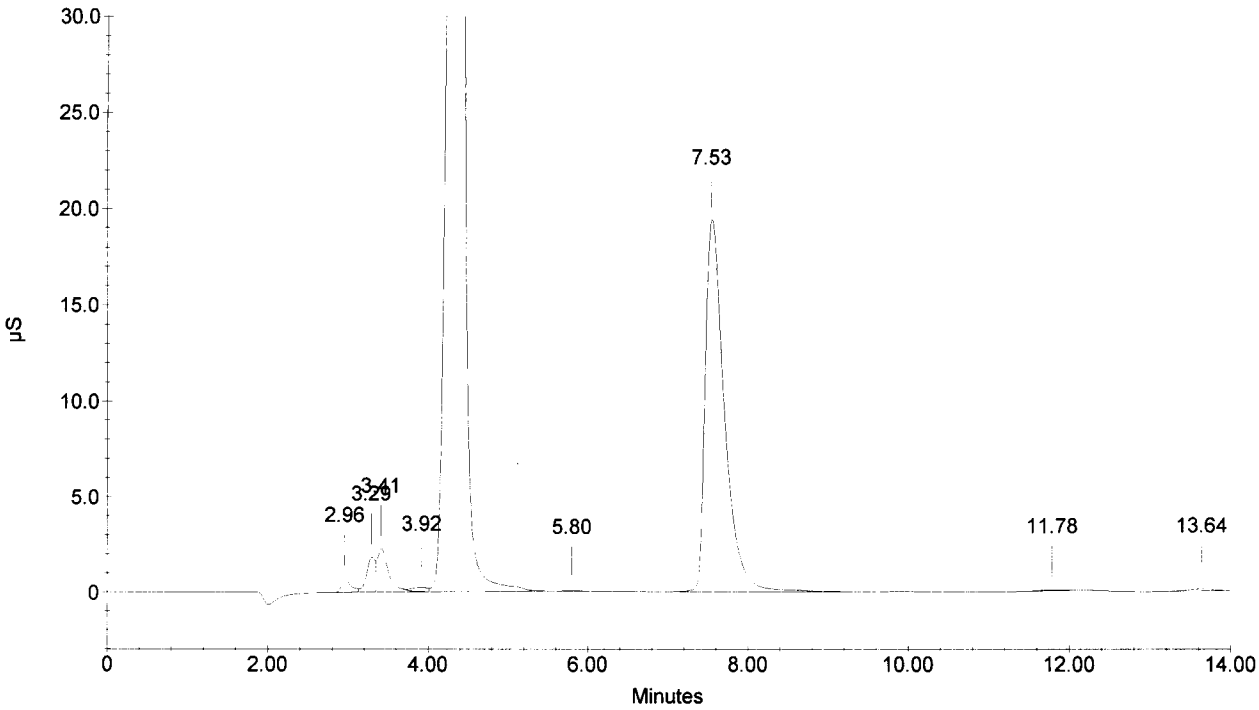
Date Time Collected : 10/25/05 10:00:35 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010093

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.301	7141	59083	2	-1.44
5	4.37	CHLORIDE	36.143	1325835	13473411	2	1.86
		NITRITE-N					
		BROMIDE					
7	7.53	NITRATE-N	7.863	192968	3246615	1	0.67
		PHOSPHATE-P					
8	11.78	SULFATE	0.100	510	9439	1	-1.81
			---total(s)---				
	0.00		44.408		16788549		

268879



Sample Name : 268880
Dilution Factor : 1.00
Injection Number : 5
Data File Name : ...\051025_005.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

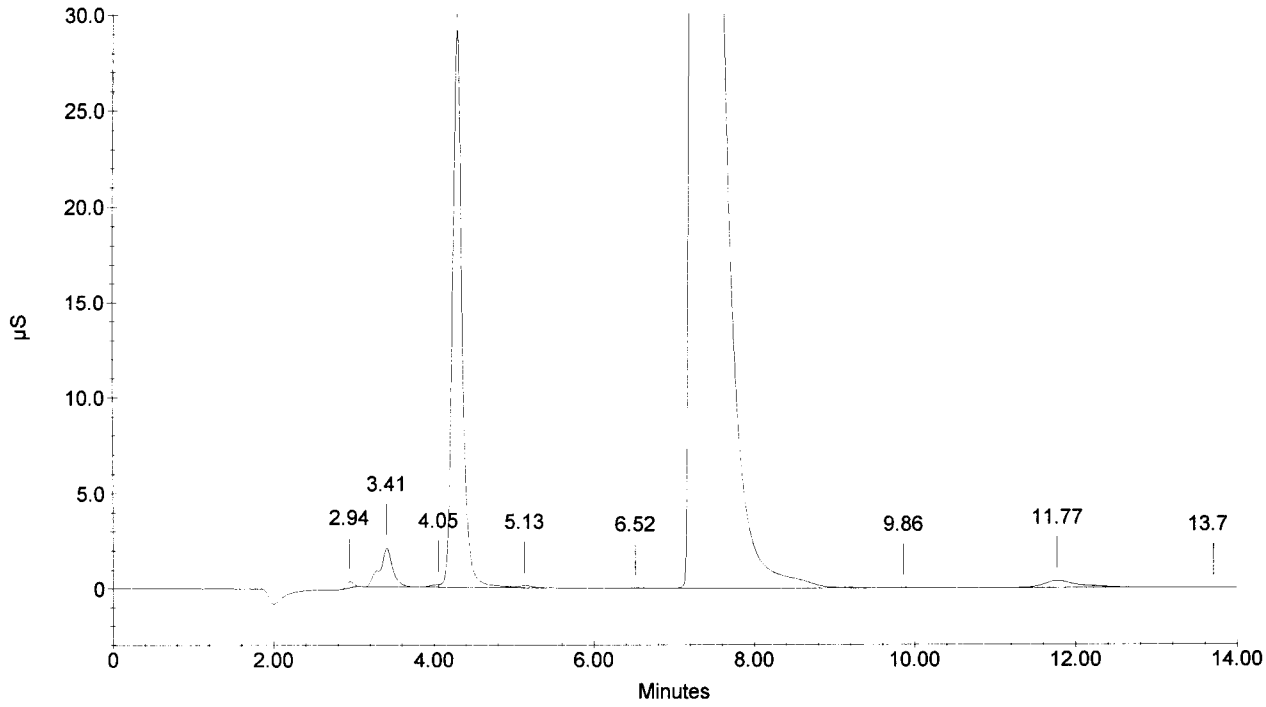
Date Time Collected : 10/25/05 10:17:16 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010094

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.94	FLUORIDE	0.131	3365	19350	1	-1.89
4	4.29	CHLORIDE	14.401	290448	2439562	3	0.00
5	5.13	NITRITE-N	0.116	1251	15192	4	-0.97
6	6.52	BROMIDE	0.087	194	2310	1	-0.05
7	7.29	NITRATE-N	77.693	1305637	25189569	3	-2.54
8	9.86	PHOSPHATE-P	0.068	175	3749	4	0.44
9	11.77	SULFATE	1.116	3735	115400	1	-1.92
			---total(s)---				
	0.00		93.612		27785133		

268880



Sample Name : 268881
Dilution Factor : 1.00
Injection Number : 6
Data File Name : ...\051025_006.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

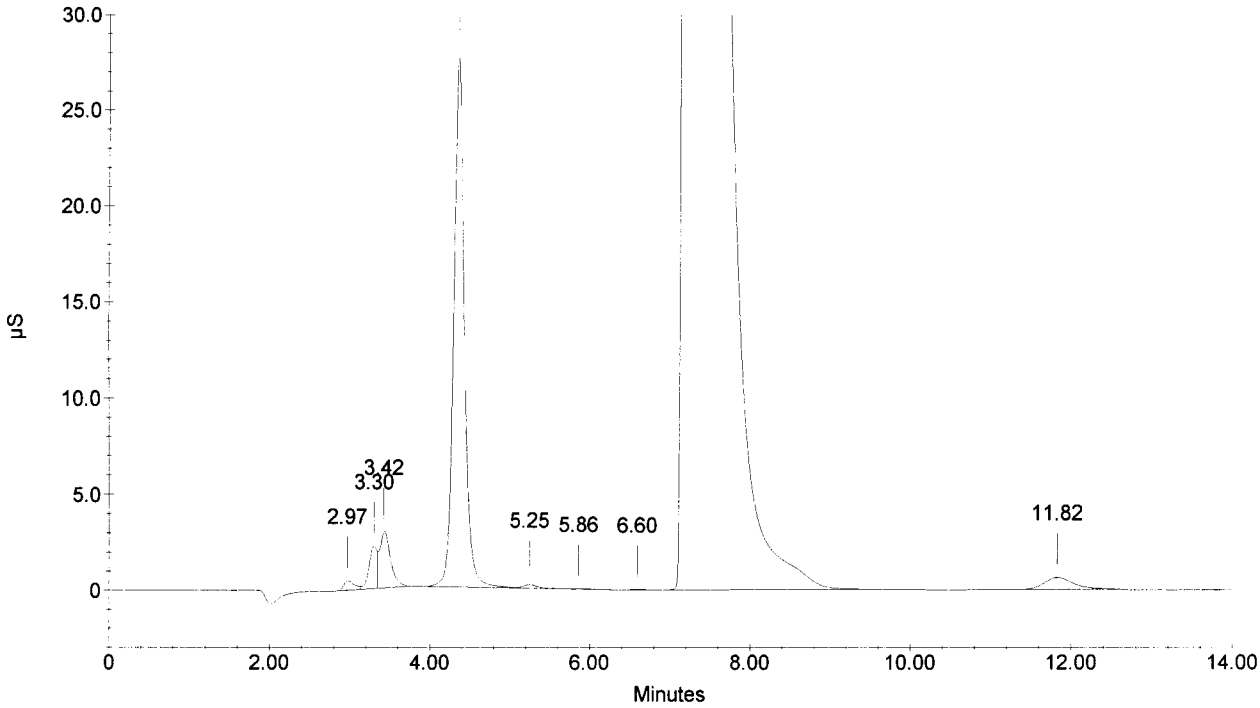
Date Time Collected : 10/25/05 10:33:56 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010095

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.242	5046	45196	2	-1.00
4	4.36	CHLORIDE	14.982 ✓	275244	2552527	2	1.55
5	5.25	NITRITE-N	0.141	1998	24202	2	1.35
7	6.60	BROMIDE	0.079	158	1793	1	1.18
8	7.24	NITRATE-N	1166.960	3358775	66252517	1	-3.25
		PHOSPHATE-P					
9	11.82	SULFATE	1.532 ✓	6313	159038	1	-1.47
			---total(s)---				
	0.00		1183.937		69035273		

268881



Sample Name : 268882
Dilution Factor : 1.00
Injection Number : 7
Data File Name : ...\051025_007.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

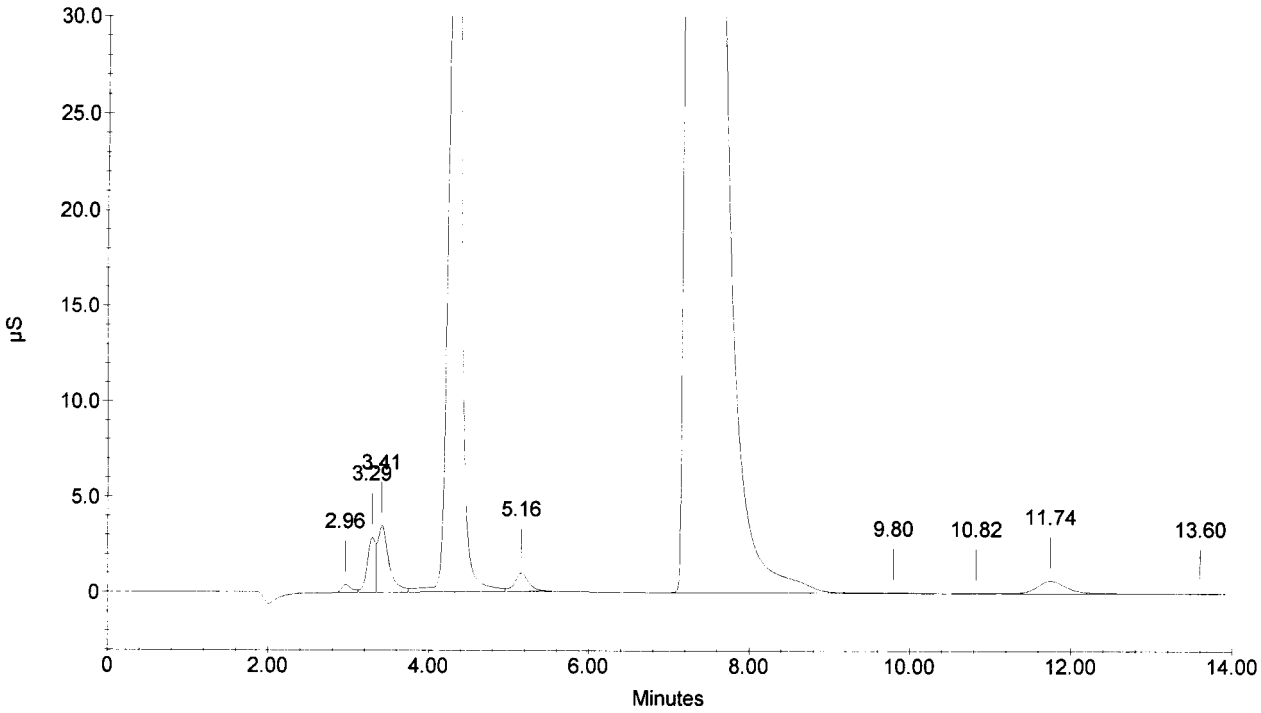
Date Time Collected : 10/25/05 10:50:37 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010096

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.192	4063	33599	2	-1.44
4	4.32	CHLORIDE	27.719	621340	5554334	2	0.62
5	5.16	NITRITE-N	0.407	9771	119100	2	-0.45
		BROMIDE					
6	7.28	NITRATE-N	178.232	1751381	35282648	3	-2.72
7	9.80	PHOSPHATE-P	0.128	383	11619	4	-0.24
9	11.74	SULFATE	1.713	6729	178098	2	-2.14
			---total(s)---				
	0.00		208.392		41179398		

268882



Sample Name : 268883
Dilution Factor : 1.00
Injection Number : 8
Data File Name : ...\051025_008.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

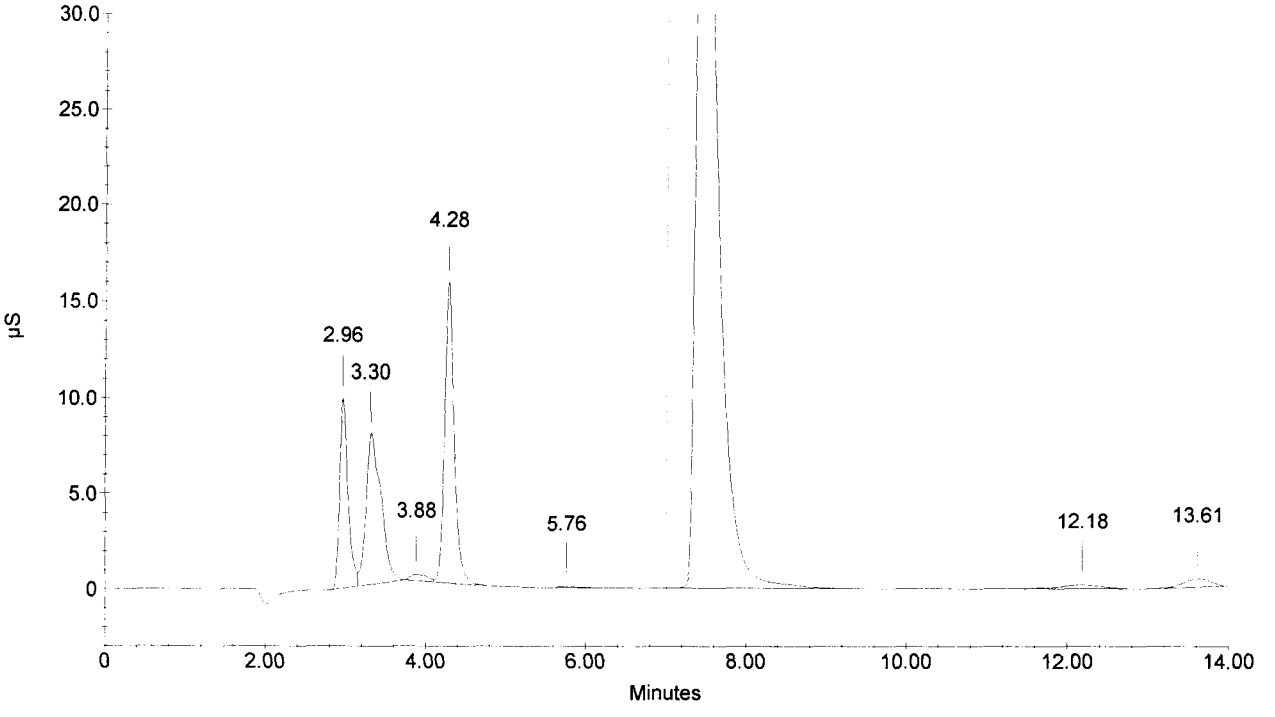
Date Time Collected : 10/25/05 11:07:18 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010097

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	3.018	98799	718032	2	-1.44
4	4.28	CHLORIDE	8.067 ✓	155541	1291446	2	-0.31
		NITRITE-N					
		BROMIDE					
6	7.44	NITRATE-N	17.958 ✓	480289	8436471	1	-0.58
		PHOSPHATE-P					
7	12.18	SULFATE	0.692 ✓	1904	71069	1	1.53
			---total(s)---				
	0.00		29.735		10517018		

268883



Sample Name : 268884
Dilution Factor : 1.00
Injection Number : 9
Data File Name : ...\051025_009.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

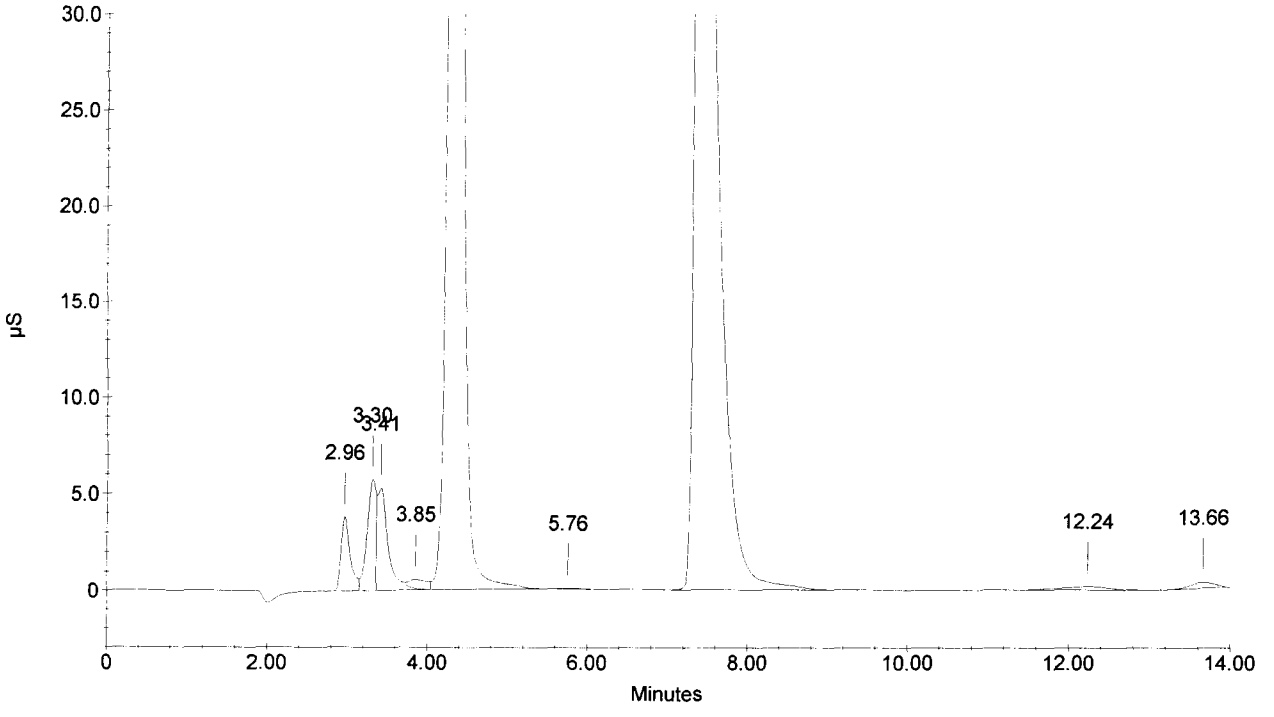
Date Time Collected : 10/25/05 11:24:11 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010098

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	1.333	37901	304098	2	-1.44
5	4.36	CHLORIDE	37.411	1098195	10899540	2	1.55
		NITRITE-N					
		BROMIDE					
7	7.40	NITRATE-N	21.915	591282	10482865	1	-1.11
		PHOSPHATE-P					
8	12.24	SULFATE	0.766 ✓	1949	78808	1	1.97
			---total(s)---				
	0.00		61.425		21765310		

268884



Sample Name : 268885
Dilution Factor : 1.00
Injection Number : 10
Data File Name : c:\peaknet\data\051025a\051025_010.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

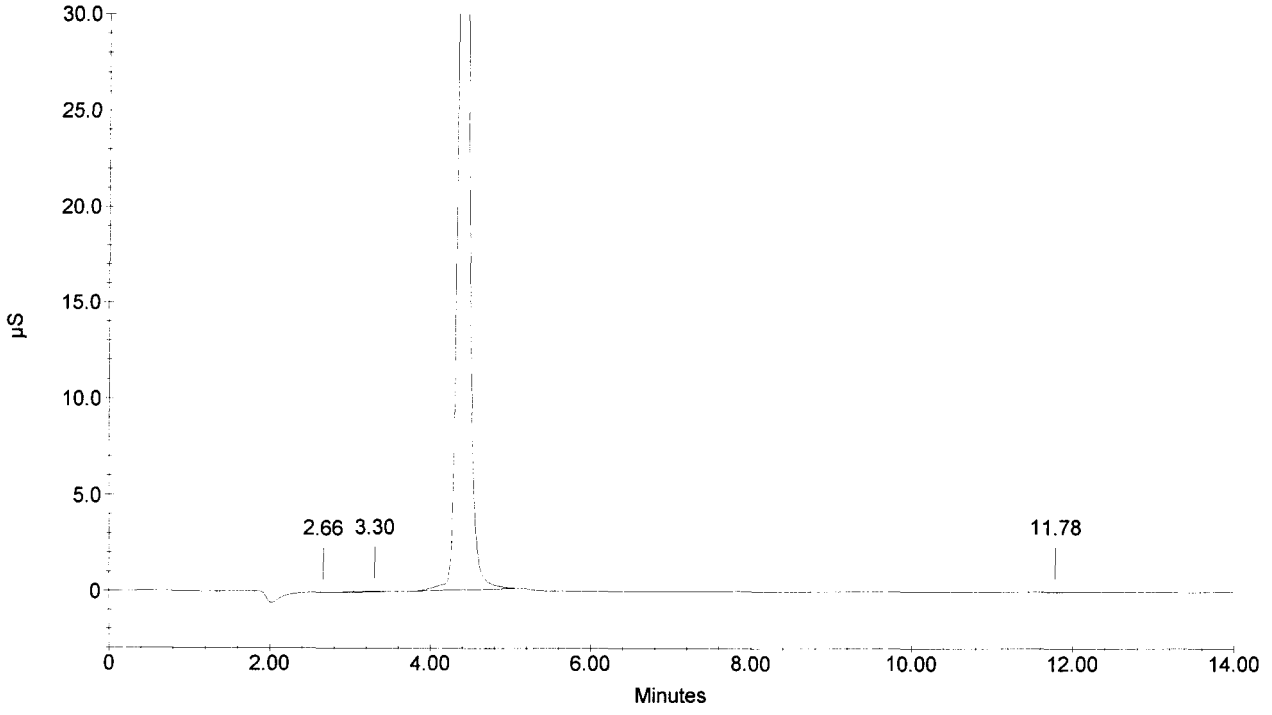
Date Time Collected : 10/25/05 11:40:57 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010099

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.66		0.000	221	2138	1	
3	4.41	CHLORIDE	26.811	664505	5290779	1	2.80
		NITRITE-N					
		BROMIDE					
		NITRATE-N ✓					
		PHOSPHATE-P					
4	11.78	SULFATE	0.028 ✓	108	1994	1	-1.81
			---total(s)---				
	0.00		26.840		5294912		

268885



Sample Name : 268886
Dilution Factor : 1.00
Injection Number : 11
Data File Name : ...\051025_011.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

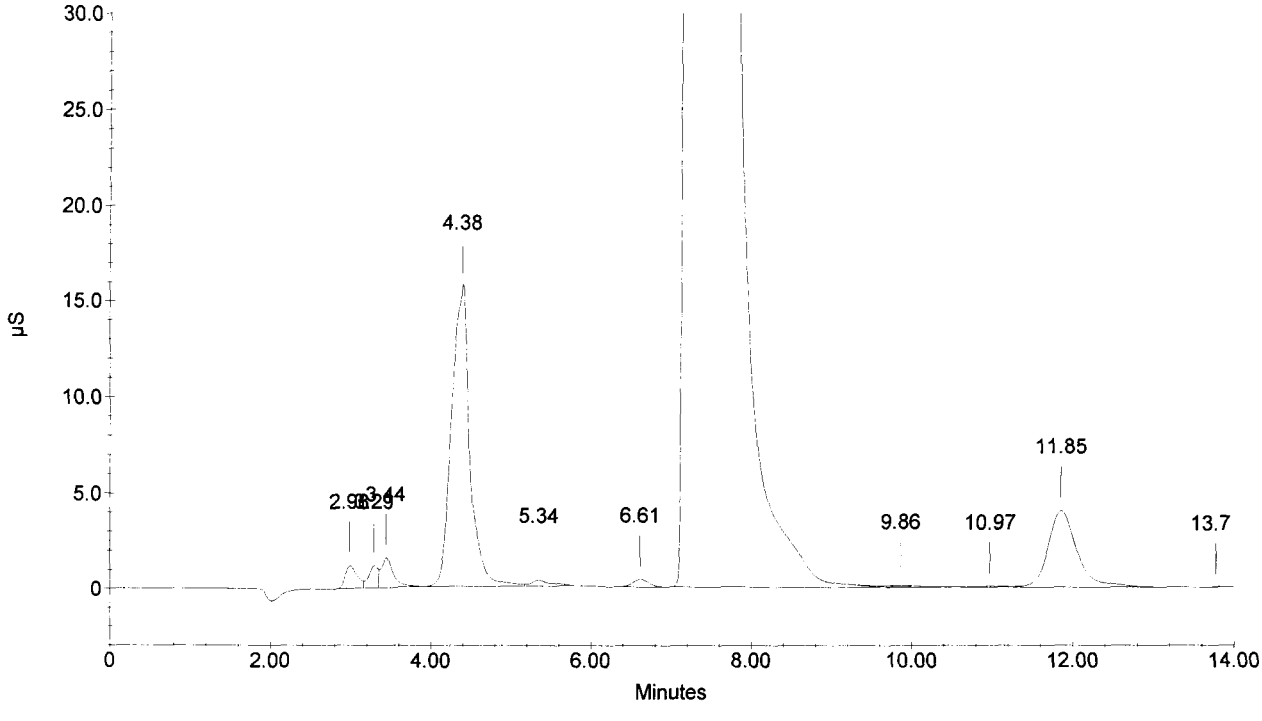
Date Time Collected : 10/25/05 11:57:42 AM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010100

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.98	FLUORIDE	0.590	11967	126934	2	-0.56
4	4.38	CHLORIDE	14.748	156173	2506780	2	2.18
5	5.34	NITRITE-N	0.231	3331	56121	2	3.15
6	6.61	BROMIDE	0.949	4089	56900	1	1.38
7	7.28	NITRATE-N	7482.035	6457680	119737348	3	-2.72
8	9.86	PHOSPHATE-P	0.243	879	26550	4	0.44
10	11.85	SULFATE	9.312	40135	1006063	2	-1.25
			---total(s)---				
	0.00		7508.107		123516697		

268886



Sample Name : 268887
Dilution Factor : 1.00
Injection Number : 12
Data File Name : ...\051025_012.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

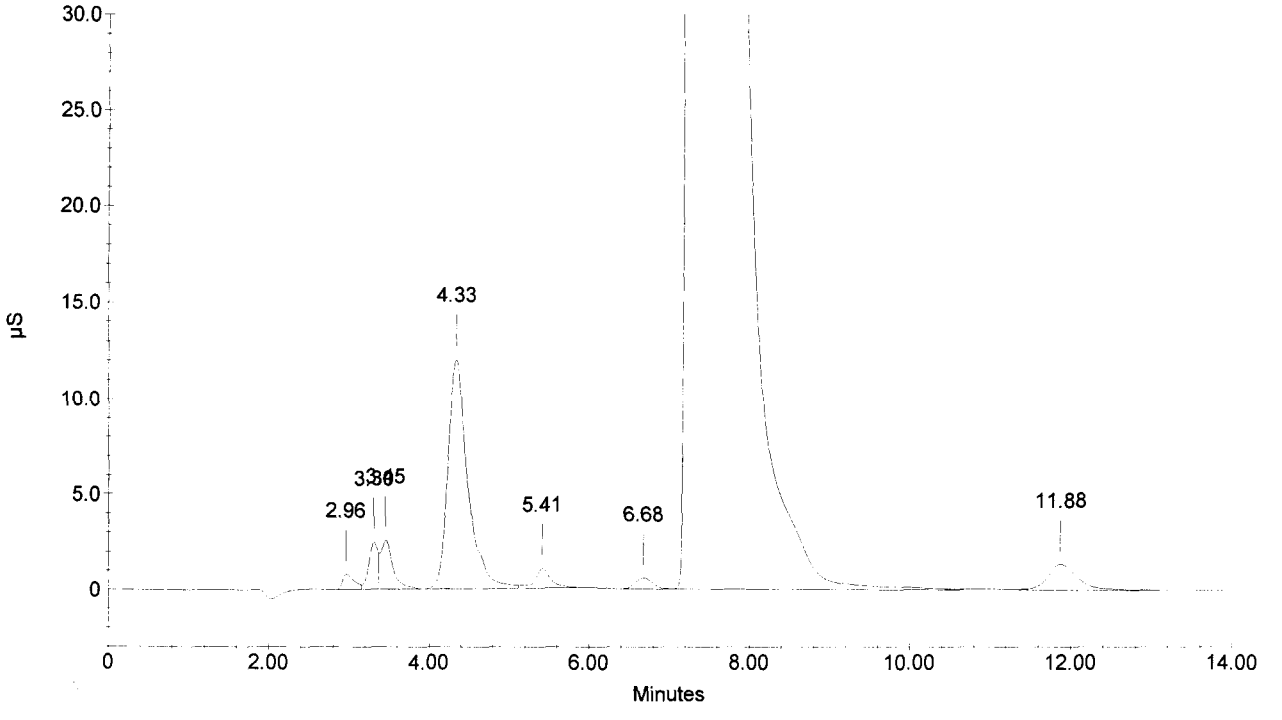
Date Time Collected : 10/25/05 12:14:27 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010101

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.405	8195	83537	2	-1.44
4	4.33	CHLORIDE	12.508	119645	2081585	2	0.93
5	5.41	NITRITE-N	0.453	10398	135268	2	4.44
6	6.68	BROMIDE	1.424	5889	87085	1	2.40
7	7.40	NITRATE-N	21156.735	7999174	167048546	2	-1.11
		PHOSPHATE-P					
8	11.88	SULFATE	3.419 ✓	13779	359029	2	-1.03
	0.00		---total(s)--- 21174.944		169795049		

268887



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 13
Data File Name : ...\051025_013.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

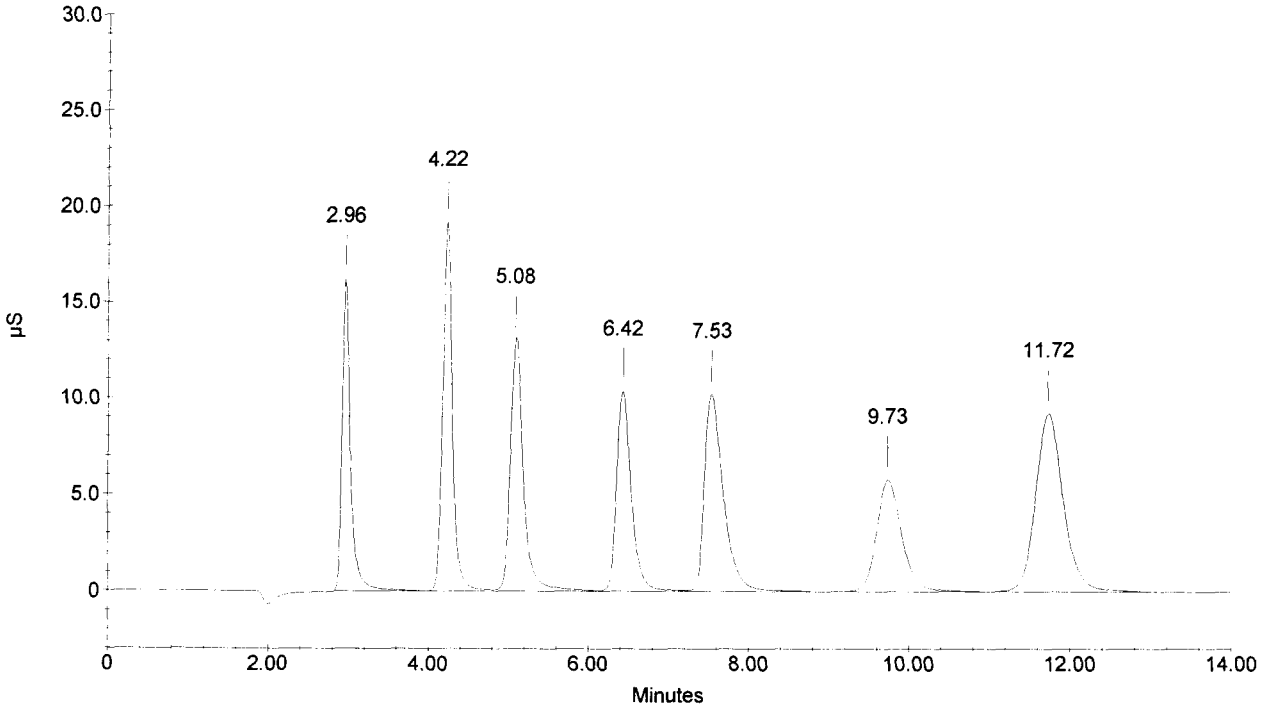
Date Time Collected : 10/25/05 12:31:13 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010102

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	96.524	161847	1180650	2	-1.44
2	4.22	CHLORIDE	197.006	191123	1601078	2	-1.55
3	5.08	NITRITE-N	84.706	130255	1497283	2	-1.99
4	6.42	BROMIDE	389.459	103391	1330597	2	-1.48
5	7.53	NITRATE-N	87.091	102163	1694064	2	0.67
6	9.73	PHOSPHATE-P	184.729	57518	1272805	2	-0.92
7	11.72	SULFATE	389.436	92070	2217101	2	-2.36
			---total(s)---				
	0.00		1428.953		10793578		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 14
Data File Name : c:\peaknet\data\051025a\051025_014.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

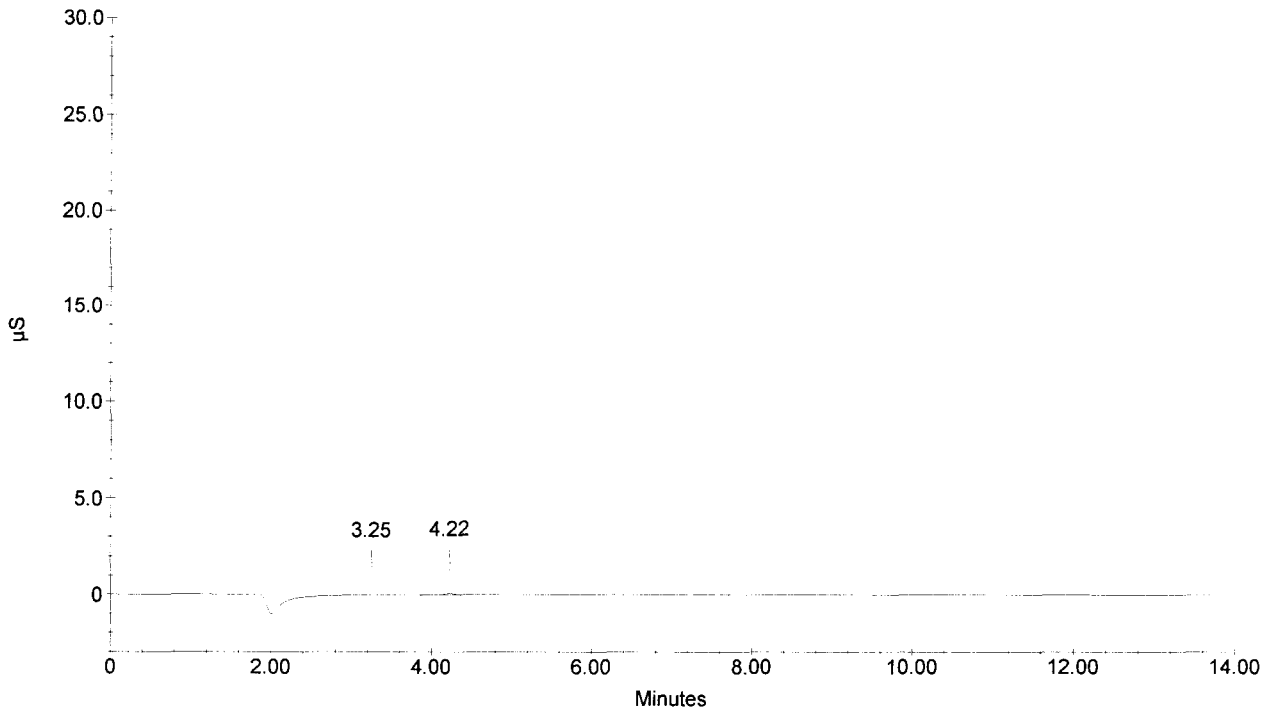
Date Time Collected : 10/25/05 12:48:00 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010103

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	3.25	FLUORIDE	0.051	146	744	1	8.33
2	4.22	CHLORIDE	0.085	866	9137	1	-1.55
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.136		9881		

CCB



Sample Name : 268888
Dilution Factor : 1.00
Injection Number : 15
Data File Name : ...\051025_015.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

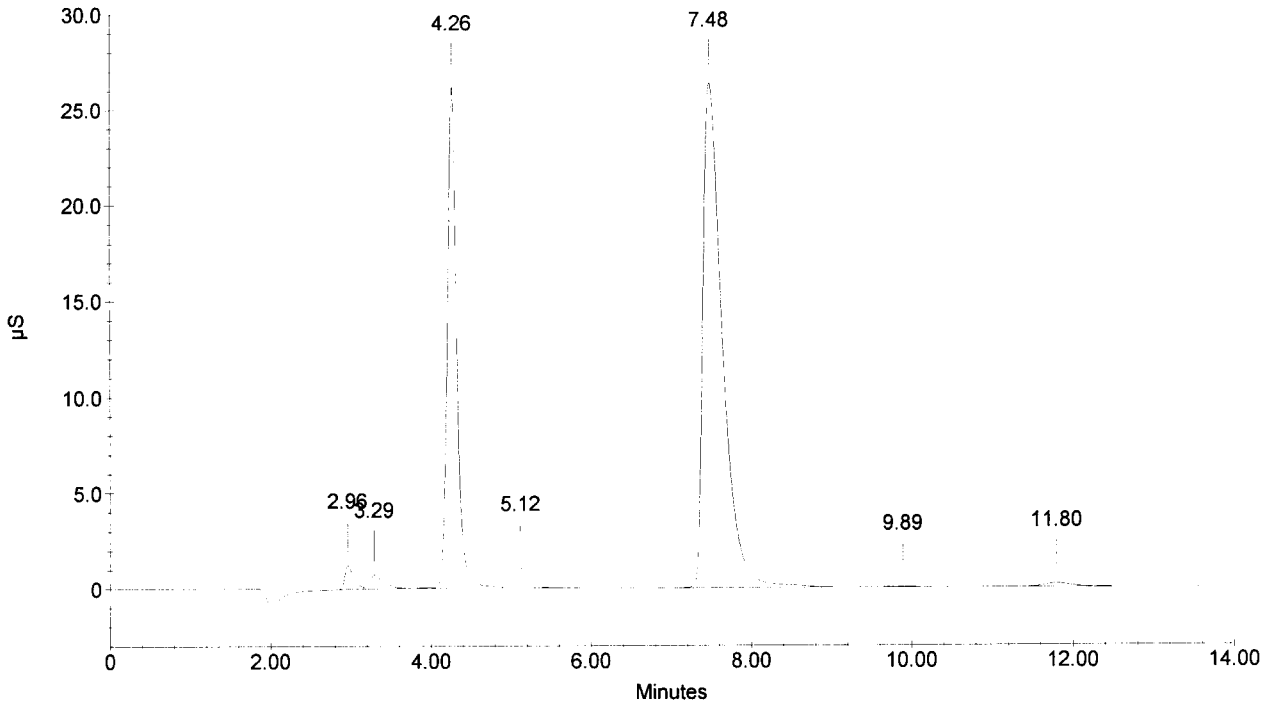
Date Time Collected : 10/25/05 1:04:54 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010104

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.448	12390	93514	2	-1.44
3	4.26	CHLORIDE	12.749 ✓	261324	2126400	2	-0.62
4	5.12	NITRITE-N	0.410	10413	119980	2	-1.22
		BROMIDE					
5	7.48	NITRATE-N	10.330 ✓	262987	4434748	1	-0.04
6	9.89	PHOSPHATE-P	0.058	140	2519	1	0.71
7	11.80	SULFATE	0.473 ✓	1927	48268	1	-1.69
			---total(s)---				
	0.00		24.468		6825430		

268888



Sample Name : 268889
Dilution Factor : 1.00
Injection Number : 16
Data File Name : ...\051025_016.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

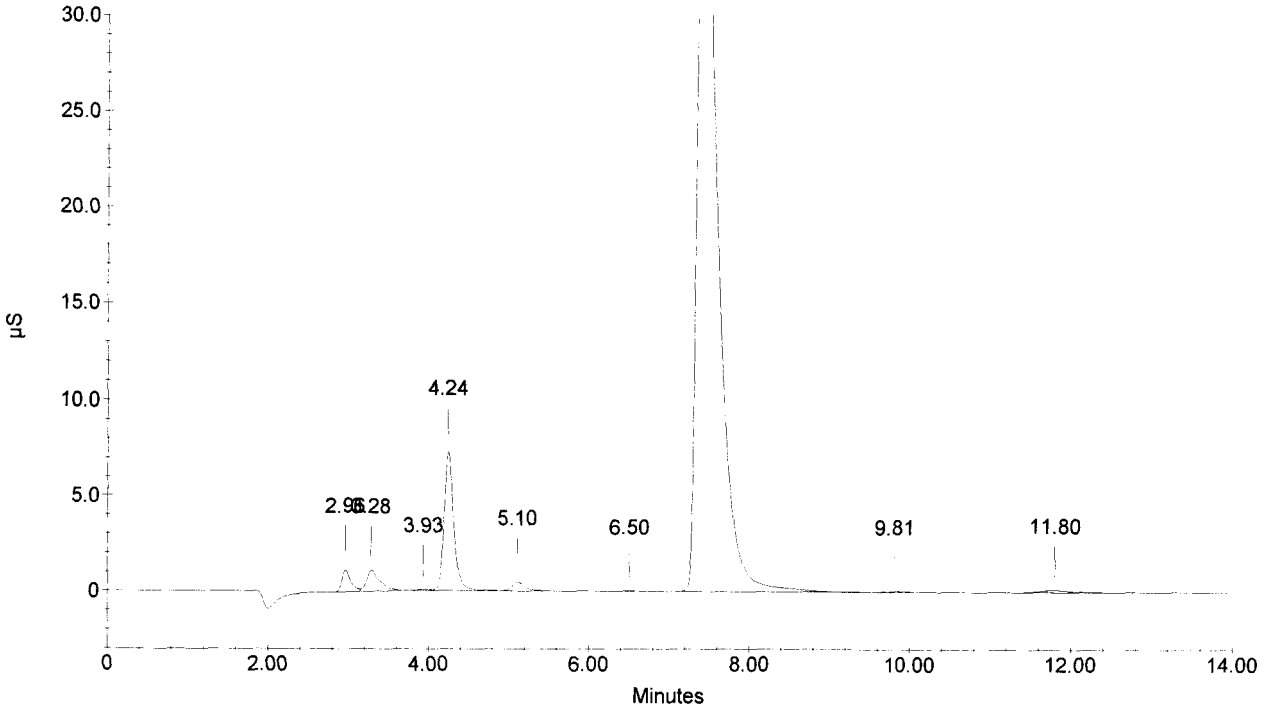
Date Time Collected : 10/25/05 1:21:39 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010105

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.426	11651	88398	2	-1.44
4	4.24	CHLORIDE	3.947	72323	610451	2	-1.24
5	5.10	NITRITE-N	0.225	4774	54165	2	-1.48
6	6.50	BROMIDE	0.095	222	2779	1	-0.26
7	7.41	NITRATE-N	15.628	418704	7191803	1	-0.94
8	9.81	PHOSPHATE-P	0.104	396	8429	1	-0.10
9	11.80	SULFATE	0.283	1148	28434	1	-1.69
	0.00		---total(s)--- 20.708		7984460		

268889



Sample Name : 268890
Dilution Factor : 1.00
Injection Number : 17
Data File Name : ...\051025_017.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

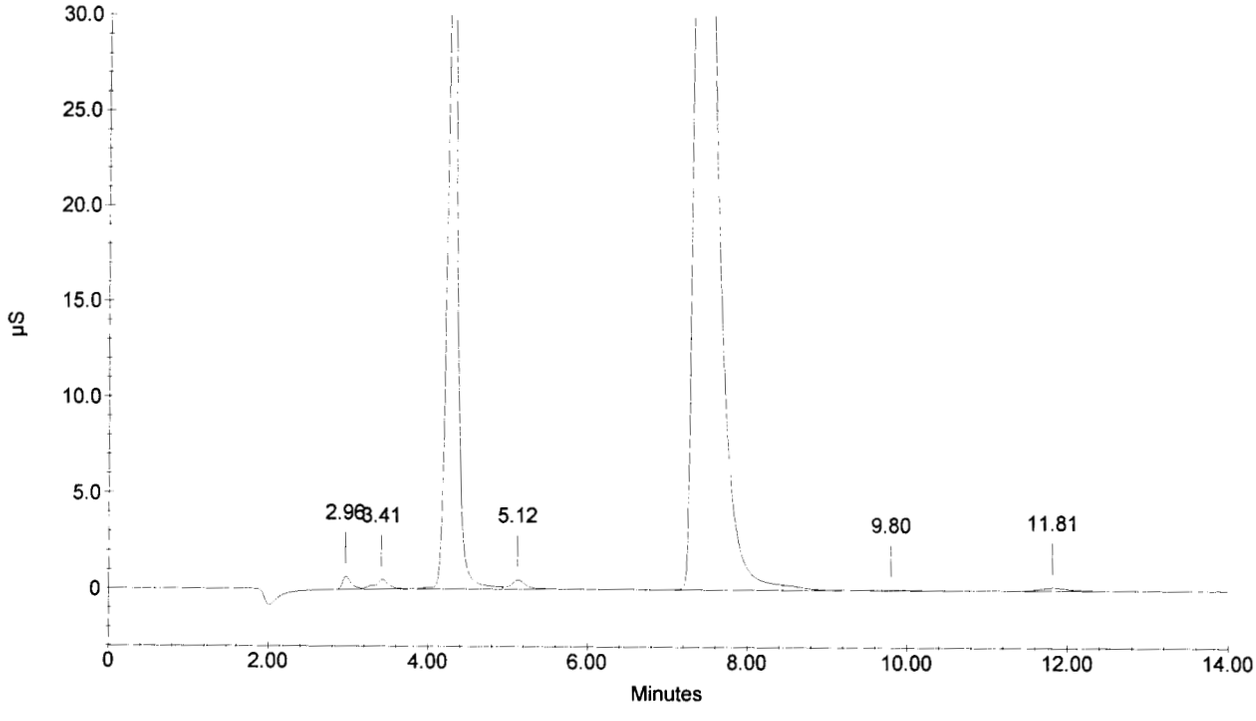
Date Time Collected : 10/25/05 1:38:27 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010106

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.273	6716	52391	2	-1.44
3	4.28	CHLORIDE	18.682	394608	3307979	2	-0.31
4	5.12	NITRITE-N	0.247	4843	61924	2	-1.22
		BROMIDE					
5	7.38	NITRATE-N	21.501	582334	10275592	2	-1.29
6	9.80	PHOSPHATE-P	0.064	149	3318	2	-0.24
7	11.81	SULFATE	0.406	1636	41225	1	-1.58
			---total(s)---				
	0.00		41.173		13742429		

268890



Sample Name : 268891
Dilution Factor : 1.00
Injection Number : 18
Data File Name : c:\peaknet\data\051025a\051025_018.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

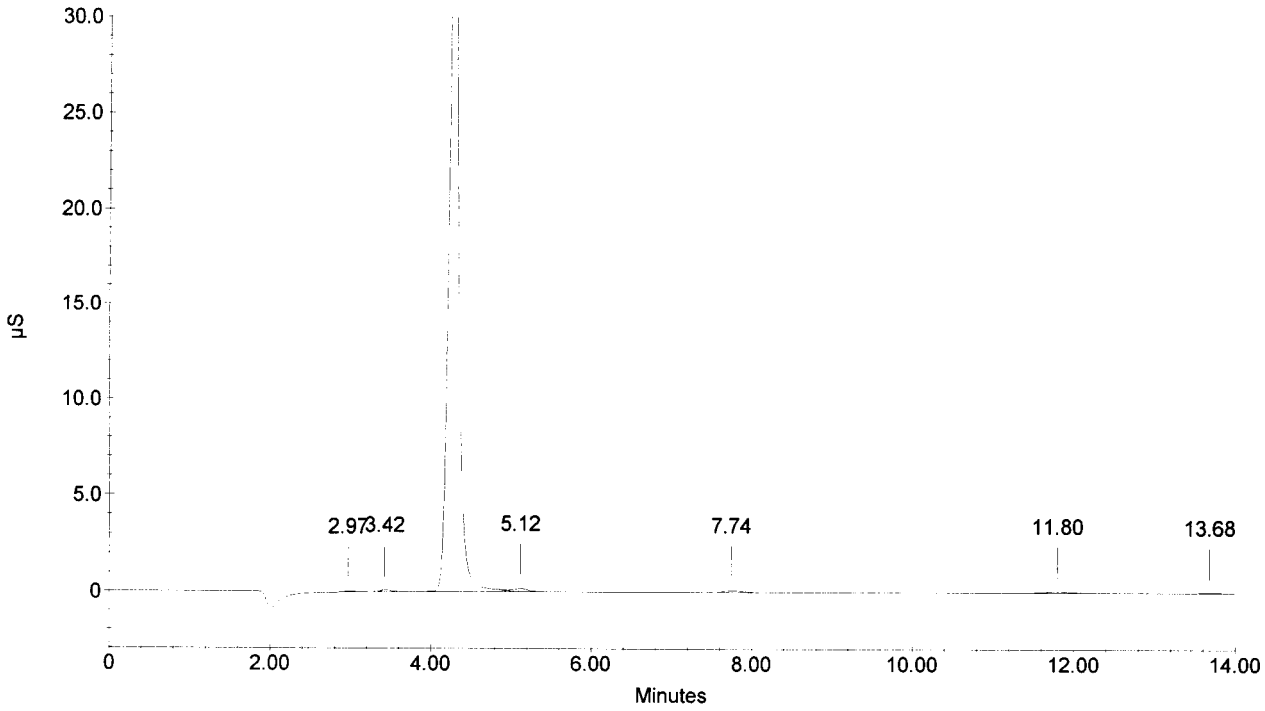
Date Time Collected : 10/25/05 1:55:13 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010107

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.055	328	1702	1	-1.00
3	4.26	CHLORIDE	18.123 ✓	381560	3189466	3	-0.62
4	5.12	NITRITE-N BROMIDE	0.132	1652	20655	4	-1.22
5	7.74	NITRATE-N PHOSPHATE-P	0.071 ✓	934	14665	1	3.52
6	11.80	SULFATE	0.213 ✓	886	21166	1	-1.69
	0.00		---total(s)--- 18.594		3247654		

268891



Sample Name : 268892
Dilution Factor : 1.00
Injection Number : 19
Data File Name : ...\051025_019.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

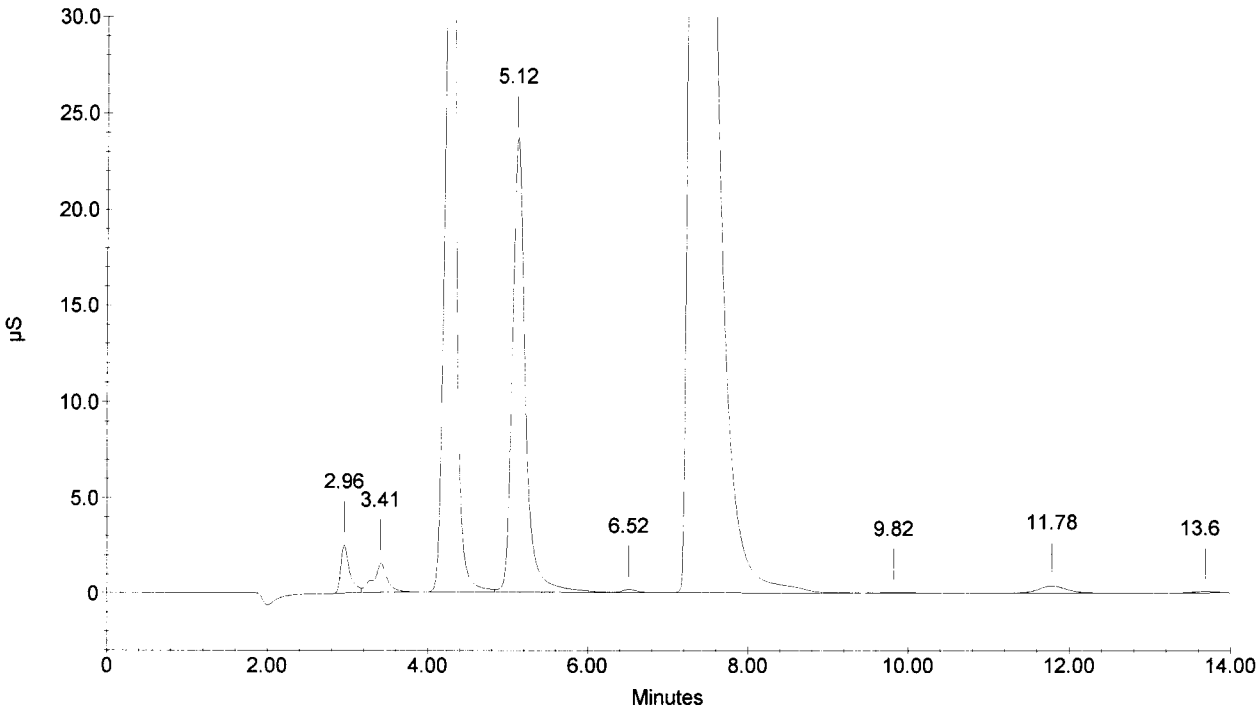
Date Time Collected : 10/25/05 2:11:59 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010108

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.880	25173	195644	2	-1.44
3	4.28	CHLORIDE	23.214	505625	4343788	2	-0.31
4	5.12	NITRITE-N	7.473	235235	2680603	2	-1.22
5	6.52	BROMIDE	0.420	1756	23334	2	-0.05
6	7.33	NITRATE-N	38.831	916352	17142255	2	-2.01
7	9.82	PHOSPHATE-P	0.131	464	11925	2	0.03
8	11.78	SULFATE	0.949	3870	97897	1	-1.81
			---total(s)---				
	0.00		71.897		24495446		

268892



Sample Name : 268892D
Dilution Factor : 1.00
Injection Number : 20
Data File Name : ...\051025_020.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

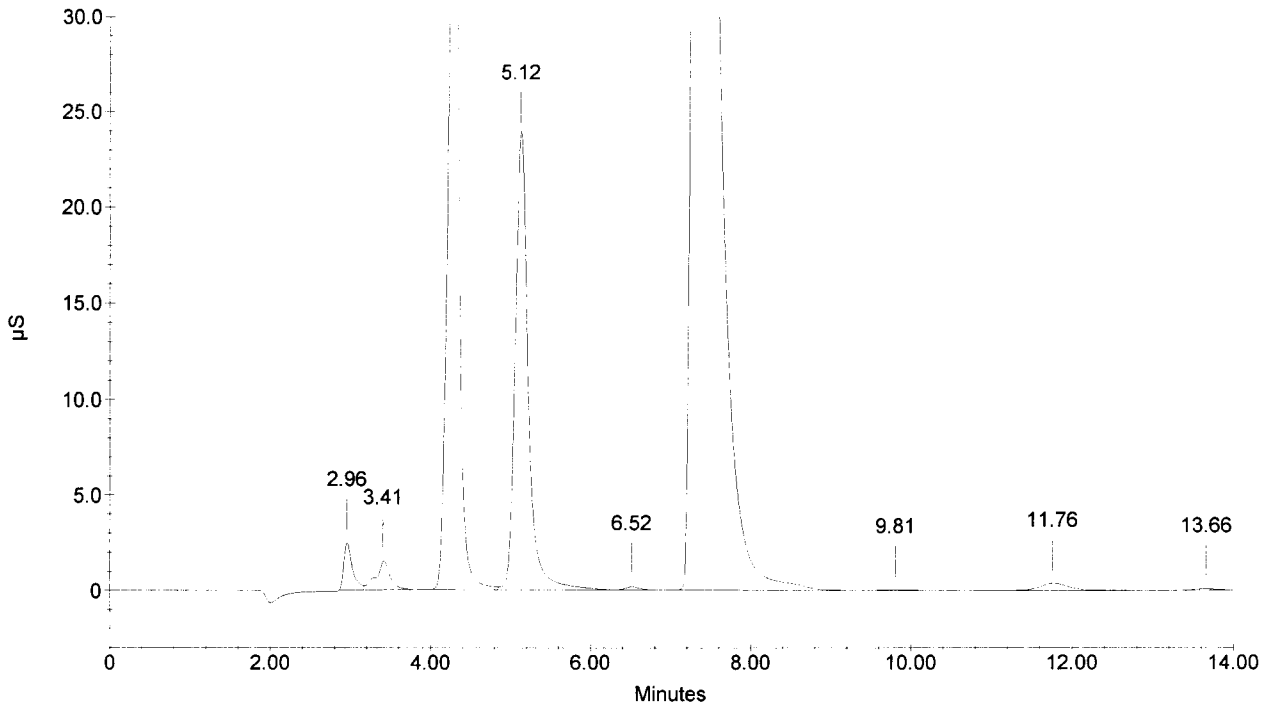
Date Time Collected : 10/25/05 2:28:43 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010109

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.849	24713	188416	2	-1.44
3	4.28	CHLORIDE	23.137	501548	4324789	2	-0.31
4	5.12	NITRITE-N	7.549	236683	2708843	2	-1.22
5	6.52	BROMIDE	0.423	1748	23530	2	-0.05
6	7.33	NITRATE-N	38.456	912056	17028102	1	-2.01
7	9.81	PHOSPHATE-P	0.109	407	9120	1	-0.10
8	11.76	SULFATE	1.034	3911	106785	1	-2.03
			---total(s)---				
	0.00		71.557		24389586		

268892D



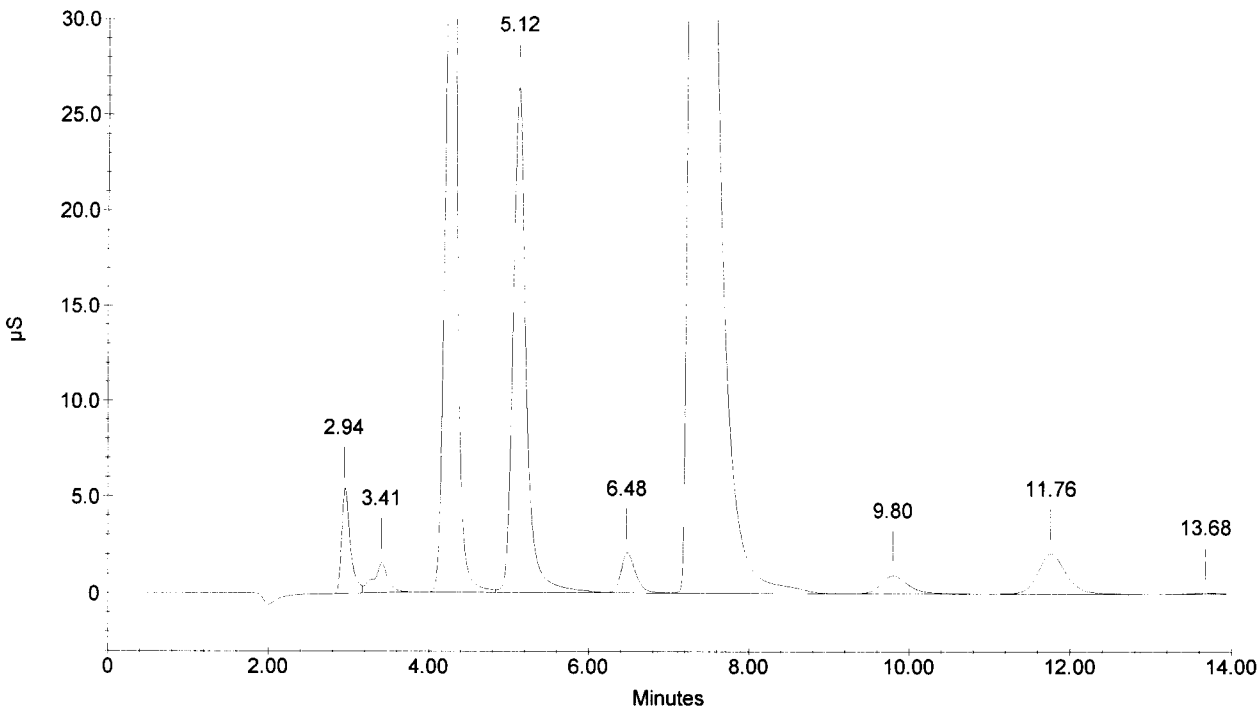
Sample Name : 268892S
Dilution Factor : 1.00
Injection Number : 21
Data File Name : ...\051025_021.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

Date Time Collected : 10/25/05 2:45:30 PM **010110**
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.94	FLUORIDE	1.770	52674	409775	2	-1.89
3	4.28	CHLORIDE	24.482	541296	4662294	2	-0.31
4	5.12	NITRITE-N	8.300	263303	2985680	2	-1.22
5	6.48	BROMIDE	4.171	20521	264136	2	-0.66
6	7.32	NITRATE-N	39.109	921966	17226243	2	-2.18
7	9.80	PHOSPHATE-P	1.782	9375	229094	2	-0.24
8	11.76	SULFATE	4.895	20779	517826	2	-2.03
			---total(s)---				
	0.00		84.509		26295048		

268892S



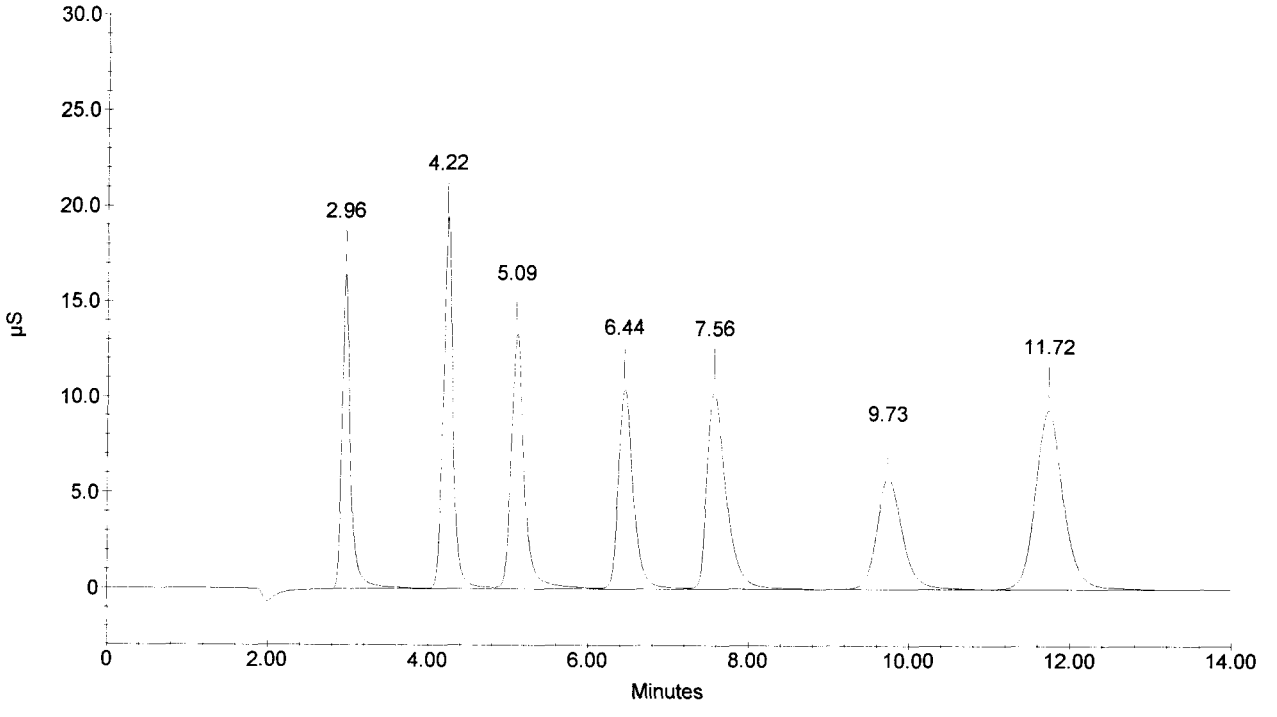
Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 22
Data File Name : c:\peaknet\data\051025a\051025_022.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

Date Time Collected : 10/25/05 3:02:16 PM **010111**
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	98.599	164261	1207737	2	-1.44
2	4.22	CHLORIDE	200.652	189229	1633275	2	-1.55
3	5.09	NITRITE-N	86.221	131933	1524774	2	-1.74
4	6.44	BROMIDE	395.954	103538	1354970	2	-1.28
5	7.56	NITRATE-N	88.319	102880	1719816	2	1.02
6	9.73	PHOSPHATE-P	188.091	58318	1297703	2	-0.92
7	11.72	SULFATE	395.137	93535	2253150	2	-2.36
	0.00		---total(s)--- 1452.974		10991425		

CCV



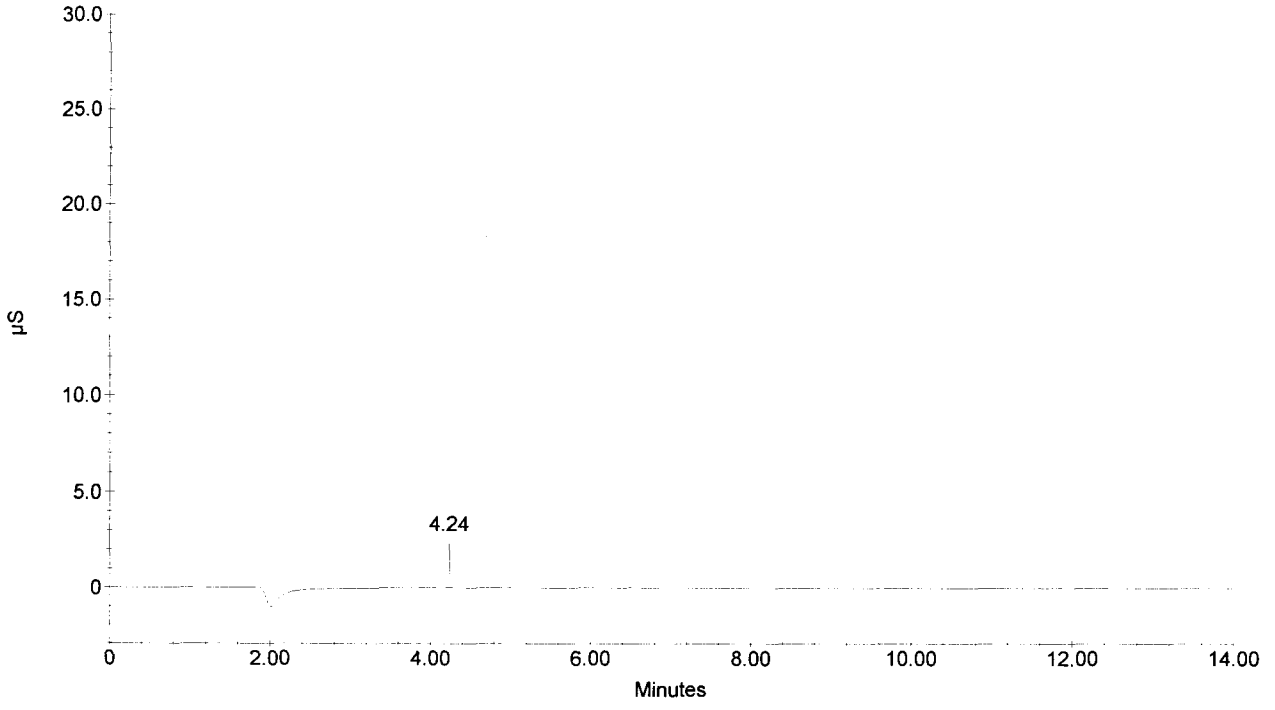
Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 23
Data File Name : c:\peaknet\data\051025a\051025_023.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

Date Time Collected : 10/25/05 3:19:00 PM **010112**
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24	CHLORIDE	0.027	64	375	1	-1.24
1	4.24	CHLORIDE	0.027	64	375	1	-1.24
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.054		751		

CCB



Sample Name : 268878 DF10
Dilution Factor : 10.00
Injection Number : 24
Data File Name : c:\peaknet\data\051025a\051025_024.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

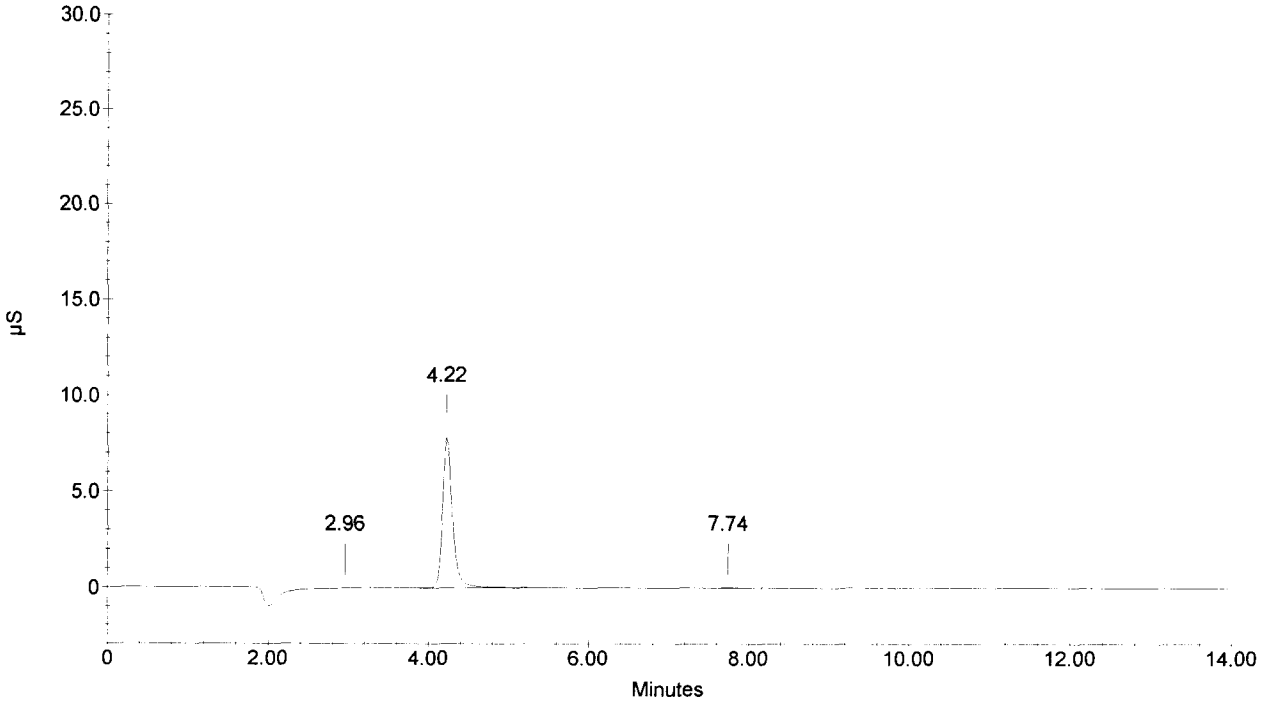
Date Time Collected : 10/25/05 3:35:41 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010113

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.502	82	464	1	-1.44
2	4.22	CHLORIDE	43.224	77427	670739	1	-1.55
		NITRITE-N					
		BROMIDE					
3	7.74	NITRATE-N	0.348	103	1473	1	3.52
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		44.075		672675		

268878 DF10



Sample Name : 268879 DF10
Dilution Factor : 10.00
Injection Number : 25
Data File Name : c:\peaknet\data\051025a\051025_025.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

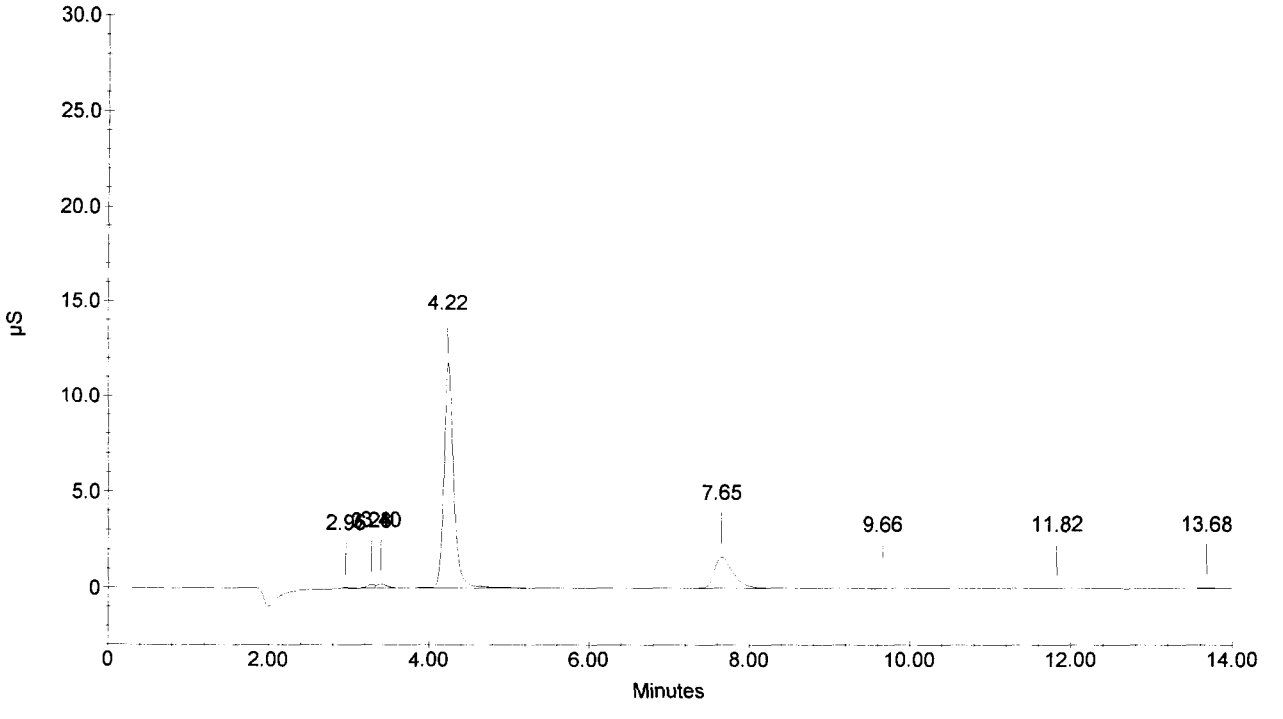
Date Time Collected : 10/25/05 3:52:24 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010114

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.577	437	2204	1	-1.44
4	4.22	CHLORIDE	63.012	115258	994143	1	-1.55
		NITRITE-N					
		BROMIDE					
5	7.65	NITRATE-N	7.441	16214	263894	1	2.27
6	9.66	PHOSPHATE-P	0.449	44	779	1	-1.60
7	11.82	SULFATE	0.212	71	1243	1	-1.47
			---total(s)---				
	0.00		71.691		1262263		

268879 DF10



Sample Name : 268880 DF10
Dilution Factor : 10.00
Injection Number : 26
Data File Name : c:\peaknet\data\051025a\051025_026.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

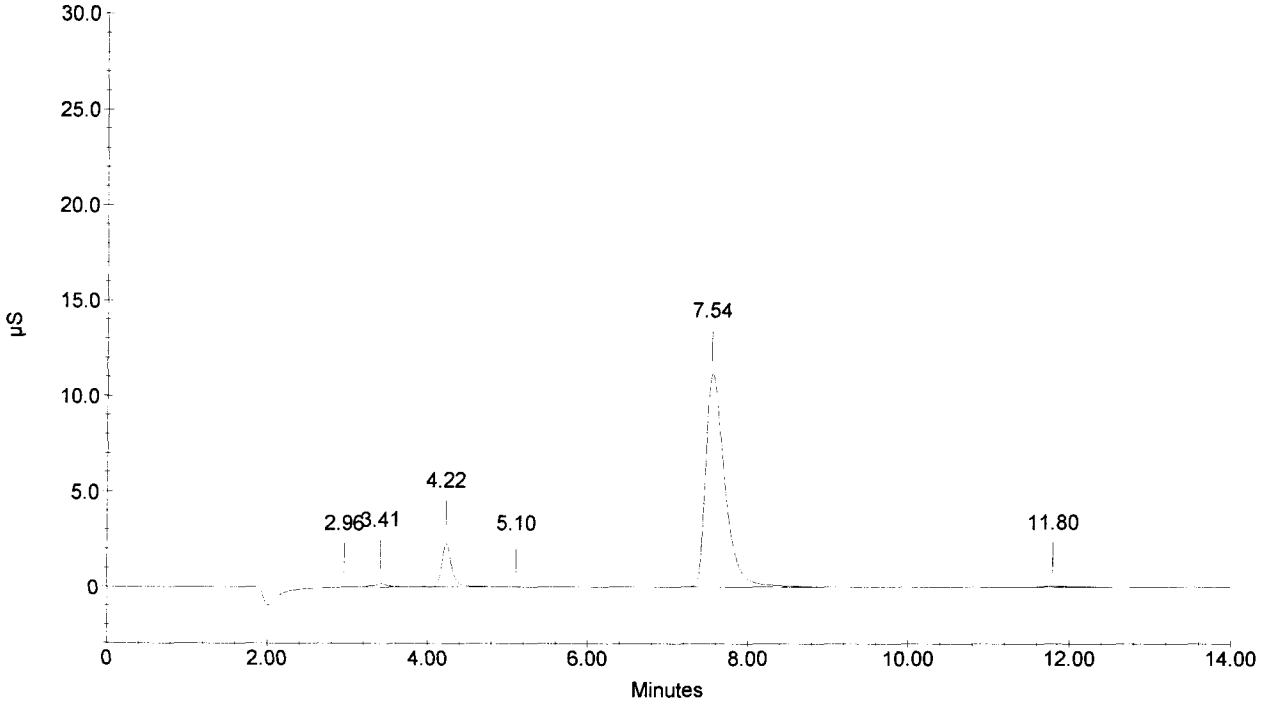
Date Time Collected : 10/25/05 4:09:09 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010115

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.521	210	920	1	-1.44
3	4.22	CHLORIDE	13.322	22565	199807	1	-1.55
4	5.10	NITRITE-N	0.764	122	971	1	-1.48
		BROMIDE					
5	7.54	NITRATE-N	47.344 ✓	111537	1854179	1	0.85
		PHOSPHATE-P					
6	11.80	SULFATE	1.866	639	18416	1	-1.69
			---total(s)---				
	0.00		63.816		2074293		

268880 DF10



Sample Name : 268881 DF10
Dilution Factor : 10.00
Injection Number : 27
Data File Name : c:\peaknet\data\051025a\051025_027.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

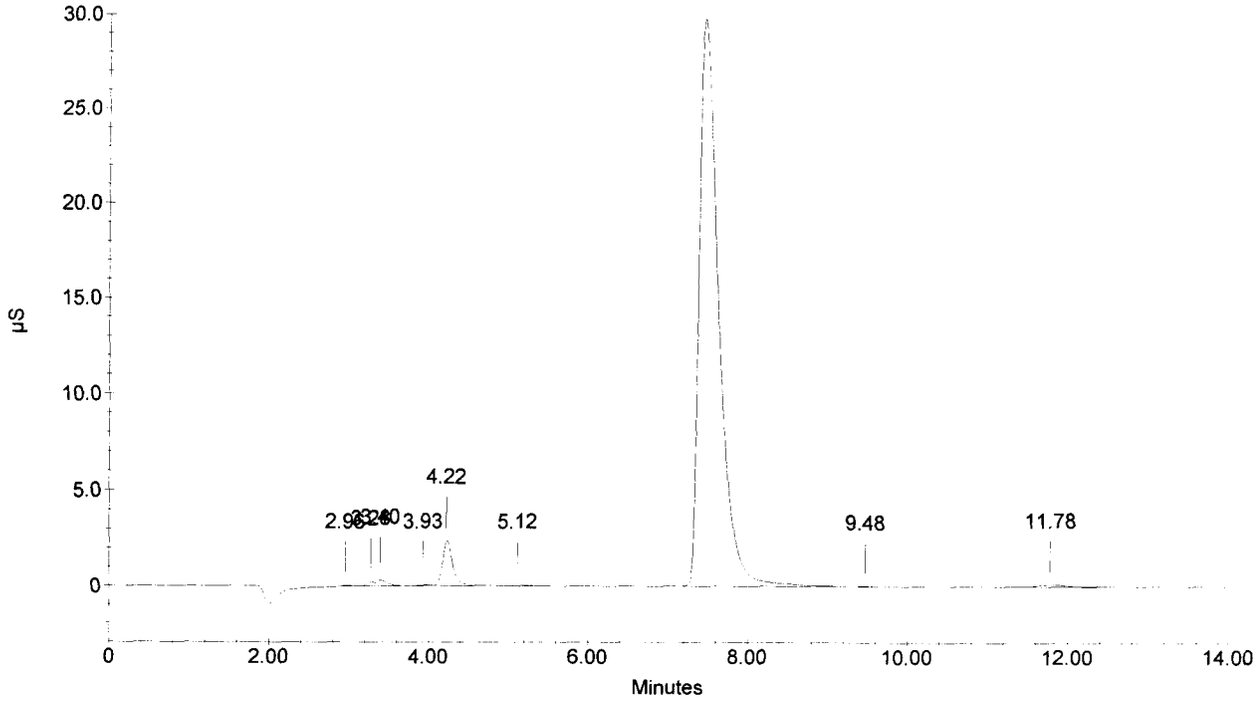
Date Time Collected : 10/25/05 4:25:54 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010116

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.560	370	1818	1	-1.44
5	4.22	CHLORIDE	13.839	23346	207785	2	-1.55
6	5.12	NITRITE-N	0.862	373	4485	1	-1.22
		BROMIDE					
7	7.45	NITRATE-N	115.610 ✓	296586	5054909	2	-0.40
8	9.48	PHOSPHATE-P	0.438	62	632	2	-3.50
9	11.78	SULFATE	2.989	1169	30095	1	-1.81
			---total(s)---				
	0.00		134.298		5299725		

268881 DF10



Sample Name : 268882 DF10
Dilution Factor : 10.00
Injection Number : 28
Data File Name : c:\peaknet\data\051025a\051025_028.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

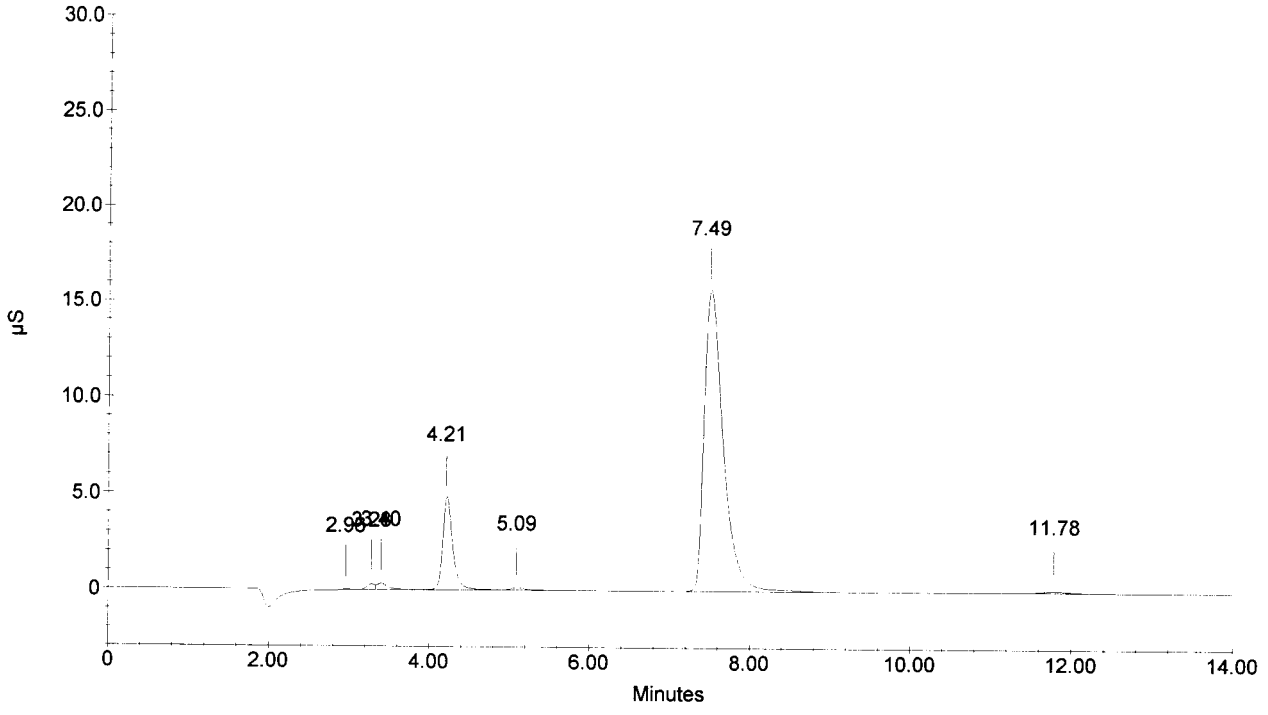
Date Time Collected : 10/25/05 4:42:39 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010117

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.523	215	959	1	-1.44
4	4.21	CHLORIDE	27.839	47465	425894	2	-1.86
5	5.09	NITRITE-N BROMIDE	1.194	1364	16328	2	-1.74
6	7.49	NITRATE-N PHOSPHATE-P	64.526	155917	2602545	1	0.13
7	11.78	SULFATE	2.418	981	24159	1	-1.81
	0.00		---total(s)--- 96.501		3069884		

268882 DF10



Sample Name : 268883 DF10
Dilution Factor : 10.00
Injection Number : 29
Data File Name : c:\peaknet\data\051025a\051025_029.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

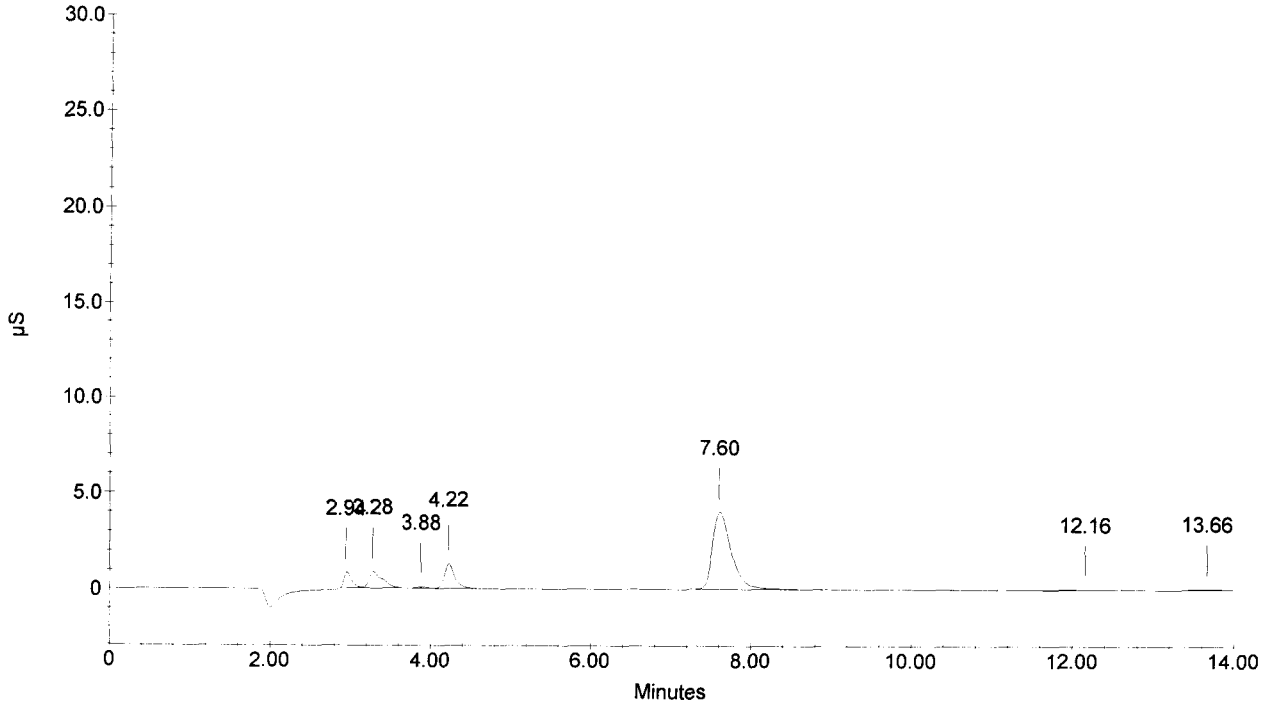
Date Time Collected : 10/25/05 4:59:23 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010118

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.94	FLUORIDE	2.780	7852	53658	2	-1.89
4	4.22	CHLORIDE	7.875	12725	116156	2	-1.55
		NITRITE-N					
		BROMIDE					
5	7.60	NITRATE-N	17.902	39941	661693	1	1.56
		PHOSPHATE-P					
6	12.16	SULFATE	0.551	147	4753	1	1.31
			---total(s)---				
	0.00		29.108		836260		

268883 DF10



Sample Name : 268884 DF10
Dilution Factor : 10.00
Injection Number : 30
Data File Name : c:\peaknet\data\051025a\051025_030.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

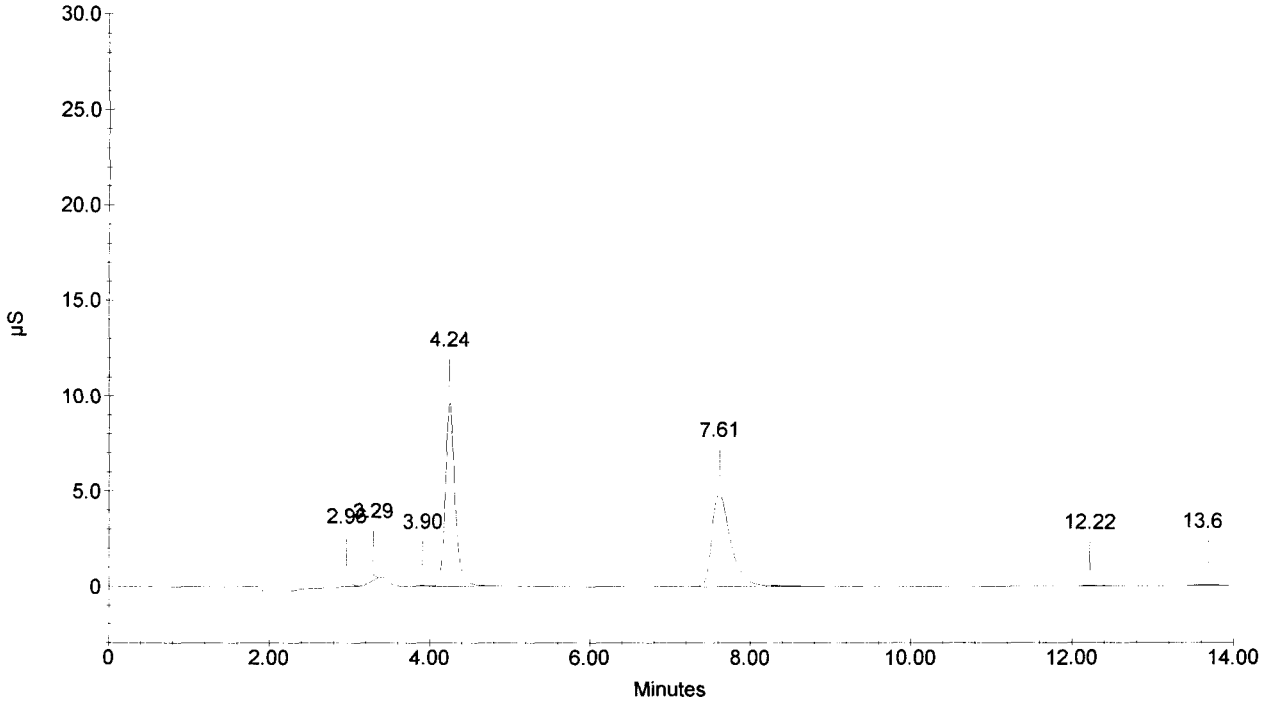
Date Time Collected : 10/25/05 5:16:07 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010119

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	1.313	3090	19371	1	-1.44
4	4.24	CHLORIDE	51.687 ✓	95664	807837	2	-1.24
		NITRITE-N					
		BROMIDE					
5	7.61	NITRATE-N	21.622✓	48622	806320	1	1.74
		PHOSPHATE-P					
6	12.22	SULFATE	0.803	200	7375	1	1.86
			---total(s)---				
	0.00		75.425		1640903		

268884 DF10



Sample Name : 268885 DF10
Dilution Factor : 10.00
Injection Number : 31
Data File Name : c:\peaknet\data\051025a\051025_031.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

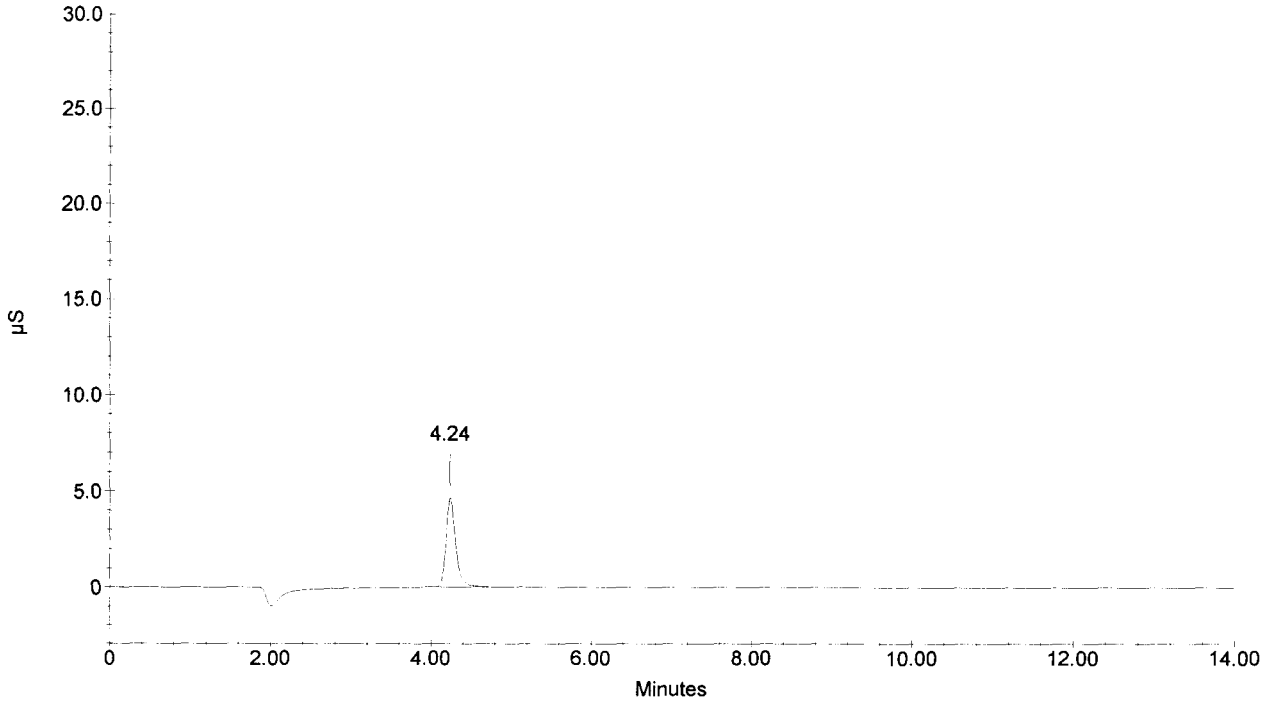
Date Time Collected : 10/25/05 5:32:52 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010120

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24	CHLORIDE	25.460	45960	388524	1	-1.24
1	4.24	CHLORIDE	25.460 ✓	45960	388524	1	-1.24
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		50.919		777049		

268885 DF10



Sample Name : 268886 DF10
Dilution Factor : 10.00
Injection Number : 32
Data File Name : c:\peaknet\data\051025a\051025_032.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

Date Time Collected : 10/25/05 5:49:33 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

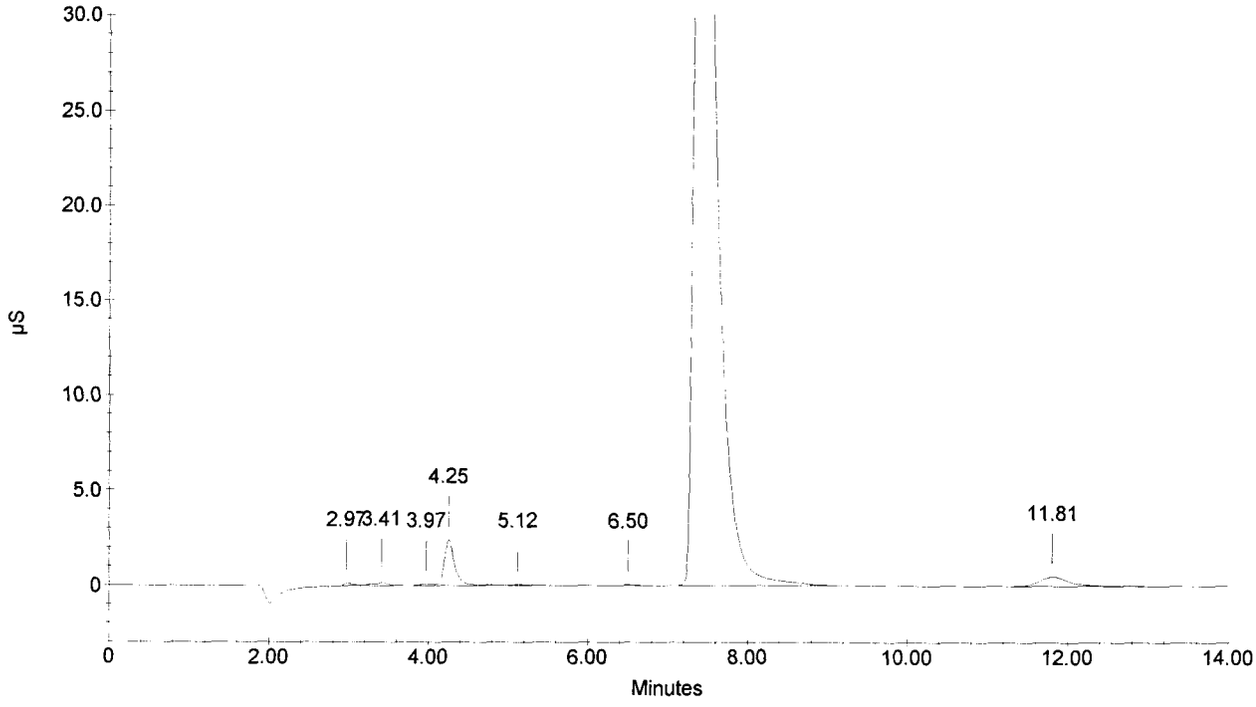
010121

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.850	1284	8566	2	-1.00
4	4.25	CHLORIDE	14.306	23715	214997	2	-0.93
5	5.12	NITRITE-N	0.961	574	8016	2	-1.22
6	6.50	BROMIDE	1.349	442	5310	1	-0.26
7	7.38	NITRATE-N	204.113	548131	9721115	1	-1.29
		PHOSPHATE-P					
8	11.81	SULFATE	12.761	4978	132183	1	-1.58
		---total(s)---					
	0.00		234.341		10090188		

Void 10/31/05 KS over curve

268886 DF10



Sample Name : 268887 DF10
Dilution Factor : 10.00
Injection Number : 33
Data File Name : c:\peaknet\data\051025a\051025_033.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

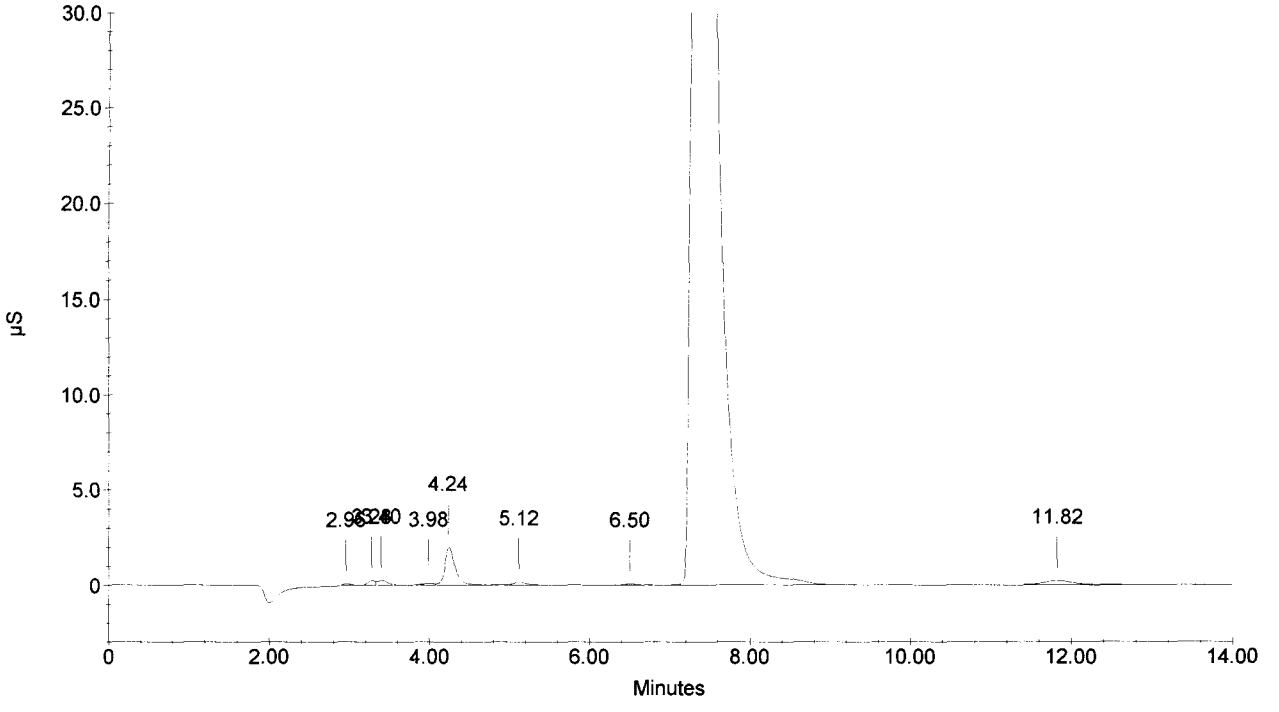
Date Time Collected : 10/25/05 6:06:19 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010122

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.701	852	5108	2	-1.44
5	4.24	CHLORIDE	12.224	19479	182901	2	-1.24
6	5.12	NITRITE-N	1.262	1537	18751	2	-1.22
7	6.50	BROMIDE	1.904	687	8814	1	-0.26
8	7.34	NITRATE-N	298.892	771643	14049799	1	-1.83
		PHOSPHATE-P					
9	11.82	SULFATE	5.665	2232	57970	1	-1.47
			---total(s)---				
	0.00		320.648		14323343		

268887 DF10



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 34
Data File Name : c:\peaknet\data\051025a\051025_034.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

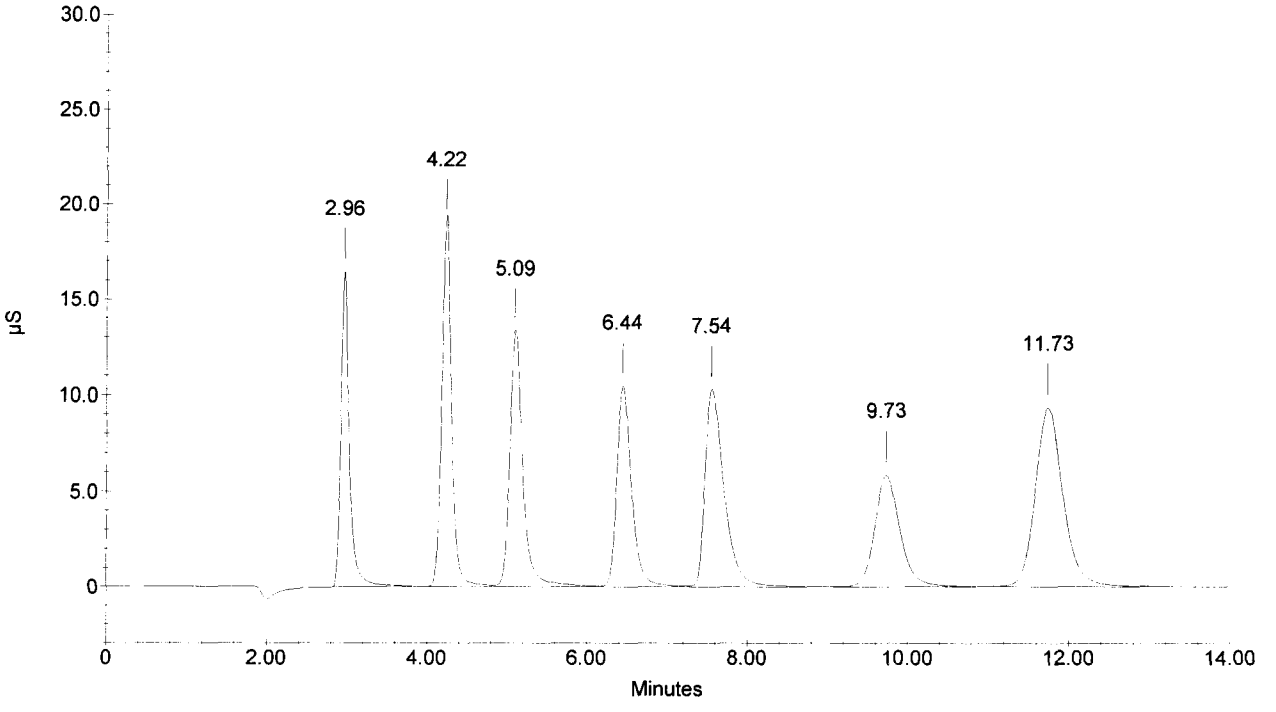
Date Time Collected : 10/25/05 6:23:04 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010123

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	98.529	164195	1206823	2	-1.44
2	4.22	CHLORIDE	200.606	190142	1632864	2	-1.55
3	5.09	NITRITE-N	86.282	132817	1525888	2	-1.74
4	6.44	BROMIDE	395.597	104382	1353625	2	-1.28
5	7.54	NITRATE-N	88.262	102581	1718620	2	0.85
6	9.73	PHOSPHATE-P	187.649	58605	1294423	2	-0.92
7	11.73	SULFATE	395.561	93501	2255833	2	-2.25
	0.00		---total(s)--- 1452.485		10988076		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 35
Data File Name : c:\peaknet\data\051025a\051025_035.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

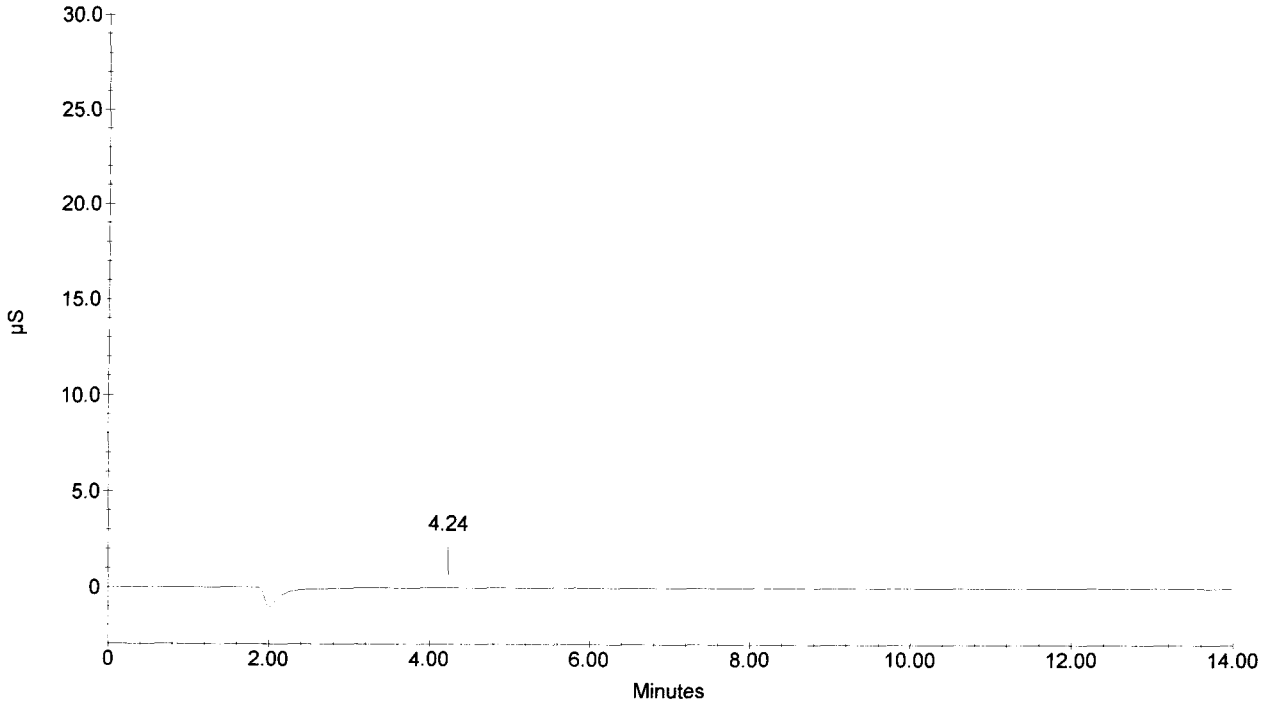
Date Time Collected : 10/25/05 6:39:49 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010124

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24		0.000	34	149	1	
		CHLORIDE					
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.000		149		

CCB



Sample Name : 268888 DF10
Dilution Factor : 10.00
Injection Number : 36
Data File Name : c:\peaknet\data\051025a\051025_036.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

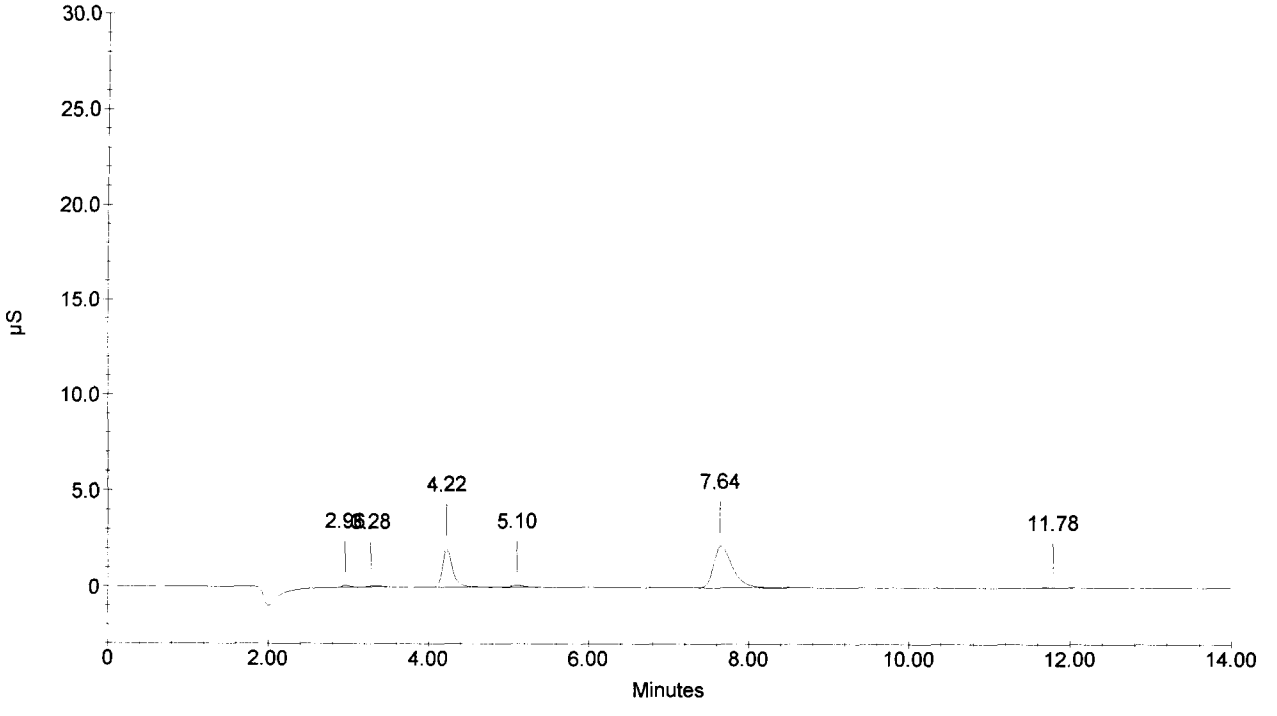
Date Time Collected : 10/25/05 6:56:31 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010125

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.764	1038	6577	2	-1.44
3	4.22	CHLORIDE	11.773	20054	175956	2	-1.55
4	5.10	NITRITE-N BROMIDE	1.056	1018	11392	2	-1.48
5	7.64	NITRATE-N PHOSPHATE-P	10.014	21701	360536	1	2.09
6	11.78	SULFATE	0.743	290	6748	1	-1.81
			---total(s)---				
	0.00		24.350		561209		

268888 DF10



Sample Name : 268889 DF10
Dilution Factor : 10.00
Injection Number : 37
Data File Name : c:\peaknet\data\051025a\051025_037.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

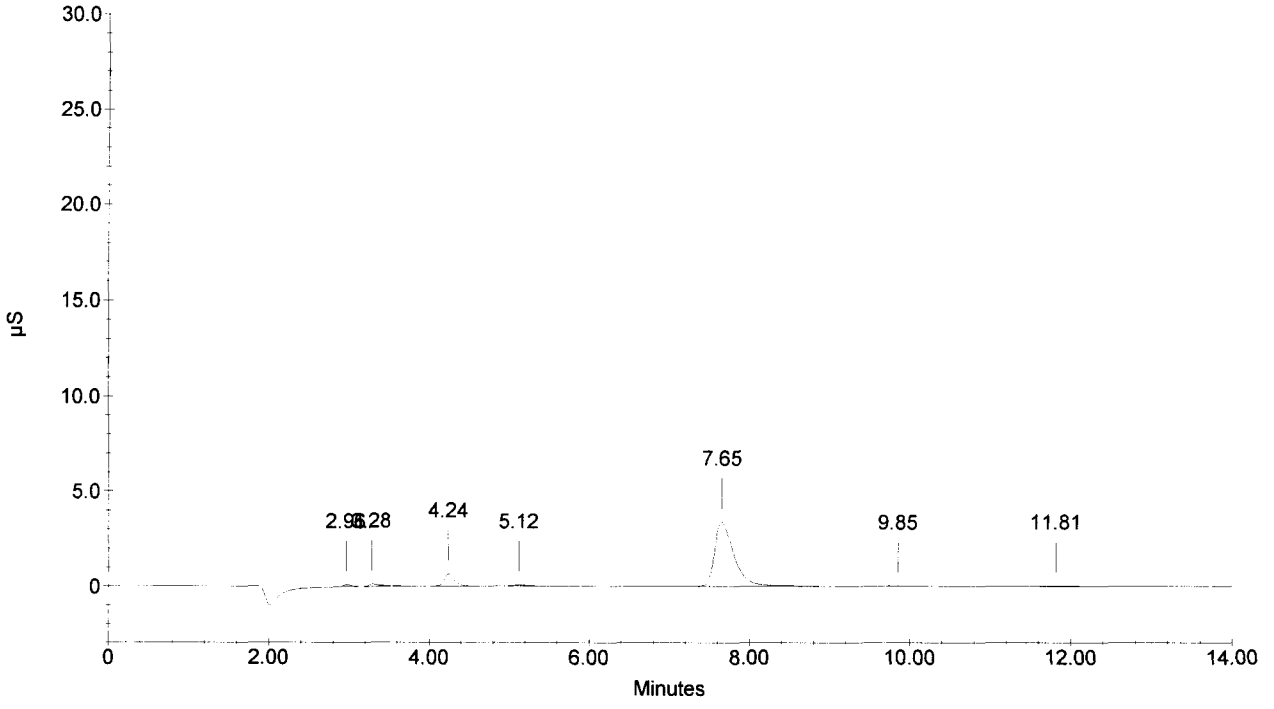
Date Time Collected : 10/25/05 7:13:15 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010126

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	0.718	876	5505	1	-1.44
3	4.24	CHLORIDE	3.905	6402	55573	1	-1.24
4	5.12	NITRITE-N	0.903	544	5954	1	-1.22
		BROMIDE					
5	7.65	NITRATE-N	15.363	33860	563944	1	2.27
6	9.85	PHOSPHATE-P	0.475	69	1114	1	0.31
7	11.81	SULFATE	0.479	197	4005	1	-1.58
			---total(s)---				
	0.00		21.843		636094		

268889 DF10



Sample Name : 268890 DF10
Dilution Factor : 10.00
Injection Number : 38
Data File Name : c:\peaknet\data\051025a\051025_038.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

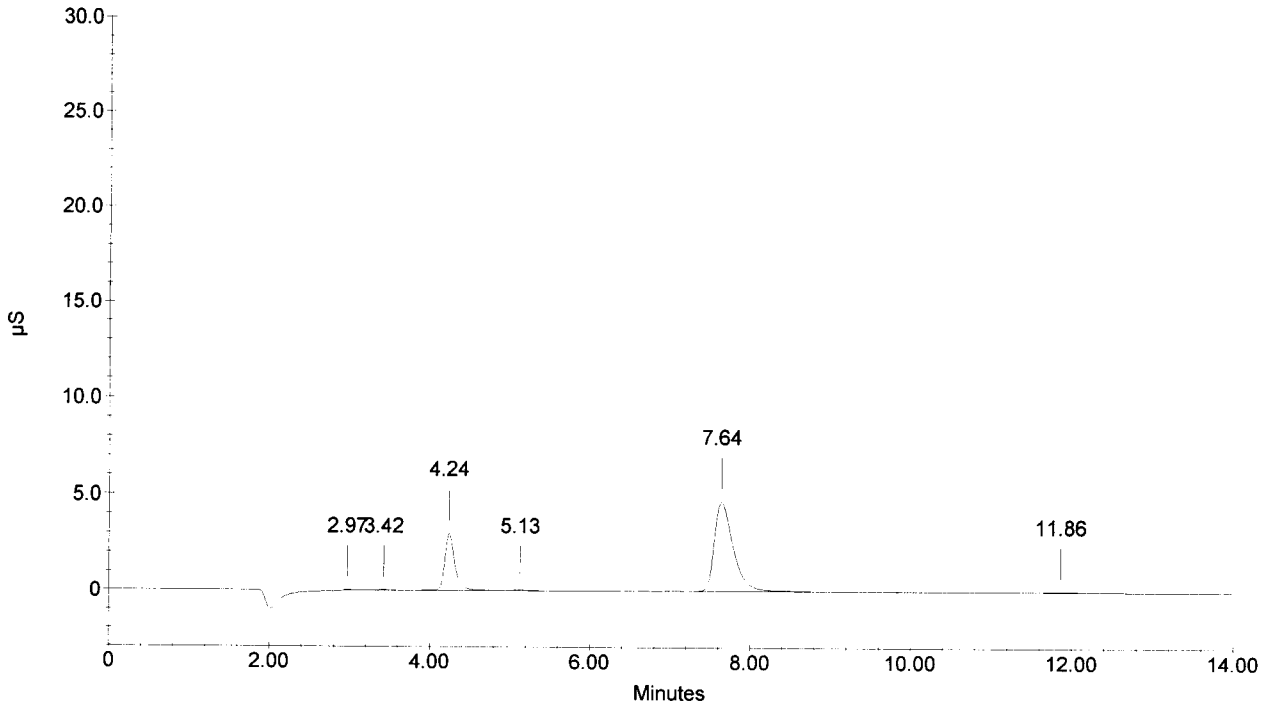
Date Time Collected : 10/25/05 7:30:00 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010127

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.606	504	2895	1	-1.00
3	4.24	CHLORIDE	17.603	29806	266005	2	-1.24
4	5.13	NITRITE-N BROMIDE	0.883	444	5232	2	-0.97
5	7.64	NITRATE-N PHOSPHATE-P	20.748	46440	772188	1	2.09
6	11.86	SULFATE	0.742	280	6742	1	-1.14
	0.00		---total(s)--- 40.582		1053062		

268890 DF10



Sample Name : 268891 DF10
Dilution Factor : 10.00
Injection Number : 39
Data File Name : c:\peaknet\data\051025a\051025_039.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

Date Time Collected : 10/25/05 7:46:44 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

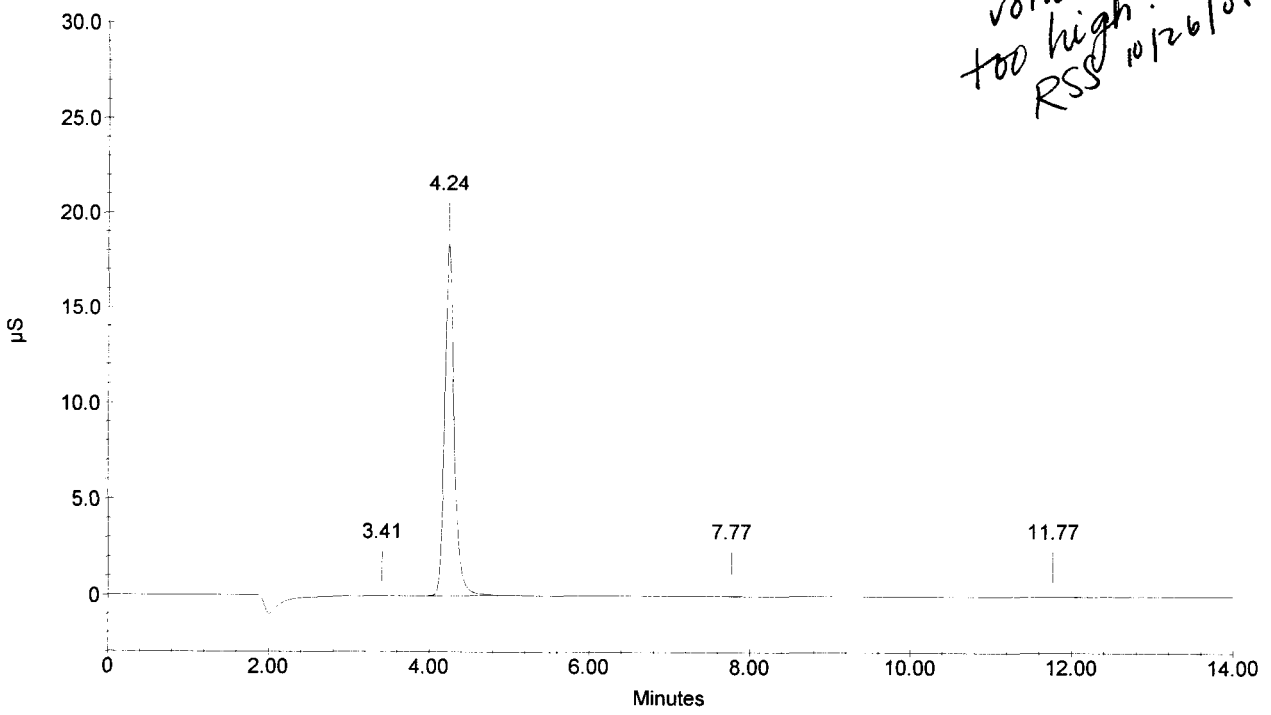
010128

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	3.41		0.000	79	506	1	
2	4.24	CHLORIDE NITRITE-N BROMIDE	93.107	182469	1506377	1	-1.24
3	7.77	NITRATE-N PHOSPHATE-P	0.354	129	1683	1	3.88
4	11.77	SULFATE	0.376	128	2945	1	-1.92
			---total(s)---				
	0.00		93.837		1511510		

268891 DF10

void: too high? RSS 10/26/05



Sample Name : 268892 DF10
Dilution Factor : 10.00
Injection Number : 40
Data File Name : c:\peaknet\data\051025a\051025_040.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

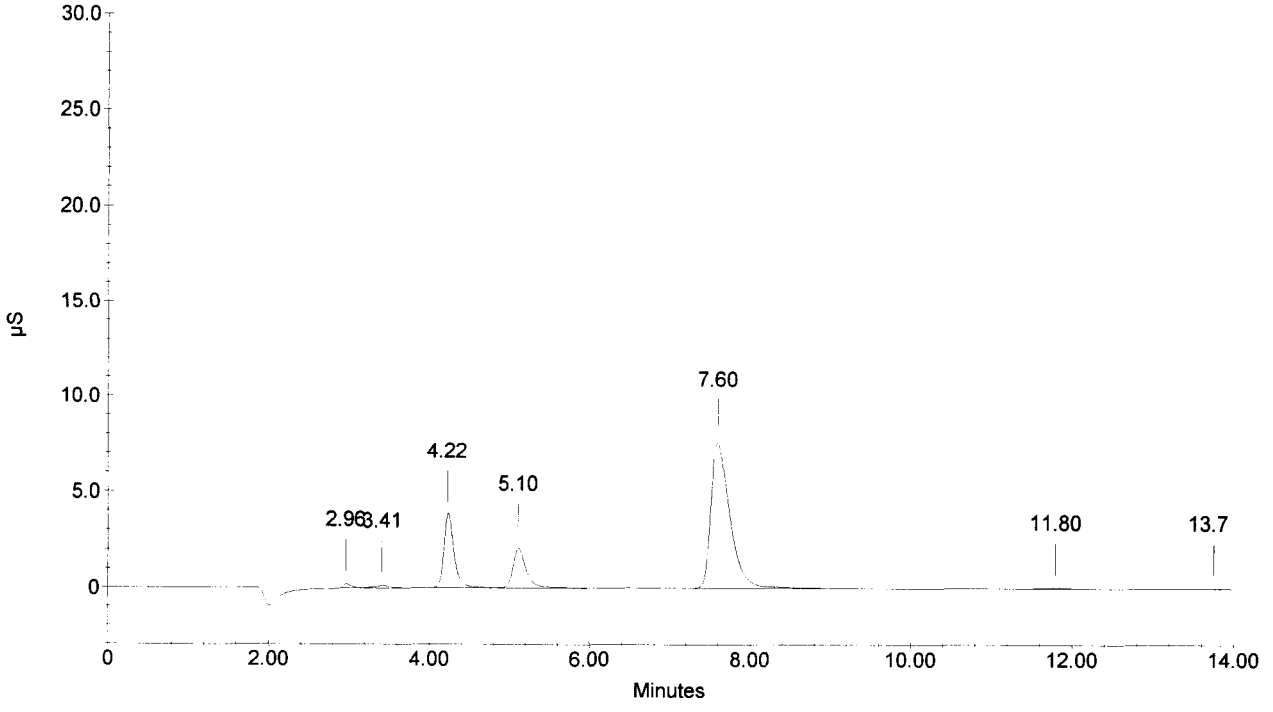
Date Time Collected : 10/25/05 8:03:27 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010129

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	1.099	2087	14369	2	-1.44
3	4.22	CHLORIDE	21.976	37458	334027	2	-1.55
4	5.10	NITRITE-N BROMIDE	7.442	20521	239468	2	-1.48
5	7.60	NITRATE-N PHOSPHATE-P	32.956	75502	1257603	1	1.56
6	11.80	SULFATE	1.055	455	9993	1	-1.69
	0.00		---total(s)--- 64.527		1855460		

268892 DF10



Sample Name : 268892D DF10
Dilution Factor : 10.00
Injection Number : 41
Data File Name : c:\peaknet\data\051025a\051025_041.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

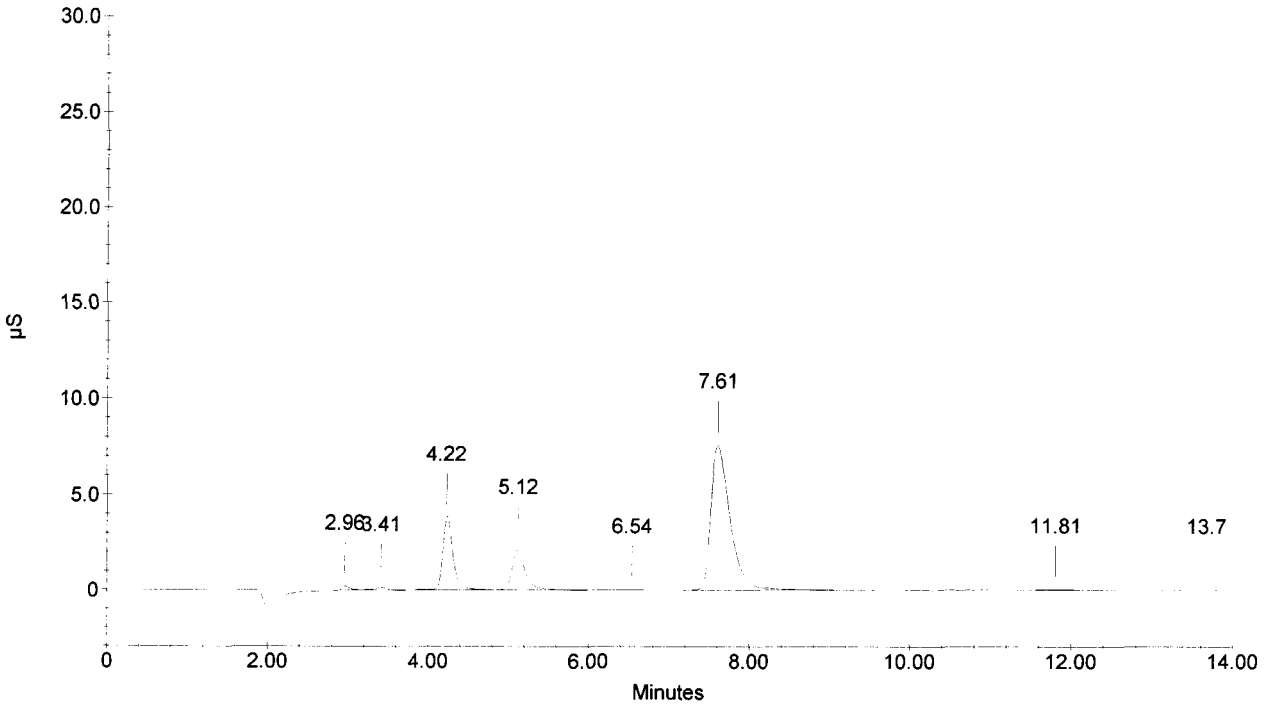
Date Time Collected : 10/25/05 8:20:13 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010130

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	1.080	2077	13924	2	-1.44
3	4.22	CHLORIDE	22.520	37816	342518	2	-1.55
4	5.12	NITRITE-N	7.551	20841	243378	2	-1.22
5	6.54	BROMIDE	0.747	139	1506	1	0.36
6	7.61	NITRATE-N	33.212	75913	1267973	1	1.74
		PHOSPHATE-P					
7	11.81	SULFATE	1.092	420	10377	1	-1.58
			---total(s)---				
	0.00		66.200		1879675		

268892D DF10



Sample Name : 268892S DF10
Dilution Factor : 10.00
Injection Number : 42
Data File Name : c:\peaknet\data\051025a\051025_042.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

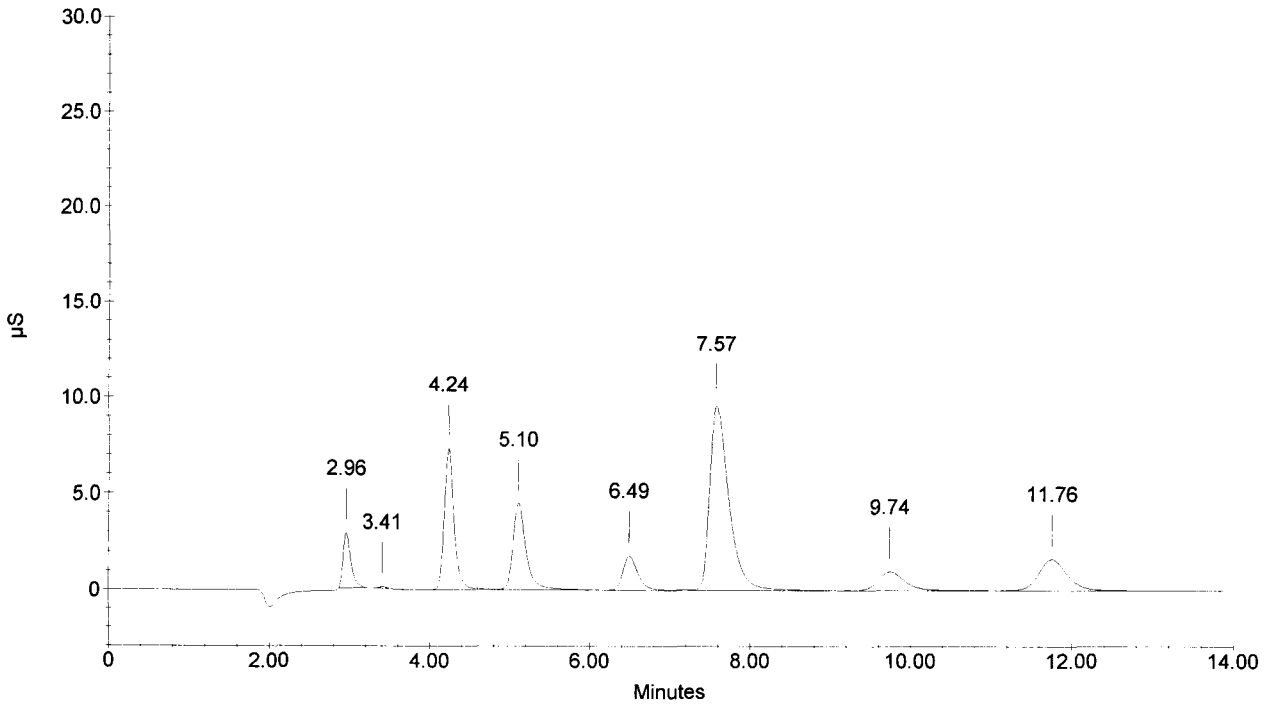
Date Time Collected : 10/25/05 8:36:56 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010131

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	8.734	28519	194142	1	-1.44
3	4.24	CHLORIDE	40.586	73206	628360	2	-1.24
4	5.10	NITRITE-N	15.276	44530	520110	2	-1.48
5	6.49	BROMIDE	37.919	17924	239486	2	-0.46
6	7.57	NITRATE-N	41.058	94923	1590210	2	1.20
7	9.74	PHOSPHATE-P	18.246	9666	234763	2	-0.78
8	11.76	SULFATE	39.108	16470	411722	2	-2.03
			---total(s)---				
	0.00		200.927		3818792		

268892S DF10



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 43
Data File Name : c:\peaknet\data\051025a\051025_043.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

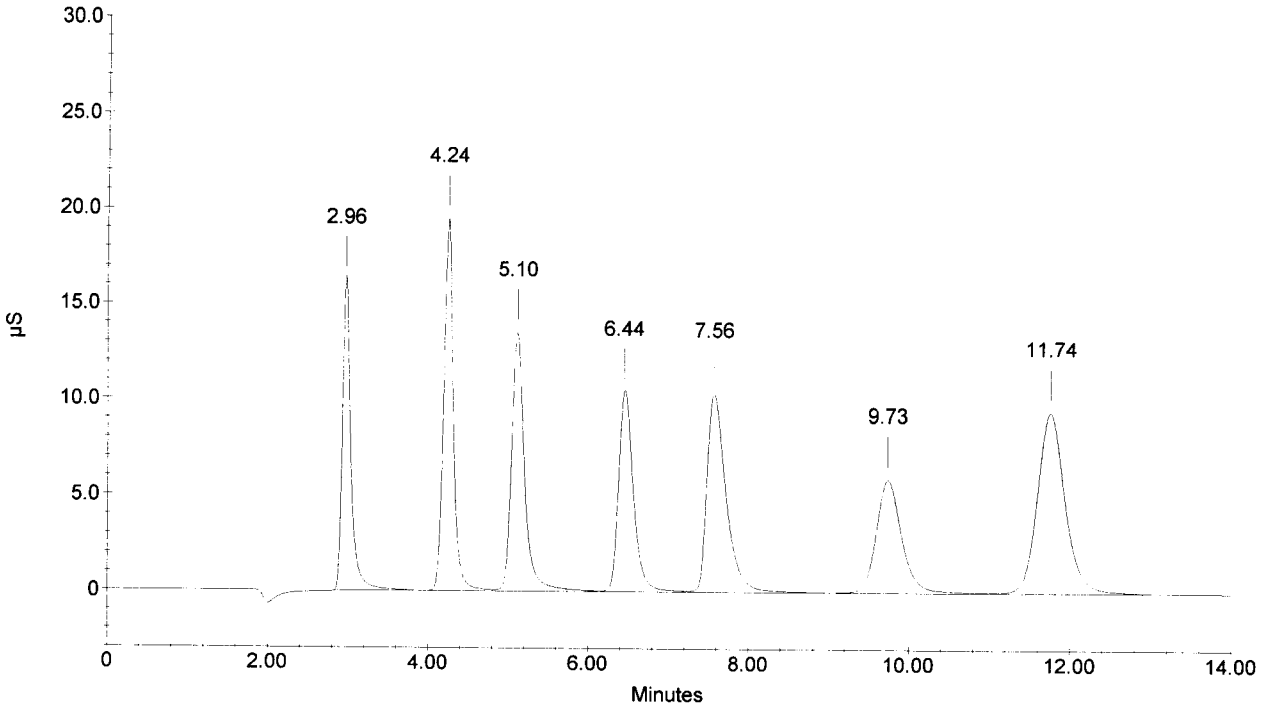
Date Time Collected : 10/25/05 8:53:43 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010132

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	98.250	162113	1203170	1	-1.44
2	4.24	CHLORIDE	200.630	194574	1633078	2	-1.24
3	5.10	NITRITE-N	86.675	134711	1533024	2	-1.48
4	6.44	BROMIDE	395.887	103825	1354715	2	-1.28
5	7.56	NITRATE-N	88.305	103066	1719519	2	1.02
6	9.73	PHOSPHATE-P	189.365	58782	1307154	2	-0.92
7	11.74	SULFATE	397.607	93873	2268803	2	-2.14
	0.00		---total(s)--- 1456.717		11019464		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 44
Data File Name : c:\peaknet\data\051025a\051025_044.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\25oct05a.sch

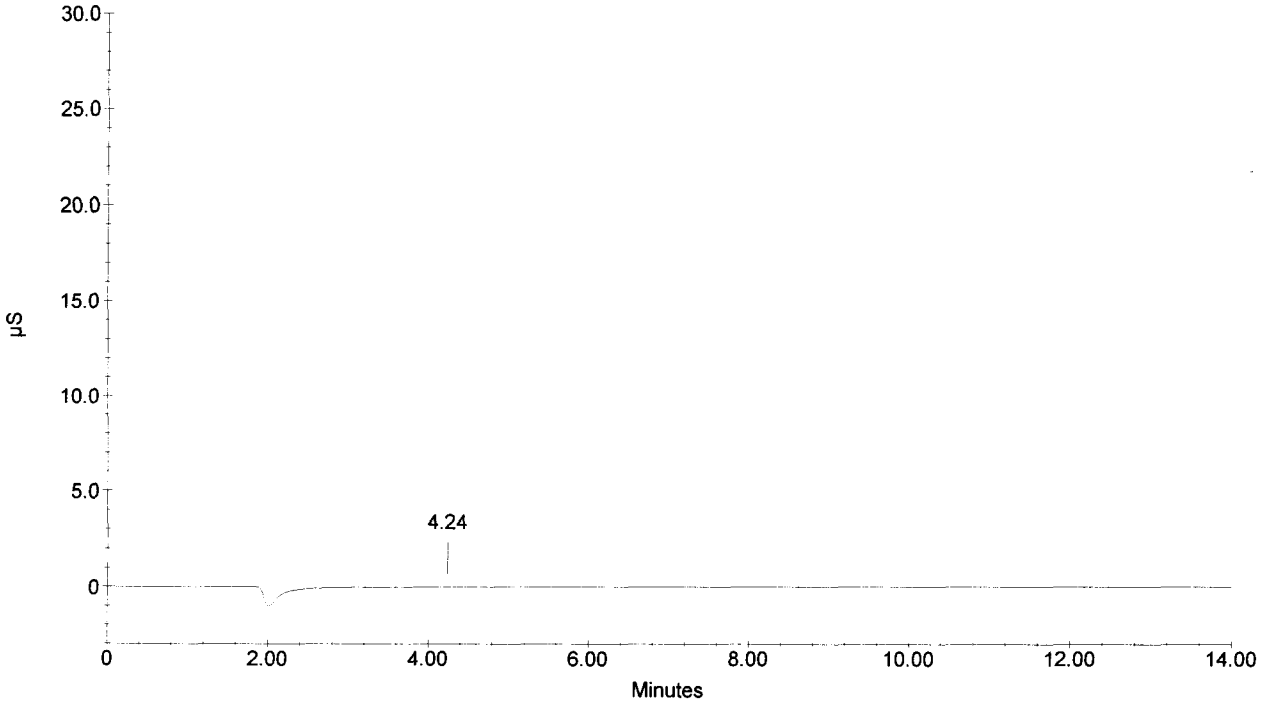
Date Time Collected : 10/25/05 9:10:28 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010133

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24	CHLORIDE	0.030	109	880	1	-1.24
1	4.24	CHLORIDE	0.030	109	880	1	-1.24
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.060		1760		

CCB



Div 20
06002.01.322
TO# 051021-6

J Warren A. Naggi
11/07/05

Analyst: RSS
Method: 300M
Sig Fig: 3

RSS

010134

Date Analyzed	System ID	Analyte	DF	Conc. mg/L	RESULT mg/L	Qual	DL	TV	%REC %RPD
11/04/05	268878	Formate	5	0.000	1	U	1		
11/04/05	268878	Acetate	5	0.298	1	U	1		
11/04/05	268879	Formate	5	2.644	2.64		1		
11/04/05	268879	Acetate	5	9.727	9.73		1		
11/04/05	268880	Formate	5	3.027	3.03		1		
11/04/05	268880	Acetate	5	4.658	4.66		1		
11/04/05	268881	Formate	5	2.860	2.86		1		
11/04/05	268881	Acetate	5	12.232	12.2		1		
11/04/05	268882	Formate	5	3.832	3.83		1		
11/04/05	268882	Acetate	5	15.949	15.9		1		
11/04/05	268883	Formate	10	3.889	3.89		2		
11/04/05	268883	Acetate	10	49.898	49.9		2		
11/04/05	268883D	Formate	10	3.521	3.52		2		9.99%
11/04/05	268883D	Acetate	10	49.451	49.5		2		0.80%
11/04/05	268883S	Formate	10	43.391	43.4		2	40	98.8%
11/04/05	268883S	Acetate	10	64.619	64.6		2	40	36.7%
11/04/05	268884	Formate	10	5.643	5.64		2		
11/04/05	268884	Acetate	10	33.472	33.5		2		
11/04/05	268885	Formate	5	0.000	1	U	1		
11/04/05	268885	Acetate	5	0.000	1	U	1		
11/04/05	268886	Formate	5	0.421	1	U	1		
11/04/05	268886	Acetate	5	1.189	1.19		1		
11/04/05	268887	Formate	5	0.522	1	U	1		
11/04/05	268887	Acetate	5	2.665	2.67		1		
11/04/05	268888	Formate	5	0.105	1	U	1		
11/04/05	268888	Acetate	5	0.791	1	U	1		
11/04/05	268889	Formate	5	0.294	1	U	1		
11/04/05	268889	Acetate	5	1.457	1.46		1		
11/04/05	268890	Formate	5	0.248	1	U	1		
11/04/05	268890	Acetate	5	0.048	1	U	1		
11/04/05	268891	Formate	5	0.182	1	U	1		
11/04/05	268891	Acetate	5	0.055	1	U	1		
11/04/05	268892	Formate	5	0.442	1	U	1		
11/04/05	268892	Acetate	5	0.791	1	U	1		

U = Undetected

Div 20
06002.01.322
TO# 051021-6

Analyst: RSS
Method: 300M
Sig Fig: 3

010135

Date Analyzed	System ID	Analyte	Conc. mg/L	RESULT mg/L	Qual	DL	TV	%REC %RPD
11/04/05	ICV (LCS)	Formate	5.001	5.00		0.2	5	100%
11/04/05	ICV (LCS)	Acetate	5.030	5.03		0.2	5	101%
11/04/05	ICB (PB)	Formate	0.166	0.2	U	0.2		
11/04/05	ICB (PB)	Acetate	0.000	0.2	U	0.2		
11/04/05	CCV	Formate	4.876	4.88		0.2	5	97.6%
11/04/05	CCV	Acetate	5.053	5.05		0.2	5	101%
11/04/05	CCB	Formate	0.179	0.2	U	0.2		
11/04/05	CCB	Acetate	0.000	0.2	U	0.2		
11/04/05	CCV	Formate	4.625	4.63		0.2	5	92.6%
11/04/05	CCV	Acetate	5.003	5.00		0.2	5	100%
*11/06/05	CCB	Formate	0.000	0.2	U	0.2		
*11/06/05	CCB	Acetate	0.000	0.2	U	0.2		

* Autosample jammed on last CCV/CCB. Restarted the instrument and re-ran on 11/6/05. Since they were still within criteria, the run was acceptable.

RSS 11/7/05

ICV/CCV = 111-02-1CV5 TV=5ppm.

U = Undetected

Schedule File: C:\PeakNet\SCHEDULE.ACI\051104.sch

Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	0PPM 110-06-IC5	Calibration St	1	orgacidas1_051104.met	051104_001.dxd	1
2	0.1 PPM 110-05-IC5	Calibration St	2	orgacidas1_051104.met	051104_a002.dxd	1
3	0.5 PPM 110-04-IC5	Calibration St	3	orgacidas1_051104.met	051104_a003.dxd	1
4	1 PPM 110-03-IC5	Calibration St	4	orgacidas1_051104.met	051104_004.dxd	1
5	5 PPM 110-02-IC5	Calibration St	5	orgacidas1_051104.met	051104_005.dxd	1
6	10 PPM 110-01-IC5	Calibration St	6	orgacidas1_051104.met	051104_006.dxd	1
7	0.2 PPM 110-07-IC5	Calibration St	7	orgacidas1_051104.met	051104_007.dxd	1
8	ICV	Sample		orgacidas1_051104.met	051104_008.dxd	1
9	skipped	Sample		orgacidas1_051104.met	051104	1
10	ICB	Sample		orgacidas1_051104.met	051104_010.dxd	1
11	268878 DF5	Sample		orgacidas1_051104.met	051104_011.dxd	5
12	268879 DF5	Sample		orgacidas1_051104.met	051104_012.dxd	5
13	268880 DF5	Sample		orgacidas1_051104.met	051104_013.dxd	5
14	268881 DF5	Sample		orgacidas1_051104.met	051104_014.dxd	5
15	268882 DF5	Sample		orgacidas1_051104.met	051104_015.dxd	5
16	268880S DF5	Sample		orgacidas1_051104.met	051104_016.dxd	5
17	268883 DF10	Sample		orgacidas1_051104.met	051104_017.dxd	10
18	268883D DF10	Sample		orgacidas1_051104.met	051104_018.dxd	10
19	268883S DF10	Sample		orgacidas1_051104.met	051104_019.dxd	10
20	268884 DF10	Sample		orgacidas1_051104.met	051104_020.dxd	10
21	CCV	Sample		orgacidas1_051104.met	051104_021.dxd	1
22	CCB	Sample		orgacidas1_051104.met	051104_022.dxd	1
23	268885 DF5	Sample		orgacidas1_051104.met	051104_023.dxd	1
24	268886 DF5	Sample		orgacidas1_051104.met	051104_024.dxd	1
25	268887 DF5	Sample		orgacidas1_051104.met	051104_025.dxd	1
26	268888 DF5	Sample		orgacidas1_051104.met	051104_026.dxd	1
27	268889 DF5	Sample		orgacidas1_051104.met	051104_027.dxd	1
28	268890 DF5	Sample		orgacidas1_051104.met	051104_028.dxd	1
29	268891 DF5	Sample		orgacidas1_051104.met	051104_029.dxd	1
30	268892 DF5	Sample		orgacidas1_051104.met	051104_030.dxd	1
31	CCV	Sample		orgacidas1_051104.met	051104_031.dxd	1
32	CCB	Sample		orgacidas1_051104.met	051104_032.dxd	1

010136

Default Method Path: C:\PEAKNET\METHOD.ACI
Default Data Path: C:\PEAKNET\DATA.ACI\051104
Comment:
AS1-ICE, 0.4 mM heptafluorbutyric acid @ 1.0 ml/min, 12.5 mL TBAOH -> 2L DI, Conductivity ~28 us.

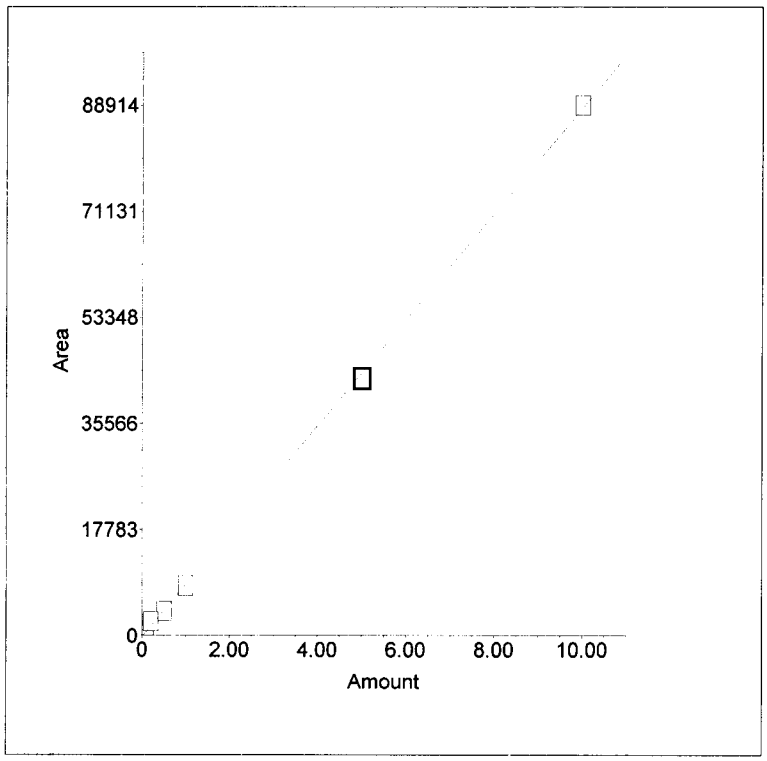
DIV 20 06002.01.322 TO#051021-6

268835 = 0.02 mL 111-01-IC5
1000mg/L → 5mL (1:10)
sample dilution.

ICV/CCV = 111-02-IC5 TV = 5ppm

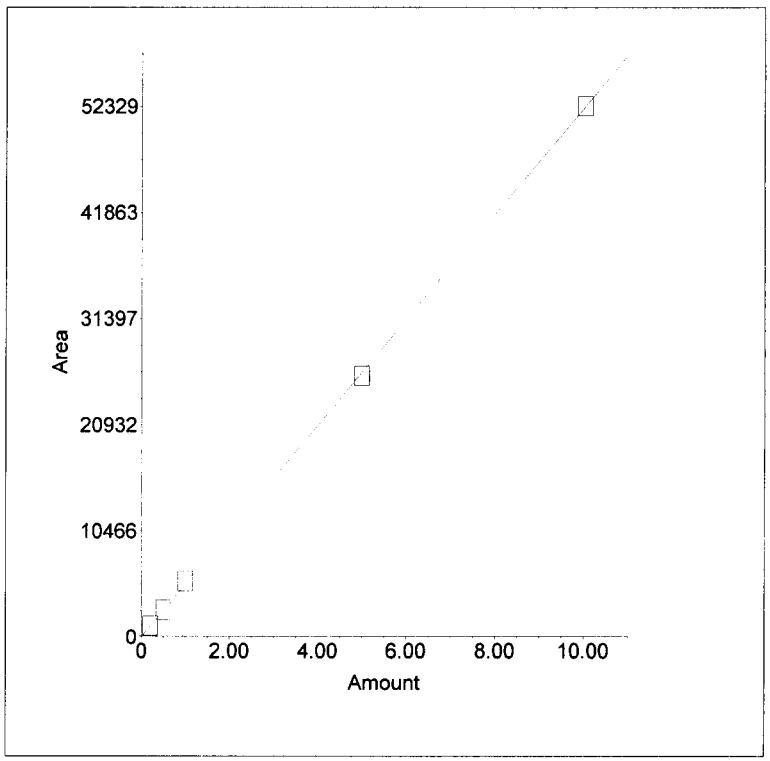
Method:C:\PEAKNET\METHOD.ACI\ORGACIDAS1_051104.MET Updated:11/4/05 2:40:29 PM

1. Component:Formate
Standard:External Fit Type:Linear
Origin:Ignore Calibration:Area
r^2=0.999683
Amt=0.0001128*Resp+0.02391



2. Component:Acetate
Standard:External Fit Type:Linear
Origin:Ignore Calibration:Area
r^2=0.999866
Amt=0.0001915*Resp+0.003342

010137



Sample Name : 0PPM 110-06-IC5
Dilution Factor : 1.00
Injection Number : 1
Data File Name : ...\051104_001.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : ...\051104.sch

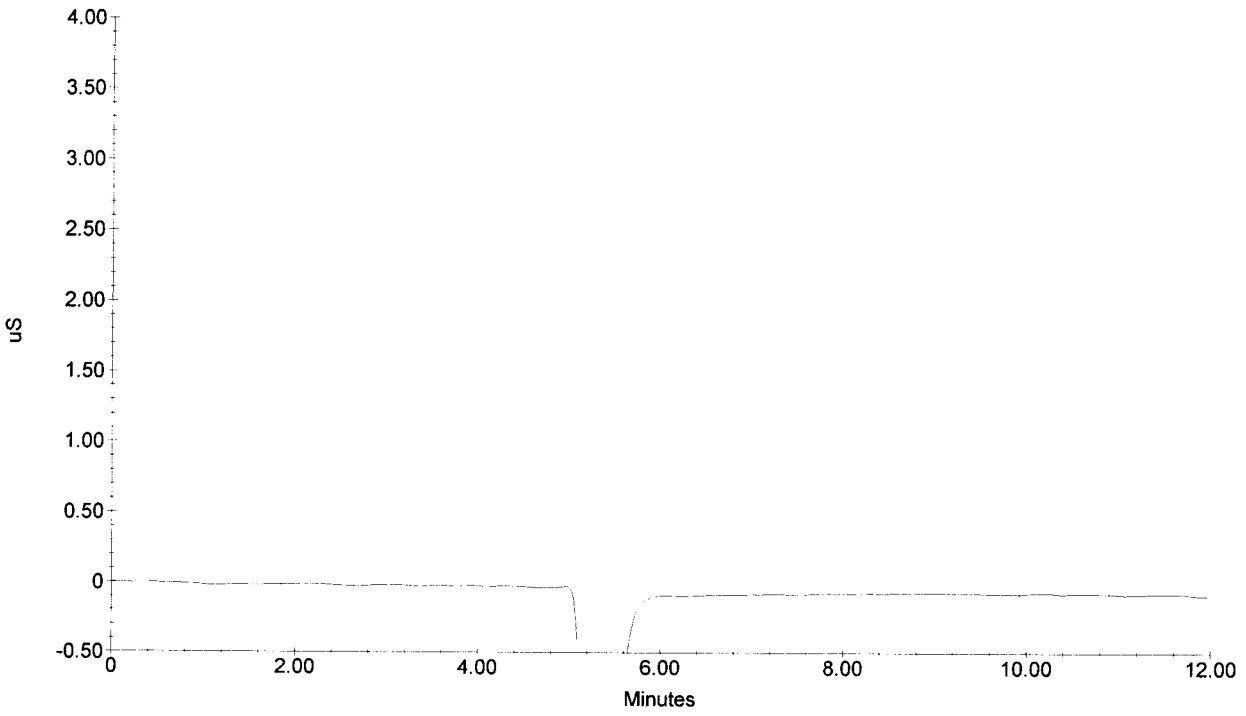
Date Time Collected : 11/4/05 12:19:51 PM
Date Time Updated : 11/4/05 2:23:47 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6
System Operator : RSS 11/4/05

010138

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (PPM)	Peak Area	Peak Height
0	0.00	(null)	0.00	0	0
		Acetate			

0PPM 110-06-IC5



Sample Name : 0.1 PPM 110-05-IC5
Dilution Factor : 1.00
Injection Number : 2
Data File Name : ...\051104_A002.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : ...\051104.sch

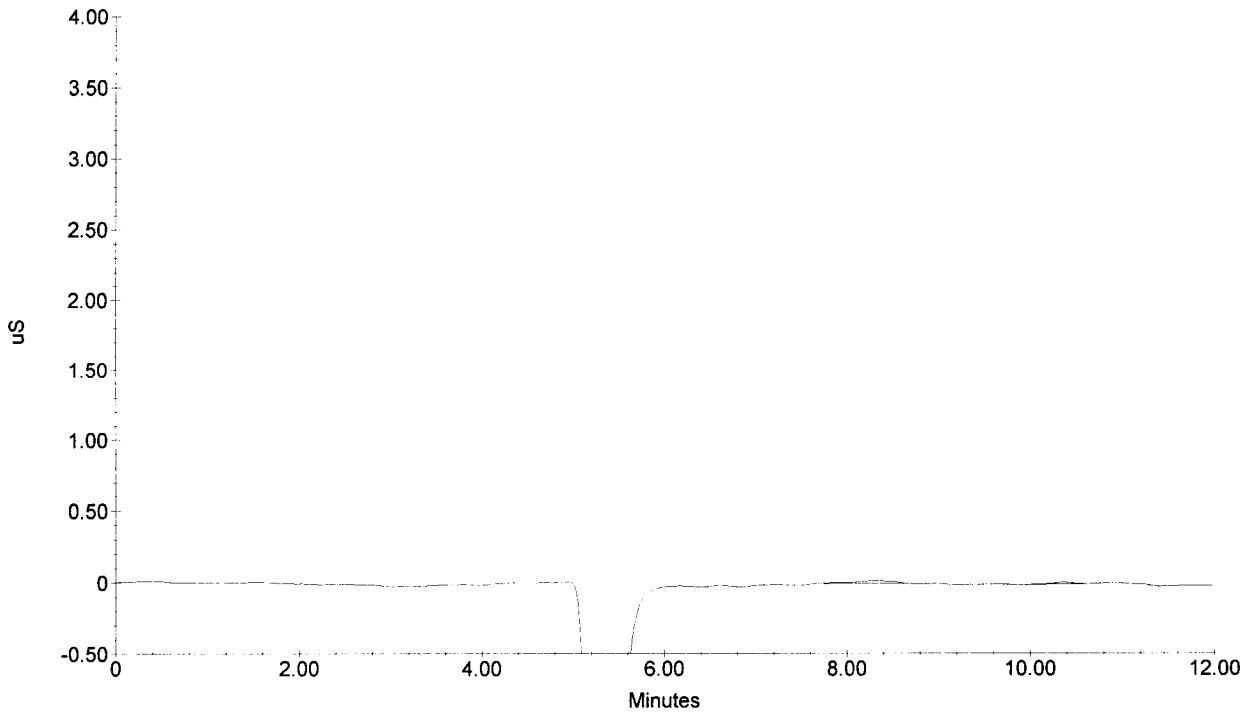
Date Time Collected : 11/4/05 1:12:29 PM
Date Time Updated : 11/4/05 2:28:35 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 * RSS 11/6/05
System Operator :

010139

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (PPM)	Peak Area	Peak Height
1	8.33	Formate	0.10	596	18
2	10.33	Acetate	0.10	230	13

0.1 PPM 110-05-IC5



Sample Name : 0.5 PPM 110-04-IC5
Dilution Factor : 1.00
Injection Number : 3
Data File Name : ...\051104_A003.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : ...\051104.sch

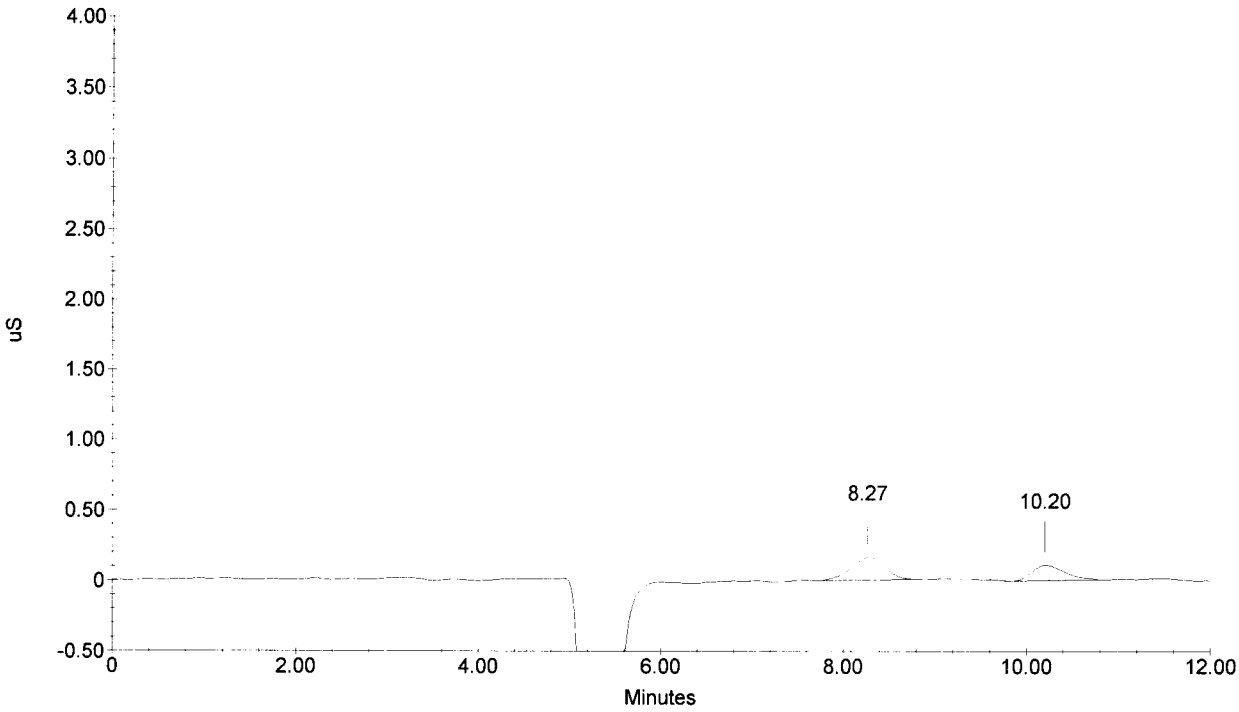
Date Time Collected : 11/4/05 1:27:17 PM
Date Time Updated : 11/4/05 2:29:32 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 * RSS 11/6/05
System Operator :

010140

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (PPM)	Peak Area	Peak Height
1	8.27	Formate	0.50	4152	160
2	10.20	Acetate	0.50	2699	109

0.5 PPM 110-04-IC5



Sample Name : 1 PPM 110-03-IC5
Dilution Factor : 1.00
Injection Number : 4
Data File Name : ...\051104_004.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : ...\051104.sch

Date Time Collected : 11/4/05 1:42:06 PM
Date Time Updated : 11/4/05 2:30:18 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1
System Operator :

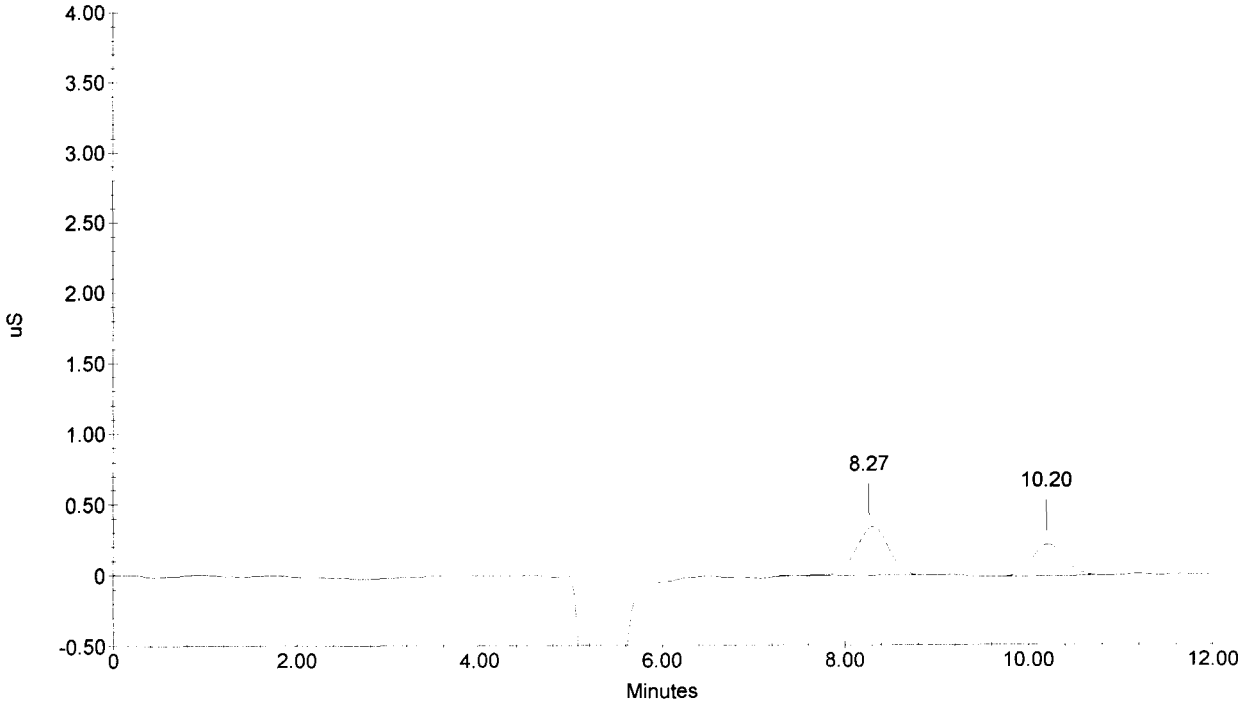
RSS 11/6/05

010141

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (PPM)	Peak Area	Peak Height
1	8.27	Formate	1.00	8418	331
2	10.20	Acetate	1.00	5473	221

1 PPM 110-03-IC5



Sample Name : 5 PPM 110-02-IC5
Dilution Factor : 1.00
Injection Number : 5
Data File Name : ...\051104_005.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : ...\051104.sch

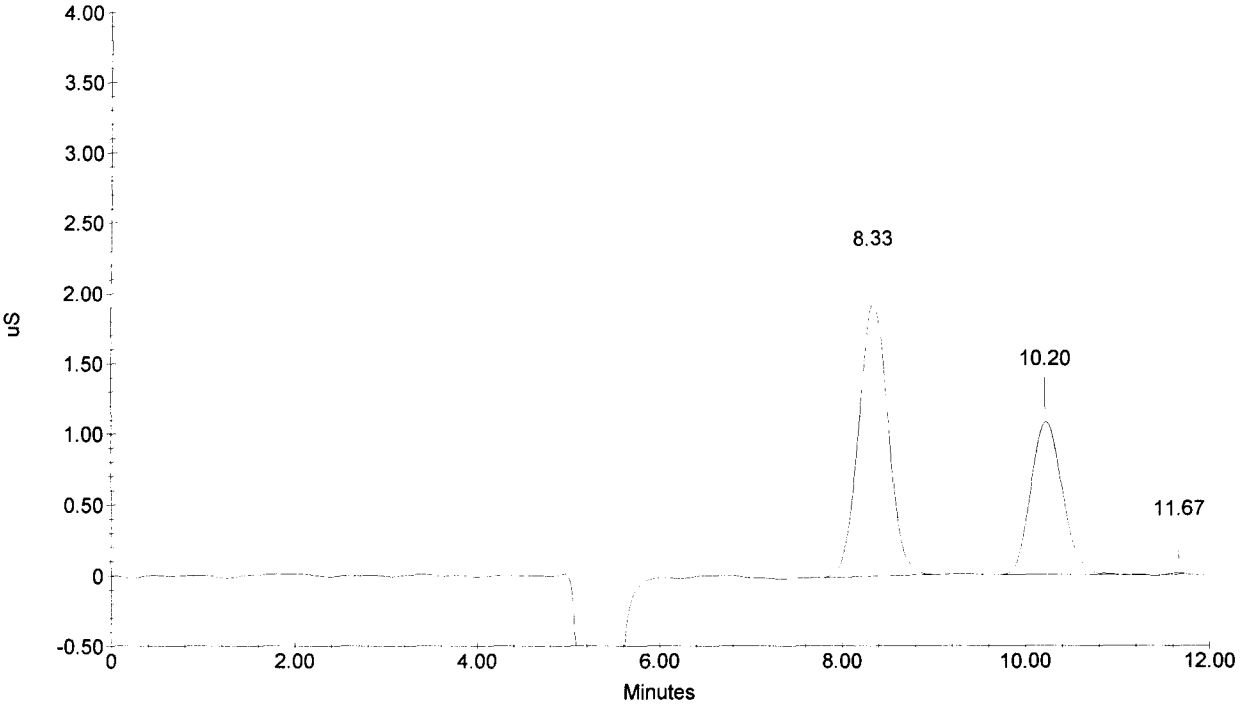
Date Time Collected : 11/4/05 1:56:54 PM
Date Time Updated : 11/4/05 2:21:55 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 x
System Operator : RSS 11/16/05

010142

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (PPM)	Peak Area	Peak Height
1	8.33	Formate	5.00	43156	1934
2	10.20	Acetate	5.00	25769	1073

5 PPM 110-02-IC5



Sample Name : 10 PPM 110-01-IC5
Dilution Factor : 1.00
Injection Number : 6
Data File Name : ...\051104_006.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : ...\051104.sch

Date Time Collected : 11/4/05 2:11:44 PM
Date Time Updated : 11/4/05 2:32:47 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6
System Operator :

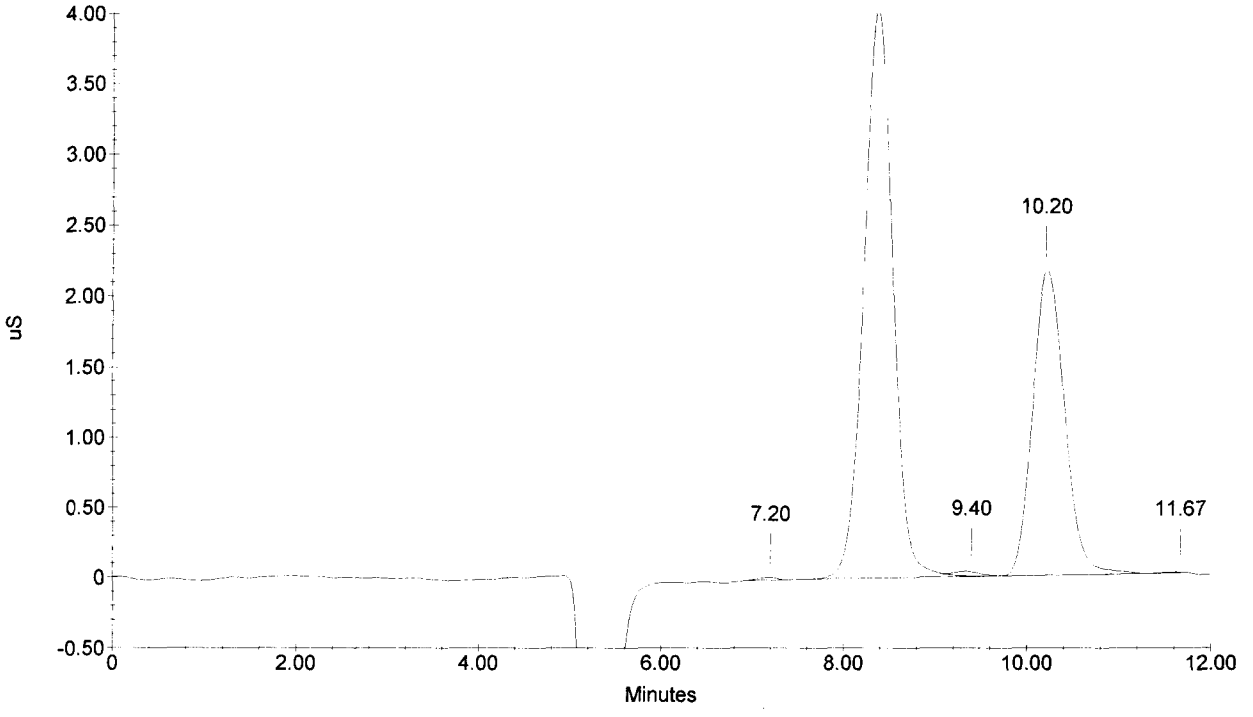
RSS 11/16/05

010143

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (PPM)	Peak Area	Peak Height
2	8.33	Formate	10.00	88914	3927
4	10.20	Acetate	10.00	52329	2162

10 PPM 110-01-IC5



Sample Name : 0.2 PPM 110-07-IC5
Dilution Factor : 1.00
Injection Number : 7
Data File Name : ...\051104_007.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : ...\051104.sch

Date Time Collected : 11/4/05 2:26:42 PM
Date Time Updated : 11/4/05 2:38:42 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS~~6~~ i
System Operator :

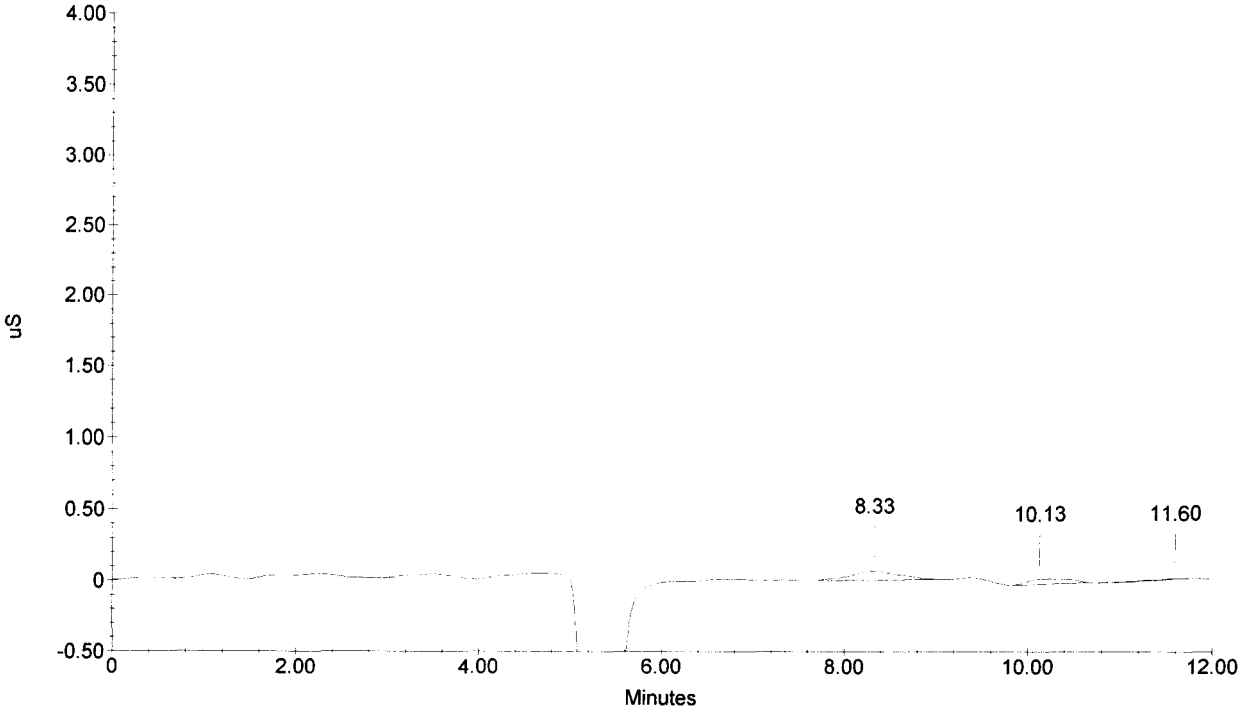
* ASS 11/6/05

010144

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (PPM)	Peak Area	Peak Height
1	8.33	Formate	10.00	2437	66
2	10.13	Acetate	10.00	1127	37

0.2 PPM 110-07-IC5



Sample Name : ICV
Dilution Factor : 1.00
Injection Number : 8
Data File Name : ...\051104_008.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

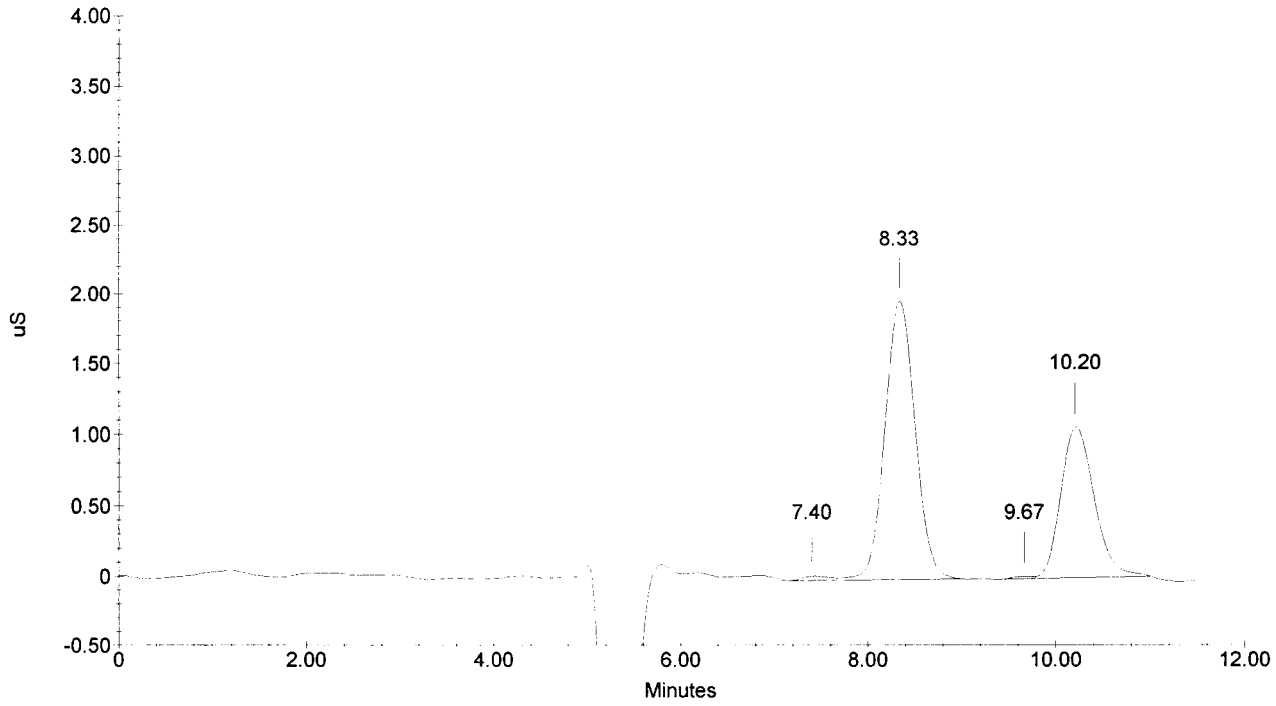
Date Time Collected : 11/4/05 3:30:38 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 * RSS 11/6/05
System Operator :

010145

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
2	8.33	Formate	5.001	1962	44010	2	0.04
4	10.20	Acetate	5.030	1060	26237	2	0.00
			---total(s)---				
	0.00		10.031		70247		

ICV



Sample Name : ICB
Dilution Factor : 1.00
Injection Number : 10
Data File Name : ...\051104_010.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

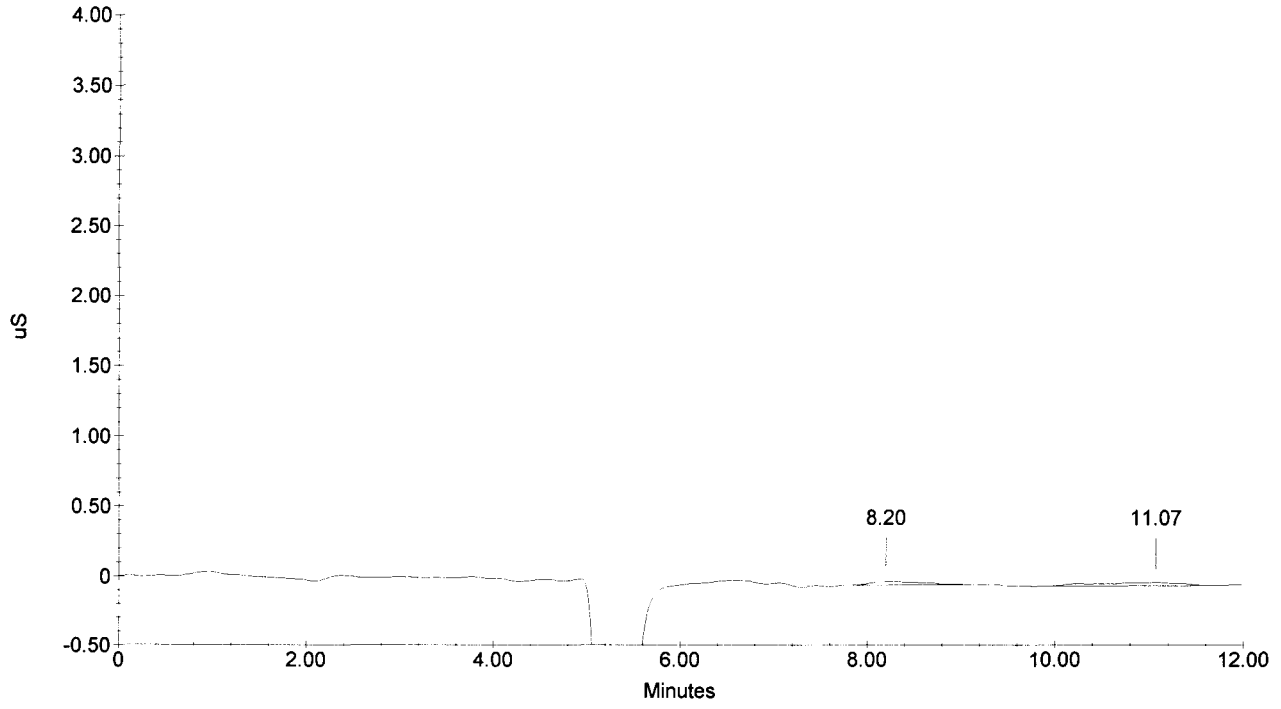
Date Time Collected : 11/4/05 4:00:43 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1
System Operator : RSS 11/7/05

010146

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	8.20	Formate Acetate	0.166	24	967	1	-1.56
	0.00		---total(s)--- 0.166		967		

ICB



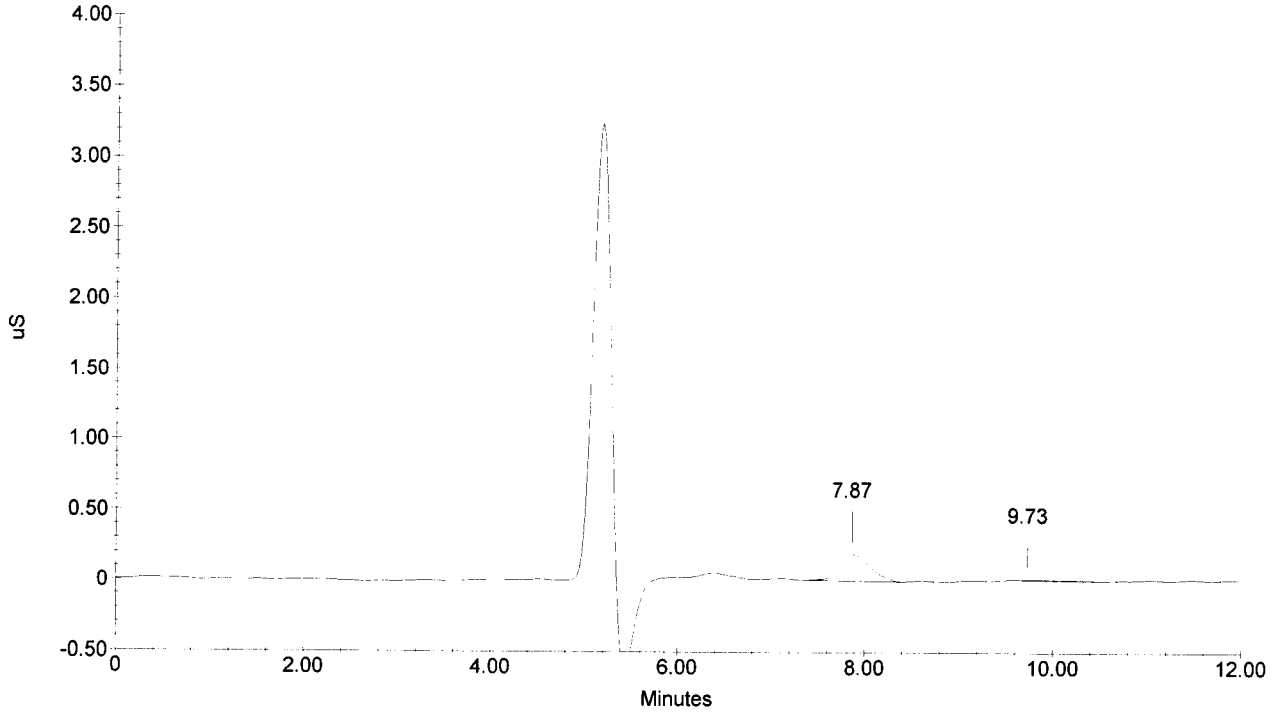
Sample Name : 268878 DF5
Dilution Factor : 5.00
Injection Number : 11
Data File Name : ...\051104_011.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 4:15:33 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 * RSS 11/6/05 010147
System Operator :

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	189	4302	1	
2	9.73	Acetate	0.298	5	260	1	-4.58
	0.00		---total(s)--- 0.298		4562		

268878 DF5



Sample Name : 268879 DF5
Dilution Factor : 5.00
Injection Number : 12
Data File Name : ...\051104_012.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

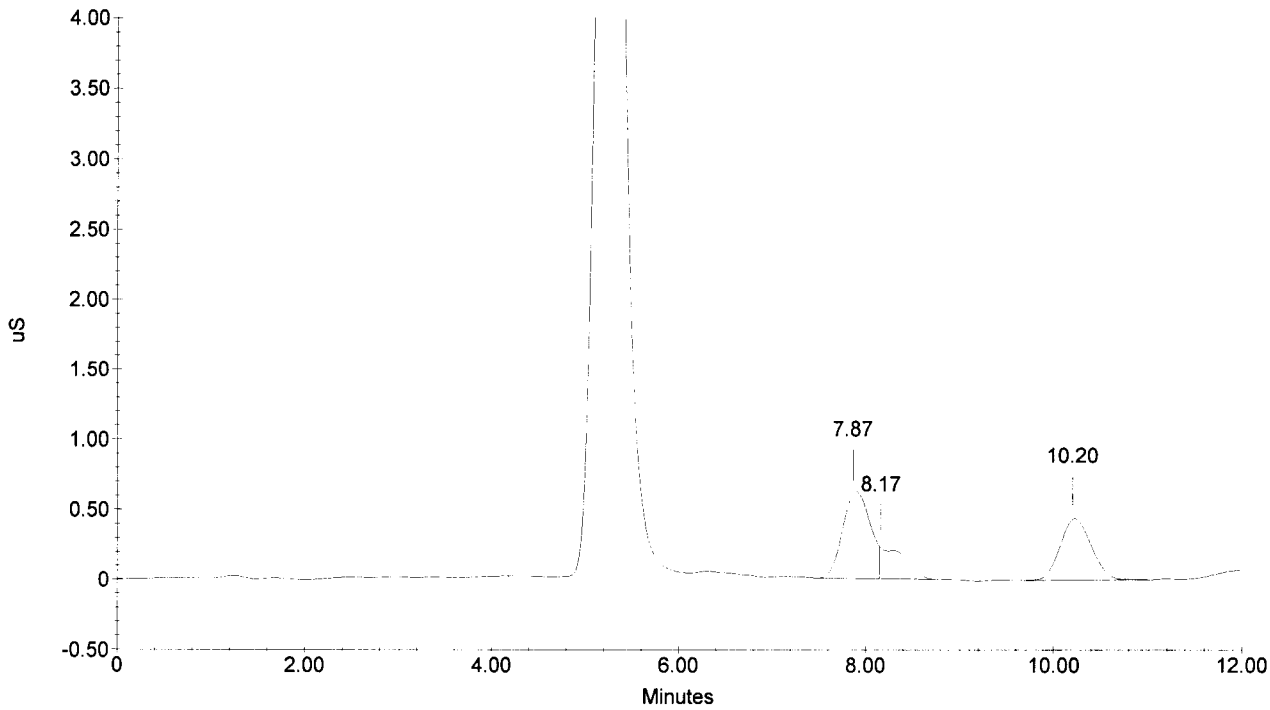
Date Time Collected : 11/4/05 4:30:22 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 * RSS 11/6/05
System Operator :

010148

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	607	12864	2	
2	8.17	Formate	2.644	221	4198	2	-1.96
3	10.20	Acetate	9.727	433	10116	1	0.00
			---total(s)---				
	0.00		12.371		27178		

268879 DF5



Sample Name : 268880 DF5
Dilution Factor : 5.00
Injection Number : 13
Data File Name : ...\051104_013.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

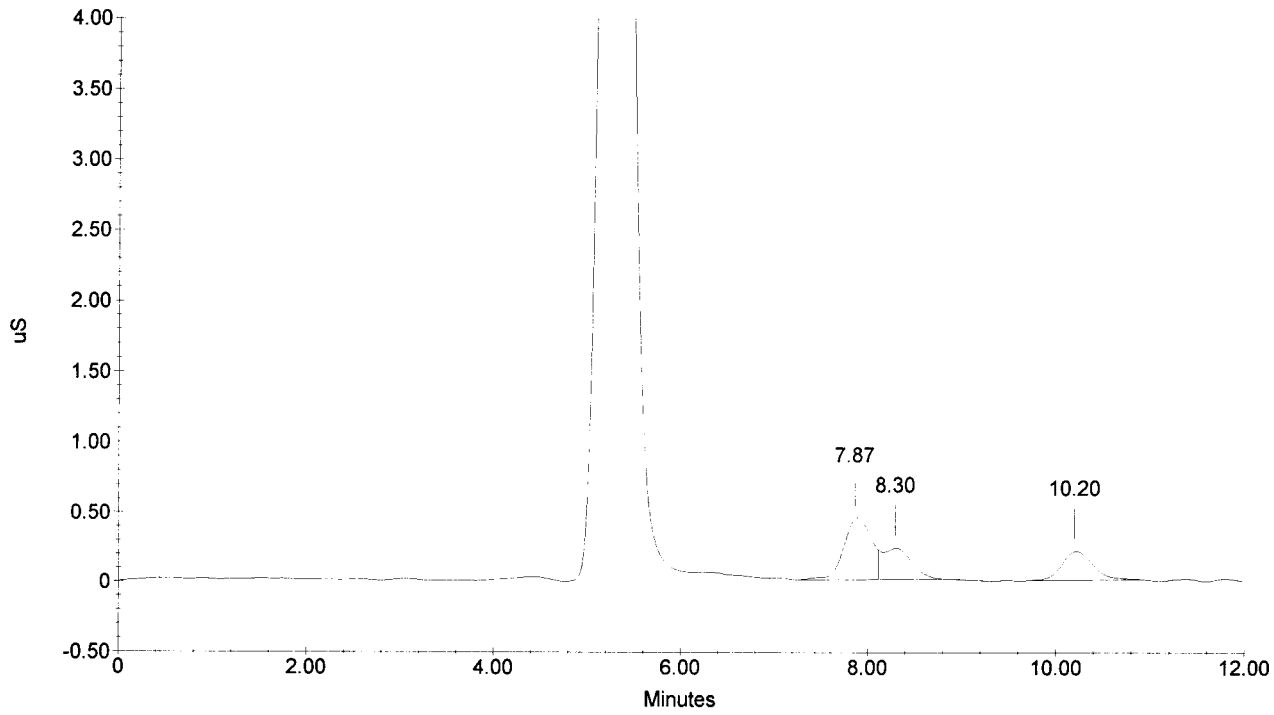
Date Time Collected : 11/4/05 4:45:38 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS8 1 RSS 11/6/05
System Operator :

010149

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	435	9130	2	
2	8.30	Formate	3.027	224	4881	2	-0.36
3	10.20	Acetate	4.658	207	4817	1	0.00
			---total(s)---				
	0.00		7.685		18828		

268880 DF5



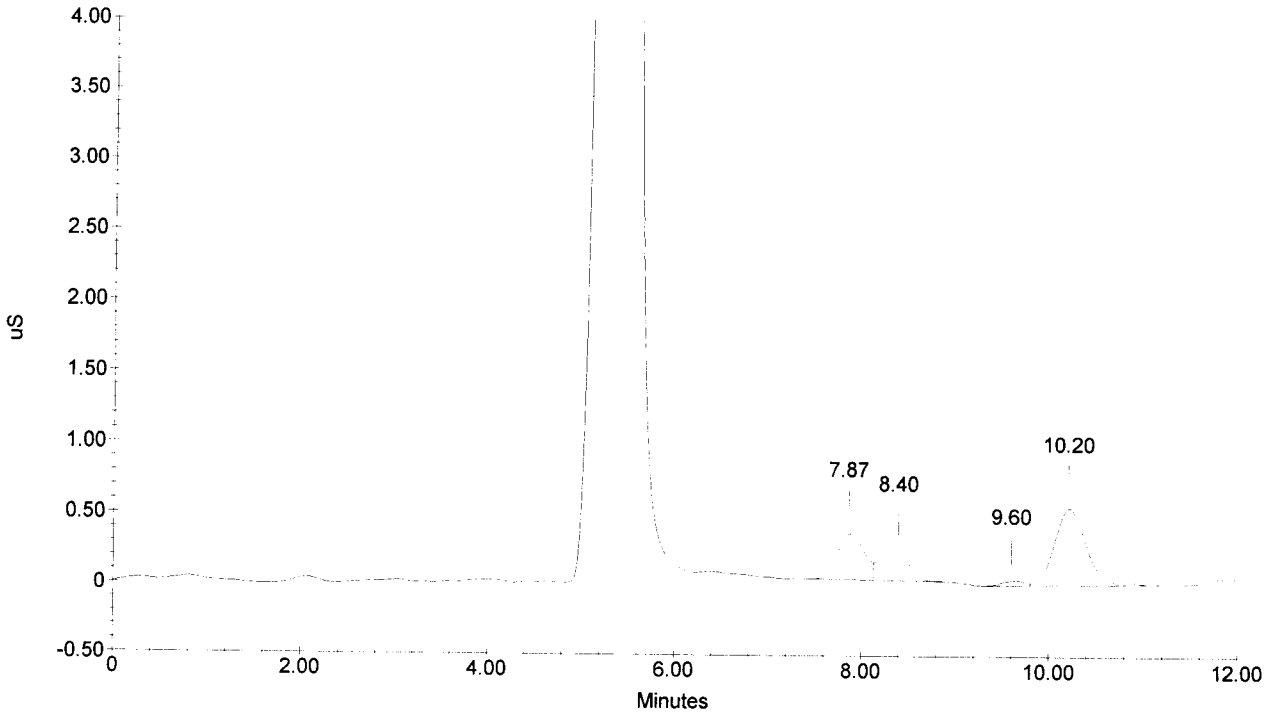
Sample Name : 268881 DF5
Dilution Factor : 5.00
Injection Number : 14
Data File Name : ...\051104_014.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 5:00:27 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS1 RSS 11/6/05 010150
System Operator :

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	323	6493	2	
2	8.40	Formate	2.860	231	4583	2	0.84
3	9.60		0.000	35	640	2	
4	10.20	Acetate	12.232	544	12734	2	0.00
	0.00		---total(s)--- 15.092		24450		

268881 DF5



Sample Name : 268882 DF5
Dilution Factor : 5.00
Injection Number : 15
Data File Name : ...\051104_015.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 5:15:24 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1
System Operator :

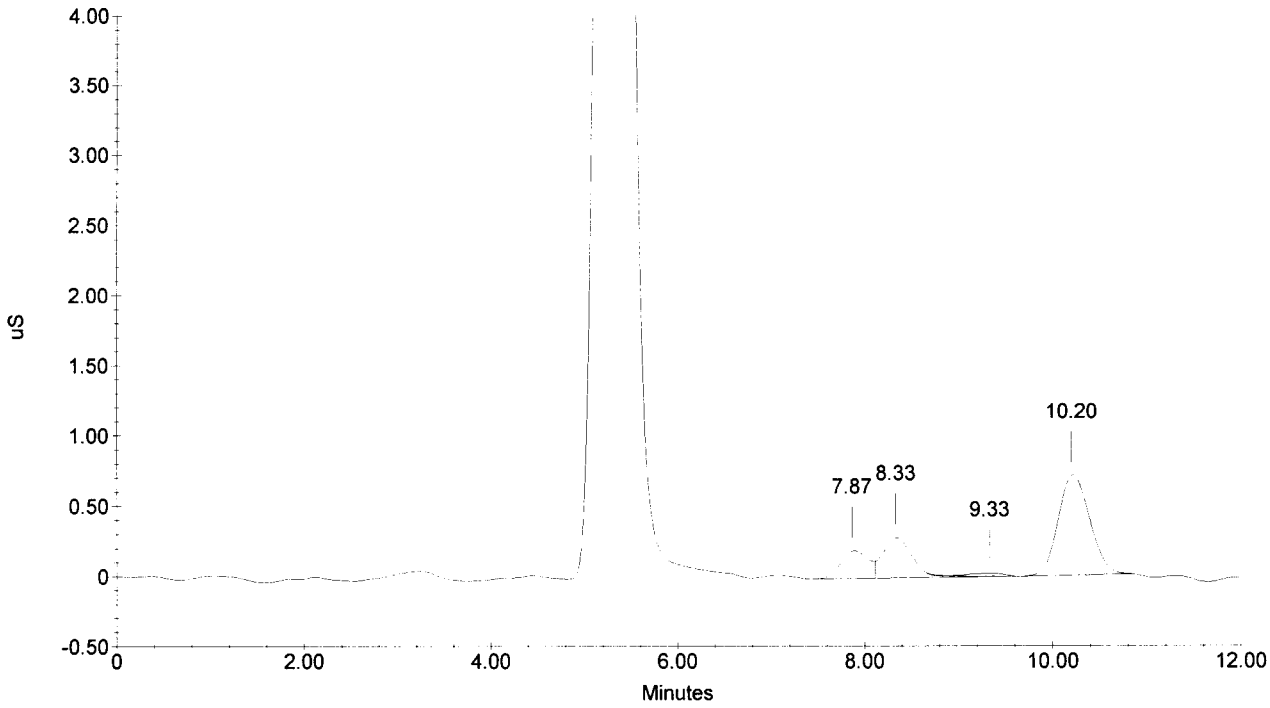
RSS 11/6/05

010151

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	199	4051	2	
2	8.33	Formate	3.832	289	6314	3	0.04
3	9.33		0.000	22	543	4	
4	10.20	Acetate	15.949	710	16619	1	0.00
			---total(s)---				
	0.00		19.781		27527		

268882 DF5



Sample Name : 268880S DF5
Dilution Factor : 5.00
Injection Number : 16
Data File Name : ...\051104_016.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

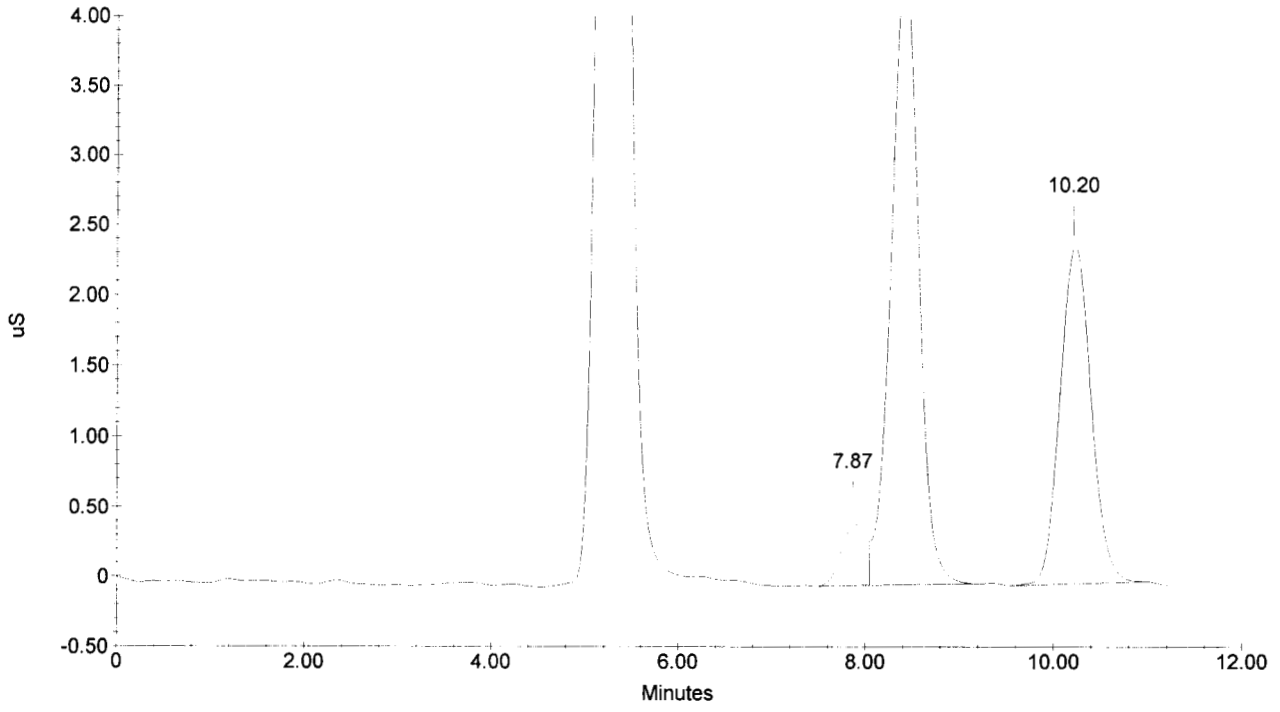
Date Time Collected : 11/4/05 5:29:36 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 + RSS 11/6/05
System Operator :

010152

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	434	7988	2	
2	8.40	Formate	50.414	4415	89254	2	0.84
3	10.20	Acetate	52.706	2377	55041	1	0.00
	0.00		---total(s)--- 103.120		152283		

268880S DF5



Sample Name : 268883 DF10
Dilution Factor : 10.00
Injection Number : 17
Data File Name : ...\051104_017.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 5:46:27 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1
System Operator :

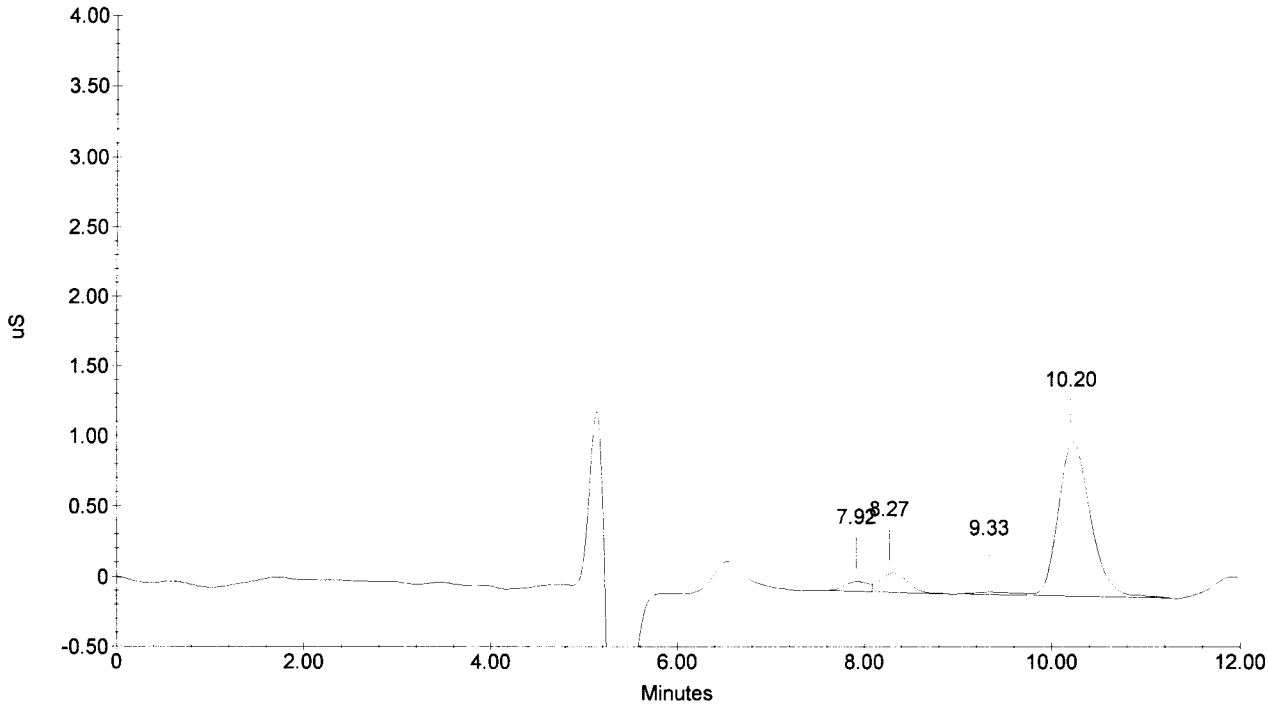
RSS 11/6/05

010153

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
2	8.27	Formate	3.889	134	2953	2	-0.76
4	10.20	Acetate	49.898	1084	26027	2	0.00
			---total(s)---				
	0.00		53.787		28980		

268883 DF10



Sample Name : 268883D DF10
Dilution Factor : 10.00
Injection Number : 18
Data File Name : ...\051104_018.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 6:01:19 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1
System Operator :

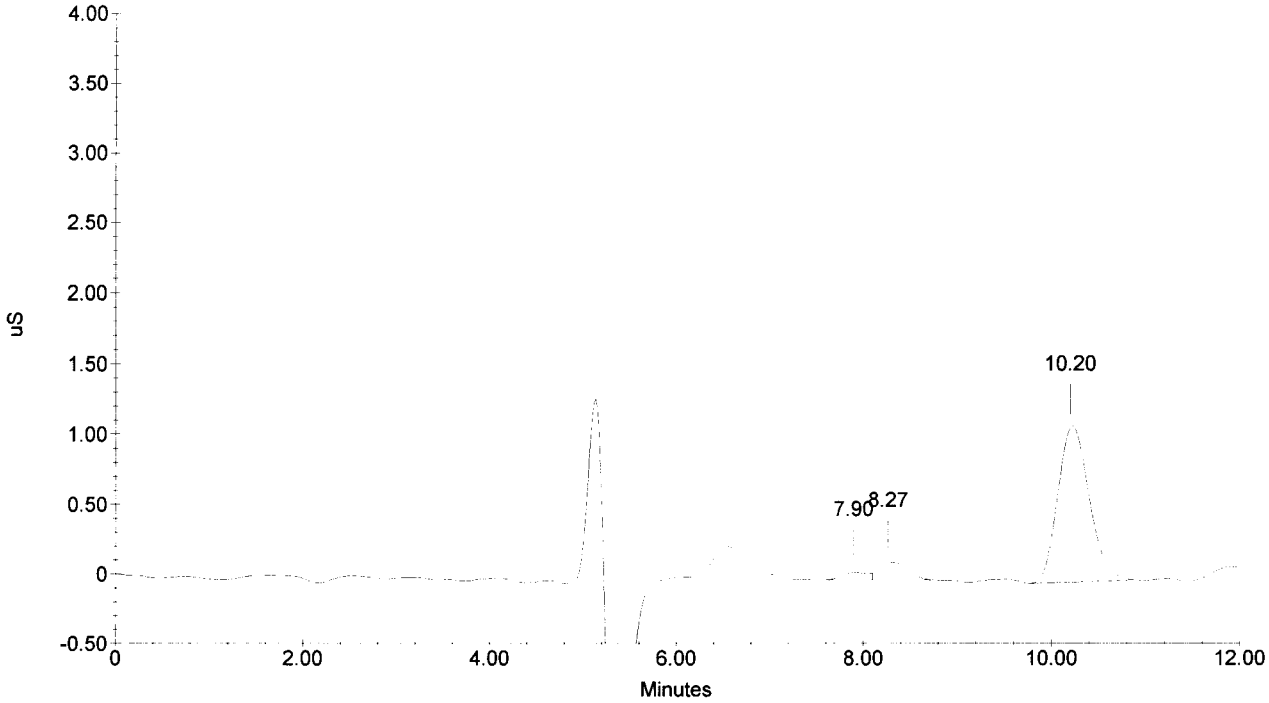
RSS 11/6/05

010154

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.90		0.000	54	1089	2	
2	8.27	Formate	3.521	121	2626	2	-0.76
3	10.20	Acetate	49.451	1102	25794	1	0.00
			---total(s)---				
	0.00		52.972		29508		

268883D DF10



Sample Name : 268883S DF10
Dilution Factor : 10.00
Injection Number : 19
Data File Name : ...\051104_019.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

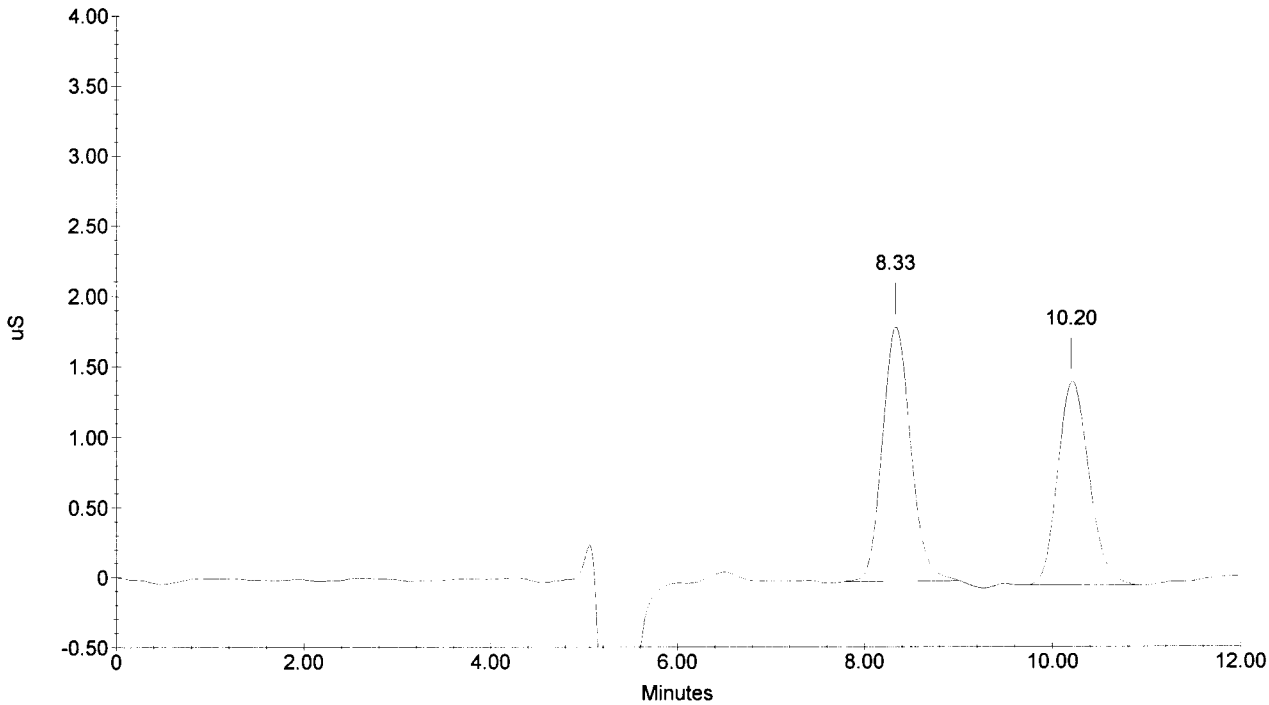
Date Time Collected : 11/4/05 6:16:11 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 *
System Operator :

RSS 11/6/05 010155

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	8.33	Formate	43.391	1806	38120	1	0.04
2	10.20	Acetate	64.619	1441	33721	1	0.00
			---total(s)---				
	0.00		108.010		71841		

268883S DF10



Sample Name : 268884 DF10
Dilution Factor : 10.00
Injection Number : 20
Data File Name : ...\051104_020.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

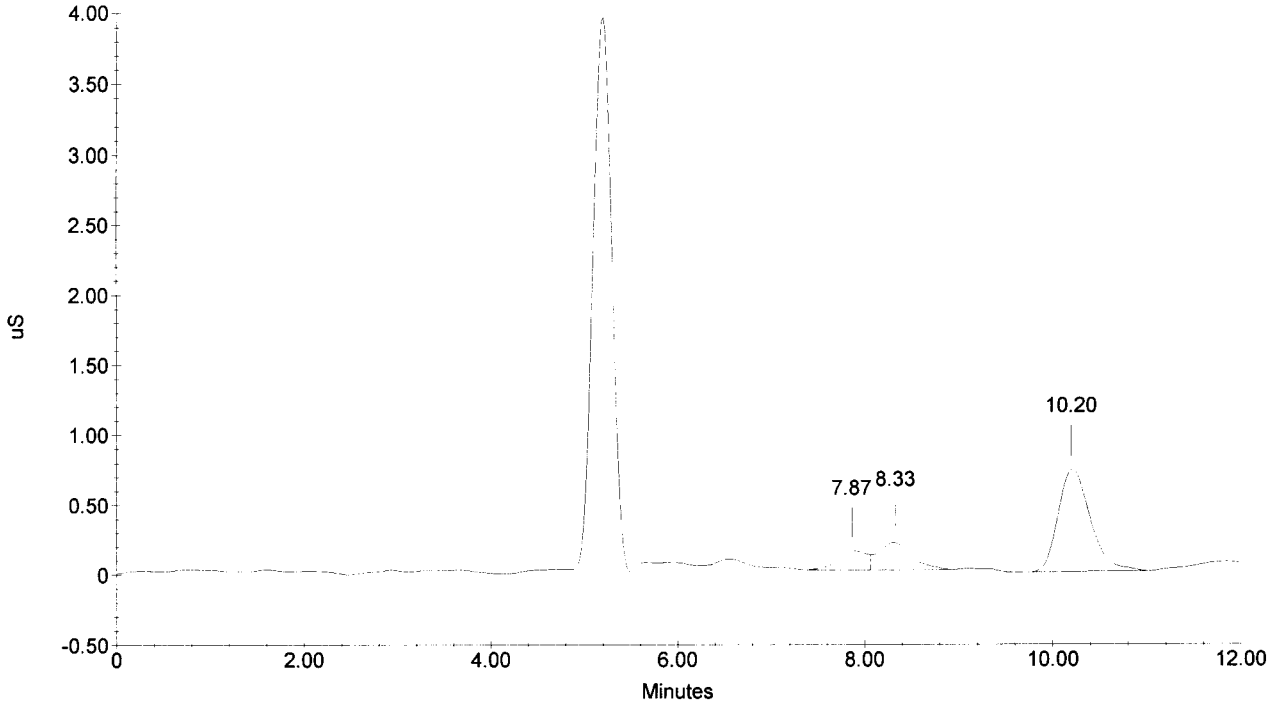
Date Time Collected : 11/4/05 6:31:03 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 *
System Operator :

RSS 11/6/05 010156

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	135	2940	2	
2	8.33	Formate	5.643	199	4514	2	0.04
3	10.20	Acetate	33.472	733	17442	1	0.00
	0.00		---total(s)--- 39.114		24896		

268884 DF10



Sample Name : CCV
Dilution Factor : 1.00
Injection Number : 21
Data File Name : ...\051104_021.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 6:45:54 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS8
System Operator :

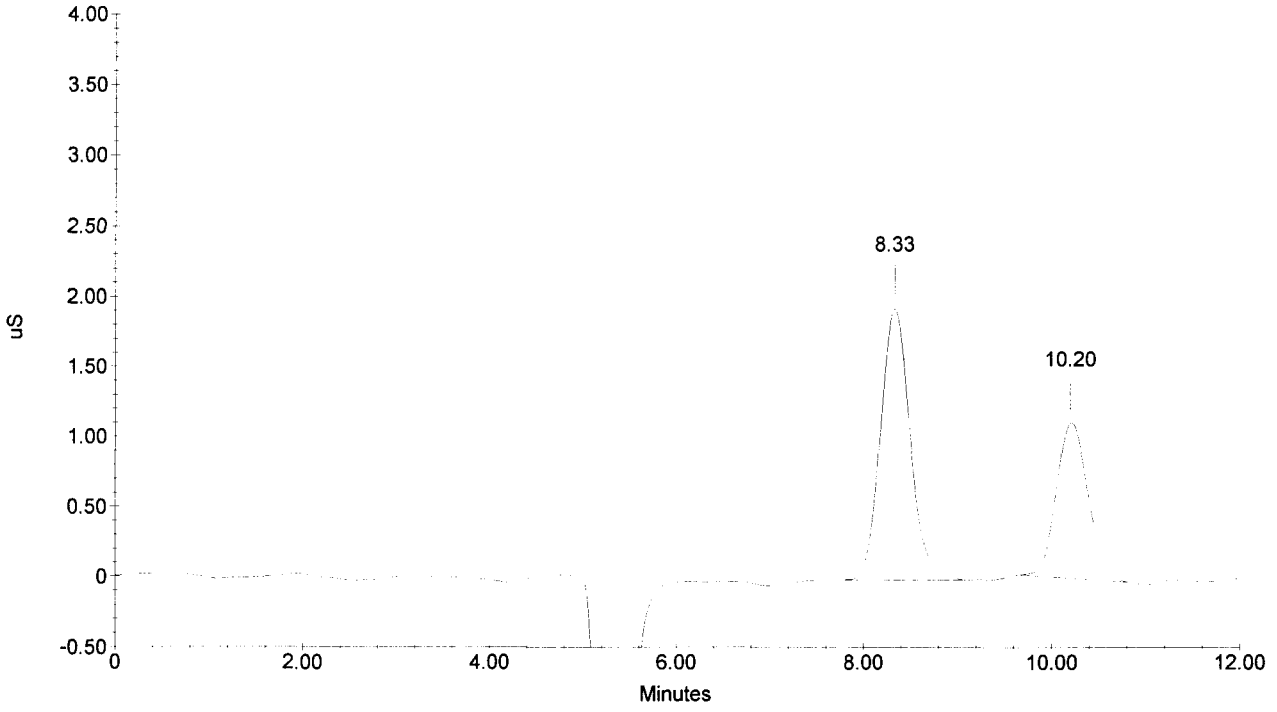
RSS 11/6/05

010157

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	8.33	Formate	4.876	1942	42901	1	0.04
2	10.20	Acetate	5.053	1114	26359	1	0.00
	0.00		---total(s)--- 9.929		69260		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 22
Data File Name : ...\051104_022.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

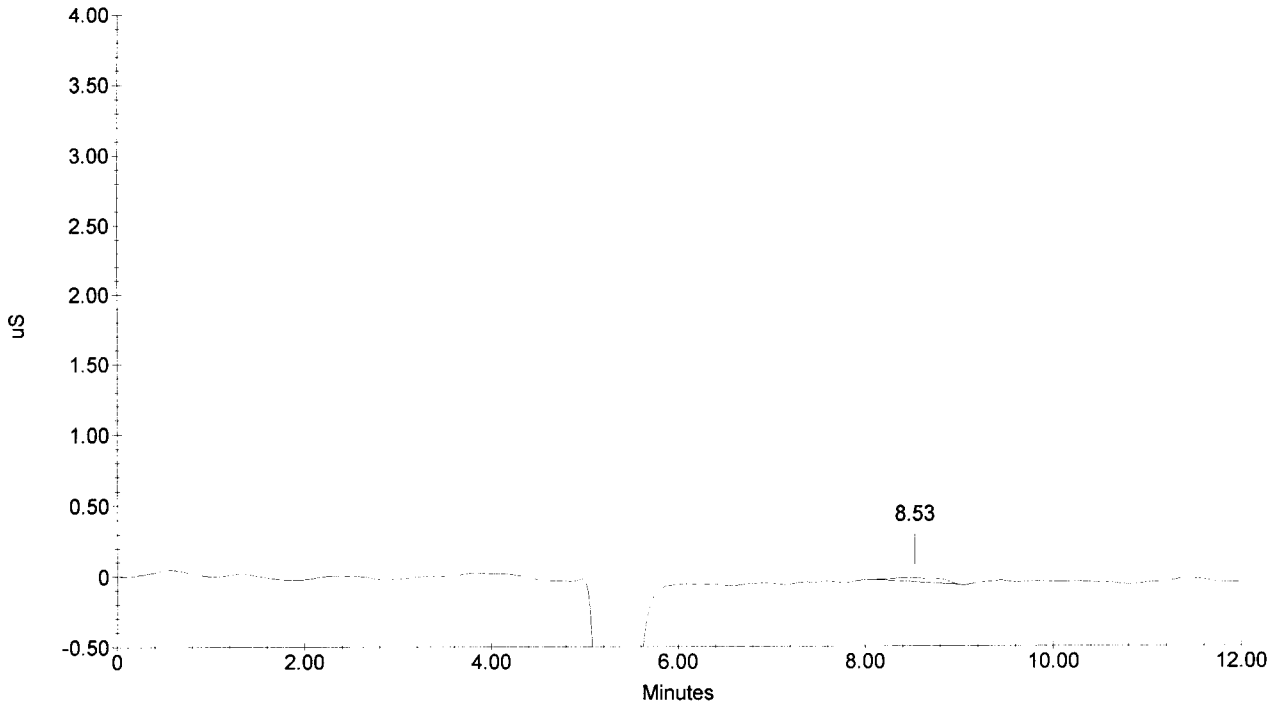
Date Time Collected : 11/4/05 7:00:46 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 * RSS 11/6/05
System Operator :

010158

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	8.53	Formate	0.179	28	1085	1	2.44
	0.00		---total(s)--- 0.179		1085		

CCB



Sample Name : 268885 DF5
Dilution Factor : 1.00
Injection Number : 23
Data File Name : ...\051104_023.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 7:15:38 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1
System Operator :

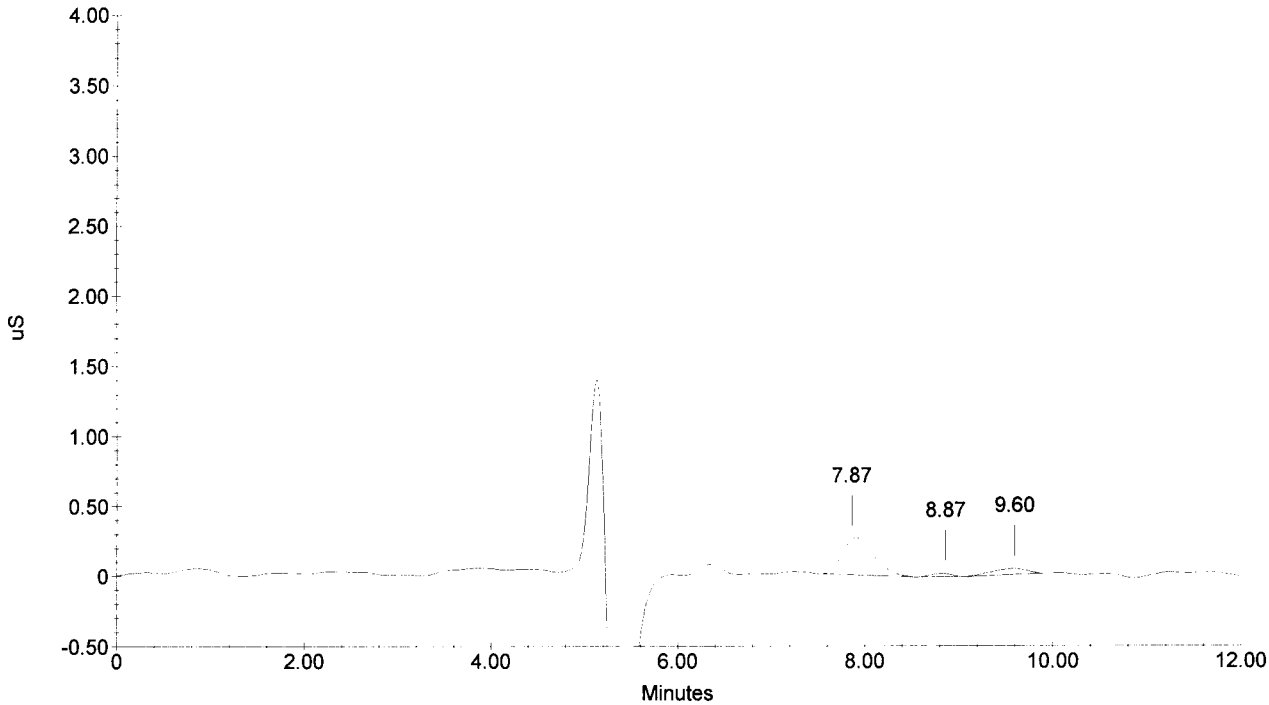
RSS 11/6/05

010159

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	257	6191	1	
2	8.87		0.000	22	318	1	
3	9.60		0.000	42	1138	1	
			---total(s)---				
	0.00		0.000		7647		

268885 DF5



Sample Name : 268886 DF5
Dilution Factor : 1.00
Injection Number : 24
Data File Name : ...\051104_024.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

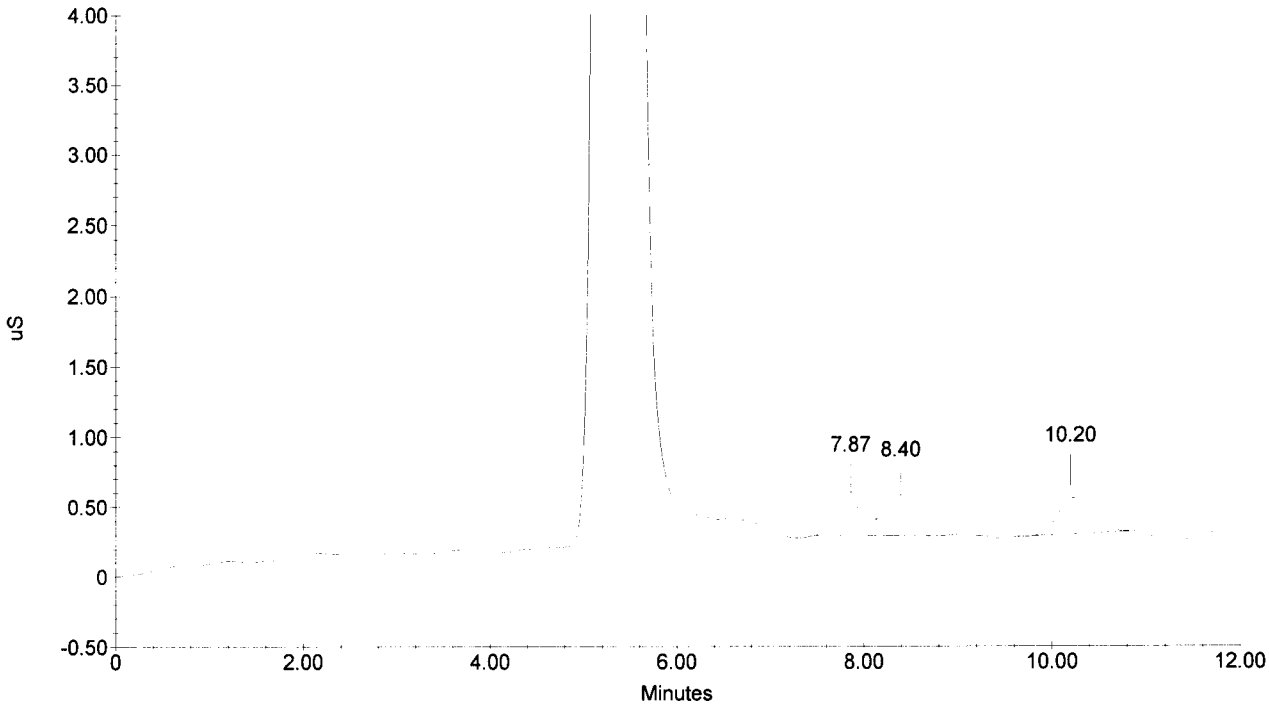
Date Time Collected : 11/4/05 7:30:30 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 * RSS 11/6/05
System Operator :

010160

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	193	4321	2	
2	8.40	Formate	0.421	159	3235	2	0.84
3	10.20	Acetate	1.189	251	6163	1	0.00
			---total(s)---				
	0.00		1.610		13719		

268886 DF5



Sample Name : 268887 DF5
Dilution Factor : 1.00
Injection Number : 25
Data File Name : ...\051104_025.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 7:45:21 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS8
System Operator :

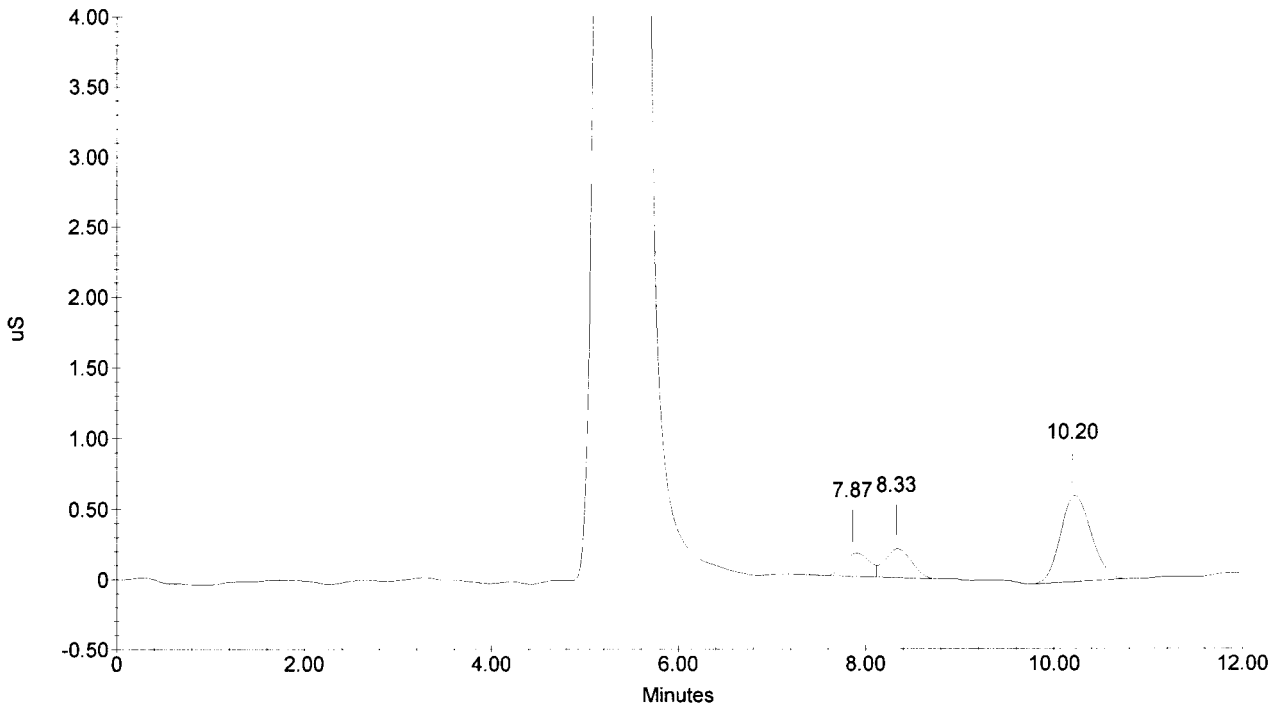
RSS 11/6/05

010161

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	161	3232	2	
2	8.33	Formate	0.522	209	4139	2	0.04
3	10.20	Acetate	2.665	606	13878	1	0.00
			---total(s)---				
	0.00		3.187		21249		

268887 DF5



Sample Name : 268888 DF5
Dilution Factor : 1.00
Injection Number : 26
Data File Name : ...\051104_026.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

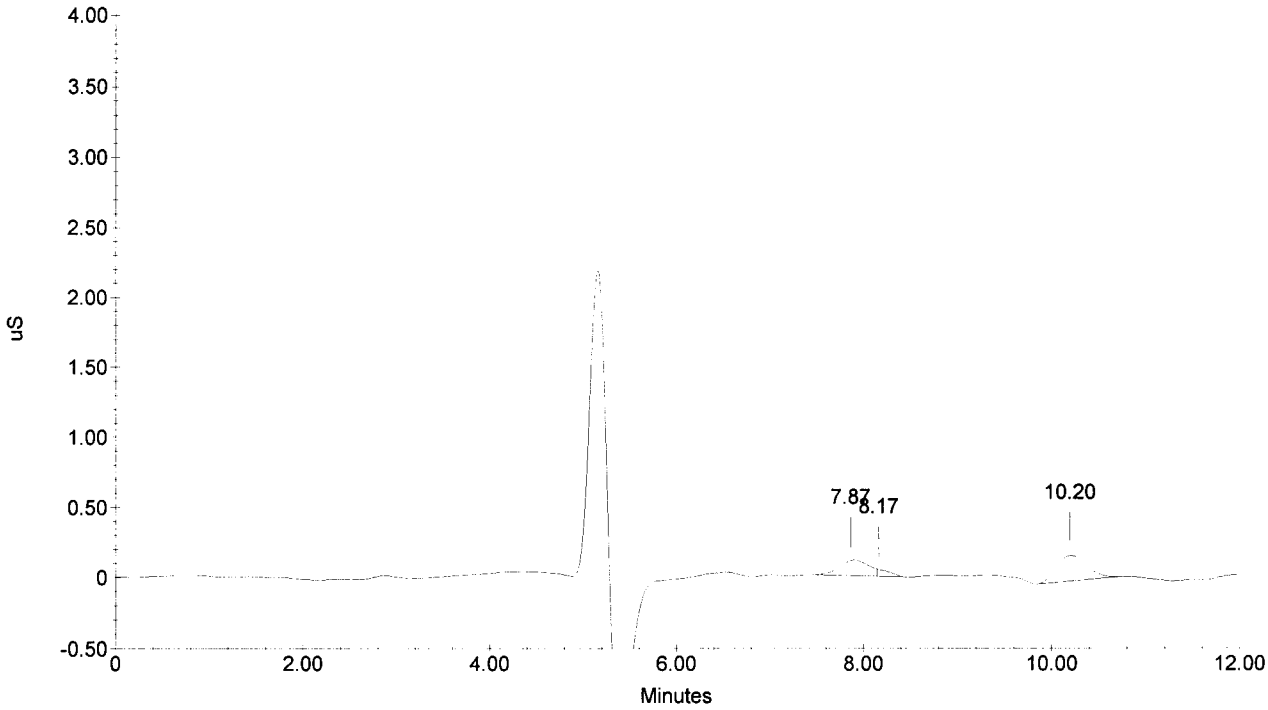
Date Time Collected : 11/4/05 8:00:13 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 * RSS 11/6/05
System Operator :

010162

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	110	2512	2	
2	8.17	Formate	0.105	48	425	2	-1.96
3	10.20	Acetate	0.791	185	4082	1	0.00
			---total(s)---				
	0.00		0.896		7019		

268888 DF5



Sample Name : 268889 DF5
Dilution Factor : 1.00
Injection Number : 27
Data File Name : ...\051104_027.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 8:15:05 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6
System Operator :

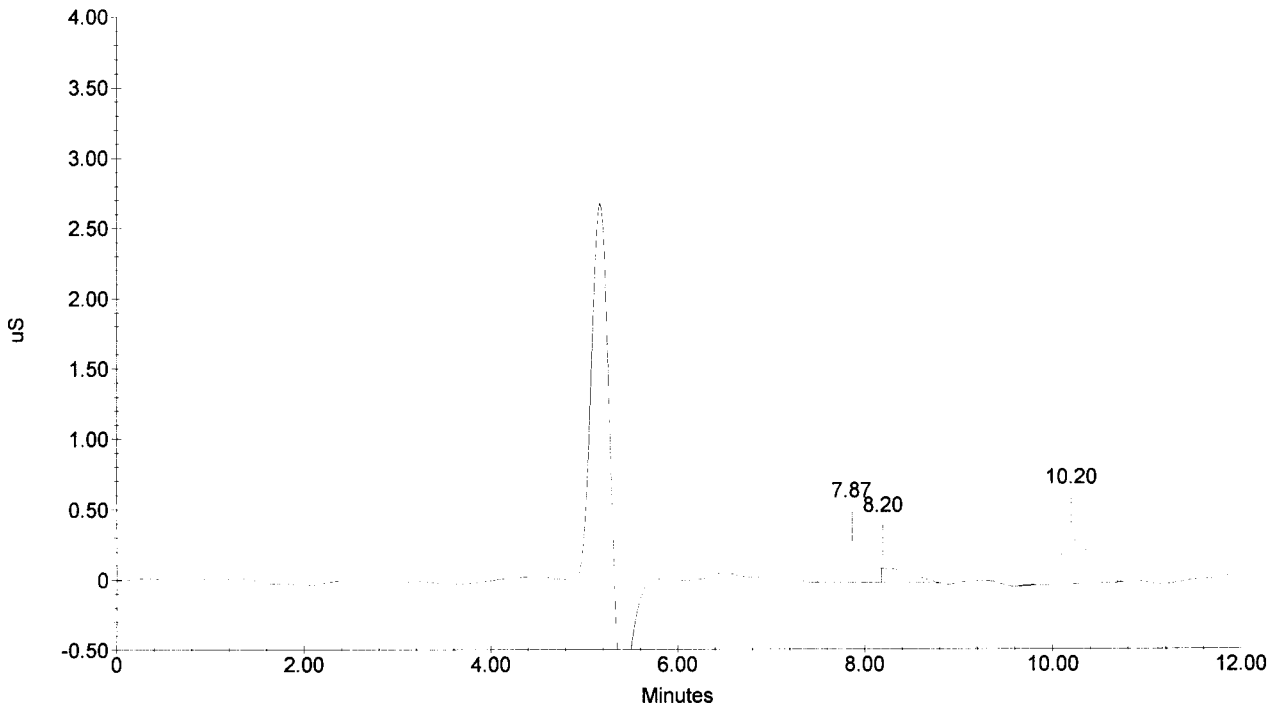
RSS 11/6/05

010163

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	199	4810	2	
2	8.20	Formate	0.294	98	2105	2	-1.56
3	10.20	Acetate	1.457	305	7563	1	0.00
			---total(s)---				
	0.00		1.751		14478		

268889 DF5



Sample Name : 268890 DF5
Dilution Factor : 1.00
Injection Number : 28
Data File Name : ...\051104_028.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

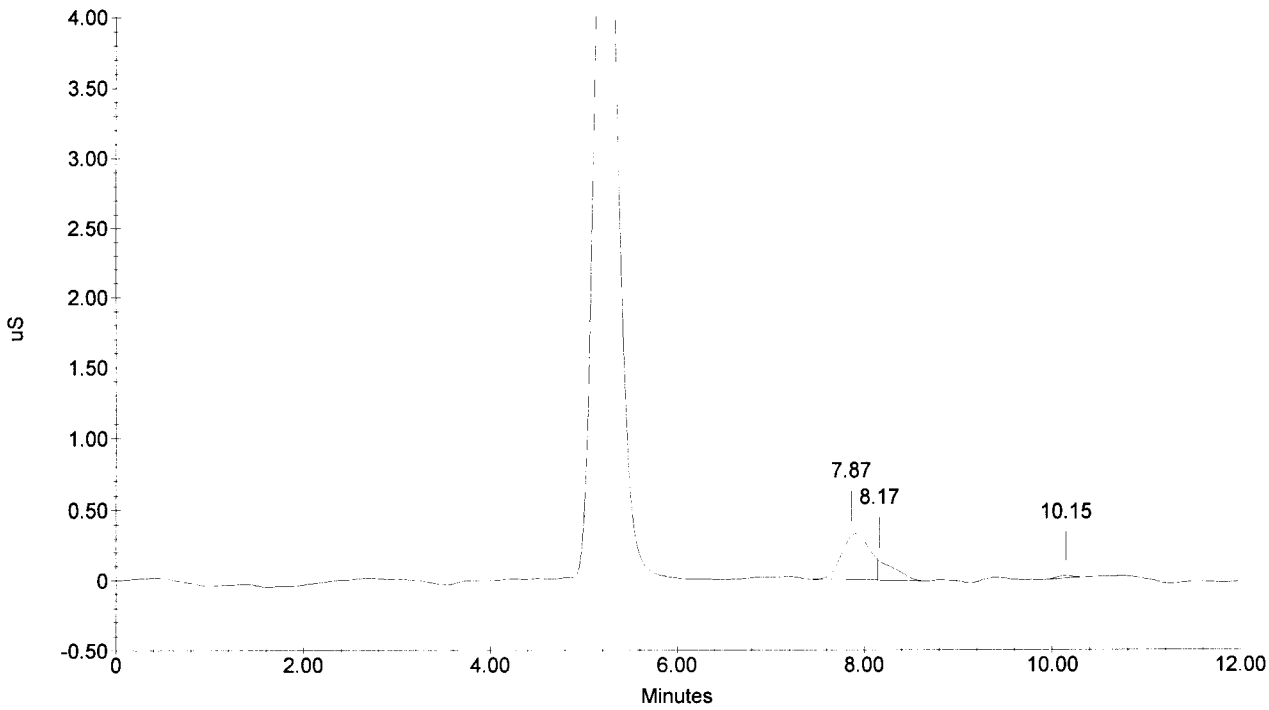
Date Time Collected : 11/4/05 8:29:58 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 * RSS 11/6/05
System Operator :

010164

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	315	6913	2	
2	8.17	Formate	0.248	135	1700	2	-1.96
3	10.15	Acetate	0.048	18	200	1	-0.49
			---total(s)---				
	0.00		0.296		8813		

268890 DF5



Sample Name : 268891 DF5
Dilution Factor : 1.00
Injection Number : 29
Data File Name : ...\051104_029.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

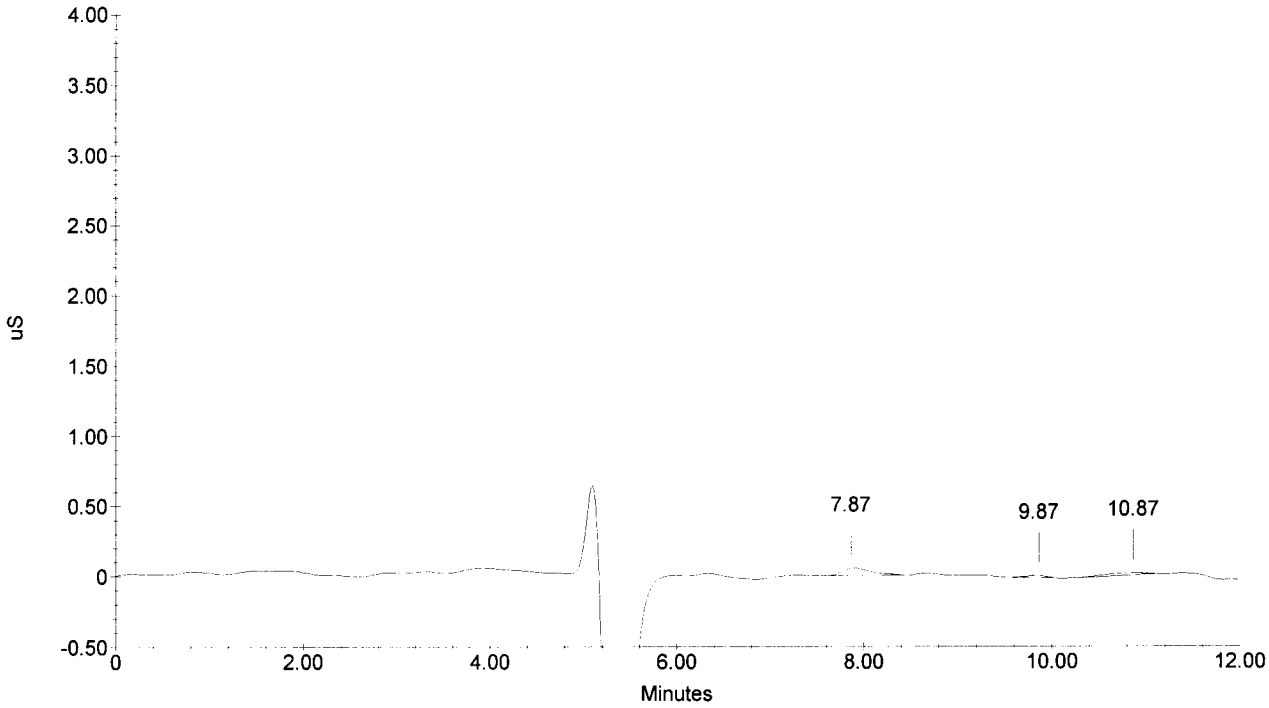
Date Time Collected : 11/4/05 8:44:49 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 * RSS 11/6/05
System Operator :

010165

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87	Formate	0.182	51	1111	1	-5.56
2	9.87	Acetate	0.055	15	235	1	-3.27
3	10.87		0.000	15	489	1	
			---total(s)---				
	0.00		0.237		1834		

268891 DF5



Sample Name : 268892 DF5
Dilution Factor : 1.00
Injection Number : 30
Data File Name : ...\051104_030.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

Date Time Collected : 11/4/05 8:59:41 PM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS8
System Operator :

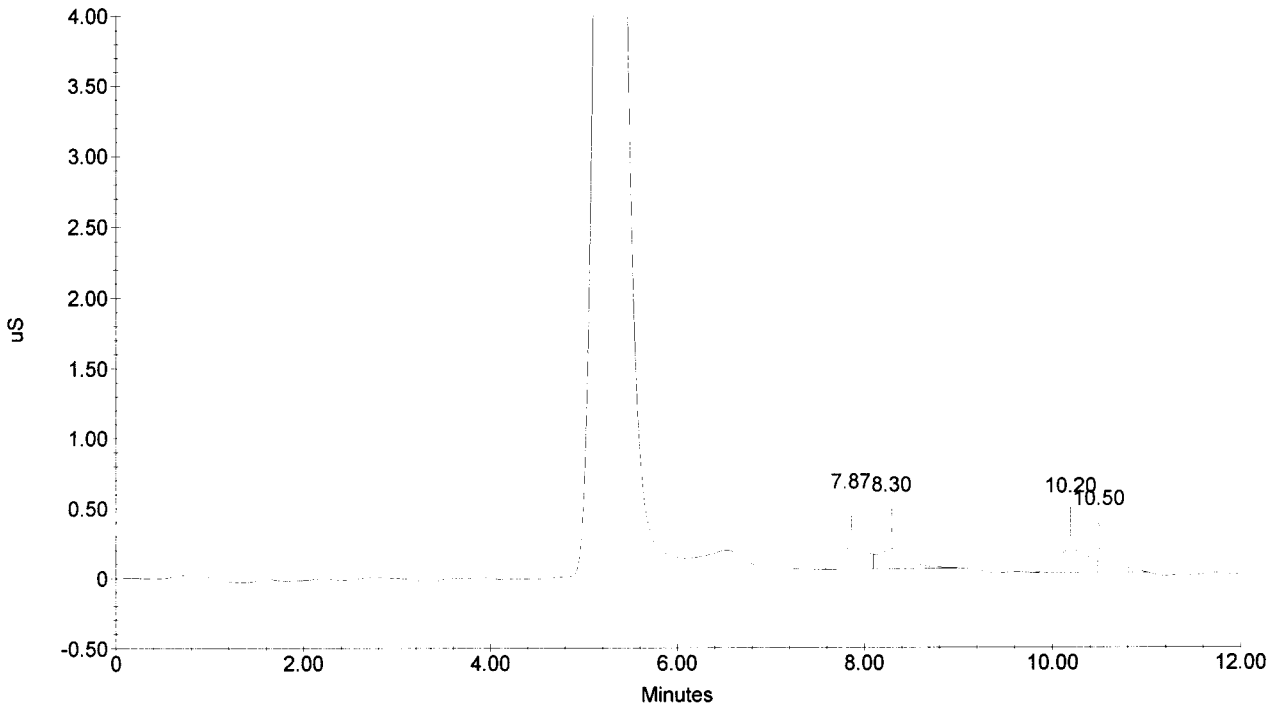
RSS 11/6/05

010166

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	7.87		0.000	174	3577	2	
2	8.30	Formate	0.442	148	3422	2	-0.36
3	10.20	Acetate	0.791	168	4084	2	0.00
4	10.50		0.000	78	1281	2	
			---total(s)---				
	0.00		1.233		12364		

268892 DF5



Sample Name : CCV
Dilution Factor : 1.00
Injection Number : 31
Data File Name : ...\051104_A031.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

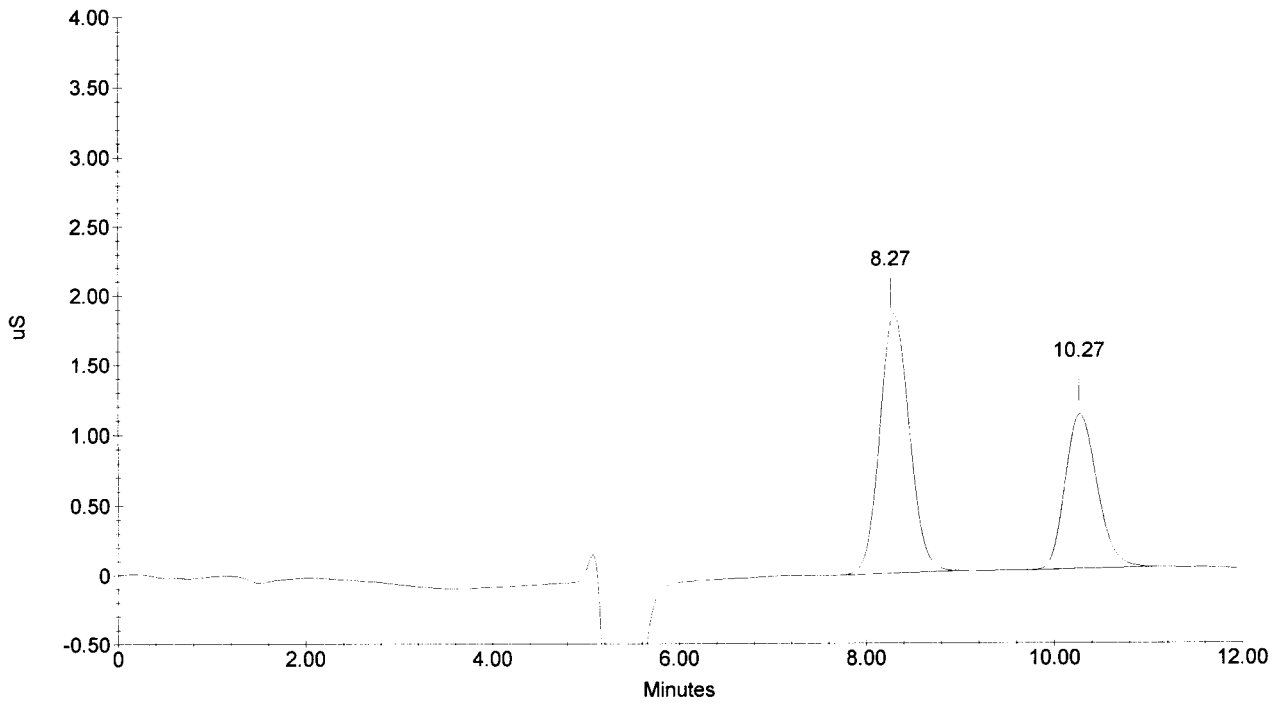
Date Time Collected : 11/6/05 11:13:21 AM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 ¥ BSC 11/6/05
System Operator :

010167

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	8.27	Formate	4.625	1791	40663	1	-0.76
2	10.27	Acetate	5.003	1094	26095	1	0.65
	0.00		---total(s)--- 9.627		66758		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 32
Data File Name : ...\051104_032.DXD
Method File Name : ...\ORGACIDAS1_051104.MET
Schedule File Name : C:\PeakNet\SCHEDULE.ACI\051104.sch

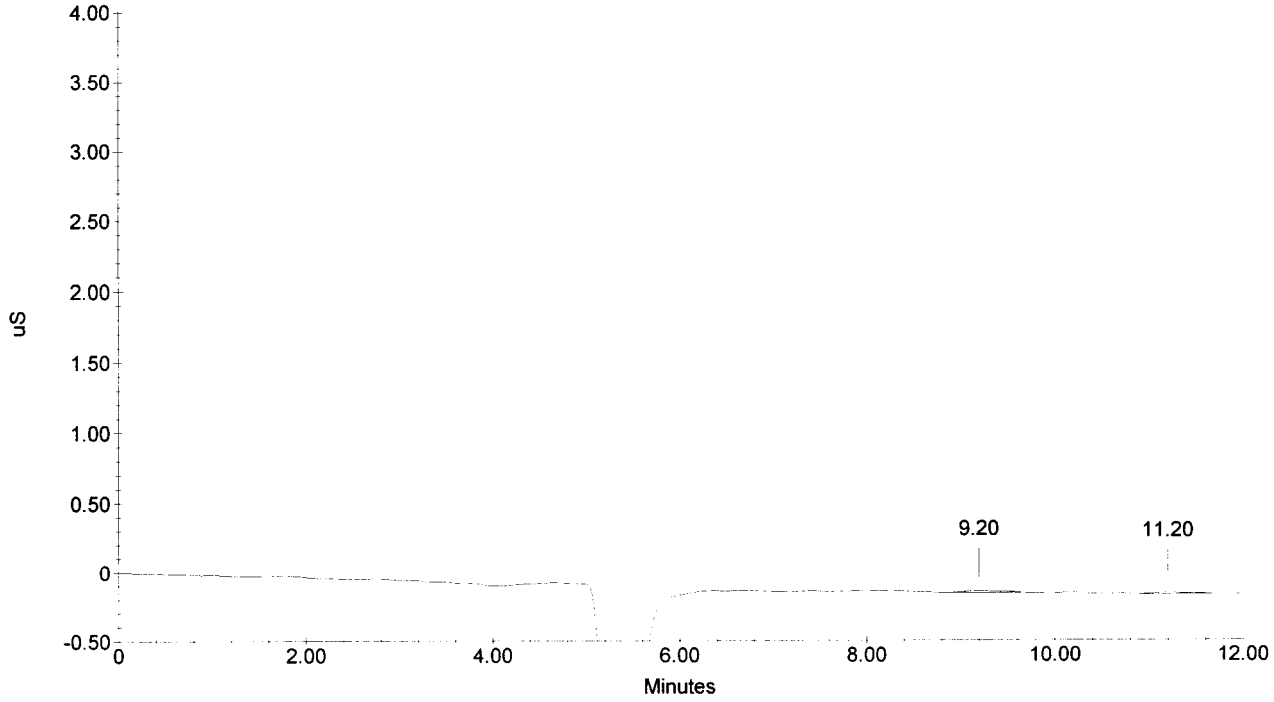
Date Time Collected : 11/6/05 11:28:11 AM
System Name : DIONEX 4000i
Detector Name : CDM-1
Column Type : ICE-AS6 1 * RSS 11/6/05
System Operator :

010168

Peak Information : All Peaks

Pk. Num	Ret Time	Component Name	Concentration (PPM)	Height	Area	Bl. Code	%Delta
1	9.20		0.000	13	381	1	
2	11.20		0.000	11	306	1	
			---total(s)---				
	0.00		0.000		687		

CCB



Schedule File: C:\PeakNet\schedule\24OCT05.sch

Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	ICV	Sample		anions051007.met	051024_001.dxd	20
2	ICB	Sample		anions051007.met	051024_002.dxd	1
3	268878 DF20	Sample		anions051007.met	051024_003.dxd	20
4	268878D DF20	Sample		anions051007.met	051024_004.dxd	20
5	268878S DF20	Sample		anions051007.met	051024_005.dxd	20
6	268879 DF20	Sample		anions051007.met	051024_006.dxd	20
7	268880 DF20	Sample		anions051007.met	051024_007.dxd	20
8	268881 DF20	Sample		anions051007.met	051024_008.dxd	20
9	268882 DF20	Sample		anions051007.met	051024_009.dxd	20
10	268883 DF20	Sample		anions051007.met	051024_010.dxd	20
11	268884 DF20	Sample		anions051007.met	051024_011.dxd	20
12	268885 DF20	Sample		anions051007.met	051024_012.dxd	20
13	CCV	Sample		anions051007.met	051024_013.dxd	20
14	CCB	Sample		anions051007.met	051024_014.dxd	1
15	268886 DF20	Sample		anions051007.met	051024_015.dxd	20
16	268887 DF20	Sample		anions051007.met	051024_016.dxd	20
17	268888 DF20	Sample		anions051007.met	051024_017.dxd	20
18	268889 DF20	Sample		anions051007.met	051024_018.dxd	20
19	268890 DF20	Sample		anions051007.met	051024_019.dxd	20
20	268891 DF20	Sample		anions051007.met	051024_020.dxd	20
21	268892 DF20	Sample		anions051007.met	051024_021.dxd	20
22	CCV	Sample		anions051007.met	051024_022.dxd	20
23	CCB	Sample		anions051007.met	051024_023.dxd	1
24	268467	Sample		anions051007.met	051024_024.dxd	1
25	268467D	Sample		anions051007.met	051024_025.dxd	1
26	268467S	Sample		anions051007.met	051024_026.dxd	1
27	268468	Sample		anions051007.met	051024_027.dxd	1
28	268467 DF10	Sample		anions051007.met	051024_028.dxd	10
29	268467D DF10	Sample		anions051007.met	051024_029.dxd	10
30	268467S DF10	Sample		anions051007.met	051024_030.dxd	10
31	268468 DF10	Sample		anions051007.met	051024_031.dxd	10
32	CCV	Sample		anions051007.met	051024_032.dxd	20
33	CCB	Sample		anions051007.met	051024_033.dxd	1

010169

Default Method Path: C:\PEAKNET\METHOD
Default Data Path: C:\PEAKNET\DATA\051024
Comment:
DIV 20 TO#051021-6 06002.01.322

ICV Sources:
1) SPEX LOT#28-138AS (INORG#5271)
   F = 100 mg/L
   Cl = 200 mg/L
   Br = 400 mg/L
   NO3N = 90.4 mg/L
   PO4P = 191 mg/L
   SO4 = 400 mg/L
2) 104-01-IC5
   NO2N 91.3mg/L

Sample Name : ICV
Dilution Factor : 20.00
Injection Number : 1
Data File Name : C:\PeakNet\data\051024\051024_001.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

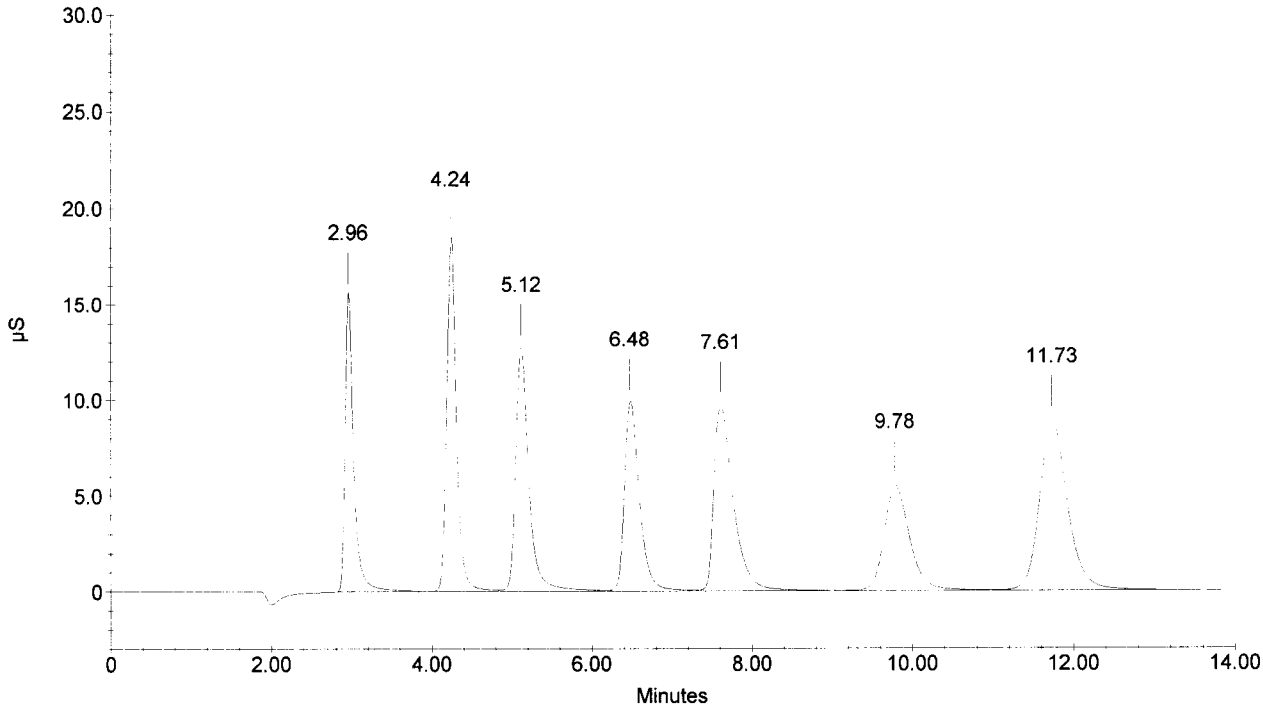
Date Time Collected : 10/24/05 2:10:42 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010170

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	94.314	153956	1151855	2	-1.44
2	4.24	CHLORIDE	191.991	181503	1556957	2	-1.24
3	5.12	NITRITE-N	82.532	126847	1457834	2	-1.22
4	6.48	BROMIDE	379.291	98163	1292607	2	-0.66
5	7.61	NITRATE-N	84.487	96585	1639606	2	1.74
6	9.78	PHOSPHATE-P	178.107	54780	1223958	2	-0.37
7	11.73	SULFATE	380.022	88938	2157852	2	-2.25
	0.00		---total(s)--- 1390.744		10480668		

ICV



Sample Name : ICB
Dilution Factor : 1.00
Injection Number : 2
Data File Name : C:\PeakNet\data\051024\051024_002.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

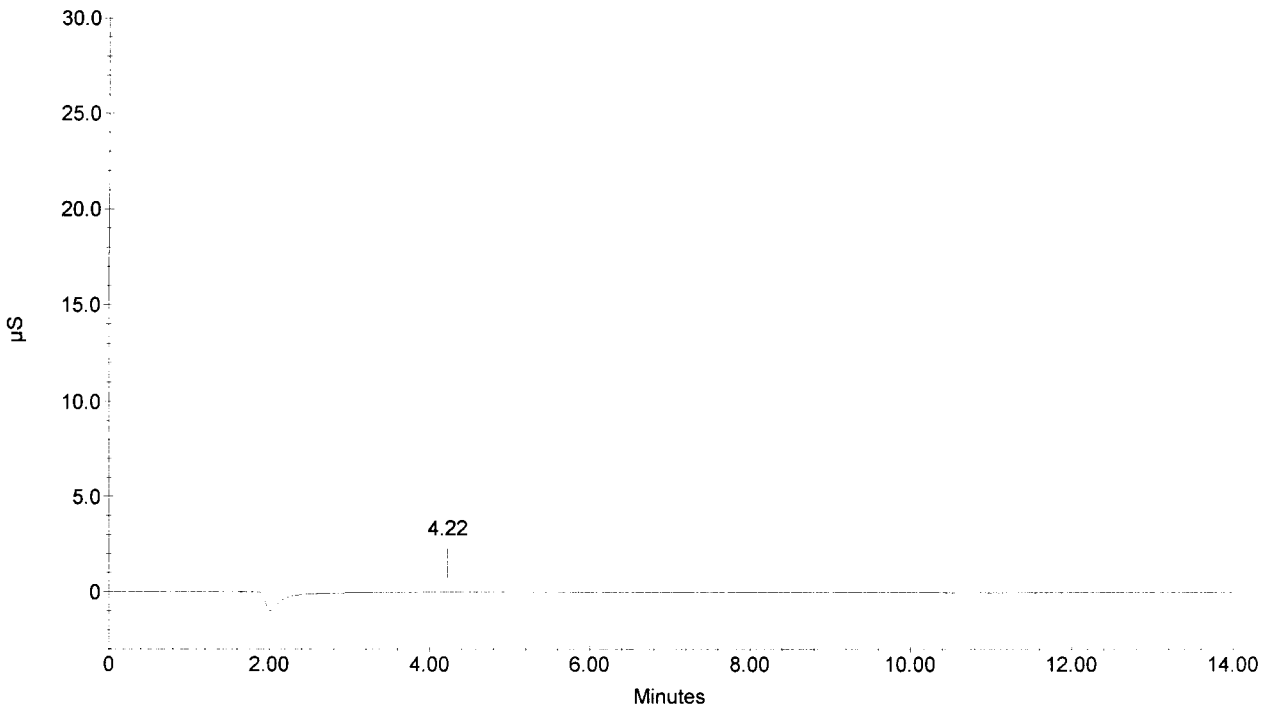
Date Time Collected : 10/24/05 2:27:27 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010171

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.22	CHLORIDE	0.028	67	499	1	-1.55
1	4.22	CHLORIDE	0.028	67	499	1	-1.55
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.055		999		

ICB



Sample Name : 268878 DF20
Dilution Factor : 20.00
Injection Number : 3
Data File Name : C:\PeakNet\data\051024\051024_003.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

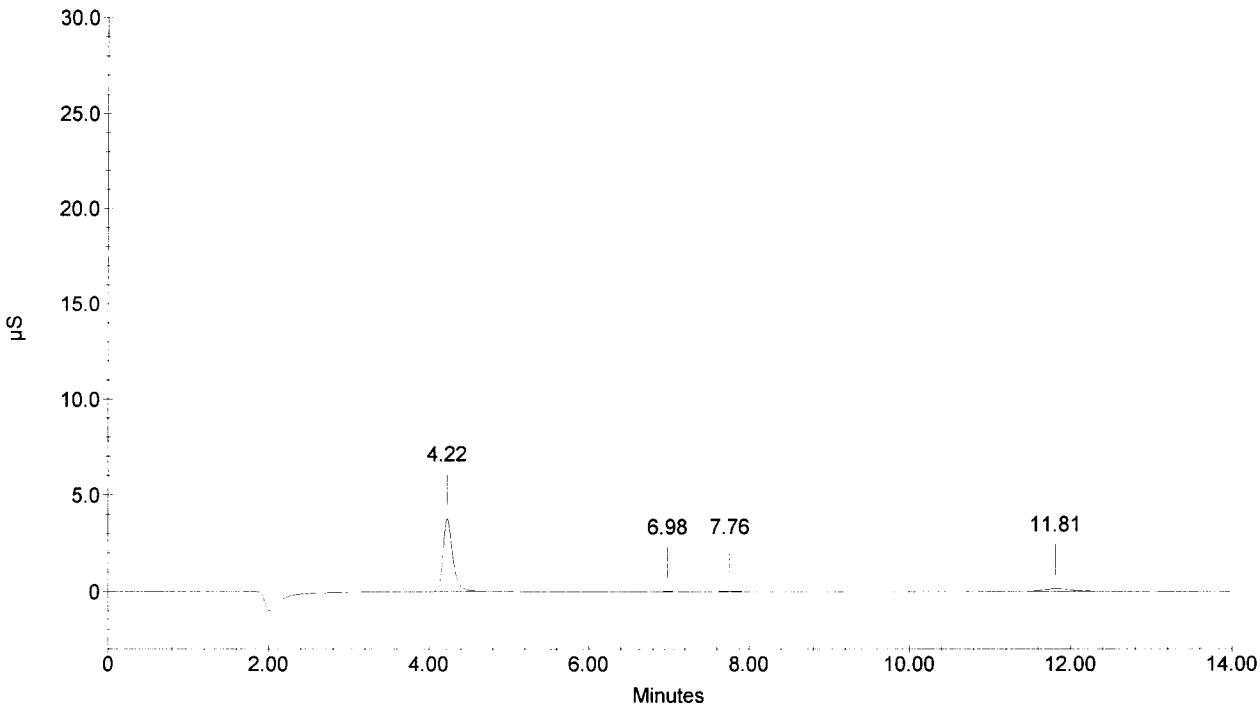
Date Time Collected : 10/24/05 2:44:13 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010172

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.22	CHLORIDE	42.054	37658	319233	1	-1.55
1	4.22	CHLORIDE	42.054	37658	319233	1	-1.55
		NITRITE-N					
2	6.98	BROMIDE	1.466	113	1421	1	7.11
3	7.76	NITRATE-N	0.835	279	4007	1	3.70
		PHOSPHATE-P					
4	11.81	SULFATE	7.068	1435	35766	1	-1.58
			---total(s)---				
	0.00		93.477		679660		

268878 DF20



Sample Name : 268878D DF20
Dilution Factor : 20.00
Injection Number : 4
Data File Name : C:\PeakNet\data\051024\051024_004.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

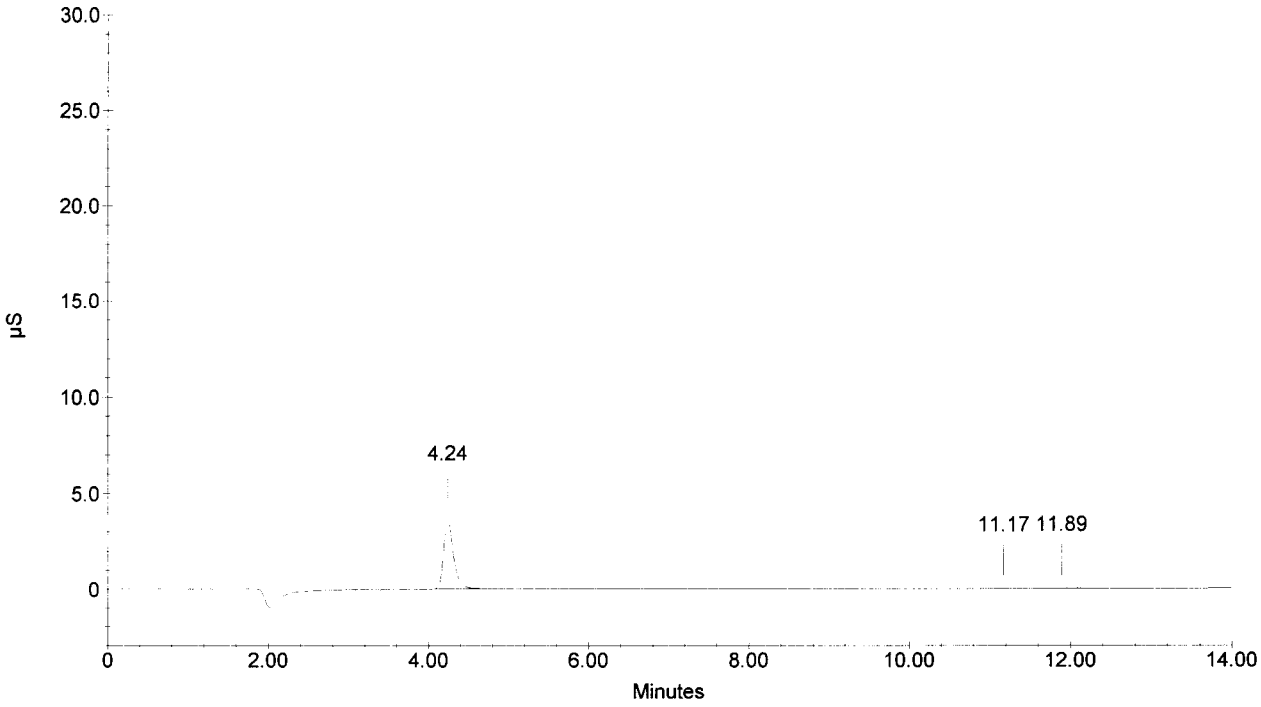
Date Time Collected : 10/24/05 3:00:59 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010173

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24	CHLORIDE	41.276	37106	313177	1	-1.24
1	4.24	CHLORIDE	41.276	37106	313177	1	-1.24
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
3	11.89	SULFATE	0.811	146	3247	1	-0.92
			---total(s)---				
	0.00		83.364		629601		

268878D DF20



Sample Name : 268878S DF20
Dilution Factor : 20.00
Injection Number : 5
Data File Name : C:\PeakNet\data\051024\051024_005.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

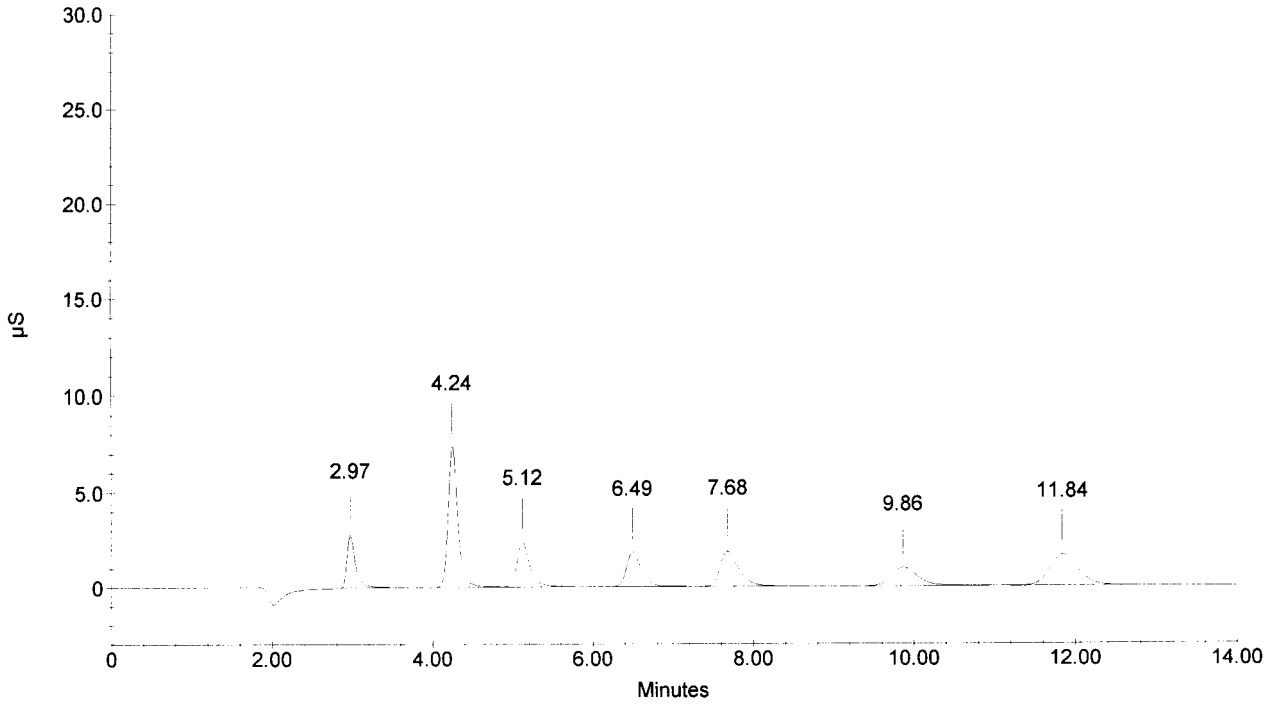
Date Time Collected : 10/24/05 3:17:46 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010174

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	18.617	27744	207806	1	-1.00
2	4.24	CHLORIDE	80.928	72988	626396	2	-1.24
3	5.12	NITRITE-N	16.725	23949	272420	2	-1.22
4	6.49	BROMIDE	77.099	18347	243582	2	-0.46
5	7.68	NITRATE-N	17.175	18655	306869	2	2.63
6	9.86	PHOSPHATE-P	36.479	9997	234680	2	0.44
7	11.84	SULFATE	78.466	16675	413061	2	-1.36
			---total(s)---				
	0.00		325.489		2304814		

268878S DF20



Sample Name : 268879 DF20
Dilution Factor : 20.00
Injection Number : 6
Data File Name : C:\PeakNet\data\051024\051024_006.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

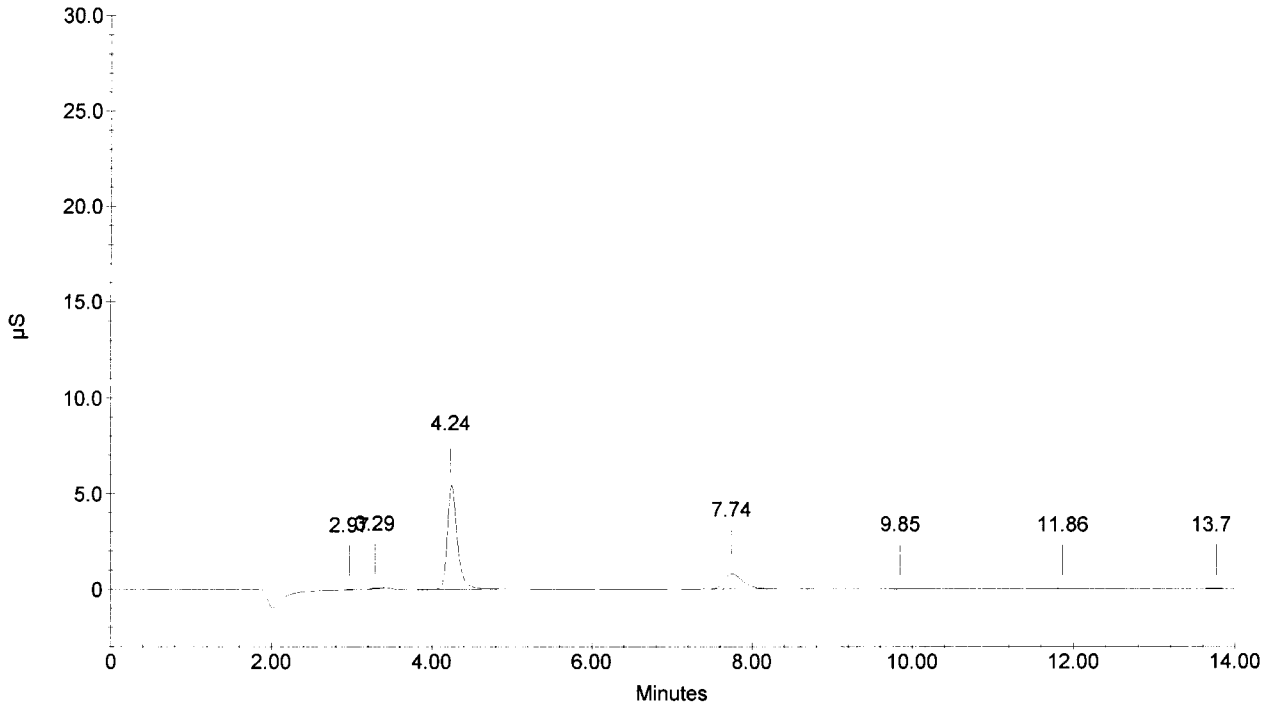
Date Time Collected : 10/24/05 3:34:33 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010175

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.041	190	900	1	-1.00
3	4.24	CHLORIDE	61.422	53155	471187	1	-1.24
		NITRITE-N					
		BROMIDE					
4	7.74	NITRATE-N	7.633	7948	129069	1	3.52
5	9.85	PHOSPHATE-P	1.566	221	5119	1	0.31
6	11.86	SULFATE	0.421	72	1223	1	-1.14
			---total(s)---				
	0.00		72.083		607500		

268879 DF20



Sample Name : 268880 DF20
Dilution Factor : 20.00
Injection Number : 7
Data File Name : C:\PeakNet\data\051024\051024_007.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

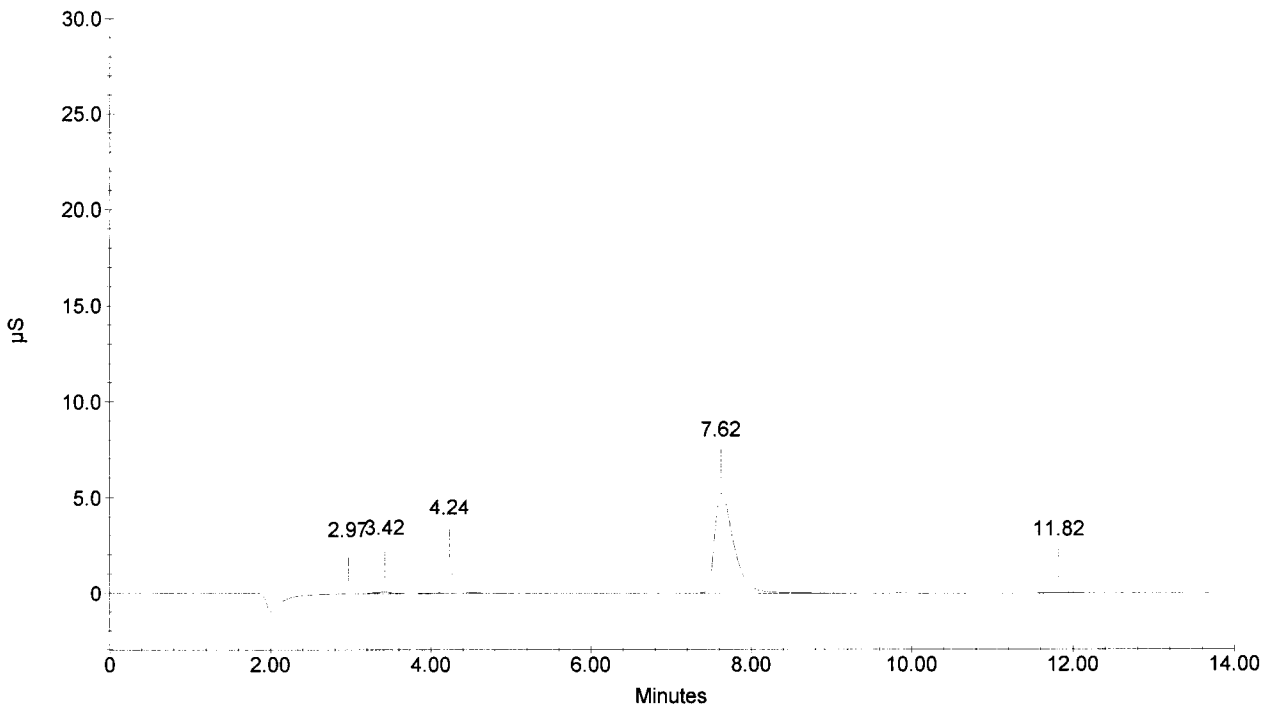
Date Time Collected : 10/24/05 3:51:20 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010176

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.985	66	249	1	-1.00
3	4.24	CHLORIDE	14.170	11526	104074	1	-1.24
		NITRITE-N					
		BROMIDE					
4	7.62	NITRATE-N	46.855	52136	877148	1	1.92
		PHOSPHATE-P					
5	11.82	SULFATE	1.756	363	8150	1	-1.47
			---total(s)---				
	0.00		63.765		989621		

268880 DF20



Sample Name : 268881 DF20
Dilution Factor : 20.00
Injection Number : 8
Data File Name : c:\peaknet\data\051024\051024_008.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

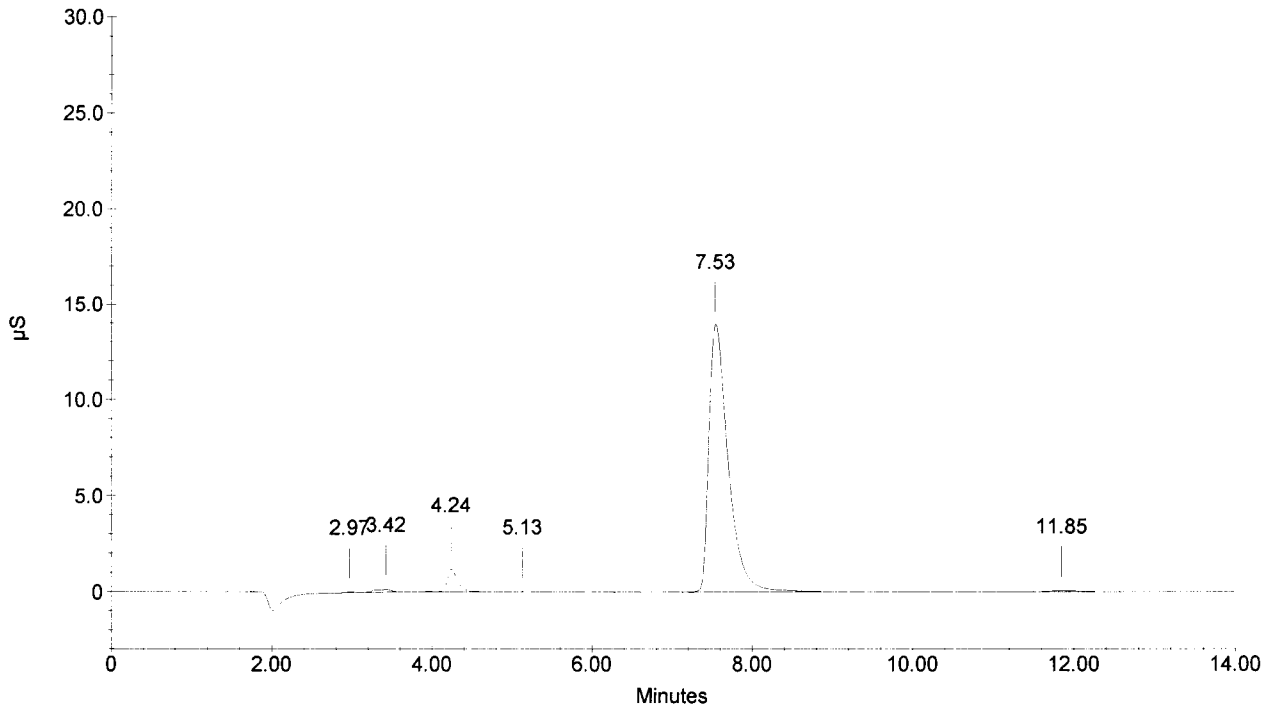
Date Time Collected : 10/24/05 4:08:08 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010177

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.018	135	634	1	-1.00
3	4.24	CHLORIDE	14.448	11618	106199	1	-1.24
4	5.13	NITRITE-N BROMIDE	1.539	145	1179	1	-0.97
5	7.53	NITRATE-N PHOSPHATE-P	116.369	138962	2321721	1	0.67
6	11.85	SULFATE	3.319	694	16272	1	-1.25
	0.00		---total(s)--- 136.693		2446005		

268881 DF20



Sample Name : 268882 DF20
Dilution Factor : 20.00
Injection Number : 9
Data File Name : c:\peaknet\data\051024\051024_009.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

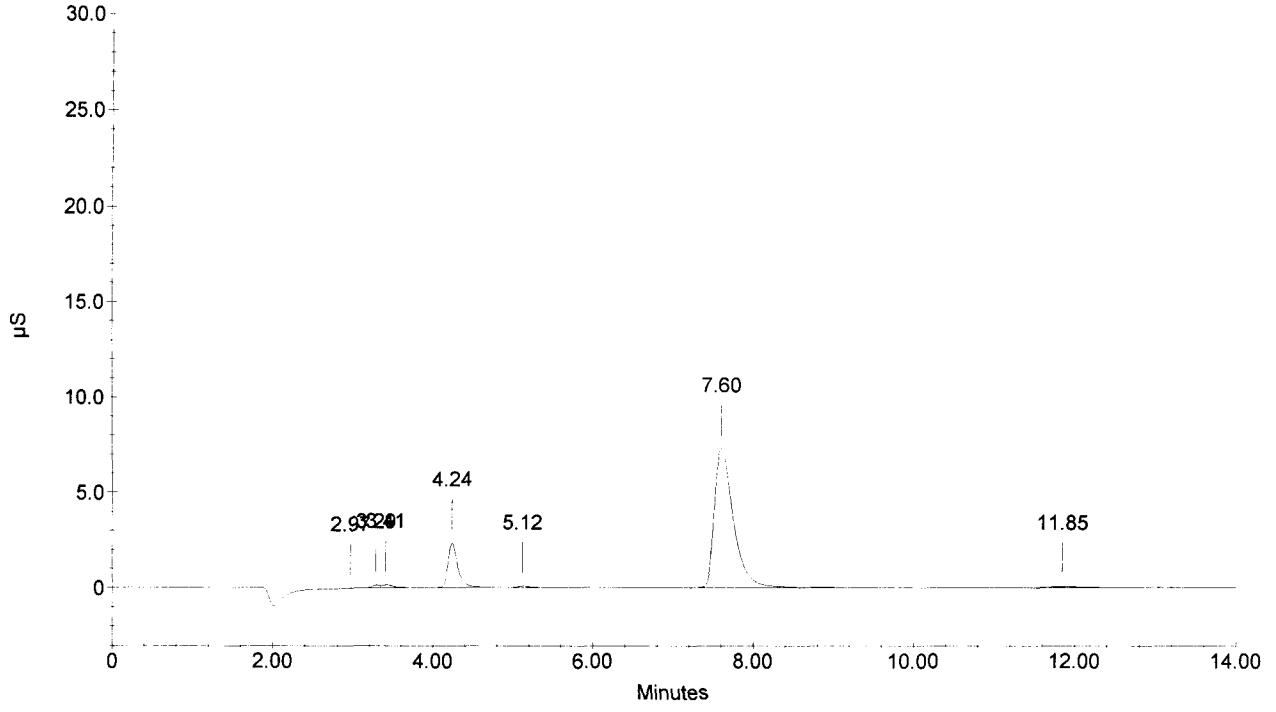
Date Time Collected : 10/24/05 4:24:54 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010178

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.003	106	458	1	-1.00
4	4.24	CHLORIDE	26.476	23182	198523	1	-1.24
5	5.12	NITRITE-N BROMIDE	1.899	741	7594	1	-1.22
6	7.60	NITRATE-N PHOSPHATE-P	63.611	72774	1211073	1	1.56
7	11.85	SULFATE	3.089	613	15075	1	-1.25
			---total(s)---				
	0.00		96.078		1432723		

268882 DF20



Sample Name : 268883 DF20
Dilution Factor : 20.00
Injection Number : 10
Data File Name : c:\peaknet\data\051024\051024_010.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

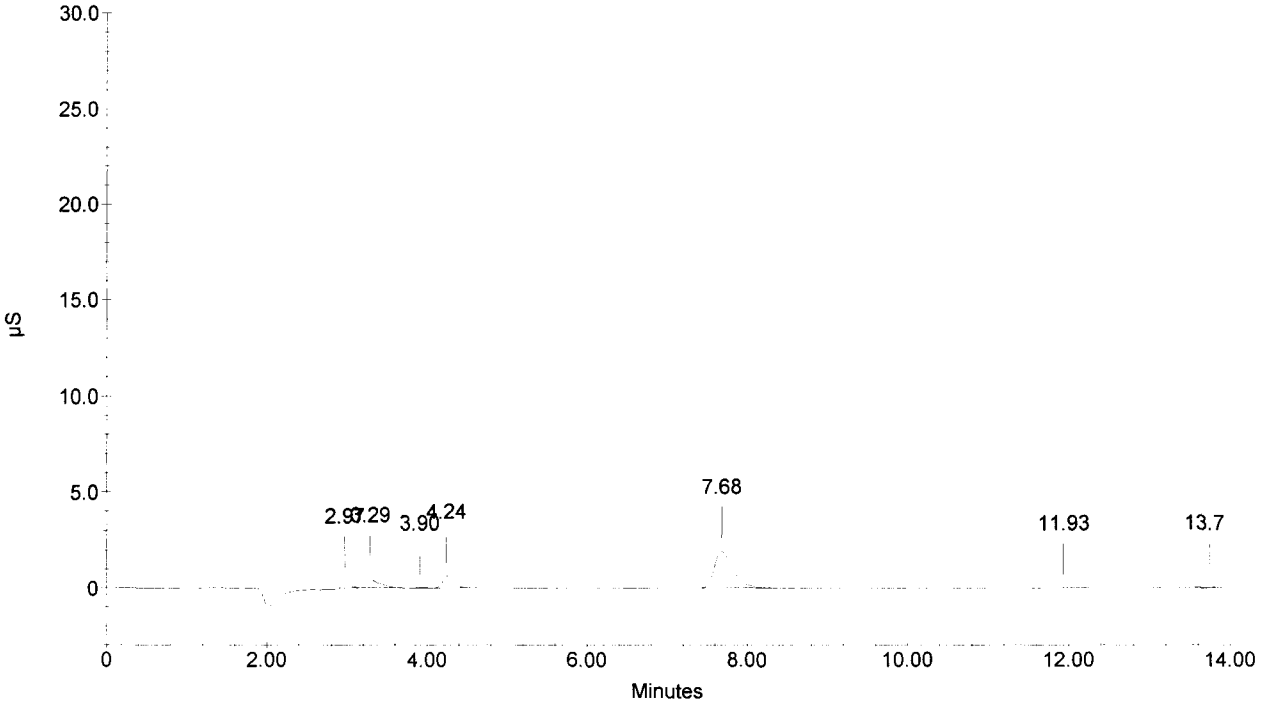
Date Time Collected : 10/24/05 4:41:37 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010179

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	3.046	3808	24265	2	-1.00
4	4.24	CHLORIDE	7.934	6253	56522	2	-1.24
		NITRITE-N					
		BROMIDE					
5	7.68	NITRATE-N	17.455	19166	312127	1	2.63
		PHOSPHATE-P					
6	11.93	SULFATE	0.422	75	1229	1	-0.58
			---total(s)---				
	0.00		28.858		394143		

268883 DF20



Sample Name : 268884 DF20
Dilution Factor : 20.00
Injection Number : 11
Data File Name : c:\peaknet\data\051024\051024_011.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

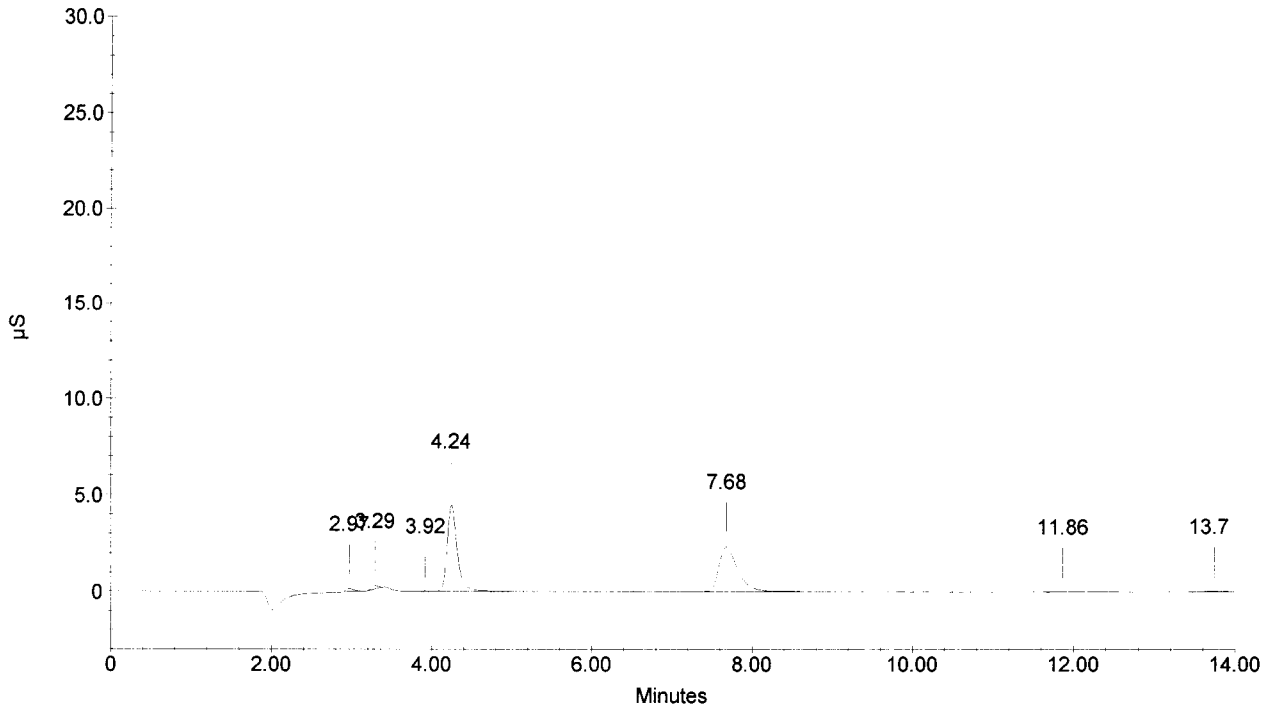
Date Time Collected : 10/24/05 4:58:26 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010180

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.776	1511	9456	1	-1.00
4	4.24	CHLORIDE	50.971	44153	388933	2	-1.24
		NITRITE-N					
		BROMIDE					
5	7.68	NITRATE-N	21.336	23225	385235	1	2.63
		PHOSPHATE-P					
6	11.86	SULFATE	0.306	41	624	1	-1.14
			---total(s)---				
	0.00		74.389		784247		

268884 DF20



Sample Name : 268885 DF20
Dilution Factor : 20.00
Injection Number : 12
Data File Name : c:\peaknet\data\051024\051024_012.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

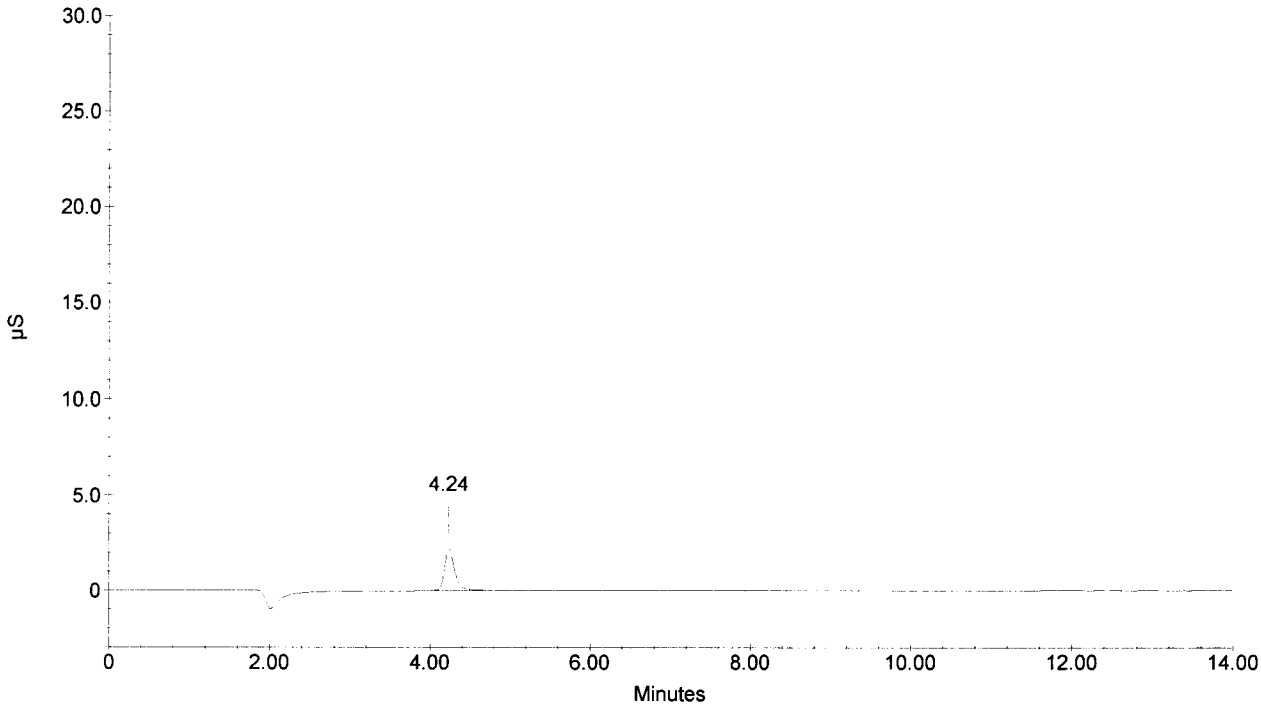
Date Time Collected : 10/24/05 5:15:14 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010181

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24	CHLORIDE	25.406	22419	190277	1	-1.24
1	4.24	CHLORIDE	25.406	22419	190277	1	-1.24
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		50.812		380554		

268885 DF20



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 13
Data File Name : c:\peaknet\data\051024\051024_013.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

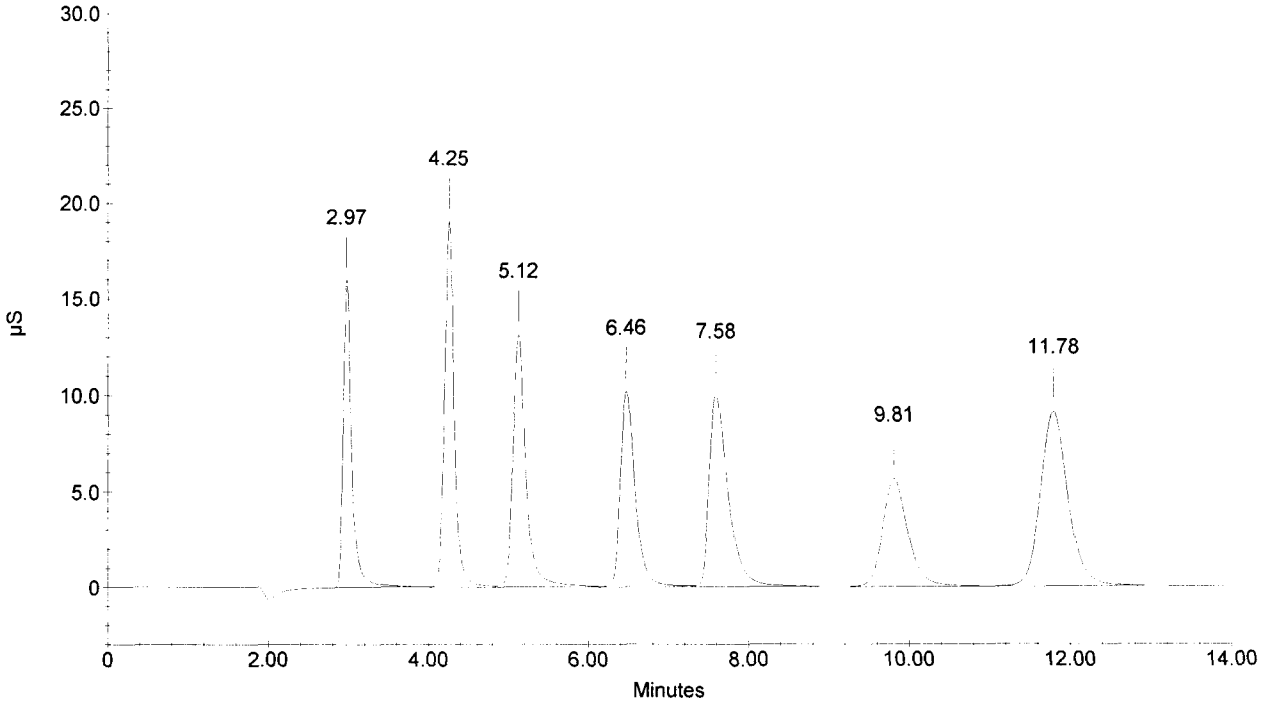
Date Time Collected : 10/24/05 5:31:59 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010182

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	95.735	158962	1170358	2	-1.00
2	4.25	CHLORIDE	195.760	189766	1590099	2	-0.93
3	5.12	NITRITE-N	84.253	130689	1489057	2	-1.22
4	6.46	BROMIDE	385.620	101338	1316228	2	-0.87
5	7.58	NITRATE-N	85.949	99555	1670167	2	1.38
6	9.81	PHOSPHATE-P	181.006	56259	1245311	2	-0.10
7	11.78	SULFATE	385.309	91155	2191085	2	-1.81
			---total(s)---				
	0.00		1413.633		10672306		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 14
Data File Name : c:\peaknet\data\051024\051024_014.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

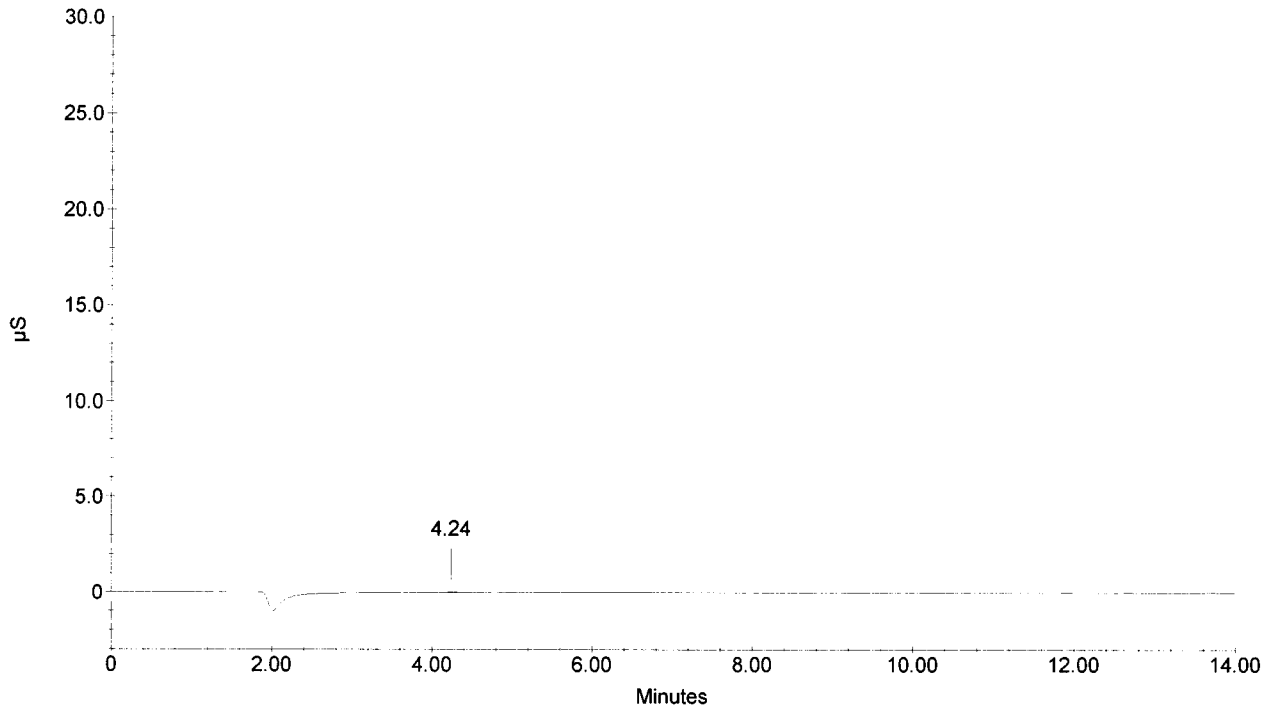
Date Time Collected : 10/24/05 5:48:48 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010183

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24	CHLORIDE	0.027	65	435	1	-1.24
1	4.24	CHLORIDE	0.027	65	435	1	-1.24
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.055		870		

CCB



Sample Name : 268886 DF20
Dilution Factor : 20.00
Injection Number : 15
Data File Name : c:\peaknet\data\051024\051024_015.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

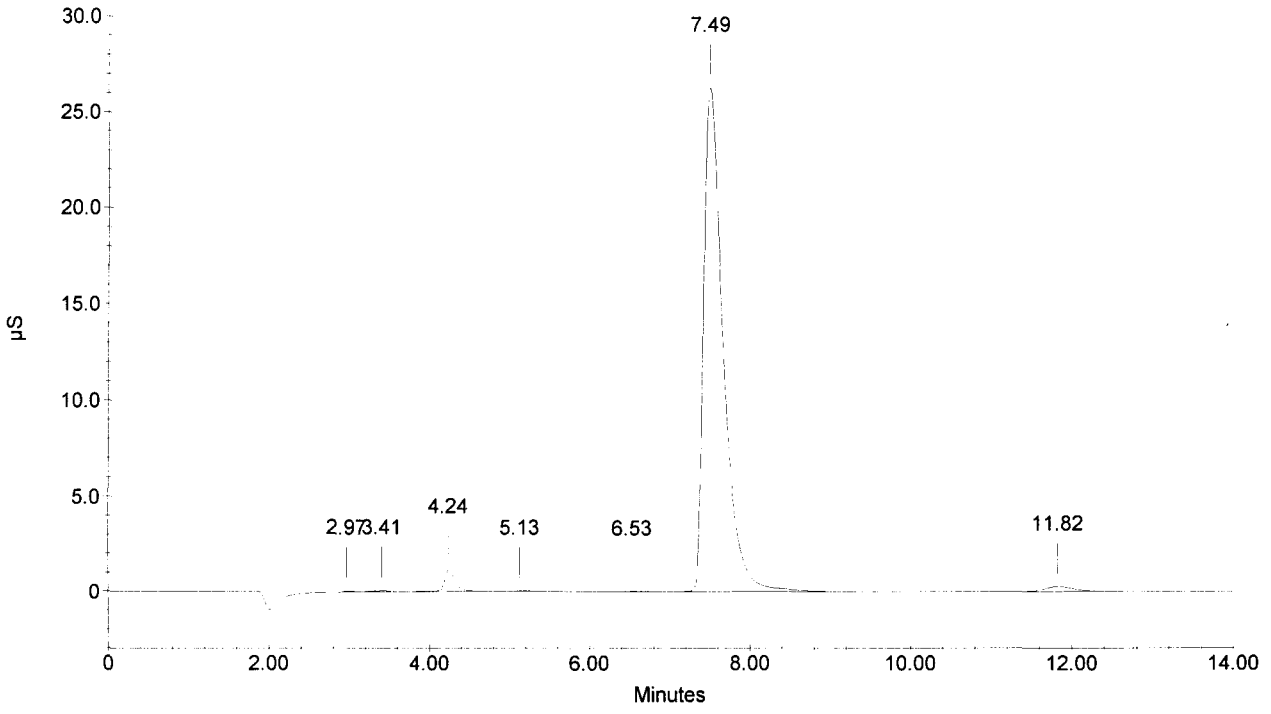
Date Time Collected : 10/24/05 6:05:35 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010184

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.270	599	3566	2	-1.00
3	4.24	CHLORIDE	15.099	11622	111176	1	-1.24
4	5.13	NITRITE-N	1.697	289	3994	1	-0.97
5	6.53	BROMIDE	1.811	209	2509	1	0.15
6	7.49	NITRATE-N	207.988	261977	4469361	1	0.13
		PHOSPHATE-P					
7	11.82	SULFATE	13.285	2805	68162	1	-1.47
			---total(s)---				
	0.00		241.149		4658769		

268886 DF20



Sample Name : 268887 DF20
Dilution Factor : 20.00
Injection Number : 16
Data File Name : c:\peaknet\data\051024\051024_016.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

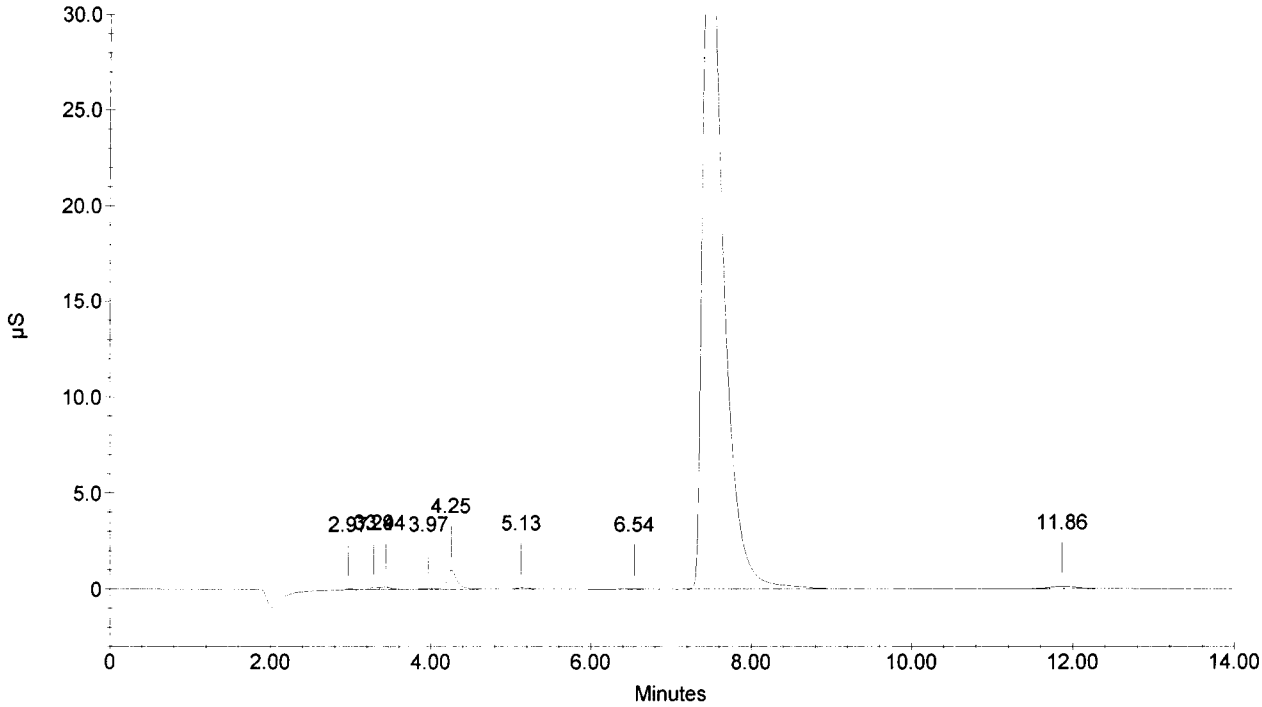
Date Time Collected : 10/24/05 6:22:23 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010185

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.168	405	2377	1	-1.00
5	4.25	CHLORIDE	12.337	9902	90076	2	-0.93
6	5.13	NITRITE-N	2.021	918	9780	1	-0.97
7	6.54	BROMIDE	2.328	344	4141	1	0.36
8	7.46	NITRATE-N	284.941 ✓	372394	6455621	1	-0.22
		PHOSPHATE-P					
9	11.86	SULFATE	6.417	1361	32381	1	-1.14
			---total(s)---				
	0.00		309.212		6594376		

268887 DF20



Sample Name : 268888 DF20
Dilution Factor : 20.00
Injection Number : 17
Data File Name : c:\peaknet\data\051024\051024_017.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

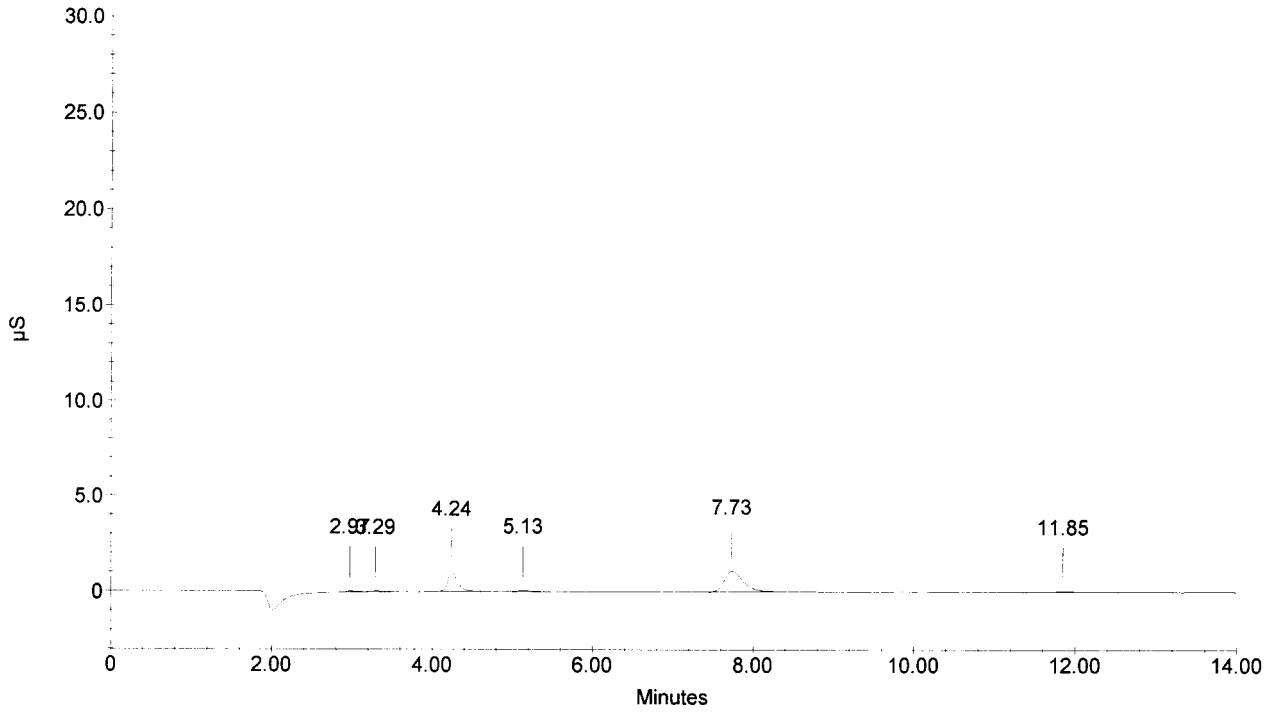
Date Time Collected : 10/24/05 6:39:13 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010186

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.207	471	2832	1	-1.00
3	4.24	CHLORIDE	11.617	9627	84583	1	-1.24
4	5.13	NITRITE-N BROMIDE	1.808	529	5975	1	-0.97
5	7.73	NITRATE-N PHOSPHATE-P	9.882	10479	170742	1	3.34
6	11.85	SULFATE	1.119	216	4847	1	-1.25
			---total(s)---				
	0.00		25.633		268979		

268888 DF20



Sample Name : 268889 DF20
Dilution Factor : 20.00
Injection Number : 18
Data File Name : c:\peaknet\data\051024\051024_018.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

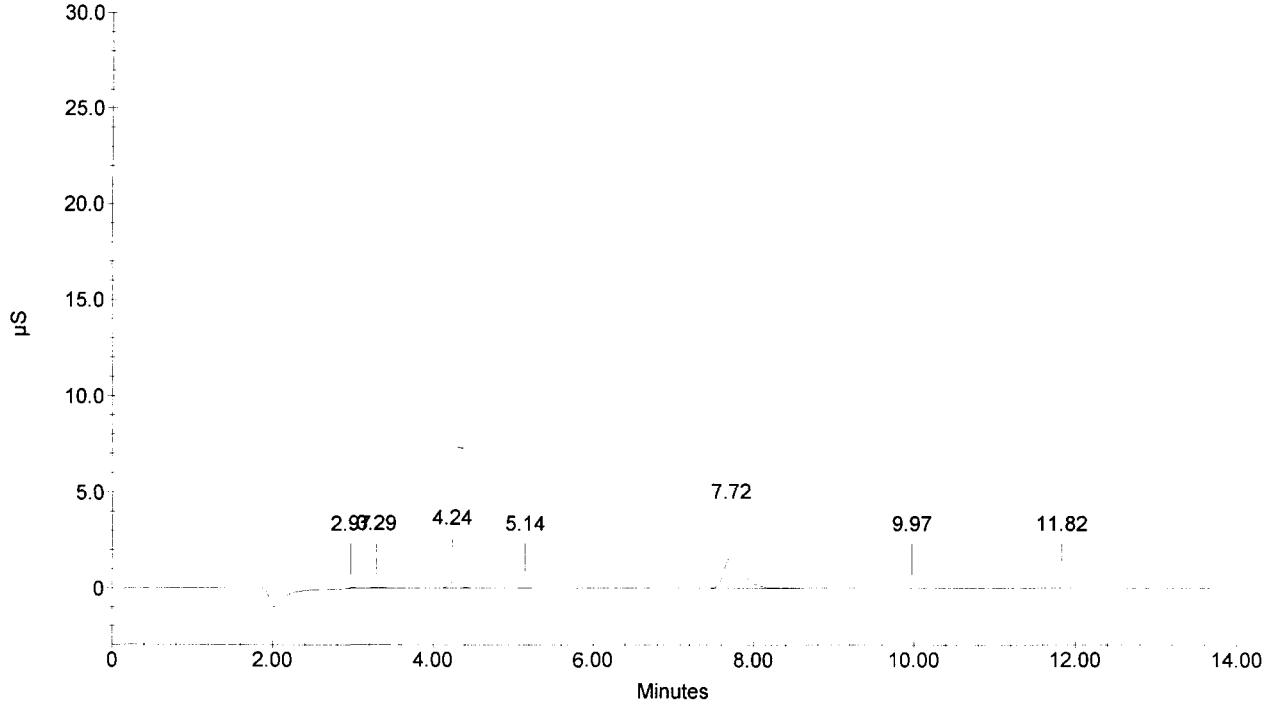
Date Time Collected : 10/24/05 6:56:01 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010187

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.195	455	2690	1	-1.00
3	4.24	CHLORIDE	4.236	3256	28412	1	-1.24
4	5.14	NITRITE-N	1.621	268	2650	1	-0.71
		BROMIDE					
5	7.72	NITRATE-N	15.718	16810	279552	1	3.16
6	9.97	PHOSPHATE-P	0.877	52	638	1	1.53
7	11.82	SULFATE	0.465	99	1452	1	-1.47
			---total(s)---				
	0.00		24.113		315394		

268889 DF20



Sample Name : 268890 DF20
Dilution Factor : 20.00
Injection Number : 19
Data File Name : c:\peaknet\data\051024\051024_019.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

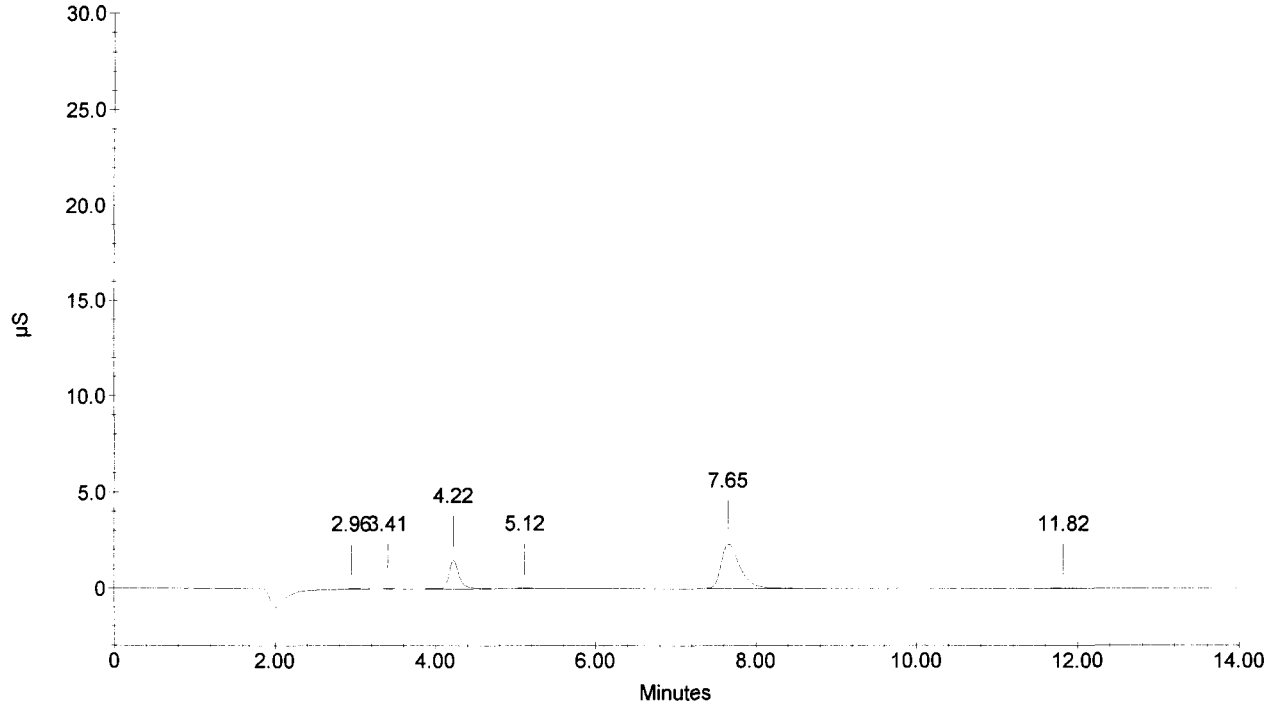
Date Time Collected : 10/24/05 7:12:48 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010188

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.96	FLUORIDE	1.056	211	1072	1	-1.44
3	4.22	CHLORIDE	18.305	14946	135723	2	-1.55
4	5.12	NITRITE-N BROMIDE	1.583	184	1960	2	-1.22
5	7.65	NITRATE-N PHOSPHATE-P	21.180	22875	382270	1	2.27
6	11.82	SULFATE	1.018	198	4320	1	-1.47
			---total(s)---				
	0.00		43.141		525344		

268890 DF20



Sample Name : 268891 DF20
Dilution Factor : 20.00
Injection Number : 20
Data File Name : c:\peaknet\data\051024\051024_020.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

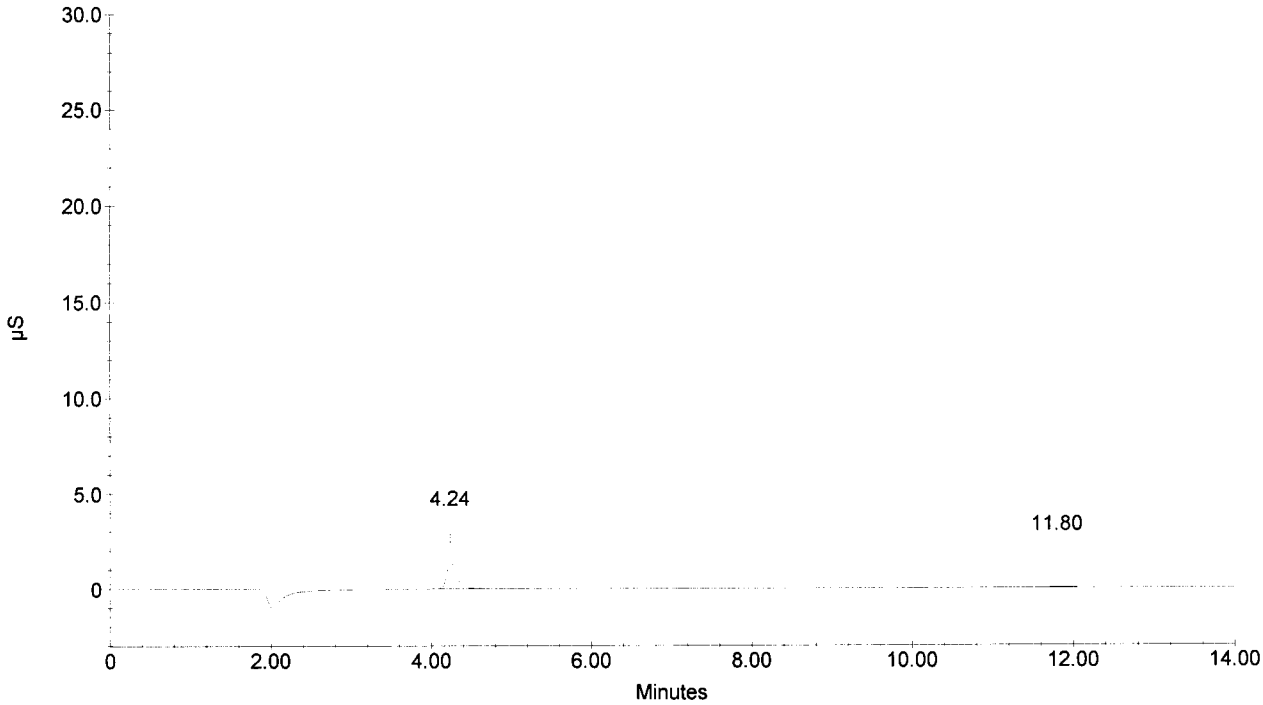
Date Time Collected : 10/24/05 7:29:35 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010189

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.24	CHLORIDE	16.195	13756	119562	1	-1.24
1	4.24	CHLORIDE	16.195	13756	119562	1	-1.24
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
2	11.80	SULFATE	0.429	69	1264	1	-1.69
			---total(s)---				
	0.00		32.819		240388		

268891 DF20



Sample Name : 268892 DF20
Dilution Factor : 20.00
Injection Number : 21
Data File Name : c:\peaknet\data\051024\051024_021.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

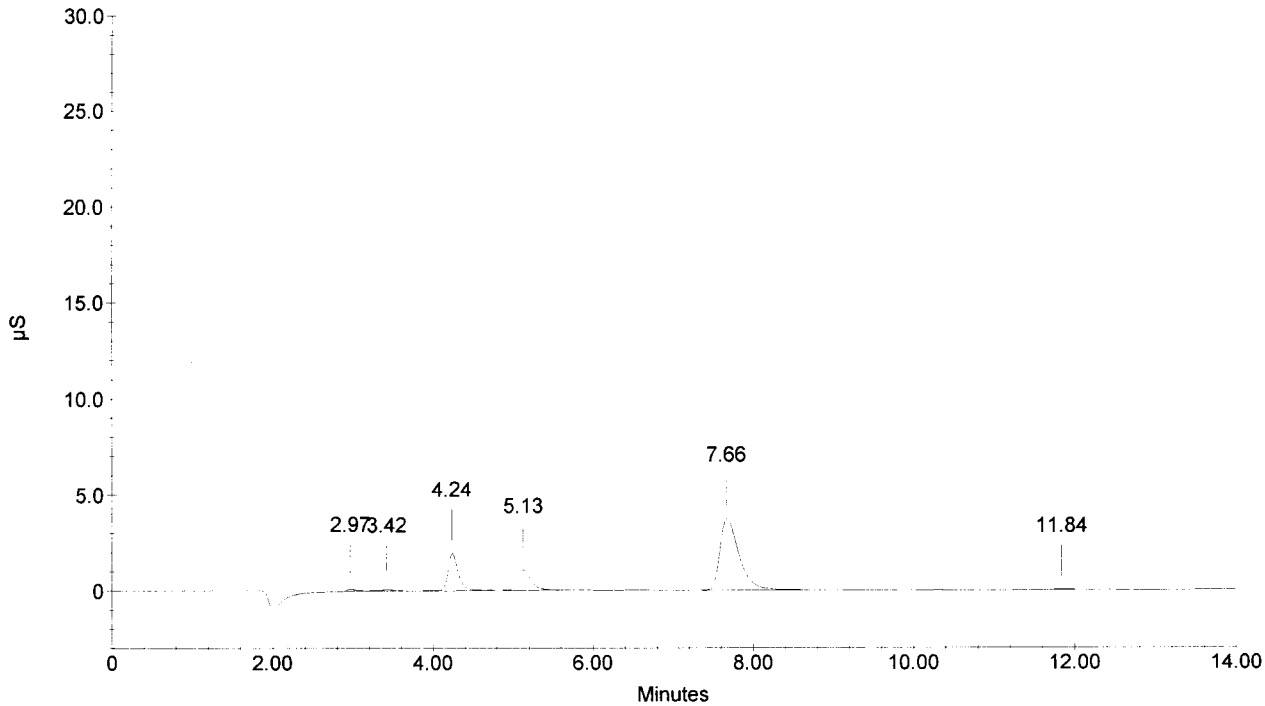
Date Time Collected : 10/24/05 7:46:23 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010190

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	1.548	1035	6803	2	-1.00
3	4.24	CHLORIDE	23.701	19379	177156	2	-1.24
4	5.13	NITRITE-N BROMIDE	8.305	10636	121914	2	-0.97
5	7.66	NITRATE-N PHOSPHATE-P	33.842	37179	623847	1	2.45
6	11.84	SULFATE	1.068	220	4582	1	-1.36
			---total(s)---				
	0.00		68.465		934301		

268892 DF20



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 22
Data File Name : c:\peaknet\data\051024\051024_022.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

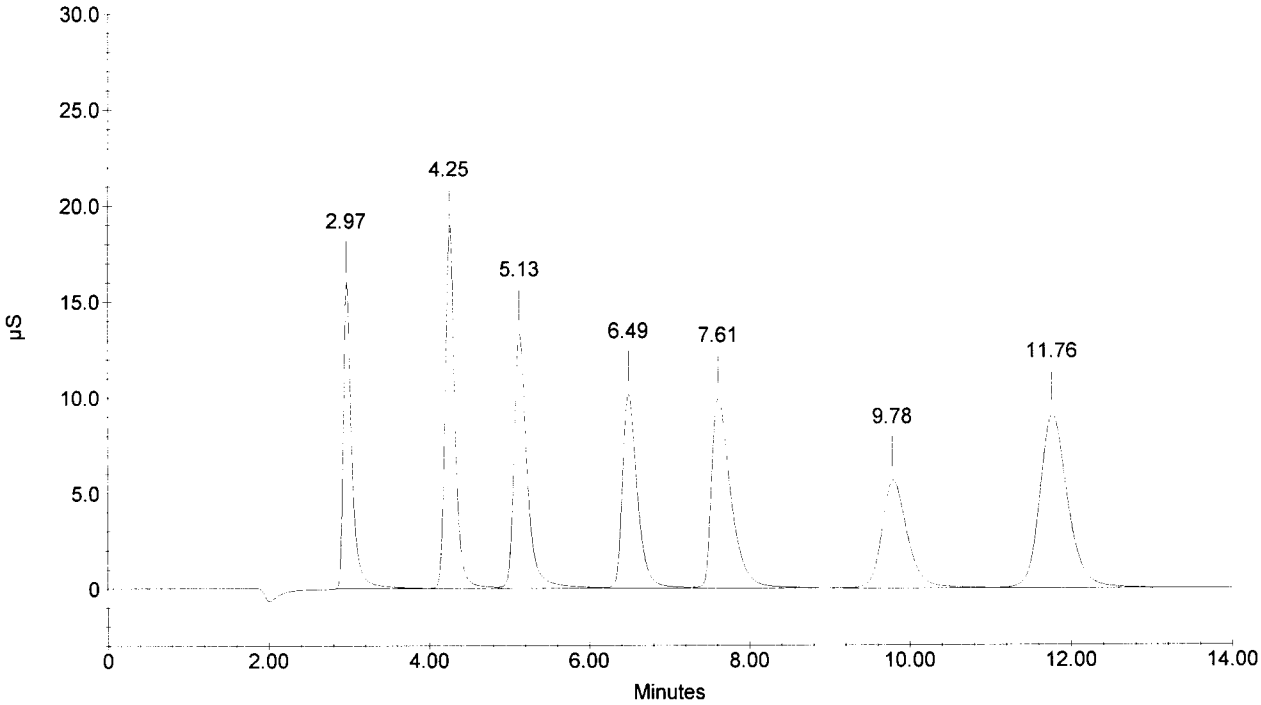
Date Time Collected : 10/24/05 8:03:10 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010191

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	96.633	158233	1182065	2	-1.00
2	4.25	CHLORIDE	196.726	185419	1598608	2	-0.93
3	5.13	NITRITE-N	86.337	133219	1526882	2	-0.97
4	6.49	BROMIDE	387.274	101393	1322414	2	-0.46
5	7.61	NITRATE-N	86.198	99215	1675367	2	1.74
6	9.78	PHOSPHATE-P	182.071	56284	1253168	2	-0.37
7	11.76	SULFATE	385.914	90709	2194895	2	-2.03
			---total(s)---				
	0.00		1421.153		10753400		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 23
Data File Name : c:\peaknet\data\051024\051024_023.DXD
Method File Name : ...\ANIONS051007.met
Schedule File Name : c:\peaknet\schedule\24oct05.sch

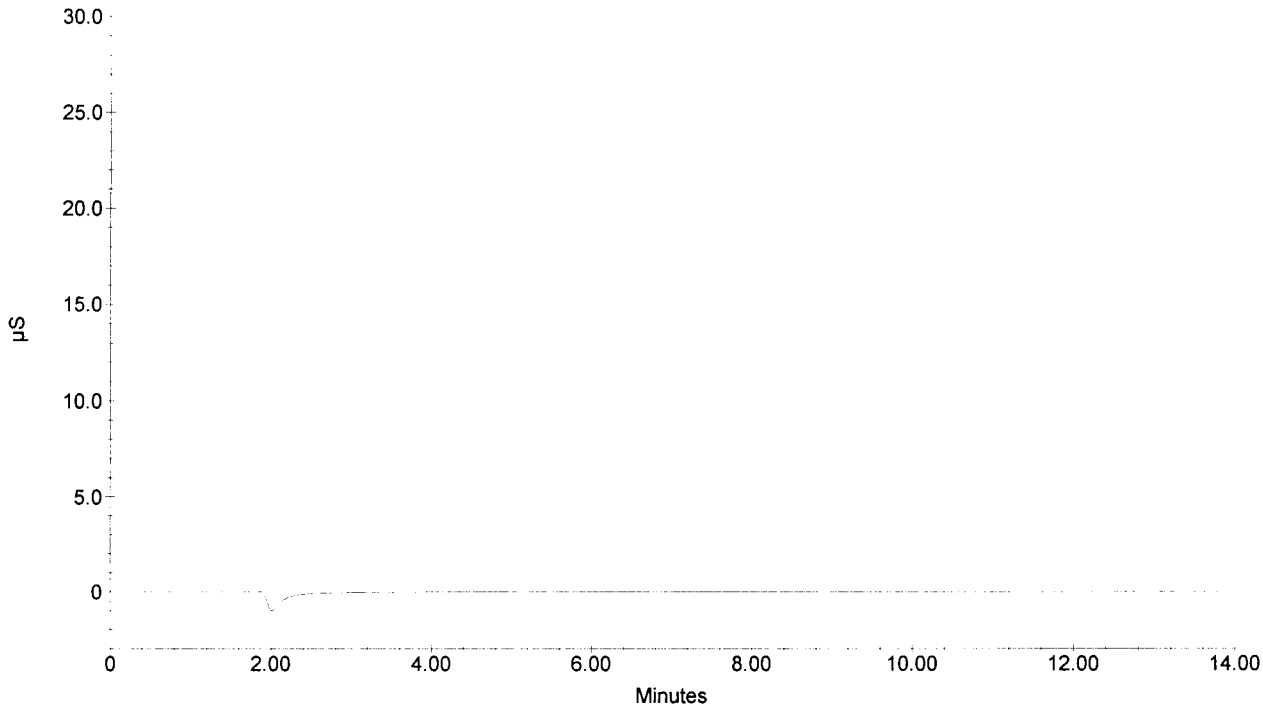
Date Time Collected : 10/24/05 8:19:59 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010192

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
0	0.00	(null)	0.000	0	0	0	0.00
		CHLORIDE					
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.000		0		

CCB



Schedule File: C:\PeakNet\schedule\051007.sch

Line	Sample	Sample Type	Level	Method	Data File	Dilution
1	0PPM 103-08-IC5	Calibration St	1	anions051007.met	051007_001.dxd	1
2	0.1PPM 103-07-IC5	Calibration St	2	anions051007.met	051007_002.dxd	1
3	0.5PPM 103-06-IC5	Calibration St	3	anions051007.met	051007_003.dxd	1
4	1PPM 103-05-IC5	Calibration St	4	anions051007.met	051007_004.dxd	1
5	5PPM 103-04-IC5	Calibration St	5	anions051007.met	051007_005.dxd	1
6	10PPM 103-03-IC5	Calibration St	6	anions051007.met	051007_006.dxd	1
7	15PPM 103-02-IC5	Calibration St	7	anions051007.met	051007_007.dxd	1
8	20PPM 103-01-IC5	Calibration St	8	anions051007.met	051007_008.dxd	1
9	ICV	Sample		anions051007.met	051007_009.dxd	20
10	ICB	Sample		anions051007.met	051007_010.dxd	1
11	MDL-1 0.1PPM	Sample		anions051007.met	051007_011.dxd	1
12	MDL-2 0.1PPM	Sample		anions051007.met	051007_012.dxd	1
13	MDL-3 0.1PPM	Sample		anions051007.met	051007_013.dxd	1
14	MDL-4 0.1PPM	Sample		anions051007.met	051007_014.dxd	1
15	MDL-5 0.1PPM	Sample		anions051007.met	051007_015.dxd	1
16	MDL-6 0.1PPM	Sample		anions051007.met	051007_016.dxd	1
17	MDL-7 0.1PPM	Sample		anions051007.met	051007_017.dxd	1
18	CCV	Sample		anions051007.met	051007_018.dxd	20
19	CCB	Sample		anions051007.met	051007_019.dxd	1
20	MDL-1 0.05PPM	Sample		anions051007.met	051007_020.dxd	1
21	MDL-2 0.05PPM	Sample		anions051007.met	051007_021.dxd	1
22	MDL-3 0.05PPM	Sample		anions051007.met	051007_022.dxd	1
23	MDL-4 0.05PPM	Sample		anions051007.met	051007_023.dxd	1
24	MDL-5 0.05PPM	Sample		anions051007.met	051007_024.dxd	1
25	MDL-6 0.05PPM	Sample		anions051007.met	051007_025.dxd	1
26	MDL-7 0.05PPM	Sample		anions051007.met	051007_026.dxd	1
27	CCV	Sample		anions051007.met	051007_027.dxd	20
28	CCV	Sample		anions051007.met	051007_028.dxd	20
29	CCB	Sample		anions051007.met	051007_029.dxd	1
30	CCB	Sample		astop.met	051007_009.dxd	1

010193

Default Method Path: C:\PEAKNET\METHOD
Default Data Path: C:\PEAKNET\DATA\051007
Comment:
EPA 300 & SW 846 9056

RSprib 10/13/05

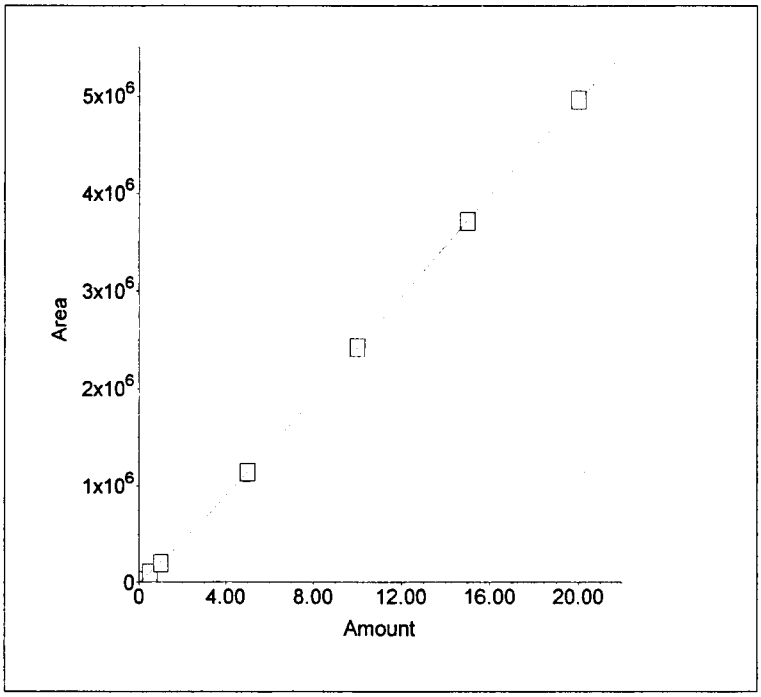
ICV Sources:
1) SPEX LOT#28-138AS (INORG#5271)
   F = 100 mg/L
   Cl = 200 mg/L
   Br = 400 mg/L
   NO3N = 90.4 mg/L
   PO4P = 191 mg/L
   SO4 = 400 mg/L
2) 104-01-IC5
   NO2N 91.3 mg/L

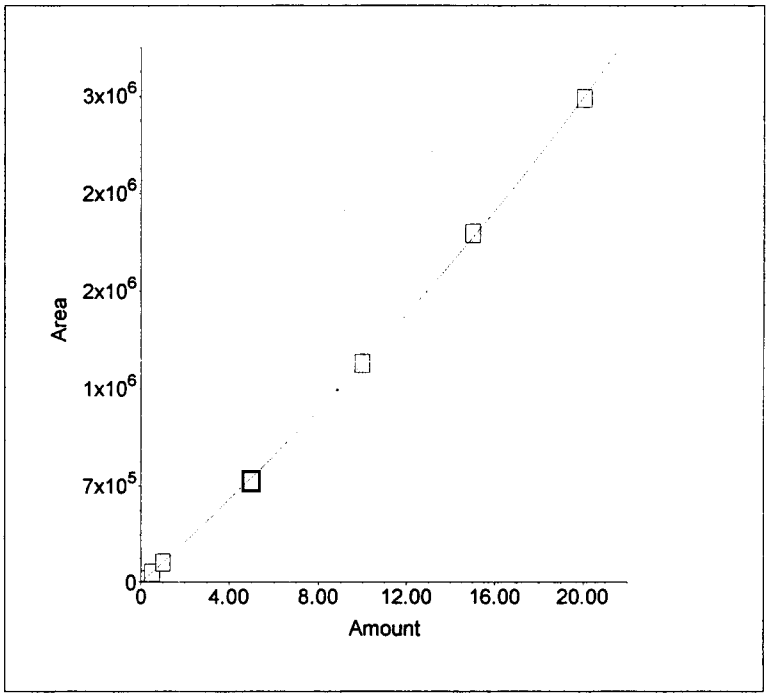
Method:C:\PEAKNET\METHOD\ANIONS051007.MET Updated:10/7/05 3:10:05 PM Total:7

1. Component:FLUORIDE
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999981
Amt=2.660458e-020*Resp³+
-2.430377e-013*Resp²+
4.296813e-006*Resp+0.04818

2. Component:CHLORIDE
Standard:External Fit Type:Quadratic
Origin:Include Calibration:Area
r^2=0.999888
Amt=-2.911221e-013*Resp²+
6.603164e-006*Resp+0.02442

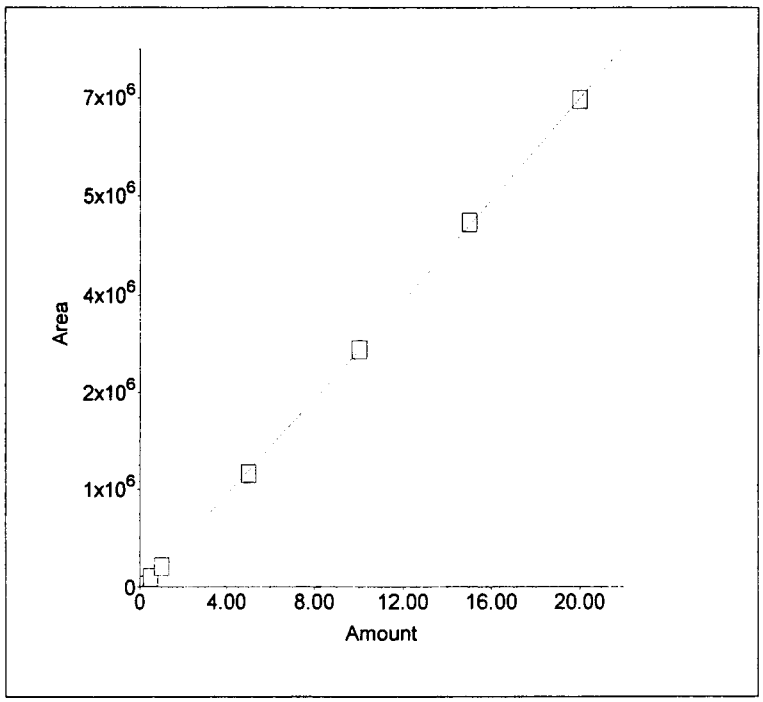
010194

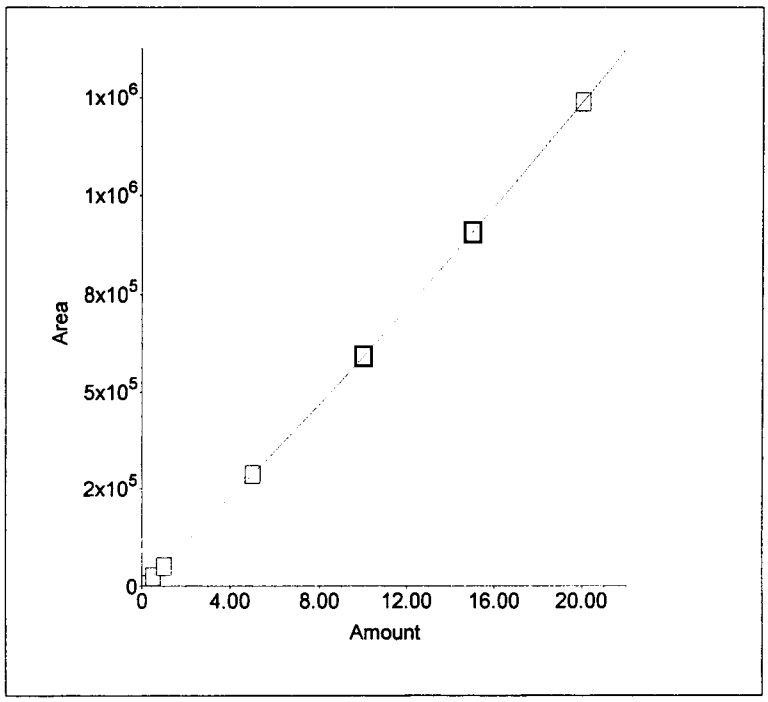




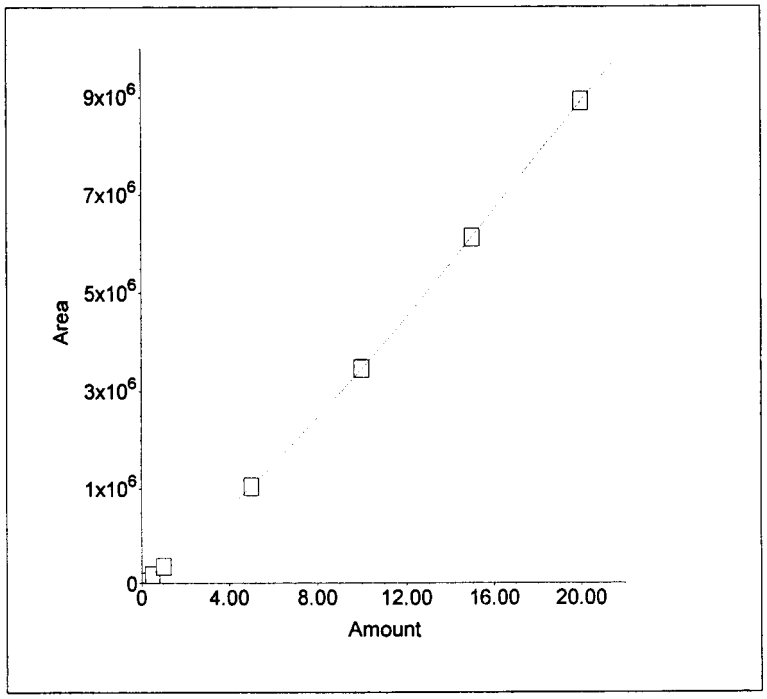
3. Component:NITRITE-N
Standard:External Fit Type:Quadratic
Origin:Include Calibration:Area
r^2=0.999891
Amt=-1.632427e-014*Resp²+
2.803915e-006*Resp+0.07364

4. Component:BROMIDE
Standard:External Fit Type:Quadratic
Origin:Include Calibration:Area
r^2=0.999978
Amt=-9.391646e-013*Resp²+
1.584624e-005*Resp+0.0508



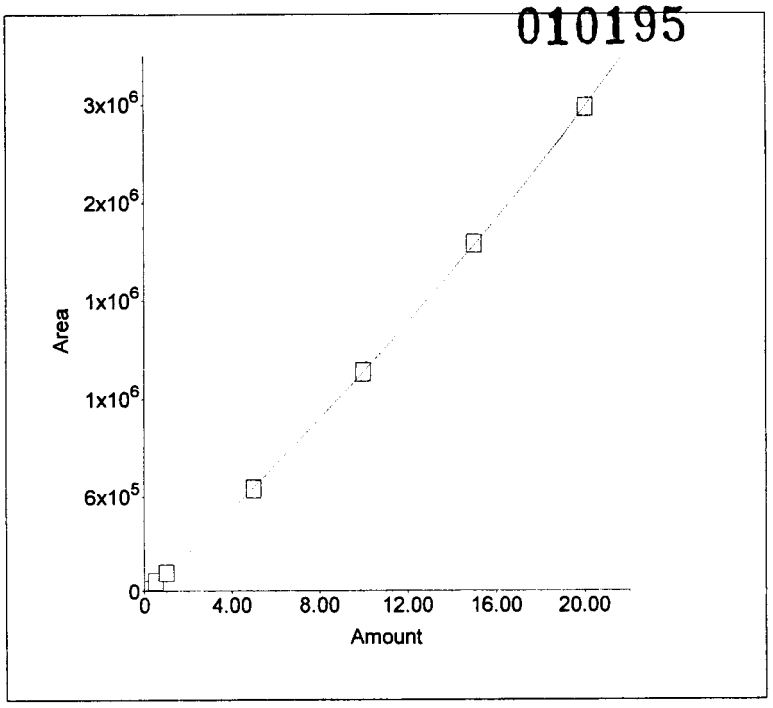


5. Component:NITRATE-N
Standard:External Fit Type:Cubic
Origin:Include Calibration:Area
r^2=0.999989
Amt=5.131172e-021*Resp³+
-1.153521e-013*Resp²+
2.732976e-006*Resp+0.03081

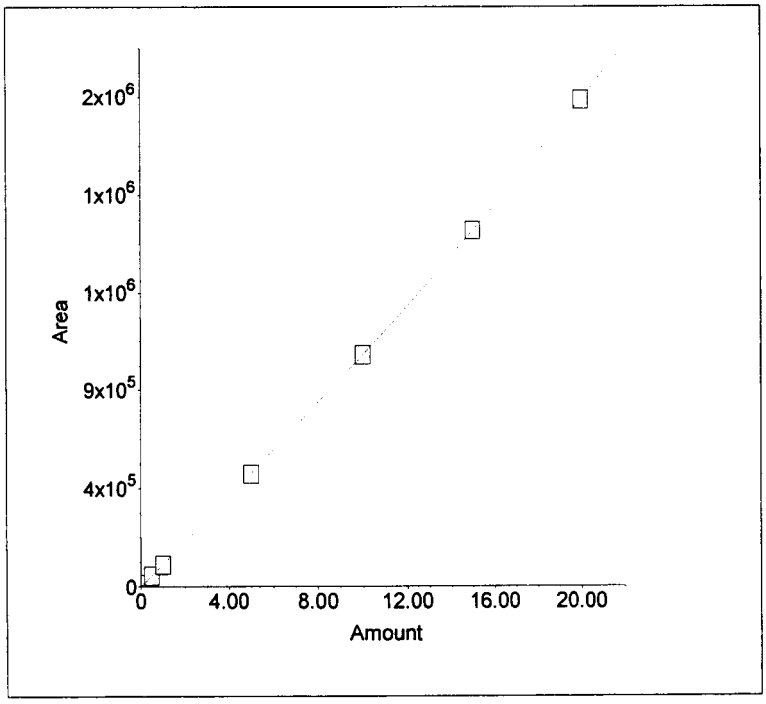


6. Component:PHOSPHATE-P
Standard:External Fit Type:Quadratic
Origin:Include Calibration:Area
r^2=0.999967
Amt=-3.660918e-013*Resp²+
7.692147e-006*Resp+0.03894

010195



7. Component:SULFATE
Standard:External Fit Type:Quadratic
Origin:Include Calibration:Area
r^2=0.999993
Amt=-3.865333e-013*Resp²+
9.635356e-006*Resp+0.009273



Sample Name : 0PPM 103-08-IC5
Dilution Factor : 1.00
Injection Number : 1
Data File Name : c:\peaknet\data\051007\051007_001.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

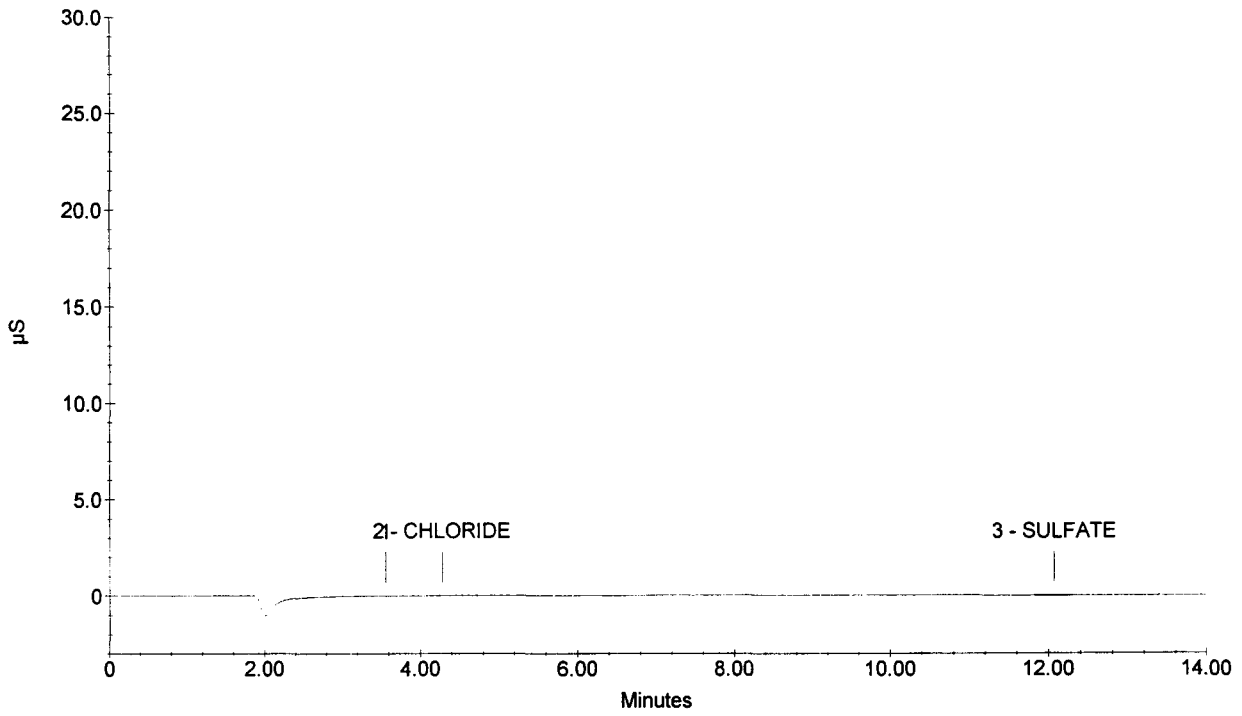
Date Time Collected : 10/7/05 12:10:32 PM
Date Time Updated : 10/7/05 12:27:05 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010196

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	3.56		0.00	1412	57
2	4.28	CHLORIDE NITRITE-N BROMIDE NITRATE-N PHOSPHATE-P	0.00	872	124
3	12.06	SULFATE	0.00	1977	107

0PPM 103-08-IC5



Sample Name : 0.1PPM 103-07-IC5
Dilution Factor : 1.00
Injection Number : 2
Data File Name : c:\peaknet\data\051007\051007_002.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

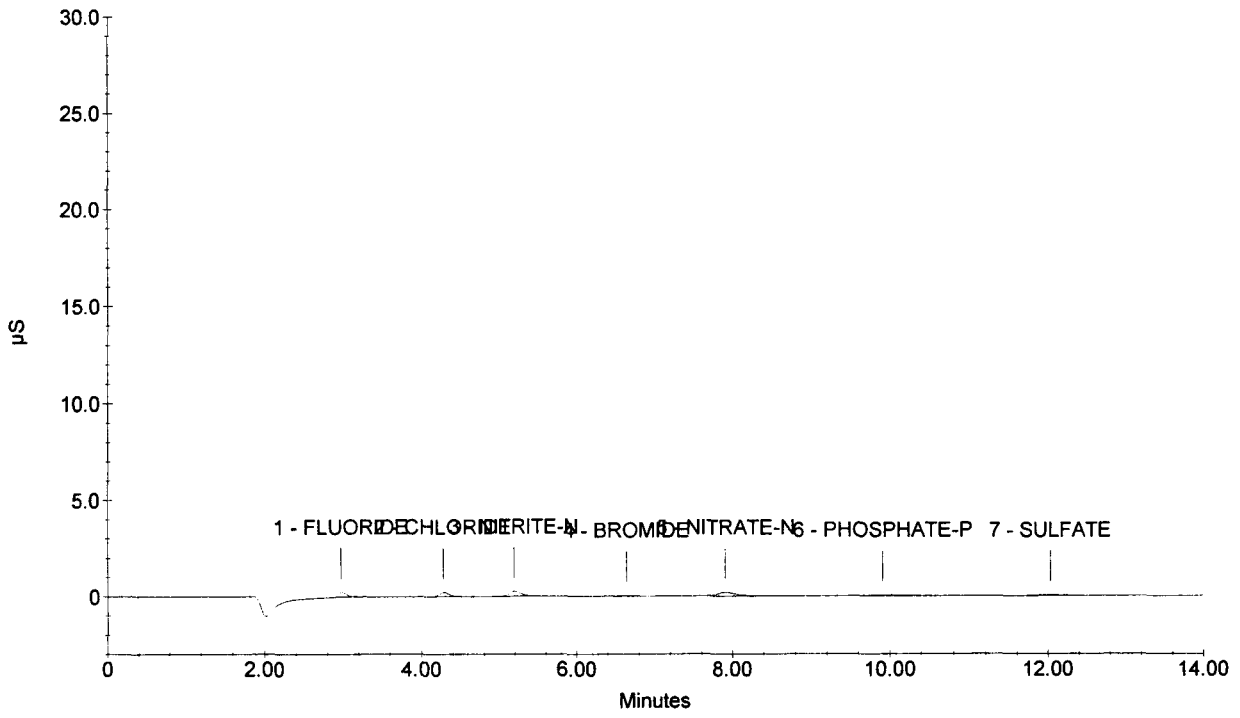
Date Time Collected : 10/7/05 12:27:12 PM
Date Time Updated : 10/7/05 12:43:46 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010197

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.97	FLUORIDE	0.10	16154	2426
2	4.28	CHLORIDE	0.10	19217	2239
3	5.18	NITRITE-N	0.10	27832	2541
4	6.64	BROMIDE	0.10	4666	391
5	7.90	NITRATE-N	0.10	30818	1907
6	9.90	PHOSPHATE-P	0.10	11516	531
7	12.02	SULFATE	0.10	10203	427

0.1PPM 103-07-IC5



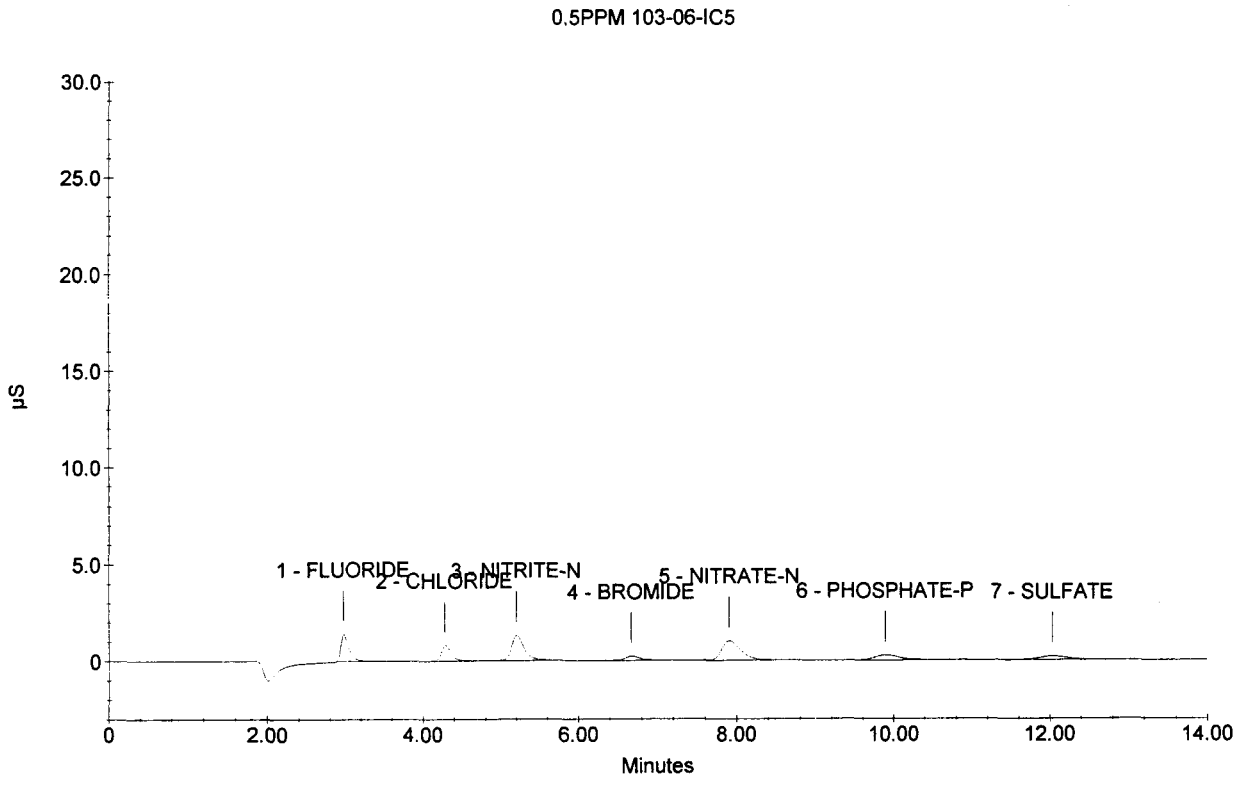
Sample Name : 0.5PPM 103-06-IC5
Dilution Factor : 1.00
Injection Number : 3
Data File Name : c:\peaknet\data\051007\051007_003.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

Date Time Collected : 10/7/05 12:43:54 PM
Date Time Updated : 10/7/05 1:00:25 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010198

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.97	FLUORIDE	0.50	100398	13741
2	4.28	CHLORIDE	0.50	69925	7848
3	5.20	NITRITE-N	0.50	149443	13046
4	6.66	BROMIDE	0.50	27909	2119
5	7.90	NITRATE-N	0.50	169126	10047
6	9.89	PHOSPHATE-P	0.50	60690	2628
7	12.02	SULFATE	0.50	50140	2004



Sample Name : 1PPM 103-05-IC5
Dilution Factor : 1.00
Injection Number : 4
Data File Name : c:\peaknet\data\051007\051007_004.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

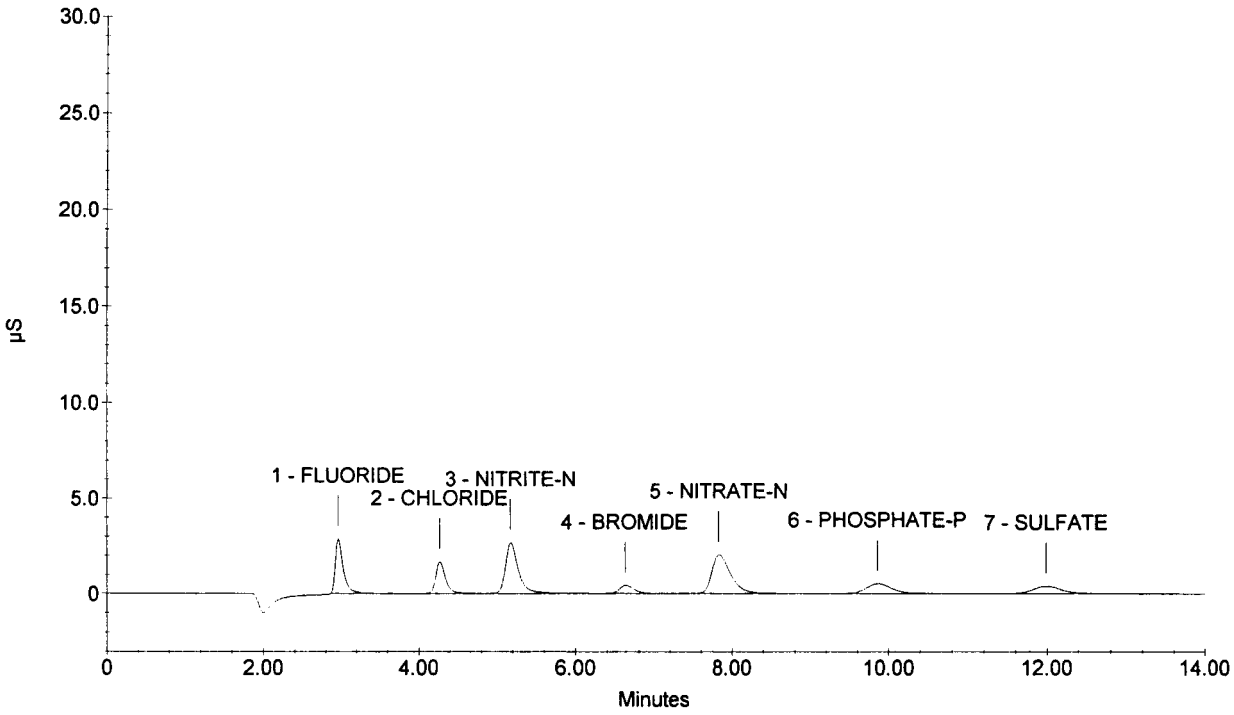
Date Time Collected : 10/7/05 1:00:34 PM
Date Time Updated : 10/7/05 1:17:05 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010199

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.96	FLUORIDE	1.00	212310	28707
2	4.26	CHLORIDE	1.00	148322	16749
3	5.17	NITRITE-N	1.00	310912	26762
4	6.62	BROMIDE	1.00	55688	4279
5	7.82	NITRATE-N	1.00	346023	20451
6	9.85	PHOSPHATE-P	1.00	121288	5283
7	11.98	SULFATE	1.00	100660	3981

1PPM 103-05-IC5



Sample Name : 5PPM 103-04-IC5
Dilution Factor : 1.00
Injection Number : 5
Data File Name : c:\peaknet\data\051007\051007_005.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

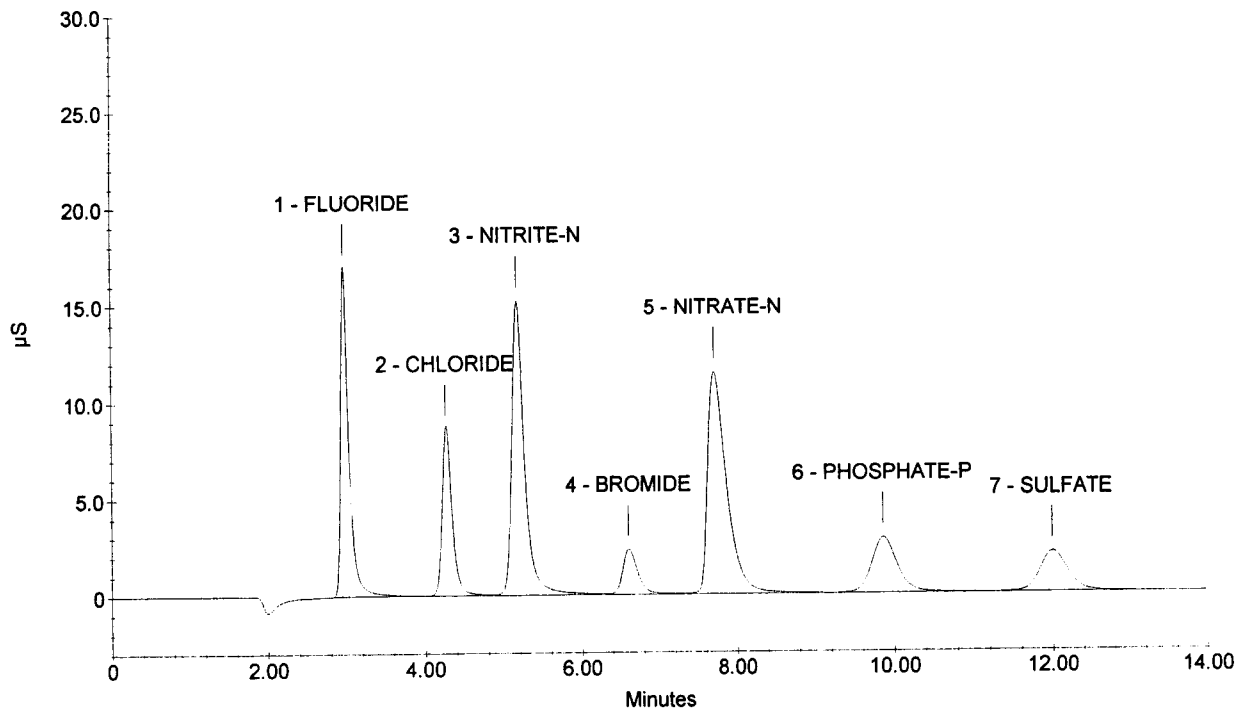
Date Time Collected : 10/7/05 1:17:14 PM
Date Time Updated : 10/7/05 1:33:46 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010200

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.97	FLUORIDE	5.00	1223708	169015
2	4.26	CHLORIDE	5.00	755014	86241
3	5.17	NITRITE-N	5.00	1726782	151797
4	6.60	BROMIDE	5.00	317135	23337
5	7.70	NITRATE-N	5.00	1960511	114764
6	9.85	PHOSPHATE-P	5.00	655761	28717
7	11.98	SULFATE	5.00	525913	20892

5PPM 103-04-IC5



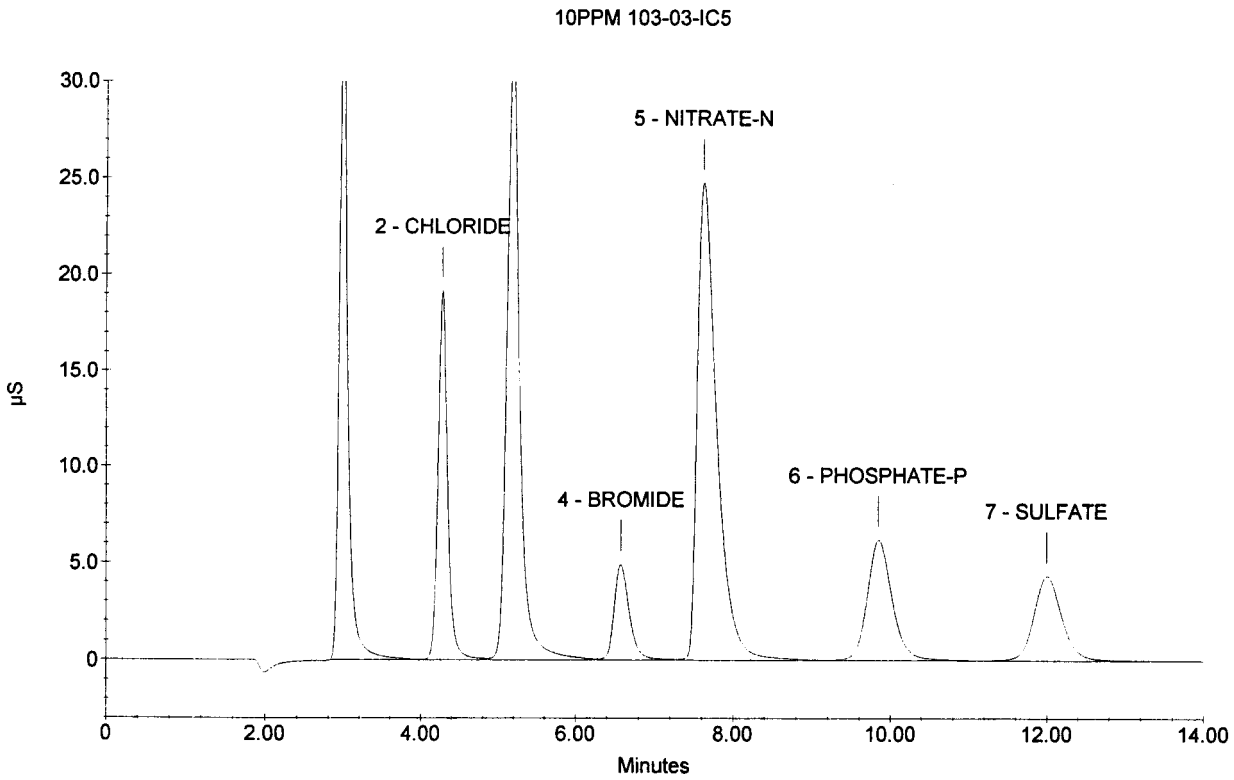
Sample Name : 10PPM 103-03-IC5
Dilution Factor : 1.00
Injection Number : 6
Data File Name : c:\peaknet\data\051007\051007_006.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

Date Time Collected : 10/7/05 1:33:54 PM
Date Time Updated : 10/7/05 1:50:27 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010201

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.98	FLUORIDE	10.00	2598135	352369
2	4.28	CHLORIDE	10.00	1626590	191326
3	5.17	NITRITE-N	10.00	3623952	315278
4	6.57	BROMIDE	10.00	654930	49127
5	7.61	NITRATE-N	10.00	4288672	247448
6	9.84	PHOSPHATE-P	10.00	1386954	61932
7	11.98	SULFATE	10.00	1084847	43358



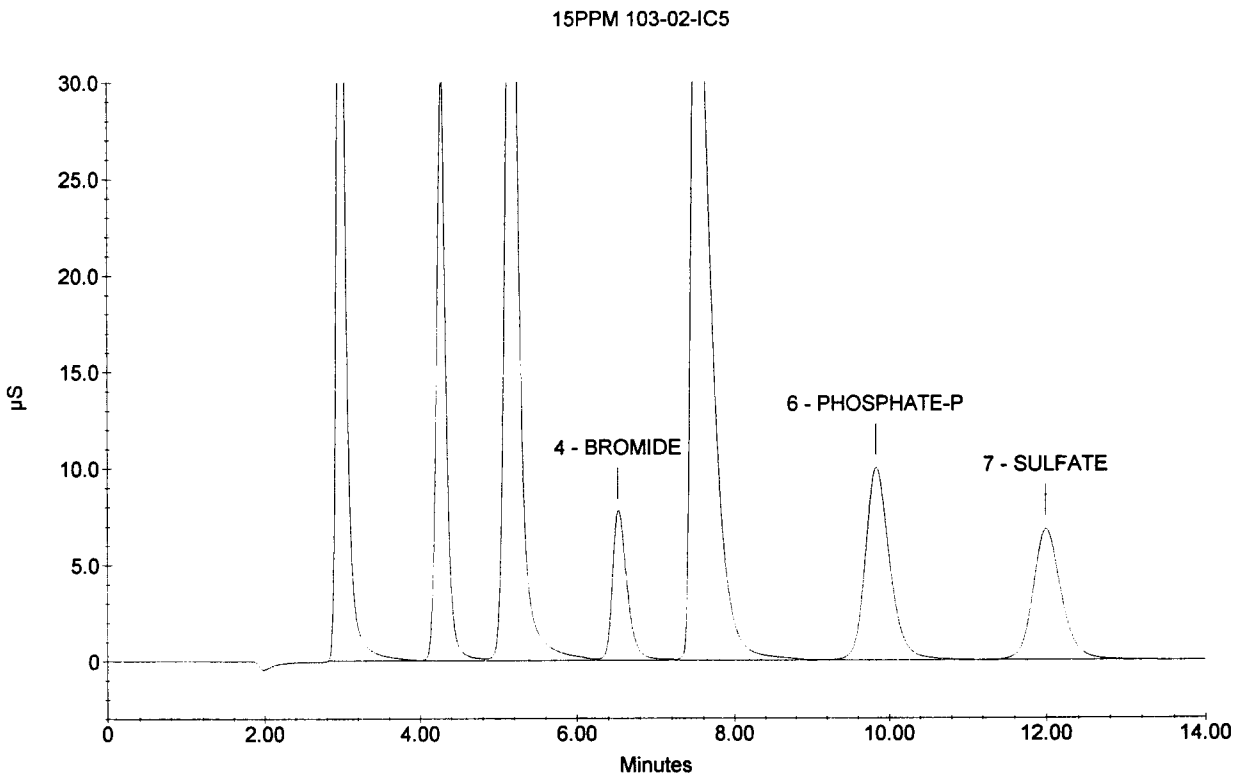
Sample Name : 15PPM 103-02-IC5
Dilution Factor : 1.00
Injection Number : 7
Data File Name : c:\peaknet\data\051007\051007_007.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

Date Time Collected : 10/7/05 1:50:35 PM
Date Time Updated : 10/7/05 2:07:06 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010202

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	2.98	FLUORIDE	15.00	3978170	515951
2	4.28	CHLORIDE	15.00	2582617	304054
3	5.17	NITRITE-N	15.00	5541847	476117
4	6.52	BROMIDE	15.00	1002841	76833
5	7.52	NITRATE-N	15.00	6844112	388528
6	9.82	PHOSPHATE-P	15.00	2179313	99587
7	11.98	SULFATE	15.00	1670214	67994



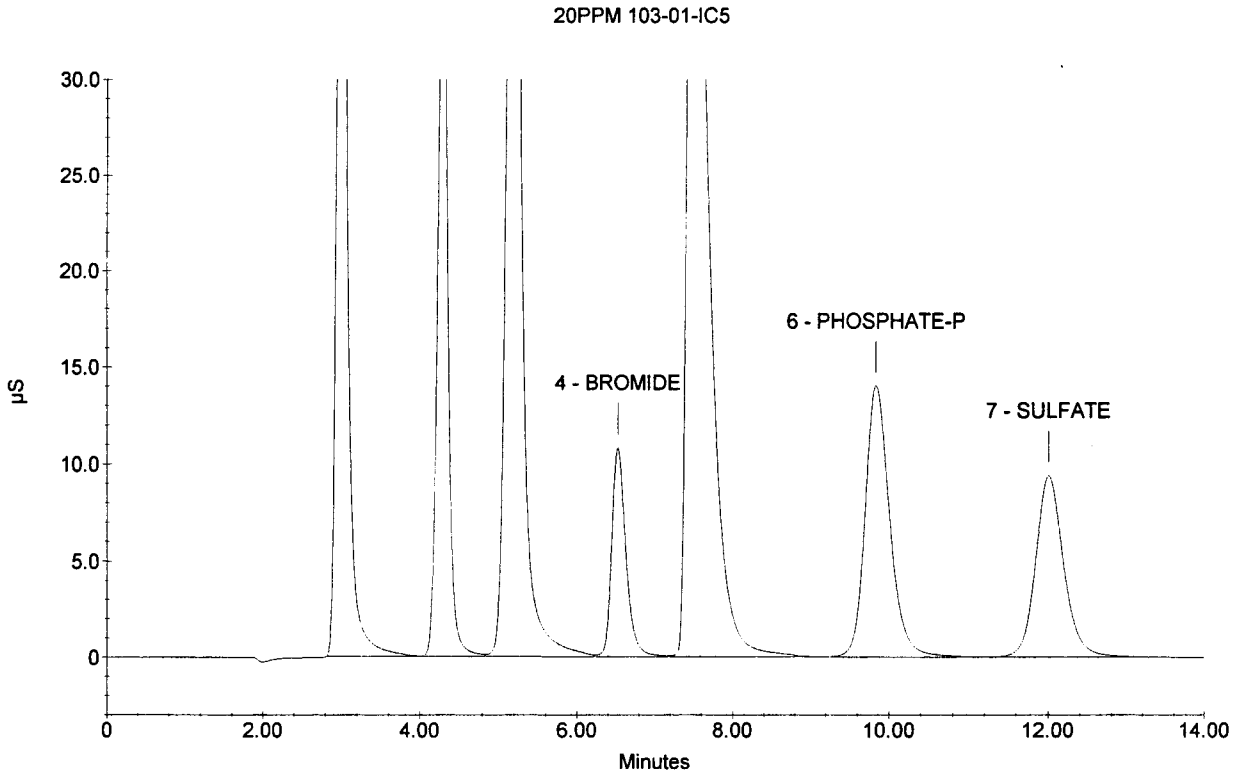
Sample Name : 20PPM 103-01-IC5
Dilution Factor : 1.00
Injection Number : 8
Data File Name : c:\peaknet\data\051007\051007_008.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

Date Time Collected : 10/7/05 2:07:14 PM
Date Time Updated : 10/7/05 2:23:46 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010203

Peak Information : All Components

Peak Number	Peak Retention Time	Component Name	Concentration, ppm (ppm)	Peak Area	Peak Height
1	3.00	FLUORIDE	20.00	5313358	655019
2	4.29	CHLORIDE	20.00	3581022	412718
3	5.18	NITRITE-N	20.00	7404480	612366
4	6.52	BROMIDE	20.00	1369927	107828
5	7.48	NITRATE-N	20.00	9511659	532581
6	9.82	PHOSPHATE-P	20.00	3027200	139875
7	12.00	SULFATE	20.00	2282361	93718



Sample Name : ICV
Dilution Factor : 20.00
Injection Number : 9
Data File Name : c:\peaknet\data\051007\051007_009.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

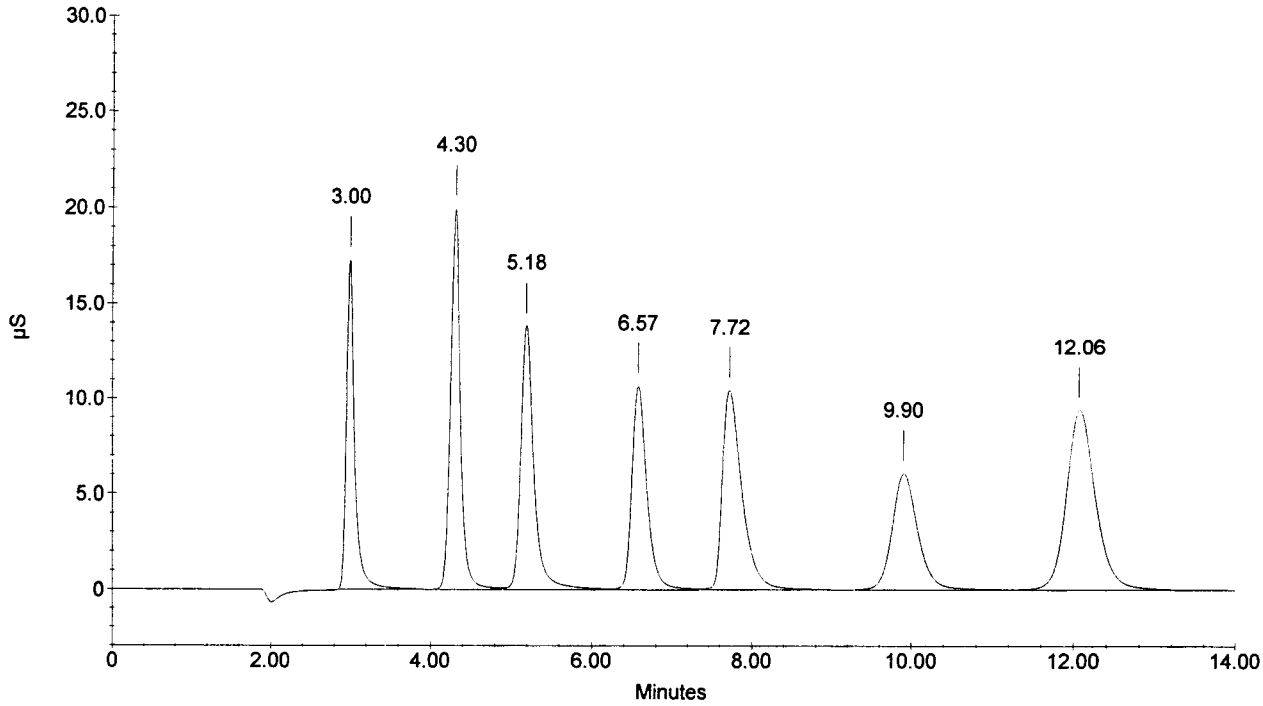
Date Time Collected : 10/7/05 4:31:47 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010204

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	3.00	FLUORIDE	102.168	172332	1254449	1	-0.11
2	4.30	CHLORIDE	206.749	199212	1687363	2	0.31
3	5.18	NITRITE-N	89.852	137890	1590730	2	0.06
4	6.57	BROMIDE	406.491	106461	1394690	2	0.77
5	7.72	NITRATE-N	90.765	104197	1771263	2	3.16
6	9.90	PHOSPHATE-P	195.705	60617	1354342	2	0.85
7	12.06	SULFATE	406.401	93874	2324749	2	0.53
			---total(s)---				
	0.00		1498.131		11377585		

ICV



Sample Name : ICB
Dilution Factor : 1.00
Injection Number : 10
Data File Name : c:\peaknet\data\051007\051007_010.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

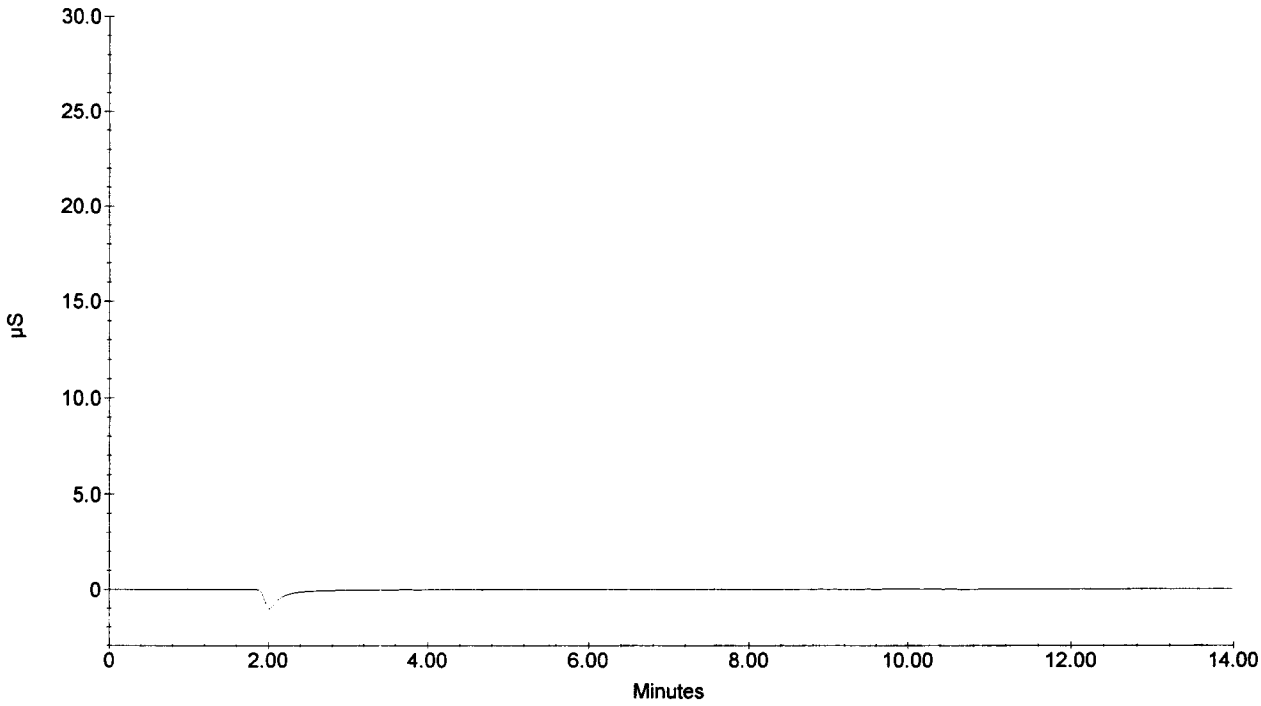
Date Time Collected : 10/7/05 4:48:38 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010205

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
0	0.00	(null)	0.000	0	0	0	0.00
		CHLORIDE					
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.000		0		

ICB



Sample Name : MDL-1 0.1PPM
Dilution Factor : 1.00
Injection Number : 11
Data File Name : ...\051007_011.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

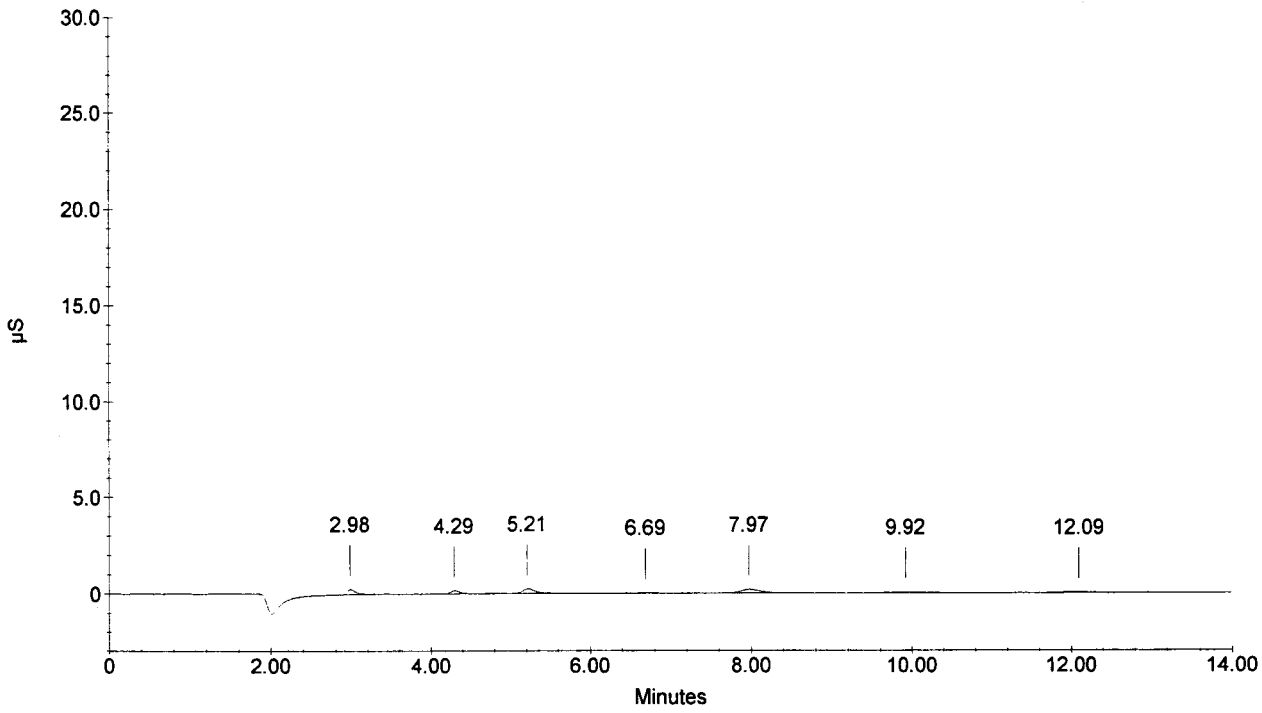
Date Time Collected : 10/7/05 5:05:16 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010206

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.98	FLUORIDE	0.133	2718	19719	1	-0.56
2	4.29	CHLORIDE	0.123	1599	14865	1	0.00
3	5.21	NITRITE-N	0.152	2477	28043	1	0.58
4	6.69	BROMIDE	0.130	412	4993	1	2.61
5	7.97	NITRATE-N	0.123	1957	33721	1	6.55
6	9.92	PHOSPHATE-P	0.133	538	12245	1	0.98
7	12.09	SULFATE	0.107	416	10098	1	0.75
			---total(s)---				
	0.00		0.900		123684		

MDL-1 0.1PPM



Sample Name : MDL-2 0.1PPM
Dilution Factor : 1.00
Injection Number : 12
Data File Name : c:\peaknet\data\051007\051007_012.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

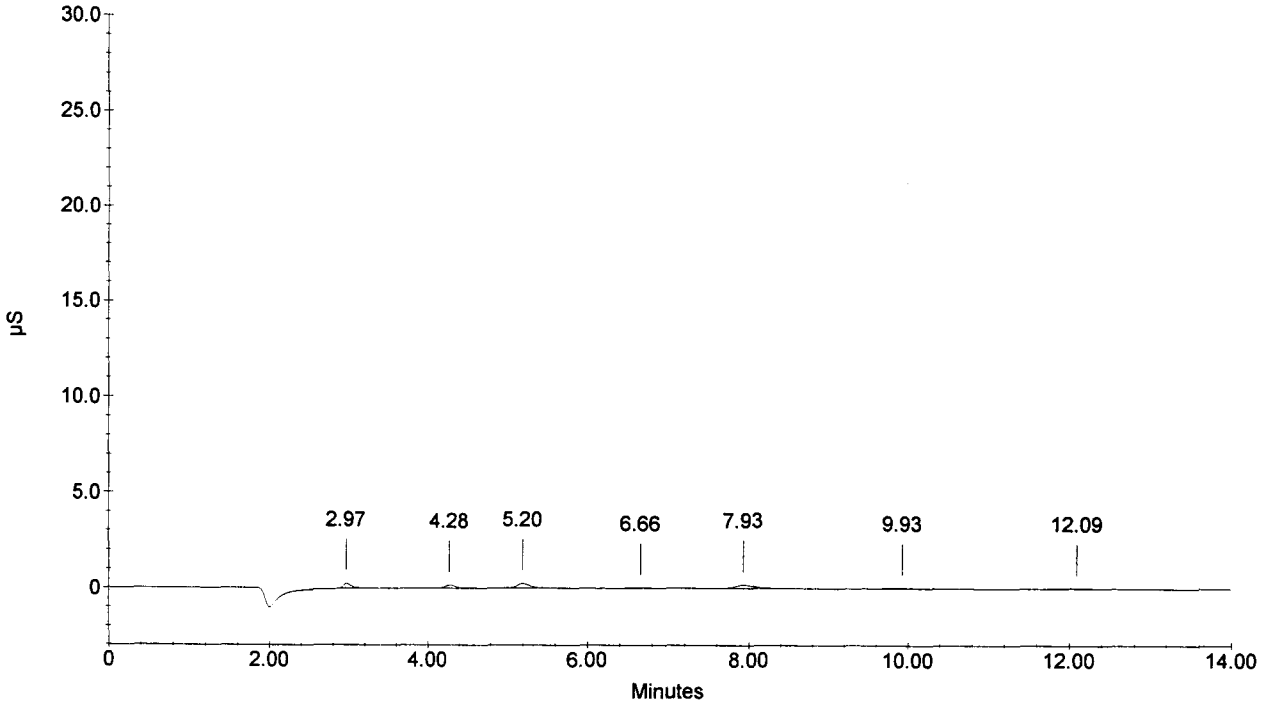
Date Time Collected : 10/7/05 5:21:58 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010207

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.120	2521	16715	1	-1.00
2	4.28	CHLORIDE	0.134	1686	16536	1	-0.31
3	5.20	NITRITE-N	0.156	2559	29279	1	0.32
4	6.66	BROMIDE	0.137	415	5446	1	2.20
5	7.93	NITRATE-N	0.120	1952	32740	1	6.02
6	9.93	PHOSPHATE-P	0.136	549	12674	1	1.12
7	12.09	SULFATE	0.095	403	8911	1	0.75
			---total(s)---				
	0.00		0.898		122301		

MDL-2 0.1PPM



Sample Name : MDL-3 0.1PPM
Dilution Factor : 1.00
Injection Number : 13
Data File Name : c:\peaknet\data\051007\051007_013.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

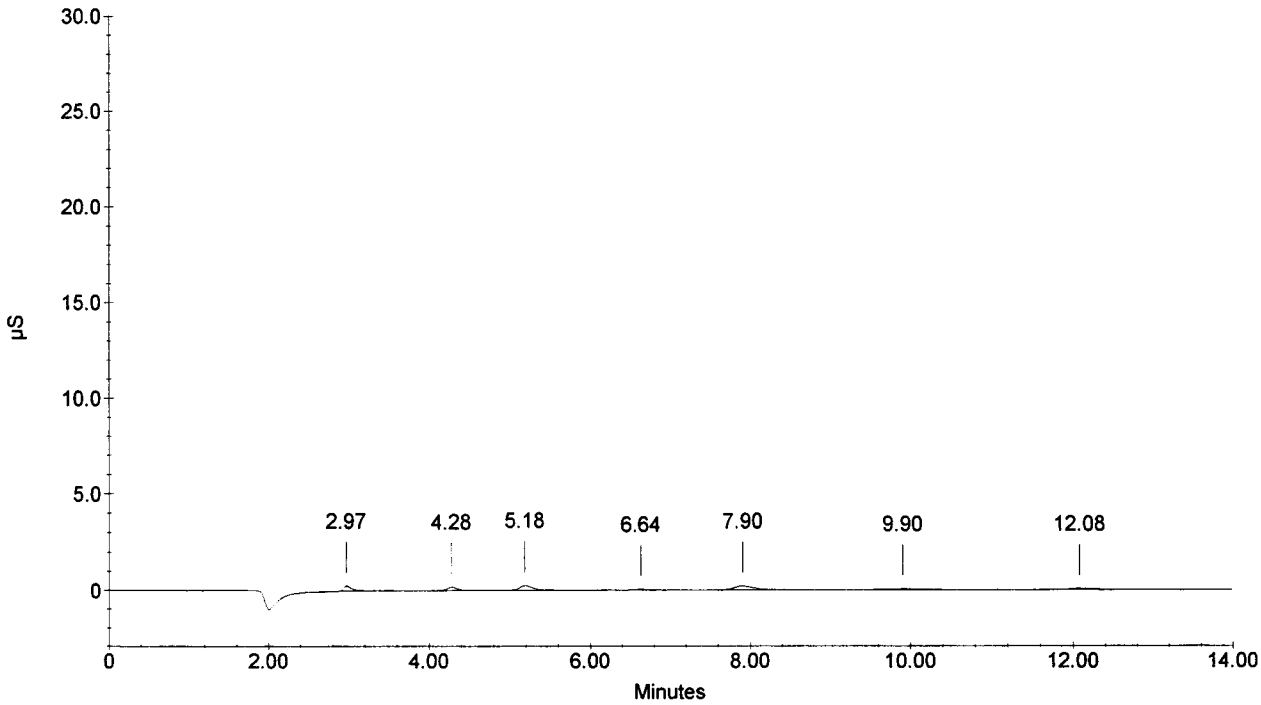
Date Time Collected : 10/7/05 5:38:39 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010208

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.117 ✓	2438	15997	1	-1.00
2	4.28	CHLORIDE	0.136 ✓	1811	16950	1	-0.31
3	5.18	NITRITE-N	0.154	2533	28792	1	0.06
4	6.64	BROMIDE	0.130 ✓	397	4975	1	1.79
5	7.90	NITRATE-N	0.124	2070	34276	1	5.66
6	9.90	PHOSPHATE-P	0.136 ✓	548	12582	1	0.85
7	12.08	SULFATE	0.148 ✓	623	14407	1	0.64
			---total(s)---				
	0.00		0.945		127980		

MDL-3 0.1PPM



Sample Name : MDL-4 0.1PPM
Dilution Factor : 1.00
Injection Number : 14
Data File Name : c:\peaknet\data\051007\051007_014.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

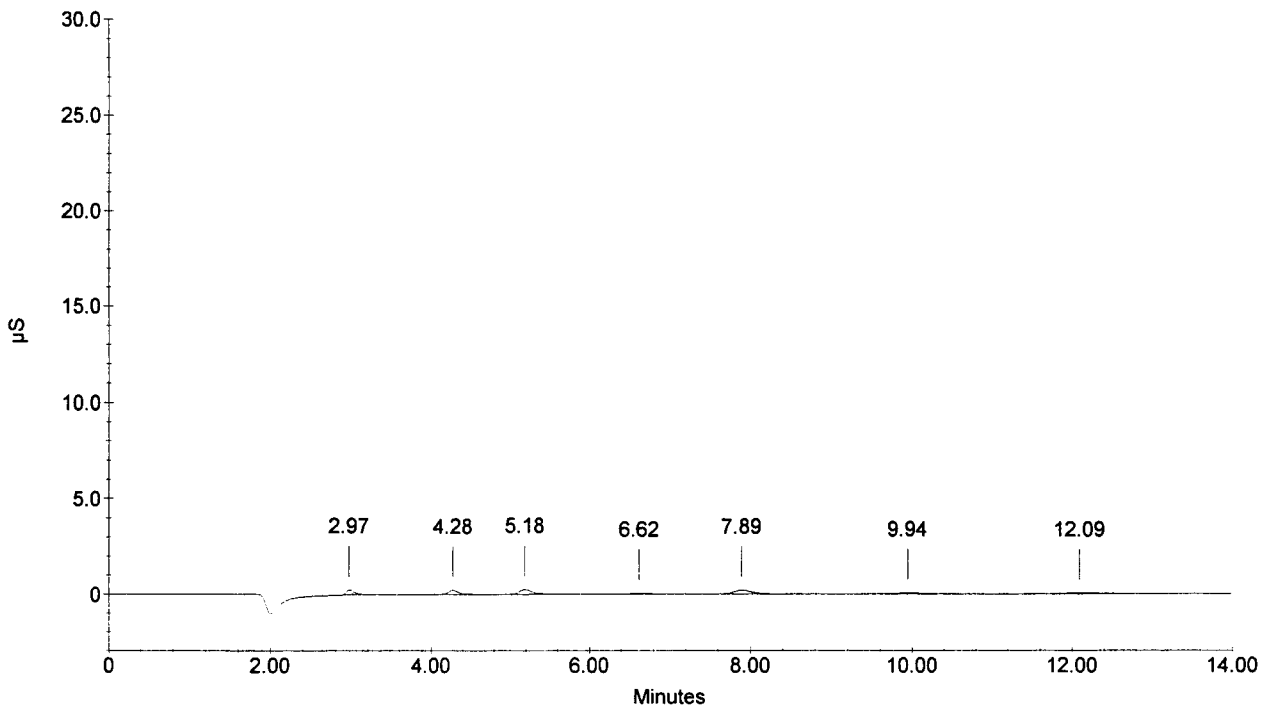
Date Time Collected : 10/7/05 5:55:19 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010209

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.117	2443	16049	1	-1.00
2	4.28	CHLORIDE	0.161	2224	20654	1	-0.31
3	5.18	NITRITE-N	0.153	2546	28278	1	0.06
4	6.62	BROMIDE	0.136	419	5359	1	1.58
5	7.89	NITRATE-N	0.121	1973	32963	1	5.48
6	9.94	PHOSPHATE-P	0.124	521	11070	1	1.26
7	12.09	SULFATE	0.108	433	10226	1	0.75
			---total(s)---				
	0.00		0.919		124599		

MDL-4 0.1PPM



Sample Name : MDL-5 0.1PPM
Dilution Factor : 1.00
Injection Number : 15
Data File Name : ...\051007_015.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

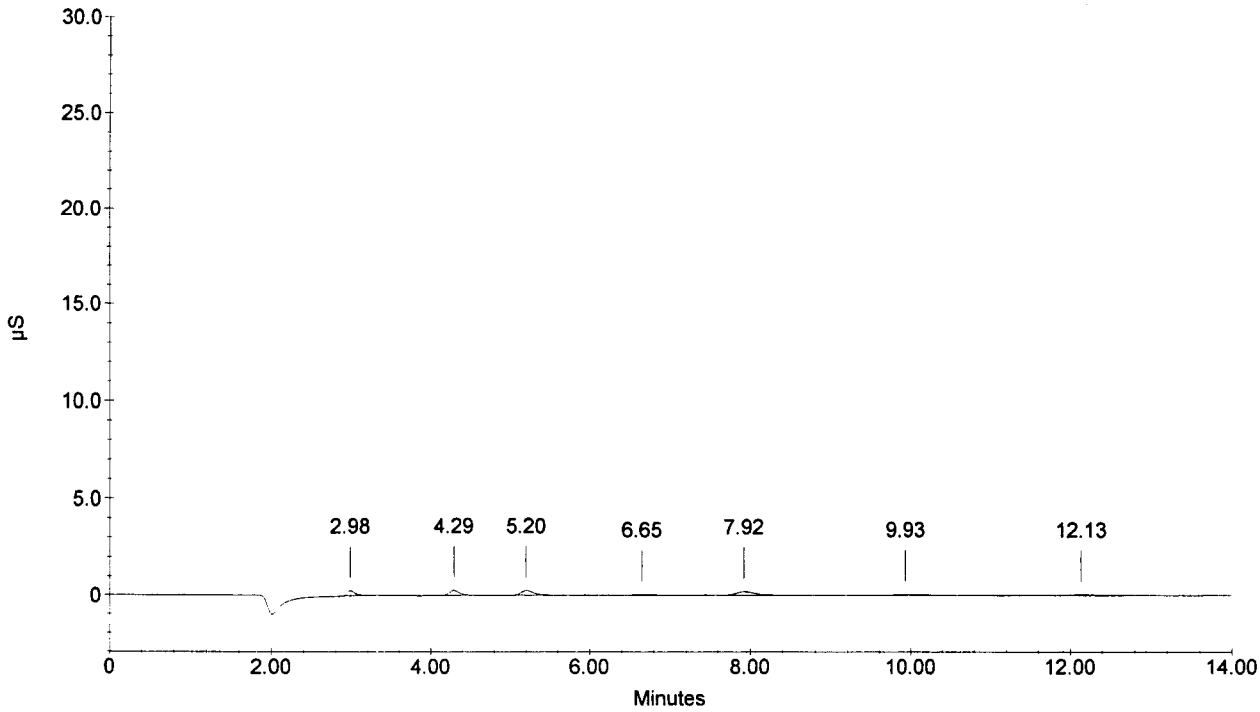
Date Time Collected : 10/7/05 6:12:02 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010210

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.98	FLUORIDE	0.120	2573	16818	1	-0.56
2	4.29	CHLORIDE	0.172	2576	22307	1	0.00
3	5.20	NITRITE-N	0.150	2499	27190	1	0.32
4	6.65	BROMIDE	0.150	438	6273	1	1.99
5	7.92	NITRATE-N	0.125	1965	34450	1	5.84
6	9.93	PHOSPHATE-P	0.142	578	13443	1	1.12
7	12.13	SULFATE	0.124	483	11927	1	1.08
	0.00		---total(s)--- 0.983		132408		

MDL-5 0.1PPM



Sample Name : MDL-6 0.1PPM
Dilution Factor : 1.00
Injection Number : 16
Data File Name : c:\peaknet\data\051007\051007_016.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

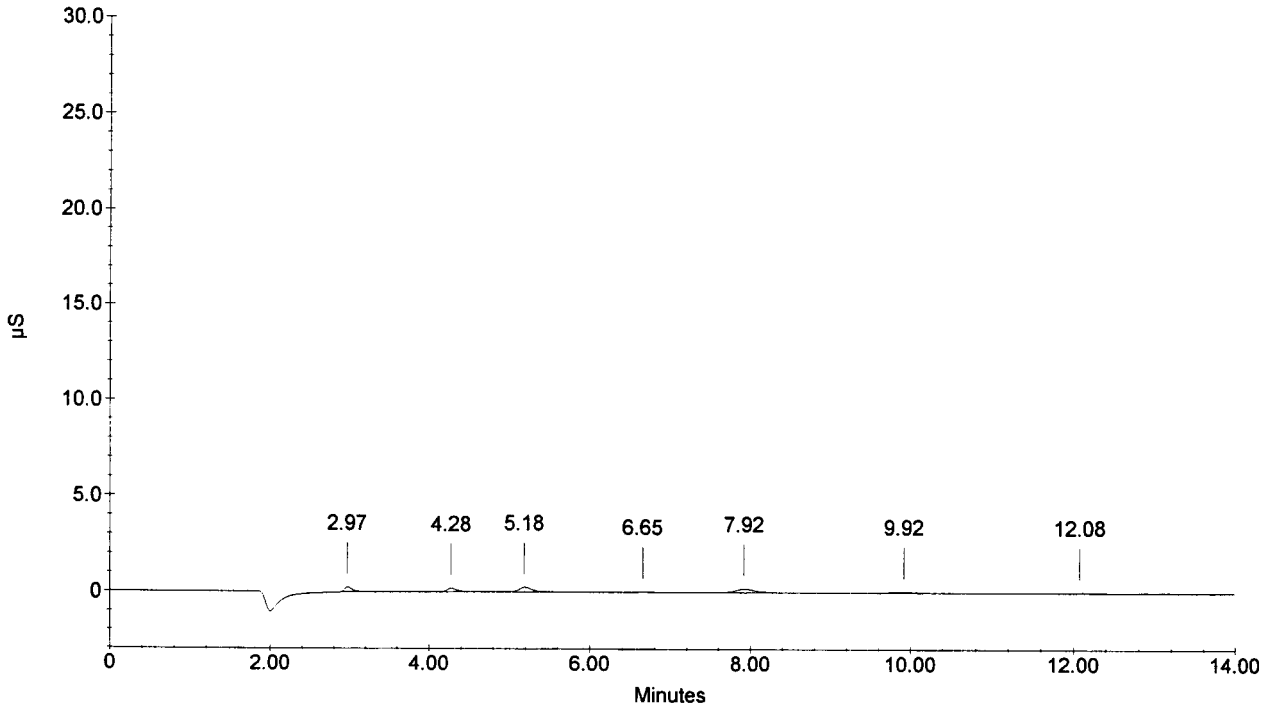
Date Time Collected : 10/7/05 6:28:45 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010211

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.118	2497	16321	1	-1.00
2	4.28	CHLORIDE	0.140	1854	17478	1	-0.31
3	5.18	NITRITE-N	0.155	2508	28936	1	0.06
4	6.65	BROMIDE	0.125	378	4713	1	1.99
5	7.92	NITRATE-N	0.119	1952	32180	1	5.84
6	9.92	PHOSPHATE-P	0.120	516	10530	1	0.98
7	12.08	SULFATE	0.109	417	10362	1	0.64
			---total(s)---				
	0.00		0.886		120519		

MDL-6 0.1PPM



Sample Name : MDL-7 0.1PPM
Dilution Factor : 1.00
Injection Number : 17
Data File Name : ...\051007_017.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

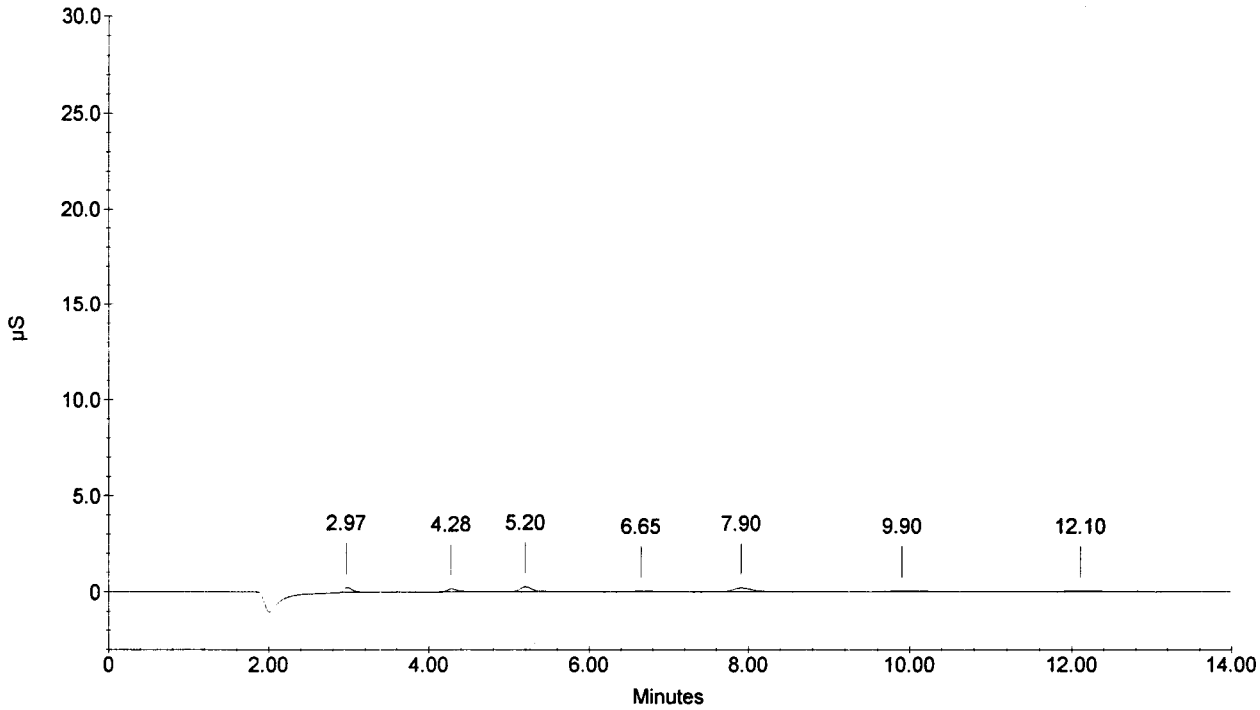
Date Time Collected : 10/7/05 6:45:25 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010212

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.120	2452	16747	1	-1.00
2	4.28	CHLORIDE	0.113	1594	13499	1	-0.31
3	5.20	NITRITE-N	0.156	2553	29263	1	0.32
4	6.65	BROMIDE	0.131	406	5052	1	1.99
5	7.90	NITRATE-N	0.121	1992	33203	1	5.66
6	9.90	PHOSPHATE-P	0.130	525	11834	1	0.85
7	12.10	SULFATE	0.098	412	9204	1	0.86
			---total(s)---				
	0.00		0.869		118802		

MDL-7 0.1PPM



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 18
Data File Name : c:\peaknet\data\051007\051007_018.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

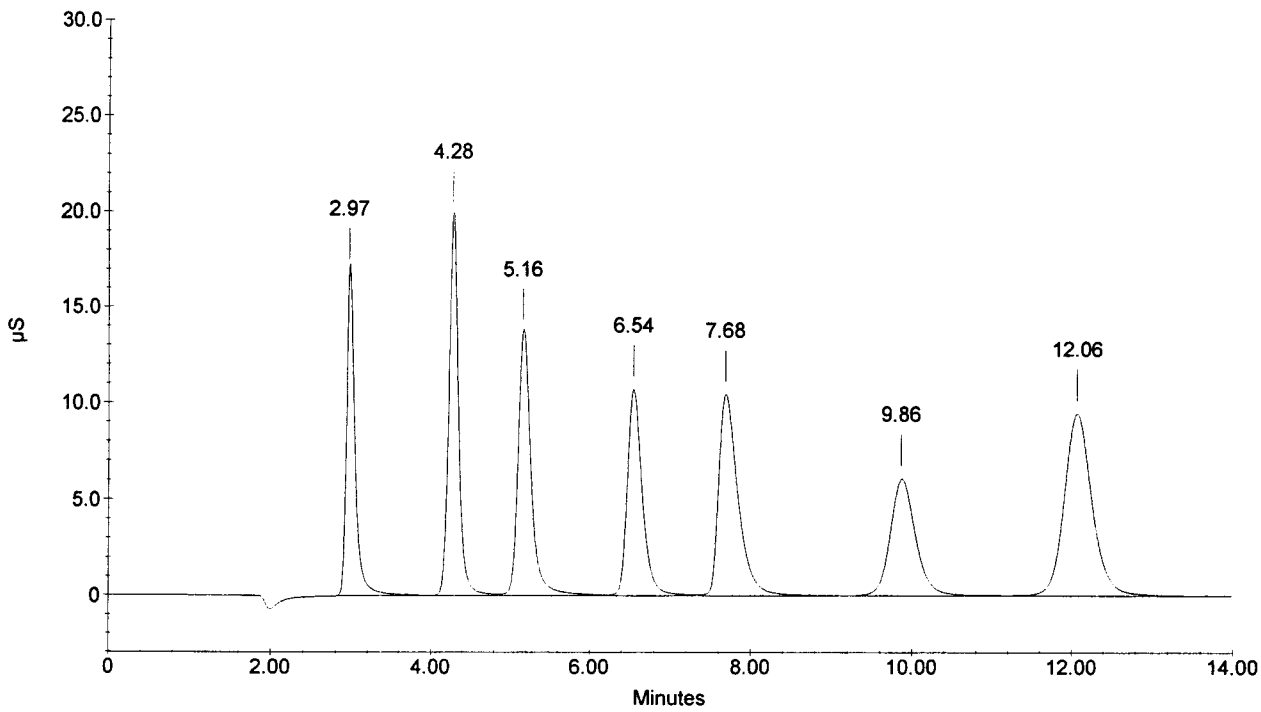
Date Time Collected : 10/7/05 7:02:06 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010213

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	102.383	168215	1257275	1	-1.00
2	4.28	CHLORIDE	206.999	197820	1689583	2	-0.31
3	5.16	NITRITE-N	89.411	136481	1582714	2	-0.45
4	6.54	BROMIDE	406.777	106958	1395771	2	0.36
5	7.68	NITRATE-N	90.697	104299	1769827	2	2.63
6	9.86	PHOSPHATE-P	195.633	60721	1353807	2	0.44
7	12.06	SULFATE	406.398	94350	2324730	2	0.53
			---total(s)---				
	0.00		1498.298		11373707		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 19
Data File Name : c:\peaknet\data\051007\051007_019.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

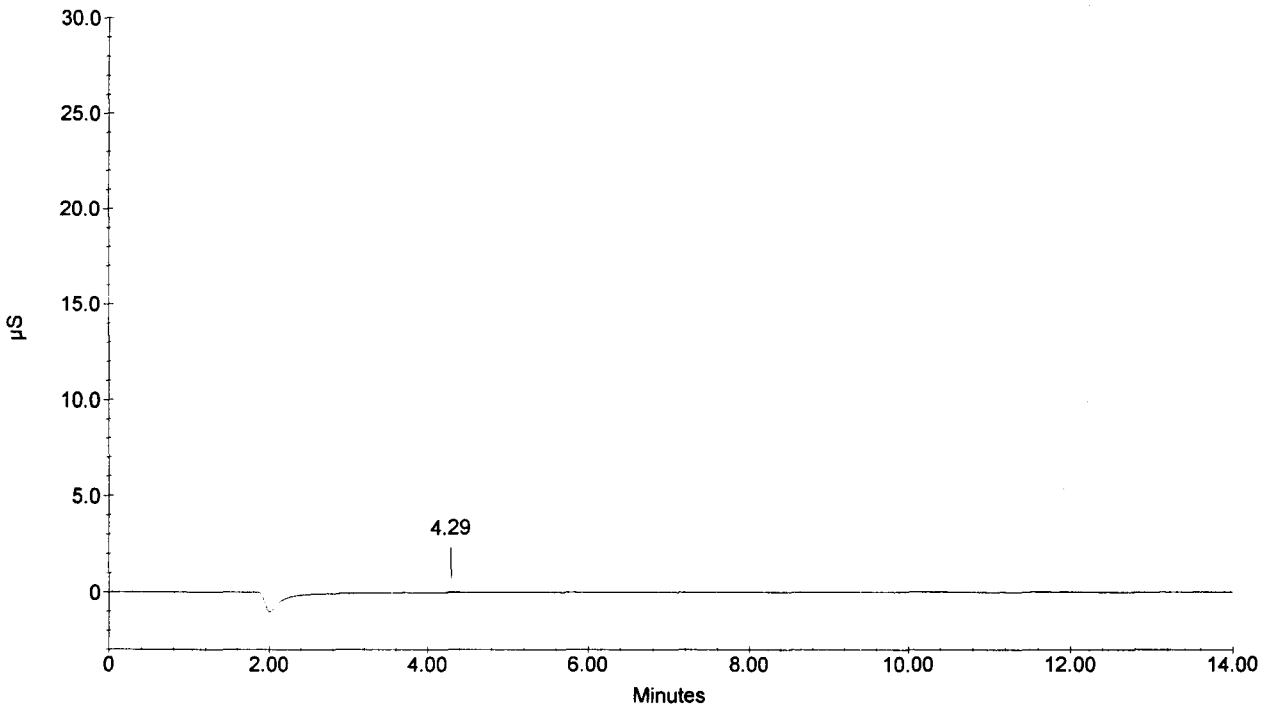
Date Time Collected : 10/7/05 7:18:49 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010214

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.29	CHLORIDE	0.032	154	1082	1	0.00
1	4.29	CHLORIDE	0.032	154	1082	1	0.00
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
		SULFATE					
			---total(s)---				
	0.00		0.063		2163		

CCB



Sample Name : MDL-1 0.05PPM
Dilution Factor : 1.00
Injection Number : 20
Data File Name : ...\051007_020.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

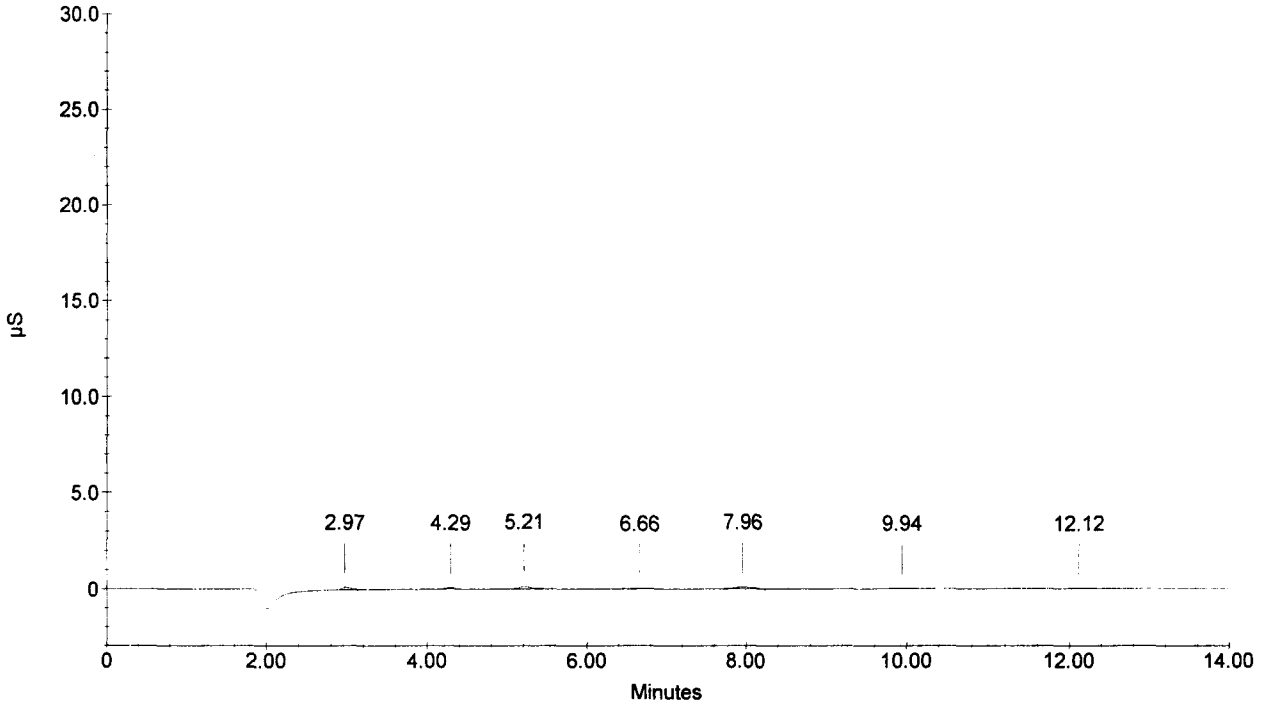
Date Time Collected : 10/7/05 7:35:29 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010215

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.084	1221	8439	1	-1.00
2	4.29	CHLORIDE	0.070	832	6883	1	0.00
3	5.21	NITRITE-N	0.111 ✓	1250	13172	1	0.58
4	6.66	BROMIDE	0.087	195	2294	1	2.20
5	7.96	NITRATE-N	0.077 ✓	956	16929	1	6.37
6	9.94	PHOSPHATE-P	0.084	282	5804	1	1.26
7	12.12	SULFATE	0.050	188	4262	1	0.97
			---total(s)---				
	0.00		0.563		57783		

MDL-1 0.05PPM



Sample Name : MDL-2 0.05PPM
Dilution Factor : 1.00
Injection Number : 21
Data File Name : c:\peaknet\data\051007\051007_021.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

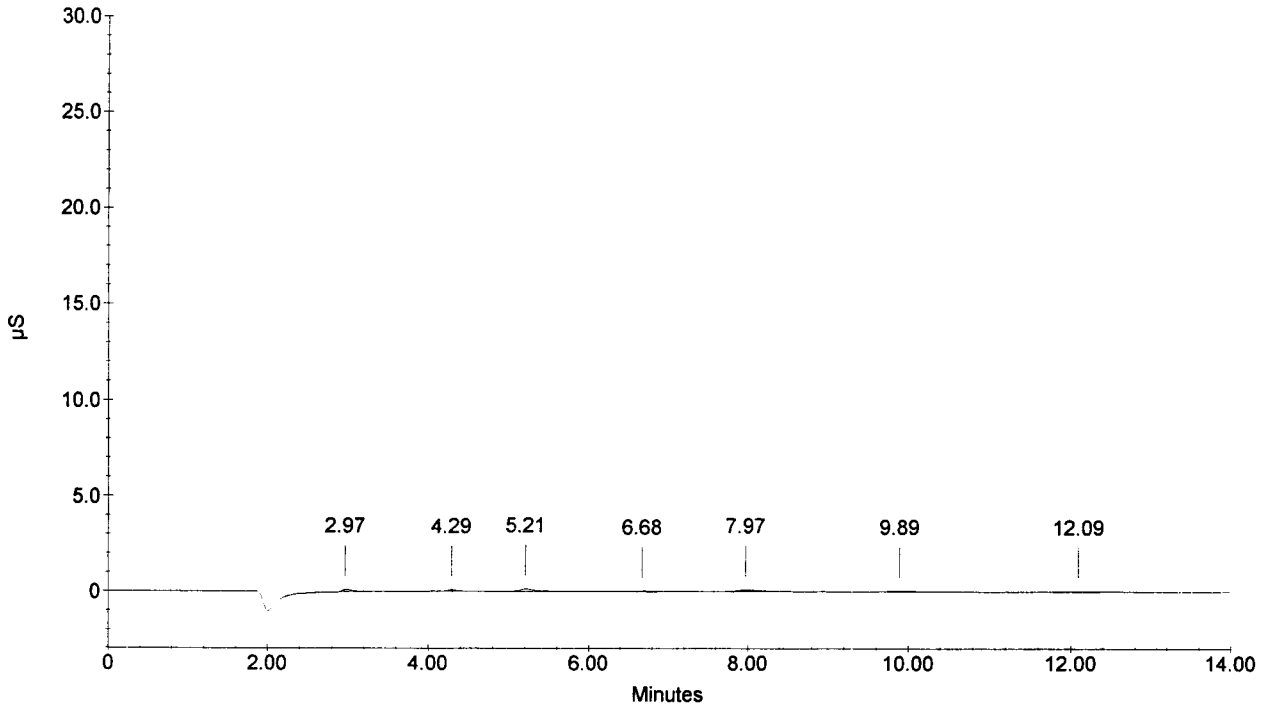
Date Time Collected : 10/7/05 7:52:10 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010216

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.080	1138	7469	1	-1.00
2	4.29	CHLORIDE	0.074	874	7443	1	0.00
3	5.21	NITRITE-N	0.112	1274	13833	1	0.58
4	6.68	BROMIDE	0.090	197	2465	1	2.40
5	7.97	NITRATE-N	0.074	952	15658	1	6.55
6	9.89	PHOSPHATE-P	0.088	290	6326	1	0.71
7	12.09	SULFATE	0.060	220	5222	1	0.75
			---total(s)---				
	0.00		0.577		58416		

MDL-2 0.05PPM



Sample Name : MDL-3 0.05PPM
Dilution Factor : 1.00
Injection Number : 22
Data File Name : ...\051007_022.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

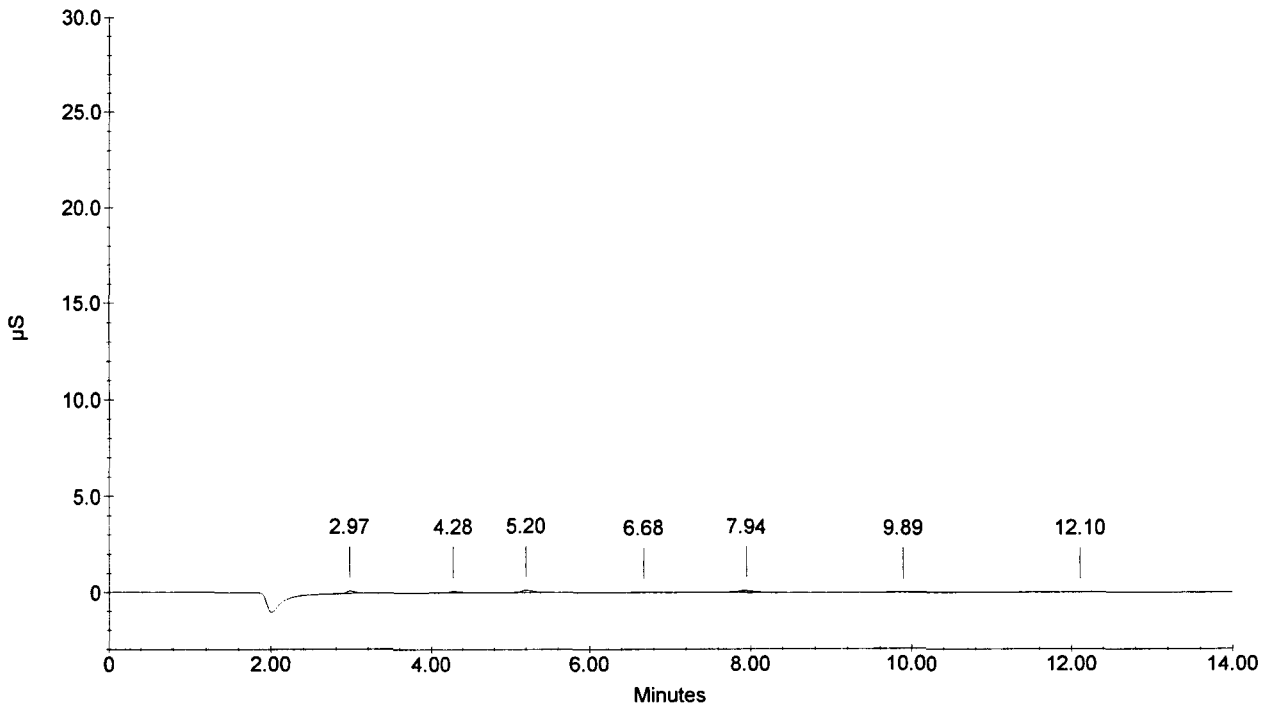
Date Time Collected : 10/7/05 8:08:50 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010217

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.090	1276	9668	1	-1.00
2	4.28	CHLORIDE	0.079	907	8240	1	-0.31
3	5.20	NITRITE-N	0.112 ✓	1224	13811	1	0.32
4	6.68	BROMIDE	0.090	196	2505	1	2.40
5	7.94	NITRATE-N	0.074 ✓	954	15863	1	6.19
6	9.89	PHOSPHATE-P	0.089	304	6508	1	0.71
7	12.10	SULFATE	0.049	205	4108	1	0.86
			---total(s)---				
	0.00		0.583		60702		

MDL-3 0.05PPM



Sample Name : MDL-4 0.05PPM
Dilution Factor : 1.00
Injection Number : 23
Data File Name : c:\peaknet\data\051007\051007_023.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

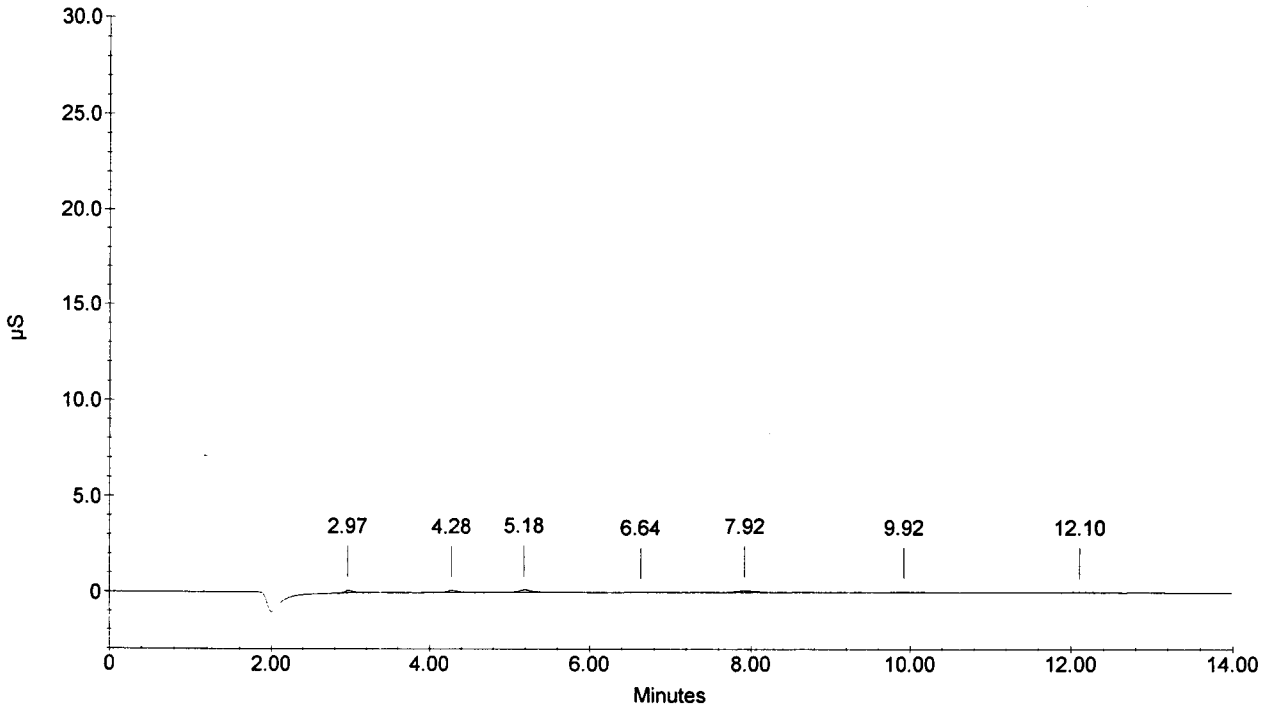
Date Time Collected : 10/7/05 8:25:31 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010218

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.080	1165	7306	1	-1.00
2	4.28	CHLORIDE	0.089	977	9789	1	-0.31
3	5.18	NITRITE-N	0.112	1239	13519	1	0.06
4	6.64	BROMIDE	0.089	208	2391	1	1.79
5	7.92	NITRATE-N	0.073	976	15362	1	5.84
6	9.92	PHOSPHATE-P	0.082	277	5598	1	0.98
7	12.10	SULFATE	0.060	217	5226	1	0.86
			---total(s)---				
	0.00		0.583		59191		

MDL-4 0.05PPM



Sample Name : MDL-5 0.05PPM
Dilution Factor : 1.00
Injection Number : 24
Data File Name : ...\051007_024.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

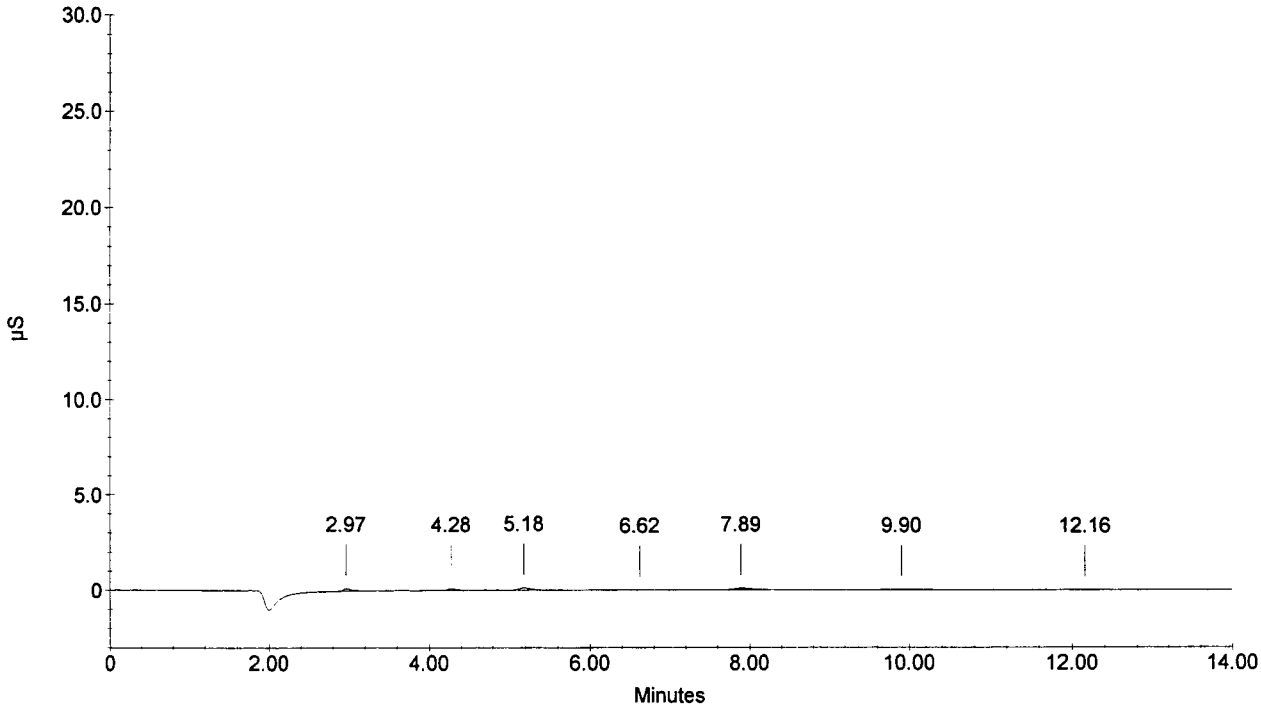
Date Time Collected : 10/7/05 8:42:13 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010219

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	0.090	1382	9843	1	-1.00
2	4.28	CHLORIDE	0.081	891	8581	1	-0.31
3	5.18	NITRITE-N	0.115	1286	14653	1	0.06
4	6.62	BROMIDE	0.087	191	2307	1	1.58
5	7.89	NITRATE-N	0.072	948	14934	1	5.48
6	9.90	PHOSPHATE-P	0.087	292	6285	1	0.85
7	12.16	SULFATE	0.052	202	4468	1	1.31
			---total(s)---				
	0.00		0.585		61071		

MDL-5 0.05PPM



Sample Name : MDL-6 0.05PPM
Dilution Factor : 1.00
Injection Number : 25
Data File Name : c:\peaknet\data\051007\051007_025.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

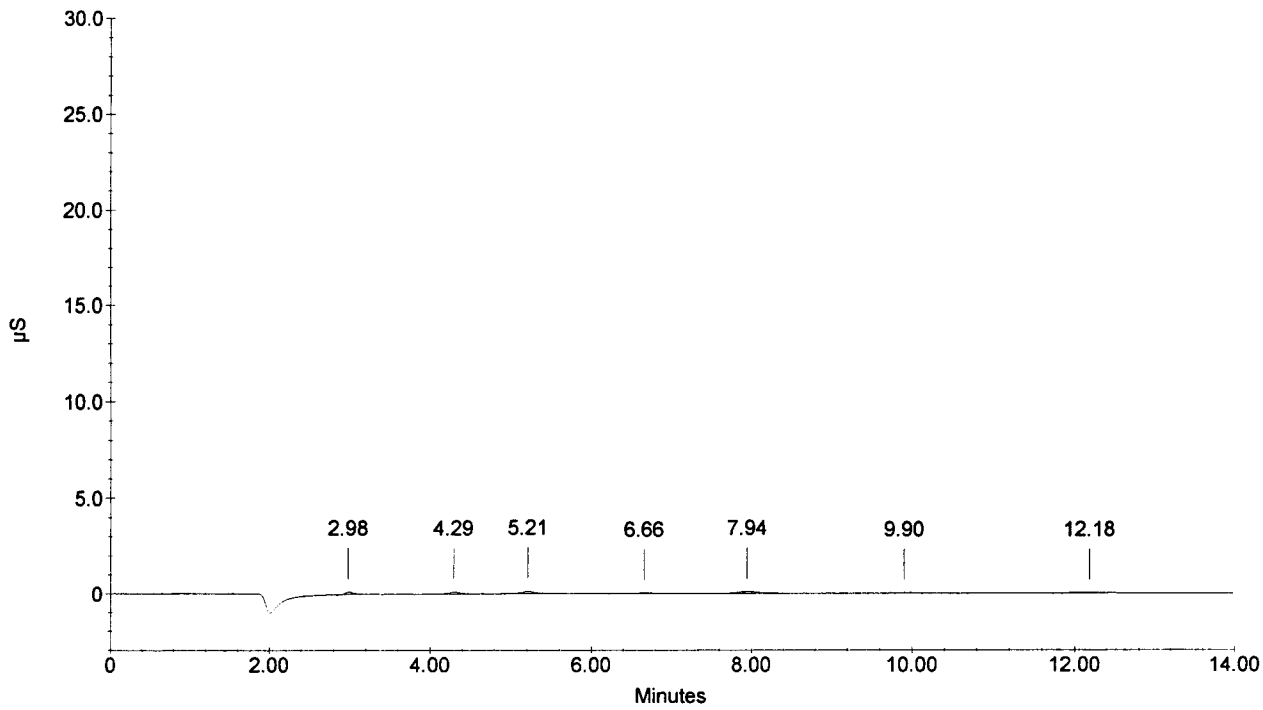
Date Time Collected : 10/7/05 8:58:53 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010220

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.98	FLUORIDE	0.080	1181	7431	1	-0.56
2	4.29	CHLORIDE	0.095	1043	10632	1	0.00
3	5.21	NITRITE-N	0.109	1233	12775	1	0.58
4	6.66	BROMIDE	0.088	196	2350	1	2.20
5	7.94	NITRATE-N	0.075	982	16360	1	6.19
6	9.90	PHOSPHATE-P	0.085	288	6013	1	0.85
7	12.18	SULFATE	0.049	225	4116	1	1.53
			---total(s)---				
	0.00		0.582		59676		

MDL-6 0.05PPM



Sample Name : MDL-7 0.05PPM
Dilution Factor : 1.00
Injection Number : 26
Data File Name : c:\peaknet\data\051007\051007_026.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

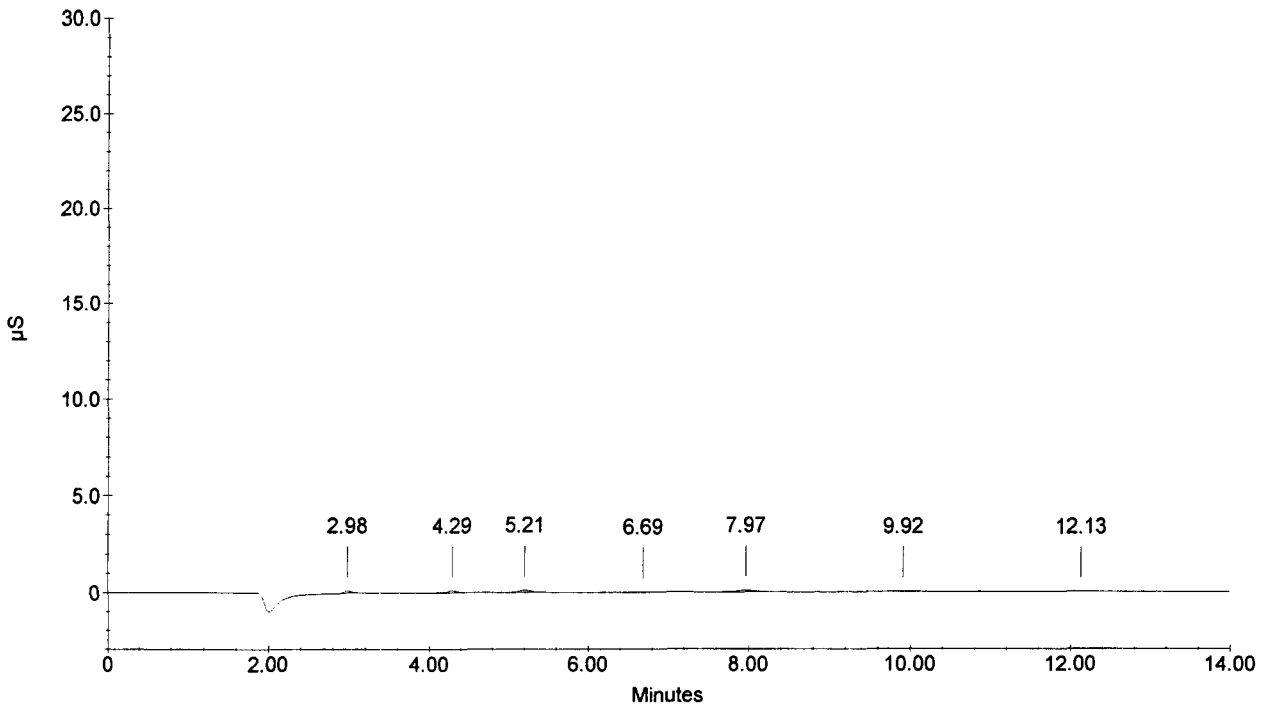
Date Time Collected : 10/7/05 9:15:34 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010221

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.98	FLUORIDE	0.081	1202	7584	1	-0.56
2	4.29	CHLORIDE	0.093	1072	10359	1	0.00
3	5.21	NITRITE-N	0.112	1237	13720	1	0.58
4	6.69	BROMIDE	0.083	177	2045	1	2.61
5	7.97	NITRATE-N	0.072	934	15244	1	6.55
6	9.92	PHOSPHATE-P	0.089	277	6526	1	0.98
7	12.13	SULFATE	0.053	216	4527	1	1.08
			---total(s)---				
	0.00		0.583		60004		

MDL-7 0.05PPM



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 27
Data File Name : c:\peaknet\data\051007\051007_027.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

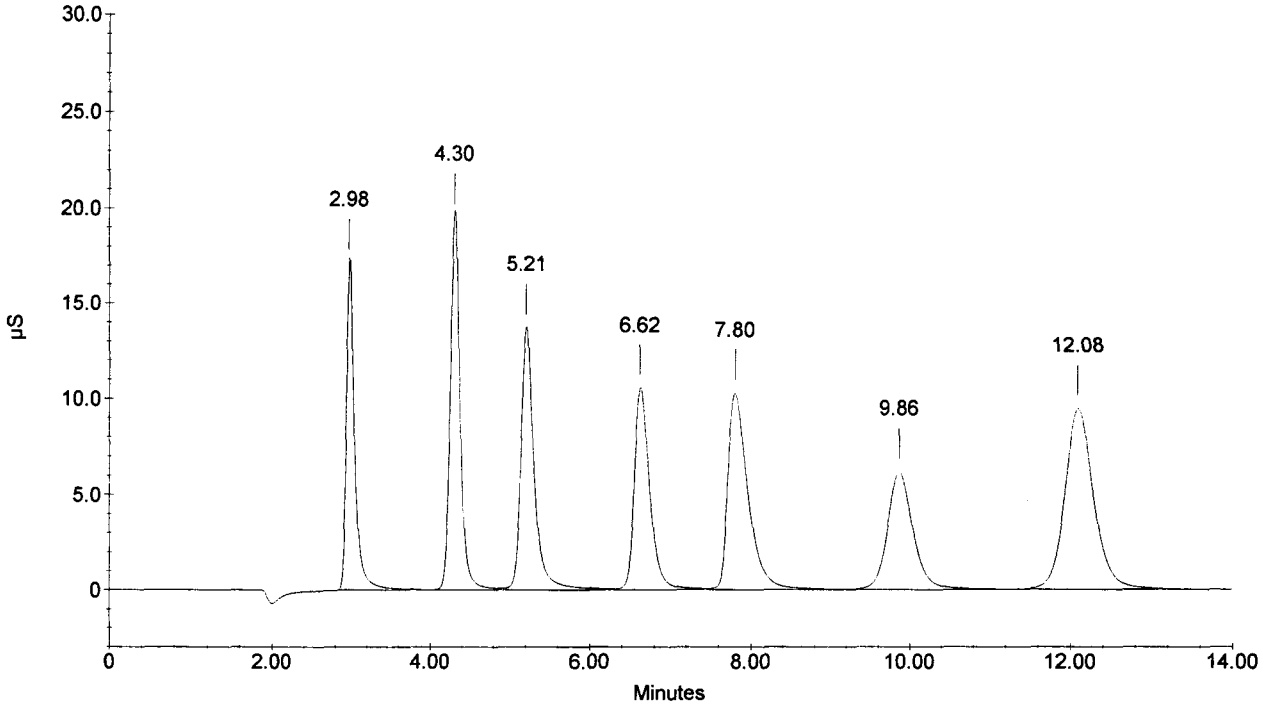
Date Time Collected : 10/7/05 9:32:15 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010222

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.98	FLUORIDE	103.333	171191	1269736	1	-0.56
2	4.30	CHLORIDE	208.673	194865	1704487	2	0.31
3	5.21	NITRITE-N	90.303	137047	1598925	2	0.58
4	6.62	BROMIDE	411.636	104786	1414165	2	1.58
5	7.80	NITRATE-N	91.773	102354	1792525	2	4.23
6	9.86	PHOSPHATE-P	198.468	61150	1374986	2	0.44
7	12.08	SULFATE	409.470	94002	2344342	2	0.64
			---total(s)---				
	0.00		1513.655		11499168		

CCV



Sample Name : CCV
Dilution Factor : 20.00
Injection Number : 28
Data File Name : c:\peaknet\data\051007\051007_028.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

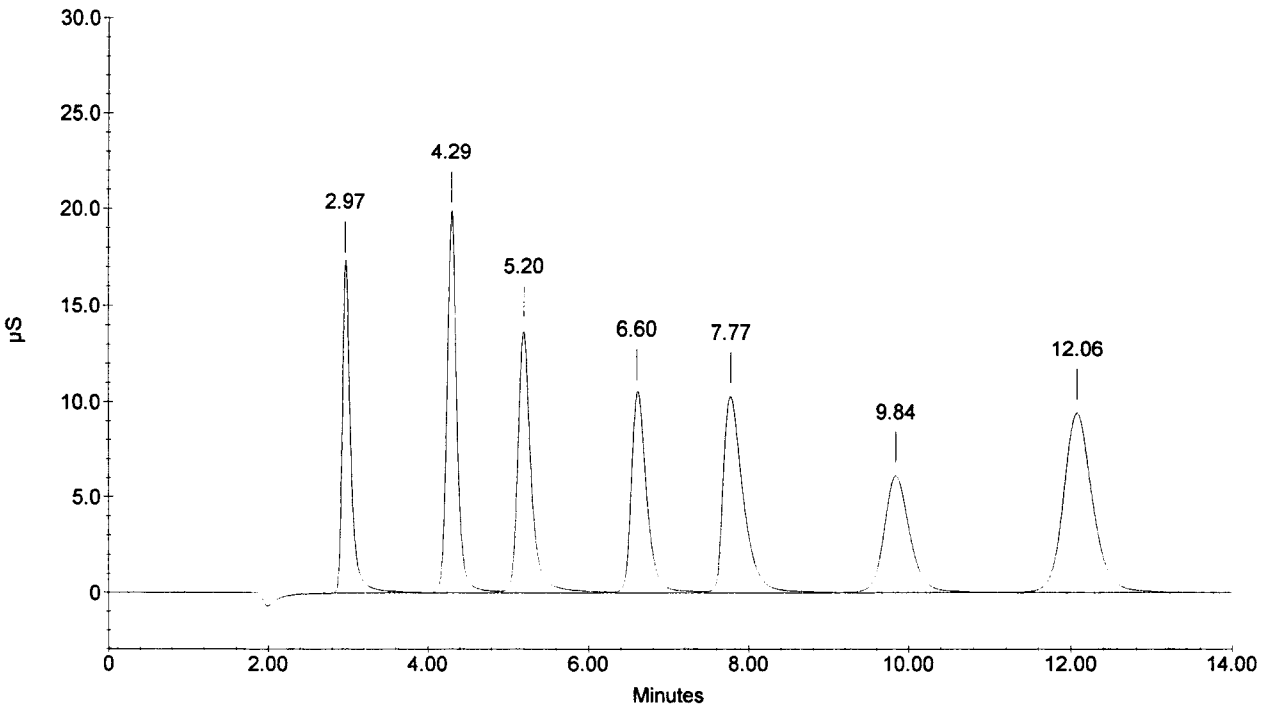
Date Time Collected : 10/7/05 9:48:58 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010223

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	2.97	FLUORIDE	103.269	170281	1268895	2	-1.00
2	4.29	CHLORIDE	208.454	196220	1702537	2	0.00
3	5.20	NITRITE-N	89.646	136953	1586982	2	0.32
4	6.60	BROMIDE	410.045	104544	1408136	2	1.18
5	7.77	NITRATE-N	91.448	102707	1785667	2	3.88
6	9.84	PHOSPHATE-P	198.096	61191	1372205	2	0.17
7	12.06	SULFATE	408.383	94212	2337397	2	0.53
			---total(s)---				
	0.00		1509.339		11461818		

CCV



Sample Name : CCB
Dilution Factor : 1.00
Injection Number : 29
Data File Name : c:\peaknet\data\051007\051007_029.DXD
Method File Name : c:\peaknet\method\anions051007.met
Schedule File Name : c:\peaknet\schedule\051007.sch

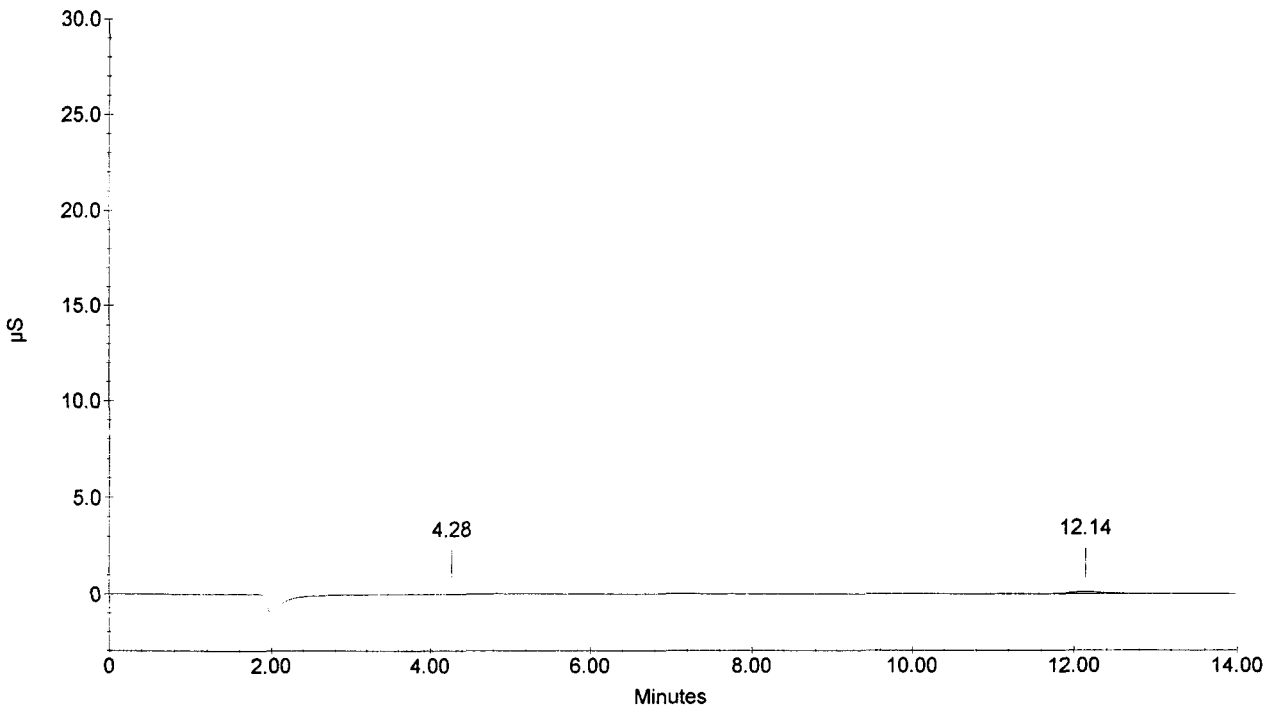
Date Time Collected : 10/7/05 10:05:39 PM
System Name : Dx-500
Detector Name : Conductivity Detector
Column Type : AS14-SN#018097 AG14-#019940
System Operator : RSPIES

010224

Peak Information : All Components

Pk. Num	Ret Time	Component Name	Concentration (ppm)	Height	Area	Bl. Code	%Delta
1	4.28	CHLORIDE	0.031	137	939	1	-0.31
1	4.28	CHLORIDE	0.031	137	939	1	-0.31
		NITRITE-N					
		BROMIDE					
		NITRATE-N					
		PHOSPHATE-P					
2	12.14	SULFATE	0.248	1029	24762	1	1.19
			---total(s)---				
	0.00		0.309		26640		

CCB



METHOD DETECTION LIMIT STUDY FOR INORGANICS

Lab Name: Southwest Research Institute
Instrument ID: Dionex DX 500 AS14/AG14
Date & Time Analyzed: 10/07/05
Analyst: RSpies
Reviewed by: MHardy

Method: EPA 300
Matrix: Water

Digestion Method: NA
Sample Wt./Vol.: NA
Final Volume: NA
Digestion Date: NA
Digested by: NA
Concentration Units: mg/L

ANALYTE	Spike Amount	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	Average	%REC	STD DEV	MDL*	PQL**	Ratio***
Fluoride	0.1	0.133	0.120	0.117	0.117	0.120	0.118	0.120	0.121	120.7%	0.006	0.018	0.088	6
Chloride	0.1	0.123	0.134	0.136	0.161	0.172	0.140	0.113	0.140	139.9%	0.021	0.065	0.323	2
Bromide	0.1	0.130	0.137	0.130	0.136	0.150	0.125	0.131	0.134	134.1%	0.008	0.025	0.127	4
Phosphate-P	0.1	0.133	0.136	0.136	0.124	0.142	0.120	0.130	0.132	131.6%	0.008	0.024	0.119	4
Sulfate	0.1	0.107	0.095	0.148	0.108	0.124	0.109	0.098	0.113	112.7%	0.018	0.057	0.285	2
Nitrite-N	0.05	0.111	0.112	0.112	0.112	0.115	0.109	0.112	0.112	223.7%	0.002	0.006	0.028	9
Nitrate-N	0.05	0.077	0.074	0.074	0.073	0.072	0.075	0.072	0.074	147.7%	0.002	0.006	0.028	9

* MDL is calculated as 3.143 times the standard deviation.
**PQL is calculated as 5 times the MDL.
***Ratio is calculated as the spike amount divided by the MDL.

010226

METHOD DETECTION LIMIT STUDY FOR INORGANICS

Lab Name: Southwest Research Institute
Instrument ID: Dionex DX 500 AS14/AG14
Date & Time Analyzed: 10/07/05
Analyst: RSpies
Reviewed by: MHardy

Method: SW 846 9056
Matrix: Water

Digestion Method: NA
Sample Wt./Vol.: NA
Final Volume: NA
Digestion Date: NA
Digested by: NA
Concentration Units: mg/L

ANALYTE	Spike Amount	MDL1	MDL2	MDL3	MDL4	MDL5	MDL6	MDL7	Average	%REC	STD DEV	MDL*	PQL**	Ratio***
Fluoride	0.1	0.133	0.120	0.117	0.117	0.120	0.118	0.120	0.121	120.7%	0.006	0.018	0.088	6
Chloride	0.1	0.123	0.134	0.136	0.161	0.172	0.140	0.113	0.140	139.9%	0.021	0.065	0.323	2
Bromide	0.1	0.130	0.137	0.130	0.136	0.150	0.125	0.131	0.134	134.1%	0.008	0.025	0.127	4
Phosphate-P	0.1	0.133	0.136	0.136	0.124	0.142	0.120	0.130	0.132	131.6%	0.008	0.024	0.119	4
Sulfate	0.1	0.107	0.095	0.148	0.108	0.124	0.109	0.098	0.113	112.7%	0.018	0.057	0.285	2
Nitrite-N	0.05	0.111	0.112	0.112	0.112	0.115	0.109	0.112	0.112	223.7%	0.002	0.006	0.028	9
Nitrate-N	0.05	0.077	0.074	0.074	0.073	0.072	0.075	0.072	0.074	147.7%	0.002	0.006	0.028	9

* MDL is calculated as 3.143 times the standard deviation.
**PQL is calculated as 5 times the MDL.
***Ratio is calculated as the spike amount divided by the MDL.

FRM-275 (Rev 0/Dec 01)

010227

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

Certificates of Analysis

010228

Fisher Scientific

TRACEMETAL GRADE NITRIC ACID
CERTIFICATE OF ANALYSIS

B McKelvey

Dr. B. McKelvey
QA/QC Manager

CATALOG NUMBER: A509
LOT NUMBER: 1105040
RELEASE DATE: May, 2005
EXPIRY DATE: May, 2008

Tests	Maximum Specification	Actual Value	Units
ASSAY (HNO_3, w/w):	67 - 70%	70%	% by w/w
Color:	10	<10	APHA

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	<0.5	Neodymium (Nd)	0.5 ppb	<0.1
Antimony (Sb)	1 ppb	<0.1	Nickel (Ni)	1 ppb	<0.1
Arsenic (As)	1 ppb	<0.1	Niobium (Nb)	0.5 ppb	<0.1
Barium (Ba)	1 ppb	<0.1	Palladium (Pd)	0.5 ppb	<0.1
Beryllium (Be)	1 ppb	<0.1	Platinum (Pt)	0.5 ppb	<0.1
Bismuth (Bi)	1 ppb	<0.1	Potassium (K)	1 ppb	<0.2
Boron (B)	1 ppb	<0.5	Praseodymium (Pr)	0.5 ppb	<0.1
Cadmium (Cd)	1 ppb	<0.1	Rhenium (Re)	0.5 ppb	<0.1
Calcium (Ca)	1 ppb	<0.5	Rhodium (Rh)	0.5 ppb	<0.1
Cerium (Ce)	0.5 ppb	<0.1	Rubidium (Rb)	0.5 ppb	<0.1
Cesium (Cs)	0.5 ppb	<0.1	Ruthenium (Ru)	0.5 ppb	<0.1
Chromium (Cr)	1 ppb	<0.5	Samarium (Sm)	0.5 ppb	<0.1
Cobalt (Co)	1 ppb	<0.1	Scandium (Sc)	0.5 ppb	<0.1
Copper (Cu)	1 ppb	<0.1	Selenium (Se)	1 ppb	<0.1
Dysprosium (Dy)	0.5 ppb	<0.1	Silver (Ag)	1 ppb	<0.1
Erbium (Er)	0.5 ppb	<0.1	Sodium (Na)	1 ppb	<0.2
Europium (Eu)	0.5 ppb	<0.1	Strontium (Sr)	1 ppb	<0.1
Gadolinium (Gd)	0.5 ppb	<0.1	Tantalum (Ta)	Information Only	<0.1
Gallium (Ga)	0.5 ppb	<0.1	Tellurium (Te)	0.5 ppb	<0.1
Germanium (Ge)	0.5 ppb	<0.1	Terbium (Tb)	0.5 ppb	<0.1
Gold (Au)	0.5 ppb	<0.1	Thallium (Tl)	0.5 ppb	<0.1
Hafnium (Hf)	0.5 ppb	<0.1	Thorium (Th)	1 ppb	<0.1
Holmium (Ho)	0.5 ppb	<0.1	Thulium (Tm)	0.5 ppb	<0.1
Indium (In)	0.5 ppb	<0.1	Tin (Sn)	1 ppb	<0.1
Iron (Fe)	1 ppb	<0.5	Titanium (Ti)	1 ppb	<0.1
Lanthanum (La)	0.5 ppb	<0.1	Tungsten (W)	0.5 ppb	<0.1
Lead (Pb)	1 ppb	<0.1	Uranium (U)	1 ppb	<0.1
Lithium (Li)	1 ppb	<0.1	Vanadium (V)	1 ppb	<0.1
Lutetium (Lu)	0.5 ppb	<0.1	Ytterbium (Yb)	0.5 ppb	<0.1
Magnesium (Mg)	1 ppb	<0.2	Yttrium (Y)	0.5 ppb	<0.1
Manganese (Mn)	1 ppb	<0.1	Zinc (Zn)	1 ppb	<0.2
Mercury (Hg)	1 ppb	<0.2	Zirconium (Zr)	1 ppb	<0.1
Molybdenum (Mo)	1 ppb	<0.1			

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 10/10/05
DATE EXPIRED: 10/10/2012
DATE OPENED: 10/25/05 DR
INORG: 54512-54516 PO: F52702

Element concentrations are at the point of bottling. Concentrations of some elements in particular, Ca, Si, K, Na, B, Al, Mg & Mn will increase due to storage in glass bottles.

Fisher Scientific

For customer service, call 1-800-766-7000.
To fax an order, use 1-800-925-1165.
To order online: www.fishersci.com

010229

Fisher Scientific

TRACEMETAL GRADE NITRIC ACID
CERTIFICATE OF ANALYSIS

B McKelvey

Dr. B. McKelvey
QA/QC Manager

CATALOG NUMBER: A509
LOT NUMBER: 1105010
RELEASE DATE: February, 2005
EXPIRY DATE: February, 2008

Tests	Maximum Specification	Actual Value	Units
ASSAY (HNO_3, w/w):	67 - 70%	70%	% by w/w
Color:	10	<10	APHA

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	<0.5	Neodymium (Nd)	0.5 ppb	<0.1
Antimony (Sb)	1 ppb	<0.1	Nickel (Ni)	1 ppb	<0.1
Arsenic (As)	1 ppb	<0.1	Niobium (Nb)	0.5 ppb	<0.1
Barium (Ba)	1 ppb	<0.1	Palladium (Pd)	0.5 ppb	<0.1
Beryllium (Be)	1 ppb	<0.1	Platinum (Pt)	0.5 ppb	<0.1
Bismuth (Bi)	1 ppb	<0.1	Potassium (K)	1 ppb	<0.2
Boron (B)	1 ppb	<0.5	Praseodymium (Pr)	0.5 ppb	<0.1
Cadmium (Cd)	1 ppb	<0.1	Rhenium (Re)	0.5 ppb	<0.1
Calcium (Ca)	1 ppb	<0.5	Rhodium (Rh)	0.5 ppb	<0.1
Cerium (Ce)	0.5 ppb	<0.1	Rubidium (Rb)	0.5 ppb	<0.1
Cesium (Cs)	0.5 ppb	<0.1	Ruthenium (Ru)	0.5 ppb	<0.1
Chromium (Cr)	1 ppb	<1	Samarium (Sm)	0.5 ppb	<0.1
Cobalt (Co)	1 ppb	<0.1	Scandium (Sc)	0.5 ppb	<0.1
Copper (Cu)	1 ppb	<0.1	Selenium (Se)	1 ppb	<0.1
Dysprosium (Dy)	0.5 ppb	<0.1	Silver (Ag)	1 ppb	<0.1
Erbium (Er)	0.5 ppb	<0.1	Sodium (Na)	1 ppb	<0.2
Europium (Eu)	0.5 ppb	<0.1	Strontium (Sr)	1 ppb	<0.1
Gadolinium (Gd)	0.5 ppb	<0.1	Tantalum (Ta)	Information Only	<0.1
Gallium (Ga)	0.5 ppb	<0.1	Tellurium (Te)	0.5 ppb	<0.1
Germanium (Ge)	0.5 ppb	<0.1	Terbium (Tb)	0.5 ppb	<0.1
Gold (Au)	0.5 ppb	<0.1	Thallium (Tl)	0.5 ppb	<0.1
Hafnium (Hf)	0.5 ppb	<0.1	Thorium (Th)	1 ppb	<0.1
Holmium (Ho)	0.5 ppb	<0.1	Thulium (Tm)	0.5 ppb	<0.1
Indium (In)	0.5 ppb	<0.1	Tin (Sn)	1 ppb	<0.1
Iron (Fe)	1 ppb	<0.5	Titanium (Ti)	1 ppb	<0.1
Lanthanum (La)	0.5 ppb	<0.1	Tungsten (W)	0.5 ppb	<0.1
Lead (Pb)	1 ppb	<0.1	Uranium (U)	1 ppb	<0.1
Lithium (Li)	1 ppb	<0.1	Vanadium (V)	1 ppb	<0.1
Lutetium (Lu)	0.5 ppb	<0.1	Ytterbium (Yb)	0.5 ppb	<0.1
Magnesium (Mg)	1 ppb	<0.2	Yttrium (Y)	0.5 ppb	<0.1
Manganese (Mn)	1 ppb	<0.1	Zinc (Zn)	1 ppb	<0.2
Mercury (Hg)	1 ppb	<0.2	Zirconium (Zr)	1 ppb	<0.1
Molybdenum (Mo)	1 ppb	<0.1			

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/26/05
DATE EXPIRED: 9/8/2016
DATE OPENED: 9/8/05
INORG: 5368-5373 PO: 152021

Element concentrations are at the point of bottling. Concentrations of some elements in particular, Ca, Si, K, Na, B, Al, Mg & Mn will increase due to storage in glass bottles.

Fisher Scientific

For customer service, call 1-800-766-7000.
To fax an order, use 1-800-925-1165.
To order online: www.fishersci.com

010230

Fisher Scientific

TRACEMETAL GRADE HYDROCHLORIC ACID
CERTIFICATE OF ANALYSIS

B McKelvey
Dr. B. McKelvey
QA/QC Manager

CATALOG NUMBER: A508
LOT NUMBER: 4105031
RELEASE DATE: July, 2005
EXPIRY DATE: July, 2008

Tests	Maximum Specification	Actual Value	Units
ASSAY (HCl, w/w).	34 - 37%	36%	% by w/w
Color:	10	<10	APHA

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	<0.5	Neodymium (Nd)	0.5 ppb	<0.1
Antimony (Sb)	1 ppb	<0.1	Nickel (Ni)	1 ppb	<0.1
Arsenic (As)	1 ppb	<0.1	Niobium (Nb)	0.5 ppb	<0.1
Barium (Ba)	1 ppb	<0.1	Palladium (Pd)	Information Only	<0.5
Beryllium (Be)	1 ppb	<0.1	Platinum (Pt)	Information Only	<0.5
Bismuth (Bi)	1 ppb	<0.1	Potassium (K)	1 ppb	<0.1
Boron (B)	1 ppb	<0.5	Praseodymium (Pr)	0.5 ppb	<0.1
Cadmium (Cd)	1 ppb	<0.1	Rhenium (Re)	0.5 ppb	<0.1
Calcium (Ca)	1 ppb	<0.5	Rhodium (Rh)	0.5 ppb	<0.1
Cerium (Ce)	0.5 ppb	<0.1	Rubidium (Rb)	0.5 ppb	<0.1
Cesium (Cs)	0.5 ppb	<0.1	Ruthenium (Ru)	0.5 ppb	<0.1
Chromium (Cr)	1 ppb	<0.1	Samarium (Sm)	0.5 ppb	<0.1
Cobalt (Co)	1 ppb	<0.1	Scandium (Sc)	0.5 ppb	<0.1
Copper (Cu)	1 ppb	<0.1	Selenium (Se)	1 ppb	<0.1
Dysprosium (Dy)	0.5 ppb	<0.1	Silver (Ag)	1 ppb	<0.1
Erbium (Er)	0.5 ppb	<0.1	Sodium (Na)	1 ppb	<0.5
Europium (Eu)	0.5 ppb	<0.1	Strontium (Sr)	1 ppb	<0.1
Gadolinium (Gd)	0.5 ppb	<0.1	Tantalum (Ta)	Information Only	<1
Gallium (Ga)	0.5 ppb	<0.1	Tellurium (Te)	0.5 ppb	<0.1
Gold (Au)	0.5 ppb	<0.1	Terbium (Tb)	0.5 ppb	<0.1
Hafnium (Hf)	0.5 ppb	<0.1	Thallium (Tl)	0.5 ppb	<0.1
Holmium (Ho)	0.5 ppb	<0.1	Thorium (Th)	1 ppb	<0.1
Indium (In)	0.5 ppb	<0.1	Thulium (Tm)	0.5 ppb	<0.1
Iron (Fe)	1 ppb	<0.5	Tin (Sn)	1 ppb	<0.1
Lanthanum (La)	0.5 ppb	<0.1	Titanium (Ti)	1 ppb	<0.1
Lead (Pb)	1 ppb	<0.1	Tungsten (W)	0.5 ppb	<0.1
Lithium (Li)	1 ppb	<0.1	Uranium (U)	1 ppb	<0.1
Lutetium (Lu)	0.5 ppb	<0.1	Vanadium (V)	1 ppb	<0.1
Magnesium (Mg)	1 ppb	<0.5	Ytterbium (Yb)	0.5 ppb	<0.1
Manganese (Mn)	1 ppb	<0.1	Yttrium (Y)	0.5 ppb	<0.1
Mercury (Hg)	1 ppb	<0.2	Zinc (Zn)	1 ppb	<0.5
Molybdenum (Mo)	1 ppb	<0.1	Zirconium (Zr)	1 ppb	<0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br)	10 ppm	<10	Total Sulphur (S)	0.3 ppm	<0.3
Total Phosphorus (P)	0.01 ppm	<0.01	Free Chlorine (Cl2)	0.5 ppm	<0.5

Element concentrations are at the point of bottling. Concentrations of some elements in particular, Ca, Si, K, Na, B, Al, Mg & Mn will increase due to storage in glass bottles.

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 10/4/05
DATE EXPIRED: 10/4/2015
DATE OPENED: 10/14/05
INORG: 5418-5423 PO: 652702

Fisher Scientific
For customer service, call 1-800-766-7000.
To fax an order, use 1-800-925-1165.
To order online: www.fishersci.com

010231

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 9/9/05
DATE EXPIRED: 9/15/2015
DATE OPENED: 9/15/05 (B)
INORG: 5321-5300 PO: 1526294

Fisher Scientific

TRACEMETAL GRADE HYDROCHLORIC ACID CERTIFICATE OF ANALYSIS

B McKelvey
Dr. B. McKelvey
QA/QC Manager

CATALOG NUMBER: A508
LOT NUMBER: 4105031
RELEASE DATE: July, 2005
EXPIRY DATE: July, 2008

Tests	Maximum Specification	Actual Value	Units
ASSAY (HCl, w/w):	34 - 37%	36%	% by w/w
Color:	10	<10	APHA

Analyte	Maximum Specification	Actual Value (in ppb)	Analyte	Maximum Specification	Actual Value (in ppb)
Aluminum (Al)	1 ppb	<0.5	Neodymium (Nd)	0.5 ppb	<0.1
Antimony (Sb)	1 ppb	<0.1	Nickel (Ni)	1 ppb	<0.1
Arsenic (As)	1 ppb	<0.1	Niobium (Nb)	0.5 ppb	<0.1
Barium (Ba)	1 ppb	<0.1	Palladium (Pd)	Information Only	<0.5
Beryllium (Be)	1 ppb	<0.1	Platinum (Pt)	Information Only	<0.5
Bismuth (Bi)	1 ppb	<0.1	Potassium (K)	1 ppb	<0.1
Boron (B)	1 ppb	<0.5	Praseodymium (Pr)	0.5 ppb	<0.1
Cadmium (Cd)	1 ppb	<0.1	Rhenium (Re)	0.5 ppb	<0.1
Calcium (Ca)	1 ppb	<0.5	Rhodium (Rh)	0.5 ppb	<0.1
Cerium (Ce)	0.5 ppb	<0.1	Rubidium (Rb)	0.5 ppb	<0.1
Cesium (Cs)	0.5 ppb	<0.1	Ruthenium (Ru)	0.5 ppb	<0.1
Chromium (Cr)	1 ppb	<0.1	Samarium (Sm)	0.5 ppb	<0.1
Cobalt (Co)	1 ppb	<0.1	Scandium (Sc)	0.5 ppb	<0.1
Copper (Cu)	1 ppb	<0.1	Selenium (Se)	1 ppb	<0.1
Dysprosium (Dy)	0.5 ppb	<0.1	Silver (Ag)	1 ppb	<0.1
Erbium (Er)	0.5 ppb	<0.1	Sodium (Na)	1 ppb	<0.5
Europium (Eu)	0.5 ppb	<0.1	Strontium (Sr)	1 ppb	<0.1
Gadolinium (Gd)	0.5 ppb	<0.1	Tantalum (Ta)	Information Only	<1
Gallium (Ga)	0.5 ppb	<0.1	Tellurium (Te)	0.5 ppb	<0.1
Gold (Au)	0.5 ppb	<0.1	Terbium (Tb)	0.5 ppb	<0.1
Hafnium (Hf)	0.5 ppb	<0.1	Thallium (Tl)	0.5 ppb	<0.1
Holmium (Ho)	0.5 ppb	<0.1	Thorium (Th)	1 ppb	<0.1
Indium (In)	0.5 ppb	<0.1	Thulium (Tm)	0.5 ppb	<0.1
Iron (Fe)	1 ppb	<0.5	Tin (Sn)	1 ppb	<0.1
Lanthanum (La)	0.5 ppb	<0.1	Titanium (Ti)	1 ppb	<0.1
Lead (Pb)	1 ppb	<0.1	Tungsten (W)	0.5 ppb	<0.1
Lithium (Li)	1 ppb	<0.1	Uranium (U)	1 ppb	<0.1
Lutetium (Lu)	0.5 ppb	<0.1	Vanadium (V)	1 ppb	<0.1
Magnesium (Mg)	1 ppb	<0.5	Ytterbium (Yb)	0.5 ppb	<0.1
Manganese (Mn)	1 ppb	<0.1	Yttrium (Y)	0.5 ppb	<0.1
Mercury (Hg)	1 ppb	<0.2	Zinc (Zn)	1 ppb	<0.5
Molybdenum (Mo)	1 ppb	<0.1	Zirconium (Zr)	1 ppb	<0.1

Analyte	Maximum Specification	Actual Value (in ppm)	Analyte	Maximum Specification	Actual Value (in ppm)
Bromide (Br)	10 ppm	<10	Total Sulphur (S)	0.3 ppm	<0.3
Total Phosphorus (P)	0.01 ppm	<0.01	Free Chlorine (Cl2)	0.5 ppm	<0.5

Element concentrations are at the point of bottling. Concentrations of some elements in particular, Ca, Si, K, Na, B, Al, Mg & Mn will increase due to storage in glass bottles.

Fisher Scientific

For customer service, call 1-800-766-7000.
To fax an order, use 1-800-925-1165.
To order online: www.fishersci.com

010232

SPEXertificate™

Certificate of Reference Material

Catalog Number: ICAL-1 **Lot No.:** 28-64AS
Description: **Instrument Calibration Standard 1**
Matrix: 5% Nitric Acid

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentration.

Refer to side 2 for details of measurement uncertainties.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Measured (mg/L)	NIST SRM
Ca	5,000	5011.87	3109a
K	5,000	5011.80	3141a
Mg	5,000	5020.86	3131a
Na	5,000	4995.13	3152a

Spex Reference Multi: Lot #6-28VY, 6-104VY, 25-178AS-REF

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the certified concentrations with no single element exceeding +/-2%. This includes uncertainty of measurements and other effects, such as transpiration losses. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 6/30/05
DATE EXPIRED: 6/30/06
DATE OPENED: 6/30/05
INORG: 5288 PO: 155205

Date of Certification: _____ Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010233

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 DESCRIPTION OF CRM

Custom-Grade **1000 µg/mL Scandium in 5% (abs) HNO_3**

Catalog Number:	CGSC1-1, CGSC1-2, and CGSC1-5
Lot Number:	**X-SC02063**
Starting Material:	Sc_2O_3
Starting Material Purity (%):	99.996919
Starting Material Lot No	BSC-632-1-5736
Matrix:	5% (abs) HNO_3

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1007 ± 2 µg/mL

Certified Density: 1.037 g/mL (measured at 22° C)

The Certified Value is the ICP value. The following equations are used in the calculations of the certified value and the uncertainty:

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty $(\pm) = 2[(\sum s_i)^2]^{1/2} / (n)^{1/2}$

$\sum s_i$ = The summation of all significant estimated errors. (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

☐ "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

☐ This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **1007 ± 2 µg/mL**
ICP Assay NIST SRM 3148a Lot Number: 792111

Assay Method #2 **1006 ± 2 µg/mL**
EDTA NIST SRM 928 Lot Number: 392110

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 9/23/05
DATE EXPIRED: 10/1/06
DATE OPENED: 9/27/05
INORG: 5404 PO: D20696435

pg. 1 of 4
5404

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	< 0.00100	M	Dy	< 0.00598	M	Li	< 0.00997	M	Pr	< 0.00030	M	Te	< 0.02990
M	Sb	< 0.00050	M	Er	< 0.00498	M	Lu	< 0.00040	M	Re	< 0.00100	M	Tb	< 0.00030
M	As	< 0.00997	M	Eu	< 0.00299	O	Mg	0.00010	M	Rh	< 0.00100	M	Tl	< 0.00100
M	Ba	< 0.00997	M	Gd	< 0.00100	M	Mn	< 0.00399	M	Rb	< 0.00100	M	Th	0.01175
M	Be	< 0.00050	M	Ga	< 0.00100	O	Hg	< 0.01000	M	Ru	< 0.00199	M	Tm	< 0.00040
M	Bi	< 0.00040	M	Ge	< 0.00598	M	Mo	< 0.00199	M	Sm	< 0.00100	M	Sn	< 0.00498
M	B	< 0.06976	M	Au	< 0.00299	M	Nd	< 0.00199	s	Sc		O	Ti	< 0.00100
M	Cd	< 0.00299	M	Hf	< 0.00199	O	Ni	< 0.00090	M	Se	< 0.00797	M	W	< 0.00997
O	Ca	0.01149	M	Ho	< 0.00050	M	Nb	< 0.00050	O	Si	0.00200	M	U	< 0.00199
M	Ce	< 0.00498	M	In	< 0.00997	n	Os		M	Ag	< 0.00199	M	V	< 0.00199
M	Cs	< 0.00030	M	Ir	< 0.00498	M	Pd	< 0.00498	O	Na	< 0.09000	M	Yb	< 0.00100
O	Cr	0.00047	O	Fe	0.00037	n	P		M	Sr	< 0.00050	O	Y	< 0.00100
M	Co	< 0.00299	M	La	< 0.00050	M	Pt	< 0.00199	O	S	< 0.02500	O	Zn	0.00060
O	Cu	< 0.00140	M	Pb	< 0.00299	O	K	< 0.10000	M	Ta	< 0.00698	O	Zr	0.02298

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; $Sc(H_2O)_6^{+3}$

Chemical Compatibility - Soluble in HCl, H_2SO_4 and HNO_3. Avoid HF, H_3PO_4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF_6^{3-} (not recommended for standard preparations).

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO_3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.

Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H_2O / HNO_3); Ores (Carbonate fusion in Pt^0 followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H_2O / HCl or HNO_3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.**)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line		Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES	335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES	337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES	424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS	45 amu	2.3 ppt	n/a	M^+	$^{16}O_2{}^{12}CH$, $^{29}Si^{16}O$, $^{90}Zr^{+2}$

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105

Recognized by:

Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:

Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter), Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:

Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

010236

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: December 14, 2004

Expiration Date: EXPIRES 1/2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Nick Maida, QA Administrator	Nicholas Maida
Certificate Approved By:	Katalin Le, QC Manager	Katalin Le
Certifying Officer:	Paul Gaines, Chemist, Senior Technical Director	Paul R Gaines

4 of 4
5/04

010237

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 DESCRIPTION OF CRM

Custom-Grade **10000 µg/mL Scandium in 5% (abs) HNO_3**

Catalog Number:	CGSC10-1, CGSC10-2, and CGSC10-5
Lot Number:	**X-SC02061**
Starting Material:	Sc_2O_3
Starting Material Purity (%):	99.996918
Starting Material Lot No	BSC-632-1-5736
Matrix:	5% (abs) HNO_3

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 10,007 ± 21 µg/mL

Certified Density: 1.071 g/mL (measured at 22° C)

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2[(\sum S_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum S$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM-certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **10,005 ± 26 µg/mL**
ICP Assay NIST SRM 3148a Lot Number: 792111

Assay Method #2 **10,007 ± 21 µg/mL**
EDTA NIST SRM 928 Lot Number: 880710

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 3/31/05
DATE EXPIRED: 3/1/06
DATE OPENED: 3/31/05
INORG: 5175 PO: 72116

1 of 4
5175

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	<	0.00100	M	Dy	<	0.00598	M	Li	<	0.00997	M	Pr	<	0.00030	M	Te	<	0.02990
M	Sb	<	0.00050	M	Er	<	0.00498	M	Lu	<	0.00040	M	Re	<	0.00100	M	Tb	<	0.00030
M	As	<	0.00997	M	Eu	<	0.00299	O	Mg		0.00100	M	Rh	<	0.00100	M	Tl	<	0.00100
M	Ba	<	0.00997	M	Gd	<	0.00100	M	Mn	<	0.00399	M	Rb	<	0.00100	M	Th		0.11759
M	Be	<	0.00050	M	Ga	<	0.00100	O	Hg	<	0.01000	M	Ru	<	0.00199	M	Tm	<	0.00040
M	Bi	<	0.00040	M	Ge	<	0.00598	M	Mo	<	0.00199	M	Sm	<	0.00100	M	Sn	<	0.00498
M	B	<	0.06976	M	Au	<	0.00299	M	Nd	<	0.00199	s	Sc			O	Ti	<	0.00100
M	Cd	<	0.00299	M	Hf	<	0.00199	O	Ni	<	0.00090	M	Se	<	0.00797	M	W	<	0.00997
O	Ca		0.11500	M	Ho	<	0.00050	M	Nb	<	0.00050	O	Si		0.02000	M	U	<	0.00199
M	Ce	<	0.00498	M	In	<	0.00997	n	Os			M	Ag	<	0.00199	M	V	<	0.00199
M	Cs	<	0.00030	M	Ir	<	0.00498	M	Pd	<	0.00498	O	Na	<	0.09000	M	Yb	<	0.00100
O	Cr		0.00470	O	Fe		0.00370	n	P			M	Sr	<	0.00050	O	Y	<	0.00100
M	Co	<	0.00299	M	La	<	0.00050	M	Pt	<	0.00199	O	S	<	0.02500	O	Zn		0.00600
O	Cu	<	0.00140	M	Pb	<	0.00299	O	K	<	0.10000	M	Ta	<	0.00698	O	Zr		0.23000

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 44.95591; +3; 6; $Sc(H_2O)_6^{+3}$

Chemical Compatibility - Soluble in HCl, H_2SO_4 and HNO_3. Avoid HF, H_3PO_4 and neutral to basic media. Stable with most metals and inorganic anions forming an insoluble carbonate, oxide, oxalate, and fluoride. Avoid mixing with elements / solutions containing moderate amounts of fluoride. The fluoride is soluble in excess HF forming ScF_6^{3-} (not recommended for standard preperations)

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10% HNO_3 / LDPE container. Small atomic radius increases hydrolysis requiring higher acid levels than other Rare Earths.

Sc Containing Samples (Preparation and Solution) - Metal (Soluble in acids); Oxide (Dissolve by heating in H_2O / HNO_3); Ores (Carbonate fusion in Pt[1] followed by HCl dissolution); Organic Matrices (Dry ash and dissolve in 1:1 H_2O / HCl or HNO_3), (Aqua Regia or nitric / perchloric / sulfuric acid digestions can be used. **Exercise caution when using perchloric acid.**)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe at ≈ concs.)
ICP-OES 335.373 nm	0.004 / 0.00002 µg/mL	1	ion	
ICP-OES 337.215 nm	0.004 / 0.00002 µg/mL	1	ion	Ti, U, Ni, Rh
ICP-OES 424.683 nm	0.003 / 0.00002 µg/mL	1	ion	Ce
ICP-MS 45 amu	2.3 ppt	n/a	M[1]	$^{13}O_2$, ^{12}CH, $^{29}Si^{16}O$, $^{90}Zr^{12}$

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105

Recognized by:

Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:

Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter), Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:

Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: July 01, 2004

Expiration Date: EXPIRES 01/2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Nick Malda, QA Administrator	Nicholas Malda
Certificate Approved By:	Katalin Le, QC Manager	Katalin Le
Certifying Officer:	Paul Gaines, Chemist, Senior Technical Director	Paul R Gaines

010241

SPEXertificate ™

Certificate of Reference Material

Catalog Number: PLB9-2X/2Y/2T **Lot No.** 10-119B

Description: 1000 mg/L Boron

Matrix: H2O

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1001 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM 3107

The CRM is prepared gravimetrically using high purity (NH4)2B4O7-4H2O Lot# 08001E. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: Titration with Sodium Hydroxide using Phenolphthalein as indicator. Sodium Hydroxide standardized against Potassium Biphthalate NIST SRM #84k

Instrumental Analysis by ICP spectrometer: 1001 mg/L

Uncertified Properties:

Density: 1.001 @ 22.3 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.06	Cu	<0.001	Pb	<0.001
As	<0.001	Fe	0.001	Re	<0.001
Ag	0.002	Ga	<0.001	Rb	<0.001
Ba	<0.001	In	<0.001	Sr	<0.001
Be	<0.001	K	<0.06	Sb	<0.001
Bi	0.03	Li	<0.001	Si	0.01
Cd	<0.001	Mn	<0.001	Ti	<0.001
Co	<0.001	Mo	<0.001	Tl	<0.001
Ca	0.001	Mg	<0.001	V	0.003
Cr	<0.001	Na	0.01	Zr	<0.001
		Ni	0.001	Zn	0.004

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN '05 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/17/95
DATE EXPIRED: 01/15/2006 V03
DATE OPENED: 01/19/95
INORG: 4966 PO: F55130

© 2000 SPEX CertiPrep, Inc.

Report of Certification

010242

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:

Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.

The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size

s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)

m = the sub-sampling mass

k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as

X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty

$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level

u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

010243

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLLI2-2X/2Y **Lot No.** 11-120LI

Description: 1000 mg/L Lithium

Matrix: 2% HNO3

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1002 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3129a

The CRM is prepared gravimetrically using high purity Lithium Carbonate Lot# 03021A. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1003 mg/L

Method: Evaporate to dryness Fume with Sulfuric Acid. Ignite and weigh as Li2SO4

Instrumental Analysis by ICP spectrometer: 1001 mg/L

Uncertified Properties:

Density: 1.013 @ 24.6 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	<0.001	Cu	0.02	Pb	0.008
Ag	<0.001	Fe	0.04	Rb	<0.001
As	0.06	Ga	<0.001	Re	<0.001
Bi	<0.001	In	<0.001	Sr	0.004
Be	<0.001	K	<0.20	Sb	0.004
B	<0.001	Li	<0.001	Si	<0.100
Ba	0.004	Mg	0.004	Tl	<0.001
Cr	<0.001	Mo	0.007	Ti	<0.001
Co	<0.001	Mn	0.004	V	0.006
Ca	0.012	Ni	<0.001	Zn	0.03
Cd	<0.001	Na	0.100	Zr	<0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/4/05
DATE EXPIRED: 8/15/10
DATE OPENED: 8/6/05
INORG: 5327 PO: 15243

Date of Certification: AUG - 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010245

SPEXertificate ™

Certificate of Reference Material

Catalog Number: PLMO9-2X/2Y/2T **Lot No.** 11-51MO
Description: 1000 mg/L Molybdenum
Matrix: H2O

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1000 mg/L
Uncertainty Associated with Measurement: +/-3.0 mg/L
Certified Value is Traceable to: NIST SRM #3134

The CRM is prepared gravimetrically using high purity (NH4)6(Mo)7(O)24-4H2OLot# 03011C. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1000 mg/L

Method: Precipitation using 8-Hydroxy Quinoline. Filter, dry, and weigh as MoO2(C9H6NO)2.

Instrumental Analysis by ICP spectrometer: 1001 mg/L
Uncertified Properties:

Density: 09989 @23.7 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
As	0.03	Cu	0.003	Pb	<0.001
Ag	<0.002	Fe	0.110	Rb	<0.001
Al	<0.002	Ga	<0.001	Re	0.030
Ba	<0.001	In	<0.001	Sr	<0.001
Be	<0.002	K	0.060	Sb	<0.001
B	<0.007	Li	<0.003	Si	<0.200
Bi	<0.001	Mn	0.002	Ti	0.003
Cd	<0.100	Mg	<0.001	Tl	<0.001
Ca	0.010	Ni	<0.001	V	0.004
Cr	<0.003	Na	<0.002	Zr	<0.001
Co	<0.001			Zn	0.006

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/4/05
DATE EXPIRED: 8/15/06
DATE OPENED: 8/5/05
INORG: 53260 PO: 152683

Date of Certification: AUG - 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 , and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010247

SPEXertificate ™

Certificate of Reference Material

Catalog Number: PLP9-2X/2Y/2T **Lot No.** 11-90P

Description: 1000 mg/L Phosphorus

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1000 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3139a

The CRM is prepared gravimetrically using high purity (NH4)H2(PO4) Lot# 04941I. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L

Method: Precipitation using Magnesia Mixture. Filter, ignite and weigh as Mg2P2O7.

Instrumental Analysis by ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.000 @ 24.3 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
As	<0.001	Cu	<0.001	Pb	<0.001
Ag	<0.009	Fe	0.02	Re	<0.001
Al	0.02	Ga	<0.001	Rb	<0.001
B	<0.002	In	<0.001	Si	0.01
Be	<0.001	K	<0.20	Sb	0.02
Ba	<0.001	Li	<0.001	Sr	<0.001
Bi	<0.001	Mo	0.002	Ti	0.006
Cr	<0.001	Mn	<0.001	Tl	0.003
Ca	0.025	Mg	0.002	V	<0.001
Cd	<0.001	Ni	<0.001	Zn	0.60
Co	<0.001	Na	0.009	Zr	<0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: _____ Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 4/30/05
DATE EXPIRED: 4/30/09
DATE OPENED: 4/30/05
INORG: 5230 PO: F35205

© 2004 SPEX CertiPrep, Inc.

010248

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010249

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 3/28/05
DATE EXPIRED: 3/31/2006
DATE OPENED: 3/28/05
INORG: 5038 PO: F53148

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLSI9-2X/2Y/2T **Lot No.** 11-33SI

Description: 1000 mg/L Silicon

Matrix: H2O / 0.4% F-

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1001.5 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3150

The CRM is prepared gravimetrically using high purity $(NH_4)_2SiF_6$ Lot# 02021D. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1004 mg/L

Method: Precipitation using Ammonium Molybdate and 8-Hydroxy Quinoline. Filter, dry, and weigh as $(C_9H_7ON)_4[Si(Mo_{12}O_{40})]$

Instrumental Analysis by ICP spectrometer: 999 mg/L

Uncertified Properties:

Density: 1.001 @ 23.7 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.003	Cu	<0.001	Pb	<0.001
Ag	<0.001	Fe	0.02	Rb	<0.001
As	<0.06	Ga	<0.001	Re	<0.001
Ba	<0.001	In	<0.001	Sr	<0.001
Be	<0.001	K	0.14	Sb	<0.001
B	<0.004	Li	0.008	Ti	<0.001
Bi	<0.001	Mo	<0.001	Tl	<0.001
Cd	<0.001	Mg	<0.001	V	<0.001
Ca	0.016	Mn	<0.001	Zn	0.002
Cr	<0.001	Na	0.003	Zr	0.002
Co	<0.001	Ni	<0.004		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: FEB '05 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010250

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA

010251

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 3/08/05
DATE EXPIRED: 3/08/06
DATE OPENED: 3/08/05
INORG: 5040 PO: F55148

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLTI9-2X/2Y/2T **Lot No.** 10-172TI

Description: 1000 mg/L Titanium

Matrix: H2O/ 0.24% F-

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 998 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3162a

The CRM is prepared gravimetrically using high purity (NH4)TiF6 Lot# 02021E. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L

Method: Precipitation using Ammonium Hydroxide. Filter, ignite and weigh as TiO2.

Instrumental Analysis by ICP spectrometer: 997 mg/L

Uncertified Properties:

Density: 1.000 @ 23.7 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.004	Cu	0.04	Pb	<0.001
As	<0.001	Fe	0.002	Rb	<0.001
Ag	<0.001	Ga	<0.001	Re	<0.001
B	<0.004	In	<0.001	Si	3.0
Ba	<0.001	K	<0.10	Sr	<0.001
Be	<0.001	Li	<0.001	Sb	<0.001
Bi	<0.001	Mg	<0.003	Tl	<0.001
Ca	0.012	Mn	<0.001	V	<0.001
Cr	<0.07	Mo	<0.001	Zr	0.004
Cd	<0.001	Na	0.02	Zn	0.004
Co	0.002	Ni	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: FEB '05 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010253

SPEXertificate ™

Certificate of Reference Material

Catalog Number: PLSR2-2X/2Y/2T **Lot No.** 10-130SR

Description: 1000 mg/L Strontium in 2% HNO3

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1000 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3153a

The CRM is prepared gravimetrically using high purity Strontium Carbonate Lot# 09031B. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1000 mg/L

Method: EDTA titration using Methyl Thymol Blue as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumental Analysis by ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.010 @ 23.5 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.002	Cu	<0.001	Pb	<0.001
As	<0.001	Fe	0.006	Rb	<0.001
Ag	<0.001	Ga	<0.001	Re	<0.001
B	<0.001	In	<0.001	Si	0.012
Ba	0.02	K	0.20	Sr	<0.001
Be	<0.001	Li	<0.001	Sb	<0.001
Bi	<0.001	Mg	<0.001	Ti	<0.001
Ca	0.016	Mn	<0.001	Tl	<0.001
Cr	0.003	Mo	<0.001	V	0.003
Cd	<0.001	Na	0.004	Zr	
Co	<0.001	Ni	<0.001	Zn	<0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 5/26/05
DATE EXPIRED: 5/30/06
DATE OPENED: 5/24/05
INORG: 5246 PO: F56180

5246
1 of 2

Date of Certification: MAY - 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001 CERTIFIED

5246
2 of 2

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732 549 7144 • 1 800 LAB SPEX • Fax: 732 603 9647 • CRMS-Inc@spexcsp.com • www.spexcsp.com

010255

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 2/28/05
DATE EXPIRED: 3/28/2006 DK
DATE OPENED: 3/28/05
INORG: 5037 PO: F55146

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLSN5-2X/2Y/2T **Lot No.** 11-45SN

Description: 1000 mg/L Tin

Matrix: 20% HCL

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 997.5 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3161

The CRM is prepared gravimetrically using high purity Tin Metal Lot# 10951C. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L

Method: Precipitation using Ammonium Hydroxide. Filter, ignite, and weigh as SnO2.

Instrumental Analysis by ICP spectrometer: 996 mg/L

Uncertified Properties:

Density: 1.041 @ 22.7 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
As	<0.10	Cu	<0.001	Pb	0.001
Ag	0.004	Fe	0.10	Re	<0.001
Al	0.007	Ga	<0.001	Rb	<0.001
B	<0.001	In	<0.01	Sb	0.002
Ba	<0.001	K	<0.20	Si	0.09
Be	<0.001	Li	<0.001	Sr	<0.001
Bi	<0.001	Mo	<0.001	Ti	<0.001
Co	0.007	Mn	<0.001	Tl	<0.001
Cd	<0.01	Mg	<0.001	V	<0.20
Ca	0.07	Na	0.045	Zn	0.70
Cr	0.007	Ni	0.045	Zr	<0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: FEB '05 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA

010257

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLLA2-2X/2Y **Lot No.** 11-32LA

Description: 1000 mg/L Lanthanum

Matrix: 2% HNO3

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1000 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3127a

The CRM is prepared gravimetrically using high purity Lanthanum Oxide Lot# 11901J. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: EDTA titration using Methyl Thymol Blue as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumental Analysis by ICP spectrometer: 999 mg/L

Uncertified Properties:

Density: 1.011 @ 21.8 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ce	0.007	Lu	<0.001	Tm	<0.001
Ca	12.00	Mn	<0.003	Ti	0.01
Dy	<0.001	Mo	<0.001	Tl	0.02
Er	<0.001	Nd	<0.001	Ta	<0.001
Eu	<0.001	Ni	<0.003	Tb	<0.001
Fe	0.02	Na	0.08	Th	<0.001
Ga	<0.001	Pr	<0.001	V	<0.001
Gd	<0.10	Rb	<0.001	W	<0.001
Hf	<0.001	Sc	0.003	Yb	<0.001
Ho	<0.001	Sm	<0.001	Y	0.003
In	<0.001			Zr	<0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/4/05
DATE EXPIRED: 8/15/06
DATE OPENED: 8/5/06
INORG: 5325 PO: F52423

Date of Certification: AUG - 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010259

SPEXertificate ™

Certificate of Reference Material

Catalog Number: PLPD3-2X/2Y **Lot No.** 9-99PD

Description: 1000 mg/L Palladium

Matrix: 10% HCl

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 999 mg/L

Uncertainty Associated with Measurement: +/-3.0 mg/L

Certified Value is Traceable to: NIST SRM #3138

The CRM is prepared gravimetrically using high purity Palladium Metal Lot# 06021C. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L

Method: Precipitation using Dimethyl Glyoxime. Filter, dry, and weigh as Pd(C4H7O2N2)2.

Instrumental Analysis by ICP spectrometer: 1000 mg/L

Uncertified Properties:

Density: 1.017 @ 24.2 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.002	Fe	0.033	Re	<0.001
Au	0.002	Ga	<0.001	Rh	<0.001
Ag	<0.001	Ir	<0.001	Rb	<0.001
B	<0.001	In	<0.001	Ru	<0.001
Be	<0.001	Mg	0.001	Sn	<0.001
Bi	<0.001	Mn	<0.001	Te	<0.001
Ca	0.006	Na	0.005	Ti	<0.001
Cd	<0.001	Ni	0.001	W	<0.001
Co	<0.001	Pb	0.002	Zr	<0.001
Cr	<0.002	Pt	0.008	Zn	0.06
Cu	0.002				

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN '05 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/17/05
DATE EXPIRED: 01/15/2006 WS
DATE OPENED: 01/19/05
INORG: 4967 PO: F55130

© 2000 SPEX CertiPrep, Inc.

010260

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X = True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i, and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

010261

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 2/8/05
DATE EXPIRED: 3/15/2006 OK
DATE OPENED: 3/7/05
INORG: Sample PO: ESS003

SPEXertificate ™

Certificate of Reference Material

Catalog Number: PLS9-2X/2Y/2T **Lot No.** 11-63S
Description: 1000 mg/L Sulfur
Matrix: H2O

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1001.5 mg/L
Uncertainty Associated with Measurement: +/- 3.0 mg/L
Certified Value is Traceable to: NIST SRM #3154

The CRM is prepared gravimetrically using high purity Ammonium Sulfate Lot# 05891M. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1003 mg/L

Method: Precipitation using Barium Chloride: Filter, ignite and weigh as BaSO4.

Instrumental Analysis by ICP spectrometer: 1000 mg/L
Uncertified Properties:

Density: 1000 @ 23.2 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ag	<0.001	Cu	<0.001	Pb	<0.001
Al	<0.001	Fe	0.01	Re	<0.001
As	<0.001	Ga	<0.001	Rb	<0.001
Be	<0.002	In	<0.001	Si	0.033
Ba	<0.001	K	0.009	Sb	<0.001
B	<0.001	Li	<0.001	Sr	<0.001
Bi	<0.001	Mg	0.004	Ti	<0.001
Cd	<0.001	Mn	<0.001	Tl	0.02
Co	<0.001	Mo	<0.001	V	<0.002
Ca	0.015	Na	0.01	Zn	0.03
Cr	<0.005	Ni	<0.001	Zr	<0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUL - 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010262

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLTH2-2X/2Y **Lot No.** 11-82TH

Description: 1000 mg/L Thorium

Matrix: 2% HNO3

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1000 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3159

The CRM is prepared gravimetrically using high purity Th(NO3)4-4H2O Lot# 01851R. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: EDTA titration using Xylenol Orange as indicator. EDTA standardized against Pb(NO3)2 NIST SRM #928.

Instrumental Analysis by ICP spectrometer: 999 mg/L

Uncertified Properties:

Density: 1.010 @ 24.1 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ca	<0.02	Lu	<0.001	Th	<0.001
Ce	0.01	La	0.003	Tb	<0.001
Dy	<0.001	Mo	<0.001	Tm	<0.001
Er	<0.001	Mn	<0.001	Ta	<0.001
Eu	<0.001	Na	0.04	Tl	<0.001
Fe	<0.01	Nd	0.003	Ti	<0.001
Gd	<0.001	Ni	<0.001	V	<0.001
Ga	<0.001	Pr	<0.001	W	<0.001
Hf	<0.001	Rb	<0.001	Y	0.002
Ho	<0.0001	Sm	<0.001	Yb	<0.001
In	<0.001	Sc	<0.001	Zr	0.001

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 8/31/05
DATE EXPIRED: 8/30/06 (P)
DATE OPENED: 8/31/05
INORG: 53658 PO: DA04005

Date of Certification: AUG - 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010264

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLU2-2X/2Y **Lot No.** 11-124U

Description: 1000 mg/L Uranium

Matrix: 2% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1000 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3164

The CRM is prepared gravimetrically using high purity Triuranium Octaoxide Lot# 04001D. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L

Method: Evaporate to dryness. Ignite and weigh as U3O8.

Instrumental Analysis by ICP spectrometer: 999 mg/L

Uncertified Properties:

Density: 1.009 @ 23.9 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.01	Cu	0.01	Pb	0.04
Ag	<0.005	Fe	0.20	Re	<0.001
As	0.05	Ga	<0.001	Rb	<0.001
Bi	<0.001	In	<0.001	Si	<0.01
Ba	0.005	K	0.03	Sb	0.004
Be	<0.001	Li	<0.001	Sr	0.003
B	<0.001	Mg	0.003	Tl	0.001
Ca	0.05	Mn	0.004	Ti	0.006
Cd	<0.001	Mo	0.006	V	0.005
Co	0.001	Ni	<0.001	Zr	<0.003
Cr	<0.002	Na	0.10	Zn	0.007

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 4/30/05
DATE EXPIRED: 4/30/06
DATE OPENED: 4/30/05
INORG: 5279 PO: 135205

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification:_____ Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010266

SPEXertificate ™

Certificate of Reference Material

Catalog Number: PLW9-2X/2Y **Lot No.** 11-83W

Description: 1000 mg/L Tungsten

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1003 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3163

The CRM is prepared gravimetrically using high purity Ammonium Tungstate Lot# M0600W. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1002 mg/L

Method: Fume with Sulfuric Acid to dryness. Ignite and weigh as WO3.

Instrumental Analysis by ICP spectrometer: 1003 mg/L

Uncertified Properties:

Density: 1.000 @ 19.6 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Ag	<0.005	Cu	<0.001	Pb	<0.001
Al	0.006	Fe	0.001	Rb	<0.001
As	0.003	Ga	<0.001	Re	0.006
B	<0.003	In	<0.001	Sr	<0.001
Be	<0.001	K	<0.10	Sb	<0.001
Bi	<0.001	Li	<0.001	Si	0.52
Ba	<0.001	Mo	<0.001	Tl	<0.001
Ca	0.005	Mn	<0.001	Ti	<0.001
Cr	<0.001	Mg	<0.001	V	<0.001
Cd	<0.001	Ni	<0.001	Zr	<0.001
Co	<0.001	Na	0.09	Zn	0.005

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 7/26/05
DATE EXPIRED: 7/30/06
DATE OPENED: 7/26/05
INORG: 5341 PO: 155213

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUL - 2005 Certifying Officer: N. Kochetakota

© 2004 SPEX CertiPrep, Inc.

010267

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010268

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 2/28/05
DATE EXPIRED: 2/28/07 DK
DATE OPENED: 2/28/05
INORG: 5039 PO: F55748

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLZR2-2X/2Y/2T **Lot No.** 11-69ZR

Description: 1000 mg/L Zirconium

Matrix: 2% HNO3

This ASSURANCE ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1004 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM #3169

The CRM is prepared gravimetrically using high purity Zirconyl Nitrate Lot# 02041A. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1004 mg/L

Method: Fume with Sulfuric Acid to dryness. Ignite and weigh as ZrO2.

Instrumental Analysis by ICP spectrometer: 1004 mg/L

Uncertified Properties:

Density: 1.011 @ 22.6 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
As	<0.001	Cu	<0.001	Pb	<0.001
Ag	0.03	Fe	0.02	Re	<0.001
Al	0.004	Ga	<0.001	Rb	<0.001
Ba	<0.002	In	<0.001	Sb	<0.001
Be	<0.001	K	<0.20	Sr	<0.001
Bi	0.15	Li	<0.001	Si	<0.10
B	<0.004	Mn	<0.001	Tl	<0.001
Cr	<0.001	Mg	<0.001	Ti	<0.003
Cd	<0.001	Mo	<0.001	V	<0.001
Co	<0.002	Ni	<0.001	Zn	0.001
Ca	<0.001	Na	0.004		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: FEB '05 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010269

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA

010270

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 1/31/05
DATE EXPIRED: 1/30/2006
DATE OPENED: 1/31/05
INORG: 4998 PO: E55139

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLNA2-3X/3Y **Lot No.** V9-56NA

Description: 10,000 mg/L Sodium

Matrix: 5% HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 9984 mg/L

Uncertainty Associated with Measurement: +/- 30.0 mg/L

Certified Value is Traceable to: NIST SRM # 3152a

The CRM is prepared gravimetrically using high purity Sodium Carbonate Lot# 05031C. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 9983 mg/L

Method: Evaporate to dryness. Fume with Sulfuric Acid. Ignite and weigh as Na2SO4.

Instrumental Analysis by ICP spectrometer: 9985 mg/L

Uncertified Properties:

Density: 1.048 @ 23.1 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	<0.001	Cu	0.01	Pb	0.009
As	<0.01	Fe	0.02	Re	<0.001
Ag	<0.02	Ga	<0.001	Rb	<0.001
B	<0.05	In	<0.001	Sr	<0.002
Ba	0.01	K	2.50	Sb	<0.001
Be	<0.009	Li	<0.002	Si	0.14
Bi	0.001	Mg	0.20	Ti	<0.02
Ca	0.75	Mn	0.001	Tl	<0.001
Cr	<0.02	Mo	<0.001	V	0.002
Cd	<0.001	Ni	<0.006	Zr	<0.01
Co	<0.001			Zn	0.02

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN -- 2005 Certifying Officer: N. Kocherlakota

© 2000 SPEX CertiPrep, Inc.

010271

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

010272

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 12/08/04
DATE EXPIRED: 11/30/2005 WS
DATE OPENED: 12/08/04
INORG: 4969 PO: F55169

SPEXertificate™

Certificate of Reference Material

Catalog Number: ICV-2A **Lot No.:** 6-114MS
Description: **Initial Calibration Verification Standard II**
Matrix: 5% Nitric Acid

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentration.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Measured (mg/L)	NIST SRM	Element	Labeled (mg/L)	Measured (mg/L)	NIST SRM
Ca	2,000	1,995.81	3109a	Ni	500	499.54	3136
K	2,000	1,995.56	3141a	V	500	499.79	3165
Mg	2,000	1,995.61	3131a	Cr	200	199.97	3112a
Na	2,000	1,995.63	3152a	Cu	200	199.98	3114
Al	1,000	989.06	3101a	Ag	100	99.44	3151
Ba	1,000	999.68	3104a	Be	100	99.16	3105a
Fe	1,000	995.89	3126a	Mn	100	100.03	3132
Co	500	500.41	3113	Zn	100	100.06	3168a

Spex Reference Multi: Lot # 1-58GM, 15-37AS, 11-171AS REF

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the certified concentrations with no single component exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: NOV '04 Certifying Officer: N. Kocherlakota

© 2000 SPEX CertiPrep, Inc.

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

010274

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 12/09/04
DATE EXPIRED: 11/30/2005 WX
DATE OPENED: 12/09/04
INORG: 4911 PO: F55102

SPEXertificate™

Certificate of Reference Material

Catalog Number: PLSB7-2X/2Y/2T **Lot No.** 10-43SB
Description: 1000 mg/L Antimony
Matrix: H2O/0.6Tart.Acid/tr.HNO3

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1004 mg/ L
Uncertainty Associated with Measurement: +/-3.0mg/L
Certified Value is Traceable to: NIST SRM 3102a

The CRM is prepared gravimetrically using high purity Antimony Metal Lot# 04021A. The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1005 mg/L

Method: Evaporate to dryness. Fume with Nitric Acid. Ignite and weigh as Sb2O4.

Instrumental Analysis by ICP spectrometer: 1002 mg/ L
Uncertified Properties:

Density: 1.046 @ 25.5 Degrees Celsius

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L	Element	mg/L
Al	0.03	Cu	0.002	Pb	0.009
As	<0.001	Fe	0.03	Rb	<0.001
Ag	<0.001	Ga	<0.001	Re	<0.001
B	<0.004	In	<0.001	Sr	<0.001
Ba	<0.001	K	0.01	Si	<0.01
Be	<0.001	Li	<0.001	Ti	<0.003
Bi	0.002	Mg	0.005	Tl	<0.001
Ca	0.14	Mn	<0.001	V	<0.001
Cr	<0.002	Mo	<0.001	Zr	<0.001
Cd	<0.001	Na	0.005	Zn	0.02
Co	<0.001	Ni	<0.001		

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: NOV '04 Certifying Officer: N. Kocherakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

010275

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010276

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 12/03/04
DATE EXPIRED: 11/30/2005 MS
DATE OPENED: 12/03/04
INORG: 4910 PO: F55102

SPEXertificate™

Certificate of Reference Material

Catalog Number: ICV-2C **Lot No.:** 6-146MS
Description: **Initial Calibration Verification Standard II**
Matrix: 5% Nitric Acid

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single element concentrates of individual elements using Class A laboratory ware to give precise concentration.

Refer to side 2 for details of measurement uncertainties.

Instrumental Analysis by ICP Spectrometer:

Element	Labeled (mg/L)	Measured (mg/L)	NIST SRM
As	500	499.69	3103a
Pb	500	499.61	3128
Se	500	499.91	3149
TL	500	499.92	3158
Cd	100	99.90	3108

Spex Reference Multi: Lot #9-34AS, 11-173AS, 1-57GM, 15-39AS REF.

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the certified concentrations with no single element exceeding +/- 2%. This includes uncertainty of measurements and other effects, such as transpiration losses. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: NOV '04 Certifying Officer: N. Kocherakota

© 2000 SPEX CertiPrep, Inc.

Report of Certification

010277

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

010278

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 **DESCRIPTION OF CRM** Custom-Grade **10000 µg/mL Aluminum in 5% (abs) HNO_3**

Catalog Number:	CGAL10-1, CGAL10-2, and CGAL10-5
Lot Number:	**X-AL04021**
Starting Material:	Al metal
Starting Material Purity (%):	99.997990
Starting Material Lot No	607116
Matrix:	5% (abs) HNO_3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 10,030 ± 19 µg/mL

Certified Density: 1.071 g/mL (measured at 22° C)

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$ — $(\bar{x})$ = mean; x_i = individual results; n = number of measurements

Uncertainty $(\pm) = 2[(\Sigma s_i)/(n)^{1/2}]^{1/2}$ — Σs_i = The summation of all significant estimated errors. (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

☐ "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

☐ This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **10,030 ± 19 µg/mL**
ICP Assay NIST SRM 3101a Lot Number: 010808

Assay Method #2 **10,022 ± 21 µg/mL**
EDTA NIST SRM 928 Lot Number: 392110

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 9/23/05
DATE EXPIRED: 10/1/06
DATE OPENED: 9/27/05
INORG: 5405 PO: D2006/0435

pg. 1 of 1
5405

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

s	Al		M	Dy	< 0.03378	O	Li	< 0.00020	M	Pr	< 0.00169	M	Te	< 0.16892
M	Sb	< 0.00282	M	Er	< 0.02815	M	Lu	< 0.00225	M	Re	< 0.00563	M	Tb	< 0.00169
M	As	< 0.05631	M	Eu	< 0.01689	O	Mg	0.00498	M	Rh	< 0.00563	M	Tl	< 0.00563
M	Ba	< 0.05631	M	Gd	< 0.00563	M	Mn	< 0.02252	M	Rb	< 0.00563	M	Th	< 0.00563
O	Be	< 0.00017	M	Ga	< 0.00563	O	Hg	< 0.00700	M	Ru	< 0.01126	M	Tm	< 0.00225
M	Bi	< 0.00225	M	Ge	< 0.03378	M	Mo	< 0.01126	M	Sm	< 0.00563	M	Sn	< 0.02815
O	B	0.01173	M	Au	< 0.01689	M	Nd	< 0.01126	M	Sc	< 0.05631	O	Ti	0.00213
M	Cd	< 0.01689	M	Hf	< 0.01126	O	Ni	< 0.00600	M	Se	< 0.04505	M	W	< 0.05631
O	Ca	0.01013	M	Ho	< 0.00282	M	Nb	< 0.00282	O	Si	0.07462	M	U	< 0.01126
M	Ce	< 0.02815	M	In	< 0.05631	n	Os		M	Ag	< 0.01126	M	V	< 0.01126
M	Cs	< 0.00169	M	Ir	< 0.02815	M	Pd	< 0.02815	O	Na	0.06396	M	Yb	< 0.00563
O	Cr	0.00533	O	Fe	0.00586	O	P	< 0.03000	M	Sr	< 0.00282	M	Y	< 0.22523
M	Co	< 0.01689	M	La	< 0.00282	M	Pt	< 0.01126	O	S	< 0.10000	M	Zn	0.00450
M	Cu	< 0.03378	M	Pb	< 0.01689	O	K	0.01208	M	Ta	< 0.03942	M	Zr	< 0.02815

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4 °C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 26.98154; +3; 6; $Al(H_2O)_6^{+3}$

Chemical Compatibility - Soluble in HCl, HNO_3, HF and H_2SO_4. Avoid neutral media. Soluble in strongly basic NaOH forming the $Al(OH)_4(H_2O)_2^{1-}$ species. Stable with most metals and inorganic anions. The phosphate is insoluble in water and only slightly soluble in acid.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO_3 / LDPE container.

Al Containing Samples (Preparation and Solution) - Metal (Best dissolved in HCl / HNO_3); α- Al_2O_3 (Na_2CO_3 fusion in Pt^0);
γ- Al_2O_3 (Soluble in acids such as HCl); Ores (Carbonate fusion in Pt^0 followed by HCl dissolution);
Organic Matrices (sulfuric/peroxide digestion or nitric / sulfuric / perchloric acid decomposition, or dry ash and dissolution in dilute HCl.

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 394.401 nm	0.05 / 0.006 µg/mL	1	atom	U, Ce
ICP-OES 396.152 nm	0.03 / 0.006 µg/mL	1	atom	Mo, Zr, Ce
ICP-OES 167.078 nm	0.1 / 0.009 µg/mL	1	ion	Fe
ICP-MS 27 amu	30 ppt	n/a	M^+	$^{12}C^{15}N$, $^{13}C^{14}N$, $^{1}H^{12}C^{14}N$, $^{11}B^{16}O$, $^{54}Cr^{2+}$, $^{54}Fe^{2+}$

8.0 HAZARDOUS INFORMATION

- Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY

- This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105**
Recognized by:
Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)
Members of IQ Net International Certification Network:
Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter), Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 **ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration"**
- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers"**
- Reference Materials Production - Accredited A2LA Certificate Number 883.02
A2LA Mutual Recognition Agreement Partners:
Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 **10CFR50 Appendix B - Nuclear Regulatory Commission**
- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance**

10.6 **MIL-STD-45662A (Obsolete/Observed)**

3 of 4
5405

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

010281

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: December 28, 2004

Expiration Date: EXPIRES 1 2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Nick Maida, QA Administrator — Nicholas Maida

Certificate Approved By: Katalin Le, QC Manager — Katalin Le

Certifying Officer: Paul Gaines, Chemist, Senior Technical Director — Paul R Gaines

010282

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: **Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 DESCRIPTION OF CRM Custom-Grade ***10000 µg/mL Calcium in 1.4% (abs) HNO3***

Catalog Number:	CGCA10-1, CGCA10-2, and CGCA10-5
Lot Number:	**X-CA03030**
Starting Material:	CaO
Starting Material Purity (%):	99.999155
Starting Material Lot No	C27L01
Matrix:	1.4% (abs) HNO_3

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 11/27/05
DATE EXPIRED: 3/1/06 DR
DATE OPENED: 11/28/05
INORG: 4988 PO: F55133

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 10,035 ± 24 µg/mL

Certified Density: 1.037 g/mL (measured at 22° C)

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum S$ = The summation of all significant estimated errors. (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

☐ "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

☐ This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **10,035 ± 24 µg/mL**
EDTA NIST SRM 928 Lot Number: 392110

Assay Method #2 **10,046 ± 65 µg/mL**
ICP Assay NIST SRM 3109a Lot Number: 000622

1 of 4
4988

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.00069	M	Dy	< 0.04098	O	Li	< 0.00002	M	Pr	< 0.00205	M	Te	< 0.20492
M	Sb	< 0.00342	M	Er	< 0.03415	M	Lu	< 0.00273	M	Re	< 0.00683	M	Tb	< 0.00205
M	As	< 0.06831	M	Eu	< 0.02049	O	Mg	0.05295	M	Rh	< 0.00683	M	Tl	< 0.00683
O	Ba	0.00065	M	Gd	< 0.00683	O	Mn	0.00038	M	Rb	< 0.00683	M	Th	< 0.00683
O	Be	< 0.00009	M	Ga	< 0.00683	O	Hg	< 0.01100	M	Ru	< 0.01366	M	Tm	< 0.00273
M	Bi	< 0.00273	M	Ge	< 0.04098	M	Mo	< 0.01366	M	Sm	< 0.00683	M	Sn	< 0.03415
O	B	< 0.00054	M	Au	< 0.02049	M	Nd	< 0.01366	O	Sc	< 0.00002	M	Ti	< 0.34153
O	Cd	< 0.00450	M	Hf	< 0.01366	O	Ni	< 0.00230	O	Se	< 0.00620	M	W	< 0.06831
s	Ca		M	Ho	< 0.00342	M	Nb	< 0.00342	O	Si	0.00132	M	U	< 0.01366
M	Ce	< 0.03415	O	In	< 0.00200	n	Os		M	Ag	< 0.01366	O	V	< 0.00090
M	Cs	< 0.00205	M	Ir	< 0.03415	M	Pd	< 0.03415	O	Na	0.01000	M	Yb	< 0.00683
O	Cr	0.00103	O	Fe	< 0.00110	O	P	< 0.00480	O	Sr	0.03530	M	Y	< 0.27323
O	Co	< 0.00120	M	La	< 0.00342	M	Pt	< 0.01366	O	S	0.00412	O	Zn	0.02353
O	Cu	< 0.00400	M	Pb	< 0.02049	O	K	< 0.00170	M	Ta	< 0.04782	M	Zr	< 0.03415

M - Checked by ICP-MS O - Checked by ICP-OES I - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

2 of 4
4988

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 40.078; +2; 6; $Ca(H_2O)_6^{+2}$

Chemical Compatibility - Soluble in HCl and HNO_3. Avoid H_2SO_4, HF, H_3PO_4 and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate and tungstate in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-10% HNO_3 / LDPE container.

Ca Containing Samples (Preparation and Solution) - Metal (best dissolved in diluted HNO_3); Ores (Carbonate fusion in Pt* followed by HCl dissolution); Organic Matrices (dry ash and dissolution in dilute HCl. Do not heat when dissolving to avoid precipitation of SiO_2) .The oxide, hydroxide, carbonate, phosphate, and fluoride of calcium are soluble in % levels of HCl or HNO_3. The sulfates (gypsum, anhydrite, etc.), certain silicates and complex compounds require fusion with Na_2CO_3 followed by HCl / water dissolution. Contamination is a very real problem when analyzing for trace levels.

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line		Estimated D.L.	Order	Type	Interferences (underlined indicates severe at* concs.)
ICP-OES	393.366 nm	0.0002 / 0.00004 µg/mL	1	ion	U, Ce
ICP-OES	396.847 nm	0.0005 / 0.00006 µg/mL	1	ion	Th
ICP-OES	422.673 nm	0.01 / 0.001 µg/mL	1	atom	Ge
ICP-MS	44 amu	1200 ppt	n/a	M'	$^{16}O_2$, ^{12}C, $^{28}Si^{16}O$, $^{44}Sr^{2+}$

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105

Recognized by:
Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:
Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter) , Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:
Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

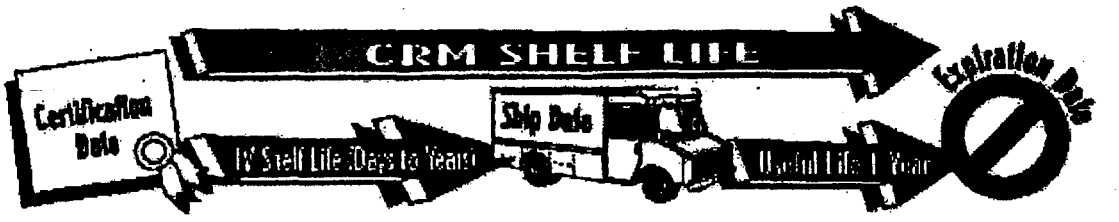
10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

364
4968

010285

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY



11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: September 20, 2004

Expiration Date: EXPIRES 1 F 2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Nick Malda, QA Administrator	Nicholas Malda
Certificate Approved By:	Katalin Le, QC Manager	Katalin Le
Certifying Officer:	Paul Gaines, Chemist, Senior Technical Director	Paul R Gaines

4 of 4
4988

010286

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 **DESCRIPTION OF CRM** Custom-Grade **10000 µg/mL Iron in 4.8% (abs) HNO_3**

Catalog Number:	CGFE10-1, CGFE10-2, and CGFE10-5
Lot Number:	**X-FE03041**
Starting Material:	Fe metal
Starting Material Purity (%):	99.998667
Starting Material Lot No	23387
Matrix:	4.8% (abs) HNO_3

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 2/28/05
DATE EXPIRED: 3/1/2006
DATE OPENED: 2/28/05
INORG: 5048 PO: F55148

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 10,041 ± 21 µg/mL

Certified Density: 1.061 g/mL (measured at 22° C)

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

Uncertainty $(\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
$\sum S$ = The summation of all significant estimated errors. (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **10,041 ± 21 µg/mL**
EDTA NIST SRM 928 Lot Number: 880710

Assay Method #2 **10,017 ± 40 µg/mL**
ICP Assay NIST SRM 3126a Lot Number: 000606

5048
1 of 4

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O Al < 0.00270	M Dy < 0.02528	O Li < 0.00003	M Pr < 0.00126	M Te < 0.12640
M Sb < 0.00211	M Er < 0.02107	M Lu < 0.00169	M Re < 0.00421	M Tb < 0.00126
M As < 0.04213	M Eu < 0.01264	O Mg < 0.00006	M Rh < 0.00421	M Tl < 0.00421
M Ba < 0.04213	M Gd < 0.00421	O Mn < 0.05000	M Rb < 0.00421	M Th < 0.00421
O Be < 0.00005	M Ga < 0.00421	O Hg < 0.01100	M Ru < 0.00843	M Tm < 0.00169
M Bi < 0.00169	I Ge	M Mo < 0.00843	M Sm < 0.00421	M Sn < 0.02107
O B < 0.00090	M Au < 0.01264	M Nd < 0.00843	M Sc < 0.04213	M Ti < 0.21066
M Cd < 0.01264	M Hf < 0.00843	O Ni < 0.00230	M Se < 0.03371	M W < 0.04213
O Ca 0.03107	M Ho < 0.00211	M Nb < 0.00211	O Si 0.01673	M U < 0.00843
M Ce < 0.02107	M In < 0.04213	n Os	M Ag < 0.00843	M V < 0.00843
M Cs < 0.00126	M Ir < 0.02107	M Pd < 0.02107	O Na 0.00956	M Yb < 0.00421
M Cr < 0.02107	s Fe	I P	M Sr < 0.00211	M Y < 0.16853
O Co 0.01195	M La < 0.00211	M Pt < 0.00843	O S < 0.07200	M Zn 0.08761
M Cu < 0.02528	M Pb < 0.01264	O K 0.00239	M Ta < 0.02949	M Zr < 0.02107

M - Checked by ICP-MS O - Checked by ICP-OES I - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

5048
2 of 4

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 55.847; +3; 6; $Fe(H_2O)_6^{3+}$

Chemical Compatibility - Stable in HCl, HNO_3, H_2SO_4, HF and H_3PO_4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

Fe Containing Samples (Preparation and Solution) - Metal (Soluble in HCl); Oxides (If the oxide has been at a high temperature then Na_2CO_3 fusion in Pt* followed by HCl dissolution otherwise dissolve in dilute HCl); Ores (See Oxides above using only the fusion approach).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line		Estimated D.L.	Order	Type	Interferences (underlined indicates severe at ≈ concs.)
ICP-OES	238.204 nm	0.005 / 0.001 µg/mL	1	ion	Ru, Co
ICP-OES	239.562 nm	0.005 / 0.001 µg/mL	1	ion	Co, W, Cr
ICP-OES	259.940 nm	0.005 / 0.001 µg/mL	1	ion	Hf, Nb
ICP-MS	56 amu	970 ppt	n/a	M+	$^{40}Ar^{16}N^{1}H$, $^{40}Ar^{16}O$, $^{38}Ar^{18}O^{1}H$, $^{38}Ar^{18}O$, $^{37}Cl^{18}O^{1}H$, $^{40}Ca^{16}O$

8.0 HAZARDOUS INFORMATION

- Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY

- *This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.*

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105

Recognized by:

Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:

Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter), Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:

Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

010289

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: July 22, 2004

Expiration Date: EXPIRES 1 MAR 2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Nick Malda, QA Administrator	Nicholas Malda
Certificate Approved By:	Katalin Le, QC Manager	Katalin Le
Certifying Officer:	Paul Gaines, Chemist, Senior Technical Director	Paul R Gaines

5048
4 of 4

010290

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 **DESCRIPTION OF CRM** Custom-Grade **10000 µg/mL Potassium in 1.4% (abs) HNO_3**

Catalog Number:	CGK10-1, CGK10-2, and CGK10-5
Lot Number:	**X-K02116**
Starting Material:	KNO3
Starting Material Purity (%):	99.996753
Starting Material Lot No	K18J19
Matrix:	1.4% (abs) HNO_3

INORGANIC LABS/RADCHEM LABS Pg. 1 of 2
DATE RECEIVED: 12/02/04
DATE EXPIRED: 12/01/2005 yes
DATE OPENED: 12/02/04
INORG: 4907 PO: E55102

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 9957 ± 28 µg/mL

Certified Density: 1.023 g/mL (measured at 22° C)

The Certified Value is the instrument analysis value. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
$\sum S$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

☐ "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

☐ This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **10,011 ± 16 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

Assay Method #2 **9957 ± 28 µg/mL**
ICP Assay NIST SRM 3141a Lot Number: 891312

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O Al < 0.00090	M Dy < 0.02426	O Li < 0.00003	M Pr < 0.00121	M Te < 0.12131
M Sb < 0.00202	M Er < 0.02022	M Lu < 0.00162	M Re < 0.00404	M Tb < 0.00121
M As < 0.04044	M Eu < 0.01213	O Mg 0.00109	M Rh < 0.00404	M Tl < 0.00404
M Ba < 0.04044	M Gd < 0.00404	O Mn < 0.00003	M Rb 0.63001	M Th < 0.00404
O Be < 0.00020	M Ga < 0.00404	O Hg < 0.01500	M Ru < 0.00809	M Tm < 0.00162
M Bi < 0.00162	O Ge < 0.00150	M Mo < 0.00809	M Sm < 0.00404	M Sn < 0.02022
O B < 0.00060	O Au < 0.00300	M Nd < 0.00809	O Sc < 0.00002	O Ti < 0.00070
M Cd < 0.01213	M Hf < 0.00809	O Ni < 0.00230	O Se < 0.05000	M W < 0.04044
O Ca 0.01360	M Ho < 0.00202	M Nb < 0.00202	O Si < 0.00340	M U < 0.00809
M Ce < 0.02022	M In < 0.04044	n Os	M Ag < 0.00809	O V < 0.00090
M Cs 0.00050	M Ir < 0.02022	M Pd < 0.02022	O Na 0.19537	M Yb < 0.00404
M Cr < 0.02022	O Fe 0.00297	O P < 0.00250	M Sr < 0.00202	M Y < 0.16175
M Co < 0.01213	M La < 0.00202	M Pt < 0.00809	O S < 0.07200	O Zn < 0.00020
M Cu < 0.02426	M Pb < 0.01213	S K	M Ta < 0.02831	M Zr < 0.02022

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 29.0983; +1; (6); $K^+(aq)$
(Coordination Number in parentheses is assumed, not certain.)

Chemical Compatibility - Soluble in HCl, HNO_3, H_2SO_4 and HF aqueous matrices. Avoid use of $HClO_4$ due to insolubility of the perchlorate. Stable with all metals and inorganic anions except ClO_4^-.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

K Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Sodium carbonate fusion in Pt[a] followed by HCl dissolution-blank levels of K in sodium carbonate critical); Organic Matrices (Sulfuric/peroxide digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe at ≈ concs.)
ICP-OES 766.490 nm	0.4 / 0.001 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES 771.531 nm	1.0 / 0.03 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES 404.721 nm	1.1 / 0.05 µg/mL	1	atom	U, Ce,
ICP-MS 39 amu	10 ppt	n/a	M+	$^{38}ArH^+$, $^{23}Na^{16}O^+$, $^{78}Se^{++}$

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105
Recognized by:
Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)
Members of IQ Net International Certification Network:
Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter) , Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02
A2LA Mutual Recognition Agreement Partners:
Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 *10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities*

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: March 30, 2004

Expiration Date:

EXPIRES
12/2005

INORGANIC LABS/RADCHEM LABS Pg 2 of 2
DATE RECEIVED: 12/02/04
DATE EXPIRED: 12/01/2005 vos
DATE OPENED: 12/02/04
INORG: 4907 PO: F55102

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	JoAnn Struthers, QA Administrative Assistant	JoAnn Struthers
Certificate Approved By:	Katalin Le, QC Manager	Katalin Le
Certifying Officer:	Paul Gaines, Chemist, Senior Technical Director	Paul R Gaines

010294

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 **DESCRIPTION OF CRM** Custom-Grade **10000 µg/mL Magnesium in 1.4% (abs) HNO_3**

Catalog Number:	CGMG10-1, CGMG10-2, and CGMG10-5
Lot Number:	**X-MG03018**
Starting Material:	Mg metal
Starting Material Purity (%):	99.994984
Starting Material Lot No	91191
Matrix:	1.4% (abs) HNO_3

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 10,039 ± 31 µg/mL

Certified Density: 1.051 g/mL (measured at 22° C)

The Certified Value is the instrument analysis value. The following equations are used in the calculation of the certified value and the uncertainty:

Certified Value ($\bar{x}$) = $\frac{\sum x_i}{n}$

Uncertainty (±) = $\frac{2[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
$\sum S$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

☐ "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

☐ This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **10,039 ± 31 µg/mL**
ICP Assay NIST SRM 3131a Lot Number: 991107

Assay Method #2 **10,079 ± 21 µg/mL**
EDTA NIST SRM 928 Lot Number: 880710

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 7/22/05
DATE EXPIRED: 8/1/06
DATE OPENED: 7/22/05
INORG: 5312 PO: F55213

Pg. 1 of 4
5312

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.04714	M	Dy	< 0.03601	O	Li	0.00623	M	Pr	< 0.00180	M	Te	< 0.18002
M	Sb	< 0.00300	M	Er	< 0.03000	M	Lu	< 0.00240	M	Re	< 0.00600	M	Tb	< 0.00180
M	As	< 0.06001	M	Eu	< 0.01800	s	Mg		M	Rh	< 0.00600	M	Tl	< 0.00600
M	Ba	< 0.06001	M	Gd	< 0.00600	O	Mn	0.07408	M	Rb	< 0.00600	M	Th	< 0.00600
O	Be	< 0.00017	M	Ga	< 0.00600	O	Hg	< 0.00900	M	Ru	< 0.01200	M	Tm	< 0.00240
M	Bi	< 0.00240	M	Ge	< 0.03601	M	Mo	< 0.01200	M	Sm	< 0.00600	M	Sn	< 0.03000
O	B	0.00303	M	Au	< 0.01800	M	Nd	< 0.01200	M	Sc	< 0.06001	O	Ti	0.09765
M	Cd	< 0.01800	M	Hf	< 0.01200	O	Ni	0.01229	M	Se	< 0.04801	M	W	< 0.06001
O	Ca	0.14984	M	Ho	< 0.00300	M	Nb	< 0.00300	O	Si	0.02357	M	U	< 0.01200
M	Ce	< 0.03000	M	In	< 0.06001	n	Os		M	Ag	< 0.01200	M	V	< 0.01200
M	Cs	< 0.00180	M	Ir	< 0.03000	M	Pd	< 0.03000	O	Na	0.02189	M	Yb	< 0.00600
O	Cr	0.02189	O	Fe	0.03704	O	P	< 0.01600	M	Sr	< 0.00300	M	Y	0.02021
M	Co	< 0.01800	M	La	< 0.00300	M	Pt	< 0.01200	n	S		O	Zn	0.00572
O	Cu	0.00674	O	Pb	0.02694	O	K	< 0.05000	M	Ta	< 0.04201	M	Zr	< 0.03000

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 24.305; +2; 6; $Mg(H_2O)_6^{+2}$

Chemical Compatibility - Soluble in HCl, HNO_3, and H_2SO_4 avoid HF, H_3PO_4 and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicates, carbonates, hydroxides, oxides, and tungstates in neutral and slightly acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-10% HNO_3 / LDPE container.

Mg Containing Samples (Preparation and Solution) - Metal (Best dissolved in diluted HNO_3); Oxide (Readily soluble in above compatible aqueous acidic solutions); Ores (Carbonate fusion in Pt[a] followed by HCl dissolution); Organic Matrices (Sulfuric / peroxide digestion or nitric / sulfuric / perchloric acid decomposition, or dry ash and dissolution in dilute HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line		Estimated D.L.	Order	Type	Interferences (underlined indicates severe at ≈ concs.)
ICP-OES	279.553 nm	0.0002 / 0.00003 µg/mL	1	ion	Th
ICP-OES	280.270 nm	0.0003 / 0.00005 µg/mL	1	ion	U, V
ICP-OES	285.213 nm	0.002 / 0.00003 µg/mL	1	atom	U, Hf, Cr, Zr
ICP-MS	24 amu	42 ppt	n/a	M[+]	$^{7}Li^{16}O$, $^{48}Ti^{12}$, $^{48}Ca^{12}$

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010106

Recognized by:

Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:

Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter), Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:

Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

010297

11.1 IV Shelf Life - *The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range.* Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: April 15, 2004

Expiration Date:

EXPIRES
1\02006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	JoAnn Struthers, QA Administrative Assistant	JoAnn Struthers
Certificate Approved By:	Katalin Le, QC Manager	Katalin Le
Certifying Officer:	Paul Gaines, Chemist, Senior Technical Director	Paul R Gaines

010298

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 DESCRIPTION OF CRM

Custom-Grade **10000 µg/mL Sodium in 1.4% (abs) HNO3**

Catalog Number:	CGNA10-1, CGNA10-2, and CGNA10-5
Lot Number:	**X-QNA02148**
Starting Material:	Na2CO3
Starting Material Purity (%):	99.999819
Starting Material Lot No:	42063
Matrix:	1.4% (abs) HNO3

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 10,006 ± 6 µg/mL

Certified Density: 1.032 g/mL (measured at 22° C)

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

Certified Value $(\bar{x}) = \frac{\sum x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty $(\pm) = \frac{2[(\sum_{s_i})^2]^{1/2}}{(n)^{1/2}}$

$\sum_{s_i}$ = The summation of all significant estimated errors. (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This IV product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **10,019 ± 33 µg/mL**
ICP Assay NIST SRM 3152a Lot Number: 990907

Assay Method #2 **10,006 ± 6 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 7/22/05
DATE EXPIRED: 8/1/06
DATE OPENED: 7/22/05
INORG: 5310 PO: F55213

1 of 4
5310

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	< 0.00090	M	Dy	< 0.00600	O	Li	< 0.00003	M	Pr	< 0.00030	M	Te	< 0.02998
M	Sb	< 0.00050	M	Er	< 0.00500	M	Lu	< 0.00040	M	Re	< 0.00100	M	Tb	< 0.00030
M	As	< 0.00999	M	Eu	< 0.00300	O	Mg	0.00010	M	Rh	< 0.00100	M	Tl	< 0.00100
M	Ba	< 0.00999	M	Gd	< 0.00100	O	Mn	< 0.00003	M	Rb	< 0.00100	M	Th	< 0.00100
O	Be	< 0.00020	M	Ga	< 0.00100	O	Hg	< 0.01500	M	Ru	< 0.00200	M	Tm	< 0.00040
M	Bi	< 0.00040	O	Ge	< 0.00150	M	Mo	< 0.00200	M	Sm	< 0.00100	M	Sn	< 0.00500
O	B	< 0.00060	O	Au	< 0.00300	M	Nd	< 0.00200	O	Sc	< 0.00002	O	Ti	< 0.00070
M	Cd	< 0.00300	M	Hf	< 0.00200	O	Ni	< 0.00230	O	Se	< 0.05000	M	W	< 0.00999
O	Ca	0.00050	M	Ho	< 0.00050	M	Nb	< 0.00050	O	Si	< 0.00340	M	U	< 0.00200
M	Ce	< 0.00500	M	In	< 0.00999	n	Os		M	Ag	< 0.00200	O	V	< 0.00090
M	Cs	< 0.00030	M	Ir	< 0.00500	M	Pd	< 0.00500	S	Na		M	Yb	< 0.00100
M	Cr	< 0.00500	O	Fe	< 0.00110	O	P	< 0.04000	M	Sr	< 0.00050	M	Y	< 0.03997
M	Co	< 0.00300	M	La	< 0.00050	M	Pt	< 0.00200	O	S	< 0.07200	O	Zn	0.00250
O	Cu	< 0.00140	M	Pb	< 0.00300	O	K	0.04000	M	Ta	< 0.00700	M	Zr	< 0.00500

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 22.98977; +1; (6); Na^{+}(aq) largely ionic in nature (Coordination Number in parentheses is assumed, not certain.)

Chemical Compatibility - Soluble in HCl, HNO_3, H_2SO_4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

Na Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Lithium carbonate fusion in graphite crucible followed by HCl dissolution - blank levels of Na in lithium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric/sulfuric/perchloric acid decomposition).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line		Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES	589.595 nm	0.07 / 0.00009 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES	588.995 nm	0.03 / 0.006 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES	330.237 nm	2.0 / 0.09 µg/mL	1	atom	Pd, Zn
ICP-MS	23 amu	310 ppt	n/a	M^{+}	$^{46}Ti^{+2}$, $^{46}Ca^{+2}$

8.0 HAZARDOUS INFORMATION

- Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY

- This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 **ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105**

Recognized by:

Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:

Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter), Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 **ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration"**

- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 **ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers"**

- Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:

Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 ***10CFR50 Appendix B - Nuclear Regulatory Commission***

- Domestic Licensing of Production and Utilization Facilities

10.5 **10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance**

10.6 ***MIL-STD-45662A (Obsolete/Observed)***

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: October 11, 2004

Expiration Date: EXPIRES 10/2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Nick Maida, QA Administrator

Nicholas Maida

Certificate Approved By: Katalin Le, QC Manager

Katalin Le

Certifying Officer: Paul Gaines, Chemist, Senior Technical Director

Paul R Gaines

010302

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 **DESCRIPTION OF CRM** Custom-Grade **1000 µg/mL Lithium in 0.07% (abs) HNO_3**

Catalog Number:	CGLI1-1, CGLI1-2. and CGLI1-5
Lot Number:	**X-LI02079**
Starting Material:	Li_2CO_3
Starting Material Purity (%):	99.997165
Starting Material Lot No	1123
Matrix:	0.07% (abs) HNO_3

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 5/19/05
DATE EXPIRED: 6/1/06
DATE OPENED: 5/19/05
INORG: 5244 PO: 55180

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 999 ± 3 µg/mL

Certified Density: 1.004 g/mL (measured at 22° C)

The Certified Value is the ICP value. The following equations are used in the calculations of the certified value and the uncertainty:

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty $(\pm) = 2\left[\left(\frac{\Sigma s_i}{n}\right)^2\right]^{1/2}$

Σs_i = The summation of all significant estimated errors. (Most common are the errors from instrumental measurement, weighing, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This IV product is Traceable to NIST via direct comparison to NIST SRMs. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors.

4.1 **Assay Method #1** **999 ± 1 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

Assay Method #2 **999 ± 3 µg/mL**
ICP Assay NIST SRM 3129a Lot Number: 000505

5244
1 of 4

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom Grade Standards.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

Custom-Grade solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Al	0.00120	M	Dy	< 0.01199	S	Li		M	Pr	< 0.00060	M	Te	< 0.05994
M	Sb	< 0.00100	M	Er	< 0.00999	M	Lu	< 0.00080	M	Re	< 0.00200	M	Tb	< 0.00060
M	As	< 0.01998	M	Eu	< 0.00599	O	Mg	0.00650	M	Rh	< 0.00200	M	Tl	< 0.00200
M	Ba	< 0.01998	M	Gd	< 0.00200	O	Mn	0.00006	M	Rb	< 0.00200	M	Th	< 0.00200
O	Be	< 0.00020	M	Ga	< 0.00200	O	Hg	< 0.01500	M	Ru	< 0.00400	M	Tm	< 0.00080
M	Bi	< 0.00080	M	Ge	< 0.01199	M	Mo	< 0.00400	M	Sm	< 0.00200	O	Sn	< 0.00600
O	B	0.00020	M	Au	< 0.00599	M	Nd	< 0.00400	M	Sc	< 0.01998	O	Ti	< 0.00070
M	Cd	< 0.00599	M	Hf	< 0.00400	O	Ni	< 0.00230	M	Se	< 0.01598	O	W	< 0.00400
O	Ca	0.04050	M	Ho	< 0.00100	M	Nb	< 0.00100	O	Si	0.04650	M	U	< 0.00400
M	Ce	< 0.00999	O	In	< 0.00400	n	Os		M	Ag	< 0.00400	O	V	0.00009
M	Cs	< 0.00060	M	Ir	< 0.00999	M	Pd	< 0.00999	O	Na	0.03200	M	Yb	< 0.00200
M	Cr	< 0.00999	O	Fe	0.00200	O	P	< 0.00250	O	Sr	0.00026	M	Y	< 0.07992
M	Co	< 0.00599	M	La	< 0.00100	M	Pt	< 0.00400	O	S	0.01250	O	Zn	0.00145
O	Cu	0.00100	M	Pb	< 0.00599	O	K	0.00950	M	Ta	< 0.01399	M	Zr	< 0.00999

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 6.941; +1; (6); Li^+(aq) large effective radius due to hydration sphere (Coordination Number in parentheses is assumed, not certain.)

Chemical Compatibility - Soluble in HCl, HNO_3, H_2SO_4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO_3/ LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3/ LDPE container.

Li Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Sodium carbonate fusion in Pt^0 followed by HCl dissolution-blank levels of Li in sodium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric / sulfuric / perchloric acid decomposition).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 670.784 nm	0.002 / 0.00002 µg/mL	1	atom	2nd order radiation from R.E.s on some optical designs
ICP-OES 460.286 nm	0.9 / 0.04 µg/mL	1	atom	Zr, Th
ICP-OES 323.261 nm	1.1 / 0.05 µg/mL	1	atom	Sb, Th, Ni
ICP-MS 7 amu	10 ppt		n/a	M

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105

Recognized by:
Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:
Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter) , Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:
Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

5244
3 of 4

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: December 10, 2004

Expiration Date: EXPIRES 01/2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By:	Nick Maida, QA Administrator	Nicholas Maida
Certificate Approved By:	Katalin Le, QC Manager	Katalin Le
Certifying Officer:	Paul Gaines, Chemist, Senior Technical Director	Paul R Gaines

5244
4044

010306

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 DESCRIPTION OF CRM I-Cal Ion Chromatography Stock Solution 1000 µg/mL Acetate in H20

Catalog Number:	ICOAC1-1 and ICOAC1-5
Lot Number:	Y-OI01104
Starting Material:	Sodium Acetate
Starting Material Purity (%):	99.9900
Starting Material Lot No.:	06829CA
Matrix:	H20

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 10/31/05
DATE EXPIRED: 12/1/06
DATE OPENED: 11/2/05
INORG: 5460 PO: DR0831785

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1001 ± 4 µg/mL 1003 ± 4 µg/g

Certified Density: 0.998 g/mL (measured at 22° C)

The Certified Value is the calculated value and is traceable to NIST SRM 84j KHP by nonaqueous titrimetry. The following equations are used in the calculation of the uncertainty:

Certified Value $(\bar{x}) = \frac{\sum x_1}{n}$

$(\bar{x})$ = mean
x_1 = individual results
n = number of measurements

Uncertainty $(\pm) = \frac{2[(\sum s_1)^2]^{1/2}}{(n)^{1/2}}$

$\sum s_1$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighting, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties."
(ISO VIM, 2nd ed., 1993, definition 6.10)

· This IV product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

Assay Method #1 **1004 ± 4 µg/mL 1006 ± 4 µg/g (Avg. 2 runs)**
IC Assay NIST SRM 84j Lot Number: 84j

Assay Method #2 **1001 ± 4 µg/mL 1003 ± 4 µg/g**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

5460

4.2 **BALANCE CALIBRATION** - All balances are checked daily using in-house procedure 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 **THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 **GLASSWARE CALIBRATION** - *In-house procedure* 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom-Grade and Environmental Standards.

5.0 Chromatogram - See Attachment 1

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Support

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep Tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipette from the container. Do not return portions removed for pipetting to container.

Ion Specific Information - For specific information regarding the ions in your blend:

- Go on line at http://ivstandards.com/extras/pertable/ and take advantage of our Interactive Periodic Table.
- E-mail Technical Support at ivtech@ivstandards.com at any time and a technical representative will respond within 24 business hours.
- Call our toll-free Technical Support line at (800) 569-6799 or dial (732) 901-1900, Monday through Friday, from 8:00 AM to 6:00 PM Eastern US Time (GMT -5 Hours)

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

010308

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105
Recognized by:
Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)
Members of IQ Net International Certification Network:
Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter) , Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02
A2LA Mutual Recognition Agreement Partners:
Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special environmental controls that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: May 10, 2005

Expiration Date: EXPIRES 1 2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Nick Maida, QA Administrator

Nicholas Maida

Certificate Approved By: Katalin Le, QC Manager

Katalin Le

Certifying Officer: Paul Gaines, Chemist, Senior Technical Director

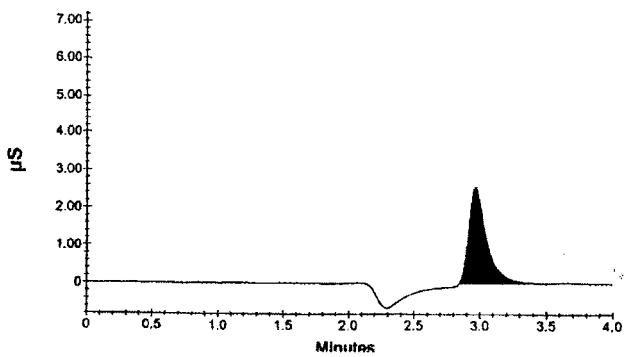
Paul R Gaines

3 of 4
5460

ATTACHMENT 1

CHROMATOGRAM FOR: 1000 μg/mL Acetate Y-OI01104

CH_3COO^- Y-OI01104



Dionex DX-120 Ion Chromatograph
Anal. Column: IonPac AS14 4 x 250 mm
Guard Column: IonPac AG14 4 x 50 mm
Anion Self Regenerating Suppressor:
ASRS-ULTRA 4mm
Suppressor Current: 100 mA
Eluent: 3.5mM Na_2CO_3
0.8mM $NaHCO_3$
Eluent Flow Rate: 0.93 mL/min
Cell Temp.: 35 °C
Scale: Y-axis = 7 µS scale
X- axis = minutes
Concentration: approx. 20µg/g

010310

inorganic ventures / iv labs

195 lehigh avenue, suite 4, lakewood, nj 08701 usa
phone: 800-669-6799 • 732-901-1900 • fax: 732-901-1903
e-mail: ivsales@ivstandards.com • website: www.ivstandards.com

certificate of analysis

1.0 **Inorganic Ventures / IV Labs is an ISO Guide 34-2000 Certified Reference Material (CRM) Manufacturer: Certificate #883-02.** The certificate is designed and the certified value(s) and uncertainty(ies) are determined in accordance with ISO Guide 31-2000 (Reference Materials - Contents of certificates and label(s), ISO Guide 34-2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statisical Principles."

2.0 DESCRIPTION OF CRM **I-Cal Ion Chromatography Stock Solution** **1000 µg/mL Formate in H20 / 0.43% Stabilizer**

Catalog Number:	ICHCO1-1 and ICHCO1-5
Lot Number:	Y-OI01107
Starting Material:	Formic Acid, Sodium salt
Starting Material Purity (%):	99.0000
Starting Material Lot No.:	06808LZ
Matrix:	H20 / 0.43% Stabilizer

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 10/31/05
DATE EXPIRED: 12/1/06
DATE OPENED: 11/2/05
INORG: 5461 PO: DR08317785

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1001 ± 10 µg/mL 1002 ± 10 µg/g

Certified Density: 0.999 g/mL (measured at 22° C)

The Certified Value is the calculated value and is traceable to NIST SRM 84j KHP by nonaqueous titrimetry. The following equations are used in the calculation of the uncertainty:

Certified Value $(\bar{x}) = \frac{\sum x_1}{n}$

$(\bar{x})$ = mean
x_1 = individual results
n = number of measurements

Uncertainty $(\pm) = \frac{2[(\sum s_1)^2]^{1/2}}{(n)^{1/2}}$

$\sum s_1$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighting, dilution to volume, and the fixed error reported on the NIST SRM certificate of analysis.)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This IV product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

Assay Method #1 **1006 ± 3 µg/mL 1007 ± 3 µg/g (Avg 2 runs)**
IC Assay NIST SRM Lot Number: in-house std

Assay Method #2 **1001 ± 10 µg/mL 1002 ± 10 µg/g**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

4.2 BALANCE CALIBRATION- All balances are checked daily using in-house procedure 6-IMM-001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.

4.3 THERMOMETER CALIBRATION - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure is 2-QC-001.Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.

4.4 GLASSWARE CALIBRATION - In-house procedure 3-QC-002 is used to calibrate all Class A Glassware used in the manufacture and quality control of Custom-Grade and Environmental Standards.

5.0 Chromatogram - N/A

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
HPLC, IC, TLC, ISE, IR, NMR, UV/VIS, MS, Capillary Eletrophoresis, Potentiometry, Wet Chemistry and Voltammetry
For the validation of analytical methods
For the preparation of "working reference samples"
For interference studies and the determination of correction coefficients
For detection limit and linearity studies
For additional intended uses, contact IV Technical Support

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep Tightly sealed when not in use. Store and use at 20 ± 4°C. Do not pipette from the container. Do not return portions removed for pipetting to container.

Ion Specific Information - For specific information regarding the ions in your blend:

- Go on line at http://ivstandards.com/extras/pertable/ and take advantage of our Interactive Periodic Table.
- E-mail Technical Support at ivtech@ivstandards.com at any time and a technical representative will respond within 24 business hours.
- Call our toll-free Technical Support line at (800) 569-6799 or dial (732) 901-1900, Monday through Friday, from 8:00 AM to 6:00 PM Eastern US Time (GMT -5 Hours)

8.0 HAZARDOUS INFORMATION - Please refer to the enclosed Material Saftey Data sheet for information regarding this CRM.

9.0 HOMOGENEITY - This solution was mixed according to in-house procedure IV-MPM-004 and is guaranteed to be homogeneous.

010312

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105
Recognized by:
Registrar Accreditation Board (ANSI-RAB)
Standards Council of Canada (SCC)
Dutch Council for Accreditation (RVA)
Entidad Mexicana de Acreditacion, a.c.(EMA)
Members of IQ Net International Certification Network:
Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter) , Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration" - Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers" - Reference Materials Production - Accredited A2LA Certificate Number 883.02
A2LA Mutual Recognition Agreement Partners:
Australia (NATA), Austria (BmwA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS, Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission - Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures / IV Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special environmental controls that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life.
Inorganic Ventures / IV Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: June 01, 2005

Expiration Date: EXPIRES 1 2006

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Nick Maida, QA Administrator

Certificate Approved By: Katalin Le, QC Manager

Certifying Officer: Paul Gaines, Chemist, Senior Technical Director

3 of 3
5161

CERTIFICATE OF ANALYSIS

Product: 14823-0000 FORMIC ACID, SODIUM SALT, 99%

Version: 0
Date Analysis: 1999-09-20
CAS No: 141-53-7

Molecular weight	: 68.01
Molecular formula	: C H O2 Na
Linear formula	: HCO2Na

Specifications		Analysis LOT A0134678
Appearance	INORGANICS LAB 27/28/29/30/34	white crystalline powder
Infrared spectrometry	DATE RECEIVED: 3/7/00	authentic
Melting point (°C)	DATE EXPIRED: 3/7/11	260.0°C
Assay Total base(%)	DATE OPENED: 3/7/00	99.9
Water (%)	INORG#: 2104 PO# F-50799	0.14 [K.F.]
Trace analysis		type: Fe measure: < 20 PPM

ACROS ORGANICS
a Fisher Scientific Worldwide company

Issued: 8-03-00
A. Vanneste Quality Control Manager
This report has been computer generated and does not contain a signature.

ACROS • Janssen Pharmaceuticalaan 3a • B-2440 Geel, Belgium • Tel: +32/14/57.52.11 • Fax: +32/14/59.34.34
ACROS ORGANICS U.S.A. • 1 Reagent Lane , Fair Lawn NJ 07410, USA • Phone: 1-800-ACROS-01 (1-800-227-6701) • Fax: 1-800-248-3079/ 1-201-703-3159

010314

ENVIRONMENTAL RESOURCE ASSOCIATES
The Industry Standard

Quality Control Standards

DataPacK™

Lot No. P116-516

WasteWatR™ Demand

Catalog No. 516

Certification

Parameter	Certified Value [1] (mg/l)	QC PALs™ [2] (mg/l)	PT PALs™ [3] (mg/l)
BOD	102	74.0 - 136	51.5 - 152
CBOD	87.6	49.1 - 130	39.3 - 136
COD	165	138 - 184	127 - 188
TOC	65.2	58.1 - 72.9	54.5 - 75.0

Analytical Verification

Parameter	Round Robin Data Mean (mg/l)	Round Robin Data Recovery (%)	Round Robin Data n	NIST Traceability SRM Number	NIST Traceability Recovery (%)
BOD	105	103%	57	SRM not available	-
CBOD	89.3	102%	46	SRM not available	-
COD	161	97.6%	36	SRM 917a	104%
TOC	65.5	100%	23	SRM 185g	98.6%

Please see footnotes on back of this page

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 9/21/05
DATE EXPIRED: 1/1/08
DATE OPENED: 9/15/05
INORG: 5383 PO: Client Provided

Pg. 1 of 2

6000 West 54th Ave., Arvada, CO 80002 1-800-372-0122 fax 303-421-0159 info@eraqc.com www.eraqc.com

ENVIRONMENTAL RESOURCE ASSOCIATES
The Industry Standard

Quality Control Standards

1. The **Certified Values** are the actual "made-to" concentrations confirmed by ERA analytical verification. The **Certified Values for BOD and CBOD** are the predicted interlaboratory means calculated from the USEPA/NELAC regression equations used for evaluating proficiency testing study data.

2. The **QC Performance Acceptance Limits (QC PALs™)** are based on actual historical data collected in ERA's Proficiency Testing program. The **QC PALs™** reflect any inherent biases in the methods used to establish the limits and closely approximate a 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use the **QC PALs™** to realistically evaluate your performance against your peers.

3. The **PT Performance Acceptance Limits (PT PALs™)** are calculated using the regression equations and fixed acceptance criteria specified in the USEPA *National Standards Criteria Document* and/or the NELAC proficiency testing requirements. Use the **PT PALs™** when analyzing this QC standard alongside USEPA and NELAC compliant PT standards. Please note that many PT study acceptance limits are concentration dependent (some non-linearly) and, therefore, the acceptance limits of this QC standard and any PT standard may differ relative to their difference in concentrations.

4. The **Analytical Verification** data include the mean value, percent recovery and number of data points reported by the laboratories in our Proficiency Testing study compared to the Certified Values. In addition, where NIST Standard Reference Materials (SRMs) are available, each analyte has been analytically traced to the NIST SRM listed.

Traceability Recovery (%) = [(% recovery certified standard)/(% recovery NIST SRM)]*100

The traceability data shown were compiled by analyzing the ERA standards or their associated stock solutions against the applicable NIST SRMs.

5. This standard **expires 1/2008.** The expiration date was determined using an ERA procedure based on ASTM standard practice D 4841-88. The expiration date is valid when the ERA standards have been stored following the directions provided in the ERA instructions that accompany this product.

Please call ERA at 1-800-372-0122 if you have any questions or need technical assistance.

6000 West 54th Ave., Arvada, CO 80002 1-800-372-0122 fax 303-421-0159 info@eraqc.com www.eraqc.com

010316

SPEXertificate™

Certificate of Reference Material

Catalog Number: ICMIX2-100 **Lot No.:** 28-164AS
Description: **IC Instrument Check Standard 2**
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

The CRM is prepared from high purity single ion concentrates of individual elements using Class A laboratory ware to give precise concentration.
Refer to side 2 for details of measurement uncertainties.

Instrumental Analysis by ION Chromatography:

Analyte	Labeled (mg/L)	Measured (mg/L)	NIST SRM
F^-	100	100	3183
Cl^-	200	196	3182
Br^-	400	400	3184
NO_3^-	400	402	3185
HPO_4^{-2}	600	596	3186
SO_4^{-2}	400	400	3181

Spex Reference Multi: Lot #IC-6-186VY

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 9/24/05
DATE EXPIRED: 9/30/06
DATE OPENED: 9/24/05
INORG: 527 PO: 55202

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others This CRM is guaranteed stable and accurate to +/- 0.5% on the average of all the certified concentrations with no single component exceeding +/- 2%. This guarantee is valid for a period of one year from the date of certification only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUN. -- 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010317

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010318

SIGMA-ALDRICH

Certificate of Analysis

Product Name	Sodium nitrite, ≥99.99%
Product Number	431605
Product Brand	Sigma-Aldrich
CAS Number	7632-00-0
Molecular Formula	$NaNO_2$
Molecular Weight	69.00

TEST	SPECIFICATION	LOT 06721HI RESULTS
APPEARANCE	OFF-WHITE TO PALE YELLOW CRYSTALS OR POWDER	OFF WHITE CRYSTALS
TITRATION	97.0% NANO2 (MINIMUM) (WITH KMNO4)	102.7% NANO2 (WITH KMNO4)
TRACE ANALYSIS, ICP	100 PPM (MAXIMUM) TOTAL METALLIC IMPURITIES	ZN 2.0 PPM CA 1.2 TL 0.9 B,PD 0.8 AG 0.7 PT 0.6 MG 0.3 FE,BI,AL 0.1 PPM
ICP ASSAY	CONFIRMS SODIUM COMPONENT.	CONFIRMS SODIUM COMPONENT
INSOLUBLE MATTER	0.01% (MAXIMUM) (C=10%, H2O)	0.004% *
CALCIUM	0.01% (MAXIMUM)	0.001% *
CHLORIDE	0.005% (MAXIMUM)	0.003% *
IRON	0.001% (MAXIMUM)	0.0001% *
HEAVY METALS	0.001% (MAXIMUM) (AS PB)	0.001% AS PB *
POTASSIUM	0.005% (MAXIMUM)	0.0005% *
SULFATE	0.01% (MAXIMUM)	0.002% *
	APPROVED FEBRUARY 22, 1999 JSB	* SUPPLIER CERTIFICATE
	OR	* SUPPLIER CERTIFICATE
	APPROVED FEBRUARY 22, 1999 JSB	MEETS OR EXCEEDS ALL ACS 9TH ED REQUIREMENTS
	OR	MEETS OR EXCEEDS ALL ACS 9TH ED REQUIREMENTS
QUALITY CONTROL ACCEPTANCE DATE		AUGUST 2000

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 7/16/01
DATE EXPIRED: 7/16/2012
DATE OPENED: 7/16/01
INORG: 2921 PO: N/A

pg 1 of 2

010319

Ronnie J. Martin, Supervisor
Quality Control
Milwaukee, Wisconsin USA

pg 2 of 2

010320

SPEXertificate™

Certificate of Reference Material

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/10/05
DATE EXPIRED: 01/15/2006 VOS
DATE OPENED: 01/11/05
INORG: 49151 PO: F55119

Catalog Number: AS-F9-2X/2Y **Lot No.** 27-122AS
Description: 1000 mg/L Fluoride
Matrix: H2O

This ASSURANCE® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 998 mg/L
Uncertainty Associated with Measurement: +/- 3.0 mg/L
Certified Value is Traceable to: NIST SRM 3183

The CRM is prepared gravimetrically using high purity Sodium Fluoride Lot# M44142 . The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 997 mg/L:
Method: Potentiometric using Fluoride combination electrode

Instrumentation Analysis By Ion Chromatography: 999 mg/L:

Uncertified Properties:

Trace Ionic Impurities in the Actual Solution via IC Analysis:

Ion	mg/L	Ion	mg/L
Br	<0.2	NO3	<0.2
Cl	<10	PO4	<1
NO2	<0.2	SO4	<0.5

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN. -- 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010321

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA

010322

SPECertificate™

Certificate of Reference Material

Catalog Number: AS-CL9-2X/2Y **Lot No.:**26-150AS
Description: 1000 mg/L of Chloride
Matrix: Water

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/10/05
DATE EXPIRED: 01/15/2006 VOA
DATE OPENED: 01/11/05
INORG: 4950 PO: F55119

This ASSURANCE ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Chloride (Cl^-): 998 mg/L ± 3 mg/L
Traceable to: NIST SRM 3182

The CRM is prepared gravimetrically using high purity Sodium Chloride (NaCl) Lot#02001F. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 998 mg/L
Method: Gravimetric analysis by precipitation using Silver Nitrate, filtering, drying and weighing as AgCl.

Instrumental Analysis by Ion Chromatography: 997 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Component	mg/L	Component	mg/L
F^-	<0.05	NO_3^-	<0.15
PO_4^{3-}	<0.15	Br^-	<0.2
SO_4^{2-}	<0.15	NO_2^-	<0.2

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable to +/- 0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN. -- 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010323

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c=\sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA

010324

SPECertificate™

Certificate of Reference Material

Catalog Number: AS-NO_2N9-2X/2Y **Lot No.:** 27-141AS
Description: 1000 mg/L of Nitrite-N
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Nitrite-N (NO_2^--N): 994 mg/L ± 3 mg/L
Traceable to: SPEX CRM #0902NO2

The CRM is prepared gravimetrically using high purity Sodium Nitrite ($NaNO_2$) Lot#0791R. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 999 mg/L
Method: Titrimetric analysis using $KMnO_4$. KMnO4 standardized with As_2O_3 NIST SRM #83d.

Instrumental Analysis by Ion Chromatography: 995 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Element	mg/L
F^-	<0.4
SO_4^{-2}	<0.4
PO_4^{-3}	<0.8
Cl^-	<20
Br^-	<20
NO_3^-	<40

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable to +/- 0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: MAR - - 2005 Certifying Officer: N. Kocherlakota

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 03/21/05
DATE EXPIRED: 03/30/2006 WS
DATE OPENED: 03/21/05
INORG: 5076 PO: F55155

© 2004 SPEX CertiPrep, Inc.

010325

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA

010326

SPECertificate™

Certificate of Reference Material

Catalog Number: AS-BR9-2X/2Y **Lot No.:** 27-142AS
Description: 1000 mg/L of Bromide
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Bromide (Br^-): 998.5 mg/L ± 3 mg/L
Traceable to: NIST SRM 3184

The CRM is prepared gravimetrically using high purity Sodium Bromide (NaBr) Lot#04931B
The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L
Method: Gravimetric analysis by precipitation using Silver Nitrate, filtering, drying and weighing as AgBr.

Instrumental Analysis by Ion Chromatography: 996 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Ion	mg/L
F^-	<0.02
NO_2^-	<0.05
NO_3^-	<0.05
PO_4^{-3}	<0.20
Cl^-	<1.50
SO_4^{-2}	<0.05

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 6/8/05
DATE EXPIRED: 6/30/06
DATE OPENED: 6/28/05
INORG: 5275 PO: D-037417 7

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% of the certified concentration value for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUN. – – 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010327

Report of Certification

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s=s^2m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U=ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010328

SPEXertificate™

Certificate of Reference Material

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/10/05
DATE EXPIRED: 01/15/2006 YES
DATE OPENED: 01/11/05
INORG: 4952 PO: F55119

Catalog Number: AS-NO_3N9-2X/2Y **Lot No.:** 27-120AS
Description: 1000 mg/L of Nitrate-N
Matrix: H_2O

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Nitrate-N (NO_3^--N): 1002.5 mg/L ± 3 mg/L
Traceable to: NIST SRM 3185

The CRM is prepared gravimetrically using high purity Sodium Nitrate ($NaNO_3$) Lot#M14156. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1001 mg/L
Method: Gravimetric analysis by precipitation using Nitron Acetate, filtering, drying and weighing as Nitron Nitrate ($C_{20}H_{17}N_4.NO_3$).

Instrumental Analysis by Ion Chromatography: 1004 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Element	mg/L
F^-	<0.05
Cl^-	<0.2
NO_2^-	<0.2
Br^-	<0.5
SO_4^-	<0.5
PO_4^{3-}	<2.0

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable to +/- 0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN. -- 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification 010329

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010330

SPECertificate™

Certificate of Reference Material

Catalog Number: AS-PO_4P9-2X/2Y **Lot No.:** 27-23AS
Description: 1000 mg/L of Phosphate-Phosphorus
Matrix: H2O

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 01/11/05
DATE EXPIRED: 01/15/2006 v03
DATE OPENED: 01/11/05
INORG: 4953 PO: F55119

This **ASSURANCE** ®certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for Ion Chromatography instrumentation. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: Phosphate-Phosphorus (P): 1002.5 mg/L ± 3 mg/L
Traceable to: NIST SRM 3186

The CRM is prepared gravimetrically using high purity (99.999%) Potassium Dihydrogen Orthophosphate (KH_2PO_4) Lot#07991C. The certified value listed is the average of values obtained by classical wet assay and Ion Chromatography analysis.

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1003 mg/L
Method: Gravimetric analysis by precipitation using Magnesia Mixture, filtering, drying and weighing as $Mg_2P_2O_7$.

Instrumental Analysis by Ion Chromatography: 1002 mg/L

Trace Anion Impurities in the Actual Solution via IC Analysis:

Element	mg/L	Element	mg/L
F^-	<0.1	NO_3^-	<0.2
Br^-	<0.1	NO_2^-	<0.2
SO_4^{-2}	<0.1	Cl^-	<2.0

Balances are calibrated regularly with weight sets traceable to NIST#s 32856, 32867 and others. This CRM is guaranteed stable and accurate to +/- 0.5% of the certified concentration value for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JAN. -- 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

Report of Certification

010331

This Certified Reference Material has been prepared and certified under an ISO 9001 system consistent with the following guides:
Guide To The Expression Of Uncertainty In Measurement 1995
EURACHEM/CITAC Guide: Quantifying Uncertainty in Analytical Measurement – Second Edition
ASTM Guide D6362-98
ISO Guide 34: Quality system guidelines for the production of reference materials.
ISO Guide 17025: Certification of reference materials, general and statistical principles
ISO Guide 31: Contents of certificates of reference materials
NIST Technical Note 1297
ILAC-G12-2000: Guidelines for the requirements for the competence of reference materials producers
ISO/REMCO N280

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO 9000 guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For further information contact CRM Sales.

Instructions for Use:

Primary usage of this CRM is in neat form or diluted serially with matrix of a purity at or greater than the purity of the original matrix solution. If dilution is required the diluent must be compatible with all certified analytes and contain stabilizers appropriate for the period of intended use. The CRM can also be used as a spike or with a spike, again with appropriate compatibility considerations. All solutions should be thoroughly mixed, by shaking, prior to use and never pipetted directly from the bottle. All surfaces that come in contact with the solution must be thoroughly cleaned and leached prior to use. Dilutions should be performed only with Class A volumetric glassware.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, analytical instrumentation and personnel have been qualified prior to use. The highest purity acids applicable, 18 megohm, double deionized water, acid-leached triple-rinsed bottles, and Class A glassware have been used in all preparations.

Homogeneity:

The Homogeneity of the CRM has been confirmed by procedures consistent with ISO guide 17025, ISO/REMCO N280 and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed for the certified values by procedures consistent with the intended use of the CRM.
The mathematical expression $k_s = s^2 m$ is employed to determine the sampling size
s = relative standard deviation in % for one component of the sample. (ie. The sub-sampling uncertainty)
m = the sub-sampling mass
k_s = mass of sub-sample necessary to ensure a relative sub-sampling error of 1% (68% confidence level) in a single determination

Statistical estimator and Confidence limits:

The certified value 'x' listed on the reverse of this document is at the 95% level of confidence and can be expressed as
X = x+/-U where X =True value (Labeled Value), U= Expanded uncertainty
$U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
u_c is obtained by combining the individual element standard uncertainty components u_i and $u_c = \sqrt{\Sigma u_i^2}$

Certification Traveler Report:

All certified values reported were derived from Traveler Report (Spex CertiPrep's traceability documentation) identified by the lot number of this CRM. For further information contact CRM Sales.

Legal Notice:

SPEX CertiPrep reference materials are not for any cosmetic, drug or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep, Inc. of any kind whatsoever, whether based on breach of warranty, alleged negligence, or otherwise, with respect to this RM shall be greater than the purchase price. In no event shall SPEX CertiPrep, Inc. be liable for any loss of profits or any incidental, special, or consequential damages.

ISO 9001
CERTIFIED

SPEX CertiPrep
203 Norcross Avenue • Metuchen, NJ 08840 USA
732-549-7144 • 1-800-LAB-SPEX • Fax: 732-603-9647 • CRMSales@spexcsp.com • www.spexcsp.com

010332

SPEXertificate ™

Certificate of Reference Material

Catalog Number: AS-SO49-2X/2Y **Lot No.** 28-26AS

Description: 1000 mg/L Sulfate

Matrix: H2O

This **ASSURANCE** ® certified reference material, CRM, is intended primarily for use as a calibration standard or quality control standard for inorganic spectroscopic instrumentation such as ICPOES, DCP, AA, ICPMS, and XRF. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

Certified Value: 1000.5 mg/L

Uncertainty Associated with Measurement: +/- 3.0 mg/L

Certified Value is Traceable to: NIST SRM 3181

The CRM is prepared gravimetrically using high purity Potassium Sulfate Lot# X34146 . The certified value listed is the average of values obtained by classical wet assay and ICP spectrometer analysis

Refer to side 2 for details of measurement uncertainties.

Classical Wet Assay: 1000 mg/L

Method: Precipitated using Barium Chloride, filtered, ignited and weighed as BaSO4

Instrumental Analysis by ICP spectrometer: 1001 mg/L

Uncertified Properties:

Trace Metallic Impurities in the Actual Solution via ICP / ICPMS Analysis:

Element	mg/L	Element	mg/L
Cl^-	<0.01	Br^-	<0.01
F^-	<0.005	$NO3^-$	<0.01
$NO2^-$	<0.01	$PO4^-$	<0.10

INORGANIC LABS/RADCHEM LABS
DATE RECEIVED: 7/19/05
DATE EXPIRED: 7/30/06
DATE OPENED: 7/19/05 (5)
INORG: 5305 PO: D2044844

Balances are calibrated regularly with weight sets traceable to NIST #32856, #32857 and others. This CRM is guaranteed stable to +/-0.5% of the certified concentration inclusive of uncertainty of measurements and other effects, such as transpiration losses, for a period of one year from the date of certification. This guarantee is valid only when the material is kept tightly capped and transported and stored under laboratory conditions.

Date of Certification: JUL. -- 2005 Certifying Officer: N. Kocherlakota

© 2004 SPEX CertiPrep, Inc.

010333

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

Pipette Calibrations

Book/Page 04 027

SwRI - Div. 01, Inorganic Labs' Fixed Volume Pipette Verification Log 010334

Balance #: 12 Thermometer #: G011 diH20 Temperature (°C): 20°C

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
Lab30	1000	1.0102	1.0100	1.0081
TMA1	1000	1.0056	1.0035	1.0001
TMA2	1000	1.0027	1.0049	1.0051
TMA3 *	1000	NOT	Found	
TMA6	1000	1.0042	1.0049	1.0041
TMB1	900	.9029	.9016	.8998
TMC1	800	.7960	.7999	.8018
TMDD1	750	.7558	.7552	.7546
TMD1	700	.6911	.6978	.6972
TMD2	700	.7037	.7056	.7033
TME1	600	.5941	.5980	.5966
TMF2	500	.5005	.5007	.5000
TMF5	500	.5020	.5038	.5051
ICF1	500	.4984	.5001	.5005
L30-500	500	.5044	.5040	.5033
TMG3 * KE 10/26/05	400	KE 10/26/05 ~~out~~ .4018	KE 10/26/05 ~~of~~ .3963	KE 10/26/05 ~~service~~ .3979
TMH1 *	300	out	of	service
TMH2	300	.3011	.3008	.3014
TMJ1	250	.2511	.2506	.2504
TMJ2	250	.2501	.2502	.2504
TMJ3	250	.2513	.2512	.2504
TMK2	200	.2001	.2005	.1999
TML1	150	.1478	.1489	.1489
TMM1	120	.1200	.1202	.1196
TMN3	100	out	of	service
ICN1	100	.1001	.1006	.1007
TMQ1	80	not	Found	
TMR1	70	out of service		
TMS1	60	↓		
LAB-30A	50			
TMU1	40	.0400	.0399	.0399
TMU2	40	.0398	.0395	.0397
TMV1	30	.0299	.0297	.0298
L30-20	20	.0205	.0200	.0200
TMW1	25	.0251	.0250	.0251
TMY1	15	Out of service		

Analyst: [signature] Date: 10-26-05

Reviewed by: [signature] Date: 10-26-05

FRM-243-b (Rev 3/Mar 03)

Book/Page: 04 028

010335

SwRI – Div. 01, Inorganic Labs' Fixed Volume Pipette Verification Log

(Space provide for Inorganic Laboratories' Fixed Volume Pipette Verification Spreadsheet)

KE 10/26/05

SwRI - Div. 01, Inorganic Labs' Fixed Volume Pipette Spreadsheet

Eppendorf #	True Value (uL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
Lab30	1000	1.0102	1.0100	1.0081	1.009	100.94
TMA1	1000	1.0056	1.0035	1.0001	1.003	100.31
TMA2	1000	1.0027	1.0049	1.0051	1.004	100.42
TMA3	1000	not	found			
TMA6	1000	1.0042	1.0049	1.0041	1.004	100.44
TMB1	900	0.9029	0.9016	0.8998	0.901	100.16
TMC1	800	0.7960	0.7999	0.8018	0.799	99.90
TMDD1	750	0.7558	0.7552	0.7546	0.755	100.69
TMD1	700	0.6911	0.6978	0.6972	0.695	99.34
TMD2	700	0.7037	0.7056	0.7033	0.704	100.60
TME1	600	0.5961	0.5980	0.5966	0.597	99.48
TMF2	500	0.5005	0.5007	0.5000	0.500	100.08
TMF5	500	0.5020	0.5038	0.5051	0.504	100.73
ICF1	500	0.4984	0.5001	0.5005	0.500	99.93
L30-500	500	0.5044	0.5040	0.5033	0.504	100.78
TMG3	400	0.4018	0.3963	0.3979	0.399	99.67
TMH1	300	Out	of	service		
TMH2	300	0.3011	0.3008	0.3014	0.301	100.37
TMJ1	250	0.2511	0.2506	0.2504	0.251	100.28
TMJ2	250	0.2501	0.2502	0.2504	0.250	100.09
TMJ3	250	0.2513	0.2512	0.2504	0.251	100.39
TMK2	200	0.2001	0.2005	0.1999	0.200	100.08
TML1	150	0.1478	0.1489	0.1489	0.149	99.02
TMM1	120	0.1200	0.1202	0.1196	0.120	99.94
TMN3	100	out	of	service		
ICN1	100	0.1001	0.1006	0.1007	0.100	100.47
TMQ1	80	not	found			
TMR1	70	Out	of	service		
TMS1	60	Out	of	service		
LAB-30A	50	out	of	service		
TMU1	40	0.0400	0.0399	0.0399	0.040	99.83
TMU2	40	0.0398	0.0395	0.0397	0.040	99.17
TMV1	30	0.0299	0.0297	0.0298	0.030	99.33
L30-20	20	0.0205	0.0200	0.0200	0.020	100.83
TMW1	25	0.0251	0.0250	0.0251	0.025	100.27
TMY1	15	Out	of	service		

FRM-246 (Rev 1/Mar 03)

Book/page: 08 031

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

010336

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	20	0.0199	0.0200	0.0200	0.020	99.83
ADJ200-A	100	0.0993	0.0993	0.0993	0.099	99.30
	200	0.1990	0.1998	0.1995	0.199	99.72
	20					
ADJ200-C	100	OUT	OF	SERVICE		
	200					
	20	0.0199	0.0203	0.0202	0.020	100.67
ADJ200-D	100	0.0984	0.0989	0.0988	0.099	98.70
	200	0.1989	0.1989	0.1980	0.199	99.30
	20					
ADJ200-G	100					
	200					
	20					
ADJ200-H	100					
	200					
	20					
ADJ200-J	100					
	200					
	20					
ADJ200-K	100	NOT	IN USE-	GLOVEBOX		
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					

FRM-247a (Rev 4/Apr 04)

Book/page: 08 032

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

010337

Balance #: 34 Thermometer #: G011 diH20 Temperature (° C) 21

	Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
20 µL – 200 µL		20	.0199	.0200	.0200
	ADJ200-A	100	.0993	.0993	.0993
		200	.1990	.1998	.1995
		20			
	ADJ200-C	100	OUT	OF	SERVICE
		200			
		20	.0199	.0203	.0202
	ADJ200-D	100	.0984	.0989	.0988
		200	.1989	.1999	.1980
		20			
	ADJ200-G	100			
		200			
		20			
	ADJ200-H	100		10-20-05	
		200			
		20			
	ADJ200-J	100			
		200			
		20			
	ADJ200-K	100	NOT	IN USE –	GLOVEBOX
		200			
		20			
	ADJ200	100		10-20-05	
		200			

Analyst: John Wilber Date: 10-20-05

Reviewed by: Florence Ohmi Date: 11/2/05

Book/page: 08 091

010338

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	100	0.1018	0.1020	0.1014	0.102	101.73
ADJ1000-C	500	0.4990	0.4988	0.4992	0.499	99.80
	1000	1.0032	1.0018	1.0009	1.002	100.20
	100	0.0992	0.0991	0.0989	0.099	99.07
ADJ1000-D	500	0.4928	0.4932	0.4936	0.493	98.64
	1000	0.9999	1.0009	1.0059	1.002	100.22
	100	0.1004	0.1004	0.1006	0.100	100.47
ADJ1000-E	500	0.4942	0.4968	0.4981	0.496	99.27
	1000	0.9990	0.9984	0.9991	0.999	99.88
	100	0.1008	0.1010	0.1004	0.101	100.73
ADJ1000-F	500	0.4991	0.4939	0.4978	0.497	99.39
	1000	0.9994	1.0018	1.0001	1.000	100.04
	100					
ADJ1000-G	500					
	1000					
	100					
ADJ1000-H	500					
	1000					
	100					
ADJ1000-J	500					
	1000					
	100					
ADJ1000-K	500	NOT	IN USE	GLOVEBOX		
	1000					
	100					
ADJ1000	500					
	1000					

FRM-247b (Rev 3/Apr 04)

Book/page: 08 092

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log 010339

Balance #: 34 Thermometer #: G011 diH20 Temperature (° C) 21

100 µL – 1000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	100	.1018	.1012	.1014
ADJ1000-C	500	.4990	.4988	.4992
	1000	1.0032	1.0018	1.0009
	100	.0992	.0991	.0989
ADJ1000-D	500	.4928	.4932	.4936
	1000	.9999	1.0009	1.0059
	100	.1004	.1004	.1006
ADJ1000-E	500	.4942	.4968	.4981
	1000	JW 10-31-05 ~~.09~~ .9990	.9984	.9991
	100	.1008	.1010	.1004
ADJ1000-F	500	.4991	.4939	.4978
	1000	.9994	1.0018	1.0001
	100			
ADJ1000-G	500			
	1000			
	100			
ADJ1000-H	500		JW 10-30-05	
	1000			
	100			
ADJ1000-J	500			
	1000			
	100			
ADJ1000-K	500	NOT	IN USE —	GLOVEBOX
	1000			
	100			
ADJ1000	500		JW 10-30-05	
	1000			

Analyst: John Weller Date: 10-30-05

Reviewed by: Noreen Ohrie Date: 11/2/05

Book/page: 08 151

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log 010840

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

10-20-05

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	500	0.5069	0.5052	0.5048	0.506	101.13
ADJ5000-C	2500	2.4918	2.4998	2.4953	2.496	99.83
	5000	5.0067	5.0220	4.9989	5.009	100.18
	500					
ADJ5000-G	2500	OUT	OF	SERVICE		
	5000					
	500					
ADJ5000-H	2500	OUT	OF	SERVICE		
	5000					
	500	0.5067	0.5033	0.5038	0.505	100.92
ADJ5000-I	2500	2.4920	2.5086	2.5072	2.503	100.10
	5000	4.9991	4.9991	4.9938	4.997	99.95
	500					
ADJ5000-J	2500					
	5000					
	500					
ADJ5000-K	2500					
	5000					
	500					
ADJ5000-L	2500					
	5000					
	500					
ADJ5000-M	2500	NOT	IN USE-	GLOVEBOX		
	5000					
	500	0.4975	0.4960	0.4982	0.497	99.45
ADJ5000-N	2500	2.4918	2.4978	2.4994	2.496	99.85
	5000	5.0250	5.0274	5.0146	5.022	100.45
	500	0.5055	0.5064	0.5052	0.506	101.14
ADJ5000	2500	2.4987	2.5166	2.5186	2.511	100.45
	5000	5.0496	5.0333	5.0472	5.043	100.87
	500					
ADJ5000	2500					
	5000					

FRM-247c (Rev 3/Apr 04)

Book/page: 08 152

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log 010341

Balance #: 34 Thermometer #: 601 diH20 Temperature (° C) 21

500 µL – 5000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	500	.5069	.5052	.5048
ADJ5000-C	2500	2.4978	2.4998	5.4953
	5000	5.0067	5.0220	4.9989
	500			
ADJ5000-G	2500	OUT	OF	Service
	5000			
	500			
ADJ5000-H	2500	OUT	OF	Service
	5000			
	500	.5067	.5055	.5058
ADJ5000-I	2500	2.4920	2.5056	2.5072
	5000	4.9991	4.9991	4.9935
	500			
ADJ5000-J	2500			
	5000			
	500			
ADJ5000-K	2500			
	5000			
	500			
ADJ5000-L	2500			
	5000			
	500			
ADJ5000-M	2500	NOT	IN USE	Calibration
	5000			
	500	.4975	.4960	.4982
ADJ5000-N	2500	2.4918	2.4978	2.4917
	5000	5.0250	5.0274	5.0146
	500	.5055	.5064	.5052
ADJ5000-O	2500	2.4987	2.5166	2.5186
	5000	5.0496	5.0333	5.0472
	500			
ADJ5000	2500			
	5000			

Analyst: John Willis Date: 10-20-05

Reviewed by: Teresa Chin Date: 11/2/05

FRM-244 (c) (Rev 3/Apr 04)

Book/page: 08 030

010342

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 12 Thermometer #: G011 diH20 Temperature (° C) 21.0

	Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
20 µL – 200 µL		20			
	ADJ200-A	100			
		200			
		20			
	ADJ200-C	100			
		200			
		20			
	ADJ200-D	100			
		200			
		20	0.0205	0.0203	0.0202
	ADJ200-G	100	0.0988	0.0983	0.0990
		200	0.1978	0.1980	0.1979
		20	0.0204	0.0203	0.0201
	ADJ200-H	100	0.0997	0.0997	0.0993
		200	0.1998	0.1999	0.1980
		20	0.0202	0.0203	0.0203
	ADJ200-J *	100	0.0989	0.0997	0.0990
		200	0.1988	0.1996	0.1979
		20			
	ADJ200-K	100			
		200			
		20			
	ADJ200	100			
		200			

mf 10/4/05

mf 10/4/05

* This pipette was verified on 10/5/05. mf
* Should not have cross-out RSS 11/1/05

Analyst: Michael Hardy Date: 10/4/05

Reviewed by: John Walker Date: 10-14-05

Book/page: 08 029

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet) 010343

mf 10/5/05

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	20					
ADJ200-A	100					
	200					
	20					
ADJ200-C	100					
	200					
	20					
ADJ200-D	100					
	200					
	20	0.0205	0.0203	0.0202	0.0203	101.67
ADJ200-G	100	0.0988	0.0983	0.0990	0.0987	98.70
	200	0.1978	0.1980	0.1979	0.1979	98.95
	20	0.0204	0.0203	0.0201	0.0203	101.33
ADJ200-H	100	0.0997	0.0997	0.0993	0.0996	99.57
	200	0.1998	0.1999	0.1980	0.1992	99.62
	20	0.0202	0.0203	0.0203	0.0203	101.33
ADJ200-J	100	0.0989	0.0997	0.0990	0.0992	99.20
	200	0.1988	0.1996	0.1979	0.1988	99.38
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200-K	100					
	200					

FRM-247a (Rev 3/Oct 03)

Book/page: 08 090

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 12 Thermometer #: G011 diH20 Temperature (° C) 21.0

	Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
100 µL – 1000 µL		100			010344
	ADJ1000-C	500			
		1000			
		100			
	ADJ1000-D	500		10/4/05	
		1000			
		100			
	ADJ1000-E	500			
		1000			
		100			
	ADJ1000-F	500			
		1000			
		100	0.1013	0.1016	0.1007
	ADJ1000-G	500	0.4938	0.4962	0.4947
		1000	0.9902	0.9906	0.9891
		100	0.1007	0.1005	0.1003
	ADJ1000-H	500	0.4919	0.4954	0.4969
		1000	0.9924	0.9960	0.9926
		100	0.0996	0.0990	0.0998
	ADJ1000-J *	500	0.4907	0.4910	0.4910
		1000	0.9819	0.9823	0.9842
		100			
	ADJ1000-K	500			
		1000		10/4/05	
		100			
	ADJ1000	500			
		1000			

*This pipette was verified on 10/5/05.

Analyst: [signature] Date: 10/4/05

Reviewed by: [signature] Date: 10-14-05

ıok/page: 08 089

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

010345

10/5/05

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	100				0.000	0.00
ADJ1000-C	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000-D	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000-E	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000-F	500				0.000	0.00
	1000				0.000	0.00
	100	0.1013	0.1016	0.1007	0.101	101.20
ADJ1000-G	500	0.4938	0.4962	0.4947	0.495	98.98
	1000	0.9902	0.9906	0.9891	0.990	99.00
	100	0.1007	0.1005	0.1003	0.101	100.50
ADJ1000-H	500	0.4919	0.4954	0.4969	0.495	98.95
	1000	0.9924	0.9960	0.9926	0.994	99.37
	100	0.0996	0.0990	0.0998	0.099	99.47
ADJ1000-J	500	0.4907	0.4910	0.4910	0.491	98.18
	1000	0.9819	0.9823	0.9842	0.983	98.28
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00

FRM-247b (Rev 2/Oct 03)

Book/page: 08 150

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 12 Thermometer #: G011 diH20 Temperature (° C) 21.0

010346

500 µL – 5000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	500			
ADJ5000-C	2500			
	5000			
	500			
ADJ5000-G	2500			
	5000			
	500			
ADJ5000-H	2500			
	5000			
	500			
ADJ5000-I	2500			
	5000			
	500	0.5050	0.4915	0.4951
ADJ5000-J*	2500	2.4949	2.4965	2.4957
	5000	4.9926	4.9919	4.9947
	500	0.4914	0.4921	0.4919
ADJ5000-K	2500	2.4973	2.4979	2.4969
	5000	5.0084	5.0009	5.0106
	500	0.4956	0.4981	0.4973
ADJ5000-L	2500	2.4884	2.4967	2.4926
	5000	4.9849	4.9843	4.9887
	500			
ADJ5000-M	2500			
	5000			
	500			
ADJ5000-N	2500			
	5000			
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			

10/4/05

10/4/05

*This pipette was verified on 10/5/05.

Analyst: Michael [illegible] Date: 10/4/05

Reviewed by: John Wilkes Date: 10-14-05

FRM-244 (c) (Rev 3/Apr 04)

Book/page: 00 40

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

10/4/05

010347

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	500				0.000	0.00
ADJ5000-C	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000-G	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000-H	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000-I	2500				0.000	0.00
	5000				0.000	0.00
	500	0.5050	0.4915	0.4951	0.497	99.44
ADJ5000-J	2500	2.4949	2.4965	2.4957	2.496	99.83
	5000	4.9926	4.9919	4.9947	4.993	99.86
	500	0.4914	0.4921	0.4919	0.492	98.36
ADJ5000-K	2500	2.4973	2.4979	2.4969	2.497	99.89
	5000	5.0084	5.0009	5.0106	5.007	100.13
	500	0.4956	0.4981	0.4973	0.497	99.40
ADJ5000-L	2500	2.4884	2.4967	2.4926	2.493	99.70
	5000	4.9849	4.9843	4.9887	4.986	99.72
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00

FRM-247c (Rev 2/Mar 03)

Book/page: 08 034

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 12 Thermometer #: G011 diH20 Temperature (° C) 21°C

010348

20 µL – 200 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	20			
ADJ200-A	100			
	200			
	20			
ADJ200-C	100			
	200			
	20			
ADJ200-D	100			
	200			
	20 *	0.0199	0.0199	0.0200
ADJ200-G	100 *	0.0990	0.0992	0.0988
	200 *	0.1974	0.1984	0.1988
	20	0.0202	0.0201	0.0200
ADJ200-H	100	0.0997	0.0995	0.0996
	200	0.1997	0.1995	0.1995
	20	0.0202	0.0202	0.0201
ADJ200-J	100	0.0997	0.0998	0.0997
	200	0.1998	0.1996	0.1995
	20			
ADJ200-K	100			
	200			
	20			
ADJ200	100			
	200			

J.V. 11/01/05

J.V. 11/01/05

* DONE BY WAN

Analyst: Warren A. Vaughn Date: 11/01/05

Reviewed by: Date: 12/21/05

Book/page: 08 033

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

010349

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	20					
ADJ200-A	100					
	200					
	20					
ADJ200-C	100					
	200					
	20					
ADJ200-D	100					
	200					
	20	0.0199	0.0199	0.0200	0.020	99.67
ADJ200-G	100	0.0990	0.0992	0.0988	0.099	99.00
	200	0.1974	0.1984	0.1988	0.198	99.10
	20	0.0202	0.0201	0.0200	0.020	100.50
ADJ200-H	100	0.0997	0.0995	0.0996	0.100	99.60
	200	0.1997	0.1995	0.1995	0.200	99.78
	20	0.0202	0.0202	0.0201	0.020	100.83
ADJ200-J	100	0.0997	0.0998	0.0997	0.100	99.73
	200	0.1998	0.1996	0.1995	0.200	99.82
	20					
ADJ200	100					
	200					
	20					
ADJ200	100					
	200					
	20					
ADJ200-K	100					
	200					

TN 11/01/05

FRM-247a (Rev 3/Oct 03)

TN 11/01/05

FRM-244 (Rev 2/Sept 02)

Book/page: 08 094

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 12 Thermometer #: G011 diH20 Temperature (° C) 21.0

010350

100 µL – 1000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	100			
ADJ1000-C	500			
	1000			
	100			
ADJ1000-D	500			
	1000			
	100			
ADJ1000-E	500			
	1000			
	100			
ADJ1000-F	500			
	1000			
	100	0.1004	0.1003	0.1005
ADJ1000-G	500	0.4958	0.4952	0.4972
	1000	0.9958	0.9949	0.9963
	100 *	0.0989	0.0998	0.0996
ADJ1000-H	500 *	0.4917	0.4940	0.4937
	1000 *	0.9838	0.9889	0.9922
	100	0.0996	0.0994	0.0992
ADJ1000-J	500	0.4925	0.4933	0.4929
	1000	~~0.9~~ 1.0029	1.0052	1.0033
	100			
ADJ1000-K	500			
	1000			
	100			
ADJ1000	500			
	1000			

J.V. 11/01/05

* Done by WAP

Analyst: [signature] Date: 11/01/05

Reviewed by: [signature] Date: 12/21/05

Book/page: 08 093

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

010351

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	100				0.000	0.00
ADJ1000-C	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000-D	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000-E	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000-F	500				0.000	0.00
	1000				0.000	0.00
	100	0.1004	0.1003	0.1005	0.100	100.40
ADJ1000-G	500	0.4958	0.4952	0.4972	0.496	99.21
	1000	0.9958	0.9949	0.9963	0.996	99.57
	100	0.0989	0.0998	0.0996	0.099	99.43
ADJ1000-H	500	0.4917	0.4940	0.4937	0.493	98.63
	1000	0.9838	0.9899	0.9922	0.989	98.86
	100	0.0996	0.0994	0.0992	0.099	99.40
ADJ1000-J	500	0.4925	0.4933	0.4929	0.493	98.58
	1000	1.0029	1.0052	1.0033	1.004	100.38
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00
	100				0.000	0.00
ADJ1000	500				0.000	0.00
	1000				0.000	0.00

JW 11/01/05

FRM-247b (Rev 2/Oct 03)

JW 11/01/05

Book/page: 08 154

SwRI Div. 01 – Inorganic Laboratory Adjustable Pipette Verification Log

Balance #: 12 Thermometer #: G 011 diH20 Temperature (° C) 21°C

010352

500 µL – 5000 µL

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)
	500			
ADJ5000-C	2500			
	5000			
	500			
ADJ5000-G	2500			
	5000			
	500			
ADJ5000-H	2500			
	5000			
	500			
ADJ5000-I	2500			
	5000			
	500	0.5000	0.5007	0.5010
ADJ5000-J	2500	2.5088	2.5119	2.5121
	5000	5.0099	5.0089	5.0125
	500	0.5077	0.5091	0.5067
ADJ5000-K	2500	2.5005	2.5001	2.5009
	5000	5.0094	5.0101	5.0199
	500 *	0.5069	0.5092	0.5049
ADJ5000-L	2500 *	2.4866	2.4888	2.4838
	5000 *	4.9767	4.9730	4.9685
	500			
ADJ5000-M	2500			
	5000			
	500			
ADJ5000-N	2500			
	5000			
	500			
ADJ5000	2500			
	5000			
	500			
ADJ5000	2500			
	5000			

J.V. 11/01/05

J.V. 11/01/05

*DONE BY WAW

Analyst: J. Van / Warren A. Naegeli Date: 11/01/05

Reviewed by: J. Vale Date: 12/21/05

FRM-244 (c) (Rev 3/Apr 04)

Book page: 08 153

SwRI – Div. 01, Inorganic Labs' Adjustable Volume Pipette Verification Log

(Space provided for Inorganic Laboratories' Adjustable Volume Pipette Verification Spreadsheet)

010353

SwRI – Div. 01, Inorganic Laboratory Adjustable Pipette Verification Spreadsheet

Eppendorf #	True Value (µL)	1st Reading (g)	2nd Reading (g)	3rd Reading (g)	Avg Wt (g)	% of True Value
	500				0.000	0.00
ADJ5000-C	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000-G	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000-H	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000-I	2500				0.000	0.00
	5000				0.000	0.00
	500	0.5000	0.5007	0.5010	0.501	100.11
ADJ5000-J	2500	2.5088	2.5119	2.5121	2.511	100.44
	5000	5.0099	5.0089	5.0125	5.010	100.21
	500	0.5077	0.5091	0.5067	0.508	101.57
ADJ5000-K	2500	2.5005	2.5001	2.5009	2.501	100.02
	5000	5.0094	5.0101	5.0199	5.013	100.26
	500	0.5069	0.5092	0.5049	0.507	101.40
ADJ5000-L	2500	2.4866	2.4888	2.4838	2.486	99.46
	5000	4.9767	4.9730	4.9685	4.973	99.45
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00
	500				0.000	0.00
ADJ5000	2500				0.000	0.00
	5000				0.000	0.00

FRM-247c (Rev 2/Mar 03)

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

010354

Balance Calibrations

#1 - SN: 99 - J50526-15

#2 - SN: 99-J50031-1

Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #:	LOCATION:	SERIAL #:	TOLERANCE:	COMMENTS:
12	Bldg. 70 Lab 47	1122510787	±0.0005	
Date	**Std Wt (g)**	**Recorded Wt (g)**	**Operator**	
10-26-05	2.0000	1.9998	KE	1
"	100.0000	99.9999	"	2
10-27-05	2.0000	2.0004	KE	1
"	100.0000	100.0004	"	2
10-28-05	2.0000	2.0000	JW	1
"	100.0000	99.9999	"	2
10-31-05	2.0000	2.0000	KE	1
"	100.0000	100.0001	"	2
11-1-05	2.0000	2.0000	JW	1
"	100.0000	100.0001	"	2

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (DQA) for service.

FRM-112 (Rev 2/Aug 03)

010355

#1-SN: 99-J50624-5

#2-SN: 5537

Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #:	LOCATION:	SERIAL #:	TOLERANCE:	COMMENTS:
19	Bldg. 70 Lab 47	0068597	±0.05	
Date	**Std Wt (g)**	**Recorded Wt (g)**	**Operator**	
10-24-05	10.00	10.00	KE	1
"	400.04 KE	400.00	"	2
10-25-05	10.00	10.00	KE	1
"	400.04 KE	400.00	"	2
10-26-05	10.00	10.00	KE	1
"	400.04	400.01	"	2
10-27-05	10.00	10.00	JW	1
"	400.04	400.00	"	2
10-28-05	10.00	10.00	JW	1
"	400.04	400.02	"	2

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (DQA) for service.

FRM-112 (Rev 2/Aug 03)

010356

#1 - SN#99-J50526-15

#2 - SN#99-J50031-1

Southwest Research Institute
Division 01

BALANCE VERIFICATION LOG

BALANCE #:	LOCATION:	SERIAL #:	TOLERANCE:	COMMENTS:
34	Bldg. 70 Lab 47	1116031935	±0.0005/0.00005	
Date	**Std Wt (g)**	**Recorded Wt (g)**	**Operator**	
10/21/05	100.0000	99.9999	WAN	#2
10/22/05	2.0000	2.0000	WAN	#1
10-24-05	2.0000	2.0000	KE	1
"	100.0000	100.0001	KE	2
10-25-05	2.0000	2.0000	KE	1
"	100.0000	99.9997	"	2
10-26-05	2.0000	1.9999	KE	1
"	100.0000	99.9999	KE	2
10-27-05	2.0000	2.0000	JW	1
"	100.0000	100.0000	"	2

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (DQA) for service.

FRM-112 (Rev 2/Aug 03)

010357

#1 - SN: 99-J50526-15
#2 - SN: 99-J50031-1

Southwest Research Institute®
Division 01

BALANCE VERIFICATION LOG

BALANCE #:	LOCATION:	SERIAL #:	TOLERANCE:	COMMENTS:
12	Bldg. 70 Lab 47	1122510787	±0.0005	
Date	**Std Wt (g)**	**Recorded Wt (g)**	**Operator**	
11-2-05	2.0000	2.0000	KE	1
"	100.0000	99.9995	"	2
11-3-05	2.0000	2.0001	[illegible]	1
"	100.0000	100.0004	"	2
11-4-05	2.0000	1.9998	KE	1
"	100.0000	100.0002	KE	2
11-7-05	2.0000	2.0000	KE	1
	100.0000	KE ~~100.0000~~ 99.9997	KE	2
11-8-05	2.0000	2.0000	[illegible]	1
"	100.0000	100.0000	"	2

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (DQA) for service.

FRM-112 (Rev 2/Aug 03)

010358

#1 - SN: 99-J50526-15

#2 - SN: 99-J50031-1

Southwest Research Institute®
Division 01

BALANCE VERIFICATION LOG

BALANCE #:	LOCATION:	SERIAL #:	TOLERANCE:	COMMENTS:
12	Bldg. 70 Lab 47	1122510787	±0.0005	
Date	**Std Wt (g)**	**Recorded Wt (g)**	**Operator**	
10-5-05	2.0000	2.0000	[illegible]	1
"	100.0000	100.0000	"	2
10-6-05	2.0000	2.0000	KE	1
"	100.0000	100.0000	"	2
10-7-05	2.0000	2.0000	KE	1
"	100.0000	99.9999	"	2
10-10-05	2.0000	2.0000	KE	1
"	100.0000	100.0002	"	2
10-11-05	2.0000	2.0000	[illegible]	1
"	100.0000	100.0001	"	2

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (DQA) for service.

FRM-112 (Rev 2/Aug 03)

010359

1 #1 - SN: 99-J50526-15

#2 - SN: 99-J50031-1

Southwest Research Institute
Division 01
BALANCE VERIFICATION LOG

BALANCE #:	LOCATION:	SERIAL #:	TOLERANCE:	COMMENTS:
34	Bldg. 70 Lab 47	1116031935	±0.0005/0.00005	
Date	**Std Wt (g)**	**Recorded Wt (g)**	**Operator**	
11-4-05	2.0000	1.9999	KE	1
"	100.0000	100.0000	KE	2
11-7-05	2.0000	2.0000	JW	1
"	100.0000	100.0001	"	2
11-8-05	2.0000	2.0000	JW	1
"	100.0000	100.0000	"	2
11-9-05	2.0000	2.0000	KE	1
"	100.0000	100.0001	"	2
11-10-05	KE 2.0000	2.0000	KE	1
"	100.0000	100.0001	"	2

If balance is out of limits, clean the balance and re-calibrate using Class "S" weights.
If balance is still out of limits, place a "DO NOT USE" sign on it and call (DQA) for service.

FRM-112 (Rev 2/Aug 03)

010360

010361

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

DI Water Verification

D.I. WATER SYSTEM NOTEBOOK
SOUTHWEST RESEARCH INSTITUTE
BUILDING 70

C40027

Contact U.S. Filter (1-800-466-7873) for repairs/exchanges. (Make sure to have a P.O.)

010362

HIGH PURITY SYSTEM (HP)

DATE / TIME	INITIALS	RESISTIVITY MONITOR (M OHMS)	RESISTIVITY MONITOR QC LT.	QC LIGHTS QC 1	QC LIGHTS QC 2	USAGE (GALS)	COMMENTS
10/12/05 659pm	DR	18.02	✓	✓	✓	11879.8	✓
10/13/05 651pm	DR	18.02	✓	✓	✓	11902.0	✓
10/14/05 503pm	DR	18.02	✓	✓	✓	11908.4	✓
10/17/05 610pm	DR	18.02	✓	✓	✓	11939.5	✓
10/18/05 548pm	DR	18.01	✓	✓	✓	11956.0	✓
10/19/05 655pm	DR	18.02	✓	✓	✓	11972.4	✓
10/20/05 605pm	DR	18.01	✓	✓	✓	11989.1	✓
10/21/05 4pm	DR	18.02	✓	✓	✓	12017.2	✓
10/24/05 3pm	DR	18.01	✓	✓	✓	12035.1	✓
10/25/05 7pm	DR	18.02	✓	✓	✓	12045.7	✓
10/26/05 645pm	DR	18.03	✓	✓	✓	12050.6	✓
10/27/05 621pm	DR	18.02	✓	✓	✓	12055.3	✓
10/28/05 540pm	DR	18.03	✓	✓	✓	12065.3	✓
10/31/05 6pm	DR	18.03	✓	✓	✓	12094.7	✓
11/1/05 7pm	DR	18.03	✓	✓	✓	12137.9	✓
11/2/05 7pm	DR	18.02	✓	✓	✓	12178.0	✓

Legend: Check = Green (OK); X = Red (call for service)

LOW PURITY SYSTEM (LP)

DATE / TIME	INITIALS	QC LIGHTS QC 1	QC LIGHTS QC 2	USAGE (GALS)	COMMENTS
10/12/05 7pm	DR	X	✓ 7.5	30913.2	No usage
10/13/05 652pm	DR	X	✓ 7.5	30913.2	No usage
10/14/05 504pm	DR	✓	✓ 7	30913.6	✓
10/17/05 611pm	DR	✓	✓ 7	30914.8	✓
10/18/05 546pm	DR	✓	✓ 6.5	30917.2	✓
10/19/05 656pm	DR	✓	✓ 6.5	30917.8	✓
10/20/05 606pm	DR	✓	✓ 6.5	30921.6	✓
10/21/05 401pm	DR	✓	✓ 7.5	30930.5	✓
10/24/05 3pm	DR	✓	✓ 7.5	30930.8	✓
10/25/05 7pm	DR	✓	✓ 7	30931.8	✓
10/26/05 646pm	DR	X	✓ 7	30932.0	need to replace/fix/mk good (X)
10/27/05 622pm	DR	✓	✓ 6.5	30935.8	✓
10/28/05 540pm	DR	✓	✓ 7	30938.7	✓
10/31/05 601pm	DR	X	✓ 7	30938.7	no usage
11/1/05 7pm	DR	X	✓ 7	30939.1	slight usage
11/2/05 7pm	DR	X	✓ 7	30939.1	no usage

Legend: Check = Green (OK); X = Red (call for service)

D.I. WATER SYSTEM NOTEBOOK
SOUTHWEST RESEARCH INSTITUTE
BUILDING 70

740028

Contact U.S. Filter (1-800-466-7873) for repairs/exchanges. (Make sure to have a P.O.)

HIGH PURITY SYSTEM (HP)

010364

DATE / TIME	INITIALS	RESISTIVITY MONITOR (M OHMS)	RESISTIVITY MONITOR QC LT.	QC LIGHTS QC 1	QC LIGHTS QC 2	USAGE (GALS)	COMMENTS
11/3/05 723pm	DR	18.03	✓	✓	✓	12221.7	✓
11/4/05 755pm	DR	18.02	✓	✓	✓	12243.4	✓
11/7/05 [illegible]	DR	18.03	✓	✓	✓	12294.8	✓
11/8/05 715pm	DR	18.02	✓	✓	✓	12308.2	✓
11/9/05 820pm	DR	18.01	✓	✓	✓	12336.4	✓
11/10/05 5pm	DR	18.01	✓	✓	✓	12346.1	✓
11/11/05 620pm	DR	18.02	✓	✓	✓	12362.9	✓
11/14/05 621pm	DR	18.01	✓	X	✓	12372.8	✓ need to get P.O. for Service call
11/15/05 930pm	DR	18.02	✓	X	✓	12417.9	U.S. Filter called
11/16/05 837pm	DR	18.03	✓	✓	✓	12465.0	Mixed Bed and Carbon Exchange. Need
11/17/05 7[illegible]pm	DR	18.02	✓	✓	✓	12549.2	✓
11/18/05 705pm	DR	18.03	✓	✓	✓	12581.8	✓
11/21/05 722pm	DR	18.02	✓	✓	✓	12619.3	✓
11/22/05 610pm	DR	18.02	✓	✓	✓	12650.7	✓
11/23/05 450pm	DR	18.02	✓	✓	✓	12672.3	✓
11/28/05 550pm	DR	18.03	✓	✓	✓	12678.7	✓

Legend: Check = Green (OK); X = Red (call for service)

LOW PURITY SYSTEM (LP)

DATE / TIME	INITIALS	QC LIGHTS QC 1	QC LIGHTS QC 2	USAGE (GALS)	COMMENTS
11/3/05 714pm	DR	✓	✓ 6.5	30940.3	✓
11/4/05 755pm	DR	X	✓ 7	30940.5	slight usage
11/7/05 721pm	DR	X	✓ 6.5	30941.5	slight usage
11/8/05 716pm	DR	X	✓ 6.5	30941.5	no usage
11/9/05 821pm	DR	X	✓ 6.5	30943.5	might be due for tank exchange
11/10/05 801pm	DR	X	✓ 6	30944.8	slight usage
11/11/05 631pm	DR	✓	✓ 6.5	30945.5	✓
11/14/05 624pm	DR	X	✓ 6.5	30945.8	need P.O. for Service call
11/15/05 931pm	DR	X	✓ 6	30948.9	U.S. Filter called
11/16/05 838pm	DR	✓	✓ 13.5	30979.2	Carbon, Mixed Bed Exchange. ALL OK
11/17/05 701pm	DR	✓	✓ 13.5	30989.0	✓
11/18/05 706pm	DR	✓	✓ 14	30990.1	✓
11/21/05 722pm	DR	✓	✓ 14	30998.0	✓
11/22/05 611pm	DR	X	✓ 14.5	30998.0	no usage
11/23/05 451pm	DR	X	✓ 14.5	30998.0	no usage
11/28/05 551pm	DR	✓	✓ 12	31001.5	✓

Legend: Check = Green (OK); X = Red (call for service)

D.I. WATER SYSTEM NOTEBOOK
SOUTHWEST RESEARCH INSTITUTE
BUILDING 70

r40028

Contact U.S. Filter (1-800-466-7873) for repairs/exchanges. (Make sure to have a P.O.)

HIGH PURITY SYSTEM (HP)

010364

DATE / TIME	INITIALS	RESISTIVITY MONITOR (M OHMS)	RESISTIVITY MONITOR QC LT.	QC LIGHTS QC 1	QC LIGHTS QC 2	USAGE (GALS)	COMMENTS
11/3/05 723pm	DR	18.03	✓	✓	✓	12221.7	✓
11/4/05 755pm	DR	18.02	✓	✓	✓	12243.4	✓
11/7/05 722pm	DR	18.03	✓	✓	✓	12294.8	✓
11/8/05 745pm	DR	18.02	✓	✓	✓	12308.2	✓
11/9/05 820pm	DR	18.01	✓	✓	✓	12336.4	✓
11/10/05 5pm	DR	18.01	✓	✓	✓	12346.1	✓
11/11/05 620pm	DR	18.02	✓	✓	✓	12362.9	✓
11/14/05 621pm	DR	18.01	✓	X	✓	12372.8	✓ need to get P.O. for Service call
11/15/05 930pm	DR	18.02	✓	X	✓	12417.9	U.S. Filter called
11/16/05 832pm	DR	18.03	✓	✓	✓	12465.0	Mixed Bed and Carbon Exchange. Need
11/17/05 7pm	DR	18.02	✓	✓	✓	12549.2	✓
11/18/05 705pm	DR	18.03	✓	✓	✓	12581.8	✓
11/21/05 722pm	DR	18.02	✓	✓	✓	12619.3	✓
11/22/05 610pm	DR	18.02	✓	✓	✓	12650.7	✓
11/23/05 450pm	DR	18.02	✓	✓	✓	12672.3	✓
11/28/05 550pm	DR	18.03	✓	✓	✓	12678.7	✓

Legend: Check = Green (OK); X = Red (call for service)

LOW PURITY SYSTEM (LP)

DATE / TIME	INITIALS	QC LIGHTS QC 1	QC LIGHTS QC 2	USAGE (GALS)	COMMENTS
11/3/05 724pm	DR	✓	✓ 6.5	30940.3	✓
11/4/05 755pm	DR	X	✓ 7	30940.5	slight usage
11/7/05 721pm	DR	X	✓ 6.5	30941.5	slight usage
11/8/05 716pm	DR	X	✓ 6.5	30941.5	no usage
11/9/05 821pm	DR	X	✓ 6.5	30943.5	might be due for tank exchange
11/10/05 801pm	DR	X	✓ 6	30944.8	slight usage
11/11/05 631pm	DR	✓	✓ 6.5	30945.5	✓
11/14/05 624pm	DR	X	✓ 6.5	30945.8	need P.O. for Service call
11/15/05 931pm	DR	X	✓ 6	30948.9	U.S. Filter called
11/16/05 838pm	DR	✓	✓ 13.5	30979.2	Carbon, Mixed bed exchange. All OK
11/17/05 701pm	DR	✓	✓ 13.5	30989.0	✓
11/18/05 706pm	DR	✓	✓ 14	30990.1	✓
11/21/05 722pm	DR	✓	✓ 14	30998.0	✓
11/22/05 611pm	DR	X	✓ 14.5	30998.0	no usage
11/23/05 451pm	DR	X	✓ 14.5	30998.0	no usage
11/28/05 551pm	DR	✓	✓ 12	31001.5	✓

Legend: Check = Green (OK); X = Red (call for service)

SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECT
CLIENT: Division 20
TASK ORDER: 051021-6
SRR: 28183
SDG: 268878
CASE: CNWRA
VTSR: October 21, 2005
PROJECT#: 06002.01.322

010365

SURVEILLANCE REPORTS
From Division 30

010366

Institute Quality Assurance Surveillance Report

Project Number: 20-06002 | **Report Number:** ~~2005-SR-0355~~ 2006-SR-0031 | **Page 1 of 1**

Surveillance Scope: Review of a Division 01 test package for Div. 20, the Center for Nuclear Waste Regulatory Analysis. This is a Nuclear Surveillance.

Reference Documents: Documentation test packages for Task Orders 051021-6, 051110-8, and 051219-5

Starting Date: 2006-02-07 **Ending Date:** 2006-02-07

Institute QA Representative: Mark R. Ehnstrom

Person(s) Conducting Test/Exam/Procedure: R. Presas

Satisfactory Findings

The data packages were reviewed for test activities performed in Division 01. The test activities were performed on a total of 23 samples provided by Dr. L. Yang of Division 20. A Laboratory Task Order form was used as a cover sheet for each package. The Laboratory Task Order form made reference to 10CFR 50, Appendix B and to 10CFR Part 21. A "Sample List/Chain of Custody" form was also used to assure positive control and responsibility for the samples. Data contained in the packages included:

- Calibration records on the specific instrumentation used during testing
- Certificates of Analysis
- Reports of Certificates
- Certificates of Reference Materials

When appropriate, test documentation was provided which showed traceability back to the National Institute of Standards. Test results had been reviewed by Division 01 supervisory personnel. Personnel training records were reviewed and were found to be satisfactory.

Unsatisfactory Findings: None

Nonconformance Report Number: N/A **CAR/SCAR Number:** N/A

Attachments: None

Recommendations/Actions: N/A

Equipment Calibration: See above.

Approved: _____
Institute Quality Assurance

Date: 2 · 14 · 2006

Distribution: Original – IQS Records
CC: M.R.Ehnstrom (30)
PM – R. Presas (01)
J. Boyd (01)

SwRI® Form QA-125-3