

TITLE _____

From Page No. _____

Specimens And Cell Configurations

12-9-02 All Final wts Taken without correction wire

316L #1 Specimen start wt = 22.85437g End wt = 21.69353g

316L #2 Specimen start wt = 22.79187g End wt = 21.64897g

316L w #5 Specimen start wt = 22.78069g End wt = 21.63781g

316L w #6 Specimen start wt = 22.72636g End wt = 21.58459g

A516-60 #1 Specimen start wt = 25.82021g End wt = 24.75590g

A516-60 #2 Specimen start wt = 25.68629g End wt = 24.62650g

A516-60 w #1 Specimen start wt = 26.42891g End wt = 25.41228g

A516-60 w #2 Specimen start wt = 26.30898g End wt = 25.25534g

C-22 #1 Specimen start wt = 24.97710g End wt = 23.86348g

C-22 #2 Specimen start wt = 24.85157g End wt = 23.77829g

C-22 w #4 Specimen start wt = 24.61667g End wt = 23.46915g

C-22 w #5 Specimen start wt = 24.51141g End wt = 23.40257g

12-9-02 Initial wts Not Taken with Correction wire

304L #2 Specimen start wt = 29.44751g End wt = 29.44890g

304L #4 Specimen start wt = 29.33494g End wt = 29.33513g

All Specimens Polished To A 600 Grit Finish

All weight measurements Taken with Sartorius Genies SN#12809099 cal 6/4/02 acc 12/4/02

Cell Configuration Number

Cell Orientation

Cell #1	C-22 #1	And C-22 #4 welds	=	Control
Cell #2	316L #1	And 316L w #5	=	Control
Cell #3	516 #1	And 516-60 w #1	=	Control
Cell #4	C-22 #2	And C-22 w #5	=	Mic / Test
Cell #5	316L #2	And 316L w #6	=	Mic / Test
Cell #6	516 #2	And 516-60 w #2	=	Mic / Test
Cell #7	304L #2		=	Control
Cell #8	304L #4		=	Mic / Test

Continued pg #56

To Page No. _____

Witnessed & Understood by me,

Date

Invented by

Date

Recorded by

w/g/r

From Page No. _____

Mic Testing Multi Specimen Cells

10/1/02 After purging cell's with N_2 for 2 hrs

Injects 1 ml of slime former @ 4:15pm Into Test Cells

Injects 1 ml of sterile Broth Into Control cells @ 4:20pm

10/2/02 - All cells OK

Control cell #1 HAD Minor Solution loss

7:30am

Test Cell #6 Have Slight Color change In Solution
Control cell #3

2:00pm All cells Remain the Same

10/3/02 3:00pm

Inoculates 1.0 ml SRB's Into Test cell #4-#5-#6

Inoculates 1.0 ml sterile Bacto's Broth Into cells #1-#2-#3

10/4/02 well Aon 304L Test Cells on Mon 10/7/02

10/7/02 Ran Polarization Resistance Tests A.m

Starts To Purge 304L cells with N_2

12:21pm Aposp 1 ml sterile Broth Into Control Cell #7

Aposp 1 ml Slime former Into Test Cell #8

10/9/02 Ran Polarization Resistance Tests @ 8:42 am

2:30pm Inoculates 1.0 ml SRB's Into 304L cell #8

Inoculates 1.0 ml Broth Into 304L cell #7

Continued on #57

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Witnessed & Understood by me, _____

Date _____

Invented by _____

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Recorded by _____

10/11/02

TITLE _____

From Page No. _____

10/11/02 Ran Polarization Resistance Test @ 8:00am

Starts To Monitor OCP After Polarization Test
Computer Set up To Monitor OCP for 144 hours
till Next Polarization Run

10/14/02

Computer shutdown @ 842 points will Restart OCP
7:30am with New file Name

10/16/02

Ran Polarization Resistance Tests @ 8:20 am
Switched Reference cell #4 from SN# 6238341 To SN# 0749094

Restarted OCP Monitor

10/17/02

Pulped 1 ml samples from Each Test Cell

9:20 am

Inoculates on To Bacto's Agar And Nutrient Agar
w/ 1.5% NaCl

10/21/02

1:30pm

Inoculates 1 ml sterile Broth Into cells #1-#2-#3-#7
Inoculates 1 ml SRB's Into Cell #4-#5-#6-#8

10/23/02

12:35pm Ran Polarization Resistance Tests

* Note cell #1 cell #2 cell #3 mild Solution Evaporation
sprayed N_2 thru solution for 3 hrs
placed 12 ml of 0.5 M NaCl solution from #53
Into Each Cell After Polarization Test were Run

1:00pm

Restarted OCP Test on cells #1-#8
Stopped OCP Test @ 1:45pm Cells #1-6 were on
wired specimens, cells #7-#8 were on unwired
Restarted OCP with All unwired specimens

To Page No. _____

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10/11/02

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Continued Mic Testing from pg #57

10/30/02 Ran Polarization Resistance Test on Cells #1-#8
9:00 amHap Computer Problem over weekend computer shutdown
Diana: Perfect OCP Amp will not continue OCP Testing
After this Polarization Resistance Testing11/20/02 Ran Polarization Resistance Tests on Cells #1-#8
3:00 pm

Entered time points in between Testing

12/4/02 Ran Polarization Resistance Tests on Cells #1-#8
9:00 amAlso stopped testing procedure @ 12/4/02 10:00 am
pulled Solution Samples on Each Cell
with no Examination of Each Specimen
And will Plate Each Solution on:Nutrient Agar with 15% NaCl for aerobic @ 31°C
and Tryptic agar (for SRB) for anaerobic @ 31°C12/6/02 10:00 am For SRB
Examine plates at 24° and at 4 days 12/6/02

TEST OR QC CELL 24 Hr - aer 4 days - aer

1 QC	*3,300 cfu/ml	same
2 QC	ng	ng
3 QC	*4,000 cfu/ml	same
4 Test	>10,000 cfu/ml	same
5 Test	>10,000 cfu/ml	same
6 Test	>10,000 cfu/ml	same
7 QC	ng	ng
8 Test	>10,000 cfu/ml	same 12/6/02

* not slime former

12/6/02 To Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

12/6/02

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12/6/02 For SRB:

TEST OR QC CELL	24 hr. ana	4 days ana
1 QC	ng	ng
2 QC	ng	ng
3 QC	ng	ng
4 Test	ng	ng
5 Test	ng	ng
6 Test	ng	ng
7 QC	ng	ng
8 Test	ng 12/6/02	ng 12/6/02

Witnessed & Understood by me, _____

Date _____

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From Page No. _____

Witnessed & Understood by me,

Date

Invented by

Recorded by

Date

To Page No. _____

From Page No. _____

Sensor Test Cell

Witnessed & Understood by me,

Date

Invented by

Recorded by

Date

To Page No. _____

10/17/02 File has been 02-09274 02.txt
 Connections: to D-SS 304-2 sensor leads
 connectors: I-1
 I-2 For currents, using 1k Resistors
 ch#33 — pt Counter electrode J. Yang
 ch#34 — Cpm of D-SS 304-2
 8:52 #2829 Connections made.
 H₂ bubbling started.
 9:15 or Injected 1.0 ml Slime Into Test Cell J. Yang
 14:44 Sensor signals: -40 to +13 mV J. Yang
 15:20 Change Resistor to 10 kΩ
 17:02 Found connector I-2 was used, changed to I-1
 returned not connected

J. Yang

10/17/02

From Page No. _____

12/8/02

17:50 #8003

-64.85 \rightarrow +27 μ V

10/21/02 @ 1:00pm

Inoculated cell with 1.0 ml SRB's

Time 12:57 Date #3368

13:16 signal +106 \rightarrow -41 μ V. J. 10/21/02

10/25/02

13:37 Signal +16.8 \rightarrow -8.3 μ V11/4/02 New file 02-1104a.
8:13

11/5/02 program did not go.

10:00 restarted 02/1105a.

11/6/02

9:21 -7.4 \rightarrow +10.20 μ V.

11/15/02 program stopped for Electrochemical Noise test

11/15/02

Back to the mnc test.

To Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Recorded by _____

Date _____

11/5/02

From Page No. _____

11/15/02

9:16 program restarted 02-1115A.

Connection same as before, see page 61

Signal: -26.9 \rightarrow +10.79 μ V/weekE_{pt} = -133 mV_{scs}, E_{com} = -669 mV_{scs}

12/1/02

3:00pm

Sensor taken out,
Removed for Examination on 12/9/02
collected solution sample

12/12/02

pictures taken before and after cleaning.
See pages 69 and 70

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Invented by _____

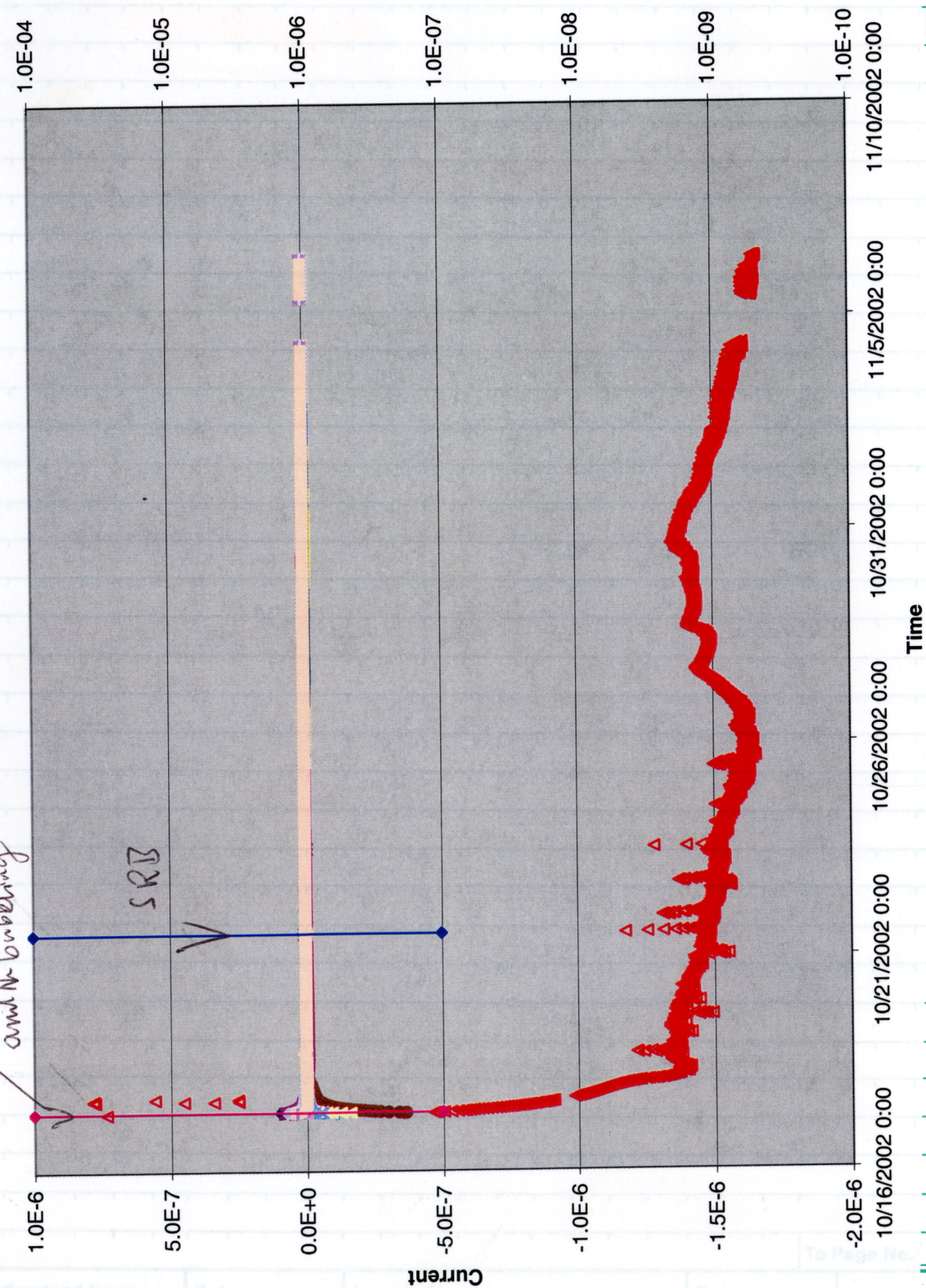
Recorded by _____

Date _____

12/1/02

From Page No. _____

02_0927a02_1105a00 Chart_Test_SS

shine
and bubbling

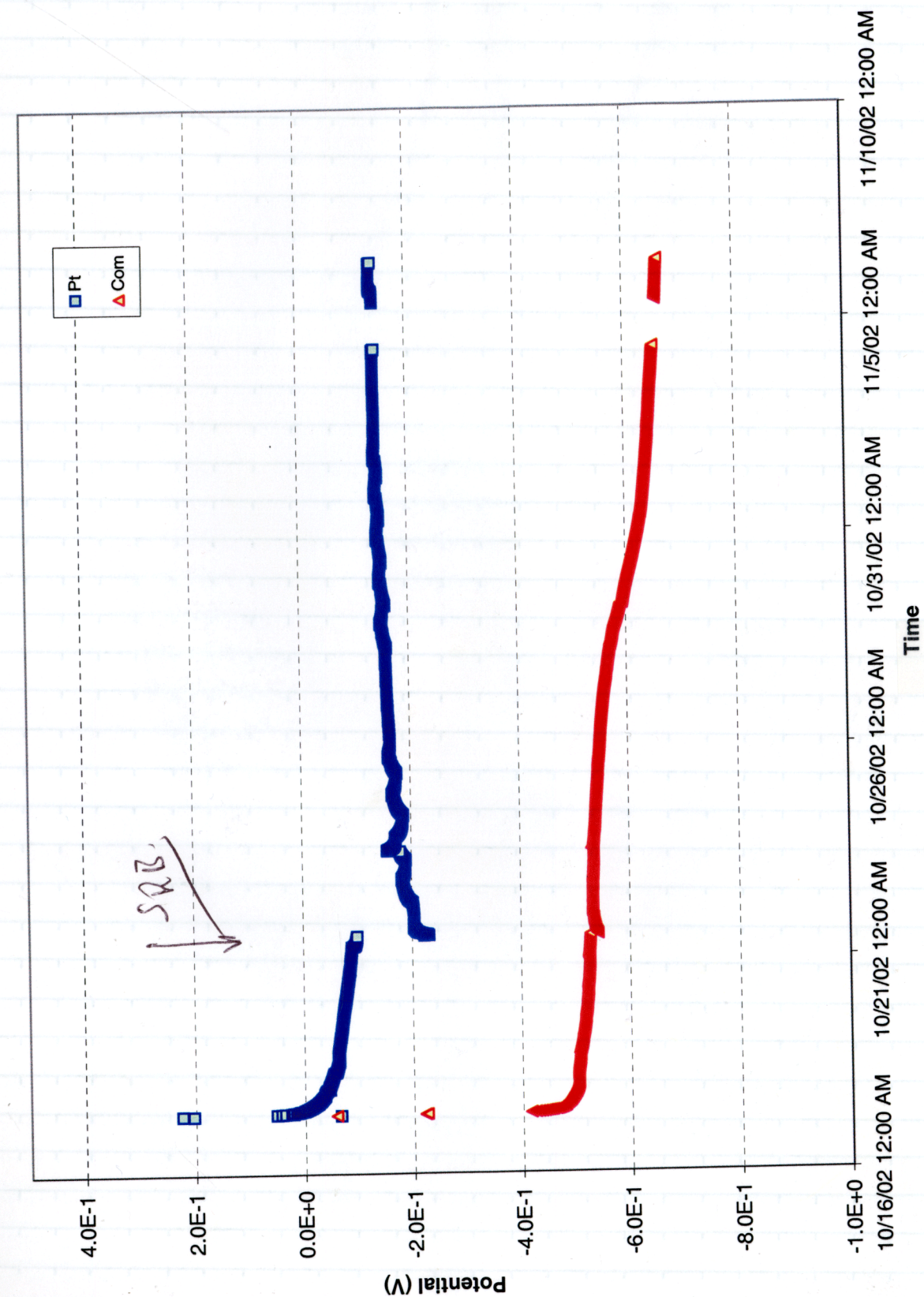
Recorded by

Rafael

11/12/02

From Page No. _____

File: 02_0927a02_1105a00 Tab: Chart_Potential



Witnessed & Understood by me,

Date

Invented by

Date

Recorded by

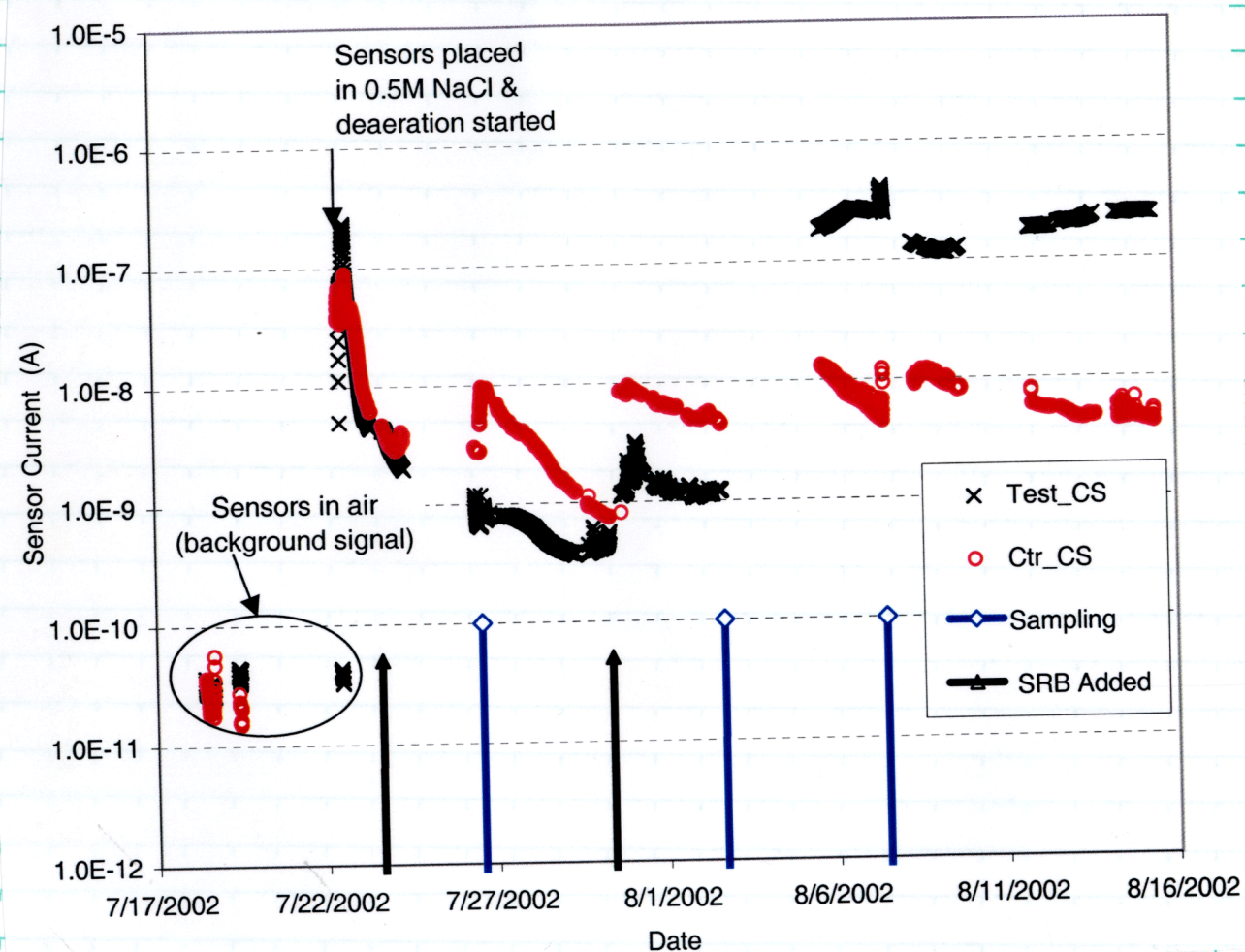
Rafael

11/12/02

From Page No.

02_0717a00_02_0925a00_MIC_Summary_a Chart_CS_SRB

Replotting of page 41.



To Page No.

Witnessed & Understood by me,

Date

Invented by

Date

Recorded by

J. Yang

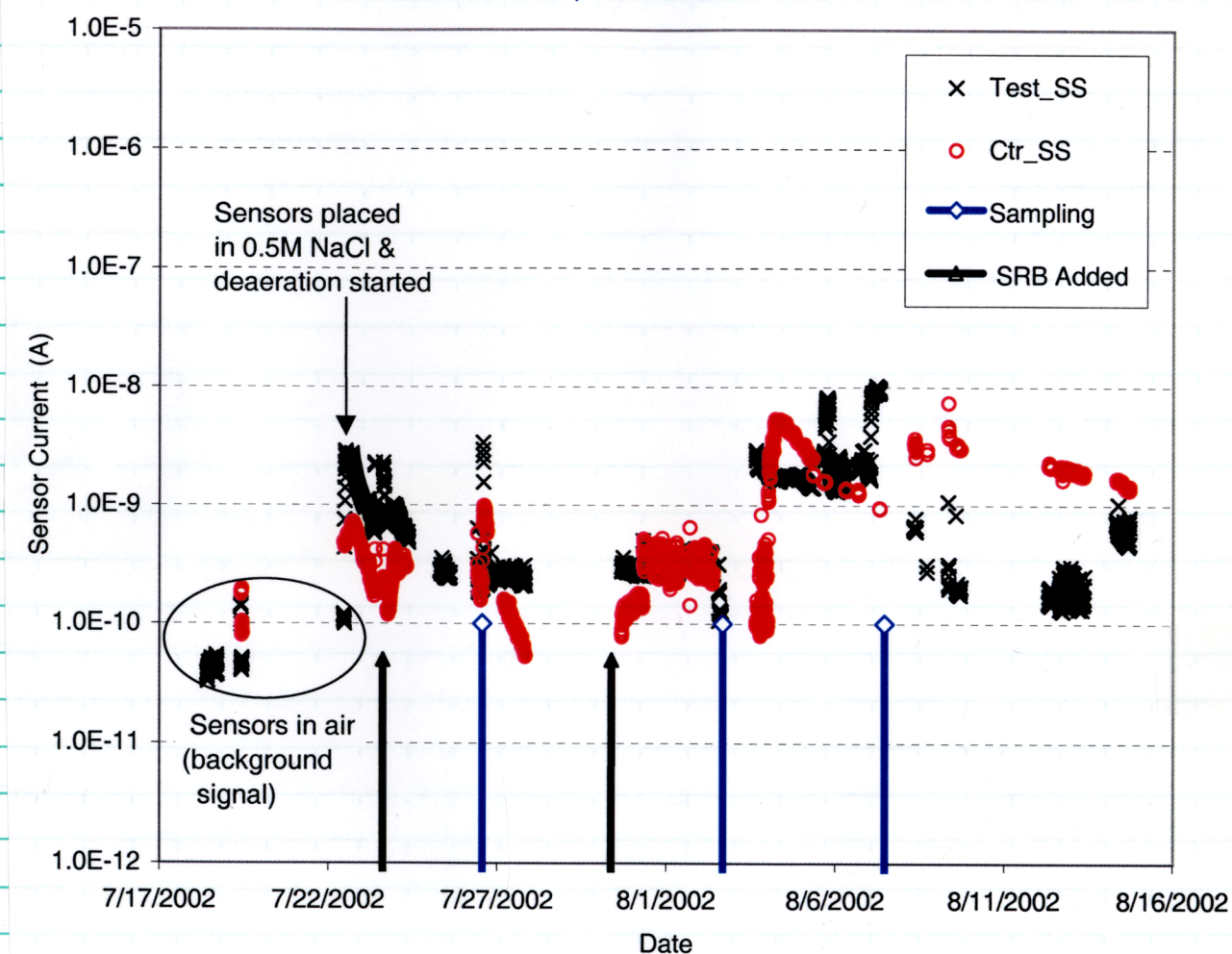
12/11/02

TITLE

From Page No.

File: 02_0717a00_02_0925a00_MIC_Summary_a Tab:Chart_SS_SRB

Replotting of page 4



To Page No.

Witnessed & Understood by me,

Date

Invented by

Date

Recorded by

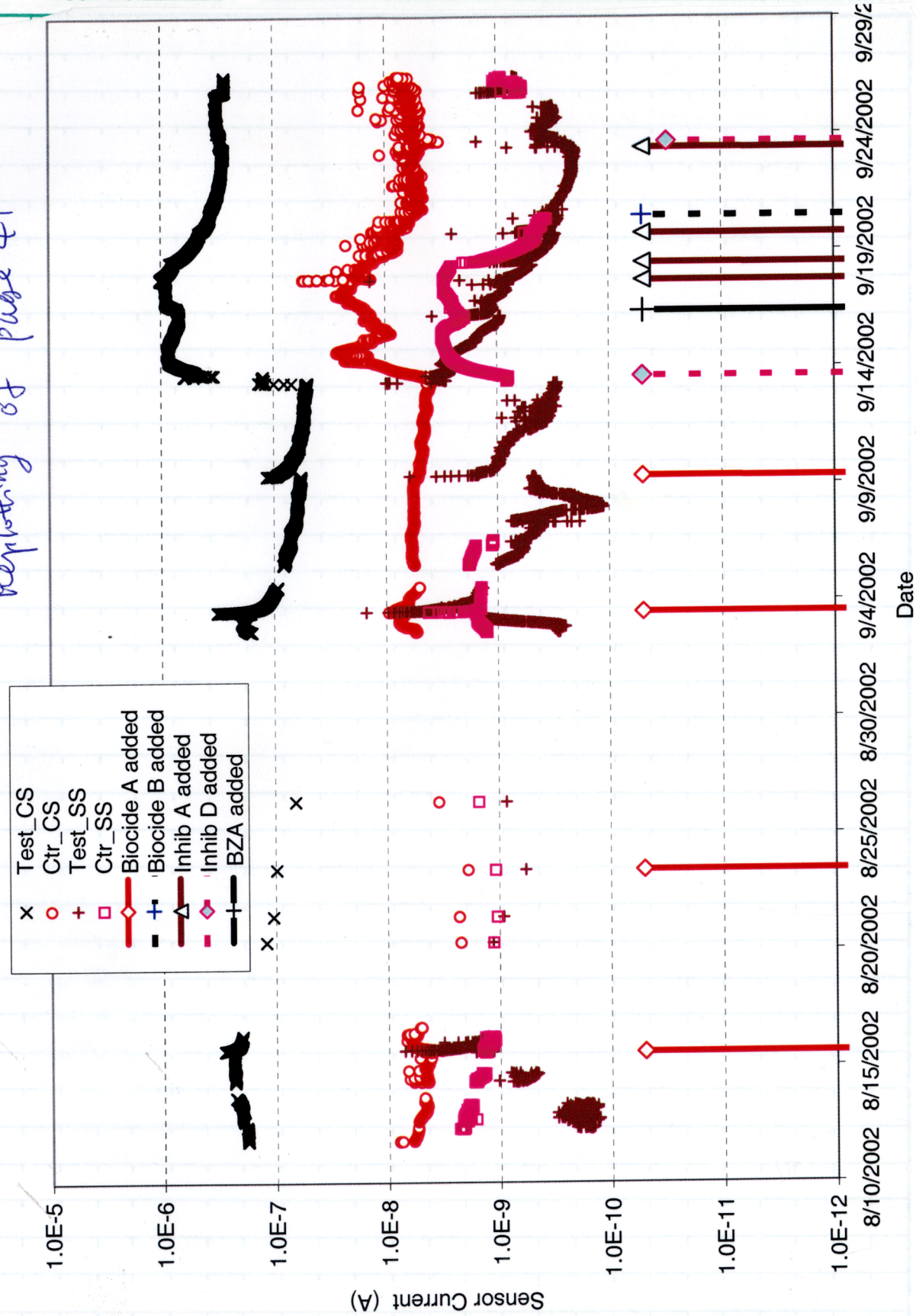
J. Yang

12/11/02

From Page No. _____

File: 02_0717a00_02_0925a00_MIC_Summary_a/ Tab: Chart_CS&SS_Biocide

Replotting of page 41



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Witnessed & Understood by me, _____

Date _____

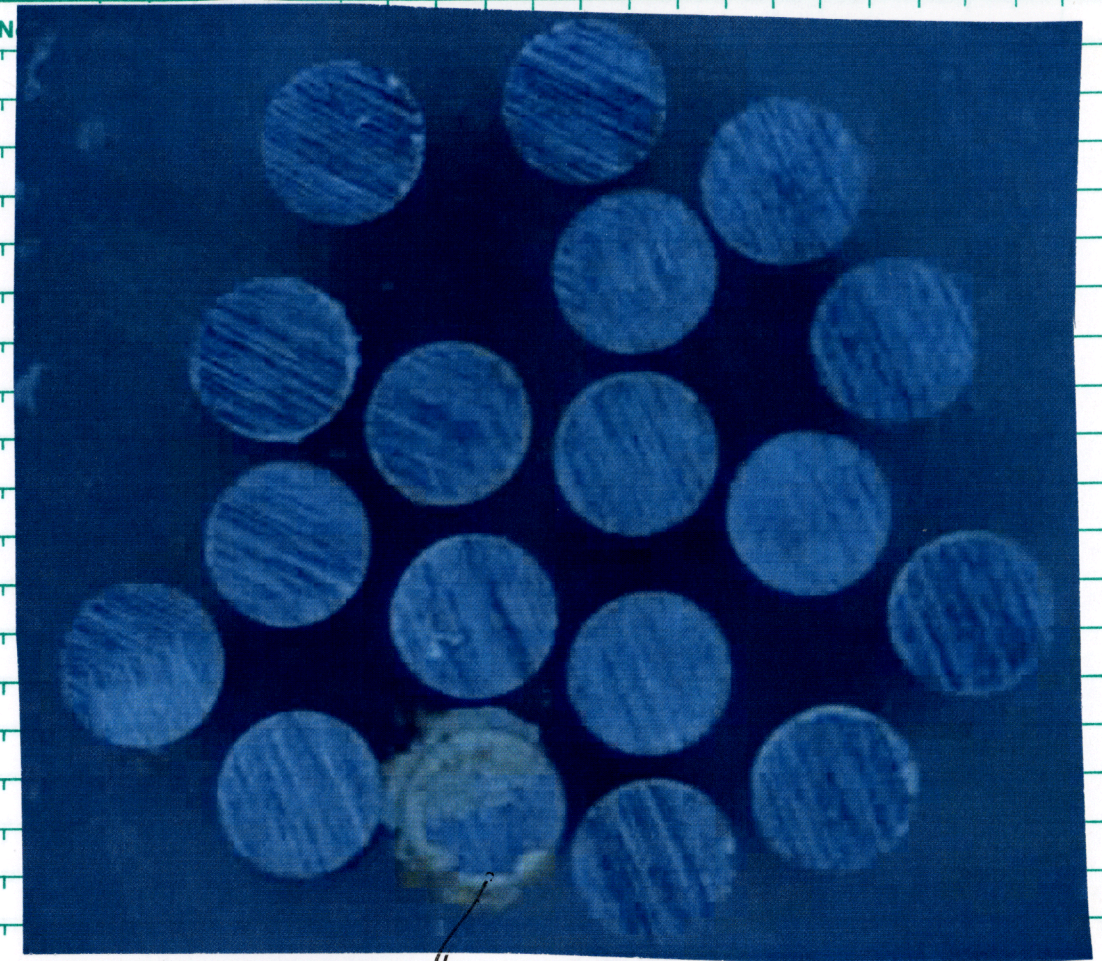
Invented by _____

Recorded by _____

Date _____

2/12/02

From Page No. _____

From
page 63M. Farver
1.7.Before
cleaning

To Page No. _____

Witnessed & Understood by me, _____

Date _____

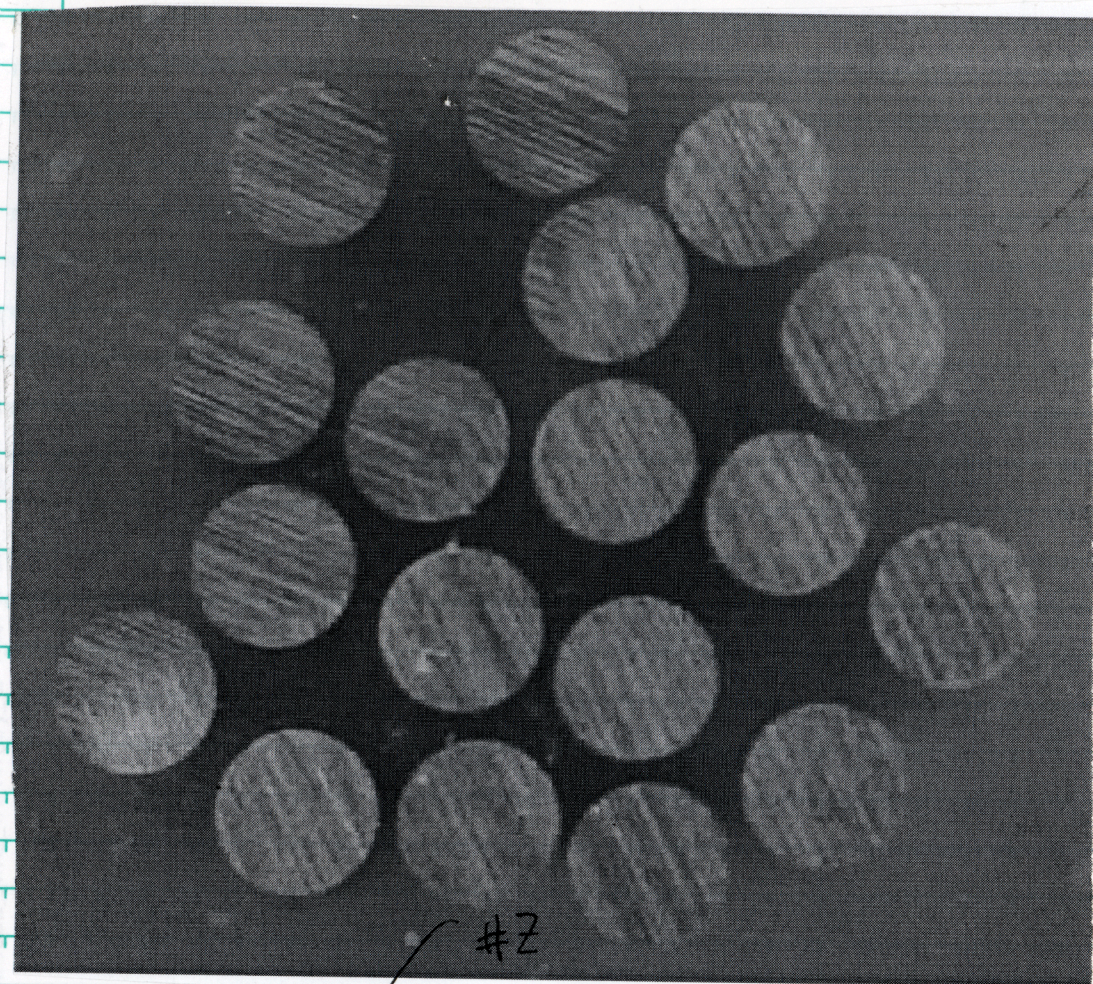
Invented by _____

Recorded by _____

Date _____

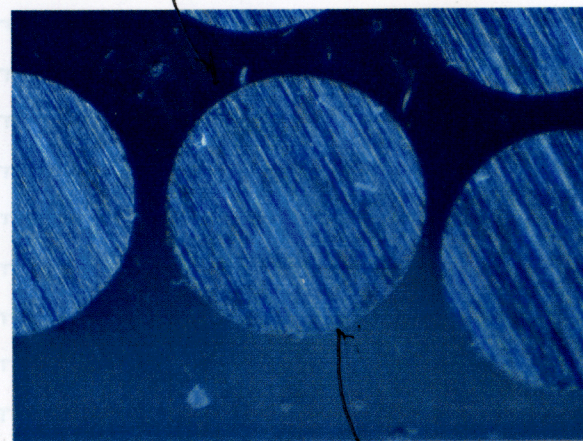
2/12/02

From Page No. _____

From
Phase 63M.F.
17.

#Z

After cleaning



After cleaning

M.F. 6.3.

#Z - Not much corrosion

To Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

J. Y. J.

2/2/02

TITLE _____

From Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

B. P. J.

3/10/02

From Page No.					
Mic test on 304 SS coupons					
Test Equipment					
Fluke	87III	SN 73980493	Due Date	1/8/04	
Fluke	87III	SN 73980493	Due Date	1/8/04	
Keithley		SN 704936	Due Date	5/26/03	
Ohaus		SN 2883	Due Date	7/29/03	
Fisher	13-620-52	SN 0249090	Due Date	N/A	
Fisher	13-620-52	SN 0199568	Due Date	N/A	
0.5 M NaCl solution					
1/15/03 Mixed up solution					
58.46 g	NaCl	Lot#	025149		
2000	mL DI H ₂ O				
304L wts taken with Sartorius Genius SN # 12809099 Cal 11/15/02 Due 5/15/03					
Specimen # 2	Start wt.	29.39308	grams		
	End wt.	N/A	grams		
Specimen # 4	Start wt.	29.28574	grams		
	End wt.	N/A	grams		
Specimen # 5	Start wt.	29.5412	grams		
	End wt.	N/A	grams		
Specimen # 6	Start wt.	28.99134	grams		
	End wt.	N/A	grams		
1/15/03	-233.6 mV	2 uA			
1/16/03	195.9 mV	0.4 uA			
1/17/03	-178.4 mV	0.1 uA			
	-196 mV	0.1 uA			
	-207 mV	0.1 uA			
Ran out of Air over weekend New Tank. Took readings then added SRB's					
1/20/03	-191 mV	0.5 uA	Cell # 1	Time	
	-157 mV	0.06 uA	Cell # 2	7:20 a.m.	
	-225 mV	1.5 uA	Cell # 1	3:00 p.m.	
	-163 mV	0.06 uA	Cell # 2		
1/21/03	-117 mV	0.1 uA	Cell # 1	7:50 a.m.	
	-187 mV	0.07 uA	Cell # 2		
	-158 mV	0.11 uA	Cell # 1	3:20 p.m.	
	-206 mV	0.12 uA	Cell # 2		
1/22/03	-125 mV	0.1 uA	Cell # 1	8:30 a.m.	
	-272 mV	0.07 uA	Cell # 2		
1/23/03	-135 mV	0.24 uA	Cell # 1	a.m.	
	-202 mV	0.09 uA	Cell # 2		
	-118 mV	0.21 uA	Cell # 1	p.m.	
	-221 mV	0.13 uA	Cell # 2		
1/24/03	-95 mV	0.18 uA	Cell # 1	8:20 a.m.	
	-233 mV	0.16 uA	Cell # 2		
	-118 mV	0.25 uA	Cell # 1	p.m.	
	-243 mV	0.24 uA	Cell # 2		
1/27/03	-181 mV	0.46 uA	Cell # 1	7:40 a.m.	
	-220 mV	0.13 uA	Cell # 2		
To Page No.					

Witnessed & Understood by me,	Date	Invented by	Date 3/10/03
		Recorded by	

[illegible]

Witnessed & Understood by me,	Date	Invented by	Date 3/10/03
		Recorded by	

From Page No. _____

2/20/03	-172 mV	0.06 uA	Cell #2	
	-228 mV	0.32 uA	Cell #1	a.m.
	-285 mV	0.03 uA	Cell #2	
2/21/03	-228 mV	0.28 uA	Cell #1	a.m.
	-191 mV	0.21 uA	Cell #2	

Stopped Test

No corrosion was observed on any specimen.

Did not re-weigh.

3/5/03. Read all harvest cultures taken from test cell. Results are as follows:

Harvest of 2/13/03

Slime former

+ (growth)
 $> 10^5$ cfu/ml

SRB

ng (no growth)

Harvest of 2/18/03

+ (growth)
 $> 10^5$ cfu/ml+ (growth)
 on 3/5/03.

as of 2/21/03 there was no growth of SRB from harvest of 2/18/03. Cultures not read again until 3/5/03.

3/5/03 ~~SRB~~

To Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

3/10/03

From Page No. _____

3/10/03

The following 304L coupons were used: 304L RT R254 #2, #4, #5
 The following Goodfellow SS wire was used:

1 meter coil #1

2 meter coil #2

PO # 1931325

LS214715 BG

SS AISI 304

Solution 0.5 M NaCl

58.27g added to 2L DI H₂O

lot # 027878

Test Equipment used:

Ohaus balance SN 2283 Due date: 7/29/03

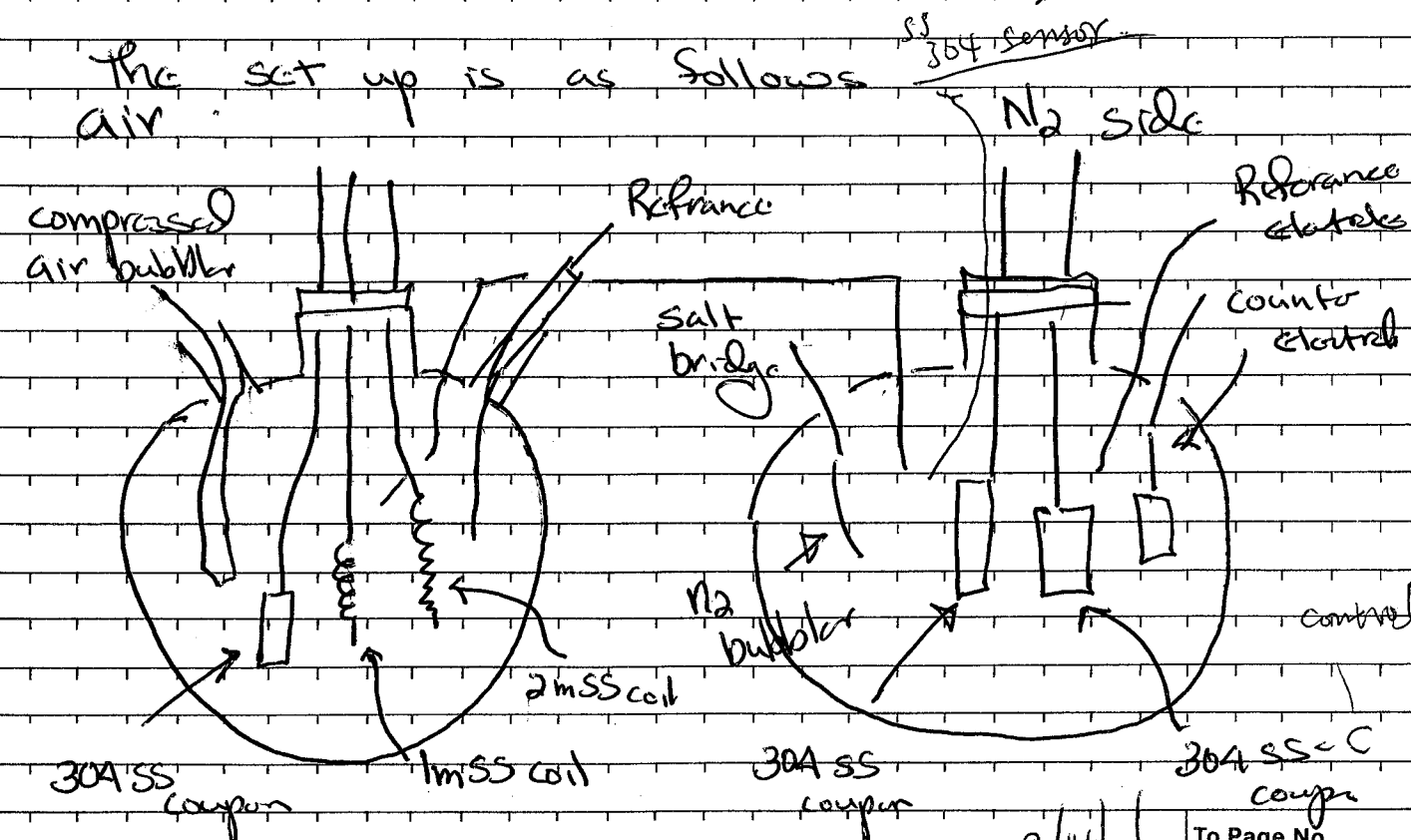
Fisher 13-620-52 SN 0142121

SN 0066112

N/A

N/A

The set up is as follows



Witnessed & Understood by me, _____

Date _____

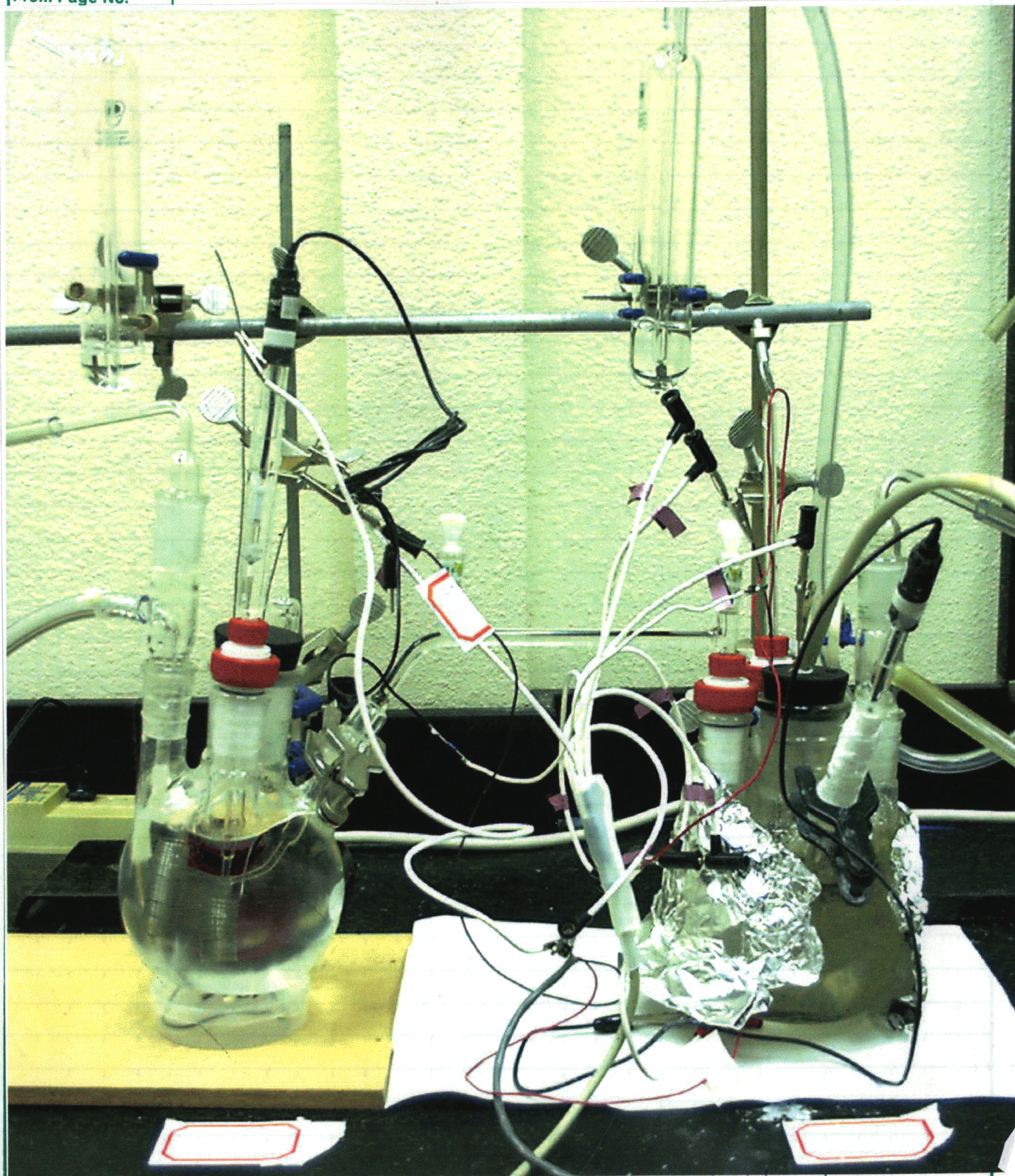
Invented by _____

Date _____

Recorded by _____

3/10/03

To Page No. _____



Witnessed & Understood by me, _____

Date _____

Invented by J. YeyRecorded by R. DykstraDate 3/10/03

To Page No. _____

3/10/03 Polished samples to 600 grit finish
2 p.m. Assembled cells
0.5M NaCl
Started N₂ & air purge

3/12/03
10:41. $E_{304, N_2} = -137.6 \text{ mV}_{SCE}$
 $E_{Pt, N_2} = -206.5 \text{ mV}_{SCE}$ (good, O₂ purged out)
 $E_{304, Air} = -53.5 \text{ mV}_{SCE}$ not quite. should be
 $E_{304, Coil} = +17.2 \text{ mV}_{SCE}$ ~400mV_{SCE} if fully purged

14:30. 304, H₂-C Install (used as a control).

16:10 Connections were made (see page 78).

16:12 program started. 10k coupling R used for sensor.
03-MAR-2003

3/13/03 Added 1K ohm Ω between air coil 304 & 304 Nitrogen coupon.

10:30
12:31 Added jumper from air coil 304 to two-wire #4 wire (connected to 2-wire shield) ASD 3/13/03

3/14/03 coupled com of SS sensor to 304 coil Electrode

8:48: Air Cell opened, installed a 2-m long, 1mm dia 304 SS orl electrode. (304 coil 2)

coupled com of SS sensor to 304 coil 2
C decoupled it from 304 coil

Witnessed & Understood by me, _____

Date _____

Invented by _____

Recorded by J. YeyDate 3/14/03

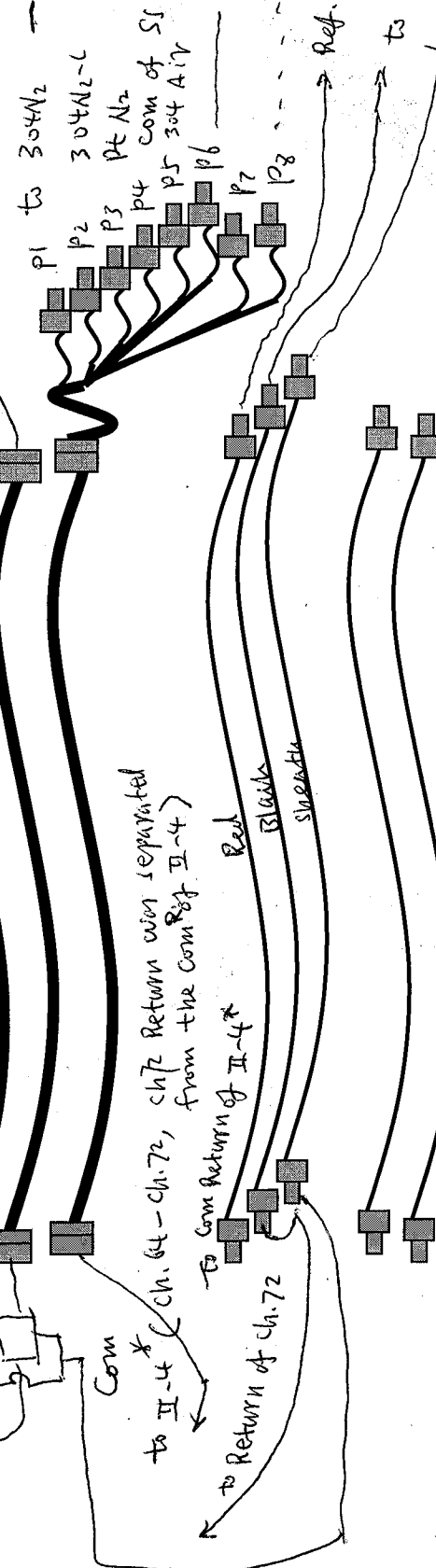
To Page No. _____

Sensor
SS304-2to
II-3 II-2

a pin cable

Recorded by

J. Yag. 3/12/03



R - coupling Ref sensor 304-2

R₁ = 1k

* II-4*

II-4 com. Return #8 (Ch72) was separated out.

updated 2003/04/08

enb.f

Mar 12/03

J. Yag

From Page No.

3/14/03 0900 Broke salt bridge tray to seal Air side. Replaced salt bridge with new one.

11:0 a.m. ENB

Aliquot (approximately 4 ml) of a 48 hr. culture of *Vibrio natriegens* (slime former) is added to the test cell after back flushing the entrance valve port with test solution. Aseptic technique is utilized.

For control cell, sterile nutrient broth with 1.5% NaCl is added through a glass port directly into the solution. Approximately 4 ml is the volume of sterile nutrient added. Aseptic technique is used. ENB 3-14-03.

11:06 Slime Former, 4 ml each cell.

12:15 cycle # S10 Stop program.

12:28 cycle # - Started program File Name: 03/Mar14b.

3/17/03 1050 a.m. ENB

Harvest solution from test cell and from control cell. Approximately 4 ml fluid withdrawn from each cell using aseptic technique. Cells are agitated for approximately 10 seconds prior to sampling.

Inoculation of SRB culture into test cell, approximately 4 ml of a one week old culture grown in modified Basal's broth. 3-17-03 Aseptic technique used. For control cell approximately 4 ml sterile modified Basal's broth is aseptically inoculated.

Harvest cultures are made onto sterile nutrient agar with 1.5% NaCl. These are inoculated using 0.00 μ l and 0.01 μ l aliquots. Cultures are incubated at 31°C.

ENB 3-17-03 Page No.

Witnessed & Understood by me,

Date

Invented by

Date

Recorded by

J. Yag 3/31/03

From Page No. _____

3/21/03 ~~SNB~~ 2:00 p.m. ~~and~~ ³⁻²¹⁻⁰³
 Harvest ~~growth~~ ^{sample} from test
 cell and from control cell. Aseptic technique
 used throughout procedure. Approximately
 4 ml SDB culture added to test cell
 following 4 ml harvest. Approximately
 4 ml sterile Baar's ^{broth} ~~broth~~ added
 to control cell following 4 ml harvest.
 All harvest cultures are inoculated
 into sterile modified Baar's Broth
 and incubated at 31°C.

Culture results from Harvest (taken
 on 3/17 are as follows:

Date of harvest: 3-17-03 31°C

Vibrio natriagans

3/21/03

⊕
 5×10^5 cfu/ml

3/24/03

same

SDB

ng.

3-21-03
~~SNB~~

ng. ~~SNB~~
 3-24-03

3/24/03 ~~SNB~~

Date of Harvest: 3-21-03 31°C

3/24/03

SDB

⊕ heavy growth
 in Baar's Broth
 subculture.

~~SNB~~
 3-24-03

To Page No. _____

Witnessed & Understood by me,

Date

Invented by

Date

Recorded by

J. Y. J.

3/31/03

From Page No. _____

3/21/03 16:16 program stopped

18:18 program restarted, File Name 03_May_25a

3/28/03 Took air side down and cleaned

12:15 entire cell with HCl & Acetone

Rise with DI. Added 0.5 M NaCl

and started Na purge

12:15 Put back into Service. Salt bridge

broke, had to replace it

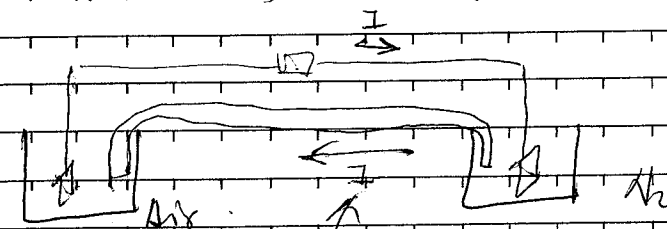
0.5 M NaCl

58.2 Ag added to 2L DI H₂O

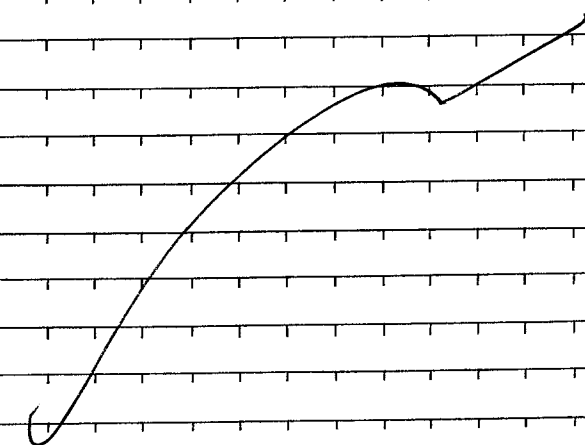
lot # 027878

3/31/03 - No bubble + Air bubble good

4/1/03 11:15 E. from Ref (air side) to Ref (Na side) = -32.2 mV



Produced 32.2 mV potential
 drop.



To Page No. _____

Witnessed & Understood by me,

Date

Invented by

Date

Recorded by

J. Y. J.

3/31/03

[illegible]

Date _____

Invented by

Recorded by _____

Date _____

3/31/53

Page No.

TITLE

From Page No.

Pages 53 - 83 Copied for QA
records - J. Yong 4/3/03

4/3/03

15121

program terminated and
Restarted using Computer #2134
File: 03-April.03a

4/4/03

9.10

S.S. 304 wire P.O.# 1831325, polished
Acetone washed and placed in N_2 cell

9116

$$E_{\text{304 wire, N}_2} = 531 \text{ mV}_{\text{SCE}}$$

92w

$$= -579 \text{ mV}_{SCB}$$

9:21

- Gov

9:20

$E_{304 \text{ wire, } 1/2} = 633 \text{ mV}_{\text{SCE}}$; $E_{304 \text{ Al-C}} = -2.4 \text{ V}_{\text{SCE}}$

This is consistent with the readings from the SS sensor.

To Page No.

Witnessed & Understood by me,

Date _____

Invented by

Recorded by _____

Date

10/3/03

From Page No. 4/4/03 Connected the solartron to do a

polarization test.

9. A3 Connected working E to 304 Ni-C, removed P-2 from 304 Ni-C and connected it to new wire (304) in Ni cell)

CorrWare setup Step 1, 20 min op crrc. Step 2
mV/sec scan up to 200 nA. repeat 3 times.

Step 3 hold @ 200 μ A for 2 hours. Step 4
p.lde 7 mV/sec scan to -50 μ A or -300 mV/sec
connected RES & counter electrode to
Solartron. 9:53 started test

12:55 Test complete. host data due to not saving correctly file would have been

03 April AA Rep. Result see page 90. d.d. 4/8/03

→ 13:00 Added a new cell with a 30% Li^+ coupon, multi channel probe, counter electrode and salt bridge. → connected to Air cell. Started N_2 purge.

1:40 started new polarization with working E connected to 30AT coupon. Stop test within 1 min. Sir would have been

63 Apr. 1 04 b Rep

also added a 3 meter coil of wire to the air cell.

2:410 connected the WE to 304112-C and disconnected the P-2 and connected to the wire.

Start the polarization test for name

will be 03-April 2019 Rep — Result see page 91 ²¹⁸ 4/1/19

1500 added wire (304) to new cell

14:37 $\phi_{304 \text{ Air-wire}} = -111 \text{ mV}_{\text{scr}}$

$$V_{304 \text{ Arr-Corl3}} = -97 \text{ mV SCE}$$

14:43 Sensor 304-1 (short) Connected to Channel 1-5
using 1k Resistor

Witnessed & Understood by me,

Date _____

Invented by

Date _____

Recorded by

2. y

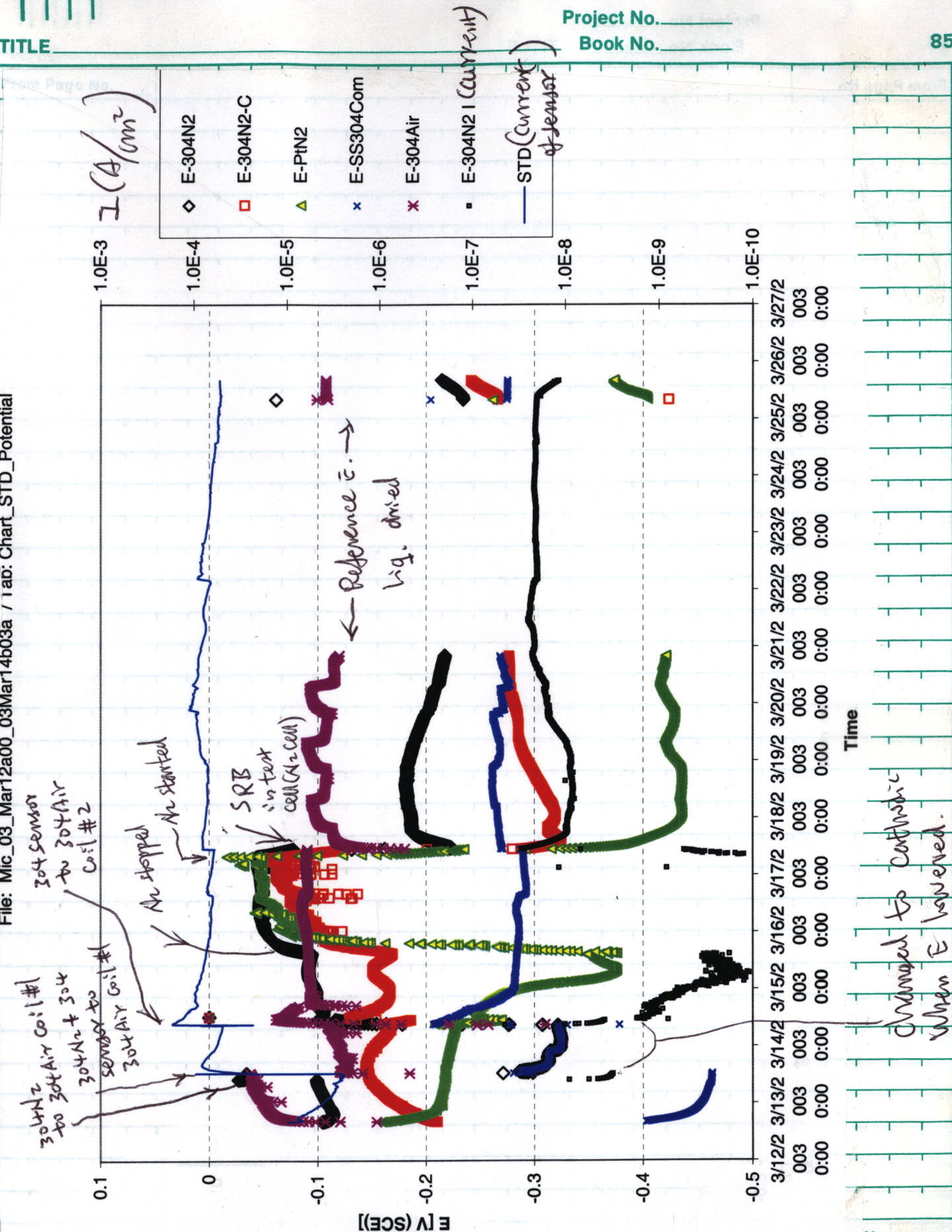
10/3/03

TITLE

Project No. _____
Book No. _____

85

File: Mic_03_Mar12a00_03Mar14b03a / Tab: Chart_STD_Potential



No

Witnessed & Understood by me.

Date _____

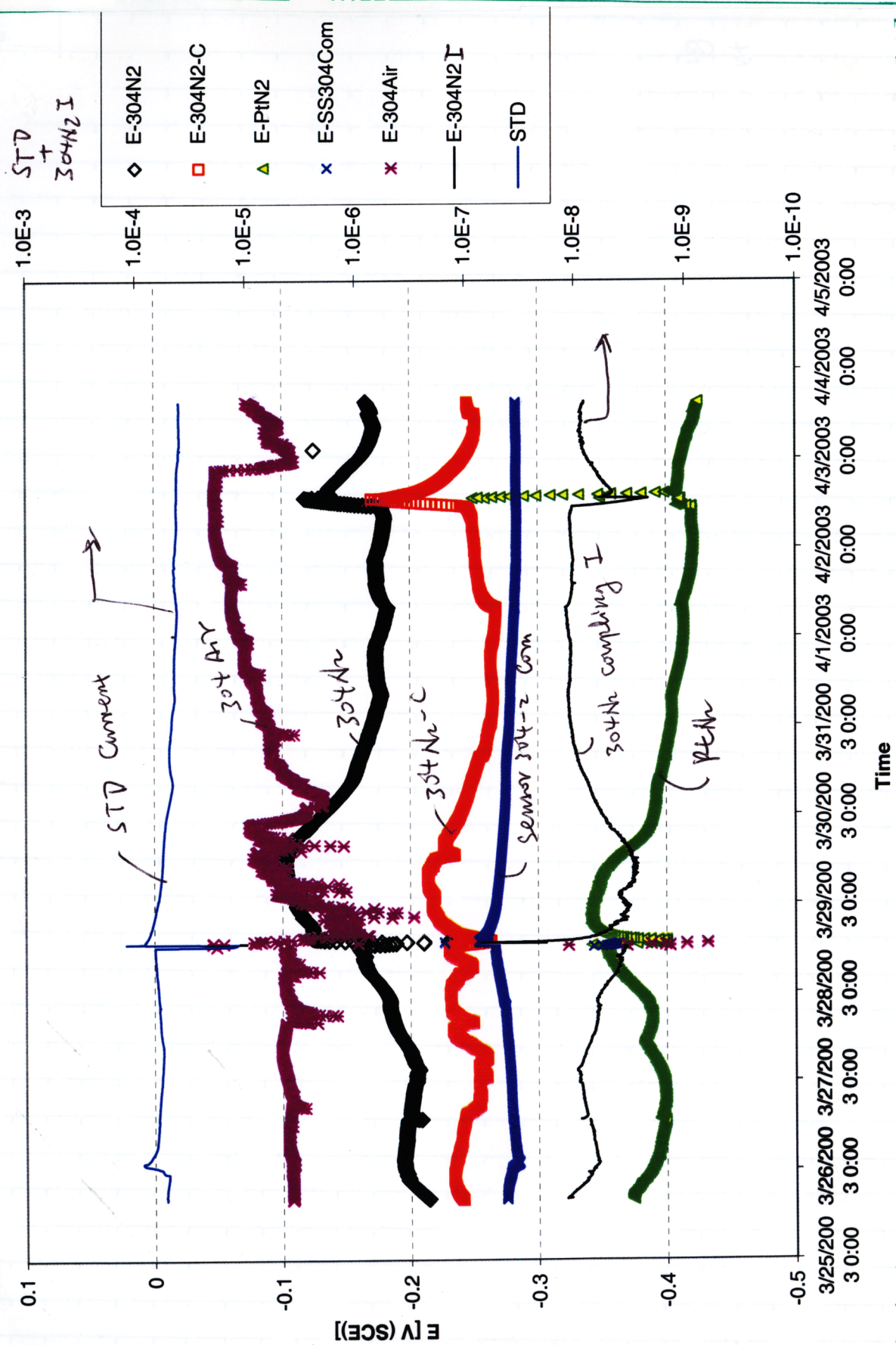
Invented by

Date _____

Recorded by

2.48 10/3/05

File: Mic_03_Mar25a00_02 / Tab: Chart_STD_Potential

 (A/cm^2) 

Page No. _____

Witnessed & Understood by me, _____

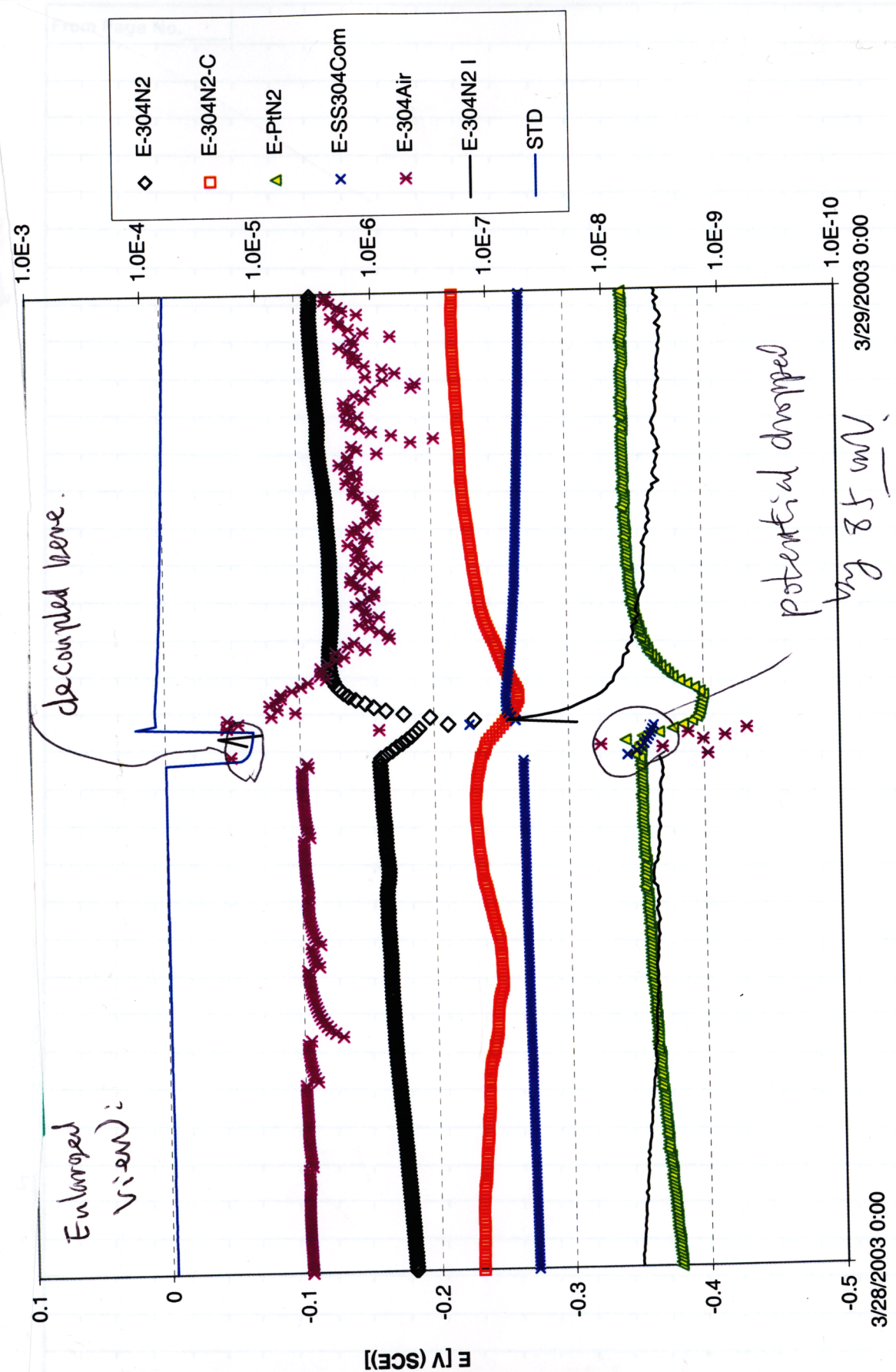
Date _____

Invented by _____

Date _____

Recorded by _____

J. Y. L. 10/3/03



Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

J. Y. L. 10/3/03

From Page No. _____

6:41/07/03 $\phi_{\text{ref, Air-control cell}} = -27 \text{ mV}_{\text{SCE}}$ (against Ref in Air side).

8:56 $\phi_{304 \text{ Ni}_2\text{-C}} = -239 \text{ mV}_{\text{SCE}}$

$\phi_{304 \text{ Ni-wire}} = -220.0 \text{ mV}_{\text{SCE}}$, not too much negative!

$\phi_{\text{ref, Air}} = -20.2 \text{ mV}_{\text{SCE}}$ (against Ref in Air side)

$\phi_{\text{ref, Ni-control}} = 0.2 \text{ mV}_{\text{SCE}}$ d.y. 4/7/03

$\phi_{304 \text{ Ni-control cell}} = -208.6 \text{ mV}_{\text{SCE}}$

$\phi_{304 \text{ Ni-control cell, wire}} = -132.8 \text{ mV}_{\text{SCE}}$

$\phi_{\text{Pt, Ni-control cell}} = +164 \text{ mV}_{\text{SCE}}$

9:06 P2 to 304 Ni₂-C from 304 Ni-wire.

$\phi_{304 \text{ cell \#3, Air side}} = -40 \text{ mV}_{\text{SCE}}$

$\phi_{304 \text{-wire, Air side}} = -50 \text{ mV}_{\text{SCE}}$

Set A = 3.64 cm²

9:30 started solution & connected Ref to Pt Ref, connected working to wire P2, connected CE to counter electrode.

03-April-07a Rep. results see page 92

11:04 $\phi_{304-1 \text{ sensor}} = -387.6$ 03-April-07a

New File started 03-April-07a results see page 92

17:03 Found #p5 came off. Reconnected to SS-304-wire.

4/7/03 Pin #6 connected to SS-304-1 (S) com.

13:43 Test (03-April-07C Rep) started. results see page 93

To Page No. _____

Witnessed & Understood by me, _____ Date _____

Invented by _____ Date 4/7/03

Recorded by J. Y. _____

From Page No. _____

4/7/03 SRS. sample harvest from 4-3-03

Test 4/7/03 Air 4/7/03

Vibrio natriegens $>10^5 \text{ cfu/ml}$ ng

Strombococcus $>10^5 \text{ cfu/ml}$ ng

Resulforhodobacterium vulgare wait on count. ng

SRS $>10^5 \text{ cfu/ml}$ on 8d/14/03 SRS

Plan is to harvest samples on a weekly basis. Therefore, next harvest will be completed on 4-12-03.

Called Bioscience systems to fax media formulation and Quality Control documents to 210-522-5184.

4/7/03 SRS

4/08/03 $\phi_{\text{counter}} = 0.8 \text{ mV}_{\text{SCE}}$, insert a Pt wire 1 mm x 10 cm depth.

4:22 $\phi_{\text{Pt wire}} = -16 \text{ mV}_{\text{SCE}}$, decreasing after increasing Ni.

14:24 connect P2 to Pt wire in Ni-control. Connector (L) of sensor 304-1 connected to I-4 & the Register. connected to (S) of the

15:13 new Data File sensor see page 84.

17:00 on the control cell 03-April-07a results see pages 80-83 Book # 287. d.y. 4/7/03

$\phi_{\text{ref}} = -18.21 \text{ mV}_{\text{SCE}}$ (Ref in Ni cell), $\phi_{\text{Pt wire}} = -82 \text{ mV}_{\text{SCE}}$ (self Ref)

disconnecting potential stat. — connected P6 to

$\phi_{\text{Pt wire}} = -431 \text{ mV}_{\text{SCE}}$ (self) ! ← !!

$\phi_{304 \text{ wire}} = -236$; $\phi_{304} = -310 \text{ mV}_{\text{SCE}}$

$\phi_{\text{Pt, Air}} = -86 \text{ mV}_{\text{SCE}}$

To Page No. _____

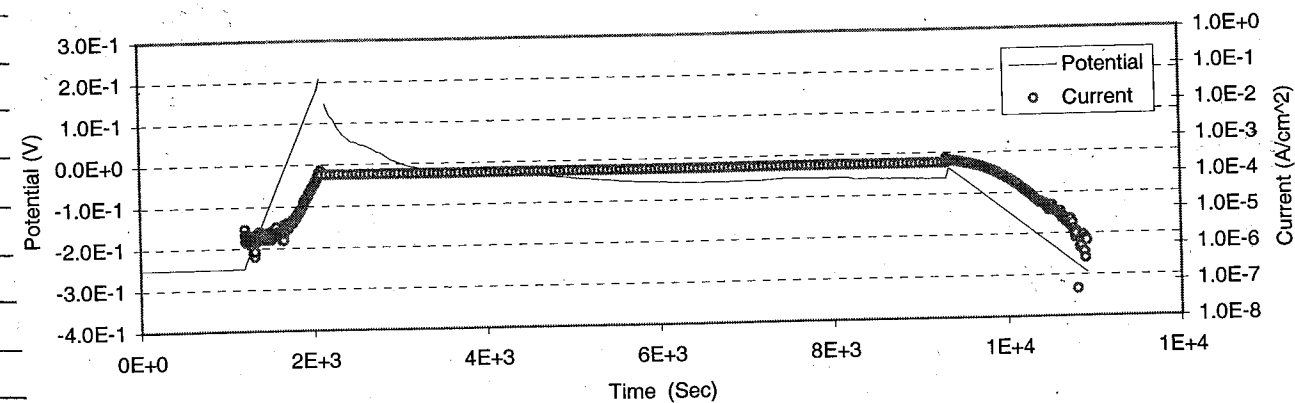
Witnessed & Understood by me, _____ Date _____

Invented by _____ Date 4/6/03

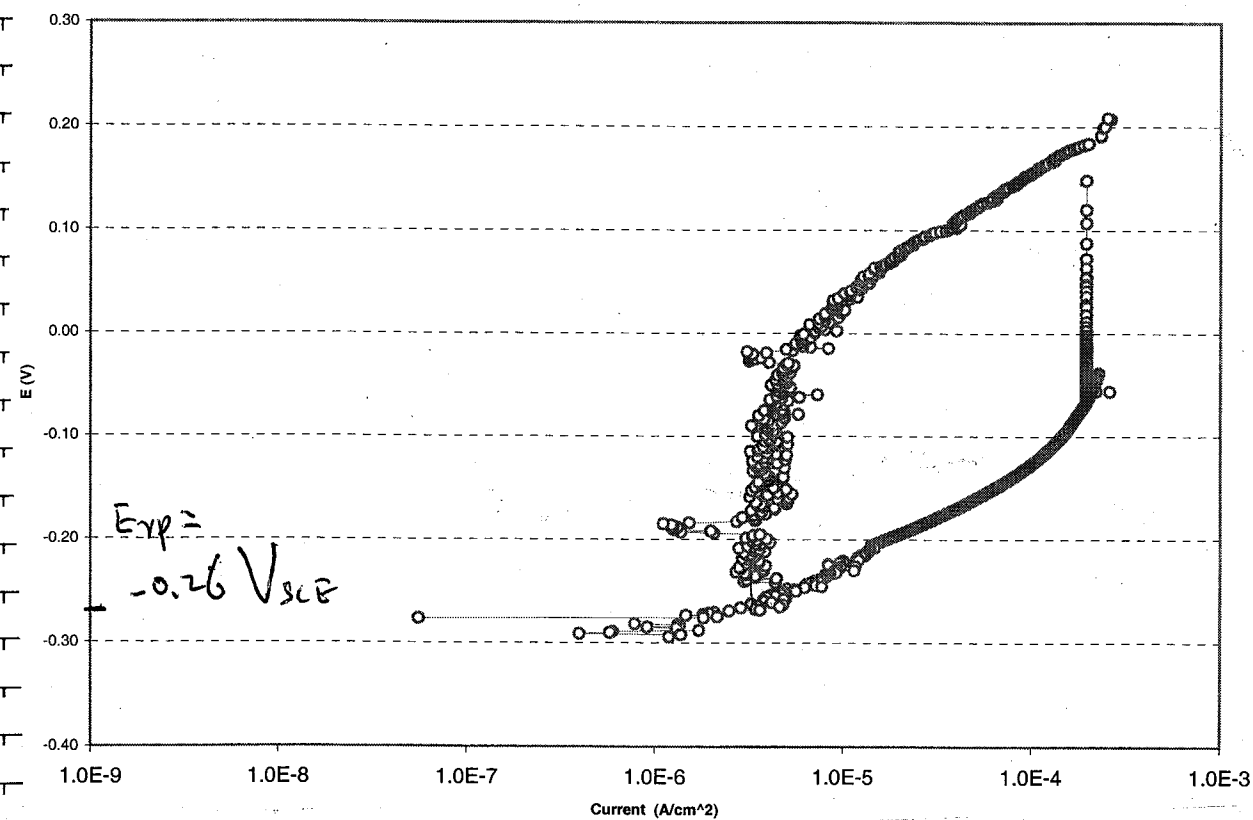
Recorded by J. Y. _____

From Page No. _____

File: 03_April04aRep / Tab: EI_Time_chart



03_April04aRep E_I_Cart



304 coupon (control) in the side cell
 304H-C
 see page 84.

To Page No. _____

Witnessed & Understood by me,

Date

Invented by

Date

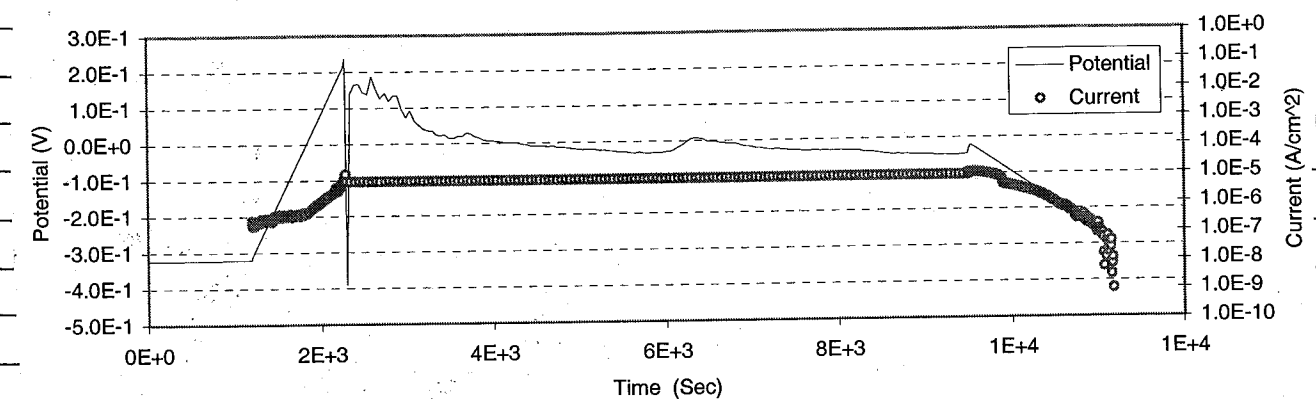
Recorded by

J. Y. S.

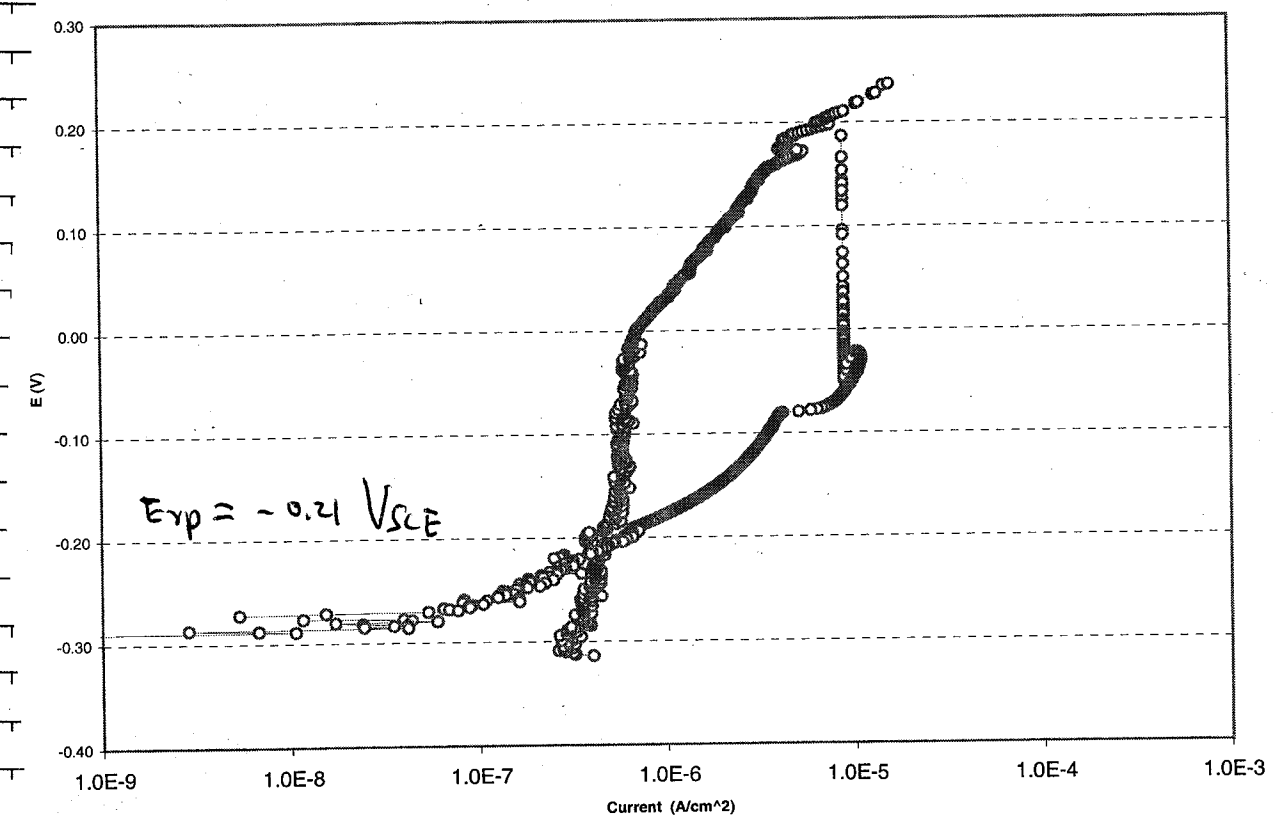
4/1/03

From Page No. _____

File: 03_April04cRep / Tab: EI_Time_chart



03_April04cRep E_I_Cart



304 coupon (control) in the side cell
 304H-C
 see page 84.

To Page No. _____

Witnessed & Understood by me,

Date

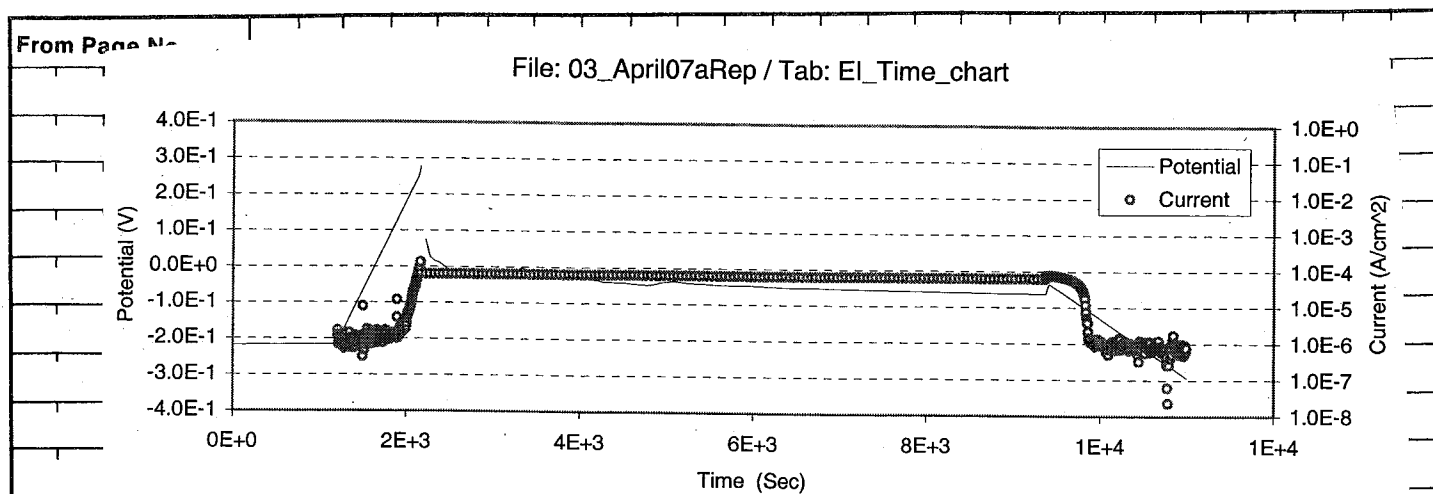
Invented by

Date

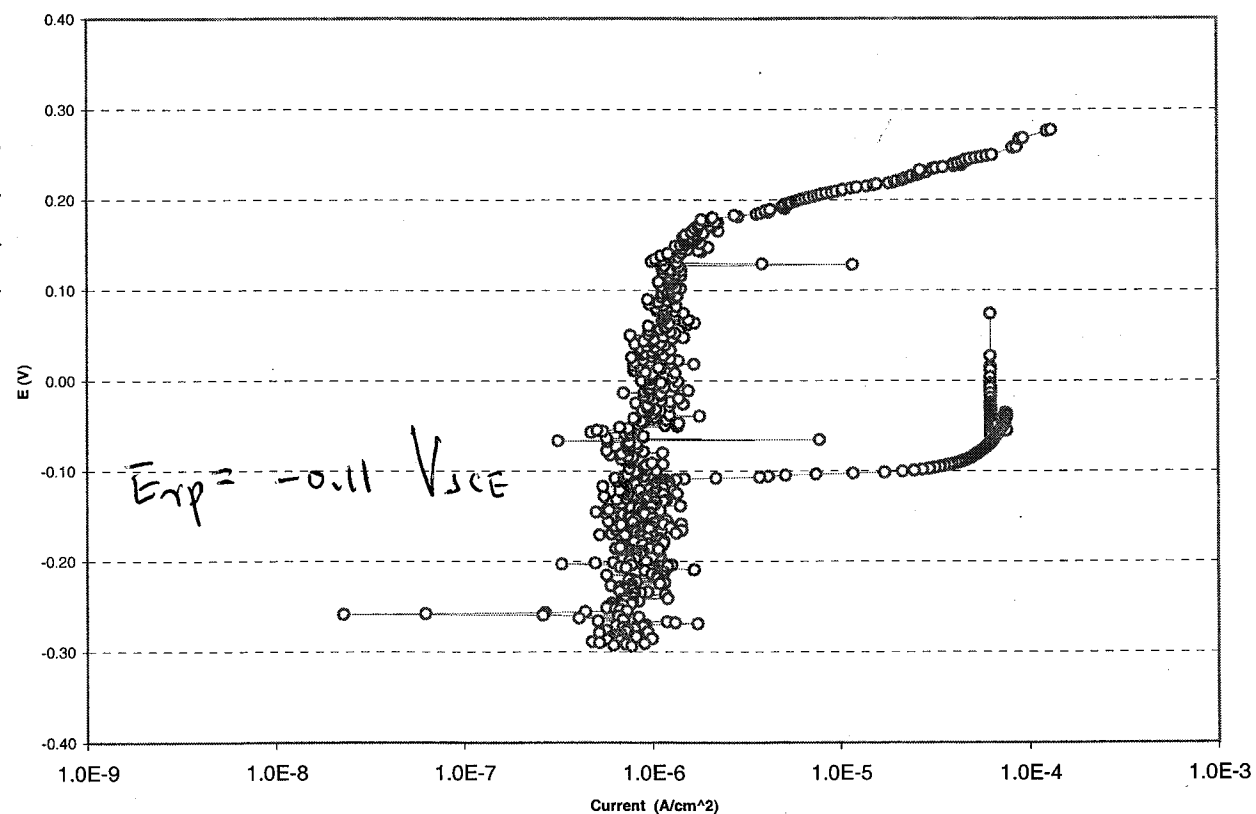
Recorded by

J. Y. S.

4/1/03



03_April07aRep E_I_Cart



304 S.S. wire in the side cell

See page 88

To Page No. _____

Witnessed & Understood by me, _____

Date _____

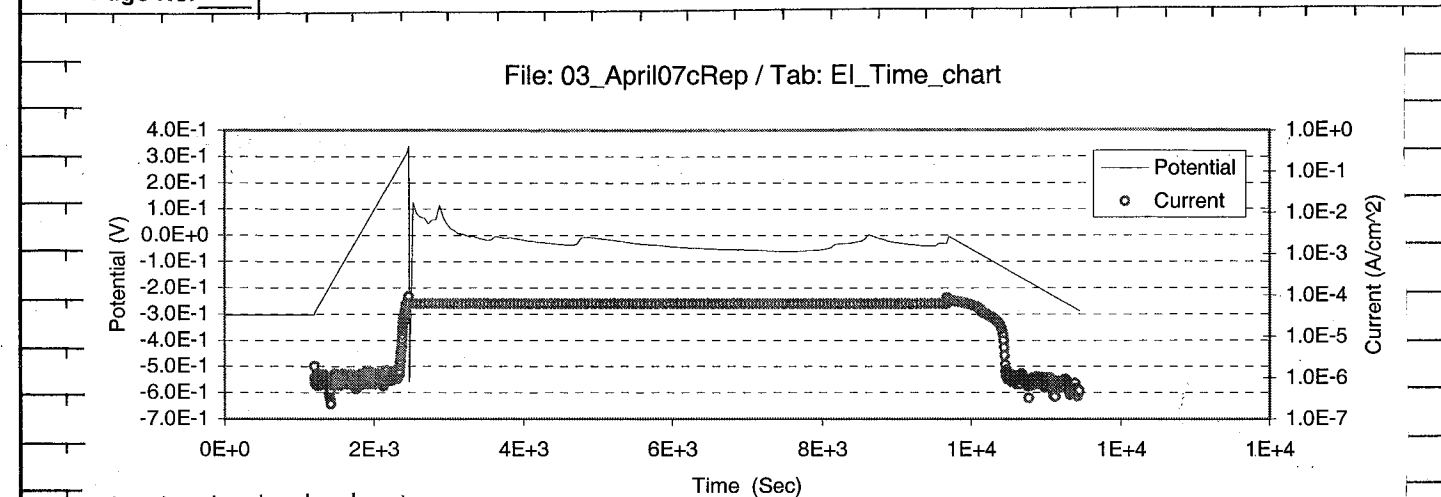
Invented by _____

Date _____

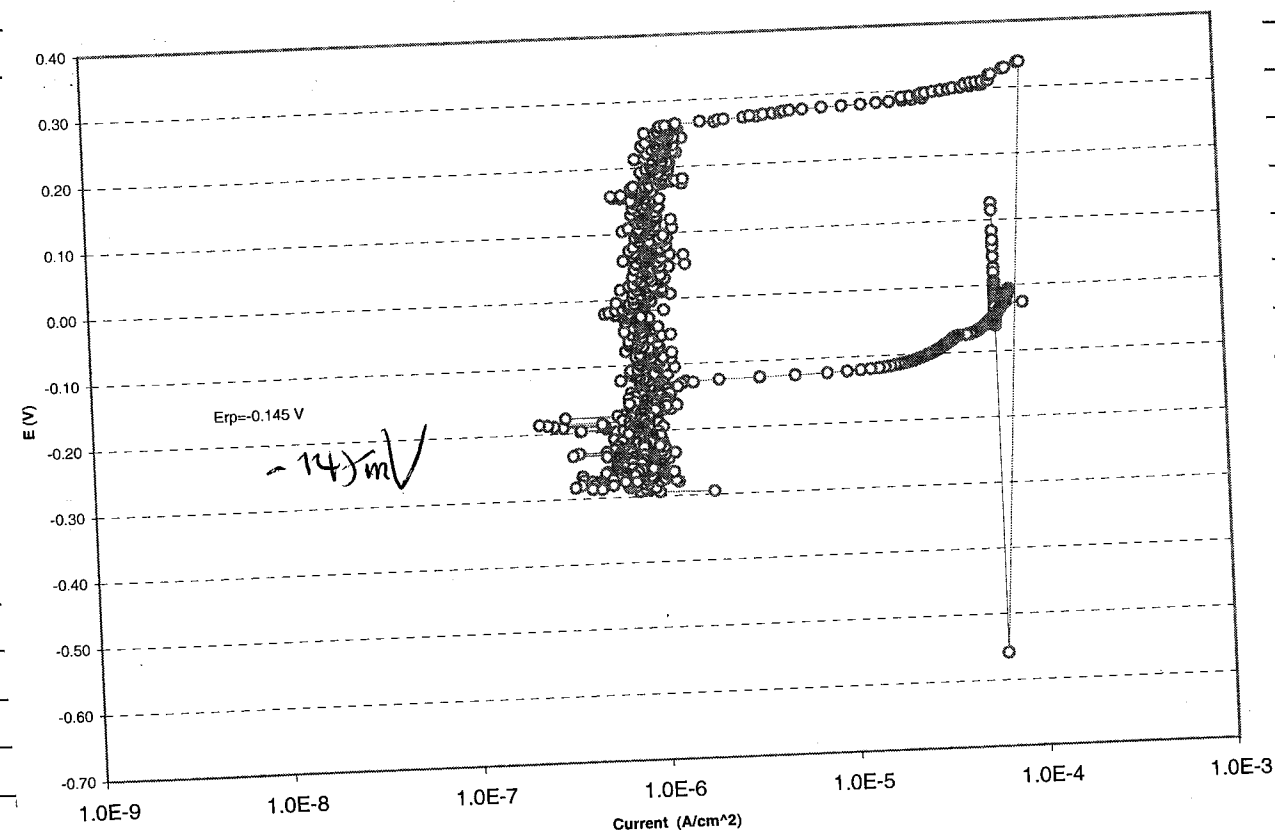
Recorded by _____

J. Y. 4/1/03

From Page No. _____



03_April07cRep E_I_Cart



304 S.S. wire in the side cell

See page 88

To Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

J. Y. 4/1/03

From Page No. _____

4/3/03 9:44 Repositioning test with wire 304 in the cell.
 03 April 08a Re, Results see page 34
 17:16 Conn of 304-1 connected to Conn of 304-2
 and all to 304 Air coil #2.

Book # 287
 J.Y.
 4/4/03

4/9/03 PERB.

Plan changes. Plan is to sample every 3 days and to carry out dilutions to monitor SRB concentrations very closely.

Today, turned sample from test cell ~ 10 ml. Perform serial dilutions in broth and on media agar plates so quantitative counts can be accomplished. 10^{-2} to 10^{-8} .

13:52 $\phi_{304 \text{ coil air}} = -10.6 \text{ mV SCE}$ $\phi_{304 \text{ wire air}} = -38.4$
 $\phi_{304 \text{ coil 3 air}} = -39.5 \text{ mV good.}$ $\phi_{304 \text{ coil 2 air}} = -264.2 \text{ mV SCE}$
 $\phi_{304 \text{ air}} = 1.8 \text{ mV}$
 $\phi_{304 \text{ th-control}} = -281.0 \text{ mV}$, $\phi_{304 \text{ wire th-control}} = -216 \text{ mV}$
 $\phi_{\text{counter th-control}} = -99.4 \text{ mV}$, $\phi_{\text{Pt wire th-control}} = -19 \text{ mV}$
 $\phi_{304 \text{ wire th}} = -178 \text{ mV}$ $\phi_{\text{Pt th}} = -286 \text{ mV}$

Go to Book # 287 page 33.

J.Y.
 4/9/03

To Page No. _____

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

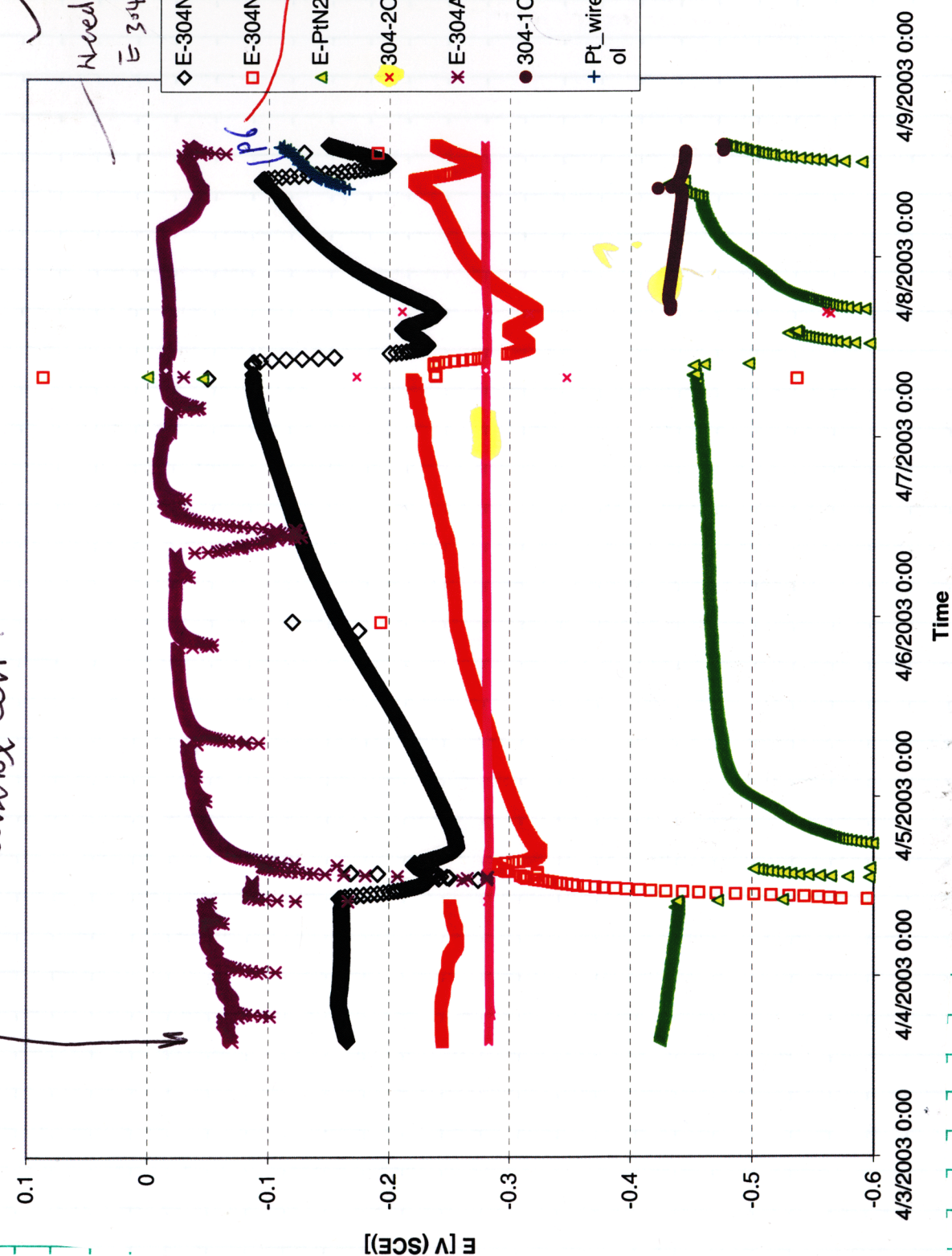
J.Y.
 4/9/03

TITLE _____

From Page No. _____

File: Mic_03_April03a00_07a00 / Tab: Potential

added control cell.



Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

J.Y.
 4/9/03

To Page No. _____

File: Mic_03_April03a00_07a00 / Tab: Chart_STD_Potential

Repassivate test in the side cell.

test cell

control cell.

E [V (SCE)]

Recorded by

Invented by

Date

Witnessed & Understood by me,

Date

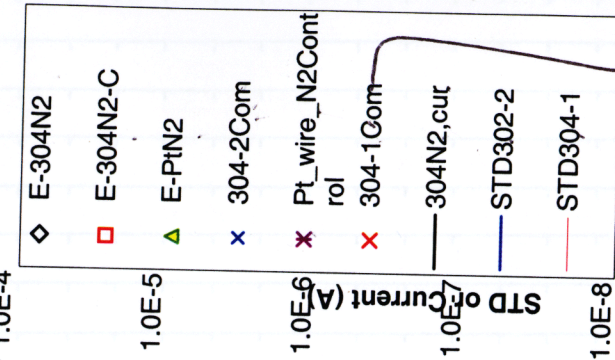
Recorded by

Invented by

Date

E [V (SCE)]

Time



in control cell, before coupling!

Coul.

st out measured

Coul. test

File: Mic_03_April03a00_07a00 / Tab: Chart_Sensor304_1_Currents

"only coupled"

Cable's connected cable 'L' connected to I-4

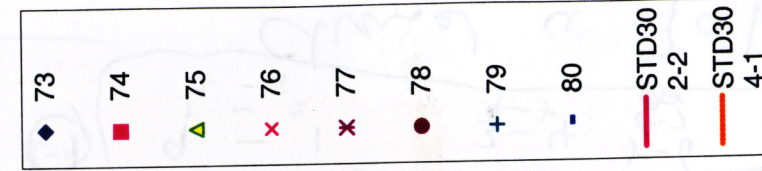
But I-4 Returns not connected to com

test

control

I [A/cm²]

Time



no coupling - coupled here!

Pages 83-97
 copied for QA records
 J.Y. 10/3/03

J. Y. 4/9/03

Go To Book 827
 227 page 33
 J.Y. 2/4/06

Work continued on Book # 287 Page 33.

Page 98

The following paper and report were published based on the work in this scientific notebook (#522):
Written

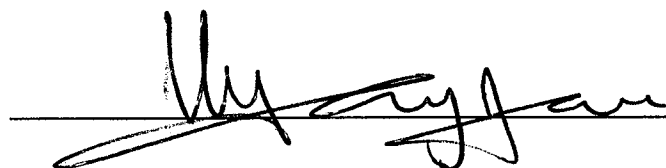
C. Sean Brossia and Lietai Yang, "Studies of Microbiologically Influenced Corrosion Using a Coupled Multielectrode Array Sensor", CORROSION/2003, paper no. 03575, (Houston, TX: NACE International, 2003).

Lietai Yang and Gustavo A. Cragolino, Studies on The Corrosion Behavior of Stainless Steels in Chloride Solutions in the Presence of Sulfate Reducing Bacteria, CORROSION/2004, paper no. 04598, Houston, TX: NACE International, 2004.

L. Yang, S. Birnbaum, and G. Cragolino, " Microbially Influenced Corrosion Studies on Engineered Barrier System Materials", Oct, 2004. CNWRA report, CNWRA 2005-01.

J. V. 84/7/06

I have reviewed this scientific notebook and find it in compliance with QAP-001. There is sufficient information regarding procedures used for conducting tests, acquiring and analyzing data so that another qualified individual could repeat the activity.

 4/12/06

ADDITIONAL INFORMATION FOR SCIENTIFIC NOTEBOOK NO. 522

Document Date:	07/16/2002
Availability:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, Texas 78228
Contact:	Southwest Research Institute® Center for Nuclear Waste Regulatory Analyses 6220 Culebra Road San Antonio, TX 78228-5166 Attn.: Director of Administration 210.522.5054
Data Sensitivity:	<input checked="" type="checkbox"/> "Non-Sensitive" <input type="checkbox"/> Sensitive <input type="checkbox"/> "Non-Sensitive - Copyright" <input type="checkbox"/> Sensitive - Copyright
Date Generated:	10/01/2002
Operating System: (including version number)	Windows
Application Used: (including version number)	Unknown
Media Type: (CDs, 3 1/2, 5 1/4 disks, etc.)	1 CD
File Types: (.exe, .bat, .zip, etc.)	Excel, Word, PowerPoint
Remarks: (computer runs, etc.)	Media contains: data files for scientific notebook