Alpha Spectrometery Analyses / 2 Meter E/W Transect at 9.1 m North + 10 m Level

Summary

Data Calculation

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

NOPI-114

sample # **NOPI-ECP-12.87/9.1 Bulk** Sep. date **6/21/93**
Analyst **B W L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	U-232* (dpm/g)
1.0023	0.75	4553.22	1/22/93	150	*4534.7329*

Th228/U232 *0.2259*

Counting time for Th = 2867.67 (min.)
Days btwn. sep. & count. = 5 (days)
CF for Th-228 = *.9941*

Counting time for U = 664.628 (min.)
Days btwn. sep. & count. = 2 (days)
CF for U-232 = *1.0022*

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
37	3274	2745	267
bkgd	bkgd	bkgd	bkgd
0.000533	0.00196	0.00679	0.0017

bkgd time 1 (min.)

U-238 counts	U-234 counts	U-232 counts
6919	6760	25272
bkgd	bkgd	bkgd
0.00171	0.0019	0.00371

bkgd time 1 (min.)

Th-232* counts	Th-230* counts	Th-228sp counts	Ra-224* counts
35.47153	*3268.37937*	*2692.3481*	*262.125*

U-238* counts	U-234* counts	U-232sp counts
6917.8635	*6758.74*	*25215*

U-238(dpm/g) =	**9.31E+02**	±	**1.26E+01**
U-234(dpm/g) =	**9.10E+02**	±	**1.25E+01**
Th-232(dpm/g) =	**1.01E+01**	±	**1.67E+00**
Th-230(dpm/g) =	**9.31E+02**	±	**2.41E+01**
U-234/U-238 =	**0.9770**	±	**0.0167**
Th-230/U-234 =	**1.0231**	±	**0.0218**
Th-230/Th-232 =	**92.1409**	±	**15.2332**
U-234/Th-232 =	**90.0609**	±	**14.9563**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppm) = **1247.296**

Th (ppm) = **41.312**

Omar Lagunas 6/28/93

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-11.4/9.13** Sep. date **6/24/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
0.9927	0.1139	449.6534	1/22/93	154	*447.7492613*

Th228/U232 *0.359*

Counting time for Th = 3729.783 (min.)
Days btwn. sep. & count. = 4 (days)
CF for Th-228 = *.9948*

Counting time for U = 4169.967 (min.)
Days btwn. sep. & count. = 4 (days)
CF for U-232 = *1.0052*

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
90	368	139	26
bkgd	bkgd	bkgd	bkgd
0	0	0	0

bkgd time 1 (min.)

U-238 counts	U-234 counts	U-232 counts
480	687	723
bkgd	bkgd	bkgd
0.0009592	0.000719	0.00096

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
90	*368*	*48.347109*	*26*

U-238* counts	**U-234* counts**	**U-232sp counts**
476.000168	*684*	*715.25*

U-238(dpm/g) =	**3.42E+01**	±	**2.01E+00**
U-234(dpm/g) =	**4.91E+01**	±	**2.62E+00**
Th-232(dpm/g) =	**3.43E+01**	±	**4.65E+00**
Th-230(dpm/g) =	**1.40E+02**	±	**1.40E+01**
U-234/U-238 =	**1.4370**	±	**0.0855**
Th-230/U-234 =	**2.8574**	±	**0.1846**
Th-230/Th-232 =	**4.0889**	±	**0.4808**
U-234/Th-232 =	**1.4310**	±	**0.2081**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **45807.413**

Th (ppb) = **140444.140**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-11.6/9.12** Sep. date **6/24/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
0.985	0.109	4534.39	1/22/93	154	***4515.188305***

Th228/U232 ***0.359***

Counting time for Th = 2342.833 (min.)
Days btwn. sep. & count. = 5 (days)
CF for Th-228 = ***.9942***

Counting time for U = 2342.85 (min.)
Days btwn. sep. & count. = 5 (days)
CF for U-232 = ***1.0056***

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
101	4735	848	193
bkgd	bkgd	bkgd	bkgd
0	0.0038	0.003	0.0017

bkgd time 1 (min.)

U-238 counts	U-234 counts	U-232 counts
14149	14136	10789
bkgd	bkgd	bkgd
0.0009	0	0

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
101	***4726.09723***	***734.7618***	***189.017***

U-238* counts	**U-234* counts**	**U-232sp counts**
14146.89144	***14136***	***10729***

U-238(dpm/g) =	**6.59E+02**	±	**8.42E+00**
U-234(dpm/g) =	**6.58E+02**	±	**8.42E+00**
Th-232(dpm/g) =	**2.47E+01**	±	**2.60E+00**
Th-230(dpm/g) =	**1.15E+03**	±	**4.30E+01**
U-234/U-238 =	**0.9992**	±	**0.0119**
Th-230/U-234 =	**1.7526**	±	**0.0294**
Th-230/Th-232 =	**46.7930**	±	**4.7055**
U-234/Th-232 =	**26.6992**	±	**2.8311**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **882703.035**

Th (ppb) = **100863.023**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-12.42/9.14-DUP** Sep. date **6/24/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
0.6849	0.2406	4534.49	1/22/93	154	***4515.287882***

Th228/U232 ***0.359***

Counting time for Th = 2343.833 (min.)
Days btwn. sep. & count. = 5 (days)
CF for Th-228 = ***.9942***

Counting time for U = 2342.833 (min.)
Days btwn. sep. & count. = 5 (days)
CF for U-232 = ***1.0056***

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
21	5887	1007	1443

U-238 counts	U-234 counts	U-232 counts
6294	6211	4468

bkgd	bkgd	bkgd	bkgd
0	0	0	0

bkgd	bkgd	bkgd
0	0	0

bkgd time 1 (min.)

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
21	***5887***	***914.90567***	***1443***

U-238* counts	**U-234* counts**	**U-232sp counts**
6294	***6211***	***4443.2***

U-238(dpm/g) =	**2.25E+03**	±	**4.40E+01**
U-234(dpm/g) =	**2.22E+03**	±	**4.35E+01**
Th-232(dpm/g) =	**1.31E+01**	±	**2.88E+00**
Th-230(dpm/g) =	**3.66E+03**	±	**1.25E+02**
U-234/U-238 =	**0.9868**	±	**0.0176**
Th-230/U-234 =	**1.6525**	±	**0.0301**
Th-230/Th-232 =	**280.3333**	±	**61.2828**
U-234/Th-232 =	**169.6418**	±	**37.5506**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **3010482.667**

Th (ppb) = **53467.259**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-11.0/9.15** Sep. date **7/2/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
1.3041	0.4371	4533.6	1/22/93	162	***4513.406558***

Th228/U232

Counting time for Th = 8434 (min.)
Days btwn. sep. & count. = 11 (days)
CF for Th-228 = ***.9863***

Counting time for U = 1917.362
Days btwn. sep. & count. = 6
CF for U-232 = ***1.0064***

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
64	393	2436	959

U-238 counts	U-234 counts
5768	6842

bkgd	bkgd	bkgd	bkgd
0.001	0.0014	0.0023	0.002

bkgd	bkgd
0.0000286	0

bkgd time 1 (min.)

bkgd time 1

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
55.566	***381.1924***	***2344.0431***	***942.132***

U-238* counts	**U-234* counts**
5767.945163	***6842***

U-238(dpm/g) =	**5.85E+01**	±	**7.85E-01**
U-234(dpm/g) =	**6.94E+01**	±	**8.58E-01**
Th-232(dpm/g) =	**1.29E+01**	±	**1.63E+00**
Th-230(dpm/g) =	**8.83E+01**	±	**4.80E+00**
U-234/U-238 =	**1.1862**	±	**0.0212**
Th-230/U-234 =	**1.2730**	±	**0.0660**
Th-230/Th-232 =	**6.8602**	±	**0.9247**
U-234/Th-232 =	**5.3889**	±	**0.6856**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **78360.000**

Th (ppb) = **52663.408**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-11.22/9.07** Sep. date **7/2/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
1.0085	0.2305	456.7194	1/22/93	162	***454.6850925***

Th228/U232 ***0.359***

Counting time for Th = 7155.15 (min.)
Days btwn. sep. & count. = 6 (days)
CF for Th-228 = ***.9916***

Counting time for U = 1916.8 (min.)
Days btwn. sep. & count. = 6 (days)
CF for U-232 = ***1.0064***

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
227	2133	1209	568

U-238 counts	U-234 counts	U-232 counts
4029	5189	4829

bkgd	bkgd	bkgd	bkgd
0	0	0	0

bkgd	bkgd	bkgd
0	0	0

bkgd time 1 (min.)

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
227	***2133***	***961.86383***	***568***

U-238* counts	**U-234* counts**	**U-232sp counts**
4029	***5189***	***4798.2***

U-238(dpm/g) =	**8.73E+01**	±	**1.86E+00**
U-234(dpm/g) =	**1.12E+02**	±	**2.25E+00**
Th-232(dpm/g) =	**8.80E+00**	±	**6.37E-01**
Th-230(dpm/g) =	**8.27E+01**	±	**2.98E+00**
U-234/U-238 =	**1.2879**	±	**0.0270**
Th-230/U-234 =	**0.7362**	±	**0.0189**
Th-230/Th-232 =	**9.3965**	±	**0.6560**
U-234/Th-232 =	**12.7642**	±	**0.9579**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **116914.157**

Th (ppb) = **36017.125**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-11.78/9.17** Sep. date **7/2/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
1.0031	0.1313	4533.6	1/22/93	161	*4513.530933*

Th228/U232 *0.359*

Counting time for Th = 7154.233 (min.)
Days btwn. sep. & count. = 6 (days)
CF for Th-228 = *.9916*

Counting time for U = 1916.966 (min.)
Days btwn. sep. & count. = 6 (days)
CF for U-232 = *1.0064*

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
129	6382	1531	690

bkgd	bkgd	bkgd	bkgd
0	0	0	0

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
129	*6382*	*1378.0653*	*690*

U-238 counts	U-234 counts	U-232 counts
17393	17923	17273

bkgd	bkgd	bkgd
0	0	0

bkgd time 1 (min.)

U-238* counts	**U-234* counts**	**U-232sp counts**
17393	*17923*	*17163*

U-238(dpm/g) =	**5.99E+02**	±	**6.43E+00**
U-234(dpm/g) =	**6.17E+02**	±	**6.58E+00**
Th-232(dpm/g) =	**1.99E+01**	±	**1.82E+00**
Th-230(dpm/g) =	**9.82E+02**	±	**2.80E+01**
U-234/U-238 =	**1.0305**	±	**0.0110**
Th-230/U-234 =	**1.5921**	±	**0.0232**
Th-230/Th-232 =	**49.4729**	±	**4.3996**
U-234/Th-232 =	**31.0744**	±	**2.8681**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **802167.322**

Th (ppb) = **81217.176**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-13.0/9.2-DUP** Sep. date **7/7/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
0.5144	0.4289	4532.77	1/22/93	174	***4511.088301***

Th228/U232 ***0.359***

Counting time for Th = 2612.82 (min.)
Days btwn. sep. & count. = 5 (days)
CF for Th-228 = *.9942*

Counting time for U = 2612.82 (min.)
Days btwn. sep. & count. = 1 (days)
CF for U-232 = ***1.0018***

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
29	34151	7327	1702
bkgd	bkgd	bkgd	bkgd
0.0004	0.0004	0	0

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
27.95487	***34149.9549***	***7251.391***	***1702***

U-238 counts	U-234 counts	U-232 counts
80299	76111	66600
bkgd	bkgd	bkgd
0	0.0004	0

bkgd time 1 (min.)

U-238* counts	**U-234* counts**	**U-232sp counts**
80299	***76110***	***66478***

U-238(dpm/g) =	**4.54E+03**	±	**2.38E+01**
U-234(dpm/g) =	**4.31E+03**	±	**2.28E+01**
Th-232(dpm/g) =	**5.21E+00**	±	**9.69E-01**
Th-230(dpm/g) =	**6.36E+03**	±	**8.19E+01**
U-234/U-238 =	**0.9478**	±	**0.0048**
Th-230/U-234 =	**1.4767**	±	**0.0096**
Th-230/Th-232 =	**1221.6101**	±	**226.9436**
U-234/Th-232 =	**827.2452**	±	**153.9819**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **6087186.903**

Th (ppb) = **21294.313**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-12.65/9.13** Sep. date **7/7/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
1.01	0.5251	4532.77	1/22/93	174	*4511.088301*

Th228/U232 *0.359*

Counting time for Th = 2612.833 (min.)
Days btwn. sep. & count. = 10 (days)
CF for Th-228 = *.9892*

Counting time for U = 5236.767 (min.)
Days btwn. sep. & count. = 6 (days)
CF for U-232 = *1.0075*

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
170	8403	301	58
bkgd	bkgd	bkgd	bkgd
0.0011	0.0031	0.0011	0

bkgd time 1 (min.)

U-238 counts	U-234 counts	U-232 counts
127590	126295	119386
bkgd	bkgd	bkgd
0	0	0

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
167.1259	*8394.90022*	*131.13734*	*58*

U-238* counts	**U-234* counts**	**U-232sp counts**
127590	*126295*	*118495.8*

U-238(dpm/g) =	**2.53E+03**	±	**1.02E+01**
U-234(dpm/g) =	**2.50E+03**	±	**1.01E+01**
Th-232(dpm/g) =	**1.07E+03**	±	**1.03E+02**
Th-230(dpm/g) =	**5.39E+04**	±	**3.16E+03**
U-234/U-238 =	**0.9899**	±	**0.0039**
Th-230/U-234 =	**21.5626**	±	**0.2429**
Th-230/Th-232 =	**50.2310**	±	**3.8913**
U-234/Th-232 =	**2.3295**	±	**0.2237**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **3383470.673**

Th (ppb) = **4389452.722**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-12.18/9.1-DUP** Sep. date 7/7/93
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
1.0285	0.2718	4532.77	1/22/93	167	*4511.958547*

Th228/U232 *0.359*

Counting time for Th = 8433.362 (min.)
Days btwn. sep. & count. = 5 (days)
CF for Th-228 = *.9922*

Counting time for U = 5236.9 (min.)
Days btwn. sep. & count. = 1 (days)
CF for U-232 = *1.0027*

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
31	2698	816	305
bkgd	bkgd	bkgd	bkgd
0	0	0	0

bkgd time 1 (min.)

U-238 counts	U-234 counts	U-232 counts
26742	26687	33057
bkgd	bkgd	bkgd
0	0.0002	0

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
31	*2698*	*775.15235*	*305*

U-238* counts	**U-234* counts**	**U-232sp counts**
26742	*26686*	*32967*

U-238(dpm/g) =	**9.67E+02**	±	**7.95E+00**
U-234(dpm/g) =	**9.65E+02**	±	**7.94E+00**
Th-232(dpm/g) =	**1.71E+01**	±	**3.13E+00**
Th-230(dpm/g) =	**1.49E+03**	±	**5.95E+01**
U-234/U-238 =	**0.9979**	±	**0.0086**
Th-230/U-234 =	**1.5437**	±	**0.0312**
Th-230/Th-232 =	**87.0323**	±	**15.7210**
U-234/Th-232 =	**56.3803**	±	**10.3272**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **1295880.199**

Th (ppb) = **70028.678**

MEASUREMENT OF ACTIVITIES OF U & Th ISOTOPES

sample # **NOPI-ECP-12.0/9.09** Sep. date **7/7/93**
Analyst **O C L**

sample weight(g)	spike weight(g)	U-232 (dpm/g)	Ref. date of spike	Days btwn ref. & sep.	**U-232* (dpm/g)**
1.0415	0.1593	4532.77	1/22/93	174	***4511.088301***

Th228/U232 ***0.359***

Counting time for Th = 2612.82 (min.)
Days btwn. sep. & count. = 5 (days)
CF for Th-228 = ***.9942***

Counting time for U = 5237.2 (min.)
Days btwn. sep. & count. = 2 (days)
CF for U-232 = ***1.0037***

Th-232 counts	Th-230 counts	Th-228 counts	Ra-224 counts
62	7953	1951	1163
bkgd	bkgd	bkgd	bkgd
0	0.0004	0	0

bkgd time 1 (min.)

U-238 counts	U-234 counts	U-232 counts
36558	40749	37261
bkgd	bkgd	bkgd
0.0017	0	0

bkgd time 1 (min.)

Th-232* counts	**Th-230* counts**	**Th-228sp counts**	**Ra-224* counts**
62	***7951.95487***	***1838.4703***	***1163***

U-238* counts	**U-234* counts**	**U-232sp counts**
36549.09676	***40749***	***37125***

U-238(dpm/g) =	**6.79E+02**	±	**5.00E+00**
U-234(dpm/g) =	**7.57E+02**	±	**5.43E+00**
Th-232(dpm/g) =	**8.35E+00**	±	**1.08E+00**
Th-230(dpm/g) =	**1.07E+03**	±	**2.71E+01**
U-234/U-238 =	**1.1149**	±	**0.0080**
Th-230/U-234 =	**1.4147**	±	**0.0173**
Th-230/Th-232 =	**128.2573**	±	**16.3521**
U-234/Th-232 =	**90.6623**	±	**11.7137**

Decay constant (m-1)	U-238	Th-232
	2.94965E-16	9.4178E-17

U (ppb) = **910123.744**

Th (ppb) = **34171.492**

Spectrum

OCL 6/27/93

MCB # 1 ACQ 06-23-93 AT 20:22:29 RT : 39877.7 LT : 39875.7
No detector description was entered
NOPI-ECP-12.87/9.1 Total Dissolution U

ROI # 7-1 RANGE : 12 = 3.83MeV to 91 = 4.25MeV
AREA : Gross = 6919 Net = 6759 +/- 93
CENTROID : 74.93 = 4.17MeV
SHAPE : Fwhm = 0.10MeV Fwtm = 0.18MeV

ID : No close library match

ROI # 7-2 RANGE : 129 = 4.46MeV to 195 = 4.81MeV
AREA : Gross = 6760 Net = 6425 +/- 99
CENTROID : 182.03 = 4.74MeV
SHAPE : Fwhm = 0.11MeV Fwtm = 0.17MeV

ID : No close library match

ROI # 7-3 RANGE : 216 = 4.93MeV to 297 = 5.36MeV
AREA : Gross = 25266 Net = 24666 +/- 180
CENTROID : 283.17 = 5.29MeV
SHAPE : Fwhm = 0.11MeV Fwtm = 0.18MeV

ID : No close library match

-48:	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0					
-30:	0	0	0	0	0	0	0
0	0	0					
-20:	0	0	0	0	0	0	0
0	0	0					
-10:	0	0	0	0	0	0	0
0	0	0					
0:	0	0	0	0	0	0	0
0	0	1					
10:	0	1	1	2	3	1	2
3	1	3					
20:	1	6	3	1	3	3	2
5	4	6					
30:	6	2	8	5	4	5	7
7	12	8					
40:	13	14	12	12	14	20	21
27	25	30					
50:	23	32	36	47	50	60	58
76	75	94					
60:	102	114	113	132	183	206	190
213	260	238					
70:	266	344	297	288	308	299	318
301	317	337					
80:	350	319	267	150	97	34	15
0	2	3					
90:	2	1	0	0	3	2	1
4	11	8					
100:	5	5	6	4	7	13	

110:	14	12	8	14	17	18	20
15	9	11					
120:	9	5	3	1	0	3	1
1	1	6					
130:	6	4	4	4	8	9	8
4	3	4					
140:	5	5	6	7	5	7	14
13	12	7					
150:	12	24	10	18	25	17	34
35	33	33					
160:	40	37	38	76	70	57	98
92	115	141					
170:	152	179	180	182	223	252	273
278	316	320					
180:	281	290	240	298	269	341	358
323	294	269					
190:	158	95	29	13	1	0	1
1	0	0					
200:	0	0	0	2	0	0	0
0	0	1					
210:	1	2	0	1	4	1	4
2	3	7					
220:	0	4	1	5	2	6	3
5	3	6					
230:	4	4	5	4	9	9	13
17	10	15					
240:	16	22	18	25	22	22	27
22	32	38					
250:	34	32	50	57	55	68	69
84	82	92					
260:	101	164	183	195	217	250	288
326	363	466					
270:	450	535	591	620	720	750	957
945	1104	1137					
280:	1050	1143	999	1032	1038	1039	1108
1152	1239	1215					
290:	1153	857	493	268	75	30	4
1	0	1					
300:	1	0	0	1	4	3	2
4	2	1					
310:	4	1	1	0	0	0	0
0	1	0					
320:	0	0	0	0	0	0	0
0	0	0					
330:	0	0	0	0	0	1	0
0	0	0					
340:	0	0	0	0	0	0	0
0	0	0					
350:	1	1	0	0	0	0	0
1	0	0					
360:	0	2	0	0	0	0	0
0	0	0					
370:	0	0	0	0	0	0	0
0	0	0					
380:	0	0	0	0	0	0	0
0	0	0					
390:	0	0	0	0	0	0	0
0	0	0					
400:	0	0	0	0	0	0	0
0	0	0					
410:	0	0	0	0	0	0	0
0	0	0					
420:	0	0	0	0	0	1	0
0	0	0					
430:	0	0	0	1	1	1	

440:	0	0	0	0	0	0	0
0	0	0					
450:	0	0	0	0	0	0	0
0	0	0					
460:	0	0	0	1			

	CH.	COUNTS	BKG COUNTS	BKG. CPM
238-U	11-91	6919	18	.00171
234-U	129-194	6760	20	.00190
232-U	213-297	25266+6	39	.003709

t_{BCK} = 10513.16 min

OCL 6/28/93

MCB # 1 ACQ 06-24-93 AT 14:22:44 RT : 61699.9 LT : 61667.7
No detector description was entered
nopi-ecp-12.87/9.10 total dissolution Th (#8)

ROI # 8-1 RANGE : 16 to 44
AREA : Gross = 37 Net = 22 +/- 9
CENTROID : 34.67
SHAPE : Fwhm = 2.62 Channels Fwtm = 7.64 Channels

ROI # 8-2 RANGE : 100 to 174
AREA : Gross = 3272 Net = 3271 +/- 57
CENTROID : 161.78
SHAPE : Fwhm = 5.20 Channels Fwtm = 11.88 Channels

ROI # 8-3 RANGE : 245 to 308
AREA : Gross = 2741 Net = 2399 +/- 76
CENTROID : 301.34
SHAPE : Fwhm = 5.27 Channels Fwtm = 10.27 Channels

ROI # 8-4 RANGE : 329 to 369
AREA : Gross = 267 Net = 227 +/- 21
CENTROID : 350.65
SHAPE : Fwhm = 6.08 Channels Fwtm = 10.20 Channels

-42:	0	0	0	0	0	0	0
0	0	0	0	0			
-30:	0	0	0	0	0	0	0
0	0	0					
-20:	0	0	0	0	0	0	0
0	0	0					
-10:	0	0	0	0	0	0	0
0	0	0					
0:	0	0	0	0	0	0	0
0	0	0					
10:	0	0	0	0	0	0	1
0	1	0					
20:	1	0	1	1	1	1	2
0	0	0					
30:	0	0	4	2	5	6	3
2	3	0					
40:	0	2	0	0	1	0	0
0	0	0					
50:	0	0	0	0	0	0	0
1	0	0					
60:	0	0	0	0	1	0	0
0	0	0					
70:	2	0	1	0	0	0	0
0	0	0					
80:	0	0	0	1	0	0	0
1	0	0					
90:	0	0	0	0	0	0	0
0	0	0					
100:	1	0	0	1	0	0	0
1	0	0					

0	0	0					
120:	2	0	1	1	0	2	2
0	0	2					
130:	1	1	3	1	0	0	0
1	4	3					
140:	2	5	7	12	15	43	40
73	81	124					
150:	132	101	71	50	28	58	71
93	134	194					
160:	280	365	409	392	258	128	56
14	5	0					
170:	0	0	0	0	0	0	1
2	1	0					
180:	0	2	1	0	0	0	0
1	1	0					
190:	0	0	0	0	0	0	0
0	1	0					
200:	0	0	0	0	0	0	0
0	0	0					
210:	0	0	0	0	0	0	0
0	0	0					
220:	0	0	0	0	0	0	0
0	0	0					
230:	0	0	0	0	0	0	0
0	0	0					
240:	0	0	0	0	1	0	0
1	0	1					
250:	1	0	0	2	1	1	2
0	0	2					
260:	3	3	1	5	0	0	0
1	2	0					
270:	1	3	0	2	1	4	4
1	6	11					
280:	12	27	37	52	64	101	110
98	78	38					
290:	27	12	16	23	16	32	66
82	125	195					
300:	246	345	331	279	162	77	23
7	1	1					
310:	1	2	0	0	0	0	0
0	1	0					
320:	0	0	0	0	0	0	2
1	0	1					
330:	0	2	0	2	0	2	0
0	0	4					
340:	0	1	2	5	1	5	10
17	16	28					
350:	31	31	17	23	19	4	12
4	2	4					
360:	2	0	4	2	3	7	4
1	1	0					
370:	0	0	0	0	0	0	0
1	0	0					
380:	0	0	0	0	2	1	0
0	1	0					
390:	0	1	0	0	1	0	0
0	1	0					
400:	1	3	1	2	4	8	7
3	8	2					
410:	4	4	0	3	1	3	5
8	4	6					
420:	3	2	1	1	1	2	3
1	0	1					
430:	2	0	0	1	0	0	0
0	1	0					

440:	0	0	0	0	0	0	0
450:	5	1	1	2	0	3	4	3
460:	14	4	5	7	10	21	22	26	30	19
		11	1							

	CH.	COUNTS	BKG. COUNTS	BKG. CPM
232-Th	16-44	37	37	.000533
230-Th	100-176	3272+1	136	.00196
228-Th	244-311	2741+4	471	.0067
224-Ra	321-368	267	1180	.0017

t_{BKG} = 69364

MCB # 1 ACQ 06-25-93 AT 15:44:32 RT : 250199.5 LT : 250198.1
No detector description was entered
nopi-ecp-~~12.42/9.14 total dissolution U~~ - bogus sample
11.4 U OCL

ROI # 7-1 RANGE : 57 = 4.07MeV to 89 = 4.24MeV
AREA : Gross = 480 Net = 435 +/- 25
CENTROID : 79.54 = 4.19MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.10MeV

7-4

ID : No close library match

ROI # 7-2 RANGE : 165 = 4.65MeV to 196 = 4.82MeV
AREA : Gross = 687 Net = 623 +/- 30
CENTROID : 186.98 = 4.77MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.11MeV

ID : No close library match

ROI # 7-3 RANGE : 269 = 5.21MeV to 300 = 5.38MeV
AREA : Gross = 723 Net = 648 +/- 31
CENTROID : 289.13 = 5.32MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.11MeV

ID : No close library match

-46:	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0							
-30:	0	0	0	0	0	0	0
0	0	0					
-20:	0	0	0	0	0	0	0
0	0	0					
-10:	0	0	0	0	0	0	0
0	0	0					
0:	0	0	0	0	0	0	0
0	0	0					
10:	0	0	1	1	2	0	0
1	0	0					
20:	0	0	0	1	2	0	1
0	0	0					
30:	0	0	0	0	1	4	0
1	1	0					
40:	1	1	0	0	1	0	1
1	1	1					
50:	1	1	0	0	2	1	0
2	1	3					
60:	1	3	3	3	5	7	3
6	10	15					
70:	19	21	18	11	24	15	19
29	42	56					
80:	49	43	33	19	11	6	1
1	1	0					
90:	1	0	0	0	0	0	0
0	0	0					
100:	0	0	2	2	0	1	1
1	0	1					
110:	2	0	1	0	0	4	3

120:	1	1	0	0	0	0	0
2	1	1					
130:	0	2	1	0	0	0	1
0	1	2					
140:	0	2	1	0	3	0	0
0	0	1					
150:	1	0	2	1	0	0	0
1	0	1					
160:	0	0	0	2	0	2	1
4	3	2					
170:	8	8	4	12	9	27	22
30	22	23					
180:	20	22	22	38	39	57	44
56	74	63					
190:	35	20	9	6	3	2	0
2	0	1					
200:	0	0	0	0	1	0	1
0	1	0					
210:	0	0	0	0	2	0	2
0	0	1					
220:	3	0	2	0	0	0	1
0	1	0					
230:	1	0	0	0	0	0	0
1	1	0					
240:	0	0	0	0	0	0	1
2	1	1					
250:	0	0	0	1	0	0	0
0	0	0					
260:	1	1	2	0	1	0	0
1	0	3					
270:	4	5	6	10	12	22	28
27	40	30					
280:	34	26	19	18	24	24	32
48	58	62					
290:	67	53	35	20	6	2	2
4	1	1					
300:	0	0	4	2	1	5	2
4	6	4					
310:	5	10	7	4	0	3	0
0	0	1					
320:	0	0	0	0	0	0	0
0	0	0					
330:	0	0	0	0	1	0	0
0	0	0					
340:	1	0	0	0	0	2	0
0	2	0					
350:	2	1	1	2	1	2	4
4	4	5					
360:	6	5	3	4	1	0	1
0	0	1					
370:	0	0	0	0	0	0	0
0	0	0					
380:	0	0	0	0	0	0	0
0	0	0					
390:	0	0	0	0	0	0	0
0	0	0					
400:	0	0	0	0	0	0	0
0	0	0					
410:	0	0	0	0	0	0	0
0	0	0					
420:	0	0	0	1	0	2	0
0	0	0					
430:	1	1	3	0	0	2	0
0	0	0					
440:	0	0	0	0	1	0	0

450:	0	0	1	0	1	0	0
0	0	0					
460:	0	2	2	0	0	1	

	CH.	COUNTS	BKG. COUNTS	BKG. COUNTS (cpm)
U-238	57-88	480	4	.0009592
U-234	165-195	165	3	.0007194
U-232	269-299	269	4	.0009592

MCB # 1 ACQ 06-29-93 AT 05:41:09 RT : 223800.5 LT : 223787.6
No detector description was entered
No sample description was entered

11.4 Th

OCL
7-13

ROI # 12-1 RANGE : 16 = 3.88MeV to 64 = 3.99MeV
AREA : Gross = 90 Net = 40 +/- 20
Could not properly fit the peak.

ROI # 12-2 RANGE : 301 = 4.52MeV to 361 = 4.66MeV
AREA : Gross = 368 Net = 268 +/- 34
CENTROID : 345.27 = 4.62MeV
SHAPE : Fwhm = 0.02MeV Fwtm = 0.06MeV

ID : No close library match

ROI # 12-3 RANGE : 620 = 5.25MeV to 683 = 5.39MeV
AREA : Gross = 140 Net = 139 +/- 12
CENTROID : 653.00 = 5.32MeV
SHAPE : Fwhm = 0.00MeV Fwtm = 0.06MeV

ID : No close library match

ROI # 12-4 RANGE : 770 = 5.59MeV to 792 = 5.64MeV
AREA : Gross = 28 Net = 7 +/- 8
Could not properly fit the peak.

-76:	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0							
-60:	0	0	0	0	0	0	0
0	0	0					
-50:	0	0	0	0	0	0	0
0	0	0					
-40:	0	0	0	0	0	0	0
0	0	0					
-30:	0	0	0	0	0	0	0
0	0	0					
-20:	0	0	0	0	0	0	0
0	0	0					
-10:	0	0	0	0	0	0	0
0	0	0					
0:	0	0	0	0	0	0	0
0	0	0					
10:	0	0	0	0	0	0	1
2	1	0					
20:	3	0	1	0	1	2	2
2	0	0					
30:	0	0	1	1	1	5	0
3	2	3					
40:	3	1	0	1	1	5	3
1	3	2					
50:	4	5	2	2	3	4	1
3	3	1					
60:	6	2	2	1	0	0	0
0	0	0					
70:	0	0	0	0	0	0	0
0	0	0					

	0	0	0				
90:		0	0	0	0	0	0	0
	0	0	0				
100:		0	0	0	0	0	0	0
	0	0	0				
110:		0	0	0	0	1	0	0
	0	0	0				
120:		0	0	1	0	0	0	1
	0	0	0				
130:		0	0	0	0	0	0	0
	0	0	0				
140:		0	0	0	0	0	0	0
	0	0	0				
150:		0	0	0	0	0	0	0
	0	0	0				
160:		0	0	0	0	0	0	0
	0	0	0				
170:		0	0	0	0	0	0	0
	0	0	0				
180:		0	0	0	0	0	1	0
	0	0	0				
190:		0	0	0	0	0	0	0
	0	0	0				
200:		1	0	0	0	0	0	0
	1	0	0				
210:		0	1	0	0	0	0	0
	0	0	0				
220:		0	0	0	0	0	0	1
	1	0	0				
230:		0	0	0	0	0	0	0
	0	0	0				
240:		0	0	0	0	1	0	0
	0	0	0				
250:		1	0	0	0	0	0	0
	1	0	0				
260:		0	0	0	0	0	0	0
	0	0	0				
270:		0	0	0	0	1	0	0
	0	0	0				
280:		0	0	2	0	0	0	0
	0	0	0				
290:		0	2	0	0	1	0	3
	4	3	0				
300:		2	1	3	3	2	4	2
	1	3	1				
310:		3	4	1	5	3	8	4
	4	2	9				
320:		4	3	4	4	3	1	7
	6	2	9				
330:		6	6	9	7	15	8	15
	15	8	11				
340:		14	10	8	11	15	15	10
	12	14	6				
350:		11	9	5	6	6	1	3
	1	2	0				
360:		3	0	1	0	0	0	0
	0	0	0				
370:		1	2	0	0	0	0	0
	0	1	0				
380:		0	0	0	0	0	1	0
	0	0	0				
390:		0	0	0	0	1	0	0
	0	0	0				
400:		0	0	0	0	0	0	0
	0	0	0				

	1	0	0				
420:		0	0	0	0	0	0	0
	0	1	0				
430:		0	0	0	0	0	0	0
	0	0	0				
440:		0	0	0	0	0	0	0
	0	0	0				
450:		0	0	0	0	0	0	0
	0	0	0				
460:		0	0	0	0	0	0	0
	0	0	0				
470:		0	0	0	0	0	0	0
	0	0	0				

	CH.	COUNTS	BKG COUNTS	BKG COUNTS (cpm)
Th-232	16-63	90	0	0
Th-230	301-360	368	0	0
Th-228	623-680	140-1	0	0
Ra-224	770-789	28-2	0	0

480:	0	0	0	0	0	0	0
0	0	0					
490:	0	0	0	0	0	0	0
0	0	0					
500:	0	0	0	0	0	0	0
0	0	0					
510:	0	0	0	0	0	0	0
0	0	0					
520:	0	0	0	0	0	0	0
0	0	0					
530:	0	1	0	0	0	0	0
0	0	0					
540:	0	0	0	0	0	0	0
0	0	1					
550:	0	0	0	0	0	1	0
0	0	0					
560:	0	0	0	0	0	0	0
0	0	0					
570:	0	0	0	0	0	0	0
0	0	0					
580:	1	0	0	0	0	0	0
0	0	0					
590:	0	0	0	0	1	0	0
0	0	0					
600:	0	0	0	1	0	1	0
1	1	1					
610:	0	0	1	0	2	2	0
0	0	1					
620:	0	0	0	3	1	2	0
4	0	2					
630:	3	2	3	2	0	2	1
1	1	1					
640:	3	0	1	0	2	2	0
1	1	4					
650:	0	1	1	6	1	5	3
3	5	4					
660:	6	5	3	5	4	4	3
6	6	6					
670:	2	5	2	3	1	1	2
1	0	0					
680:	3	0	0	1	1	0	0
0	0	0					
690:	0	0	0	0	0	0	0
0	0	0					
700:	0	0	0	0	0	0	0
0	0	0					
710:	0	0	0	0	0	0	0
0	0	0					
720:	0	0	0	0	0	0	0
0	0	0					
730:	0	0	0	1	0	0	0
0	0	0					
740:	0	0	0	0	0	0	0
0	0	0					
750:	0	0	1	1	0	1	0
1	0	0					
760:	0	1	0	0	0	1	0
0	0	1					
770:	1	1	0	2	1	0	2
0	1	2					
780:	0	4	0	3	1	0	3
1	1	3					

790:								
	0	0	0					
800:		0	0	1	1	1	0	0
	0	0	0					
810:		0	0	0	0	0	1	0
	0	0	0					
820:		0	0	1	0	0	0	0
	0	0	0					
830:		0	0	0	0	0	0	0
	0	0	0					
840:		1	0	0	0	0	0	0
	0	0	0					
850:		0	0	0	0	0	0	0
	0	0	0					
860:		0	0	0	0	0	0	0
	0	0	0					
870:		0	0	0	1	1	1	0
	0	0	0					
880:		0	0	0	0	0	0	0
	0	0	0					
890:		0	0	0	0	1	0	0
	0	1	0					
900:		0	0	0	0	0	0	0
	0	1	0					
910:		0	0	0	0	0	0	0
	0	0	0					
920:		1	0	0	0	0	0	0
	0	0	1					
930:		0	0	0	0	1	0	1
	1	0	0					
940:		0	1	0	0	2	1	0
	0							

MCB # 1 ACQ 06-29-93 AT 05:41:08 RT : 140579.4 LT : 140571.0
No detector description was entered
NOPI-ECP-11.4/9.13 U CHannel #7 Bulk Dissolution

OCL 7/14

ROI # 7-1 RANGE : 42 = 3.95MeV to 152 = 4.19MeV
AREA : Gross = 14148 Net = 13704 +/- 147
CENTROID : 125.35 = 4.14MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.12MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.097 +/- 0.00

ROI # 7-2 RANGE : 281 = 4.48MeV to 400 = 4.74MeV
AREA : Gross = 14136 Net = 13656 +/- 151
CENTROID : 374.68 = 4.68MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.13MeV

ID : Th-230 at 4.69MeV
Corrected Rate = 0.097 +/- 0.00

ROI # 7-3 RANGE : 517 = 5.00MeV to 632 = 5.25MeV
AREA : Gross = 10789 Net = 10499 +/- 126
CENTROID : 609.70 = 5.20MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.12MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.075 +/- 0.00

-264:	1	1	0	1	0	0	1
-250:	1	0	0	0	2	0	2
-240:	1	2	1	0	0	1	0
-230:	2	0	0	2	3	0	4
-220:	1	6	8	3	4	4	5
-210:	5	7	2	6	4	6	2
-200:	8	7	10	7	12	2	6
-190:	12	11	4	7	5	7	7
-180:	8	12	1	2	3	1	4
-170:	7	3	0	1	3	0	0
-160:	0	0	1	0	2	5	1
-150:	0	6	4	1	6	5	2
-140:	1	4	6	4	2	7	7
-130:	8	12	9	11	5	10	10
-120:	9	11	11	10	19	18	19
-110:	33	29	28	16	32	30	27
-100:	34	24	26	24	19	15	16
-90:	8	3	4	2	1	0	0
-80:	0	0	0	0	0	0	0
-70:	0	0	1	1	0	0	0
-60:	0	1	0	0	0	0	0
-50:	0	0	0	1	0	0	0
-40:	0	0	0	0	0	1	0
-30:	0	0	0	0	0	0	51
-20:	64	67	66	68	80	54	81
-10:	74	48	53	76	60	66	45
0:	0	0	0	0	0	0	0
10:	0	0	0	1	4	3	3
20:	3	3	1	0	5	2	1

30:	4	2	2	5	2	5	2
40:	4	1	6	3	8	5	5
50:	6	3	6	10	4	13	10
60:	7	18	12	12	14	10	9
70:	17	28	19	22	12	22	17
80:	35	45	50	33	30	38	41
90:	58	78	78	82	105	88	101
100:	133	140	151	165	166	196	181
110:	235	259	277	245	255	285	305
120:	366	386	387	424	436	462	440
130:	463	414	401	386	345	299	220
140:	102	68	52	29	21	18	12
150:	3	3	1	0	3	2	0
160:	0	2	2	4	2	3	2
170:	1	3	2	2	2	0	3
180:	2	5	3	9	8	6	5
190:	4	11	7	4	8	11	8
200:	12	10	11	8	13	15	14
210:	18	18	13	11	12	18	12
220:	12	10	13	8	7	7	5
230:	1	3	3	1	3	5	4
240:	0	3	1	1	2	2	2
250:	1	2	5	1	1	0	2
260:	2	2	3	1	2	2	5
270:	4	4	1	10	7	4	2
280:	2	5	7	8	4	11	5

	CH.	COUNTS	BKG COUNTS	(cpm)
U-238	41 - 152	14148+1	2	.0009
U-234	281-400	14136	0	0
U-232	517-631	10789	0	0

290:	6	9	9	8	11	3	10
300:	10	6	13	8	10	13	11
310:	9	13	14	18	12	14	12
320:	17	15	24	14	24	24	19
330:	49	41	43	50	51	56	65
340:	75	79	92	100	105	108	120
350:	188	178	201	212	241	246	238
360:	257	263	255	251	246	285	316
370:	400	397	406	432	434	441	494
380:	397	414	316	306	236	180	176
390:	53	33	20	15	7	4	2
400:	2	0	0	0	1	1	1
410:	0	0	0	0	0	0	0
420:	0	0	1	0	0	1	0
430:	0	0	0	1	1	0	0
440:	0	0	0	0	0	1	3
450:	1	1	1	2	0	2	1
460:	0	1	1	1	1	1	1
470:	2	0	3	2	0	2	0
480:	3	2	3	3	2	2	1
490:	0	0	1	1	2	2	1
500:	1	1	2	1	0	3	2
510:	2	0	2	1	3	0	0
520:	5	3	1	2	6	1	7
530:	4	6	3	5	1	9	7
540:	10	2	11	7	8	4	9
550:	6	7	6	9	12	8	13
560:	30	26	29	20	35	23	29
570:	41	64	41	52	57	55	88
580:	113	118	124	143	126	126	153
590:	179	177	195	171	176	160	190
600:	212	212	230	258	275	286	284
610:	347	347	368	304	353	299	293
620:	143	131	98	75	59	46	26
630:	6	1	0	4	1	1	2
640:	4	3	2	5	6	1	6
650:	4	5	6	7	11	9	10
660:	7	3	5	4	2	1	0
670:	0	1	1	1	0	1	0
680:	0	0	0	0	0	0	0
690:	0	0	0	0	0	0	0
700:	0	0	0	0	0	0	0
710:	0	0	0	0	0	0	0
720:	0	0	0	0	0	0	0
730:	0	0	1	0	0	1	0
740:	1	0	0	0	0	1	0
750:	0	0	0	1	0	0	0

MCB # 1 ACQ 06-29-93 AT 05:41:09 RT : 140579.2 LT : 140570.8
No detector description was entered
No sample description was entered

11.6 Th #8 OCL

ROI # 8-1 RANGE : 29 = 3.92MeV to 97 = 4.07MeV
AREA : Gross = 100 Net = 14 +/- 30
Could not properly fit the peak.

7/14

ROI # 8-2 RANGE : 236 = 4.38MeV to 357 = 4.65MeV
AREA : Gross = 4734 Net = 4465 +/- 98
CENTROID : 336.43 = 4.60MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.13MeV

ID : U-235 at 4.60MeV
Corrected Rate = 0.032 +/- 0.00

ROI # 8-3 RANGE : 601 = 5.18MeV to 675 = 5.35MeV
AREA : Gross = 848 Net = 679 +/- 51
CENTROID : 657.70 = 5.31MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.08MeV

ID : U-232 at 5.32MeV
Corrected Rate = 0.005 +/- 0.00

ROI # 8-4 RANGE : 752 = 5.52MeV to 805 = 5.63MeV
AREA : Gross = 193 Net = 112 +/- 28
CENTROID : 780.12 = 5.58MeV
SHAPE : Fwhm = 0.00MeV Fwtm = 0.02MeV

ID : No close library match

-91:	3	3	2	1	1	0	1
-80:	1	4	0	1	1	1	1
-70:	0	1	0	0	0	0	0
-60:	0	1	0	0	0	0	0
-50:	0	0	0	0	0	0	1
-40:	1	2	2	0	1	0	1
-30:	0	1	1	3	1	0	21
-20:	17	30	33	19	30	42	29
-10:	24	21	28	21	28	22	20
0:	0	0	0	0	0	0	0
10:	0	0	0	1	1	4	5
20:	5	1	1	2	0	1	2
30:	4	1	5	2	2	0	2
40:	2	3	2	1	2	2	5
50:	2	2	3	3	2	2	1
60:	1	0	0	0	1	1	1
70:	2	2	0	1	0	3	2
80:	1	0	1	1	1	1	2
90:	2	1	1	2	0	1	2
100:	1	1	0	0	1	3	0
110:	0	0	1	0	1	0	2
120:	1	2	1	0	1	0	1
130:	1	4	3	2	0	1	2
140:	2	2	2	1	1	1	2

150:	1	0	0	0	0	0	3
160:	1	5	0	0	2	2	1
170:	2	0	1	2	0	0	1
180:	3	2	3	1	0	1	0
190:	3	1	0	1	1	2	2
200:	4	1	1	2	2	1	2
210:	2	3	1	0	0	2	2
220:	4	1	1	2	4	1	3
230:	1	5	3	2	0	1	2
240:	2	1	7	2	2	2	4
250:	3	1	2	2	3	5	2
260:	3	2	5	6	4	4	5
270:	6	2	7	5	2	4	8
280:	10	1	11	16	9	17	12
290:	18	15	18	17	21	21	23
300:	19	32	30	39	54	46	69
310:	46	64	73	58	56	53	51
320:	50	74	61	77	66	83	84
330:	132	132	131	141	154	151	160
340:	157	149	129	121	89	91	73
350:	20	15	12	12	3	7	2
360:	0	0	1	0	0	1	0
370:	0	0	0	0	0	1	2
380:	1	0	0	0	0	1	0
390:	0	1	0	0	1	1	1
400:	1	0	0	0	0	0	1
410:	0	0	0	1	0	0	0
420:	1	0	0	0	1	0	1
430:	0	1	0	1	0	0	0
440:	0	0	0	0	0	0	2
450:	0	0	0	1	0	0	1

	CHANNELS	COUNTS	BKG COUNTS	(cpm)
Th-232	12-61	104	0	0
Th-230	235-357	4734+1	9	.0038
Th-228	601-674	848	7	.0030
Ra-224	752-804	193	4	.0017

460:	0	3	0	0	1	2	0
470:	1	0	0	0	0	1	0
480:	1	0	0	0	0	1	0
490:	0	0	0	0	0	1	0
500:	2	0	0	0	0	0	0
510:	0	0	0	1	0	0	0
520:	0	0	1	0	1	0	0
530:	0	1	0	0	2	0	0
540:	0	0	0	0	1	0	1
550:	0	1	1	1	0	0	0
560:	1	1	0	0	0	1	0
570:	1	2	0	3	0	0	1
580:	1	0	0	0	3	3	2
590:	3	0	2	0	0	3	0
600:	0	1	5	2	6	2	5
610:	2	5	3	5	5	4	8
620:	11	9	8	6	10	16	7
630:	3	9	4	12	5	7	10
640:	9	11	7	9	13	13	10
650:	12	22	24	21	26	22	37
660:	37	27	26	26	20	12	26
670:	8	4	3	5	1	0	0
680:	0	0	0	0	0	0	2
690:	2	0	1	0	0	0	0
700:	0	0	0	0	1	0	0
710:	1	0	0	2	0	0	0
720:	0	1	0	0	1	1	0
730:	0	1	0	1	0	0	0
740:	1	0	0	1	0	0	0
750:	1	3	2	2	3	6	1
760:	0	1	7	4	6	4	6
770:	7	5	4	11	8	1	8
780:	12	6	7	2	1	2	2
790:	1	0	1	3	5	1	1
800:	1	3	3	1	1	0	0
810:	4	4	2	0	0	0	3
820:	0	0	0	0	1	1	0
830:	0	0	0	1	0	1	0
840:	0	0	0	0	0	1	0
850:	2	0	0	0	0	1	1
860:	0	1	1	0	0	0	1
870:	2	0	0	1	0	1	0
880:	0	4	2	2	1	1	0
890:	2	0	1	1	0	1	1
900:	3	4	2	1	4	3	2
910:	4	2	1	2	1	1	2
920:	2	3	2	1	2	4	6
930:	7	3	1				

MCB # 1 ACQ 06-29-93 AT 05:41:09 RT : 140578.5 LT : 140570.1
No detector description was entered
nopi-ecp-12.42/9.14 total dissolution U #11 dup OCL 7/12

ROI # 11-1 RANGE : 51 = 3.96MeV to 155 = 4.19MeV
AREA : Gross = 6293 Net = 6188 +/- 89
CENTROID : 133.88 = 4.14MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.10MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.044 +/- 0.00

ROI # 11-2 RANGE : 321 = 4.57MeV to 408 = 4.76MeV
AREA : Gross = 6209 Net = 6089 +/- 88
CENTROID : 382.89 = 4.71MeV
SHAPE : Fwhm = 0.05MeV Fwtm = 0.11MeV

ID : U-234 at 4.72MeV
Corrected Rate = 0.043 +/- 0.00

ROI # 11-3 RANGE : 569 = 5.13MeV to 641 = 5.29MeV
AREA : Gross = 4471 Net = 4288 +/- 80
CENTROID : 618.82 = 5.24MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.11MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.031 +/- 0.00

-63:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	0	0	0	0	0	0
20:	2	1	0	0	0	0	2
30:	1	0	1	0	0	1	0
40:	2	0	0	1	1	3	0
50:	1	1	1	0	2	2	1
60:	1	1	1	2	2	1	1
70:	2	3	6	3	2	4	3
80:	3	4	8	4	6	5	6
90:	11	12	9	12	12	10	23
100:	35	23	28	36	40	38	42
110:	69	80	76	91	79	95	105
120:	110	124	136	137	119	152	137
130:	201	217	235	232	255	254	247
140:	189	162	152	106	91	77	47
150:	14	6	6	2	2	0	0
160:	0	0	0	0	0	0	0
170:	0	1	1	1	0	0	0
180:	0	3	1	2	1	3	0
190:	1	1	0	1	3	2	1
200:	3	1	5	1	5	3	0
210:	8	8	8	7	5	8	8
220:	6	10	16	13	9	12	7

230:	4	6	4	5	1	1	2
240:	2	1	1	0	0	1	0
250:	0	2	0	1	0	0	0
260:	0	0	1	0	1	0	0
270:	0	0	1	0	0	0	0
280:	0	0	0	1	0	1	1
290:	0	1	1	2	3	0	2
300:	0	2	2	1	3	6	2
310:	3	0	2	3	3	0	1
320:	0	0	1	5	3	4	0
330:	5	10	3	6	8	7	7
340:	11	14	19	18	22	22	26
350:	37	37	37	38	46	55	54
360:	90	89	94	113	95	101	104
370:	116	132	139	126	132	164	155
380:	214	199	222	242	233	257	241
390:	144	148	112	99	62	40	28
400:	8	3	1	2	1	1	1
410:	0	0	0	1	0	1	0
420:	0	0	0	0	0	0	0
430:	0	0	0	0	0	0	0
440:	0	0	0	0	0	0	0
450:	0	0	0	0	0	0	0
460:	0	0	0	0	1	0	0
470:	1	1	1	0	1	1	2
480:	0	0	0	0	0	0	2

	CHANNELS	COUNTS	BKG. COUNTS	BKG. COUNTS (cpm)
U-238	50 - 154	6293 + 1	0	0
U-234	322 - 403	6209 + 2	0	0
U-232	566 - 636	4471 - 3	0	0

490:	0	0	0	0	1	0	1
500:	0	0	1	0	0	0	1
510:	0	0	1	0	0	0	1
520:	0	1	0	1	0	0	0
530:	0	0	0	0	0	1	1
540:	1	3	0	2	0	0	3
550:	1	1	1	2	1	0	0
560:	1	1	3	2	3	2	3
570:	4	4	2	6	7	9	8
580:	15	10	14	27	27	19	25
590:	46	56	58	66	61	62	77
600:	80	79	63	71	81	67	72
610:	106	97	120	113	128	135	146
620:	175	146	151	142	146	128	123
630:	38	33	24	21	11	6	4
640:	0	0	0	0	0	0	1
650:	1	0	4	1	3	4	6
660:	1	2	3	9	6	3	2
670:	1	7	2	0	0	1	2
680:	1	0	0	0	0	0	0
690:	0	1	0	0	0	0	0
700:	0	0	0	0	0	0	0
710:	0	0	1	0	0	0	0
720:	0	0	0	0	0	0	0
730:	0	0	0	0	0	0	0
740:	0	0	1	0	0	1	0
750:	0	0	0	0	0	0	0
760:	1	0	1	1	0	2	2
770:	1	3	5	2	3	2	2
780:	4	2	1	3	1	2	1
790:	0	0	0	0	0	0	0
800:	0	0	0	0	0	0	0
810:	0	0	0	0	0	0	0
820:	0	0	0	0	0	0	0
830:	0	0	0	0	0	0	0
840:	0	0	0	0	0	0	0
850:	0	0	0	0	0	0	0
860:	0	0	0	0	0	0	0
870:	0	1	0	0	0	0	0
880:	0	0	0	0	0	0	0
890:	0	0	0	0	1	0	0
900:	0	0	0	0	0	0	0
910:	0	0	0	0	0	0	0
920:	2	0	0	1	0	0	0
930:	0	1	1	0	2	0	0
940:	1	0	0	1	2	0	0
950:	0	0	0	1	0	0	0
960:	0						

MCB # 1 ACQ 06-25-93 AT 11:01:08 RT : 267134.2 LT : 267132.7
No detector description was entered
nopi-ecp-12.42/9.14 test Th calculation

7/13
OCL

ROI # 8-1 RANGE : 49 = 4.09MeV to 78 = 4.24MeV
AREA : Gross = 1443 Net = 1353 +/- 41
CENTROID : 70.43 = 4.20MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.09MeV

ID : U-238 at 4.20MeV
Corrected Rate = 0.005 +/- 0.00 ⇒ Th-232

ROI # 8-2 RANGE : 138 = 4.56MeV to 184 = 4.80MeV
AREA : Gross = 7280 Net = 6043 +/- 120
CENTROID : 161.61 = 4.69MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.06MeV

ID : Th-230 at 4.69MeV ⇒ Th-230
Corrected Rate = 0.023 +/- 0.00

ROI # 8-3 RANGE : 256 = 5.19MeV to 311 = 5.48MeV
AREA : Gross = 2027 Net = 1860 +/- 57
CENTROID : 282.47 = 5.32MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.12MeV

ID : U-232 at 5.32MeV ⇒ Th-228
Corrected Rate = 0.007 +/- 0.00 U-232

ROI # 8-4 RANGE : 338 = 5.62MeV to 360 = 5.73MeV
AREA : Gross = 514 Net = 347 +/- 29
CENTROID : 351.30 = 5.69MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.07MeV

ID : Th-227 at 5.69MeV ⇒ Ra-224
Corrected Rate = 0.001 +/- 0.00

~~ROI # 8-5 RANGE : 366 = 5.77MeV to 366 = 5.77MeV~~
~~AREA : Gross = 8~~ Net area not defined.

-58:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	1	0	0	1	1	0	0
20:	0	0	0	0	3	1	1
30:	2	2	2	2	2	2	3
40:	1	0	0	0	2	2	0
50:	4	4	8	6	11	10	14
60:	41	52	65	50	61	40	54
70:	145	177	160	87	63	26	5
80:	0	0	1	0	0	0	0
90:	0	0	2	0	0	1	0
100:	2	2	3	6	3	5	3

110:	6	1	3	2	0	1	1
120:	2	1	0	1	2	4	4
130:	1	5	3	3	4	7	5
140:	11	17	19	41	47	67	89
150:	233	215	155	97	96	81	145
160:	502	589	692	630	430	272	122
170:	72	61	40	34	46	52	74
180:	136	114	84	33	12	1	4
190:	1	0	0	0	1	0	0
200:	0	0	1	0	0	0	0
210:	0	0	0	2	1	0	0
220:	0	0	0	0	1	0	0
230:	0	0	0	1	0	0	0
240:	0	0	0	0	0	2	1
250:	0	1	2	3	0	1	0
260:	5	4	3	4	11	10	13
270:	37	43	48	47	33	24	32
280:	74	96	122	141	110	83	45
290:	11	7	8	7	13	15	33
300:	102	94	104	82	65	31	13
310:	4	1	0	2	1	1	2
320:	2	5	1	1	2	2	2
330:	1	2	2	4	8	4	3
340:	6	9	3	9	9	15	18
350:	54	50	60	60	34	22	16
360:	9	0	6	4	9	9	8
370:	2	2	2	0	0	0	2
380:	0	0	1	1	1	2	2
390:	3	0	0	4	2	3	2
400:	1	0	4	4	7	7	8
410:	8	6	3	7	6	9	13
420:	12	16	10	13	9	6	3
430:	3	3	0	1	4	0	0
440:	1	0	1	0	1	4	2
450:	6	4	4	5			

	CHANNELS	COUNTS	BKG. COUNTS	BKG. COUNTS (cpm)
Th-232	~~49 - 78~~ ~~24 - 40~~	~~1443~~ 21		
Th-230/U-234	130 - 185	7280 + 31 - 1424		
Th-228/U-232	260 - 310	2027 - 2 - 1018		
Ra-224	338 - 360	514		
U-238	49 - 78	1443		

Th-230 correction

$U\text{-}238 \times \frac{U\text{-}234}{U\text{-}238} = 1424$

Th-228 correction

$U\text{-}238 \times \frac{U\text{-}232}{U\text{-}238}$

MCB # 1 ACQ 07-07-93 AT 21:03:21 RT : 115046.8 LT : 115041.7
No detector description was entered
No sample description was entered 110U # 7

7-1 RANGE : 35 = 3.94MeV to 160 = 4.21MeV
AREA : Gross = 5767 Net = 5495 +/- 105 OCL
CENTROID : 126.77 = 4.14MeV
SHAPE : Fwhm = 0.05MeV Fwtm = 0.11MeV 7/15

ID : U-238 at 4.15MeV
Corrected Rate = 0.048 +/- 0.00

ROI # 7-2 RANGE : 284 = 4.48MeV to 404 = 4.75MeV
AREA : Gross = 6843 Net = 6401 +/- 122
CENTROID : 375.61 = 4.69MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.12MeV

ID : Th-230 at 4.69MeV
Corrected Rate = 0.056 +/- 0.00

ROI # 7-3 RANGE : 485 = 4.93MeV to 638 = 5.26MeV
AREA : Gross = 149801 Net = 148377 +/- 428
CENTROID : 611.47 = 5.21MeV
SHAPE : Fwhm = 0.07MeV Fwtm = 0.13MeV

ID : U-232 at 5.26MeV
Corrected Rate = 1.290 +/- 0.00

-253:	1	0	0	1	0	0	0
-240:	1	2	1	0	0	1	0
-230:	2	0	0	2	3	0	4
-220:	1	6	8	3	4	4	5
-210:	5	7	2	6	4	6	2
-200:	8	7	10	7	12	2	6
-190:	12	11	4	7	5	7	7
-180:	8	12	1	2	3	1	4
-170:	7	3	0	1	3	0	0
-160:	0	0	1	0	2	5	1
-150:	0	6	4	1	6	5	2
-140:	1	4	6	4	2	7	7
-130:	8	12	9	11	5	10	10
-120:	9	11	11	10	19	18	19
-110:	33	29	28	16	32	30	27
-100:	34	24	26	24	19	15	16
-90:	8	3	4	2	1	0	0
-80:	0	0	0	0	0	0	0
-70:	0	0	1	1	0	0	0
-60:	0	1	0	0	0	0	0
-50:	0	0	0	1	0	0	0
-40:	0	0	0	0	0	1	0
-30:	0	0	0	0	0	0	51
-20:	64	67	66	68	80	54	81
-10:	74	48	53	76	60	66	45
0:	0	0	0	0	0	0	0
10:	0	0	1	1	3	2	3
20:	4	2	2	2	1	2	1
30:	2	2	3	2	1	2	3

40:	5	3	5	9	5	3	3
50:	2	5	3	1	4	3	4
60:	5	4	6	3	5	4	6
70:	11	7	12	7	10	16	21
80:	9	17	10	20	17	19	14
90:	30	17	27	15	18	33	43
100:	50	45	51	47	63	66	78
110:	89	100	93	87	97	110	123
120:	128	154	152	140	161	201	212
130:	201	175	188	161	148	127	112
140:	61	41	38	22	14	17	7
150:	3	5	3	5	1	2	1
160:	0	2	0	2	1	4	1
170:	1	1	3	0	0	0	3
180:	0	1	0	3	3	2	4
190:	1	7	4	6	5	3	8
200:	7	5	7	6	9	7	7
210:	6	9	10	12	6	8	7
220:	5	13	7	8	13	6	2
230:	0	3	2	3	1	4	0
240:	1	4	2	1	1	2	0
250:	1	3	1	2	4	1	2
260:	0	1	6	3	1	1	3
270:	2	1	3	7	0	1	1
280:	3	2	3	3	2	8	6
290:	3	13	1	3	5	7	4

	CHANNELS	COUNTS	BKG COUNTS	BKG COUNTS (cpm)
U-238	34 - 159	5767 + 1	2	.00002860
U-234	284 - 403	6843 - 1	0	0
U-232	484 - 673	149801 + 348	0	0

300:	5	6	8	8	9	4	13
310:	8	10	11	8	5	9	11
320:	7	9	10	12	16	16	12
330:	13	20	18	16	20	34	20
340:	28	33	49	45	38	48	46
350:	57	66	91	92	88	94	101
360:	117	133	129	115	132	142	121
370:	176	154	191	189	211	204	220
380:	210	229	192	161	141	121	104
390:	38	39	25	23	12	12	7
400:	2	2	2	1	3	1	2
410:	0	3	4	0	1	5	1
420:	3	8	1	1	5	2	7
430:	8	4	1	4	6	8	3
440:	3	8	4	8	4	7	6
450:	5	9	4	7	9	6	6
460:	6	8	9	6	5	10	6
470:	7	5	9	10	7	8	9
480:	9	13	20	8	5	11	7
490:	16	31	19	15	16	11	22
500:	24	16	21	22	31	33	26
510:	33	35	30	29	31	33	26
520:	30	49	41	39	57	47	56
530:	67	65	73	73	64	103	91
540:	91	94	106	112	115	121	133
550:	155	170	168	169	174	200	208
560:	257	279	299	332	338	357	390
570:	519	574	606	701	709	806	859
580:	1191	1285	1435	1572	1723	1737	1911
590:	2348	2353	2461	2405	2429	2584	2542
600:	2605	2682	2767	2908	3125	3251	3597
610:	4320	4581	4847	4843	4773	4708	4507
620:	3089	2568	2244	1678	1384	1009	754
630:	155	91	42	23	22	14	10
640:	13	10	11	15	17	10	13
650:	17	17	19	36	35	30	35
660:	25	30	19	23	17	15	15
670:	9	3	1	2	0	1	0
680:	1	1	0	0	0	0	0
690:	1	0	0	0	0	1	0
700:	0	0	0	0	1	0	0
710:	0	0	0	0	0	0	0
720:	0	1	0	0	2	0	0
730:	0	0	1	0	0	1	1
740:	2	1	0	0	0	1	2
750:	0	1	5	2	3	7	2
760:	6	5	3	6	9	8	7
770:	11						

MCB # 1 ACQ 07-12-93 AT 01:05:28 RT : 506047.8 LT : 506040.5
No detector description was entered
NOPI-ECP-11.0/9.15 total dissolution Th #1

1-1 RANGE : 20 = 3.84MeV to 78 = 3.98MeV
AREA : Gross = 65 Net = 63 +/- 9
CENTROID : 61.78 = 3.94MeV
SHAPE : Fwhm = 0.00MeV Fwtm = 0.02MeV

ID : No close library match

OCL
7/21

ROI # 1-2 RANGE : 296 = 4.52MeV to 344 = 4.64MeV
AREA : Gross = 394 Net = 295 +/- 32
CENTROID : 333.96 = 4.62MeV
SHAPE : Fwhm = 0.02MeV Fwtm = 0.03MeV

ID : Th-230 at 4.62MeV
Corrected Rate = 0.001 +/- 0.00

ROI # 1-3 RANGE : 561 = 5.18MeV to 649 = 5.40MeV
AREA : Gross = 2436 Net = 2228 +/- 71
CENTROID : 629.31 = 5.35MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.07MeV

ID : Th-228 at 5.34MeV
Corrected Rate = 0.004 +/- 0.00

ROI # 1-4 RANGE : 701 = 5.53MeV to 750 = 5.65MeV
AREA : Gross = 959 Net = 861 +/- 40
CENTROID : 736.65 = 5.62MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.06MeV

ID : Th-227 at 5.67MeV
Corrected Rate = 0.002 +/- 0.00

-114:	0	0	0	0	0	0	0
-100:	0	0	0	0	0	0	0
-90:	0	0	0	0	0	0	0
-80:	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	0	0	0	0	1	2
20:	0	0	1	1	1	1	0
30:	1	2	0	1	1	3	0
40:	4	0	0	1	0	0	0
50:	2	0	0	0	1	1	2
60:	3	3	6	1	2	3	1
70:	1	1	5	1	3	0	1
80:	0	0	0	0	0	0	0

90:	0	0	0	0	0	1	0
100:	0	0	0	0	0	0	1
110:	0	0	0	0	0	0	0
120:	0	0	0	1	0	0	0
130:	1	0	1	0	0	0	0
140:	1	0	1	0	0	0	1
150:	0	0	0	0	1	0	0
160:	0	0	0	0	0	0	0
170:	0	0	0	1	1	2	0
180:	0	0	0	1	0	1	0
190:	0	0	0	0	0	0	0
200:	0	0	1	0	1	0	0
210:	0	0	0	0	0	0	0
220:	0	0	0	0	0	0	0
230:	0	2	0	1	0	0	1
240:	0	0	1	0	1	0	0
250:	0	0	0	1	0	1	0
260:	0	1	0	0	0	1	0
270:	0	0	1	0	0	1	1
280:	0	0	0	1	0	1	0
290:	2	1	2	0	2	0	1
300:	4	8	6	4	9	6	8
310:	7	6	5	5	2	5	4
320:	7	6	3	4	9	7	10
330:	21	13	19	23	19	31	16
340:	8	3	5	2	0	1	1
350:	0	0	1	0	1	0	1
360:	2	0	0	0	0	3	0
370:	0	0	0	0	0	0	1
380:	0	0	1	3	3	1	1
390:	3	1	2	1	1	1	1
400:	1	2	0	0	0	0	0
410:	0	0	0	0	0	0	0
420:	0	0	0	1	1	0	1
430:	0	0	0	0	0	1	0

	CHANNELS	COUNTS	BKG COUNTS	BKG COUNTS (cpm)
Th-232	21-74	65-1	7	.0010
Th-230	296-343	394-1	10	.0014
Th-228	561-646	2436	14	.0020
Ra-224	701-750	959	15	.0020

440:	0	0	0	1	0	0	0
450:	1	0	0	1	0	0	0
460:	0	0	2	0	1	0	0
470:	0	1	0	0	0	1	0
480:	0	0	2	0	0	1	0
490:	0	1	0	0	1	0	0
500:	0	0	1	1	1	0	0
510:	0	0	0	0	1	3	0
520:	1	1	1	0	1	0	2
530:	1	1	1	1	0	2	1
540:	3	0	3	1	3	3	2
550:	3	1	0	0	1	3	3
560:	0	2	5	3	1	3	2
570:	3	5	4	7	7	6	5
580:	10	5	8	8	11	14	12
590:	23	23	28	23	27	30	31
600:	46	32	27	21	10	25	15
610:	18	15	20	22	23	20	30
620:	42	48	49	70	72	72	78
630:	113	108	109	113	85	67	61
640:	5	5	3	4	8	4	1
650:	0	2	0	0	1	1	1
660:	1	0	1	0	0	1	0
670:	1	1	0	0	1	0	1
680:	0	1	1	0	0	1	0
690:	1	0	0	0	0	0	1
700:	0	1	2	2	1	2	5
710:	0	3	2	6	8	4	4
720:	17	9	21	18	25	18	28
730:	37	40	34	46	49	68	52
740:	48	35	27	13	11	2	7
750:	0	1	2	0	1	0	0
760:	0	1	0	2	0	1	0
770:	1	0	1	0	0	1	0
780:	0	1	1	0	1	0	1
790:	0	0	0	1	0	0	0
800:	0	0	0	1	0	0	0
810:	1	0	1	0	0	1	0
820:	0	0	0	0	0	0	0
830:	0	0	0	0	0	0	0
840:	0	0	0	0	0	0	1
850:	1	0	0	1	1	0	1
860:	0	1	2	0	1	1	3
870:	5	4	8	9	4	4	13
880:	13	11	9	12	10	9	14
890:	17	7	5	5	10	3	5
900:	3	6	3	3	2	6	2

MCB # 1 ACQ 07-07-93 AT 21:03:09 RT : 429340.3 LT : 429309.3 OCL

No detector description was entered

No sample description was entered NOPI-ECP-11.22/9.07 total dissolution Th #6

7/12

ROI # 6-1 RANGE : 16 = 3.87MeV to 77 = 4.03MeV

AREA : Gross = 227 Net = 142 +/- 31

CENTROID : 52.92 = 3.97MeV

SHAPE : Fwhm = 0.00MeV Fwtm = 0.06MeV

ID : No close library match ⟹ 232-Th

ROI # 6-2 RANGE : 248 = 4.49MeV to 329 = 4.70MeV

AREA : Gross = 2113 Net = 1765 +/- 79

CENTROID : 309.39 = 4.65MeV

SHAPE : Fwhm = 0.07MeV Fwtm = 0.15MeV

ID : Th-230 at 4.62MeV

Corrected Rate = 0.004 +/- 0.00

ROI # 6-3 RANGE : 531 = 5.23MeV to 719 = 5.73MeV

AREA : Gross = 1209 Net = 982 +/- 89

CENTROID : 591.54 = 5.39MeV

SHAPE : Fwhm = 0.03MeV Fwtm = 0.13MeV

ID : Th-228 at 5.42MeV

Corrected Rate = 0.002 +/- 0.00 ⟹ & U^{232}

ROI # 6-4 RANGE : 793 = 5.93MeV to 946 = 6.33MeV

AREA : Gross = 568 Net = 414 +/- 65

CENTROID : 916.02 = 6.25MeV

SHAPE : Fwhm = 0.01MeV Fwtm = 0.11MeV ⟹ ? Ra-224 & ?

ID : No close library match

228:	1	2								
230:	1	1	2	1	1	0	2	2	4	4
240:	2	2	0	4	4	3	5	0	4	6
250:	4	3	1	6	1	3	6	2	11	10
260:	7	8	8	8	7	20	14	5	17	7
270:	18	10	10	18	16	16	14	17	18	23
280:	25	19	19	17	25	35	23	25	26	25
290:	31	41	24	31	45	30	43	37	32	44
300:	50	46	51	42	63	49	47	48	49	49
310:	46	55	59	62	61	62	57	53	46	35
320:	37	39	27	17	22	8	6	6	6	0
330:	1	0	1	0	0	0	0	0	1	0
340:	0	0	0	0	0	1	0	0	0	0
350:	1	1	0	0	0	0	0	0	0	2
360:	0	1	0	0	0	0	2	0	0	0
[illegible]	1	0	0	1	0	0	0	0	1	0
380:	0	0	0	0	0	0	1	0	0	0
390:	0	0	0	0	0	0	0	0	0	0
400:	0	0	0	0	0	0	0	0	0	1
410:	0	0	0	0	0	0	0	1	0	0

420:	2	0	0	2	0	0	1	0	0	0
430:	0	0	0	0	0	0	0	0	0	0
440:	0	0	0	0	0	0	1	0	0	0
450:	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	1	0	0	0	0	0
[illegible]:	1	1	0	1	0	0	0	0	1	1
480:	0	0	0	0	0	0	0	0	1	1
490:	2	0	0	1	1	1	1	1	0	0
500:	1	1	1	0	1	0	0	1	0	1
510:	1	0	0	3	1	2	1	0	0	1
520:	0	0	0	1	1	2	3	2	1	0
530:	0	2	2	2	2	2	4	4	1	1
540:	2	4	4	3	3	6	5	3	5	3
550:	5	7	8	4	9	6	11	6	4	6
560:	6	10	7	10	11	7	7	13	12	9
570:	11	7	9	7	10	8	5	5	12	16
580:	12	12	12	14	12	14	16	17	13	20
590:	19	29	28	20	17	15	21	15	21	13
600:	14	14	15	12	9	5	4	2	1	2
610:	0	2	2	1	2	1	1	0	1	0
620:	0	1	1	2	2	2	0	1	1	0
630:	2	1	1	0	1	0	2	0	1	2
640:	2	0	4	1	0	0	5	2	2	1
650:	2	3	1	3	4	1	5	1	1	1
660:	0	3	1	4	4	5	3	6	5	4
670:	5	8	3	8	2	5	6	5	6	7
680:	9	7	4	9	13	12	13	14	14	6
690:	14	13	13	18	13	6	16	9	14	8
700:	15	11	14	7	5	8	9	6	4	5
[illegible]:	4	3	1	3	3	2	0	1	0	0
[illegible]:	0	3	1	1	0	1	1	2	1	1
730:	0	1	0	0	0	0	0	1	0	0
740:	2	0	1	0	0	0	0	0	0	0
750:	1	0	0	0	0	1	0	0	0	0
760:	0	0	0	1	0	0	0	0	0	0

770:	1	0	0	0	0	0	0	1	1	0
780:	0	0	1	0	0	0	3	1	1	0
790:	0	1	1	0	2	2	3	3	1	2
[illegible]:	3	5	1	1	1	0	0	1	1	2
[illegible]:	5	3	4	2	4	3	0	3	1	3
820:	1	2	1	4	2	2	4	3	6	4
830:	2	6	2	3	3	5	3	2	3	4
840:	2	5	2	2	3	1	5	2	2	4
850:	2	4	2	1	3	1	1	0	1	1
860:	0	2	0	1	0	1	0	1	2	0
870:	0	1	0	2	0	0	0	1	1	0
880:	0	0	1	0	0	3	2	1	2	0
890:	2	1	4	1	1	5	3	4	8	3
900:	5	5	4	5	3	8	8	7	9	11
910:	3	11	7	11	9	12	13	22	7	16
920:	14	17	13	19	11	9	10	9	6	14
930:	5	11	6	11	3	3	7	0	2	0
940:	3	1	1	0	0	2	0	0	0	0
950:	0	0	0	0	0	0	0	0	0	0
960:	0	0	0	0	0	0	0	0	1	0
970:	0	0	0	0	0	0	0	0	1	0
980:	0	0	0	0	0	0	0	0	0	0
990:	0	0	1	0	0	0	0	0	0	0
1000:	22	24	25	18	29	32	28	33	31	32
1010:	36	31	36	40	24	22	37	30	25	24
1020:	36	35	36	6	0	0	0	0	0	0
1030:	0	0	0	0	0	0	0	0	0	0
1040:	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0
1070:	0	0	0	0	0	0	0	0	0	0
1080:	0	0	0	0	0	0	0	0	0	0
1090:	0	0	0	0	0	0	0	0	0	0
1100:	0	0	0	0	0	0	0	0	0	0
1110:	0	0	0	0	0	0	0	0	0	0
1120:	0	0	0	0	0	0	0	0	0	0
1130:	0	0	0	0	0	0	0	0	0	0
1140:	0	0	0	0	0	0	0	0	0	0
1150:	0	0	0	0	0	0	0	0	0	0
1160:	0	0	0	0	0	0	0	0	0	0
1170:	0	0	0	0	0	0	0	0	0	0
1180:	0	0	0	0	0	0	0	0	0	0
1190:	0	0	0	0	0	0	0	0	0	0
1200:	0	0	0	0	0	0	0	0	0	0
1210:	0	0	0	0	0	0	0	0	0	0
1220:	0	0	0	0	0	0	0	0	0	0
1230:	0	0	0	0	0	0	0	0	0	0
1240:	0	0	0	0	0	0	0	0	0	0
1250:	0	0								

MCB # 1 ACQ 07-07-93 AT 21:03:53 RT : 115014.0 LT : 115008.8
No detector description was entered
nopi-ecp-11.22/9.07 total dissolution U #12

OCL
7-20

ROI # 12-1 RANGE : 14 = 3.87MeV to 155 = 4.19MeV
AREA : Gross = 4029 Net = 3604 +/- 115
CENTROID : 128.98 = 4.13MeV
SHAPE : Fwhm = 0.07MeV Fwtm = 0.14MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.031 +/- 0.00

ROI # 12-2 RANGE : 268 = 4.45MeV to 406 = 4.76MeV
AREA : Gross = 5189 Net = 4771 +/- 118
CENTROID : 378.19 = 4.70MeV
SHAPE : Fwhm = 0.09MeV Fwtm = 0.14MeV

ID : Th-230 at 4.69MeV ⇐ NO! U-234
Corrected Rate = 0.041 +/- 0.00

ROI # 12-3 RANGE : 525 = 5.03MeV to 643 = 5.30MeV
AREA : Gross = 4829 Net = 4620 +/- 92
CENTROID : 618.86 = 5.24MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.16MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.040 +/- 0.00

-79:	0	0	0	0	0	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0	0	0	0		
-50:	0	0	0	0	0	0	0	0	0	0		
-40:	0	0	0	0	0	0	0	0	0	0		
-30:	0	0	0	0	0	0	0	0	0	0		
-20:	0	0	0	0	0	0	0	0	0	0		
-10:	0	0	0	0	0	0	0	0	0	0		
0:	0	0	0	0	0	0	0	0	0	0		
10:	0	0	0	0	2	2	5	0	3	1		
20:	4	3	1	2	0	3	1	4	1	1		
30:	0	1	0	2	6	4	3	2	3	2		
40:	5	4	4	2	3	0	2	0	3	2		
50:	3	2	4	6	4	5	5	8	5	5		
60:	6	5	4	8	5	3	3	5	6	9		
70:	14	7	6	7	9	3	16	8	5	11		
80:	16	14	16	15	14	25	18	11	14	17		
90:	19	17	22	24	19	25	29	30	18	35		
100:	25	39	35	35	34	41	37	50	58	59		
110:	64	49	56	62	52	85	60	67	90	67		
120:	66	76	86	71	88	91	93	89	90	89		
130:	85	104	107	98	105	90	87	106	97	85		
140:	68	87	58	65	60	27	29	19	21	22		
150:	13	11	7	3	5	0	0	2	1	1		
160:	0	0	1	0	0	1	0	0	0	2		
[illegible]	1	0	1	1	3	2	0	2	2	2		
[illegible]	0	0	1	1	1	1	3	3	1	2		
190:	2	3	5	1	4	0	4	0	3	2		
200:	3	3	3	4	3	2	3	5	2	4		
210:	6	5	2	7	4	2	6	3	5	3		

220:	2	7	5	5	7	1	2	2	4	1
230:	2	5	2	2	2	3	0	3	0	1
240:	3	0	0	1	0	1	0	0	0	0
250:	1	1	0	3	0	0	4	1	1	2
[illegible]0:	1	2	1	1	2	0	1	0	2	2
[illegible]0:	2	1	2	4	5	7	4	3	2	2
280:	3	1	2	4	2	2	3	2	8	1
290:	7	6	6	4	2	5	8	4	2	1
300:	3	3	5	1	3	6	5	7	7	4
310:	6	5	8	4	8	5	14	12	9	9
320:	10	10	9	12	12	7	9	10	15	9
330:	20	15	14	15	19	21	16	24	13	29
340:	25	27	36	34	28	24	31	23	36	42
350:	53	40	59	38	55	73	65	75	61	75
360:	82	94	89	83	81	80	81	87	108	83
370:	90	106	113	116	99	103	120	109	120	126
380:	118	119	119	129	109	126	135	117	109	127
390:	90	92	71	64	58	43	45	21	29	27
400:	11	11	8	7	9	3	0	2	0	0
410:	2	0	0	0	0	0	1	0	0	0
420:	1	1	0	1	0	1	0	0	0	2
430:	0	1	0	0	0	1	0	0	0	0
440:	1	0	1	1	0	0	0	0	0	1
450:	0	1	0	0	1	1	0	1	0	0
460:	1	0	2	2	0	1	0	0	0	0
470:	0	0	0	0	0	1	0	0	0	1

480:	1	0	1	1	2	1	1	2	0	1
490:	1	1	0	0	1	1	2	1	1	0
500:	1	1	0	2	2	2	2	3	0	0
[illegible]0:	1	5	0	2	1	4	0	2	0	2
[illegible]0:	1	2	3	2	2	1	2	3	3	5
530:	4	3	6	4	6	3	3	4	4	5
540:	10	2	4	5	2	3	4	4	5	7
550:	8	6	9	10	7	9	8	5	8	5
560:	12	6	18	5	15	7	18	15	17	16
570:	18	14	16	17	15	18	27	22	33	29
580:	32	24	31	30	29	32	40	44	36	53
590:	58	70	51	81	55	57	65	63	83	67
600:	77	92	102	76	73	85	76	73	94	94
610:	85	107	99	106	106	100	92	106	112	119
620:	144	112	137	129	106	121	103	102	78	90
630:	66	65	49	36	27	25	17	11	9	4
640:	4	2	2	0	0	1	0	1	0	0
650:	1	0	3	1	0	3	3	1	0	0
660:	1	0	0	1	1	2	1	0	1	0
670:	1	0	0	2	0	0	0	0	1	0
680:	0	0	0	0	0	0	0	0	0	0
690:	0	0	0	0	0	1	0	0	0	0
700:	0	0	0	0	0	0	0	0	0	0
710:	0	0	0	0	0	0	0	0	0	0
720:	0	0	0	0	0	0	0	0	0	0
730:	1	0	0	0	0	0	0	0	0	0
740:	0	0	0	0	1	0	0	0	0	0
750:	0	0	0	0	0	0	0	0	0	0
[illegible]0:	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	2	0	0	1	0	1	0	1	1
780:	2	4	0	1	0	0	0	0	1	0
790:	0	1	0	0	0	1	0	0	0	0
800:	0	0	0	0	0	0	0	0	0	0
810:	0	0	0	0	0	0	0	0	0	0
820:	0	0	0	0	0	0	0	0	0	0
830:	0	0	0	0	0	0	0	0	0	0
840:	0	0	0	0	0	0	0	0	0	0
850:	0	0	0	0	0	0	0	0	0	0
860:	0	0	0	0	0	0	0	0	0	0
870:	0	0	0	0	0	0	0	0	0	0
880:	0	0	0	0	0	0	0	0	0	0
890:	0	0	0	0	0	0	0	0	0	0
900:	0	0	0	0	0	0	0	0	0	0
910:	0	0	0	0	0	0	0	0	0	0
920:	0	0	0	0	1	0	0	0	0	0
930:	0	0	0	0	0	0	0	0	0	0
940:	0	0	0	0	1					

MCB # 1 ACQ 07-12-93 AT 01:05:29 RT : 506028.2 LT : 506021.0
No detector description was entered
No sample description was entered 11.22 th #2

ROI # 6-1 RANGE : 12 = 3.86MeV to 68 = 4.01MeV
AREA : Gross = 311 Net = 141 +/- 40
CENTROID : 50.00 = 3.96MeV
SHAPE : Fwhm = 0.00MeV Fwtm = 0.04MeV

ID : No close library match

ROI # 6-2 RANGE : 214 = 4.40MeV to 331 = 4.71MeV
AREA : Gross = 2924 Net = 2669 +/- 86
CENTROID : 306.99 = 4.64MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.18MeV

ID : Th-230 at 4.62MeV
Corrected Rate = 0.005 +/- 0.00

ROI # 6-3 RANGE : 519 = 5.20MeV to 616 = 5.46MeV
AREA : Gross = 997 Net = 898 +/- 49
CENTROID : 591.06 = 5.39MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.16MeV

ID : Th-228 at 5.42MeV
Corrected Rate = 0.002 +/- 0.00

ROI # 6-4 RANGE : 648 = 5.54MeV to 718 = 5.73MeV
AREA : Gross = 839 Net = 714 +/- 45
CENTROID : 691.69 = 5.66MeV
SHAPE : Fwhm = 0.05MeV Fwtm = 0.10MeV

ID : Th-227 at 5.67MeV
Corrected Rate = 0.001 +/- 0.00

ROI # 6-5 RANGE : 995 = 6.46MeV to 1007 = 6.49MeV
AREA : Gross = 508 Net = 73 +/- 24
CENTROID : 1000.89 = 6.48MeV
SHAPE : Fwhm = 0.01MeV Fwtm = 0.01MeV

ID : No close library match

-160:	0	0	0	0	0	0	0
-150:	0	0	0	0	0	0	0
-140:	0	0	0	0	0	0	0
-130:	0	0	0	0	0	0	0
-120:	0	0	0	0	0	0	0
-110:	0	0	0	0	0	0	0
-100:	0	0	0	0	0	0	0
-90:	0	0	0	0	0	0	0
-80:	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	2	2	3	4	0	4
20:	4	2	2	2	3	7	7
30:	2	4	5	4	4	4	9
40:	1	7	12	5	6	6	7
50:	15	7	7	7	5	10	10
60:	8	11	9	11	2	6	4
70:	1	1	1	0	1	0	0
80:	0	0	0	0	1	0	1
90:	0	0	0	0	0	0	0
100:	0	0	0	0	1	0	0
110:	0	0	0	0	0	0	0
120:	1	0	0	0	0	0	0
130:	0	0	0	0	0	0	0
140:	0	1	0	1	0	0	0
150:	0	0	0	0	0	0	0
160:	0	0	2	1	0	1	0
170:	0	0	1	0	0	0	0
180:	0	0	0	0	0	0	0
190:	0	0	0	0	1	2	0
200:	0	0	0	0	1	2	2
210:	0	1	0	0	2	2	1
220:	3	1	0	2	0	3	3
230:	2	6	2	2	0	3	3
240:	2	1	5	0	4	6	2
250:	2	5	7	6	8	2	9
260:	13	10	20	14	14	14	12
270:	20	20	25	22	17	19	14
280:	34	28	41	35	37	37	34
290:	50	43	46	55	44	49	54
300:	56	53	55	72	82	60	87
310:	77	57	76	64	65	51	68
320:	31	46	28	32	24	10	12
330:	1	3	1	0	0	0	0
340:	0	0	0	0	0	0	0
350:	1	1	0	0	0	0	0
360:	1	1	0	0	1	0	1
370:	0	0	0	0	0	0	0
380:	0	0	0	0	0	0	0

390:	0	0	0	0	0	0	0
400:	0	0	0	0	0	0	0
410:	0	0	1	0	1	0	0
420:	0	0	0	0	0	0	0
430:	0	0	0	1	0	0	0
440:	0	0	0	0	1	0	0
450:	1	0	1	0	0	0	0
460:	0	1	0	0	0	0	0
470:	0	0	0	0	0	0	0
480:	0	0	0	0	0	0	0
490:	0	1	0	0	1	0	0
500:	1	0	0	0	0	1	0
510:	1	1	0	0	2	1	0
520:	1	2	2	1	2	4	2
530:	0	1	4	3	5	7	2
540:	6	2	3	3	4	0	7
550:	5	6	7	6	10	12	8
560:	14	13	6	9	12	16	15
570:	12	16	21	14	11	15	14
580:	18	22	16	14	20	21	26
590:	31	32	17	24	22	12	19
600:	19	19	17	12	13	6	6
610:	5	1	0	1	2	1	0
620:	1	3	1	2	1	0	2
630:	1	3	4	1	0	2	2
640:	2	0	2	4	6	3	6
650:	2	1	7	2	2	7	4
660:	3	7	3	8	11	5	7
670:	11	14	9	13	15	18	9
680:	15	12	22	21	20	24	25
690:	29	30	19	29	26	27	25
700:	24	18	12	8	15	9	8
710:	1	2	3	1	4	1	2
720:	2	0	0	0	3	0	1
730:	0	1	1	0	0	0	1
740:	1	0	0	1	1	1	0
750:	0	1	0	0	0	0	0
760:	1	1	0	1	0	0	1
770:	0	1	0	0	1	0	0
780:	2	1	0	0	1	2	1
790:	0	1	1	0	2	0	0
800:	4	1	2	3	1	6	8
810:	5	5	2	3	5	7	2
820:	2	5	2	8	8	7	10
830:	6	8	3	4	12	11	4
840:	7	2	10	7	8	12	1
850:	4	4	2	2	7	3	0
860:	0	0	1	1			

MCB # 1 ACQ 07-07-93 AT 21:03:30 RT : 429286.0 LT : 429254.9
No detector description was entered
No sample description was entered

OCL
7-8

ROI # 8-1 RANGE : 12 = 3.89MeV to 71 = 4.02MeV
AREA : Gross = 129 Net = 39 +/- 29
CENTROID : 18.00 = 3.90MeV
SHAPE : Fwhm = 0.00MeV Fwtm = 0.01MeV

ID : No close library match

ROI # 8-2 RANGE : 247 = 4.40MeV to 358 = 4.65MeV
AREA : Gross = 6379 Net = 6099 +/- 105
CENTROID : 335.48 = 4.60MeV
SHAPE : Fwhm = 0.05MeV Fwtm = 0.13MeV

ID : U-235 at 4.60MeV
Corrected Rate = 0.014 +/- 0.00

ROI # 8-3 RANGE : 594 = 5.17MeV to 681 = 5.36MeV
AREA : Gross = 1531 Net = 1355 +/- 61
CENTROID : 657.96 = 5.31MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.09MeV

ID : U-232 at 5.32MeV
Corrected Rate = 0.003 +/- 0.00

ROI # 8-4 RANGE : 744 = 5.50MeV to 801 = 5.62MeV
AREA : Gross = 689 Net = 573 +/- 40
CENTROID : 775.13 = 5.57MeV
SHAPE : Fwhm = 0.03MeV Fwtm = 0.08MeV

ID : No close library match

-63:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	4
-20:	8	4	0	3	3	2	1
-10:	4	3	5	2	0	5	0
0:	0	0	0	0	0	0	0
10:	0	0	1	2	2	2	2
20:	3	5	2	1	0	1	4
30:	0	3	5	2	1	4	5
40:	5	2	4	3	5	2	2
50:	2	0	3	1	1	0	1
60:	2	2	0	0	1	2	0
70:	1	0	0	0	0	1	1
80:	0	0	0	0	0	1	0
90:	2	0	1	4	1	4	1
100:	1	3	2	0	1	2	0
110:	1	4	4	2	3	5	3
120:	5	0	9	1	1	3	2
130:	2	4	0	2	2	2	2

140:	0	1	0	0	2	2	2
150:	0	1	2	3	1	1	2
160:	3	1	1	0	2	2	2
170:	2	1	1	0	0	1	1
180:	1	1	2	0	1	0	0
190:	2	1	0	1	1	4	0
200:	0	0	1	4	2	2	1
210:	3	0	3	0	3	2	2
220:	2	3	1	1	0	3	2
230:	2	3	3	1	0	2	5
240:	1	0	4	2	3	2	1
250:	3	4	6	3	5	3	1
260:	0	3	2	3	5	2	3
270:	6	4	10	2	4	9	7
280:	8	6	6	14	15	24	14
290:	22	28	22	27	35	30	37
300:	51	49	62	55	63	64	77
310:	69	76	88	76	76	69	99
320:	93	79	90	114	108	123	116
330:	179	161	151	182	184	214	224
340:	189	164	151	158	129	112	81
350:	48	29	13	6	8	4	5
360:	2	0	1	1	2	1	1
370:	1	1	1	1	0	1	1
380:	0	2	1	1	3	1	0
390:	1	1	1	0	0	0	0
400:	0	1	1	0	0	0	0
410:	0	0	2	0	0	1	0
420:	0	2	0	0	1	0	0
430:	0	0	1	0	1	0	1
440:	0	0	2	0	0	0	1
450:	1	0	0	0	0	1	1
460:	0	0	0	0	0	1	0
470:	0	0	0	0	0	0	0
480:	1	1	0	0	0	0	0

12 - 70	129	0	0
246 - 360	6379 + 3	0	0
594 - 680	1531	0	0
743 - 801	689 + 1	0	0

490:	2	1	1	1	2	2	1
500:	0	0	0	1	0	0	1
510:	0	0	1	0	0	0	0
520:	0	1	0	3	0	1	0
530:	0	0	0	1	0	0	0
540:	0	1	0	1	1	0	0
550:	0	2	3	3	0	0	3
560:	0	1	1	0	1	1	3
570:	1	1	0	5	1	1	2
580:	0	1	1	3	2	3	2
590:	3	1	0	0	4	2	3
600:	2	4	2	8	7	10	4
610:	12	6	9	9	13	7	16
620:	12	7	20	27	24	15	13
630:	8	13	14	12	16	6	19
640:	19	16	12	22	21	17	25
650:	36	30	36	47	37	43	53
660:	49	43	41	54	44	36	31
670:	12	12	10	11	4	5	4
680:	2	0	0	1	0	0	1
690:	0	2	0	0	0	1	0
700:	1	0	1	1	0	1	0
710:	0	1	3	2	0	0	0
720:	1	0	1	1	1	2	1
730:	2	4	1	2	0	1	2
740:	3	3	1	1	2	2	3
750:	4	3	4	5	8	7	6
760:	5	15	9	14	18	18	21
770:	19	24	23	33	21	23	34
780:	27	20	22	13	15	13	12
790:	4	3	3	3	3	5	3
800:	3	1	1	1	3	3	3
810:	1	2	3	3	0	2	0
820:	0	2	0	0	1	1	0
830:	1	0	0	0	1	1	0
840:	0	0	1	0	0	1	1
850:	0	0	1	0	2	0	1
860:	0	1	0	2	1	0	0
870:	0	0	1	0	0	1	2
880:	1	1	0	2	0	0	3
890:	0	1	1	3	2	1	4
900:	2	0	4	2	8	0	2
910:	1	1	4	1	2	5	3
920:	3	7	7	8	6	5	8
930:	5	8	5	7	7	14	4
940:	4	4	5	1	4	9	5
950:	6	3	2	5	2	2	5
960:	1						

MCB # 1 ACQ 07-07-93 AT 21:03:44 RT : 115023.1 LT : 115018.0

OCL 7/10

No detector description was entered

~~No sample description was entered~~ NODI-ECP- 11.78/9.17 - WR TOTAL U DISSOLUTION # 11

ROI # 11-1 RANGE : 60 = 3.98MeV to 160 = 4.20MeV
AREA : Gross = 17377 Net = 16989 +/- 152
CENTROID : 134.82 = 4.15MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.12MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.148 +/- 0.00

	CH.	COUNTS	BKG	CPS
U 238	55 -159	17377+16	0	0
U 234	297 - 406	17921+2	0	0
U 232	544 - 642	17310-37	0	0

ROI # 11-2 RANGE : 298 = 4.51MeV to 406 = 4.76MeV
AREA : Gross = 17921 Net = 17250 +/- 170
CENTROID : 383.66 = 4.71MeV
SHAPE : Fwhm = 0.07MeV Fwtm = 0.12MeV

ID : U-234 at 4.72MeV
Corrected Rate = 0.150 +/- 0.00

~~ROI # 11-3 RANGE : 409 = 4.77MeV to 409 = 4.77MeV~~
~~AREA : Gross = 2 Net area not defined.~~

ROI # 11-4 RANGE : 531 = 5.04MeV to 643 = 5.29MeV
AREA : Gross = 17310 Net = 17084 +/- 145
CENTROID : 620.75 = 5.24MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.13MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.149 +/- 0.00

-82:	0	0	0	0	0	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0	0	0	0		
-60:	0	0	0	0	0	0	0	0	0	0		
-50:	0	0	0	0	0	0	0	0	0	0		
-40:	0	0	0	0	0	0	0	0	0	0		
-30:	0	0	0	0	0	0	0	0	0	0		
-20:	0	0	0	0	0	0	0	0	0	0		
-10:	0	0	0	0	0	0	0	0	0	0		
0:	0	0	0	0	0	0	0	0	0	0		
10:	0	0	1	0	1	1	4	1	0	0		
20:	0	3	0	1	0	3	2	0	1	0		
30:	2	0	1	3	1	2	0	0	0	2		
40:	2	1	0	0	1	2	2	2	2	2		
50:	1	1	4	5	4	1	5	3	4	4		
60:	8	5	6	5	9	3	5	6	4	8		
70:	7	6	5	15	9	11	9	14	11	8		
80:	11	20	17	27	22	22	33	20	29	26		
90:	34	36	41	46	40	35	47	61	65	57		
100:	76	90	83	97	115	134	130	113	139	160		
110:	190	196	235	241	230	231	268	277	276	306		
120:	304	310	360	345	367	379	387	415	428	467		
130:	468	471	532	550	558	592	569	570	573	640		
140:	592	539	481	458	352	311	252	206	158	96		
150:	85	53	28	14	15	11	5	2	3	1		
160:	0	2	0	3	3	1	0	0	1	0		

170:	3	2	1	1	2	1	0	2	3	2
180:	2	4	2	2	2	2	5	1	5	2
190:	3	8	2	4	9	8	9	5	8	4
200:	4	11	7	15	10	10	21	9	14	15
	15	16	14	19	21	21	18	23	13	20
220:	22	32	23	21	25	24	24	14	13	17
230:	16	14	16	13	10	4	6	5	2	1
240:	1	1	3	1	2	2	0	2	1	1
250:	0	2	0	0	1	2	1	1	2	2
260:	0	0	1	1	1	2	0	0	1	1
270:	2	2	1	1	1	0	3	2	5	2
280:	1	4	4	1	7	3	2	1	1	2
290:	3	2	2	5	3	3	4	2	8	8
300:	7	6	4	4	5	4	5	6	8	3
310:	7	5	8	3	7	6	5	14	12	9
320:	8	9	13	8	5	14	15	8	18	14
330:	21	18	15	17	17	26	27	21	30	35
340:	38	40	43	51	69	69	61	76	59	90
350:	103	111	116	121	144	133	147	170	200	234
360:	222	244	247	268	282	288	311	325	302	329
370:	311	325	358	314	361	397	386	400	461	443
380:	463	547	539	546	580	582	589	611	606	538
390:	540	477	435	364	350	290	207	171	126	83
400:	66	34	21	10	9	3	2	0	1	2
410:	0	0	0	0	0	0	0	0	1	2
420:	0	0	0	0	0	0	0	1	1	0
430:	0	0	0	1	0	1	1	0	0	0
440:	0	0	0	0	1	0	1	0	1	0
450:	0	0	0	1	0	1	0	2	0	0
	0	1	1	0	0	0	0	1	1	1

470:	1	1	1	1	1	2	0	0	2	2
480:	1	1	1	1	4	1	1	0	2	0
490:	1	0	2	0	0	2	0	1	3	0
[illegible]	2	0	0	1	0	1	0	0	2	0
510:	2	0	0	0	1	3	1	0	1	1
520:	1	2	1	1	1	1	3	1	1	0
530:	0	2	1	6	4	3	2	2	3	2
540:	6	4	4	0	5	3	3	6	6	1
550:	7	9	12	4	5	6	2	6	7	7
560:	11	10	11	9	10	15	15	11	15	18
570:	22	18	30	36	29	33	35	61	41	54
580:	64	65	84	80	84	107	92	107	137	130
590:	167	145	171	174	209	225	260	284	277	256
600:	307	291	311	280	287	295	297	296	312	288
610:	293	367	361	379	417	415	437	480	519	509
620:	549	560	561	598	574	576	495	475	445	416
630:	302	238	187	138	108	63	52	52	22	18
640:	7	1	2	0	3	2	2	2	1	2
650:	0	1	1	5	1	5	2	3	2	3
660:	2	1	6	2	5	5	6	4	5	4
670:	2	3	4	4	4	1	2	4	3	2
680:	1	0	2	0	0	0	0	1	0	0
690:	0	0	0	0	0	0	0	0	0	0
700:	0	0	0	0	0	0	0	0	0	0
710:	0	0	0	0	0	0	0	0	0	0
720:	0	0	0	0	1	0	0	0	0	0
730:	0	0	0	0	0	0	0	0	0	0
740:	0	0	0	0	0	0	0	0	0	0
[illegible]	1	0	1	1	0	0	0	0	2	0
[illegible]	0	0	1	0	0	0	1	2	2	0
770:	1	2	1	2	4	1	2	2	1	1
780:	3	0	2	2	0	4	3	2	1	0
790:	1	0	0	0	0	0	0	0	0	0
800:	0	0	0	0	0	0	0	0	0	0
810:	0	0	1	0	0	0	0	0	0	0
820:	0	0	0	0	0	0	0	0	0	0
830:	0	0	0	0	0	0	0	0	0	0
840:	0	0	0	0	0	0	0	0	0	0
850:	0	0	0	0	0	0	0	0	0	0
860:	0	0	0	0	0	0	0	0	0	0
870:	0	0	0	0	0	0	0	0	0	0
880:	0	0	0	0	0	0	0	0	0	0
890:	0	0	0	0	0	0	0	0	0	0
900:	0	0	0	0	0	0	0	0	0	0
910:	0	0	0	0	0	0	0	0	0	0
920:	1	0	0	0	0	0	0	0	0	1
930:	0	0	3	0	0	1	0	0	0	1
940:	0	0								

MCB # 1 ACQ 07-12-93 AT 01:05:29 RT : 156776.9 LT : 156770.0
No detector description was entered
No sample description was entered 1178th 2. CHN #8

OCL 7/21

ROI # 8-1 RANGE : 42 = 3.95MeV to 115 = 4.11MeV
AREA : Gross = 40 Net = -106 +/- 39
Could not properly fit the peak.

ROI # 8-2 RANGE : 265 = 4.44MeV to 356 = 4.64MeV
AREA : Gross = 2227 Net = 2133 +/- 59
CENTROID : 335.89 = 4.60MeV
SHAPE : Fwhm = 0.05MeV Fwtm = 0.14MeV

ID : U-235 at 4.60MeV
Corrected Rate = 0.014 +/- 0.00

ROI # 8-3 RANGE : 603 = 5.19MeV to 677 = 5.35MeV
AREA : Gross = 533 Net = 457 +/- 36
CENTROID : 661.38 = 5.32MeV
SHAPE : Fwhm = 0.02MeV Fwtm = 0.08MeV

ID : U-232 at 5.32MeV
Corrected Rate = 0.003 +/- 0.00

ROI # 8-4 RANGE : 738 = 5.48MeV to 789 = 5.60MeV
AREA : Gross = 354 Net = 250 +/- 32
CENTROID : 775.11 = 5.57MeV
SHAPE : Fwhm = 0.02MeV Fwtm = 0.07MeV

ID : No close library match

-80:	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	0	0	1	1	0	3
20:	1	0	3	0	0	0	0
30:	0	1	3	1	0	2	0
40:	0	0	3	1	1	0	0
50:	0	1	0	0	0	0	0
60:	2	0	0	0	0	0	3
70:	0	0	0	0	1	0	0
80:	1	0	0	1	0	2	0
90:	0	1	1	1	0	0	0
100:	1	2	0	1	0	0	1
110:	1	0	1	1	1	3	1
120:	0	1	0	0	2	0	1
130:	1	2	0	3	0	1	1
140:	0	0	0	1	0	0	0
150:	0	0	0	1	0	0	0

160:	0	0	1	1	0	0	0
170:	2	0	0	0	0	1	1
180:	0	1	0	1	1	0	0
190:	1	1	1	2	1	0	1
200:	0	0	0	0	1	1	1
210:	0	0	0	1	0	0	0
220:	2	0	1	2	0	0	0
230:	0	0	1	1	0	0	0
240:	0	0	2	1	0	2	2
250:	2	2	0	1	0	2	2
260:	2	1	0	0	1	1	2
270:	1	1	1	2	1	3	3
280:	2	3	3	4	5	4	4
290:	8	9	15	13	11	9	15
300:	14	22	20	24	21	17	28
310:	21	33	33	32	33	35	25
320:	34	49	28	34	36	39	48
330:	61	48	58	54	62	62	65
340:	73	57	58	48	54	49	42
350:	12	20	7	7	1	2	1
360:	0	1	0	0	0	0	0
370:	0	1	1	1	0	0	1
380:	0	0	0	2	0	0	0
390:	1	0	0	1	0	0	0
400:	0	0	0	0	0	0	0
410:	0	0	0	0	0	0	0
420:	0	0	1	0	0	0	0
430:	0	0	0	0	1	0	0
440:	0	1	0	0	0	0	0
450:	0	0	0	0	0	0	0
460:	0	0	0	0	1	0	1

470:	0	1	0	0	1	1	0
480:	0	0	0	0	0	0	0
490:	0	0	0	1	0	0	0
500:	0	0	0	0	0	0	1
510:	0	0	0	0	0	0	0
520:	1	0	0	0	0	0	0
530:	1	0	0	0	1	0	1
540:	0	1	0	0	1	0	0
550:	2	0	0	1	0	0	0
560:	0	0	0	1	0	1	0
570:	1	1	0	0	0	0	2
580:	0	3	1	0	0	1	0
590:	2	1	1	0	1	1	1
600:	1	2	0	1	1	2	0
610:	2	3	1	5	1	3	2
620:	7	9	3	5	12	8	7
630:	7	6	9	5	4	1	1
640:	3	6	5	6	7	9	9
650:	6	11	19	20	16	15	19
660:	15	21	14	14	17	13	8
670:	11	7	6	5	6	2	1
680:	1	5	2	0	0	0	1
690:	1	0	0	0	1	2	1
700:	2	0	0	1	0	0	0
710:	0	1	0	0	0	0	0
720:	1	1	1	1	1	1	0
730:	2	0	1	1	0	1	2
740:	2	0	1	0	0	1	2
750:	5	4	2	6	1	5	2
760:	5	7	5	12	9	8	6
770:	6	9	14	16	13	14	16
780:	5	14	15	13	8	9	4
790:	2	4	2	1	1	1	1
800:	0	4	0	0	0	0	0
810:	1	2	0	1	0	1	0
820:	0	0	0	0	1	0	0
830:	0	0	1	0	0	0	0
840:	0	0	0	0	0	0	0
850:	0	0	0	1	0	1	1
860:	1	0	0	1	0	0	1
870:	0	0	1	1	0	0	0
880:	0	0	0	1	0	0	1
890:	0	0	1	1	2	0	1
900:	1	1	4	1	0	1	3
910:	0	0	3	0	3	2	1
920:	3	3	3	2	2	1	2
930:	2	7	3	3	5	3	10
940:	2	3	4	3			

MCB # 1 ACQ 07-12-93 AT 01:05:29 RT : 156776.7 LT : 156769.9
No detector description was entered
[redacted] DUP U total dissolution #9
NOPI-ECP-13.0/9.2 -

OCL
7-14

ROI # 9-1 RANGE : 11 = 3.87MeV to 159 = 4.20MeV
AREA : Gross = 80248 Net = 77789 +/- 369
CENTROID : 129.07 = 4.13MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.16MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.496 +/- 0.00

ROI # 9-2 RANGE : 268 = 4.45MeV to 402 = 4.75MeV
AREA : Gross = 76937 Net = 70908 +/- 448
CENTROID : 377.60 = 4.69MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.15MeV

ID : Th-230 at 4.69MeV
Corrected Rate = 0.452 +/- 0.00 ⟹ U-234

ROI # 9-3 RANGE : 532 = 5.04MeV to 645 = 5.30MeV
AREA : Gross = 66642 Net = 61778 +/- 386
CENTROID : 613.02 = 5.22MeV
SHAPE : Fwhm = 0.09MeV Fwtm = 0.16MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.394 +/- 0.00

	CHANNELS	COUNTS	BKG COUNTS	(cpm) BKG COUNTS
U-238	10 - 163	80248+51	0	0
U-234	294 - 406	76937 - 826	1	.0004
U-232	532 - 644	66642 - 42	0	0

-99:	0	0	0	0	0	0	0
-80:	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	2
10:	2	8	21	32	47	79	55
20:	36	39	30	51	35	41	49
30:	61	51	45	57	42	63	51
40:	75	61	70	71	75	70	79
50:	104	79	77	94	94	93	102
60:	126	127	113	140	137	124	143
70:	159	171	141	174	170	204	194
80:	231	251	263	258	276	278	299
90:	375	432	424	440	454	463	500
100:	613	671	681	743	774	812	850
110:	1015	1205	1149	1221	1316	1218	1300
120:	1512	1593	1612	1593	1788	1707	1810
130:	1986	2055	1965	1998	1997	1991	1915
140:	1607	1403	1228	1033	873	689	517
150:	144	111	47	48	31	20	14
160:	15	13	12	9	13	13	8
170:	16	14	16	25	23	15	22
180:	33	22	23	23	25	25	38
190:	44	37	38	41	49	32	38
200:	48	49	58	60	51	78	76
210:	66	78	97	84	74	89	80
220:	91	91	96	85	50	69	65
230:	61	48	36	28	28	29	22
240:	17	29	19	29	25	24	25
250:	29	18	26	39	22	23	25
260:	31	30	35	27	36	40	44
270:	37	37	29	36	28	40	48
280:	56	58	58	56	49	56	64
290:	68	60	67	69	64	72	82
300:	88	85	98	72	93	100	106
310:	106	127	98	118	142	153	139
320:	171	166	145	203	175	219	219
330:	258	242	251	273	280	285	326
340:	447	394	439	458	491	527	555
350:	665	745	815	866	836	883	923
360:	1090	1182	1200	1246	1313	1323	1383
370:	1516	1523	1587	1541	1617	1713	1653
380:	1878	1962	1928	2026	1960	1909	1804
390:	1248	1127	949	772	616	466	345
400:	75	41	26	13	4	7	4
410:	6	9	1	4	2	4	7
420:	4	8	6	2	7	3	4
430:	8	7	4	5	5	8	8
440:	6	10	6	7	4	3	6
450:	4	8	5	10	9	11	9

460:	15	5	12	11	11	13	14
470:	12	11	13	11	13	15	12
480:	13	15	13	15	14	29	25
490:	22	19	18	20	23	19	19
500:	23	21	30	16	24	30	22
510:	33	30	37	26	34	31	32
520:	39	41	50	44	61	50	47
530:	55	65	60	64	73	67	73
540:	64	86	86	86	95	86	115
550:	118	118	101	113	121	131	132
560:	170	153	169	176	213	209	224
570:	257	254	272	284	331	307	350
580:	475	468	514	536	599	587	594
590:	830	829	863	966	938	1012	1106
600:	1118	1134	1167	1123	1137	1250	1207
610:	1372	1375	1433	1493	1620	1653	1688
620:	1635	1717	1619	1525	1448	1290	1070
630:	616	443	334	265	160	111	97
640:	25	26	35	19	16	24	21
650:	35	26	43	40	50	36	44
660:	49	44	47	57	58	63	37
670:	30	36	27	24	16	17	20
680:	9	6	6	6	2	2	2
690:	0	1	0	1	2	0	1
700:	0	1	0	2	1	1	2
710:	0	1	3	2	3	4	3
720:	5	1	2	5	2	2	4
730:	4	4	0	4	4	2	3
740:	13	6	6	12	4	7	10
750:	10	7	9	11	12	12	15
760:	21	17	21	25	26	16	17
770:	42	37	26	31	46	45	38
780:	42	38	36	43	34	21	23
790:	17	7	3	3	3	0	0
800:	1	1	0	0	0	0	1
810:	0	1	0	0	0	0	0
820:	1	1	0	1	1	1	0
830:	0	1	0	2	0	3	0
840:	0	0	2	0	0	0	2
850:	1	0	0	1	0	2	1
860:	0	0	1	0	0	1	1
870:	0	1	0	0	0	1	2
880:	1	1	1	0	0	1	0
890:	2	2	2	0	1	3	5
900:	3	5	2	2	2	5	0
910:	3	1	5	4	4	3	5
920:	5	4	4	3	9		

MCB # 1 ACQ 07-12-93 AT 01:05:30 RT : 156776.0 LT : 156769.2
No detector description was entered
nopi-ecp-13.0/9.2 DUP total dissolution Th #13

OCL
7-14

13-1 RANGE : 24 = 3.90MeV to 81 = 4.02MeV
AREA : Gross = 126 Net = -19 +/- 35
Could not properly fit the peak.

ROI # 13-2 RANGE : 210 = 4.31MeV to 357 = 4.64MeV
AREA : Gross = 33883 Net = 33019 +/- 231
CENTROID : 328.97 = 4.58MeV
SHAPE : Fwhm = 0.10MeV Fwtm = 0.19MeV

ID : U-235 at 4.60MeV
Corrected Rate = 0.211 +/- 0.00

ROI # 13-3 RANGE : 579 = 5.14MeV to 680 = 5.37MeV
AREA : Gross = 7060 Net = 6619 +/- 117
CENTROID : 651.73 = 5.30MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.17MeV

ID : U-232 at 5.32MeV
Corrected Rate = 0.042 +/- 0.00

ROI # 13-4 RANGE : 729 = 5.48MeV to 819 = 5.68MeV
AREA : Gross = 1669 Net = 998 +/- 102
CENTROID : 770.26 = 5.57MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.08MeV

ID : No close library match

-84:	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	0	0	1	2	5	4
20:	3	0	5	1	2	2	2
30:	2	3	3	5	1	3	2
40:	3	0	0	4	2	3	2
50:	3	3	2	5	6	0	5
60:	0	2	3	0	1	5	3
70:	0	0	3	1	1	4	1
80:	4	1	0	1	2	4	1
90:	1	3	3	0	2	1	4
100:	0	5	1	3	5	1	1
110:	2	2	0	2	1	3	4
120:	2	2	1	2	1	3	3
130:	1	5	0	2	1	1	2
140:	3	2	2	2	0	2	2
150:	2	2	5	3	4	2	2

160:	1	4	6	3	2	4	4
170:	6	2	2	4	7	6	2
180:	4	5	1	5	8	2	9
190:	5	4	2	7	9	5	7
200:	5	4	6	5	9	8	13
210:	6	6	10	7	6	8	16
220:	17	8	18	14	14	7	13
230:	15	12	23	16	17	20	25
240:	13	27	25	25	25	20	28
250:	30	28	30	42	35	32	44
260:	37	51	43	49	56	47	70
270:	86	74	86	98	105	97	104
280:	116	122	160	164	152	189	185
290:	214	232	245	261	280	254	322
300:	326	344	357	417	392	419	456
310:	515	468	496	530	506	545	496
320:	537	528	593	612	621	591	692
330:	730	768	747	737	798	771	723
340:	604	589	503	426	387	308	251
350:	99	57	31	21	22	10	1
360:	1	1	1	0	2	0	0
370:	0	1	0	1	1	0	0
380:	1	0	1	1	0	1	0
390:	0	0	0	0	2	1	1
400:	2	0	0	1	0	1	1
410:	1	1	0	2	2	0	1
420:	1	1	2	0	1	0	0
430:	1	0	2	0	0	0	0
440:	0	1	1	0	0	1	0
450:	0	0	0	1	0	1	1
460:	1	0	1	1	1	0	1

	CH	COUNTS	BKG COUNTS	(cpm)
Th-232	21 - 81	126 + 6	1	0
Th-230	210 - 357	33883	1	0
Th-228	576 - 679	7060 + 3	0	0
Ra-224	729 - 831	1669 + 2	0	0

CORRECTION :

	CH	COUNTS
Th-232	45 - 62	29
Th-230	160 - 364	34151
Th-228	513 - 679	7327

Ra224 CH 725 - 821 Co 1702

470:	0	0	0	1	0	1	2
480:	0	1	1	1	0	1	1
490:	2	1	1	1	3	2	1
500:	2	0	4	1	2	1	2
510:	0	0	0	0	2	1	0
520:	3	2	2	1	1	5	3
530:	3	5	2	2	1	3	1
540:	7	4	1	1	2	2	2
550:	2	4	3	5	1	2	5
560:	7	5	6	7	4	9	4
570:	7	6	9	12	6	10	6
580:	9	9	13	15	9	13	22
590:	18	26	17	14	21	18	25
600:	34	41	34	34	43	42	39
610:	49	46	71	57	66	58	75
620:	87	83	100	96	93	77	77
630:	78	72	85	76	89	97	80
640:	105	101	98	129	126	140	147
650:	163	174	181	146	170	149	185
660:	120	124	113	105	100	71	77
670:	20	26	19	7	5	3	4
680:	0	2	1	1	1	0	1
690:	1	0	1	1	1	0	2
700:	4	1	4	3	5	4	1
710:	1	2	3	2	6	3	1
720:	4	3	3	2	2	4	4
730:	10	5	6	14	10	8	10
740:	17	15	9	15	15	19	14
750:	20	26	18	24	24	26	25
760:	32	32	24	39	41	35	51
770:	35	36	48	46	46	44	34
780:	32	25	20	18	8	15	15
790:	5	10	8	11	7	13	11
800:	9	9	8	6	11	12	6
810:	6	5	5	6	4	2	2
820:	3	1	1	1	1	1	1
830:	3	3	0	2	3	3	2
840:	3	1	2	1	4	2	2
850:	2	3	0	2	1	3	4
860:	4	6	4	5	6	1	6
870:	2	5	8	4	5	3	6
880:	4	9	9	12	8	6	11
890:	15	12	12	9	14	6	6
900:	14	15	20	18	14	16	14
910:	10	12	14	7	12	13	10
920:	21	13	20	15	17	14	19
930:	13	11	9	9	9	6	10

MCB # 1 ACQ 07-12-93 AT 01:05:30 RT : 156776.0 LT : 156769.2
No detector description was entered
nopi-ecp-13.0/9.2 DUP total dissolution Th #13

R 13-1 RANGE : 41 = 3.93MeV to 57 = 3.97MeV
AREA : Gross = 45 Net = 11 +/- 9
CENTROID : 53.50 = 3.96MeV
SHAPE : Fwhm = 0.01MeV Fwtm = 0.01MeV

ID : Th-232 at 3.95MeV
Corrected Rate = 0.000 +/- 0.00

ROI # 13-2 RANGE : 158 = 4.20MeV to 366 = 4.66MeV
AREA : Gross = 34151 Net = 33942 +/- 203
CENTROID : 328.94 = 4.58MeV
SHAPE : Fwhm = 0.11MeV Fwtm = 0.19MeV

ID : U-235 at 4.60MeV
Corrected Rate = 0.217 +/- 0.00

ROI # 13-3 RANGE : 513 = 4.99MeV to 679 = 5.37MeV
AREA : Gross = 7327 Net = 6994 +/- 126
CENTROID : 651.56 = 5.30MeV
SHAPE : Fwhm = 0.07MeV Fwtm = 0.18MeV

ID : U-232 at 5.32MeV
Corrected Rate = 0.045 +/- 0.00

ROI # 13-4 RANGE : 724 = 5.47MeV to 821 = 5.68MeV
AREA : Gross = 1702 Net = 1388 +/- 79
CENTROID : 768.70 = 5.57MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.19MeV

ID : Th-227 at 5.67MeV
Corrected Rate = 0.009 +/- 0.00

-75:	0	0	0	0	0	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0	0	0	0		
-50:	0	0	0	0	0	0	0	0	0	0		
-40:	0	0	0	0	0	0	0	0	0	0		
-30:	0	0	0	0	0	0	0	0	0	0		
-20:	0	0	0	0	0	0	0	0	0	0		
-10:	0	0	0	0	0	0	0	0	0	0		
0:	0	0	0	0	0	0	0	0	0	0		
10:	0	0	0	1	2	4	4	3	3	2		
20:	2	2	2	2	2	2	2	1	1	2		
30:	2	3	3	3	3	2	2	1	2	3		
40:	2	1	1	2	3	3	3	3	3	2		
50:	2	3	3	4	4	3	3	2	2	2		
60:	2	2	2	1	2	3	3	2	1	0		
70:	0	1	1	2	2	2	2	2	2	3		
[illegible]:	3	2	1	1	2	2	2	1	1	1		
90:	2	2	2	2	1	2	4	4	3	2		
100:	2	2	3	3	3	2	1	1	2	2		
110:	2	1	1	1	2	3	3	2	2	2		
120:	2	2	2	2	2	2	2	2	1	1		

130:	2	2	2	1	1	1	2	1	1	1
140:	2	2	2	2	1	2	2	3	2	2
150:	2	3	4	4	3	2	2	1	1	2
160:	2	4	4	4	3	3	3	3	3	4
[illegible]	4	3	3	4	5	5	4	4	4	4
180:	4	4	4	5	5	6	7	8	7	6
190:	6	4	4	6	7	7	6	7	7	7
200:	6	5	5	6	8	9	9	7	6	5
210:	6	7	8	8	8	9	11	11	12	14
220:	14	14	14	14	12	11	12	12	13	14
230:	14	16	18	18	18	20	20	18	18	19
240:	21	23	25	25	24	24	25	25	26	28
250:	29	30	33	36	36	37	40	40	38	39
260:	42	45	47	49	52	56	63	70	76	79
270:	80	82	87	95	100	104	114	129	135	129
280:	124	133	148	159	167	178	188	195	201	210
290:	219	232	246	260	269	283	308	335	350	348
300:	341	348	369	391	407	422	432	437	454	483
310:	496	493	499	513	520	518	509	509	529	547
320:	548	555	580	603	614	629	652	672	694	722
330:	743	750	752	759	768	762	746	735	715	671
340:	618	566	504	438	376	315	256	203	156	119
350:	90	62	39	25	18	11	5	2	2	1
360:	1	1	1	1	1	0	0	0	0	0
370:	0	0	1	1	1	0	0	0	0	0
380:	0	1	1	1	1	0	0	0	1	1
390:	0	0	0	1	1	1	1	0	0	0
400:	1	1	0	0	1	1	1	1	1	1
410:	1	1	1	1	1	1	1	1	0	0
[illegible]	1	1	1	1	0	0	0	0	0	0
[illegible]	0	1	1	0	0	0	0	0	0	0
440:	0	1	1	0	0	0	1	1	1	1
450:	0	0	0	0	1	1	1	1	0	0
460:	0	1	1	1	1	1	1	1	1	1
470:	0	0	0	0	1	1	1	1	1	1

480:	1	1	1	1	1	1	1	1	0	1
490:	1	1	1	2	2	2	2	2	2	2
500:	2	2	2	2	2	2	2	1	1	0
[illegible]	0	0	0	1	1	1	1	1	1	2
520:	2	2	2	2	2	3	3	2	2	2
530:	3	3	3	2	2	2	2	2	3	4
540:	5	4	2	2	2	2	3	4	4	4
550:	3	3	4	3	3	3	4	5	5	6
560:	6	6	6	6	6	6	7	8	8	7
570:	7	7	9	9	9	8	8	8	8	7
580:	8	10	12	12	13	15	18	18	17	17
590:	19	20	19	18	18	21	24	27	30	34
600:	36	37	36	37	40	42	44	48	51	51
610:	51	54	60	62	63	65	69	73	75	77
620:	82	88	94	94	89	83	80	82	83	81
630:	78	78	79	83	87	89	88	92	99	104
640:	104	103	109	119	130	137	140	138	140	149
650:	161	170	169	163	160	165	175	180	170	149
660:	130	120	113	105	93	81	69	57	46	36
670:	27	22	17	10	6	4	4	4	3	2
680:	1	1	1	1	1	1	1	1	1	1
690:	1	1	1	1	1	1	1	1	2	2
700:	3	3	3	4	4	3	3	3	3	2
710:	2	2	3	3	4	3	2	2	2	3
720:	3	3	3	2	3	4	5	6	10	12
730:	11	8	8	10	10	10	10	10	12	14
740:	15	14	13	14	16	16	16	15	15	16
750:	19	22	22	23	24	26	27	28	28	28
[illegible]	30	30	31	35	39	41	44	44	43	41
[illegible]	39	40	44	46	45	42	38	35	32	29
780:	27	25	21	16	13	13	13	12	12	11
790:	9	9	9	9	10	11	12	12	11	9
800:	8	8	8	8	10	10	8	8	8	8
810:	7	6	5	5	4	3	3	3	3	3
820:	2	2	1	1	1	1	2	2	3	2
830:	2	2	2	2	2	3	2	1	1	2
840:	2	2	2	2	2	3	3	2	2	2
850:	2	2	1	1	2	3	3	2	1	2
860:	3	5	5	5	4	4	3	3	4	5
870:	4	5	6	5	4	5	6	6	5	4
880:	5	8	9	10	9	8	9	9	8	10
890:	12	12	12	11	10	8	8	11	14	14
900:	15	16	18	17	16	15	15	15	14	13
910:	12	12	11	11	11	12	14	17	18	18
920:	18	17	17	17	16	16	16	16	16	15
930:	13	11	10	9	8	8	8	8	8	7
940:	5	3	2	1	2	3	4	4	4	

OCL 7-13

MCB # 1 ACQ 07-12-93 AT 01:05:28 RT : 156777.4 LT : 156770.5
No detector description was entered TOTAL DISSOLUTION
No sample description was entered NOPI-ECP-12.65/9.13 Th #5

ROI # 5-1 RANGE : 13 = 3.78MeV to 118 = 4.06MeV
AREA : Gross = 8254 Net = 7830 +/- 122
CENTROID : 96.58 = 4.00MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.17MeV

ID : Th-232 at 4.01MeV
Corrected Rate = 0.050 +/- 0.00

ROI # 5-2 RANGE : 252 = 4.42MeV to 358 = 4.70MeV
AREA : Gross = 1823 Net = 1582 +/- 75
CENTROID : 335.25 = 4.64MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.14MeV

ID : Th-230 at 4.62MeV
Corrected Rate = 0.010 +/- 0.00

ROI # 5-3 RANGE : 587 = 5.32MeV to 638 = 5.45MeV
AREA : Gross = 306 Net = 202 +/- 32
CENTROID : 616.04 = 5.40MeV
SHAPE : Fwhm = 0.01MeV Fwtm = 0.06MeV ⇐ Th-228

ID : No close library match

ROI # 5-4 RANGE : 715 = 5.66MeV to 752 = 5.76MeV
AREA : Gross = 58 Net = -9 +/- 19 ⇐ Ra-224
Could not properly fit the peak.

-87:	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	1	0	1	5	4	10
20:	5	9	17	9	9	7	24
30:	12	11	13	19	18	15	16
40:	32	20	19	24	29	31	25
50:	43	47	35	34	51	42	44
60:	63	64	61	52	76	59	82
70:	99	93	102	100	137	137	148
80:	142	179	134	146	141	153	145
90:	149	201	202	232	226	243	294
100:	259	199	201	145	122	118	84
110:	19	19	21	9	7	8	9
120:	6	4	3	3	3	2	1
130:	2	1	4	2	2	1	2
140:	0	2	4	2	0	2	1
150:	0	2	0	2	0	0	0

160:	0	0	3	1	0	0	2
170:	0	3	3	5	0	1	1
180:	2	4	2	4	4	5	4
190:	5	3	6	1	1	2	1
200:	6	1	3	4	7	2	8
210:	1	9	9	4	6	2	0
220:	0	1	1	0	2	2	0
230:	0	0	0	2	0	1	0
240:	0	2	0	1	0	3	1
250:	1	1	1	3	4	3	4
260:	3	4	5	3	2	4	3
270:	6	4	4	2	7	6	4
280:	4	6	8	7	2	3	11
290:	12	8	9	16	8	11	13
300:	11	15	22	13	12	24	28
310:	19	25	23	37	33	26	26
320:	17	18	21	19	22	24	29
330:	40	51	47	54	64	61	67
340:	45	46	40	19	24	14	14
350:	6	5	3	3	2	2	2
360:	2	1	0	1	1	2	1
370:	0	0	2	4	0	4	1
380:	1	2	1	1	3	4	3
390:	5	1	2	3	1	4	3
400:	3	6	4	4	6	5	5
410:	9	7	9	4	7	7	8
420:	14	23	12	12	14	14	10
430:	9	9	6	4	3	5	5
440:	5	5	0	2	4	2	4
450:	1	0	3	2	0	1	2
460:	0	1	0	1	1	1	0

	CHANNELS	COUNTS	BKG COUNTS	(cpm) BKG COUNTS
Th-230	33-126	825A + 22	15	.0145
Th-232	11-29	1823 + 6	2	.0019
Th-228	586 - 631	304	7	.0068
Ra-224	714-751	58	0	000

CORRECTIONS

470:	0	0	0	2	0	1	1
480:	1	1	3	0	1	1	1
490:	3	0	3	1	1	1	5
500:	2	0	4	0	6	5	3
510:	4	1	2	5	3	5	3
520:	6	4	4	6	10	3	1
530:	3	6	5	6	4	5	8
540:	3	6	6	4	0	1	4
550:	2	3	1	1	3	0	0
560:	1	0	1	2	1	2	0
570:	1	1	0	1	4	3	3
580:	1	1	2	1	5	0	2
590:	4	3	4	1	5	2	3
600:	3	7	2	6	10	5	5
610:	7	16	18	18	12	10	20
620:	11	11	12	9	9	2	4
630:	1	1	0	1	0	0	1
640:	0	0	0	0	1	0	0
650:	0	0	0	0	0	0	0
660:	0	0	1	0	0	0	0
670:	0	0	0	0	0	0	0
680:	0	0	0	0	0	0	0
690:	0	0	0	0	0	0	0
700:	0	0	0	3	0	0	0
710:	1	0	0	0	1	0	2
720:	3	0	1	1	0	1	0
730:	1	1	0	2	1	1	1
740:	6	3	1	1	0	1	3
750:	4	2	0	1	5	5	5
760:	5	3	4	5	8	5	5
770:	17	13	8	14	12	11	16
780:	10	9	11	5	6	4	7
790:	1	2	0	1	2	0	0
800:	0	0	1	0	0	0	0
810:	0	0	0	0	0	0	0
820:	0	0	0	0	0	0	0
830:	0	0	0	0	0	0	0
840:	0	0	0	0	0	0	0
850:	0	0	0	0	0	0	0
860:	0	0	0	0	0	0	0
870:	0	0	0	0	0	0	0
880:	0	0	0	0	0	0	0
890:	0	0	0	0	0	0	0
900:	0	0	0	0	0	0	0
910:	0	0	0	0	0	0	0
920:	0	0	0	0	0	0	0
930:	0	0	0	0	0	0	0

	CH	COUNTS	BKG
Th-232	13-36	170	3
Th-230	33-126	8403	8
Th-228	586-631	301	3
Ra-224	714-757	58	0

MCB # 1 ACQ 07-08-93 AT 05:22:03 RT : 314232.2 LT : 314206.2
No detector description was entered
nopi-ecp-12.65/9.13 total dissolution #11 OCL

I # 11-1 RANGE : 8 = 3.86MeV to 163 = 4.21MeV 7-10
AREA : Gross = 127611 Net = 124853 +/- 440
CENTROID : 130.05 = 4.14MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.16MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.397 +/- 0.00

ROI # 11-2 RANGE : 249 = 4.40MeV to 406 = 4.76MeV
AREA : Gross = 126243 Net = 120108 +/- 525
CENTROID : 379.67 = 4.70MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.16MeV

ID : Th-230 at 4.69MeV
Corrected Rate = 0.382 +/- 0.00 ⟸ U-234

ROI # 11-3 RANGE : 489 = 4.95MeV to 645 = 5.30MeV
AREA : Gross = 119339 Net = 115496 +/- 461
CENTROID : 617.03 = 5.23MeV
SHAPE : Fwhm = 0.09MeV Fwtm = 0.17MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.368 +/- 0.00

-54:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	1	0	2	0
10:	6	5	19	46	97	130	138
20:	113	67	64	76	83	87	94
30:	115	89	104	111	75	120	120
40:	139	112	125	128	141	135	140
50:	156	157	154	169	166	175	181
60:	175	191	185	222	192	245	250
70:	255	268	264	291	307	300	293
80:	345	348	359	383	399	372	437
90:	516	496	571	598	614	660	679
100:	851	922	973	976	1123	1131	1239
110:	1541	1602	1705	1771	1885	1924	1928
120:	2250	2343	2424	2494	2642	2746	2725
130:	3118	3152	3345	3330	3211	3373	3271
140:	2719	2598	2247	1987	1716	1445	1188
150:	372	266	180	134	96	57	43
160:	28	31	29	34	25	31	21
170:	26	31	38	35	39	40	38
180:	44	31	46	52	42	44	44
190:	64	63	73	68	74	79	70
200:	83	81	82	107	110	101	104
210:	143	127	137	151	139	151	139
220:	139	159	141	134	144	133	144
230:	116	92	80	81	82	71	66

240:	52	44	65	51	50	49	(49
250:	56	43	59	57	56	57	56
260:	70	60	58	48	64	82	64
270:	69	85	68	88	86	104	90
280:	107	98	101	84	121	110	119
290:	114	148	137	110	137	148	133
300:	165	159	168	186	162	157	161
310:	209	205	218	226	221	240	220
320:	263	262	287	265	269	302	329
330:	333	380	387	410	416	472	415
340:	531	563	553	657	706	696	729
350:	968	1015	1051	1175	1258	1281	1325
360:	1733	1778	1867	1866	1919	1999	2044
370:	2224	2251	2305	2384	2555	2539	2734
380:	3077	3074	3244	3208	3309	3270	3198
390:	2542	2323	2034	1701	1592	1200	995
400:	257	188	118	74	40	35	15
410:	14)	18	12	17	10	12	6
420:	13	15	12	18	15	17	14
430:	18	22	12	10	16	22	19
440:	24	14	16	20	31	25	21
450:	16	24	17	29	22	25	21
460:	21	25	21	22	24	29	38
470:	28	36	30	40	33	29	34
480:	44	31	39	44	50	(42	45
490:	46	42	40	38	34	46	47

	CHANNEL	COUNTS	BKG COUNTS	(cpm) BKG COUNTS
U-238	10 - 164	127611 - 21	0	0
U-234	246 - 410	120243 + 52	0	0
U-232	485 - 650	119339 + 47	0	0

500:	51	62	68	59	43	63	64
510:	79	69	79	65	65	80	85
520:	96	70	92	92	96	90	85
530:	110	106	125	110	122	145	110
540:	133	148	156	147	191	162	158
550:	197	191	230	214	212	234	229
560:	272	290	253	305	301	324	326
570:	437	419	397	468	451	505	518
580:	679	715	769	828	855	913	925
590:	1184	1300	1375	1478	1569	1600	1731
600:	1758	1916	1951	1942	1939	1923	1972
610:	2141	2325	2428	2474	2637	2648	2820
620:	3109	3060	3082	2983	2951	2638	2502
630:	1488	1183	955	736	540	407	275
640:	47	34	23	10	7	4	3
650:	1	4	3	7	7	11	5
660:	8	5	13	12	8	10	20
670:	11	8	8	5	7	4	4
680:	2	2	0	0	1	0	0
690:	0	0	0	0	0	1	0
700:	0	0	0	0	0	0	0
710:	0	0	1	0	1	0	0
720:	0	0	0	0	1	0	0
730:	0	1	0	1	0	0	2
740:	0	1	0	0	1	0	0
750:	0	2	1	0	2	0	6
760:	2	1	2	2	0	2	1
770:	3	2	2	1	2	2	5
780:	1	3	8	7	4	2	2
790:	2	2	2	3	0	1	0
800:	0	0	0	0	0	0	0
810:	0	0	0	0	0	0	0
820:	0	0	0	0	0	0	0
830:	0	0	0	0	0	0	0
840:	0	0	0	0	0	0	0
850:	0	0	1	0	0	0	0
860:	0	0	0	0	0	0	0
870:	1	0	0	0	0	1	0
880:	0	1	0	0	0	0	0
890:	0	0	0	0	0	0	0
900:	1	0	0	0	0	0	0
910:	1	0	1	1	0	0	0
920:	1	0	0	0	1	0	0
930:	1	0	1	0	0	3	0
940:	0	1	0	0	0	0	0
950:	0	1	0	2	0	0	0
960:	0	2	0	0	1	0	1

MCB # 1 ACQ 07-08-93 AT 05:21:55 RT : 314239.9 LT : 314214.0
No detector description was entered
nopi-ecp-12.18/9.1 DUP U total dissolution #9

OCL 7-12

I # 9-1 RANGE : 43 = 3.94MeV to 159 = 4.20MeV
AREA : Gross = 26737 Net = 26346 +/- 183
CENTROID : 130.49 = 4.14MeV
SHAPE : Fwhm = 0.07MeV Fwtm = 0.13MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.084 +/- 0.00

ROI # 9-2 RANGE : 285 = 4.48MeV to 407 = 4.76MeV
AREA : Gross = 26730 Net = 26281 +/- 187
CENTROID : 379.12 = 4.70MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.13MeV

ID : Th-230 at 4.69MeV
Corrected Rate = 0.084 +/- 0.00 ⇐U-234

ROI # 9-3 RANGE : 533 = 5.04MeV to 643 = 5.29MeV
AREA : Gross = 33054 Net = 32516 +/- 205
CENTROID : 616.63 = 5.23MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.13MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.103 +/- 0.00

-253:	9	14	16	13	14	16	18
-240:	8	9	4	5	2	0	2
-230:	1	1	1	0	1	2	0
-220:	0	0	0	2	3	0	1
-210:	0	1	0	1	1	0	0
-200:	1	0	0	0	0	0	0
-190:	0	0	0	1	0	0	0
-180:	0	0	0	1	0	0	0
-170:	0	1	1	0	0	1	1
-160:	0	0	1	0	0	0	0
-150:	0	0	0	0	0	0	0
-140:	0	0	1	3	1	1	0
-130:	2	0	1	2	1	2	1
-120:	0	1	3	0	3	2	0
-110:	3	2	1	1	5	3	3
-100:	2	1	2	5	4	5	2
-90:	5	3	10	4	4	6	2
-80:	3	2	5	1	3	1	3
-70:	3	1	1	1	1	0	1
-60:	1	1	0	0	0	1	0
-50:	0	3	0	1	0	0	0
-40:	1	0	0	0	0	1	0
-30:	1	1	0	0	0	1	25
-20:	48	49	60	51	56	36	30
-10:	45	44	31	51	35	44	41
0:	0	0	0	0	0	0	0
10:	0	0	1	2	5	6	5
20:	5	2	1	3	2	6	7
30:	2	2	2	3	5	3	10

40:	6	3	2	7	5	4	4
50:	7	9	10	9	12	9	9
60:	9	13	11	10	15	17	12
70:	15	18	19	17	27	19	38
80:	42	32	48	32	69	49	63
90:	75	90	109	74	107	126	127
100:	143	186	179	217	237	252	259
110:	307	344	389	398	438	488	463
120:	568	554	576	599	600	643	650
130:	804	823	822	834	865	815	781
140:	640	569	488	385	353	261	227
150:	36	36	24	11	9	5	5
160:	3	2	3	3	5	3	2
170:	0	3	7	4	0	6	6
180:	4	8	8	3	3	6	3
190:	6	10	7	10	7	12	12
200:	9	14	18	11	17	18	18
210:	21	24	33	20	23	32	21
220:	30	30	34	26	18	32	25
230:	10	18	6	8	11	2	3
240:	3	5	3	1	4	1	0
250:	1	3	2	2	1	4	2
260:	7	2	2	2	5	4	4
270:	1	5	3	7	4	4	4
280:	6	2	4	4	10	6	9
290:	3	2	17	6	7	12	14

	CH.	COUNTS	BKG COUNTS	(cpm)
U-238	42 - 161	26737 + 5	0	0
U-234	294 - 406	26730 - 43	1	.0002
U-232	532 - 643	33054 + 3	0	0

300:	9	20	9	10	8	15	19
310:	17	19	21	18	17	17	16
320:	24	27	19	32	27	44	36
330:	57	58	57	63	64	50	51
340:	85	107	107	106	134	149	154
350:	218	208	250	266	264	275	345
360:	448	443	452	435	477	452	455
370:	534	522	596	570	602	674	731
380:	771	787	810	797	800	814	762
390:	523	478	364	327	257	180	140
400:	21	8	11	5	3	2	1
410:	0	1	1	0	1	0	0
420:	1	0	1	0	1	1	1
430:	1	1	1	1	1	1	2
440:	2	0	5	0	2	0	1
450:	2	3	0	1	3	0	1
460:	3	0	1	2	2	2	2
470:	2	1	3	4	2	2	3
480:	0	1	1	0	2	5	2
490:	1	2	1	4	3	3	1
500:	3	5	2	1	3	3	2
510:	4	1	3	1	6	2	3
520:	6	5	5	5	4	5	6
530:	5	5	3	4	6	9	14
540:	8	10	7	8	19	12	18
550:	16	16	17	29	19	25	22
560:	28	38	32	33	44	46	55
570:	71	65	83	70	93	98	124
580:	161	175	194	196	234	246	272
590:	374	420	489	485	496	527	520
600:	546	547	551	564	583	580	604
610:	713	730	811	791	898	968	978
620:	1032	1040	957	889	837	787	658
630:	289	234	195	121	79	46	29
640:	2	5	4	1	5	1	4
650:	8	8	8	6	7	9	9
660:	8	17	9	12	15	11	9
670:	8	7	9	5	7	2	1
680:	1	0	0	0	1	0	0
690:	0	1	0	0	0	0	0
700:	0	0	0	0	0	0	0
710:	1	0	0	0	0	0	0
720:	0	1	0	0	0	1	0
730:	1	0	0	0	1	0	0
740:	0	0	0	1	3	2	0
750:	0	2	3	3	2	1	2
760:	4	2	2	0	1	1	1
770:	1						

MCB # 1 ACQ 07-12-93 AT 01:05:30 RT : 506009.0 LT : 506001.7
No detector description was entered
No sample description was entered 1218Thd. CHN #14

ROI # 14-1 RANGE : 15 = 3.88MeV to 76 = 4.01MeV
AREA : Gross = 31 Net = 30 +/- 6
Could not properly fit the peak. OCL

ROI # 14-2 RANGE : 233 = 4.37MeV to 359 = 4.65MeV 7-13
AREA : Gross = 2697 Net = 2443 +/- 87
CENTROID : 337.30 = 4.60MeV
SHAPE : Fwhm = 0.06MeV Fwtm = 0.15MeV

ID : U-235 at 4.60MeV
Corrected Rate = 0.005 +/- 0.00

ROI # 14-3 RANGE : 592 = 5.17MeV to 687 = 5.38MeV
AREA : Gross = 813 Net = 811 +/- 29
CENTROID : 662.80 = 5.33MeV
SHAPE : Fwhm = 0.04MeV Fwtm = 0.14MeV

ID : U-232 at 5.32MeV
Corrected Rate = 0.002 +/- 0.00

ROI # 14-4 RANGE : 722 = 5.46MeV to 807 = 5.65MeV
AREA : Gross = 307 Net = 221 +/- 37
CENTROID : 778.58 = 5.59MeV
SHAPE : Fwhm = 0.01MeV Fwtm = 0.06MeV

ID : No close library match

-56:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	0	0	0	0	1	0
20:	0	0	1	1	1	0	0
30:	2	1	0	2	0	2	0
40:	0	1	0	0	1	0	0
50:	1	1	1	1	0	1	0
60:	2	0	1	0	0	0	0
70:	0	0	0	1	0	0	0
80:	0	0	0	0	0	0	0
90:	0	0	0	0	0	0	2
100:	0	0	0	0	0	0	0
110:	1	0	0	0	0	0	0
120:	0	0	0	0	0	1	0
130:	0	0	0	0	1	1	0
140:	0	0	1	0	1	0	0
150:	0	0	0	0	0	0	0
160:	0	1	0	0	0	0	0
170:	0	0	0	0	0	0	0
180:	0	0	0	0	0	0	0

190:	0	0	0	0	0	0	0
200:	0	1	0	0	0	0	1
210:	1	0	0	1	0	0	1
220:	0	1	1	0	0	0	1
[illegible]0:	0	2	0	1	2	3	1
240:	0	0	1	1	1	2	0
250:	0	1	0	5	1	5	3
260:	2	0	5	0	1	0	3
270:	3	6	3	3	6	7	3
280:	5	6	11	8	7	13	7
290:	13	11	11	16	16	13	11
300:	27	19	21	30	29	20	29
310:	29	27	24	27	39	33	37
320:	39	40	30	39	41	48	37
330:	60	54	51	69	64	90	59
340:	56	61	65	73	64	55	48
350:	32	33	21	14	17	9	2
360:	1	0	1	0	0	0	0
370:	0	0	0	1	1	0	0
380:	0	0	1	1	0	0	1
390:	0	0	0	0	0	0	0
400:	0	0	0	0	0	1	0
410:	0	0	0	0	0	0	0
420:	0	0	0	0	0	0	0
430:	0	0	0	0	0	0	0
440:	0	0	0	0	0	0	0
450:	0	0	0	0	0	0	0
460:	0	0	0	0	0	0	0
470:	0	0	0	0	0	1	0
[illegible]0:	0	0	0	0	0	0	0
[illegible]0:	0	0	0	0	0	0	1

	CH	COUNTS	BKG COUNTS	(cpm)
Th-232	15-76	31	0	0
Th-230	231-360	2697 + 1	0	0
Th-228	600-676	813 + 3	0	0
Ra-224	722-805	307 - 2	0	0

500:	0	1	0	0	0	0	0
510:	0	0	0	0	0	0	0
520:	0	0	0	0	0	0	0
[illegible]0:	0	0	0	0	0	0	1
540:	0	0	0	0	0	0	0
550:	0	0	0	1	0	0	1
560:	1	0	1	2	0	0	0
570:	2	0	1	2	0	3	0
580:	0	1	0	0	4	1	0
590:	0	0	1	0	0	1	0
600:	5	4	1	1	3	2	2
610:	3	2	2	4	5	4	6
620:	6	11	13	10	4	5	5
630:	9	8	9	6	11	7	8
640:	7	4	5	12	12	10	18
650:	10	19	19	10	12	12	13
660:	22	24	20	21	28	35	13
670:	18	16	12	5	7	2	9
680:	0	3	1	1	2	0	1
690:	0	0	0	0	0	1	1
700:	0	0	0	0	0	0	0
710:	0	0	0	1	0	0	2
720:	0	0	1	3	1	0	1
730:	0	2	1	2	1	2	1
740:	0	4	1	3	1	1	5
750:	2	1	4	3	3	5	2
760:	1	4	5	3	5	6	9
770:	5	9	10	10	4	10	7
[illegible]0:	7	10	10	6	4	8	9
[illegible]0:	4	0	2	2	1	3	1
800:	0	0	2	1	1	0	1
810:	3	0	1	0	2	2	2
820:	0	0	1	0	2	0	0
830:	0	0	0	0	0	0	0
840:	0	0	1	1	0	0	0
850:	0	0	0	0	0	0	0
860:	0	0	0	2	1	1	1
870:	0	0	0	0	1	1	3
880:	3	0	0	1	0	0	0
890:	0	2	2	1	1	2	1
900:	2	0	2	3	3	0	1
910:	0	1	1	3	0	1	0
920:	1	2	3	1	3	2	1
930:	10	1	5	5	6	2	5
940:	3	5	5	3	2	3	3
950:	2	3	1	0	1	1	0
960:	1	0	0	0	1	1	0

OCL 7-9

MCB # 1 ACQ 07-08-93 AT 05:21:37 RT : 314258.3 LT : 314232.4
No detector description was entered
No sample description was entered NOPI-ECP-12.0/9.09 U TOTAL DISSOLUTION

ROI # 7-1 RANGE : 13 = 3.89MeV to 152 = 4.19MeV #7
AREA : Gross = 36557 Net = 35437 +/- 246
CENTROID : 128.15 = 4.14MeV
SHAPE : Fwhm = 0.07MeV Fwtm = 0.13MeV

ID : U-238 at 4.15MeV
Corrected Rate = 0.113 +/- 0.00

ROI # 7-2 RANGE : 261 = 4.43MeV to 400 = 4.74MeV
AREA : Gross = 40749 Net = 39769 +/- 248
CENTROID : 375.79 = 4.69MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.13MeV

ID : Th-230 at 4.69MeV
Corrected Rate = 0.127 +/- 0.00 ⟸ U-234

ROI # 7-3 RANGE : 501 = 4.96MeV to 639 = 5.27MeV
AREA : Gross = 37272 Net = 36786 +/- 218
CENTROID : 611.67 = 5.21MeV
SHAPE : Fwhm = 0.08MeV Fwtm = 0.14MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.117 +/- 0.00

-91:	0	0	0	0	0	0	0
-80:	0	0	0	0	0	0	0
-70:	0	0	0	0	0	0	0
-60:	0	0	0	0	0	0	0
-50:	0	0	0	0	0	0	0
-40:	0	0	0	0	0	0	0
-30:	0	0	0	0	0	0	0
-20:	0	0	0	0	0	0	0
-10:	0	0	0	0	0	0	0
0:	0	0	0	0	0	0	0
10:	0	0	0	2	4	13	12
20:	12	6	4	6	3	7	9
30:	6	1	8	12	5	11	8
40:	11	8	6	13	10	12	9
50:	17	13	14	13	18	16	11
60:	15	20	28	31	23	29	18
70:	41	43	35	42	46	50	51
80:	78	79	73	91	104	100	100
90:	124	155	163	178	197	207	250
100:	295	314	363	397	386	413	420
110:	598	574	603	637	711	640	722
120:	816	819	901	915	943	994	993
130:	1151	1214	1164	1172	1052	1062	955
140:	497	385	303	225	139	115	66
150:	12	9	8	1	3	5	3
160:	3	5	5	2	3	5	6
170:	6	8	5	6	6	2	3
180:	18	16	9	9	7	6	20
190:	13	15	26	20	15	17	20

200:	27	26	30	26	36	27	40
210:	42	34	32	44	48	48	54
220:	46	49	38	36	23	28	20
230:	14	12	4	7	8	4	8
240:	11	7	4	1	3	2	3
250:	2	6	5	4	5	2	7
260:	3	7	8	7	5	5	4
270:	2	7	5	6	9	2	9
280:	8	11	7	11	8	11	12
290:	15	18	9	10	14	12	17
300:	15	17	17	23	28	23	31
310:	25	28	33	34	48	37	33
320:	44	45	51	55	59	71	70
330:	116	78	111	117	102	125	128
340:	213	181	200	265	266	239	302
350:	432	482	492	501	555	592	647
360:	726	734	739	766	715	785	788
370:	874	927	954	1062	1060	1101	1211
380:	1287	1295	1194	1221	1084	963	780
390:	353	283	166	132	86	53	33
400:	1	0	1	1	2	1	1
410:	1	1	3	2	1	0	1
420:	3	4	3	0	0	3	1
430:	1	2	0	4	2	1	2
440:	2	0	1	2	2	1	2
450:	2	5	1	1	2	0	1

	CHANNELS	COUNTS	BKG COUNTS	BKG COUNTS (cpm)
U-238	13 - 153	36557 + 1	2	.0017
U-234	261 - 400	40749	0	0
U-232	501 - 637	37272 - 11	0	0

460:	4	0	1	3	2	4	3
470:	3	4	1	1	0	2	2
480:	3	5	2	0	1	2	4
490:	5	1	2	2	9	3	3
500:	0	6	2	4	5	3	4
510:	5	9	8	4	3	6	8
520:	4	5	5	9	13	11	11
530:	5	11	12	11	15	13	13
540:	21	20	21	20	15	20	26
550:	24	29	32	33	33	45	38
560:	49	72	58	72	77	91	77
570:	127	134	133	155	167	200	215
580:	271	315	341	364	359	461	431
590:	573	617	633	668	671	657	626
600:	590	630	633	734	696	780	794
610:	1006	1099	1090	1140	1139	1162	1132
620:	908	837	688	594	466	370	257
630:	50	51	30	8	13	7	7
640:	1	1	7	4	3	3	4
650:	1	7	9	3	5	5	8
660:	8	12	5	7	10	7	2
670:	2	1	1	0	2	2	0
680:	0	0	0	0	0	0	0
690:	0	0	0	0	1	0	0
700:	0	0	0	0	0	0	0
710:	0	0	0	0	1	0	1
720:	0	0	0	0	0	0	0
730:	0	0	0	0	0	0	0
740:	1	0	0	1	0	0	1
750:	1	0	1	1	0	1	1
760:	4	3	1	3	0	1	2
770:	3	3	4	2	2	5	3
780:	5	5	3	1	0	2	0
790:	0	1	0	0	1	0	0
800:	0	0	0	0	0	0	0
810:	0	0	0	0	0	0	0
820:	0	0	0	0	1	0	0
830:	0	0	0	0	0	0	0
840:	0	0	0	0	0	0	1
850:	0	0	0	0	0	0	0
860:	0	0	0	0	0	0	0
870:	0	0	0	0	0	0	0
880:	0	0	0	0	0	0	0
890:	0	0	0	0	0	0	0
900:	0	0	0	0	0	0	1
910:	0	0	0	0	0	0	0
920:	0	1	1	0	0	1	0
930:	0	0	0				

MCB # 1 ACQ 07-12-93 AT 01:05:29 RT : 156776.6 LT : 156769.7
No detector description was entered
nopi-ecp-12.0/9.09 total dissolution Th #10

OCL
7-12

I # 10-1 RANGE : 40 = 3.93MeV to 79 = 4.02MeV
AREA : Gross = 62 Net = -18 +/- 21
Could not properly fit the peak.

ROI # 10-2 RANGE : 205 = 4.30MeV to 351 = 4.63MeV
AREA : Gross = 7952 Net = 7263 +/- 153
CENTROID : 313.61 = 4.55MeV
SHAPE : Fwhm = 0.11MeV Fwtm = 0.20MeV

ID : U-235 at 4.56MeV
Corrected Rate = 0.046 +/- 0.00

ROI # 10-3 RANGE : 546 = 5.07MeV to 686 = 5.38MeV
AREA : Gross = 1952 Net = 1581 +/- 100
CENTROID : 637.14 = 5.27MeV
SHAPE : Fwhm = 0.07MeV Fwtm = 0.17MeV

ID : U-232 at 5.26MeV
Corrected Rate = 0.010 +/- 0.00

ROI # 10-4 RANGE : 704 = 5.42MeV to 788 = 5.61MeV
AREA : Gross = 1163 Net = 839 +/- 71
CENTROID : 755.74 = 5.54MeV
SHAPE : Fwhm = 0.05MeV Fwtm = 0.12MeV

ID : No close library match

-140:	0	0	1	0	0	0	0
-130:	0	0	0	0	0	0	0
-120:	1	0	0	0	1	0	1
-110:	0	1	1	0	0	1	2
-100:	0	0	0	1	0	0	1
-90:	2	0	1	0	0	3	1
-80:	1	1	1	0	0	0	1
-70:	0	2	0	0	0	1	0
-60:	2	1	1	0	1	0	0
-50:	0	0	1	0	0	0	0
-40:	0	0	2	0	0	0	0
-30:	1	0	0	0	0	0	11
-20:	11	10	14	19	15	20	17
-10:	17	21	21	23	27	14	14
0:	0	0	0	0	0	0	0
10:	0	0	1	2	7	7	7
20:	1	3	3	2	0	3	3
30:	0	1	2	2	3	0	0
40:	2	1	3	0	3	2	1
50:	1	0	0	0	4	0	1
60:	0	2	3	1	2	1	2
70:	1	0	2	1	4	0	3
80:	3	0	0	3	0	3	2
90:	2	1	1	1	6	3	0

100:	0	1	3	1	1	1	1
110:	3	0	2	1	3	6	3
120:	1	0	3	3	1	5	2
130:	3	0	4	6	2	5	1
140:	4	4	3	4	3	6	5
150:	7	3	4	4	4	1	3
160:	7	7	4	6	4	5	3
170:	4	4	3	2	6	4	4
180:	6	4	2	3	7	1	5
190:	8	5	2	12	7	5	5
200:	7	6	10	4	1	8	11
210:	7	7	8	10	5	10	11
220:	12	12	9	14	7	11	14
230:	6	7	13	15	16	16	16
240:	10	18	20	11	19	11	17
250:	31	29	26	21	28	30	27
260:	32	36	34	35	35	40	31
270:	49	42	37	65	46	64	59
280:	68	82	70	74	74	80	76
290:	102	111	96	86	86	107	114
300:	115	111	104	136	115	125	144
310:	121	122	160	139	134	150	140
320:	131	138	130	150	150	144	113
330:	80	73	63	48	44	47	27
340:	15	10	7	9	4	1	5
350:	1	0	1	0	2	1	1
360:	0	0	0	0	0	1	2
370:	1	0	0	1	1	0	0
380:	0	0	1	0	0	1	0
390:	0	0	0	0	2	0	0
400:	0	1	2	2	0	1	1

	CH.	COUNTS	BKG COUNTS	CPM
Th-232	40-79	62	0	0
Th-230	204-350	7952+1	1	.0004
Th-228	545-685	1952-1	0	0
Ra-224	704-788	1163	0	0

410:	1	1	1	3	1	0	0
420:	2	0	4	0	0	0	0
430:	0	1	0	0	1	0	2
440:	1	0	1	2	0	1	1
450:	1	3	1	0	0	1	0
460:	1	0	3	3	0	1	0
470:	1	2	1	1	1	2	2
480:	0	1	4	0	0	4	1
490:	1	0	2	2	1	4	3
500:	1	0	4	2	1	0	3
510:	0	1	1	2	1	2	3
520:	1	1	3	0	2	2	5
530:	0	1	1	5	2	3	2
540:	4	5	2	4	1	1	6
550:	4	5	4	8	4	2	4
560:	4	0	7	3	7	8	5
570:	3	5	7	8	9	5	5
580:	10	6	6	15	7	5	7
590:	11	12	9	13	9	14	13
600:	15	11	24	14	15	22	19
610:	15	17	14	27	19	19	23
620:	23	21	21	22	27	26	33
630:	29	38	31	28	33	39	37
640:	42	35	39	38	38	43	33
650:	27	26	30	17	13	10	15
660:	5	8	5	6	7	2	3
670:	6	1	3	1	4	4	4
680:	2	3	2	2	3	1	2
690:	2	4	0	2	5	3	6
700:	1	2	3	0	4	7	6
710:	3	2	4	3	2	4	4
720:	7	8	17	8	10	6	14
730:	8	12	15	23	7	8	23
740:	18	21	14	18	21	21	18
750:	22	29	22	25	37	26	37
760:	35	22	24	28	20	16	20
770:	16	14	9	12	6	7	10
780:	4	5	5	2	2	2	2
790:	1	1	3	3	4	4	2
800:	0	1	2	2	0	1	1
810:	2	1	0	0	3	1	0
820:	3	1	1	3	0	3	1
830:	2	0	2	2	1	1	0
840:	1	1	0	1	1	0	1
850:	1	1	1	3	1	4	2
860:	2	2	6	1	3	4	3
870:	7	1	3	3	4	1	5
880:	2	7	6	4			

Analysis Sheet

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOPI-ECP-12.42/9.14 - DUP.

Date: 6/23/93

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 11902G) 3.0681 g

Sample Powder .6849 g

Drying Under Heat Lamp

Start Dry 9:14 AM

Finish Dry 9:45 AM

Melting in Muffle Furnace

Start Time 10:30 AM

Finish Time 11:05 AM

Temp. oC 950

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 199 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051.0 pCi/g

Spike Weight: .2406 grams

U spec. Activity 4534.49 dpm/g

Th/U ratio: .2275

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917019) 37.49 g

10% TBP/Amyl Acetate 25.0 ml

(Lot # 911238) (Lot # 902158)

Shaken in Erlenmeyer Flask

Start Time 1:21 PM Finish Time 1:50 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290)

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:37	Finish Time	2:50
Extraction 2	Start Time	3:10	Finish Time	3:24
Extraction 3	Start Time	3:37	Finish Time	3:56
Extraction 4	Start Time	4:10	Finish Time	4:30

U/Th FUSION SAMPLE SHEET

Gently boil H2SO4 to dryness

Start Time 5:00 pm Finish Time 6/24 7:00 AM

Heat more strongly to drive off SO3

6/24 Start Time 7:00 AM Finish Time 11:00 AM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930089)
45 ml 0.1 N HCl and conditioned with 15 ml + 20 ml + 10 ml

60 ml 9 N HCL 9 N HCl (Lot #)
10 ml + 20 ml + 20 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 30 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 15 ml + 15 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 15 ml + 15 ml

Drying of Th eluate

Start Time 5:00 pm Finish Time 6/25 7:30 AM

Drying of U eluate

6/25 Start Time 5:30 pm Finish Time 7:30 AM

PLATING:

U: Date 6/25/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 7
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910651)
Add 1- 2 ml 0.4 M TTA in benzene ml used 1.5
(Lot # 904728) (Lot # 920979)

FILE NAME 124Ud. CHN
Date and time started counting 6/29/93 17:33 Initials OCL
Date and time finish counting 7/1/93 9:41 Total time minutes 2342.8333

PLATING Continued:

Th: Date 6/25/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 4
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 910651-)24

Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728) (Lot # 920979)

FILE NAME 1242Thd.CHN
Date and time started counting 6/29/93 17:33 Initials OCL
Date and time finish counting 7/2/93 8:55 Total time minutes 2342.8333

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOP1 - ECP - 12.87/9.1

Date: 6/21/93

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 11902G) 3.0570 g

Sample Powder 1.0023 g

Drying Under Heat Lamp

Start Dry 10:00 AM

Finish Dry 10:25 AM

Melting in Muffle Furnace

Start Time 11:05 AM

Finish Time 11:41 AM

Temp. oC 950°C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 200 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051 pCi/g

Spike Weight: .75 grams

U spec. Activity 4534.73 dpm/g

Th/U ratio: .2259

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917019) 37.65 g

10% TBP/Amyl Acetate 25 ml

(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask

Start Time 1:15 PM Finish Time 1:49 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290)

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:07 PM	Finish Time	2:22 PM
Extraction 2	Start Time	2:33 PM	Finish Time	2:48 PM
Extraction 3	Start Time	3:01 PM	Finish Time	3:18 PM
Extraction 4	Start Time		Finish Time	

U/Th FUSION SAMPLE SHEET

Gently boil H2SO4 to dryness

Start Time 3:56 PM Finish Time 6/22/93 10:50 AM

Heat more strongly to drive off SO3

6/22/93 Start Time [redacted] OCL 6/26 11:00 AM Finish Time 2:00 PM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930089)
45 ml 0.1 N HCl and conditioned with 15 ml + 15 ml + 15 ml

60 ml 9 N HCL 9 N HCl (Lot # 930089)
15 ml + 15 ml + 15 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 19 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 20 ml + 20 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 20 ml + 15 ml + 20 ml

Drying of Th eluate

Start Time 4:20 PM Finish Time 6/23/93 9:00 AM

Drying of U eluate

Start Time 5:10 PM Finish Time 6/23/93 9:00 AM

PLATING:

U: Date 6/23/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910651)
Add 1- 2 ml 0.4 M TTA in benzene ml used 3
(Lot # 904728) (Lot # 920979)

FILE NAME 128791U.CHN
Date and time started counting 6/23/93 21:22 Initials OCL
Date and time finish counting 6/24/93 8:25 Total time minutes 664.58

PLATING Continued:

Th: Date 6/23/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 5
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 910651)

Add 1- 2 ml 0.4 M TTA in benzene ml used 3
(Lot # 904728) (Lot # 920979)

FILE NAME 1287 Th. CHN
Date and time started counting 6/24/93 15:28 Initials OCL
Date and time finish counting 6/25/93 8:47 Total time minutes 1027.78

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOP1-ECP-11.4|9.13

Date: 6|23|93

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 11902G) 3.0188 g

Sample Powder .9927 g

Drying Under Heat Lamp
Start Dry 9:25 AM
Finish Dry 9:45 AM

Melting in Muffle Furnace
Start Time 10:30 AM
Finish Time 11:00 AM
Temp. oC 950

Quenching Sample in 1 N HNO3
Volume 1.0 N HNO3 (Lot# 913941) 200 ml

U-232/Th-228 SPIKE #: 25 B
Reference Date 1|22|93
Reference Activty 204.88 pCi/g
Spike Weight: .1139 grams
U spec. Activity 449.6534 dpm/g
Th/U ratio: .2291

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.5 g

10% TBP/Amyl Acetate 25 ml
(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask
Start Time 1:20 PM Finish Time 1:50 PM
Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290)
Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:37 PM	Finish Time	2:50 PM
Extraction 2	Start Time	3:10 PM	Finish Time	3:24 PM
Extraction 3	Start Time	3:37 PM	Finish Time	3:56 PM
Extraction 4	Start Time	4:10 PM	Finish Time	4:30 PM

Gently boil H2SO4 to dryness

Start Time 5:00 PM Finish Time 6/24 7:30 AM

Heat more strongly to drive off SO3

6/24/93 Start Time 7:30 AM Finish Time 11:00 AM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939 A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930089)
45 ml 0.1 N HCl and conditioned with 20 ml + 10 ml + 15 ml

60 ml 9 N HCL 9 N HCl (Lot # 930089)
15 ml + 10 ml + 10 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 30 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 20 ml + 15 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 15 ml + 15 ml

Drying of Th eluate

Start Time 5:00 PM Finish Time 6/25/93 7:30 AM

Drying of U eluate

Start Time 5:30 PM Finish Time 6/25/93 9:00 PM

PLATING:

U: Date 6/25/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910551)
Add 1- 2 ml 0.4 M TTA in benzene 920979 ml used 3
(Lot # 904728) (Lot #)

FILE NAME 114U.CHN

Date and time started counting 6/28/93 ~~20:25~~ 17:33 Initials OCL
Date and time finish counting 7/2/93 8:55 Total time minutes 4169.9667

PLATING Continued: * VERY CLOUDY. ($Al(NO_3)_3 \cdot 9H_2O$) !!

Th: Date 6/29/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 5

Transfer wash with pasteur pipet to centrifuge tube

Adjust pH to 1.0 with NaOH solutions (Lot # 910651)

Add 1- 2 ml 0.4 M TTA in benzene ml used ~~3~~ 2 OCL 6/29/93

(Lot # 904728) (Lot # 920979)

FILE NAME 114Th.CHN

Date and time started counting 6/29/93 17:33 [redacted] Initials OCL

Date and time finish counting 7/2/93 8:55 Total time minutes 3729.7833

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOPI-ECP-11.6/9.12

Date: 6/23/93

Analyst: BWL

FUSION:

Weights: SPEX LiBO2 (Lot # 119026) 3.0140 g

Sample Powder .9850 g

Drying Under Heat Lamp
Start Dry 9:25 AM
Finish Dry 9:45 AM

Melting in Muffle Furnace
Start Time 10:30 AM
Finish Time 11:00 AM
Temp. oC 950

Quenching Sample in 1 N HNO3
Volume 1.0 N HNO3 (Lot# 913941) 202 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051.0 pCi/g

Spike Weight: .1090 grams

U spec. Activity 4534.39 dpm/g

Th/U ratio: .2275

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.50 g

10% TBP/Amyl Acetate 25 ml
(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask
Start Time 13:20 Finish Time 13:50
Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290)
Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:37 PM	Finish Time	2:50 PM
Extraction 2	Start Time	3:10 PM	Finish Time	3:24 PM
Extraction 3	Start Time	3:37 PM	Finish Time	3:56 PM
Extraction 4	Start Time	4:10 PM	Finish Time	4:30 PM

U/Th FUSION SAMPLE SHEET

Gently boil H2SO4 to dryness

Start Time 5:00 pm Finish Time 6/24 7:30 AM

Heat more strongly to drive off SO3

6/24/93 Start Time 7:30 AM Finish Time 11:00 AM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930089)
45 ml 0.1 N HCl and conditioned with 20 ml + 10 ml + 15 ml

60 ml 9 N HCL 9 N HCl (Lot # 930089)
15 ml + 10 ml + 10 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 30 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 15 ml + 20 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 20 ml + 15 ml + 15 ml

Drying of Th eluate

Start Time 5:00 pm Finish Time 6/25 7:30 AM

Drying of U eluate

Start Time 6/25 5:30 pm Finish Time 6/25 9:00 AM

PLATING:

U: Date 6/25/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910651)
Add 1- 2 ml 0.4 M TTA in benzene ml used 3
(Lot # 904728) (Lot # 920979)

FILE NAME 116U.CHN
Date and time started counting 6/29/93 17:33 Initials OCL
Date and time finish counting 7/1/93 9:41 Total time minutes 2342.85

PLATING Continued:

Th: Date 6/29/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 5
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 920979)

Add 1- 2 ml 0.4 M TTA in benzene ml used 3-4
(Lot # 904728) (Lot # 910651-24)

FILE NAME 116Th. CHN
Date and time started counting 6/29/93 17:33 Initials OCL
Date and time finish counting 7/1/93 9:41 Total time minutes 2342.8333

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOPI-ECP-11.0/9.15-WR

Date: 6-30-93

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 119026) 3.0350 g

Sample Powder 1.0341 g

Drying Under Heat Lamp

Start Dry 11:31 AM

Finish Dry 11:50 AM

Melting in Muffle Furnace

Start Time 12:41 PM

Finish Time 1:10 PM

Temp. oC 950°C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 198 ml

U-232/Th-228 SPIKE #: 75A

Reference Date 1/22/93

Reference Activty 2051 pCi/g

Spike Weight: .4371 grams

U spec. Activity _____ dpm/g

Th/U ratio: _____

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.51 g

10% TBP/Amyl Acetate 25 ml

(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask

Start Time 3:50 PM Finish Time 4:20 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

7/1 Add 25 ml H2SO4 (Lot # FL-05-1230)

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1 Start Time 8:29 AM Finish Time 8:45 AM

Extraction 2 Start Time 9:30 AM Finish Time 10:45 AM

Extraction 3 Start Time 10:55 AM Finish Time 11:10 AM

Extraction 4 Start Time 11:20 AM Finish Time 11:35 AM

Gently boil H2SO4 to dryness
Start Time 11:50 AM Finish Time 3:29 PM
Heat more strongly to drive off SO3
Start Time 3:29 PM Finish Time 4:48 PM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930085)
45 ml 0.1 N HCl and conditioned with 20 ml + 15 ml + 15 ml

7/2 60 ml 9 N HCL 9 N HCl (Lot # 930085)
15 ml + 15 ml + 10 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 15 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 10 ml + 15 ml + 15 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 20 ml + 10 ml

Drying of Th eluate
Start Time 3:40 PM Finish Time 12:30 PM
- 5:00 PM : 7/5

Drying of U eluate
Start Time 9:30 AM Finish Time 1:00 PM

PLATING:

U: Date 7/6 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 5
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 916051-24)
Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904128) (Lot # 920979)

FILE NAME 110U.CHN
Date and time started counting 7/8/93 9:11 Initials OCL
Date and time finish counting 7/9/93 17:07 Total time minutes 1917.35

PLATING Continued:

Th: Date 7/13/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 916051-24)

Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904128) (Lot # 920797)

FILE NAME _____
Date and time started counting 7/13/93 13:13 Initials OCL
Date and time finish counting _____ Total time minutes _____

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOPI-ECP- 11.22/9.07 - WR

Date: 6/30/93

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 11902G) 3.0146 g

Sample Powder 1.0085 g

Drying Under Heat Lamp

Start Dry 11:31 AM

Finish Dry 11:50 AM

Melting in Muffle Furnace

Start Time 12:41 PM

Finish Time 1:10 PM

Temp. oC 950 °C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 200 ml

U-232/Th-228 SPIKE #: 25B

Reference Date 1/22/93

Reference Activty 204.88 pCi/g

Spike Weight: .2305 grams

U spec. Activity 456.7194 dpm/g

Th/U ratio: .2310

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.52 g

(Lot # 902158) 10% TBP/Amyl Acetate (Lot # 911238) 25 ml

Shaken in Erlenmeyer Flask

Start Time 3:50 PM Finish Time 4:20 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

7/1 Add 25 ml H2SO4 (Lot # FL-05-1290)

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1 Start Time 8:29 AM Finish Time 8:45 AM

Extraction 2 Start Time 9:30 AM Finish Time 10:45 AM

Extraction 3 Start Time 10:55 AM Finish Time 11:10 AM

Extraction 4 Start Time 11:20 AM Finish Time 11:35 AM

Gently boil H2SO4 to dryness
Start Time 11:50 AM Finish Time 3:58 PM
Heat more strongly to drive off SO3
Start Time 3:58 PM Finish Time 5:12 PM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930085)
45 ml 0.1 N HCl and conditioned with 20 ml + 15 ml + 15 ml

7/2 60 ml 9 N HCL 9 N HCl (Lot # 930085)
15 ml + 15 ml + 10 ml + 15 ml

Elution:

Dissolve dried residue in 9 N HCl 20 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 10 ml + 15 ml + 15 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 15 ml + 20 ml

Drying of Th eluate
Start Time 3:00 PM Finish Time 12:00 PM
5:00 PM 7/5 ; 7:40 AM

Drying of U eluate
Start Time 9:50 PM Finish Time 1:00 PM

PLATING:

U: Date 7/6 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 5
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 916051-24)
Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728) (Lot # 920979)

FILE NAME 1122U.CHN
Date and time started counting 7/8/93 9:11 Initials OCL
Date and time finish counting 7/9/93 17:07 Total time minutes 1916.8

PLATING Continued:

Th: Date 7/7 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 916051-2)

Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728) (Lot # 920979)

FILE NAME 1122Th.CHN
Date and time started counting 7/8/93 9:11 Initials OCL
Date and time finish counting 7/13/93 8:40 Total time minutes 7155.15

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOPI-ECP- 11.78 / 9.17 - WR

Date: 6/30/93

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 11906 r2) 3.0518 g

Sample Powder 1.0031 g

Drying Under Heat Lamp

Start Dry 11:31 AM

Finish Dry 11:50 AM

Melting in Muffle Furnace

Start Time 12:41 PM

Finish Time 1:10 PM

Temp. oC 950° C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 198 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051 pCi/g

Spike Weight: .1313 grams

U spec. Activity 4533.6 dpm/g

Th/U ratio: .2330

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.56 g

10% TBP/Amyl Acetate 25 ml

(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask

Start Time 3:50 PM Finish Time 4:20 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290)

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	8:29 AM	Finish Time	8:45 AM
Extraction 2	Start Time	9:30 AM	Finish Time	10:45 AM
Extraction 3	Start Time	10:55 AM	Finish Time	11:10 AM
Extraction 4	Start Time	11:20 AM	Finish Time	11:35 AM

Gently boil H2SO4 to dryness
Start Time 11:50 AM Finish Time 3:33 PM
Heat more strongly to drive off SO3
Start Time 3:33 PM Finish Time 5:00 PM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930085)
45 ml 0.1 N HCl and conditioned with 20 ml + 15 ml + 15 ml

7/2 60 ml 9 N HCL 9 N HCl (Lot # 930085)
15 ml + 15 ml + 10 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 20 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 10 ml + 15 ml + 15 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 15 ml + 20 ml

Drying of Th eluate
Start Time 2:45 PM Finish Time 12:10 PM
5:00PM : 7:10AM 7/5

Drying of U eluate
Start Time 9:41 AM Finish Time 1:00 PM

PLATING:

U: Date 7/6 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 916051-24)
Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728) (Lot # 920979)

FILE NAME 1178U.CHN
Date and time started counting 7/8/93 9:11 Initials OCL
Date and time finish counting 7/9/93 17:07 Total time minutes 1916.9667

PLATING Continued:

Th: Date 7/7 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 5
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 916051-24)

Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904128) (Lot # 920919)

FILE NAME 1178Th. CHN
Date and time started counting 7/8/93 9:11 Initials OCL
Date and time finish counting 7/13/93 8:40 Total time minutes 7154.233

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOPI-ECP-13.0/9.2-WR DUP

Date: 7/7

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot #_____) 3.0243 g

Sample Powder 0.5144 g

Drying Under Heat Lamp

Start Dry 10:29 AM

Finish Dry _____

Melting in Muffle Furnace

Start Time 11:49 AM

Finish Time 12:20 PM

Temp. oC 950°C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 200 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051 pCi/g

Spike Weight: .4289 grams

U spec. Activity 4532.77 dpm/g

Th/U ratio: .2384

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.51 g

(Lot # 902158) 10% TBP/Amyl Acetate (Lot # 911238) 25 ml

Shaken in Erlenmeyer Flask

Start Time 1:30 PM Finish Time 1:56 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:40 PM	Finish Time	2:53 PM
Extraction 2	Start Time	3:09 PM	Finish Time	3:24 PM
Extraction 3	Start Time	3:45 PM	Finish Time	4:00 PM
Extraction 4	Start Time	4:20 PM	Finish Time	4:40 PM

184

Gently boil H2SO4 to dryness Start Time 3:00 AM Finish Time 7:50 AM

Heat more strongly to drive off SO3 Start Time 8:10 AM Finish Time 9:15 AM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930085)
45 ml 0.1 N HCl and conditioned with 15 ml + 20 ml + 10 ml

60 ml 9 N HCL 9 N HCl (Lot # 930085)
20 ml + 10 ml + 15 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 25 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 10 ml + 20 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 15 ml + 20 ml

Drying of Th eluate Start Time 8:17 AM Finish Time 11:47 AM

Drying of U eluate Start Time 10:30 AM Finish Time 2:40PM

PLATING:

U: Date 7/9/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910651-24
Add 1- 2 ml 0.4 M TTA in benzene ml used 1.5
(Lot # 904728) (Lot # 920979)

FILE NAME 130U dup
Date and time started counting 7/9/93 17:05 Initials OCL
Date and time finish counting 7/13/93 8:40 Total time minutes 2612.82

PLATING Continued:

Th: Date 7/13 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 7
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 910651-24

Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728) (Lot # 920979)

FILE NAME 130Thd.chn
Date and time started counting 7/13/93 13:13 Initials OCL
Date and time finish counting 7/15/93 8:42 Total time minutes 2612.82

U/Th FUSION SAMPLE SHEET

12.65 9.13

Sample I.D. # NOPI-ECP- [redacted]/[redacted] - WR

Date: 7/7

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 11902G) 3.0068 g

Sample Powder 1.0100 g

Drying Under Heat Lamp

Start Dry 10:29 AM

Finish Dry 10:51 AM

Melting in Muffle Furnace

Start Time 11:49 AM

Finish Time 12:20 PM

Temp. oC 950 °C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 202 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051 pCi/g

Spike Weight: .5251 grams

U spec. Activity 4532.77 dpm/g

Th/U ratio: .2384

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.54 g

10% TBP/Amyl Acetate 25 ml

(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask

Start Time 1:30 PM Finish Time 1:56 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:40 PM	Finish Time	2:53 PM
Extraction 2	Start Time	3:09 PM	Finish Time	3:24 PM
Extraction 3	Start Time	3:45 PM	Finish Time	4:00 PM
Extraction 4	Start Time	4:20 PM	Finish Time	4:40 PM

Gently boil H2SO4 to dryness
Start Time 3:00 AM Finish Time 7:50 AM

Heat more strongly to drive off SO3
Start Time 8:10 AM Finish Time 9:15 AM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930085)
45 ml 0.1 N HCl and conditioned with 15 ml + 20 ml + 10 ml

60 ml 9 N HCL 9 N HCl (Lot # 930085)
20 ml + 10 ml + 15 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 25 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 15 ml + 15 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 20 ml + 15 ml

Drying of Th eluate
Start Time 8:30 AM Finish Time 11:47 AM

Drying of U eluate
Start Time 10:10 AM Finish Time 2:37 PM

PLATING:

U: Date 7/9/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910651-24
Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728) (Lot # 920797)

FILE NAME 12650.CHN
Date and time started counting 7/9/93 5:05 PM Initials OCL
Date and time finish counting 7/13/93 8:40 Total time minutes 5236.7667

very cloudy mixture

PLATING Continued:

Th: Date 7/13/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 7

Transfer wash with pasteur pipet to centrifuge tube → after centrifuged, solid (white) on bottom

Adjust pH to 1.0 with NaOH solutions (Lot # 910651-24)

Add 1- 2 ml 0.4 M TTA in benzene ml used 3

(Lot # 904728) (Lot # 920797)

FILE NAME 1265Th.CHN

Date and time started counting 7/13/93 13:13 Initials OCL

Date and time finish counting 7/15/93 8:52 Total time minutes 2612.833

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOP1-ECP-12.18|9.1-WR DUP

Date: 7/7

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot #_____) 3.0128 g

Sample Powder 1.0285 g

Drying Under Heat Lamp

Start Dry 10:29 AM

Finish Dry _____

Melting in Muffle Furnace

Start Time 11:49 AM

Finish Time 12:20 PM

Temp. oC 950°C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 200 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051 pCi/g

Spike Weight: 2718 grams

U spec. Activity _____ dpm/g

Th/U ratio: _____

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.56 g

10% TBP/Amyl Acetate 25 ml

(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask

Start Time 1:32 PM Finish Time 1:56 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:40 PM	Finish Time	2:53 PM
Extraction 2	Start Time	3:09 PM	Finish Time	3:24 PM
Extraction 3	Start Time	3:45 PM	Finish Time	4:00 PM
Extraction 4	Start Time	4:20 PM	Finish Time	4:40 PM

Gently boil H2SO4 to dryness Start Time 3:00 AM Finish Time 7:50 AM

Heat more strongly to drive off SO3 Start Time 8:10 AM Finish Time 9:10 AM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 45 ml 0.1 N HCl and conditioned with 0.1 N HCl (Lot # 930085) 15 ml + 20 ml + 10 ml

60 ml 9 N HCL 9 N HCl (Lot # 930085) 20 ml + 10 ml + 15 ml + 15 ml

Elution:

Dissolve dried residue in 9 N HCl 25 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 10 ml + 20 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 15 ml + 20 ml

Drying of Th eluate Start Time 8:20 AM Finish Time 11:47 AM

Drying of U eluate Start Time 10:30 AM Finish Time 2:40 PM

PLATING:

U: Date 7/9/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910651-24
Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728 (Lot # 920797)

FILE NAME 1218Ud.CHN
Date and time started counting 7/9/93 5:05 PM Initials OCL
Date and time finish counting 7/13/93 8:40 AM Total time minutes 5236.9

PLATING Continued:

Th: Date 7/13/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 1.0 with NaOH solutions (Lot # 910651-24)

Add 1- 2 ml 0.4 M TTA in benzene ml used 2
(Lot # 904728) (Lot # 920797)

FILE NAME _____
Date and time started counting _____ Initials _____
Date and time finish counting _____ Total time minutes _____

U/Th FUSION SAMPLE SHEET

Sample I.D. # NOPI-ECP-12.0/9.09 - WR

Date: 7/7

Analyst: OCL

FUSION:

Weights: SPEX LiBO2 (Lot # 11902G) 3.0727 g

Sample Powder 1.0415 g

Drying Under Heat Lamp

Start Dry 10:29 AM

Finish Dry 10:51 AM

Melting in Muffle Furnace

Start Time 11:49 AM

Finish Time 12:20 PM

Temp. oC 950°C

Quenching Sample in 1 N HNO3

Volume 1.0 N HNO3 (Lot# 913941) 200 ml

U-232/Th-228 SPIKE #: 25A

Reference Date 1/22/93

Reference Activty 2051 pCi/g

Spike Weight: .1593 grams

U spec. Activity 4532.77 dpm/g

Th/U ratio: .2384

Transfer 100 ml of glass solution into labeled Nalgene bottle and proceed with solvent extraction.

SOLVENT EXTRACTION:

Weight: Al(NO3)-9H2O (Lot # 917079) 37.52 g

10% TBP/Amyl Acetate 25 ml

(Lot # 902158) (Lot # 911238)

Shaken in Erlenmeyer Flask

Start Time 1:30 PM Finish Time 1:56 PM

Pour into Separatory Funnel, drain inorganic to waste, and organic to new Erlenmeyer flask

Add 25 ml H2SO4 (Lot # FL-05-1290

Extract, Pour into Separatory Funnel and save H2SO4

Extraction 1	Start Time	2:40 PM	Finish Time	2:53 PM
Extraction 2	Start Time	3:09 PM	Finish Time	3:24 PM
Extraction 3	Start Time	3:45 PM	Finish Time	4:00 PM
Extraction 4	Start Time	4:20 PM	Finish Time	4:40 PM

Gently boil H2SO4 to dryness
Start Time 3:00 AM Finish Time 7:10 AM
Heat more strongly to drive off SO3
Start Time 8:10 AM Finish Time 9:15 AM

COLUMN SEPARATION:

Column Preparation:

BIO-RAD Anion Exchange Resin (Lot # 44939A)
AG 1-X8 100-200 mesh Chloride form

Prewash 4 cm x 1 cm column of resin with 0.1 N HCl (Lot # 930085)
45 ml 0.1 N HCl and conditioned with 15 ml + 20 ml + 10 ml

60 ml 9 N HCL 9 N HCl (Lot # 930085)
20 ml + 10 ml + 15 ml+ 15 ml

Elution:

Dissolve dried residue in 9 N HCl 25 ml and load on column and allow to drain

Elute Th fraction with 9 N HCl (45-60 ml) 15 ml + 20 ml + 15 ml

Elute U fraction with 0.1 N HCl (45-60 ml) 15 ml + 15 ml + 20 ml

Drying of Th eluate
Start Time 8:23 AM Finish Time 11:50 AM

Drying of U eluate
Start Time 10:37 AM Finish Time 12:40 pm

PLATING:

U: Date 7/9/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6
Transfer wash with pasteur pipet to centrifuge tube
Adjust pH to 3- 3.5 with NaOH solutions (Lot # 910651-24
Add 1- 2 ml 0.4 M TTA in benzene ml used 2-3
(Lot # 904728) (Lot # 920979)

FILE NAME 120U.CHN
Date and time started counting 7/9/93 5:05pm Initials OCL
Date and time finish counting 7/13/93 8:40 Total time minutes 5237.20

VERY CLOUDY MIXTURE

PLATING Continued:

Th: Date 7/13/93 Initials OCL

Wash residue with < 5 ml 0.1N HNO3 (Lot # 913941) ml used 6

Transfer wash with pasteur pipet to centrifuge tube - after spin, grey-white solid on bottom

Adjust pH to 1.0 with NaOH solutions (Lot # 910651-24)

Add 1- 2 ml 0.4 M TTA in benzene ml used 3

(Lot # 904728) (Lot # 920797)

FILE NAME 120Th. CHN

Date and time started counting 7/13/93 13:13 Initials OCL

Date and time finish counting 7/15/93 8:42 Total time minutes 2612.82