8/5

EXP.

DATE OPER.

CUSTOMER

REG. NO.

GRAD. POS.

IN 2134 OUT 2134+2e-3s

DETECT. VOLTS

GEOM. APS

CHAN. SECT. 1 2 3 4

AMP ZERO

GAIN

TIME BG

Δt_L Δt_C

Ag .164 mg 20" @ 21 25 May 15

Sb 5 mg 20" @ 21:34 May 15

5h Std.

4x4 Detector

$\sum_{54}^{60} c = 70,200$

$3,717$

$66,583$ counts for 100 sec, for 5 min Activation for 37.5 mg,

$\frac{66,583}{37.5} = 1,776$ counts for 100 sec for 5 min Act. for 1 mg

$1.776 \times 4 = 7104$ counts for 100 sec for 20 min Act. for 1 mg.

(4 = factor to make it read 20 min.)

Activity @ reactor discharge

$\frac{7104}{.141} = 50,383$ $\quad 4t = \frac{189.65}{17 \text{ hrs.}}$

Decay factor .141

50,383 counts for 100 sec for 20 min act. for 1 mg @ reactor discharge

Ag Std. Wt. .163 mg

40"

30" dt = 4.5"

Σ 7810

Σ 390

7420

$\frac{7420}{.163}$ = 45,521 Counts / 1 gram Ag

Pb #1 6003

14.7 mg

Σ 5614

Σ 747

4842

$\frac{4842}{14.7}$ = 329 Counts / mg

= .329 Counts / MG

$\frac{.329}{45521}$ = 7.2×10^{-6}

7.2 parts / million

Pb #2 6003

11.7 mg

Σ = 2096

Σ = 108

1988

$\frac{1988}{11.7}$ = 170

$\frac{.170}{45521}$ = 3.7×10^{-6}

3.7 parts / million

6003 B 7.9 mg.

Σ Counts 275,480
Bkgd. 15,561
= 259,019

Decay time
20:52
16:42
4:10 = 4.16

Decay factor .958

$\frac{259,019}{.958}$ = 270,375 Counts @ reactor discharge

$\frac{270,375}{7.9}$ = 34,225 Counts @ reactor discharge for 1 mg

$\frac{34.225}{50,283}$ = .679 mg / million Rad
679 grams / million ✓

6003 C 5.1 mg

Σ counts 182,280
Bkgd 10,024
= 172,256

Decay time = 20:64
16:42
4:22 ⇒ 4.37

Decay fact = .956

$\frac{172,256}{.956}$ = 180,184

$\frac{180,184}{5.1}$ = 35,330 Counts @ reactor discharge for 1 mg

$\frac{35,330}{50,385}$ = .701 mg / million Rad
701 grams / million

Pb #3 L003
6.9 mg

$\Sigma c = 2316$

$GB = \frac{43}{2273}$

$\frac{2273}{6.9} = 329$

$\frac{329}{45521} = 7.2 \times 10^{-6}$

7.2 parts / million

1.8

6903 ( ) 4.6 mg ( )

Σ 163,579
Σ 8,750
154,829

Decay time
20:68
16:42
4:26 4.43

$\frac{154.829}{.955} = 162,125$ decay factor .955

$\frac{162,125}{4.6} = 35,244$

$\frac{35,244}{50,383} = .699$

699 parts/million

Pb for Mg

6000-1

Wt 151.7 mg

$\Sigma c = 6908$

$\Sigma a = 167$

6741

$\frac{6741}{15.7} = 429$ C/mg lead

429×10^{-3} C/mg lead

$\frac{429 \times 10^{-3}}{45521} = 9.4 \times 10^{-6}$

9.4 parts / million

6000-2

Wt. 18.5 mg

$\Sigma c = 7991$

1080

8911

$\frac{8911}{18.5} = 481$ C/mg

487×10^{-3} C/mg

$\frac{481 \times 10^{-3}}{45521} = 10.3 \times 10^{-6}$ mg/mg lead

10.3 parts / million

6000-3

Wt. 211

$\Sigma c = 10257$

1512

8745

$\frac{8745}{211} = 414$ Coul / mg lead

414×10^{-3} Coul / mg lead

$\frac{414}{\quad} =$

Σ 2 225
2,566
17,369

Using from 21:12 / 17:04 / 4:08 → 4.1

$\frac{24,369}{.958} = 25,437$ .958

$\frac{25,437}{5.6} = 4,542$

$\frac{4,542}{50,383} = .0901$

90 parts / million ✓

Sb 6000 C 5.4 mg.

Σ -27,298
Σ = 2,583
24,715

21 17 / 17:04 / 4:13 → 4.2

$\frac{24,715}{.958} = 25,798$ .958

$\frac{25,798}{5.6} = 4,777$

$\frac{4,777}{52,772} = .0905$

90 parts / million

Q1 b Sb, a Subtracted

5.7 mg.

out Beaker 19:10 May 15

Counted 21:43 May 15

$\sum_{54}^{60} c = 4,046$

$\sum_{b}^{(2.2)(7)} = 154$

3,892

Decay time

21:43

19:10

2:33 → 2.55 hrs

Decay Factor .971

$\frac{3892}{.971} = 4,008$

$\frac{4008}{781.4} = 5.13$

$\frac{5.13}{5.7} = .900$ mg/mg lead

$.900 \times 10^{-3}$ mg/μg lead

900×10^{-6} mg/μg lead

900 parts/million

Q1a Sb (as Sb electrode)

8mg

19:01

$\sum_{57}^{60} c = 7129$

$\sum_{40x7} p = \frac{280}{6849}$

Decay time

12:28

19:01

3:27 → 3.45 hrs

.965 = Decay Factor

$\frac{6849}{.965} = 7097$

$\frac{7097}{781.4} = 9.08$

$\frac{9.08}{8.0} = 1.135$ mg/mg lead

1.135×10^{-3} mg/mg lead

1135×10^{-6} mg/mg lead

1135 parts/million

Q2a for Sb on substrate
41.8 mg

$\sum_{54}^{60} C = 26,176$

$\sum_{125 \times 7} Elapsed = \frac{1,015}{25:161}$

Decay time
22:40
19:17
3:23 → 2.38
.966 decay factor

$\frac{25,161}{.966} = 26047$

$\frac{26,047}{781.4} = 33.33$

$\frac{33.33}{41.8} = .797$ mg Sb/gm basalt

$.797 \times 10^{-3}$ mg/μgm basalt

797×10^{-6} mg/μgm basalt

797 parts/million

Q2(b) - cal

Sb

25.2 mg

Irr. @ 19:28

$\sum_{50}^{60} c = 17740$

$\varepsilon_{110 \times 7} = \frac{770}{16,970}$

Decay time

22:48

19:28

3:20 → 3.33

$\frac{16,970}{,966} = 17,567$,966

$\frac{17,567}{781.4} = 22.48$

$\frac{22.48}{25.2} = .892$ mg/gm

892×10^{-6} mg/mg Sb

892 ppm / million

Velocity of Std = 3.114×10^{5}

t_1 Time from ...	Δt_c	Correction factor (f)	$f \times \Delta t_c$	$t_1 + (f \times \Delta t_c)$	Decay factor	Net Count	(H) Velocity density	J (H) Actual Std.	J Wt. ...
21"	44.1	.448	19.76	40.76	.308	3163	10,269	3.298×10^{-2}	$\frac{32.78 \times 10^{-2}}{4.57 \times 10^{-2}} = 7.22$
20"	44.1	.448	19.76	39.76	.317	2781	8,773	2.817×10^{-2}	$\frac{2.817 \times 10^{-2}}{3.8 \times 10^{-2}} = 7.2$

Ag Calculations Using Correction factor when count time is comparable to $T^{1/2}$

"T" time from start of counts	Δt_c	Correction factor (f)	$f \times \Delta t_c$	$T + (f \times \Delta t_c)$	Decay factor	Net Count	Net count / Decay factor	[illegible]	[illegible]
20"	45.C"	.446	20.3"	40.3	.3123	3111	9962	7.35×10^{-8}	9.17×10^{-6}
20"	[illegible]	.447	19.6"	39.6	.31?	2367	7,420	[illegible] $\times 10^{-8}$	[illegible]
24"	[illegible]	.450	18.9"	42.9	.29	1337	4610	3.40×10^{-8}	[illegible]
20"	[illegible]	.446	20.5"	[illegible]	[illegible]	[illegible]	14,675	[illegible]	[illegible]
30"	[illegible]	.441	22	42	.2975	7046	23,684	[illegible]	[illegible]
20"	40	.453	18.1	38.1	.333	9512	2871	[illegible]	[illegible]
20"	41	.451	18.5	38.5	.329	[illegible]	2894	[illegible]	[illegible]
20	[illegible]	.447	20.1	[illegible]	.314	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	.447	19.6	39.[illegible]	.3105	[illegible]	[illegible]	[illegible]	[illegible]
20	[illegible]	.450	18.9	38.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20"	55.8	[illegible]			.1508	12,181	48,628	3.38×10^{-7}	[illegible]
35"	50.4	[illegible]			.1758	5819	33,100	2.3×10^{-7}	[illegible] $\times 10^{-7}$

Sb Std: — 27.5 mg was 5/15/.

1979 counts/300 sec for 1 mg and 20 sec irradiation

$1979 \times \frac{3}{2} = 2968.5$

2968.5 counts/300 sec for 1 mg and 20 sec irr.

Sb 67.2 hr = 8½

@ 1a 5/26/61 8.0 mg.

May 15 ... 1901 out 19 ... on.

Count → May 26 08:45

240
13:44
253:44

Decay time

240 hrs until 1901 on May 25

13:44

253:44 → 253.63 hrs

Decay Factor 0.0733

59
Σ 1925 Gross
53 - 203 rotated
1722 Net count for 300 sec

1722 / .0733 = 23,492 counts for 300 sec for 8.0 mg @ reactor deck level

23,492 / 8 = 2937 counts for 300 sec for 1 mg @ reactor face

2937 / 2968.5 = .989

989 x 10^6 mg Sb / mg Pb.

∴ 989 ppm.

Q110 5/26/66 [illegible] mg.

May 15 in 1[illegible] at 1913 + 20 cm.

counted 0855

Decay time

240 hours until 1910 on May 25

4:50 min to May 25

+ 8:55

12:105 → 12:45

+ 13:45

253:45 → 253.75

Decay Factor .0733

59 = 1411

58 = 161

1250

$\frac{1250}{.0732} = 17,05$ [illegible] per 5.7 mg load @ reactor discharge

$\frac{17,053}{5.7} = 2,992$

$\frac{2992}{2968.5} = 1.008$

100% plus

O2(c) 5/26/44 41.8 mg.

May 15 in 19[17] sat 19[17] + 20 cc.

Counted May 26 at 8[7] =

Decay time

= 240 hrs until 19[17] on May 25

4:43
+9:15
13.58

13'58

253:58 → 253.97

Decay factor .073

Σ 7031 counts

53 406 bkgd

6625 net

$\frac{6625}{.073}$ = 90,753 counts for 41.8 mg Li at reactor during

$\frac{90,753}{41.8}$ = 2171

$\frac{2171}{2968.5}$ = 731

731 ppm

O2b 5/__/__ 25.2 mg.

May 15 19__ in 19^22 out 19^__ __

Counting May __ @ 09__

Decay time

246 hrs until 19^22 on May 25

13:__ + 9:22 = 13.54

25_:5_ → 253.9 hrs

Decay factor .073

$\sum_{52}^{55}$ 4484 Gross

336 Bkgd.

4148 Net

$\frac{4148}{.073}$ = 56,822

$\frac{56,822}{25.2}$ = 2,255

$\frac{2255}{2965.5}$ = 760

760 jpm

@4.5 = 5/26/64 3.8 mc,

May 15 1964 in 19½ out 10" + 20 cm

Counted May 26 @ 09:35

Decay time

240 hrs until 19" on May 25

4:19
9:35
13:54

13:54 → 253:54 → 253.9

Decay Factor .073

$\sum_{54}^{60} = 903$

154

749

$\frac{749}{073} = 10,260$

$\frac{10,260}{3.8} = 2700$

$\frac{2700}{2968.5} = 910$

910 fpfm

La

Control May 20

240

4.07
9.43
13.50 13.50

253.50 → 253.53

.073

2582 gross
245 Bldg
2337 net.

2337 / 073 = 32,000

32000 / 13.0 = 2460

2460 / 2968.5 = 825

825 lpm

0.45 Lb = 21.5 mg

May 5 1964 20:37 to 20:37 + 20"

Counted May 26 1964 @ 10:05 AM

Assay Folder

540 Fire t = 20:37 a 25

3:22
10:05
13:28

+ 13:28

253:28 → 253.46

4172 gross

280 Illegal

3892 Net.

.0734

$\frac{3892}{.0734} = 53900$

$\frac{53,900}{21.5} = 2460$

$\frac{2460}{2968.5} = 830$

Q9c.

14.12
254.12

680 Gross
126 Tare
554 Net

$\frac{554}{.0737} = 7517$

$\frac{7517}{2.3} = 3268.$

$\frac{3268}{2968.5} = 1.101$

1101 pf

20 seconds from reactor to start analysis

Q1a (8.0 mg

KP.

ATE May 15 OPER.

STOMER

G. NO.

AD. POS. 5-7 x 10^{13}

19 01 May 15 OUT 19 01 20 sec.

FTECT. 4x4 VOLTS

OM. 9 sec ABS. 1/2

N. SECT. 1 2 3 4

ZERO

BG

Δt_C

$\sum_{13}^{88} c = 3,543$

$\sum_{13} = 432$

$\varepsilon_B = 3,111$

$\frac{3,111}{45,337} = .0686$

$\frac{.0686}{8.0} = .00857$ mg/mg

8.57 parts/million

Using Correction when count time is changed

$\sum_{62}^{69}$ counts = 4,247

$72 \times 8 = 576$

3671 counts @ (20 + 40/2) sec after reactor

$\frac{3671}{.315} = 11,653$ counts @ reactor shutdown

$\frac{11,653}{164,286} = .0708$ mg Ag per 8.0 mg Lead

$\frac{.0708}{8.0} = .00885$ mg Ag per mg Lead

8.85 parts per million

00000 TS

$\sum_{53}^{60}$ counts = 16,130

$\sum_{53}^{60}$ Pulses = $\frac{840}{15,290}$

Decay time 21.55

$\frac{-19.01}{2.54} \rightarrow 2.9$

.971

$\frac{15,290}{.971} = 15,743$ counts/200 sec @ reactor discharge

$\frac{15,743}{2070} = 7.605$ mg/mg lead

8.0

$\frac{760.5}{8.0} = .951$ mg/mg lead

951 parts/million

.095 % Pb

$\sum_{54}^{60}$ counts = 15,444

$\sum_{50}^{60}$ Pulses $\frac{700}{100.2}$ = $\frac{700}{14,744}$

$\frac{14,744}{.971} = 15,180$

$\frac{15,180}{1979} = 7.67$

$\frac{7.67}{8.0} = .958$

95.8 parts/million

Olb 5.7 mg

ET.

TE May 15 OPER.

STOMER

IG. NO.

RAD. POS.

IN 19¹⁰ OUT 19¹⁰ + 20 sec.

DETECT. VOLTS

FROM ABS.

N. SECT. 1 2 3 4

ZERO

BG

Δt_C

$\sum_{63}^{68}$ count = 2631

Σ Bkgd = $\frac{264}{2367}$

$\frac{2367}{45,337} = .052$

$\frac{.052}{5.7} = .00912$

9.12 parts/million

As

$\sum_{26}^{69}$ c = 3,063

$\frac{352}{2711} = 4418$ count at $(20 + \frac{40}{2})$ sec

$\frac{2711}{.315} = 8,606$ count at reactor energy

$\frac{8,606}{164,396} = .052$ mg As for 5.7 mg Pb

$\frac{.052}{5.7} = .00912$ mg As per mg Pb

9.12 parts/million

Q1

Channel 57 estimated at 2,300

$\frac{2\sqrt{\ldots + \text{Bkg}}}{\ldots}$

$\sum_{53}^{60}$ = 11,407
640
10,767

$\frac{2\sqrt{11{,}407 + 640}}{10{,}767} = \frac{2\sqrt{12047}}{10767}$

$= \frac{219.4}{10{,}767}$

$= .020$

Decay time
21:63
19:10
2:53 → 2.88
.971

$\frac{10{,}767}{.971}$ = 11,088 counts/200 sec @ reactor discharge

$\frac{11{,}088}{2070}$ = 5.357 µg/5.7 mg lead

$\frac{5.357}{5.7}$ = .939 µg/mg lead

939 parts/million

.094 % Sb.

970
.02 ×
19.40

970 ± .02 = 19.4

970 ± 20 =

$\sum_{54}^{60}$ = 10,719
ΣBKG = 546
10,173

$\frac{10{,}173}{1979}$ = 5.14

5.14 5.293

928 parts/million

Q2 a 41.8 mg.

P.

TE May 15 OPER.

STOMER

G. NO.

RAD. POS.

N 19[17] OUT 19[17] + 20 sec

ETECT. VOLTS

EOM. ABS.

HAN. SECT. 1 2 3 4

MP ZERO

AIN

IME BG

Δt_L Δt_C

$\sum_{13}^{69} = 14461$

3280

$11,181$

$\frac{11,181}{45,337} = .27$

$\frac{.27}{41.8} = .00645$

6.45 parts/million

Aj $\sum_{6x}^{69}$ counts = 17,135

$380 = 3040$

$14,095$ counts at $(20 + \frac{40}{2})$ sec

$\frac{14,095}{.315} = 44,746$ counts for 41.8 mg Aj @ reactor bottom

$\frac{44,746}{164,396} = .272$ mg Aj for 41.8 mg Aj

$\frac{.272}{41.8} = .00651$ mg Aj for 1 mg of Aj

6.51 parts/million

.00651 g Aj

Q2a

$\sum_{53}^{60} c = 64,738$

$\sum c_{61} = 2,880$

$61,858$

Decay factor

22:10 → 21:70

− 19:17

1:53 → 2.88

.970

$\frac{61,858}{.970} = 63,771$ counts/100 sec @ reader discharge

$\frac{63,771}{2070} = 30.80$ MS/41.8 gm load

$\frac{30.80}{41.8} = .736$ MS/gm load

736 grams / million

.0742 Sb

$\sum_{54}^{60} c = 61,385$

$- 1400$

$59,985$

$\frac{59,985}{.970} = 61,840$

$\frac{61,840}{1979} = 31.24$

$\frac{31.24}{41.8} = .747$

747 grams / million

Q2b 25.2 mg

?.

IE May 15 OPER.

STOMER

G. NO.

RAD. POS.

1925 OUT 1925 + 2 hr

FFECT. KVOLTS

EOM. ABS.

AN. SECT. 1 2 3 4

MP ZERO

AIN

ME BG

Δt_L Δt_C

$\sum_{62}^{68} c = 6641$

$\sum_{63}^{68} D = 822$

5819

137/822

$\frac{5819}{45337} = .13$

35 seconds before counting started not 20

$.13 \times \left(\frac{.315}{.205}\right) = .199$

$\frac{.199}{2512} = .00789$

$\sum_{62}^{69}$ Count = 9,821

$1378 = \frac{1096}{1725}$ counts after $\left(35'' + \frac{42''}{2}\right)$

55 sec

$\frac{1725}{.205} = 32,804$ counts for 25.2 mg Pb at reactor discharge

$\frac{32.804}{164,396} = .199$ mg As for 25.2 mg Pb

$\frac{.199}{25.2} = .00791$

7.91 ppm As for mixture =

.0007 %

Sb = T½ 67.2 hrs

Sb 126

$\sum_{53}^{60} c = 40,018$

1600

38,418

Decay factor

2217 → 21:77

19:28

2:49 → 2.81

.971

$\frac{38,418}{.971} = 39,565$ counts for 200 sec @ reactor discharge

$\frac{39,565}{2070} = 19.11$ mg/25.2 mg. of lead

$\frac{19.11}{25.2} = .758$ mg/mg of lead;

758 parts per million

.076 % Sb.

$\sum c = 37,877$

$\sum e = 1600$

$\frac{36,477}{97} = 37,520$

$\frac{37,520}{1975} = 18.98$

$\frac{18.98}{25.2} = .753$

Q 4 5 S 3.8 mg

E May 15 OPER.

TOMER

G. NO.

D. POS.

1941 OUT 1941 + 20

DETECT. VOLTS

GEOM. ABS.

AN. SECT. 1 2 3 4

AMP ZERO

GAIN

TIME BG

Δt_L Δt_C

$\sum_{63}^{63}$ Counts = 1,427

Σ B = 90

1,337

$\frac{1337}{45,337} = .029$

24 sec before ? moving shutter

$.029 \times \frac{.315}{.128} = .0326$

$\frac{.0326}{3.8} = .00857$

8.57

$\sum_{62}^{69}$ counts = 1,640

15×8 = 120

1,520 counts at $\left(24 \sec + \frac{40}{2}\right)$ 44 sec.

Decay factor .28

$\frac{1520}{.28} = 5428$ counts for 3.8 mg lead at center decay

$\frac{5428}{164,356} = .03302$ μg for 3.8 mg lead

$\frac{.03302}{3.8} = .00868$ μg for 1 mg lead

8.68 parts/million

Sb 84,5, (appears to be over substitution of Cu)

$\sum_{53}^{60} c = 6,636$

$\sum b = 608$

$6,028$

Decay Factor

22:22 → 21:82

19:41

2:41 → 2.68

$\frac{6028}{.973} = 6195$ counts/200 sec @ reactor discharge

.923

$\frac{6195}{2070} = 2.993$ ns/3.8 mg

$\frac{2.993}{3.8} = .787$ ns/mg lead

$.798 \times 10^{-3}$ ns/mg lead

.787 parts/million

.08% Sb.

$\sum_{54}^{60} 6286$

$\sum_{54}^{60} 532$

5754

$\frac{5754}{.973} = 5913$

$\frac{5913}{1.77} = 3.357$

@ 4.5 La 13.0 mg.

P.
TE May 15 OPER.
STOMER
G. NO.
:AD. POS.
19:53 OUT 19:53 + 20 sec
TECT. VOLTS
OM. ABS.
AN. SECT. 1 2 3 4

P ZERO
IN
E BG
L Δt C

$\sum_{63}^{68}$ count = 5060
$\sum$ Bkgd = 498
4562

$\frac{83}{\cancel{6}} \, 498$

$\frac{4562}{45337} = .0100$

$\frac{.0100}{13.0} = .000769$

7.69 parts/million

$\sum_{62}^{69}$ count = 5882
83×8 = 664
5218 count for 13.0 mg at 20 sec + 40/2 sec

$\frac{5218}{.315}$ = 16,565 counts for 13.0 mg lead @ reactor shutdown

$\frac{16,565}{164,396}$ = .1007 mg for 13.0 mg lead

$\frac{.1007}{13.0}$ = .00775 mg for 1 gram lead

7.75 parts per million

(.0078%)

Sb^{122}

$\sum_{53}$ counts = 21,506

$\sum$ Background = 1,240

20,566

Decay factor

22:29 → 21:89

19:53 → 19:53

2.36 → 2.6 hrs.

.974

$\frac{20,566}{.974}$ = 21,715 counts for 200 sec @ reactor discharge

$\frac{21,715}{2070}$ = 10.20 mg / 13.0 mg

$\frac{10.20}{13.0}$ = .784 mg/mgram

$.784 \times 10^{-3}$ mg/mg load.

784 parts/million

.078% Sb

$\sum_{54}$ = 20713

$\sum$ = 1085

13,628

$\frac{19,628}{.974}$ = 20,150

$\frac{20,150}{1979}$ = 10.18

E 4,5 Lb 21.5 mg

P. _____

TE 5/15 OPER. _____

ST MER _____

G. NO. _____

AD. POS. _____

5101 = OUT _____

ETECT. _____ VOLTS _____

EOM. _____ ABS. _____

AN. SECT. 1 2 3 4

MP _____ ZERO _____

AIN _____

ME _____ BG _____

L _____ Δt_C _____

$\sum_{63}^{67} C = 8061$

$\sum B = \frac{1020}{7046}$

$\frac{7046}{45337} = .0155$

$\frac{.0155}{21.5} = .00721$

7.21 feet/million

Q 4,5 Lb Ag

40"

20"

$\sum$ counts = 9,517

170 x 8 = 1360

8157 counts for 21.5 mg at 20 cm + 40/2 cm

$\frac{8157}{.315} = 25,895$ counts for 21.5 mg lead at reactor bearing

$\frac{25,895}{164,396} = .157$ mg of 21.5 mg of lead

$\frac{.157}{21.5} = .00732$ mg for mg of lead

$= 7.32 \times 10^{-6}$ mg for mg of lead

Q4.5 LL61

Sb. 122

$\sum_{53}^{60}$ counts 35,363
− 1600
33,763

Decay time
22:35
20:01
2:34 → 2.5 l

.974 = Decay Factor

$\frac{33,763}{.974}$ = 34,664 counts for 200 sec at reactor discharge

$\frac{34,664}{2070}$ = 16.74 ng / 21.5 mg lead

$\frac{16.74}{21.5}$ = .778 ng / mg lead

= 7.78×10^{-4} gm / mg lead

778 parts / million

.78 % Sb

$\sum_{54}^{60}$ c = 33588

$\sum$ b = 1400

-32188

$\frac{32188}{.974}$ = 33,040

$\frac{33040}{1979}$ = 16.69

$\frac{16.69}{21.5}$ = .77C

Cf

Cf @ 2.3 mg.

EXP.

DATE 5/15 OPER.

CUSTOMER

CHG. NO.

IRRAD. POS.

IN 20:08 OUT 20:08 + 20 sec.

DETECT. VOLTS

GEOM. ABS.

CHAN. SECT. 1 2 3 4

AMP ZERO

GAIN

TIME BG

Δt_L Δt_C

$\frac{\Sigma}{63}$ = 1025 / 69 = 956

$\frac{956}{45337}$ = .0211

$\frac{.0211}{2.3}$ = .00917 mg/mg.

= 9.17×10^{-3} mg/mg

9.17×10^{-3} mg/mg

9.17 parts/million

Ag

$\frac{\Sigma}{62}$ = 1,111

11.5% = 92

1,069 counts for 200 sec 2.3 mm mg at $\left(20 + \frac{40}{2}\right)$ sec

$\frac{1069}{.315}$ = 3,393

$\frac{3,393}{164,391}$ = 0.0206

$\frac{.0206}{2.3}$ = 8.97×10^{-3} mg per gram Cf

8.97×10^{-6} g per g Cf

Q9(c)

$\sum_{22}^{32}$ count 4450

$\sum$ Weight $\frac{440}{4440}$

Decay time

22:41

20:08

2:33 ⇒ 2.55

Decay factor .974

$\frac{4440}{.974}$ = 4,558 counts/2 min @ reactor discharge

$\frac{4558}{2070}$ = 2.201 mg/2.3 mg. lead

$\frac{2.201}{2.3}$ = .956 mg/mg lead

$.956 \times 10^{-3}$ mg/mg lead

956 parts per million

.096 % Sb

$\sum_{54}^{46}$ = 4651

$\sum_{}$ = $\frac{385}{4266}$

$\frac{4266}{.974}$ = 4379

$\frac{4379}{1979}$ = 2.21

.021

Q9b 2.3 mg

EXP.

DATE May 15 OPER.

CUSTOMER

CHG. NO.

IRRAD. POS.

IN 20:16 OUT 20:16 + 20 sec.

DETECT. VOLTS

GEOM. ABS.

CHAN. SECT. 1 2 3 4

AMP ZERO

GAIN

TIME BG

Δt_L Δt_C

$\sum_{13}^{LP} c = 1033$

$\Sigma B = \frac{81}{952}$

$\frac{952}{45337} = .0209$

$\frac{209}{2.3} = 0.0909$

9.09 parts/million

A_5^{110} Determination $T_{1/2} = 24$ sec.

Σ count = 1229

Σ Bkgd = 104

1125 net count after $(20 + \frac{40}{2})$ sec for 2.3 mg. Cu

$\frac{1125}{.315} = 3,571$ count @ reactor divisor for 2.3 mg Cu

$\frac{3571}{164,396} = .0217$ mg for 2.3 mg Cu

$\frac{.0217}{2.3} = .00944$ mg for

9.44 parts/million

^{122}Sb 99%

$\sum_{53}^{57}$ count = 5001

count = $\frac{400}{4601}$

Decay factor
22:54
20:16
2:38 → 2.63 hrs

$\frac{4601}{.973} = 4728$ counts/200 sec @ reset overnight

Decay factor .973

$\frac{4728}{2070} = 2.284$ mg/2.3 mg

$\frac{2.284}{2.3} = 993$ mg/mg lead

$= .993 \times 10^{-3}$ mg/mg lead

9.93×10^{-4} mg/mg lead

.993 parts/million

.099 % Sb.

$\sum_{53}^{60}$ C = 4762

$\sum_{53}^{57}$ B = $\frac{350}{4412}$

$\frac{4412}{.973} = 4534$

$\frac{4534}{1979} = 2.291$

$\frac{2.29}{2.3} = .996$

Q145 10.9 mg

EXP.

DATE May 15 OPER.

CUSTOMER

CHG. NO.

IRRAD. POS.

IN 20:24 OUT 20 sec.

DETECT. VOLTS

GEOM. ABS.

CHAN. SECT. 1 2 3 4

AMP ZERO

GAIN

TIME 2258 BG 200 sec

Δt_L Δt_C

$\sum_{63}^{66} C = 4397$

396

4001

$\frac{66}{396}$

$\frac{4001}{45,337} = .088$

$\frac{.088}{10.9} = .00809$

8.09 parts / million

Σ counts = 5,125

.66 × 8 = 528

4597 counts for 10.9 mg Au @ (20 + 40/2) sec

$\frac{4597}{.315} = 14,593$ counts for 10.9 mg Au @ reactor finishing

$\frac{14593}{164396} = .0887$ mg of Ag for 10.9 mg Au

$\frac{.0887}{10.9} = .00814$ mg Ag per mg Au

8.14 parts per million Ag.

Q145

$\sum_{53}^{60}$ counts = 18,568

$\sum$ weight = 540

17,728

Decay time

12:60

− 10:24

2:36 → 2.6 hrs

decay factor .974

$\frac{17,728}{.974} = 18,201$ counts/200 sec @ reactor discharge

$\frac{18,201}{2070} = 8.79$ mg/10.9 mg load

$\frac{8.79}{10.9 \times 10^{+3}} = 8.06 \times 10^{-4}$ mg/mg sample load

806 parts/million

.081% Sb

$\sum_{54}^{60}$ counts = 17574

$\sum$ weight = 770

16,804

$\frac{16.804}{.974} = 17,250$

$\frac{17,250}{1979} = 8.72$

$\frac{8.72}{10.9} = .800$

800 parts/million

Q14 LA

EXP.

DATE May 15 OPER.

CUSTOMER

CHG. NO.

IRRAD. POS.

IN 20:31 OUT 20:31 + 2 sec.

DETECT. VOLTS

GEOM. ABS.

CHAN. SECT. 1 2 3 4

AMP ZERO

GAIN

RANGE BG

TEMP Δt_C

$\sum_{63}^{69} C = 3419$

$\sum B = 331$

3083

56 / 6 / 336

$\frac{3083}{45337} = .068$

$\frac{.068}{.85} = .00800$

8.00 parts/million

Ag Q14 LA

$\sum_{62}^{69} C = 3,979$

$5 \times 8 = \frac{.448}{3.531}$ counts for 8.5 mg. leak at (20 + 40/2) sec

$\frac{3,531}{.315} = 11,209$ counts for 8.5 mg. 2 min. at reactor standing

$\frac{11,209}{164396} = .0681$ mg. for 8.5 mg. load

$\frac{.0681}{8.5} = .00802$ mg. for mg

8.02 parts/million

Q14 2a

785 parts / million

$\sum_{54}^{b} c$ = 13,448

(7×7) = 672

12,776

$\frac{12,776}{.971}$ = 13,150

$\frac{13.150}{1978}$ = 6.64

$\frac{6.64}{8.5}$ = .781

781 parts / million

14 Lb 4 mg

XP.

ATE May 15 OPER.

USTOMER

HG. NO.

RAD. POS.

:30:37 OUT + 20 sec

ETECT. VOLTS

EOM. ABS.

CHAN. SECT. 1 2 3 4

MP ZERO

AIN

TIME BG

Δt_L Δt_C

$\sum_{63}^{63} c = 1871$

144

1727

24 L / 144

$\frac{1727}{45337} = .0381$

$\frac{.0381}{4.7} = .00811$

8.11 parts/million

Ag Determination

$\sum_{62}^{69}$ counts = 2,209

Σ BG = 192 40 sec.

2,017 net count for 4.7 mg lead at $(20 + \frac{21}{2})$ per

decay factor .315

$\frac{2,017}{.315} = 6,403$ count for 4.7 mg lead at counter discharge

$\frac{6,403}{164,296} = .0389$ mg Ag for 4.7 mg lead.

$\frac{.0389}{4.7} = .00828$ mg Ag for mg lead.

$= 8.28 \times 10^{-6}$ mg Ag for mg lead

14 L(b)

$\sum_{53}^{60}$

785 parts/million
079 70.86

$\sum_{54}^{60}$ 7648

$\sum_{65(1)}$ 455
7193

$\frac{7193}{.971} = 7407$

$\frac{7407}{1979} = 3.743$

$\frac{3.743}{4.700} = .796$ "S/gm Lead

796 parts per million

Q9 (b) 2.3 mg.

May 15 in 20:16 out 20:16 – 20 sec

Counted May 16 @ 10:23

240 hrs. t May 25th 20:16

3.44
10:23
13:67 → 14.12
Decay 0737

60
54

668 Gross
140 Bkgd
528 Net

254.12

$\frac{528}{0737}$, 7170

$\frac{7170}{2.3}$ = 3130

$\frac{3130}{2968.5}$ = 1050

1050 ppm

Q,14 =

Counting May 24 @ 10:53 for 240 [illegible]

Decay from
240 hrs until 25 May 10:24

3:36
10:53
13:29 → 14:29 → 14:5

14.5

254.5 hrs.

Decay factor .0725

27 / 189 = 54

2269
189
2080

$\frac{2080}{.0725} = 28730$

$\frac{28730}{10.9} = 2635$

$\frac{2635}{296.5} = 889$

889 ppm

Q14 La E.5 m.

May 15 in 20:31 out 20:31 + 20 sec.

counted May 26 10:33 for 200"

540 hrs to 20:31 May 25

3:29

10:33

13:62 → 14.03

14.03

254.03 hrs

Decay factor = .073

60 | 1736

54 | 189

27 | 7

189 | 1547

$\frac{1547}{073} = 21191$

$\frac{21191}{8.5} = 2493$

$\frac{2493}{2918.5} = 840$

840 ppm

Q.-26. 4.7 ms

May 6 ... 37 ... 37 ...

... May 26 ... 300

$\sum^{6}$ 1068 gross

55 — 147 bleed.

921 net

240 ... 37 May 25

3.23

10.42

13.65 → 14.08

254.08 hrs

.073 = duty factor

$\frac{921}{.073} = 12,616$

$\frac{12616}{4.7} = 2684.$

$\frac{2684}{2968.5} = .904.$

90% [illegible]

$T_{1/2} = 67.2$ hrs

Sample	mg Wt.	Gross Count	Bkgd	Net	MIN. Activation Time	Decay Time	Decay Factor f	
a	7.34	104,[illegible]	3[illegible]	101,703	2'	25.8 hrs	.766	-Cu
Q1 b	5.17	78,[illegible]	2520	75566	2'	26.4 hrs	.762	-Cu
c	1.95	28,[illegible]	[illegible]	27,[illegible]	2'	25.0	.773	-Cu
D	1.36	19979	651	19328	2'	25.22	.771	-Cu
E	3.48	51485	1540	49945	2'	25.35	.750	-Cu
	4.18	267138	9100	258038	2'	29.7	.736	after wash
a		284391	9800	274591		27	.757	200"
	2.49	253797	8400	245397	2'	27.66	.752	again
Q2 b		252,477	8400	244077		27.65	.757	-Cu
c	4.57	30,565	1050	29,515	1'	17.2	.8375	
d	3.89	24,920	819	24,101	1'	17.27	.8368	
Q3	.023	925	462	463	1'	19.5 hrs	.8177	
		41170	1750	39420		27.78	.751	-Cu
S	3.79	38144	1365	36779	2'	29.37	.739	after ws
	12.8	133,050	5180	127870	2'	27.88	.750	-Cu
Q4 ha								
hb	21.4	218,156	7700	210056	2'	27.95	.750	-Cu
c	1.22	14481	616	13,865	2'	26.57	.7602	-Cu
	2.27	30,351	1260	29091	2'	25.18	.748	-Cu
P9 a	2.27	31,185	1190	29995	2'	28.3	.747	-Cu
b								
c	1.52	21,353	840	20513	2'	27.15	.7558	-Cu
S	12.7	114716	3220	111697	2'	28.9	.742	-Cu
	4.57	105899	3080	102819	2'	29.02	.741	-Cu
Q14	5.43	86916	2520	84396	2'	28.6	.745	-Cu
	[illegible]	49851	1680	48171	2'	28.72	.7435	-Cu
		39,[illegible]	1260	38420	[illegible]	27.72	.751	-Cu

Std. 2.24 x 10^4 counts/µg for 2 min activation

	net / f = C@T₀	C@T₀ / wt. = c/mg	c/mg / spec. act.
	132,724	16,942	756
	99,168	17,490	781
	35,264	19062	851
	25069	18,433	823
	66593	19136	854
	350595	8387 (x 3/2)	562
	362756	8678 (x 3/2)	581
	326,326	13105	585
	324,570	13035	582
	35,241	7712	689
	28801	7404	661
SPEC	566.22	24618	$\frac{2.198 \times 10^3}{32}$ = 733 ppm (counted for 950 sec.)
	52490	14,035	627
	49,769	13,307	594
	170,493	13,320	595
	280608	13113	585
	18239	14950	667
	38892	17133	765
	40154	16943	756
	27141	17856	797
	150,535	14069	628
	138757	14499	647
	113283	13503	603
	64790	14054	6[illegible]1
	51158	14411	643