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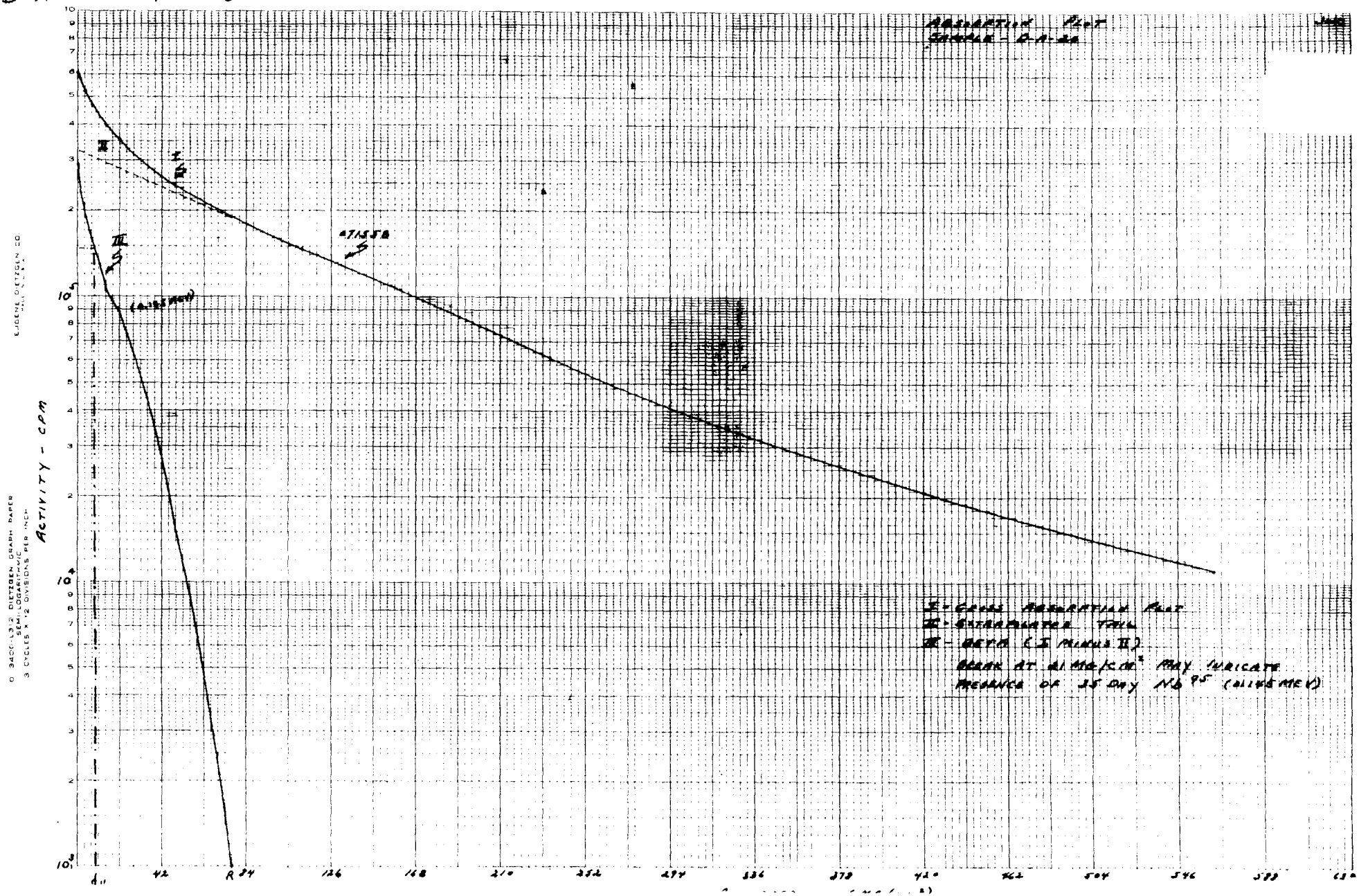
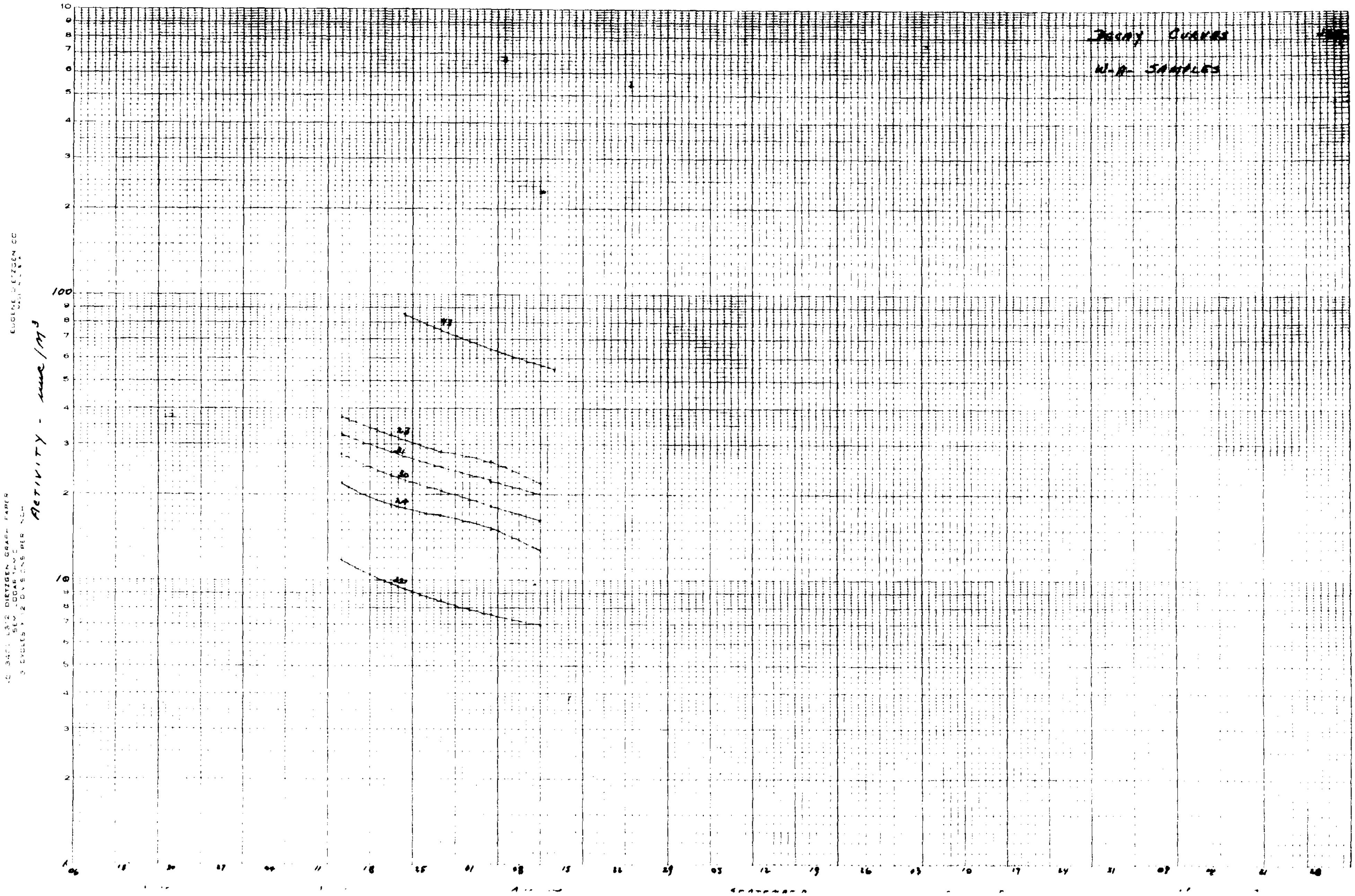
BEST COPY AVAILABLE

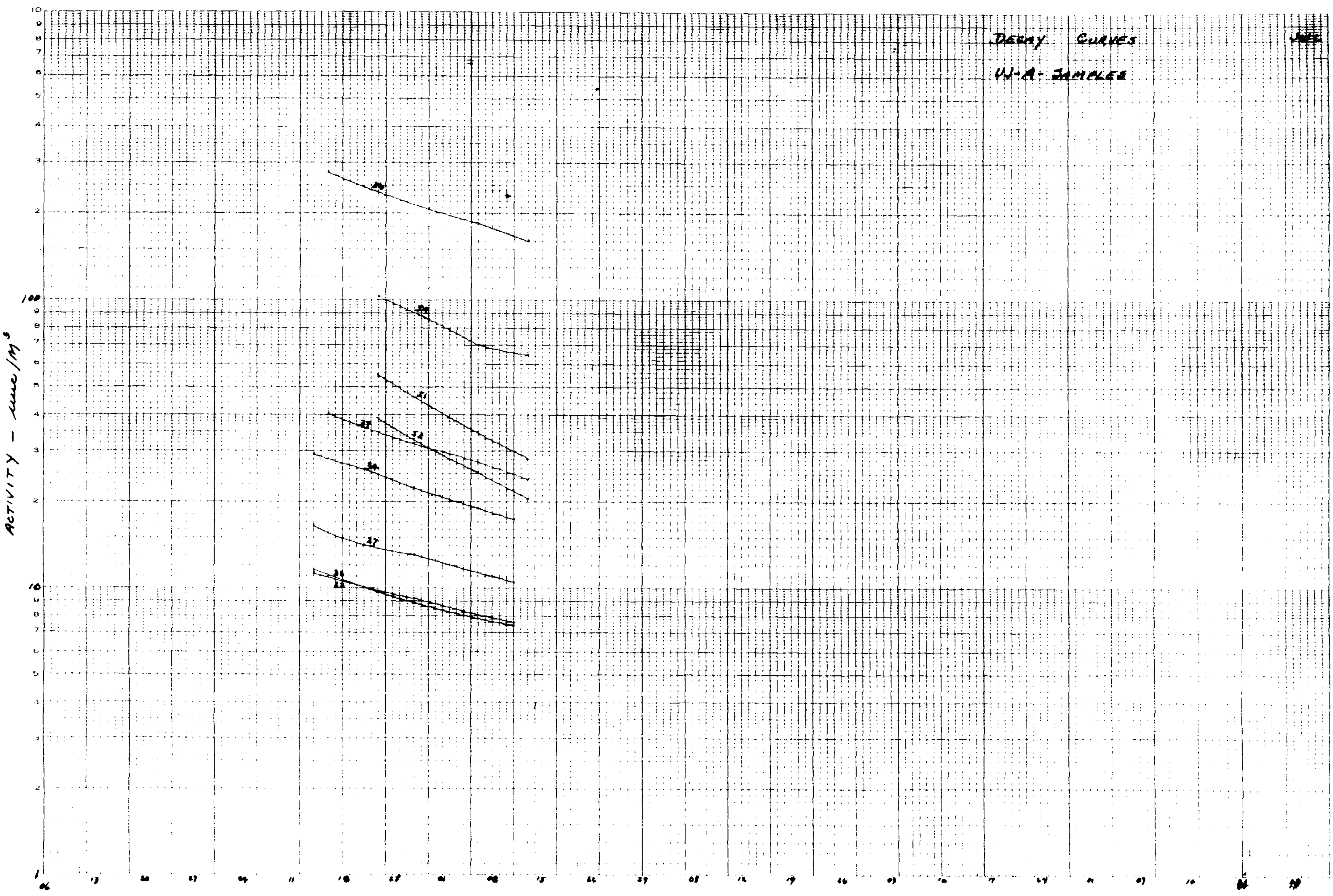
D-A-20 071558

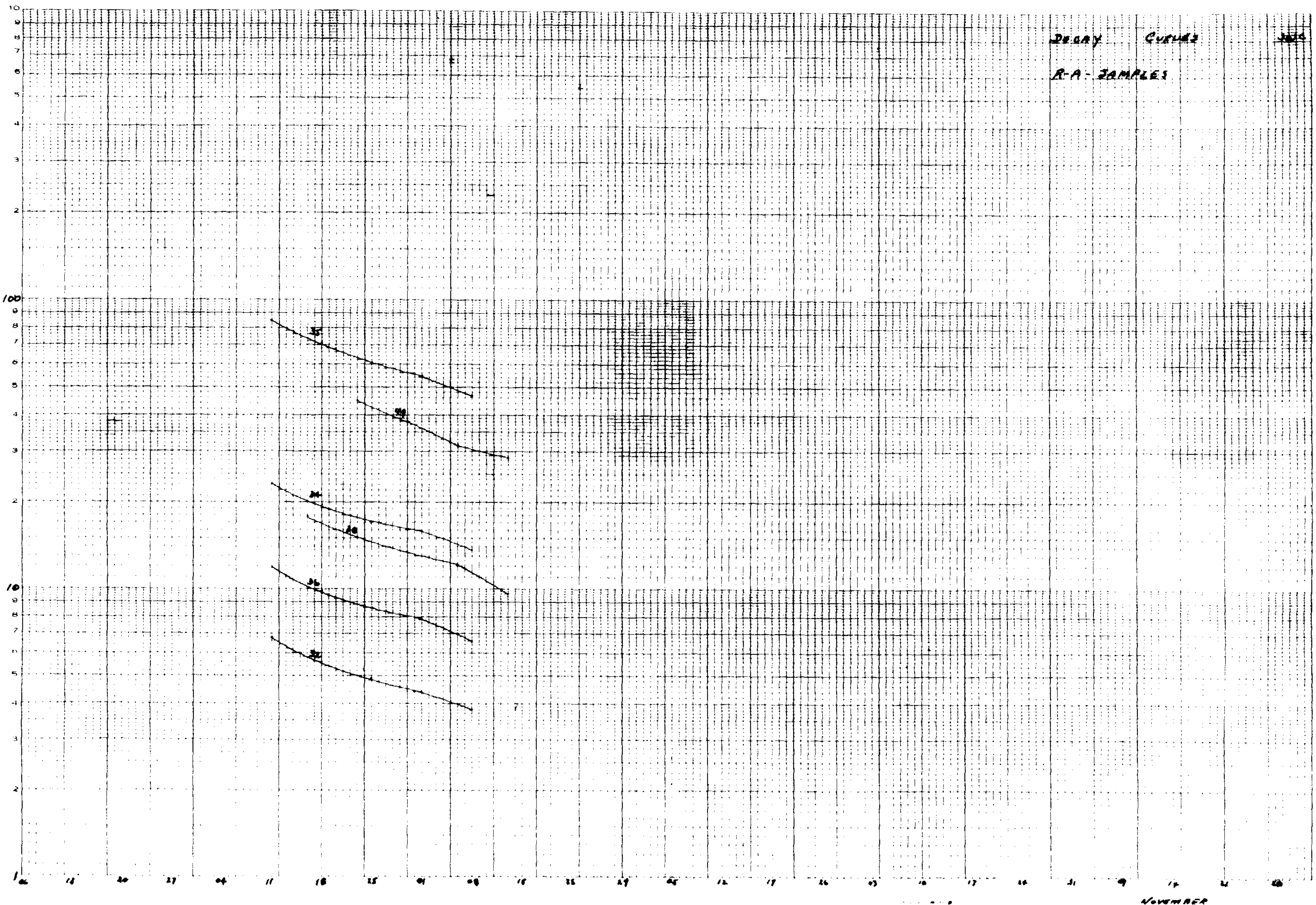


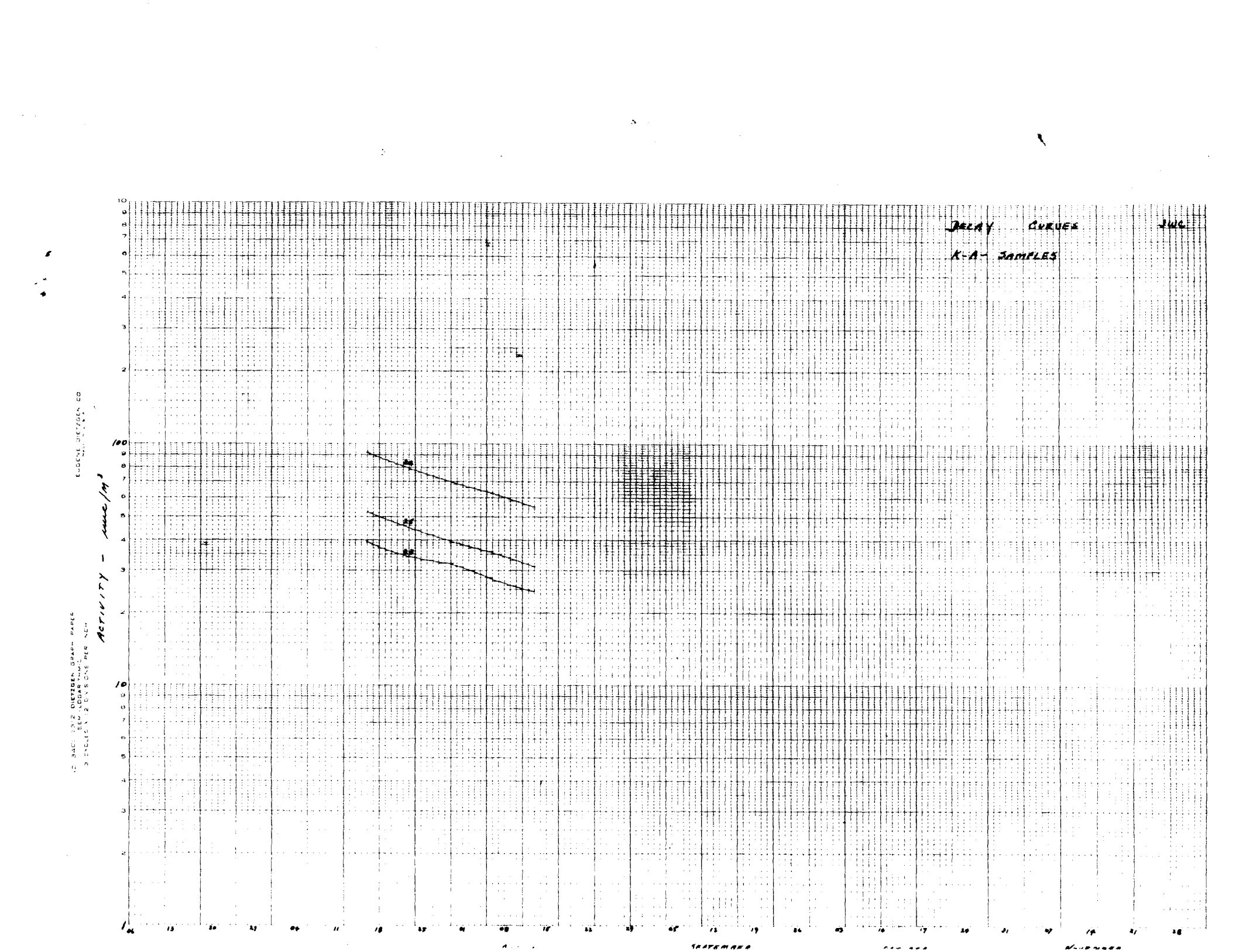
D-A-20 071558

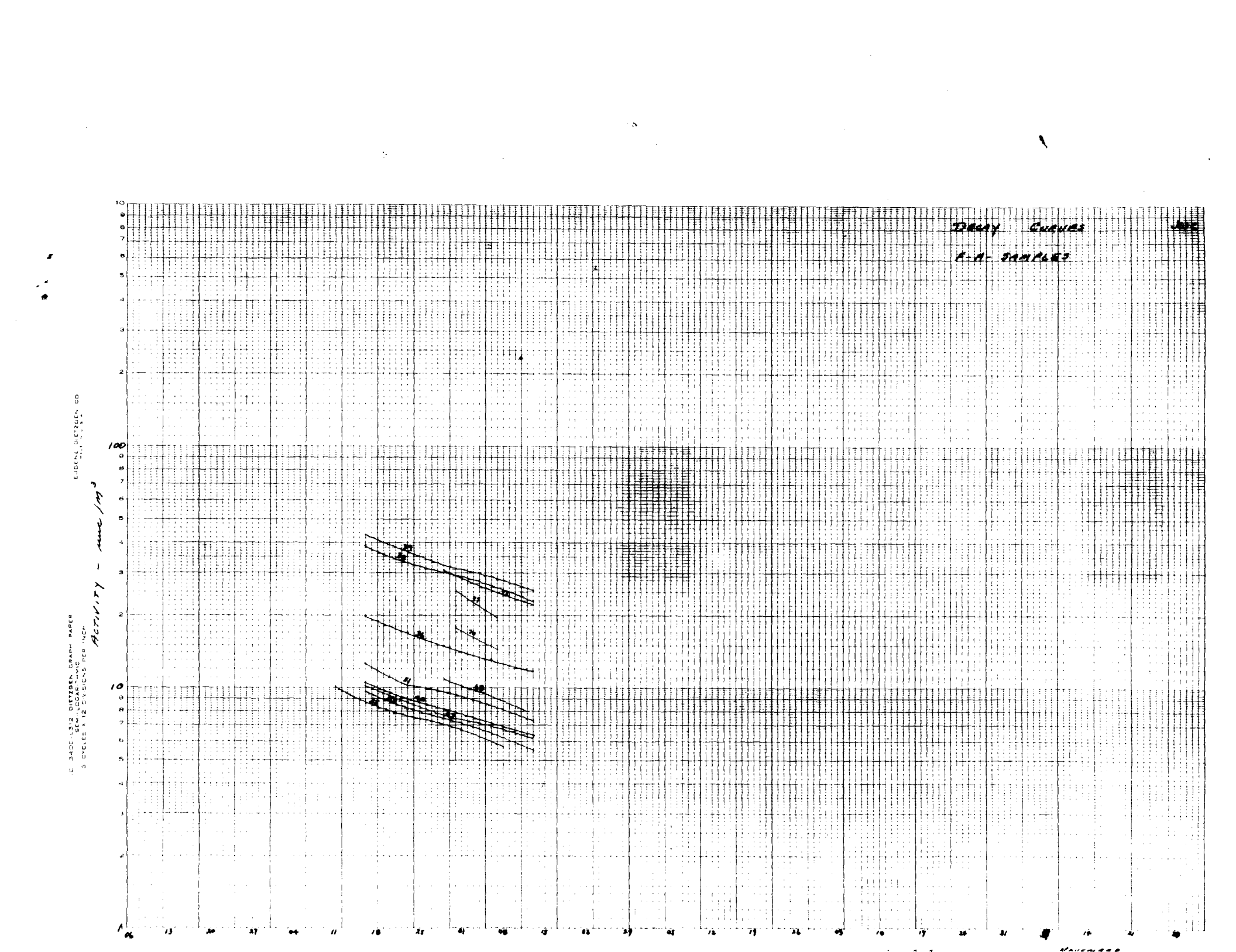

DECAY CURVES
W-B SAMPLES
ACTIVITY - uuc/M3
100
10
DIETZGEN GRAPH PAPER
EUGENE DIETZGEN CO

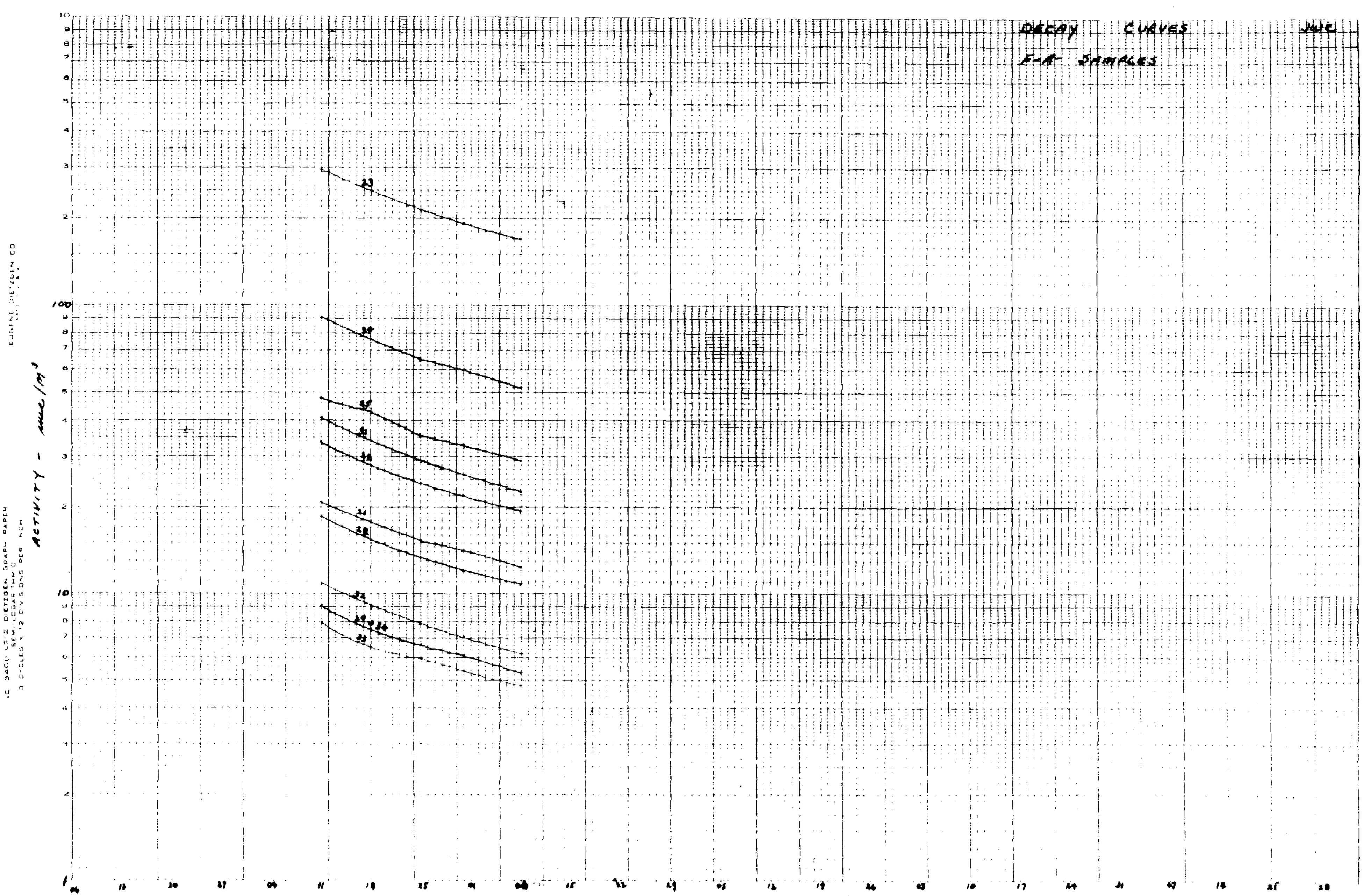
Steady Current
VT-A - Samples
Activity - mm/m²



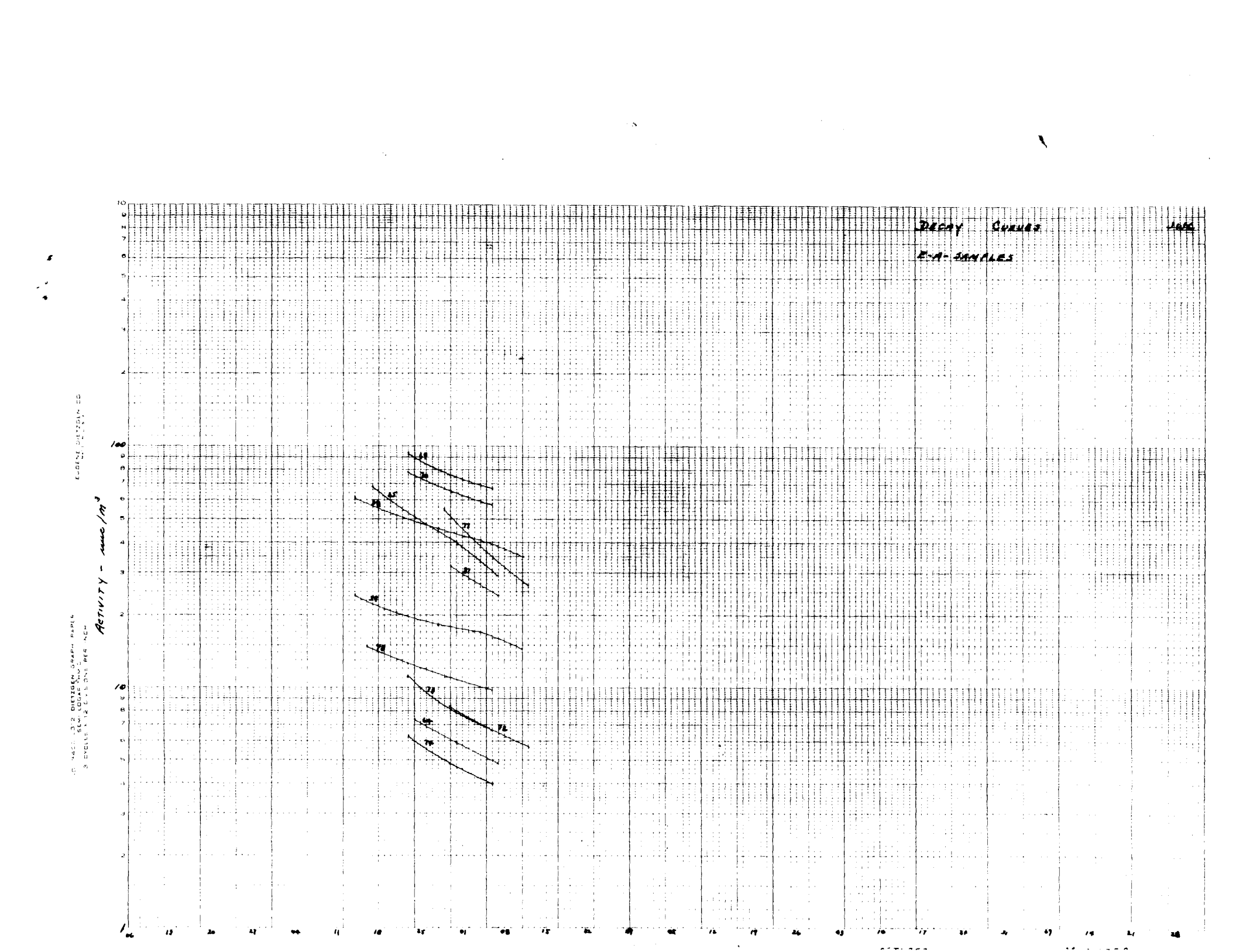

DECAY CURVES
R-A-SAMPLES
ACTIVITY - μμc/m³
NOVEMBER
35
34
36
32
10 3400 L-212 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 12 DIVISIONS PER INCH
EUGENE DIETZGEN CO.

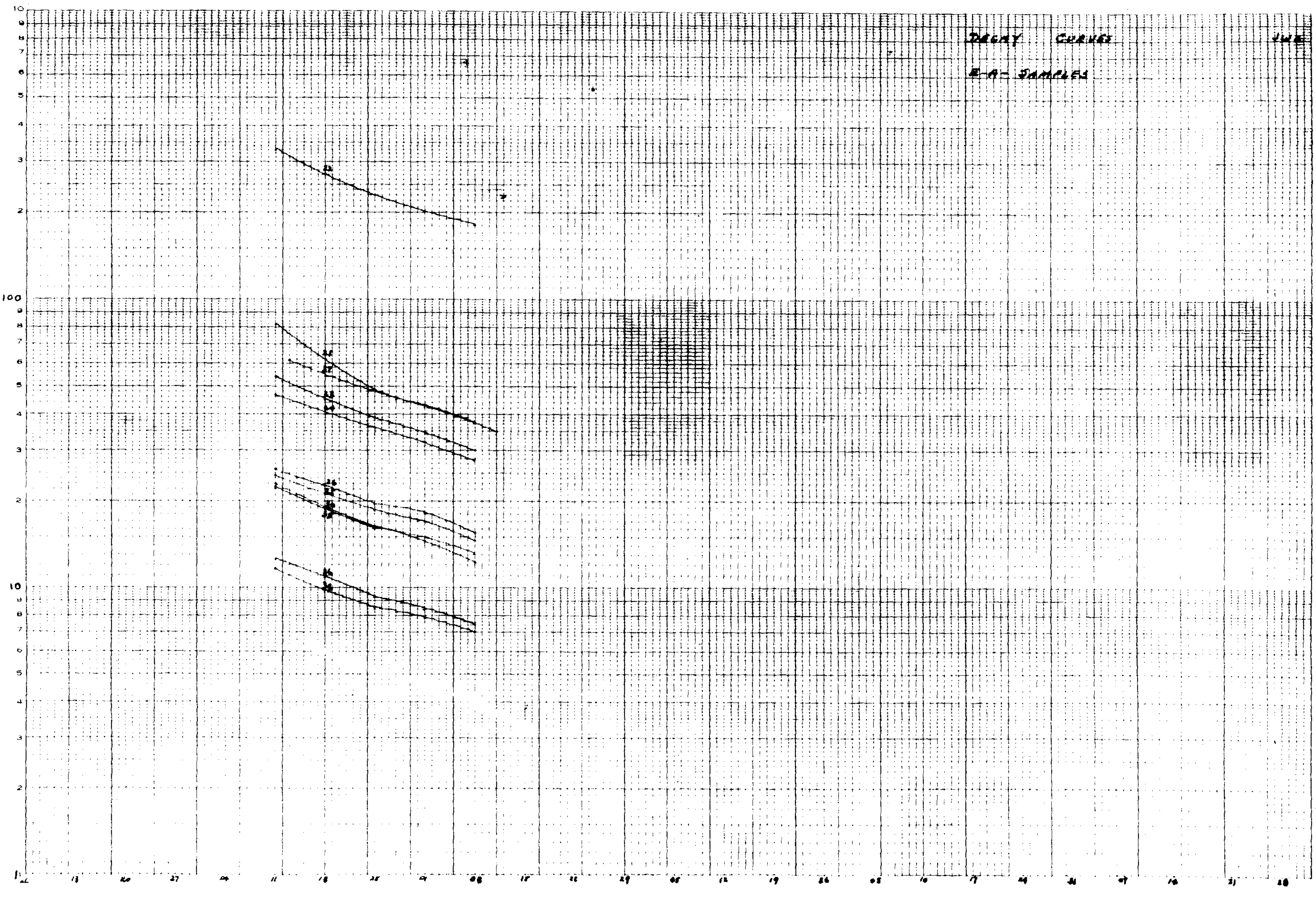

DELAY CURVES JWG
K-A- SAMPLES
ACTIVITY - mμc/m³
EUGENE DIETZGEN CO
SEMI-LOGARITHMIC
3 CYCLES X 2 DIVISIONS PER INCH

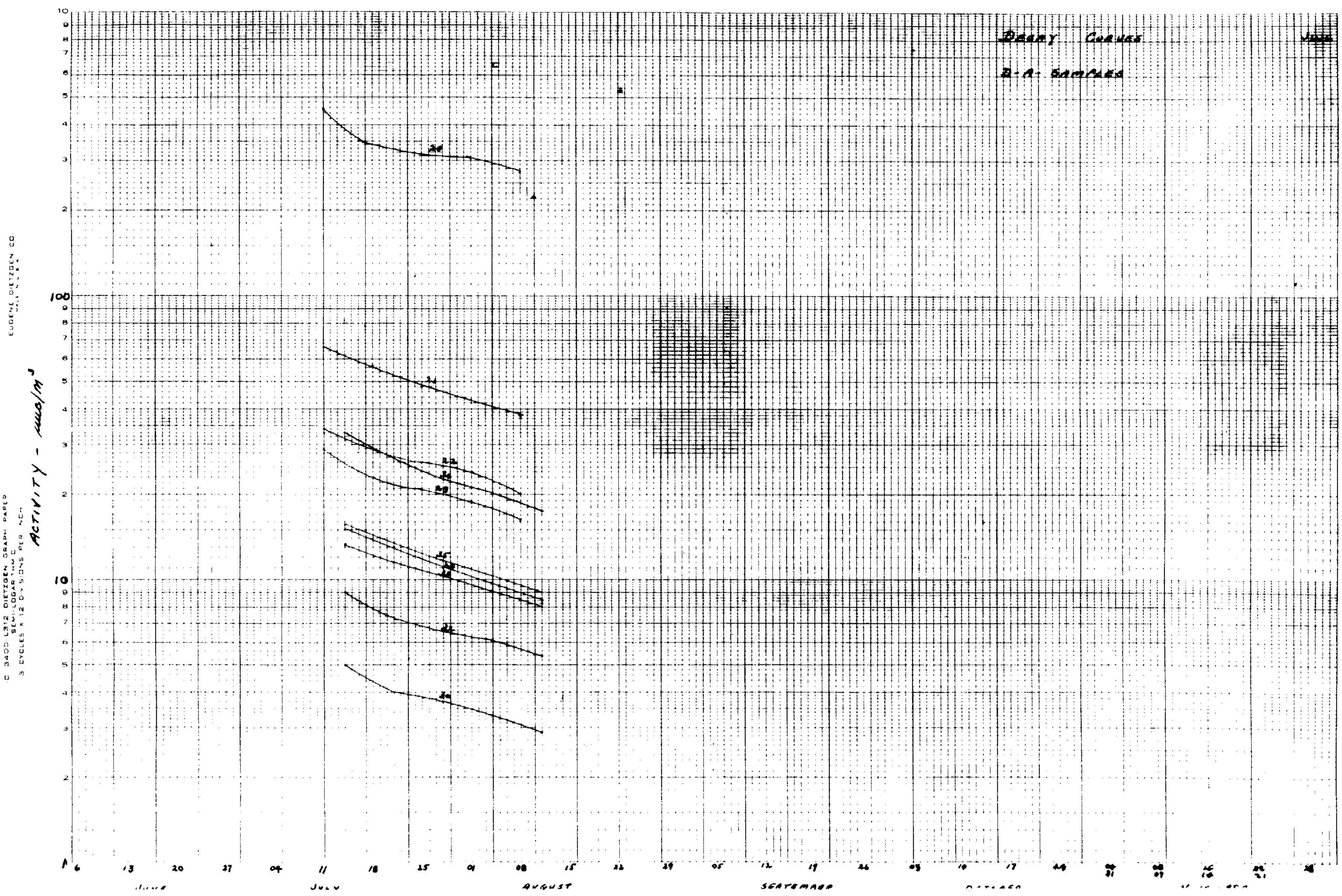

Decay Curves
A-A- Samples
Activity - mμc/mg
EUGENE DIETZGEN CO
SEMI-LOGARITHMIC
5 CYCLES X 12 DIVISIONS PER INCH



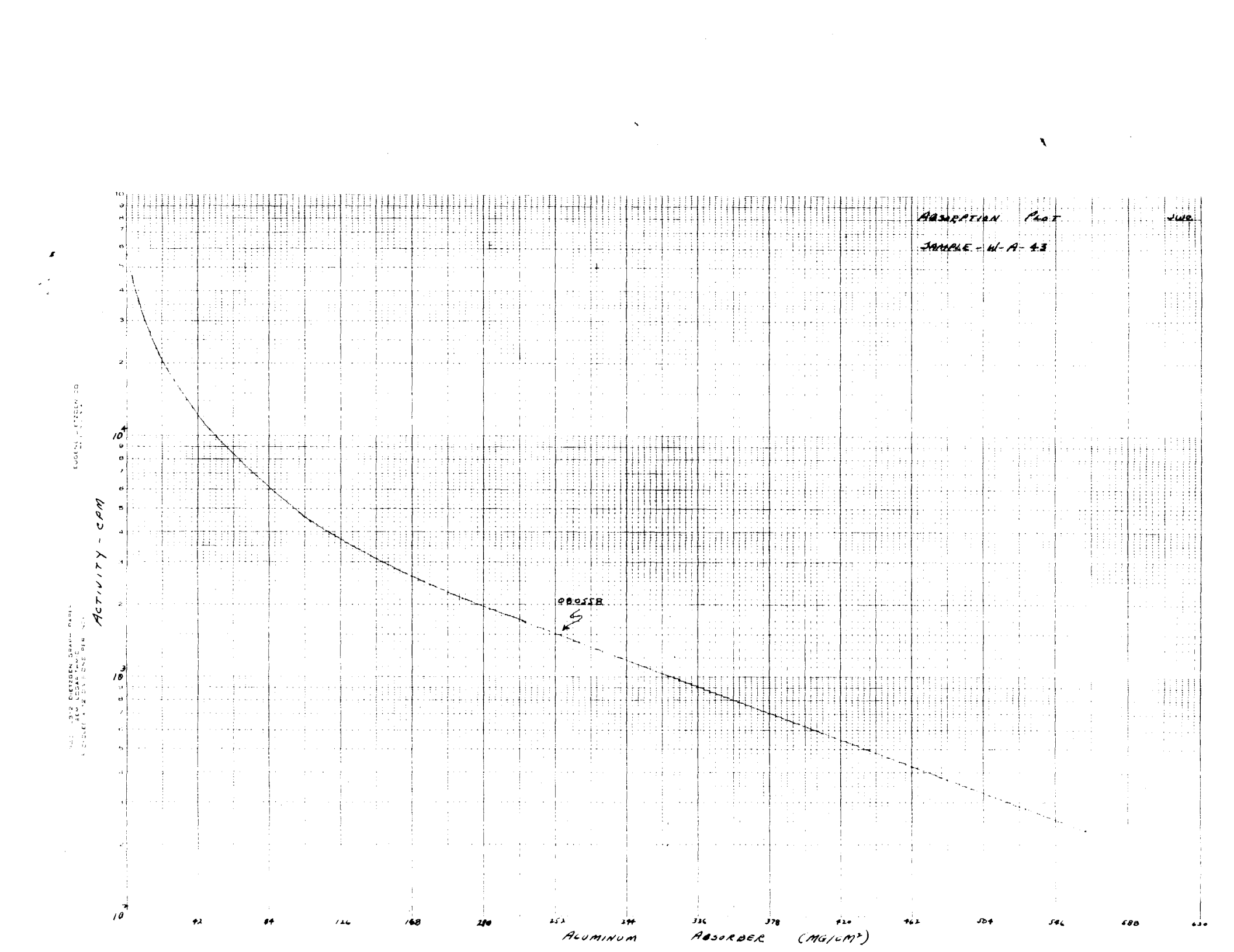
DECAY CURVES
F-A SAMPLES
JWC
ACTIVITY - μμc/M³
33
34
35
31
36
24
28
22
29
26
25
10 340G-L3-2 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 12 DIVISIONS PER INCH
EUGENE DIETZGEN CO

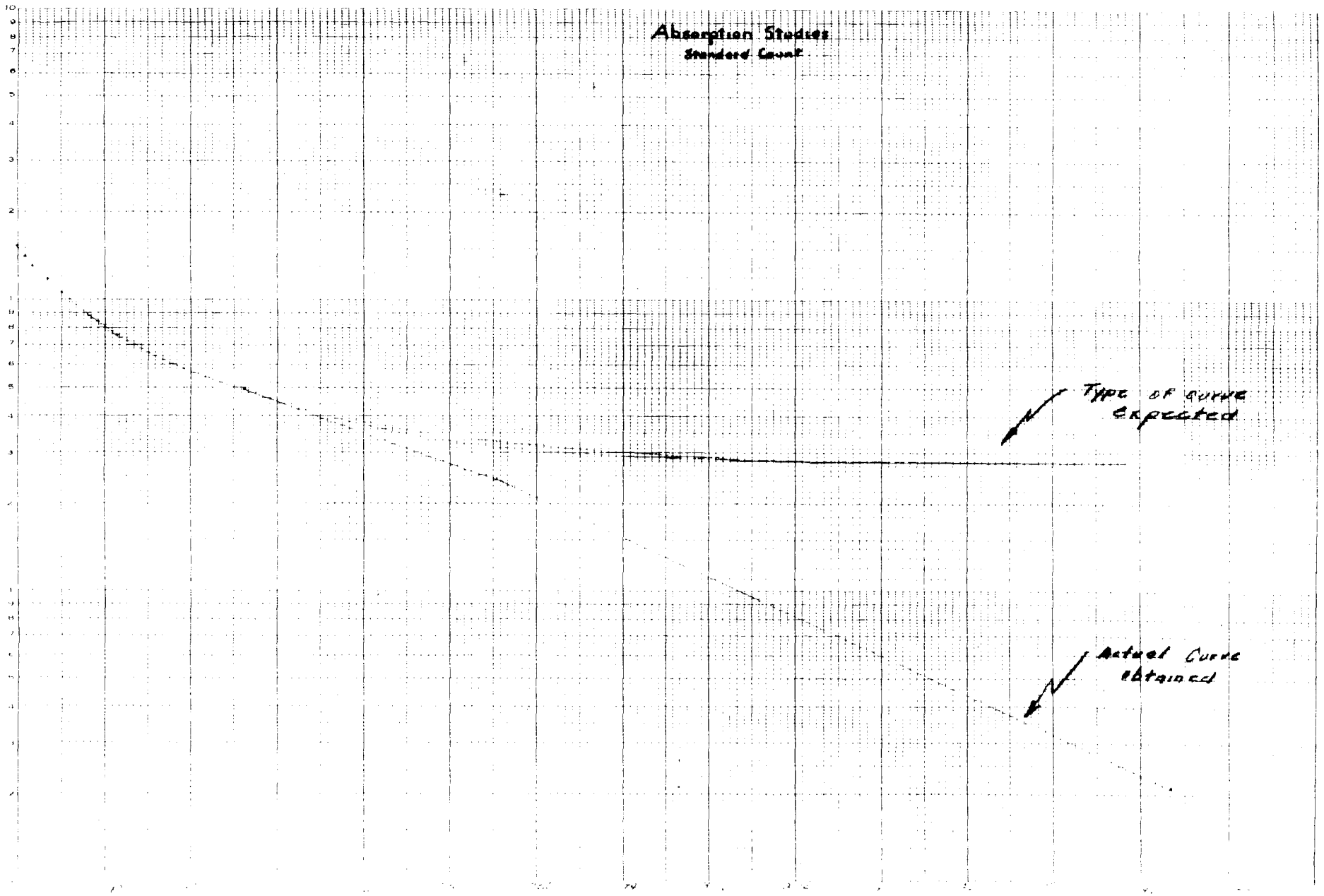

DECAY CURVES
E-A- SAMPLES
ACTIVITY - mμc/m³

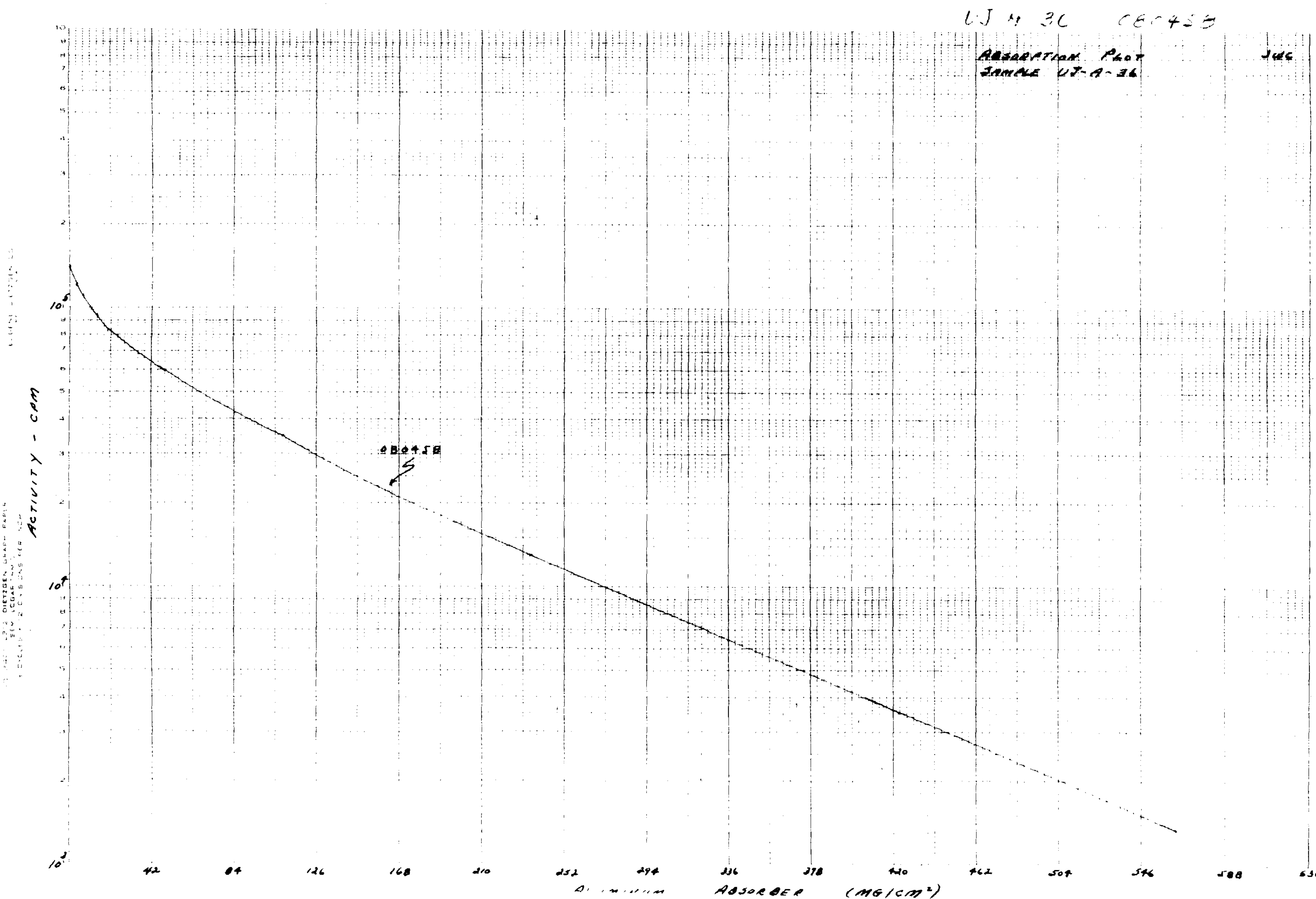


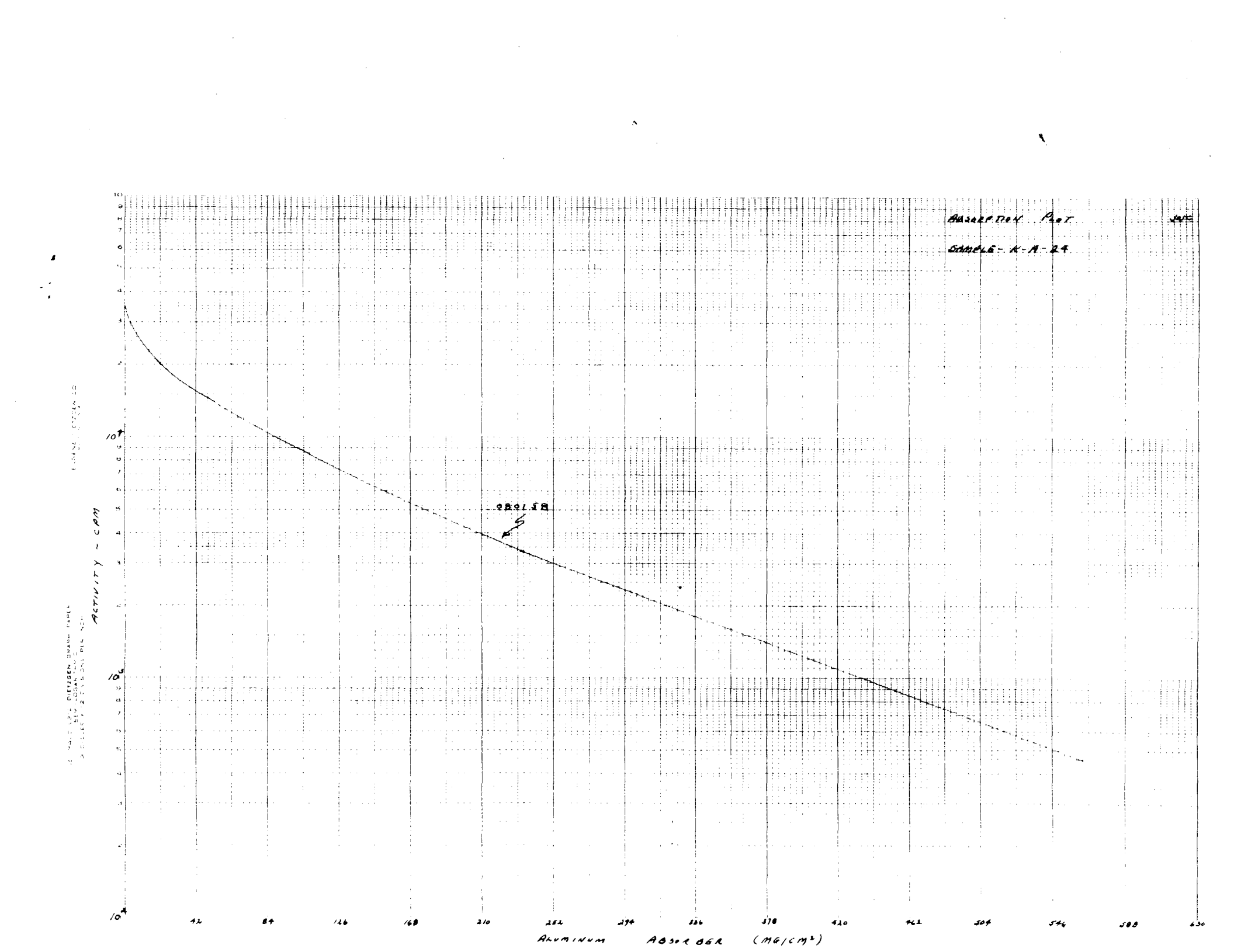


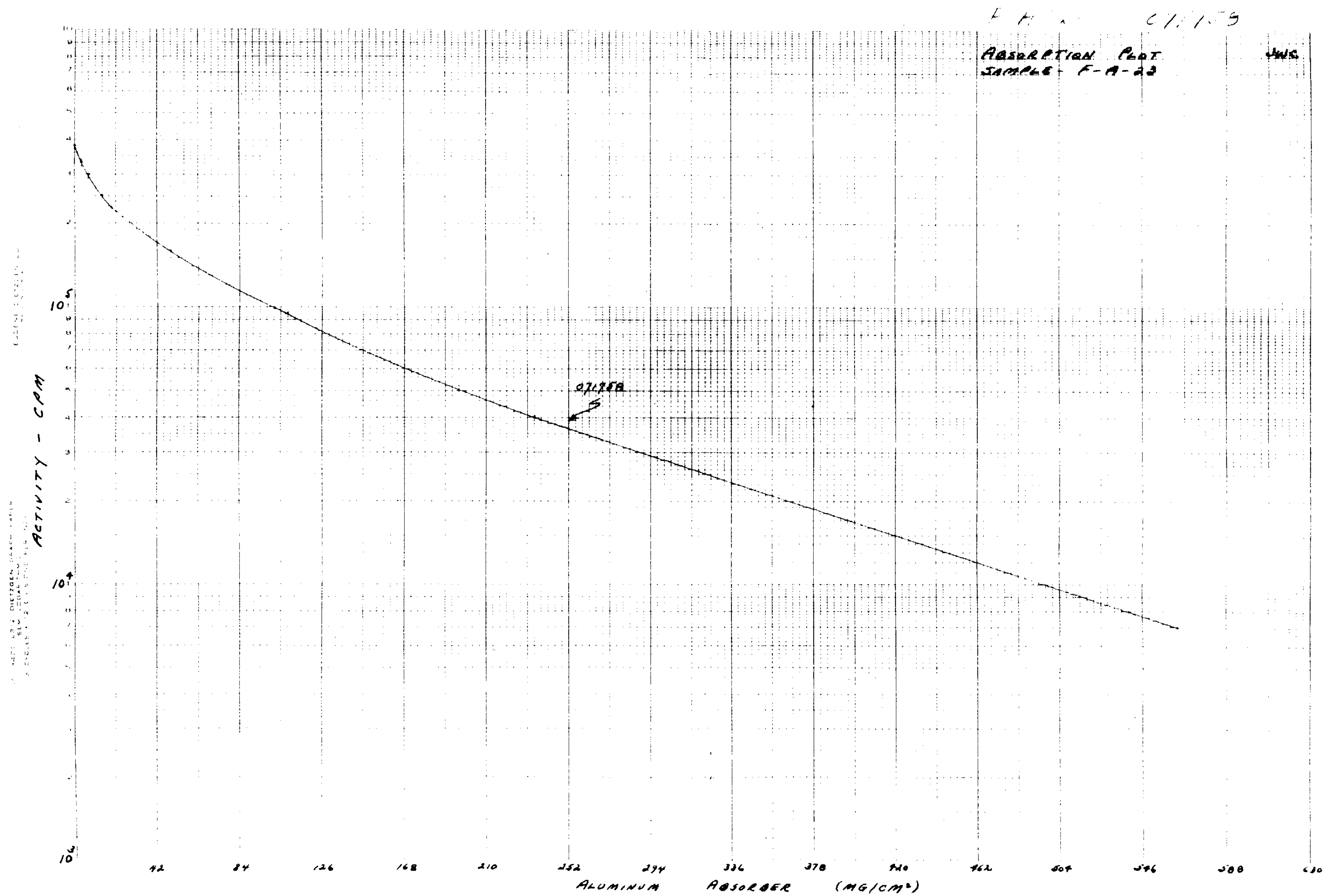
DECAY CURVES
B-A SAMPLES
ACTIVITY - μμc/m³
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
C 3400-L312 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 12 DIVISIONS PER INCH
EUGENE DIETZGEN CO.


ABSORPTION PLOT
SAMPLE - W-A- 4.3
ACTIVITY - CPM
ALUMINUM ABSORBER (MG/CM²)
42
84
126
168
210
252
294
336
378
420
462
504
546
588
630


Absorption Studies
Standard Count
Type of curve expected
Actual Curve obtained

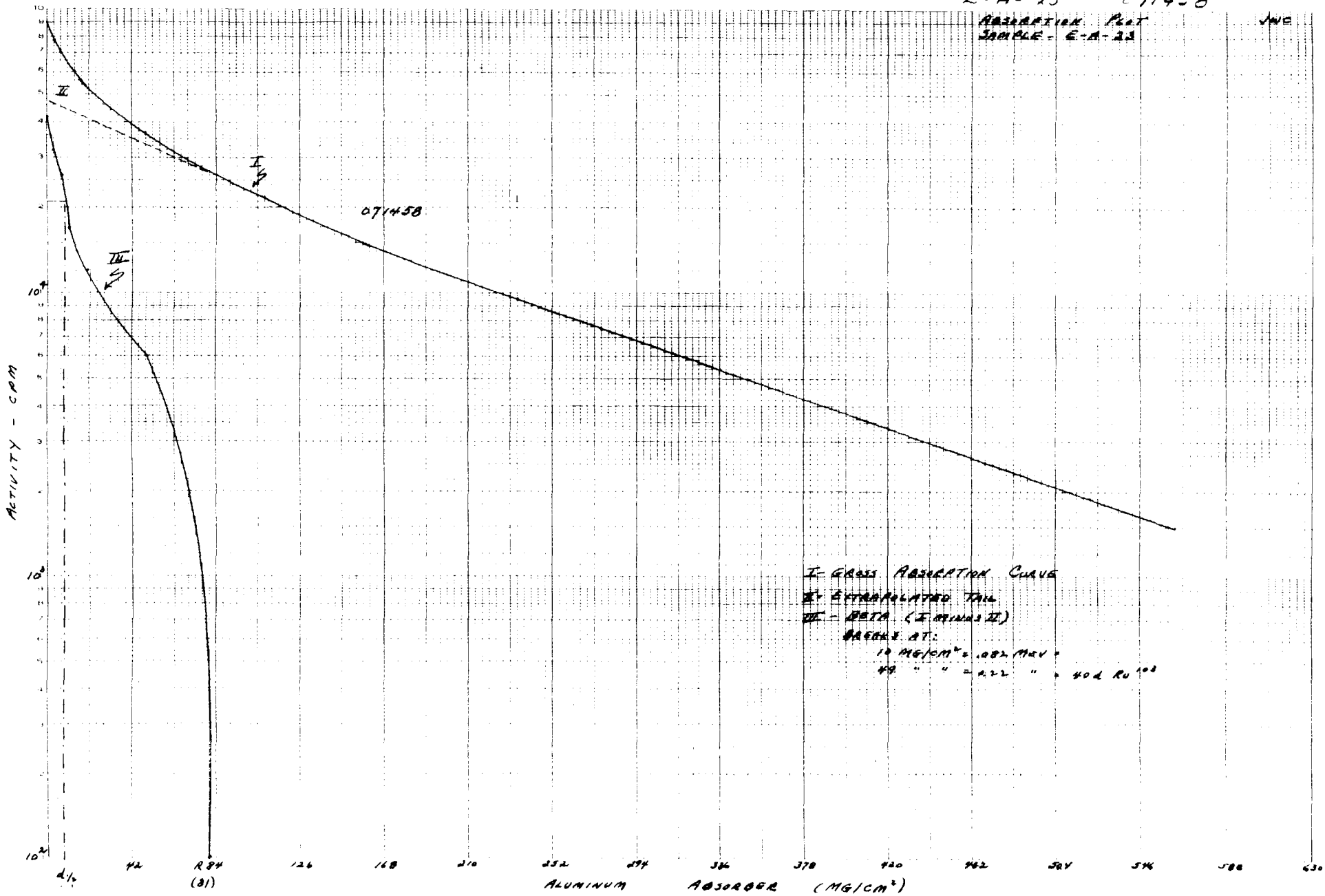

UJ M 3C CE0453
ABSORPTION PLOT
SAMPLE UJ-A-36
JWC
0B0458
ACTIVITY - CPM
10^5
10^4
10^3
42
84
126
168
210
252
294
336
378
420
462
504
546
588
630
ALUMINUM ABSORBER (MG/CM²)

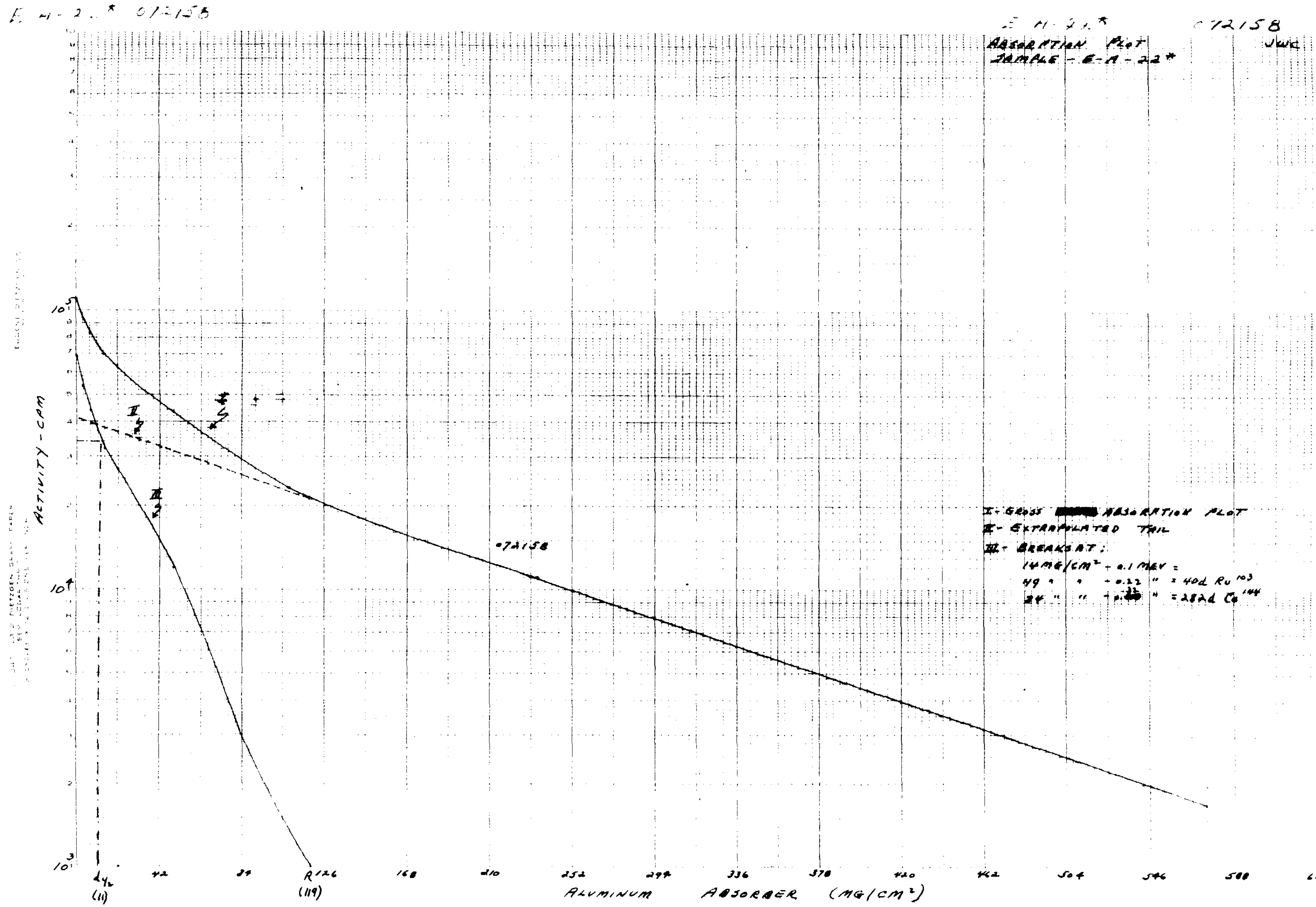

ABSORPTION PLOT
SAMPLE - K-A-24
ACTIVITY - CPM
ALUMINUM ABSORBER (MG/CM²)
42
84
126
168
210
252
294
336
378
420
462
504
546
588
630


ABSORPTION PLOT
SAMPLE - F-A-22
JWS
071958
ACTIVITY - CPM
ALUMINUM ABSORBER (MG/CM²)
42
84
126
168
210
252
294
336
378
420
462
504
546
588
630

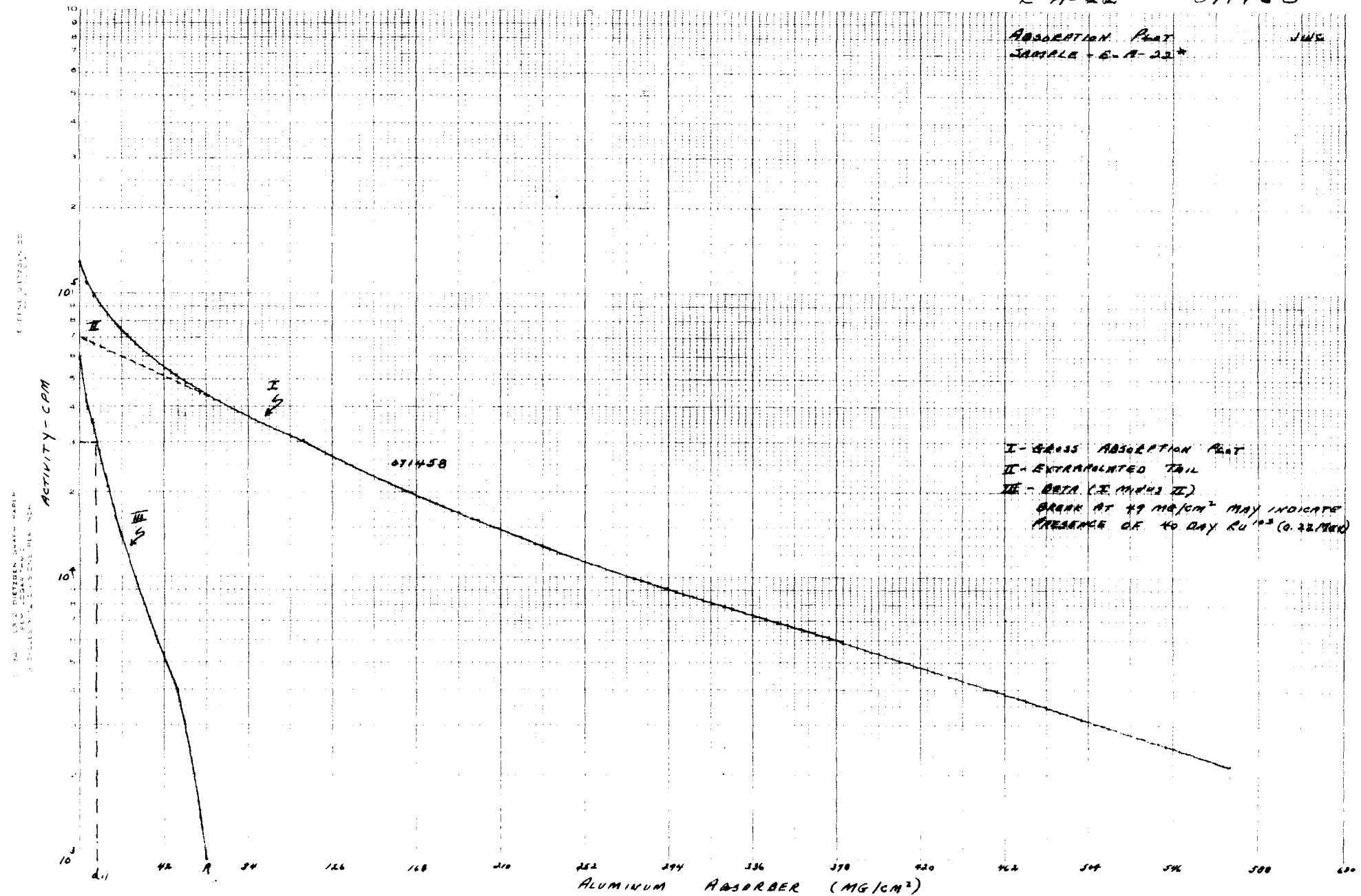
E-M-23 071458

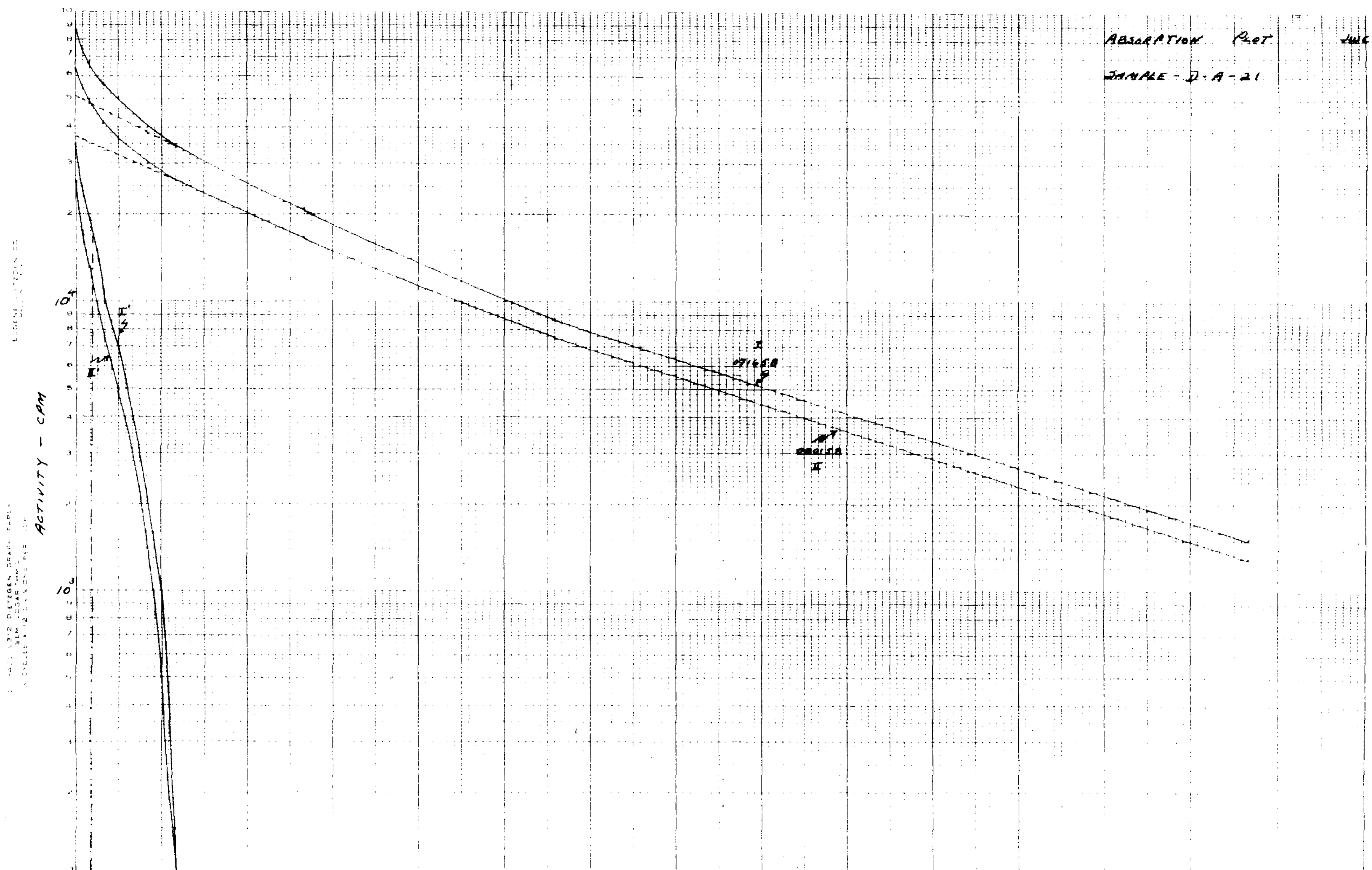
ABSORPTION PLOT
SAMPLE - E-M-23




E-M-2.* 072158
E-M-2.* 072158
JWC
ABSORPTION PLOT
SAMPLE - E-M-22*
I - GROSS [redacted] ABSORPTION PLOT
II - EXTRAPOLATED TAIL
III - BREAKS AT:
14 MG/CM² → 0.1 MEV =
49 " " → 0.22 " = 40d Ru 103
84 " " → " = 282d Ce 144
072158
ACTIVITY - CPM
ALUMINUM ABSORBER (MG/CM²)
R 126
(119)
(11)

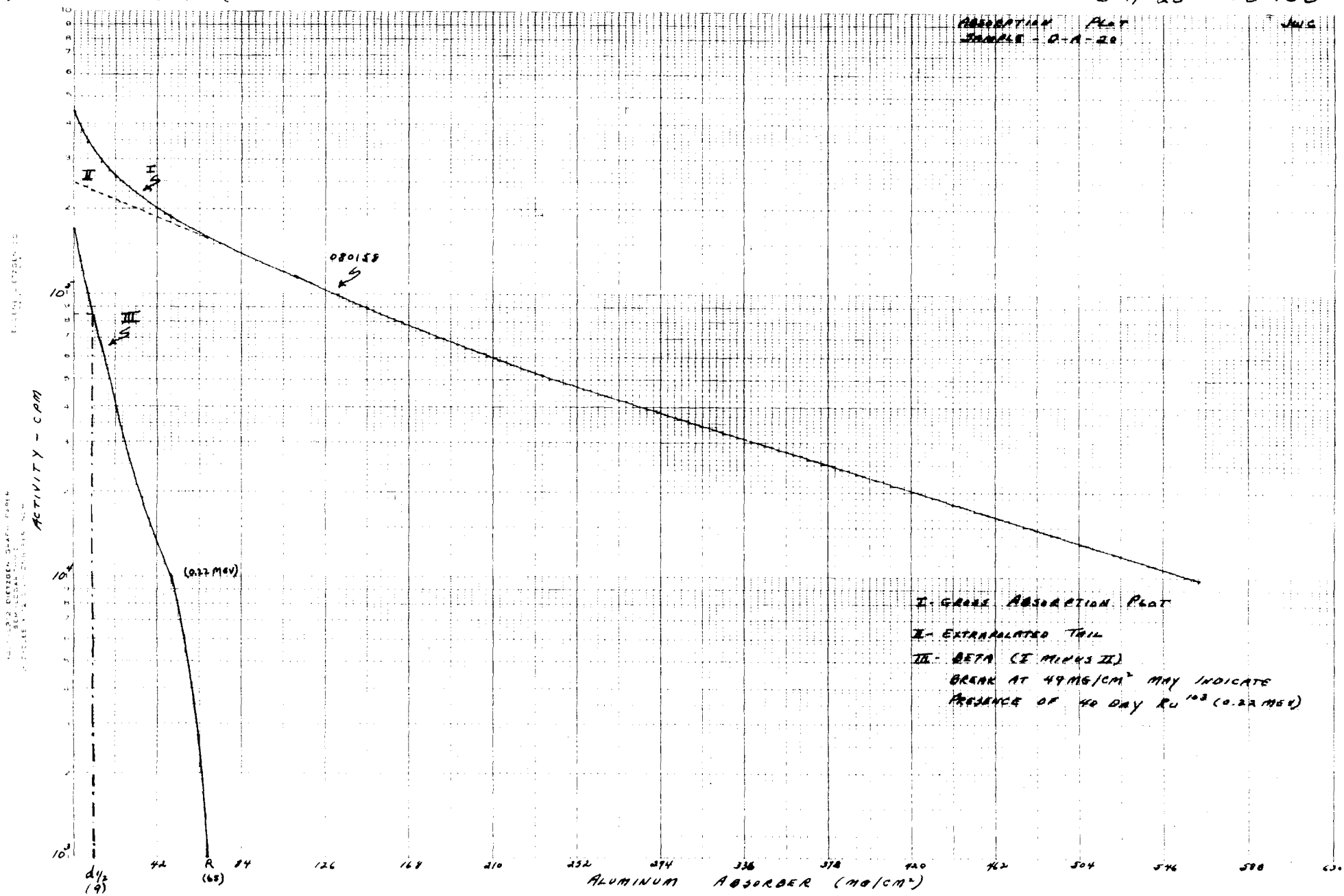
E-H-22* 071458


E-H-22* 071458
ABSORPTION PLOT
SAMPLE - E-H-22*
JWE
ACTIVITY - CPM
ALUMINUM ABSORBER (MG/CM²)
I
II
III
071458
I - GROSS ABSORPTION PLOT
II - EXTRAPOLATED TAIL
III - BETA (I MINUS II)
BREAK AT 49 MG/CM² MAY INDICATE PRESENCE OF 40 DAY Ru 10⁶ (0.22 MEV)
d.11
R
42
84
126
168
210
252
294
336
378
420
462
504
546
588
630



ABSORPTION PLOT
SAMPLE - D-A-21
ACTIVITY - CPM
ALUMINUM ABSORBER (MG/CM²)

D-A-20 080158


ABSORPTION PLOT
SAMPLE - D-A-20
080158
II
III
(0.22 MEV)
ACTIVITY - CPM
ALUMINUM ABSORBER (MG/CM²)
d1/2 (9)
R (65)
42
84
126
168
210
252
294
336
378
420
462
504
546
588
630
I - GROSS ABSORPTION PLOT
II - EXTRAPOLATED TAIL
III - BETA (I MINUS II)
BREAK AT 49 MG/CM² MAY INDICATE
PRESENCE OF 40 DAY Ru 106 (0.22 MEV)

Title: Absorption Studies

Purpose: Investigation of data accumulated during operation Plumbbob to check on usefulness of data in the identification of Beta emitters. Also to correlate Absorption with decay studies in attempt to explain observed differences in type of detonation.

Procedure: Semi-log plots are to be made of activity in cpm vs mg/cm² of Aluminum absorber thickness. An extrapolated tail of the decay plot would give the non Beta energies. A graphic subtraction of the non-Beta emitters from the gross cpm would give the Beta curve. The observed change in slopes in the Beta curve would indicate a thickness of absorber where certain Beta emitters were blocked out. A correlation would then be check for the equivalent mev that such a thickness of Aluminum would stop. By the determination of the mev a possible single Beta emitter could be chosen which was characterized by the mev determined.

Two locations, WT and LM, were shown on plume results of ~~Shot 7. Ammi...~~. Shot 8.

C. Preliminary Observations

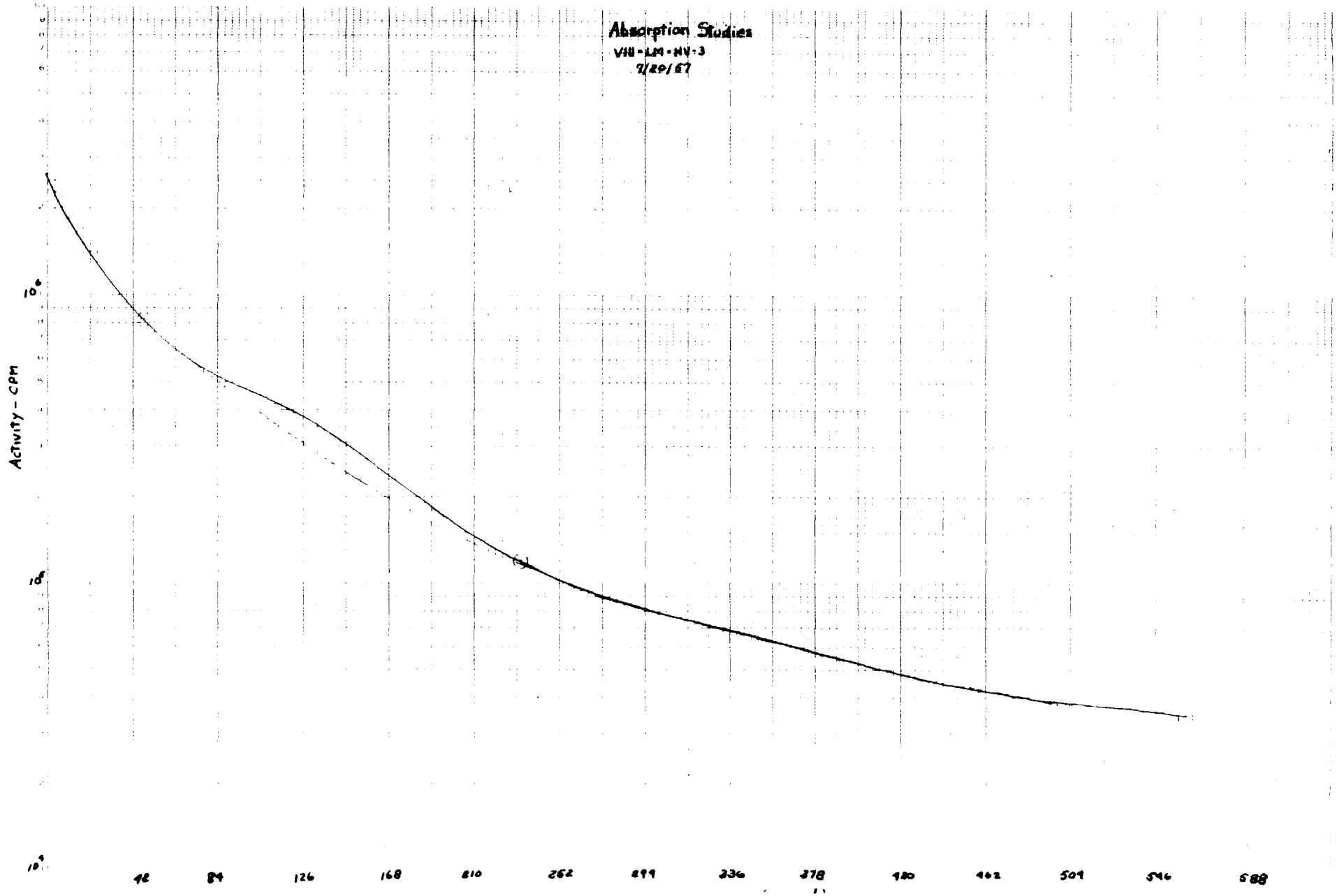
It has been observed from the ~~plotted~~ semi log plotted values that the curve does not reach a ~~flat~~ lower Dose flattening point. Such a flattening is characteristic at the values of absorbers ~~that~~ thick enough to stop all Beta particles, where the remaining activity is due solely to Gamma energies, and possibly X-Rays. This is in part due to a insufficient number of absorbers ~~being used~~ to define the curve.

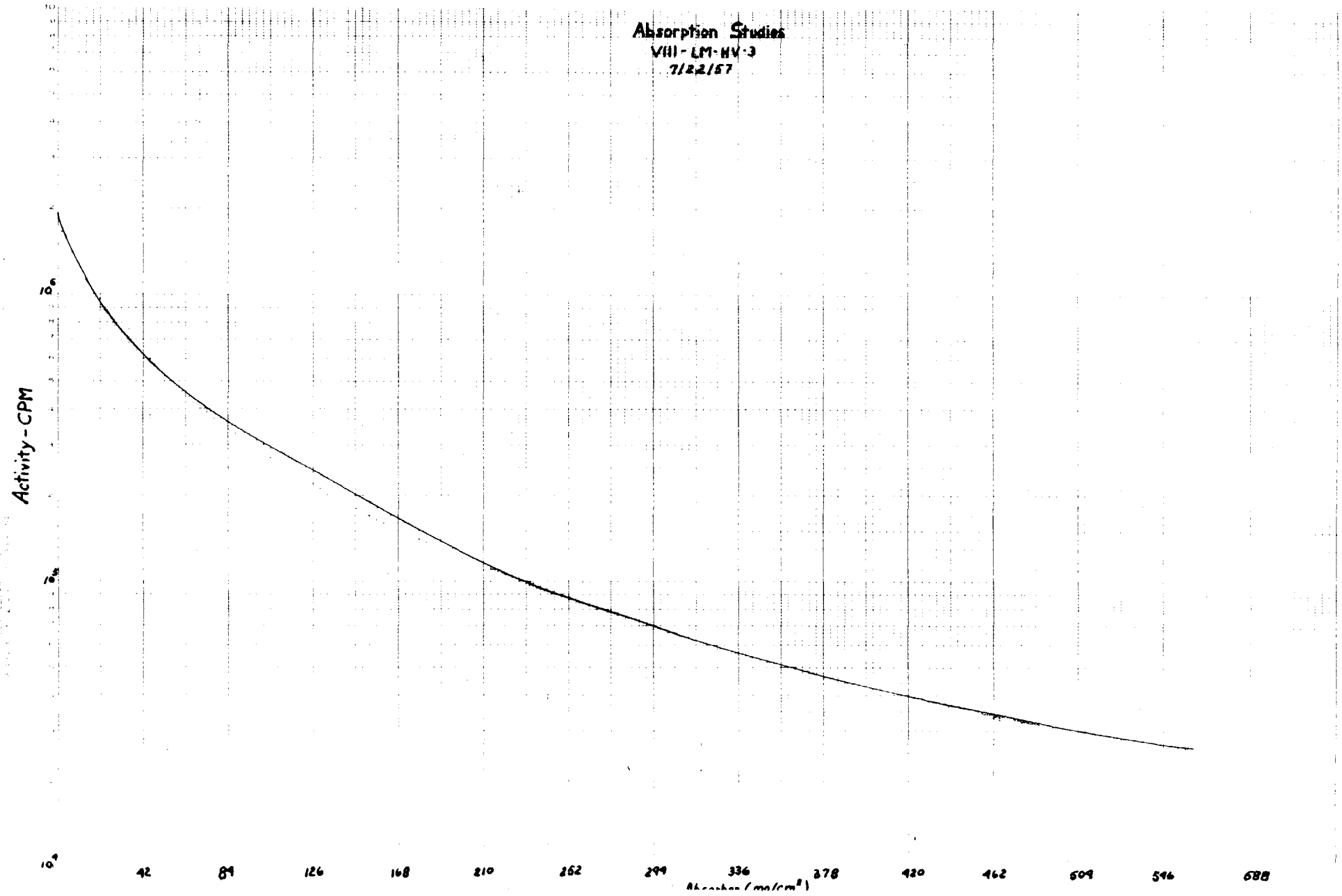
D. Proposal

Due to the difficulties that has arisen from the plots it has been decided to eliminate Gamma radiation before plotting the plots.

Absorbtion Data

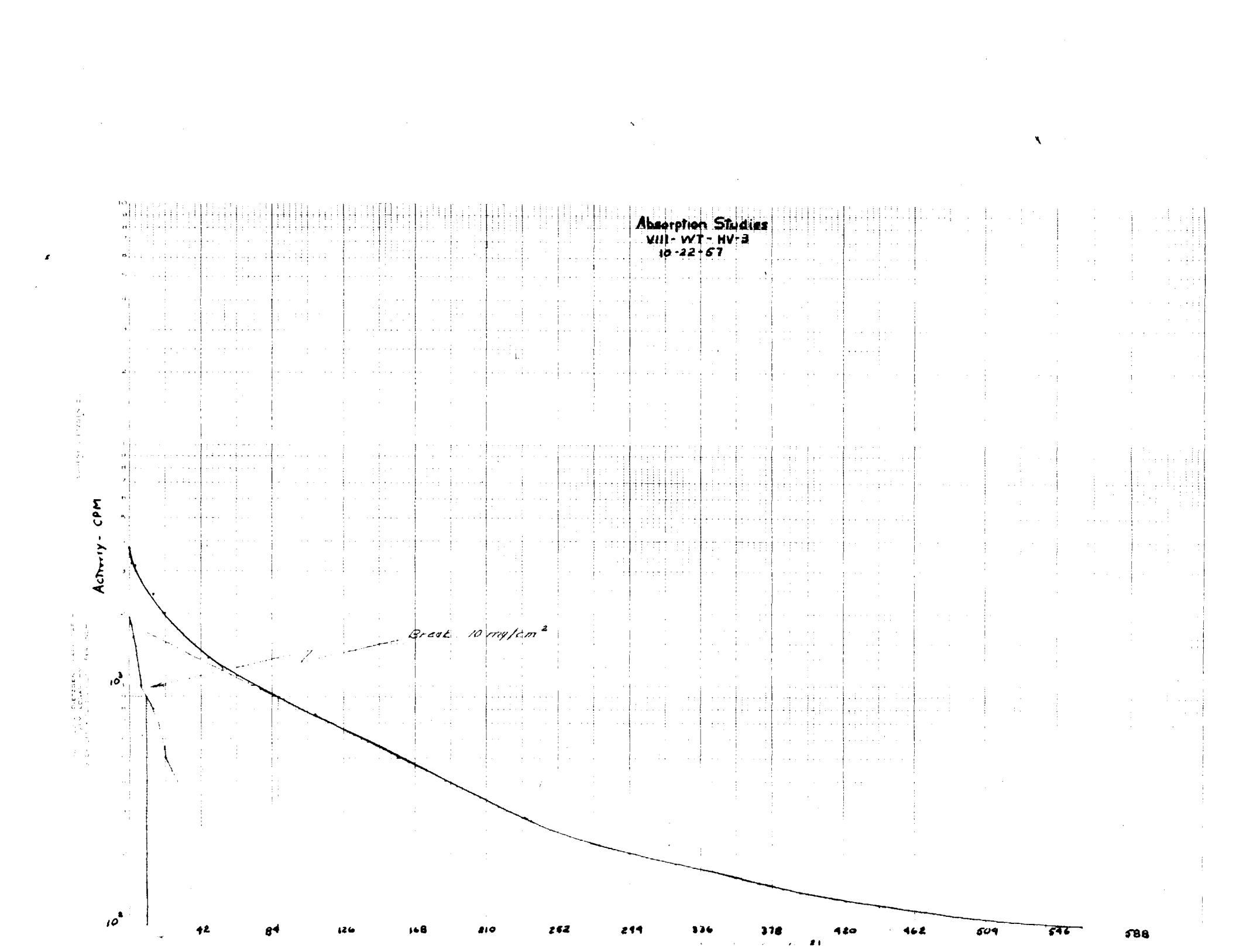
Sample	Date Counted	Time Counted	Absorber Thickness	CPM	Conversion Factor	Reduction % between thicknesses	Reduction % back thickness
VIII-LM-HV-3	7/20/57	1205	0	2,631,234		—	—
		1207	.00035	2,365,147		10.1	10.1
		1208	.0005	2,286,881		3.3	13.1
		1209	.001	2,037,382		10.9	22.6
		1210	.002	1,647,060		19.2	37.4
		1211	.003	1,407,139		14.6	46.5
		1213	.007	824,897		41.4	68.7
		1214	.016	431,331		47.7	83.6
		1215	.034	120,702		72.0	95.8
		1216	.082	34,898		71.2	98.6
	7/22/57	1512	0	1,901,211		—	—
		1513	.00035	1,682,278		11.5	11.5
		1514	.0005	1,602,076		4.8	15.8
		1515	.001	1,418,990		11.4	25.4
		1516	.002	1,136,050		20.0	40.2
		1517	.003	961,714		15.4	49.4
		1519	.007	565,534		41.2	78.2
		1520	.016	284,358		49.7	85.0
		1521	.034	98,548		65.4	94.8
		1522	.082	26,576		73.2	98.6

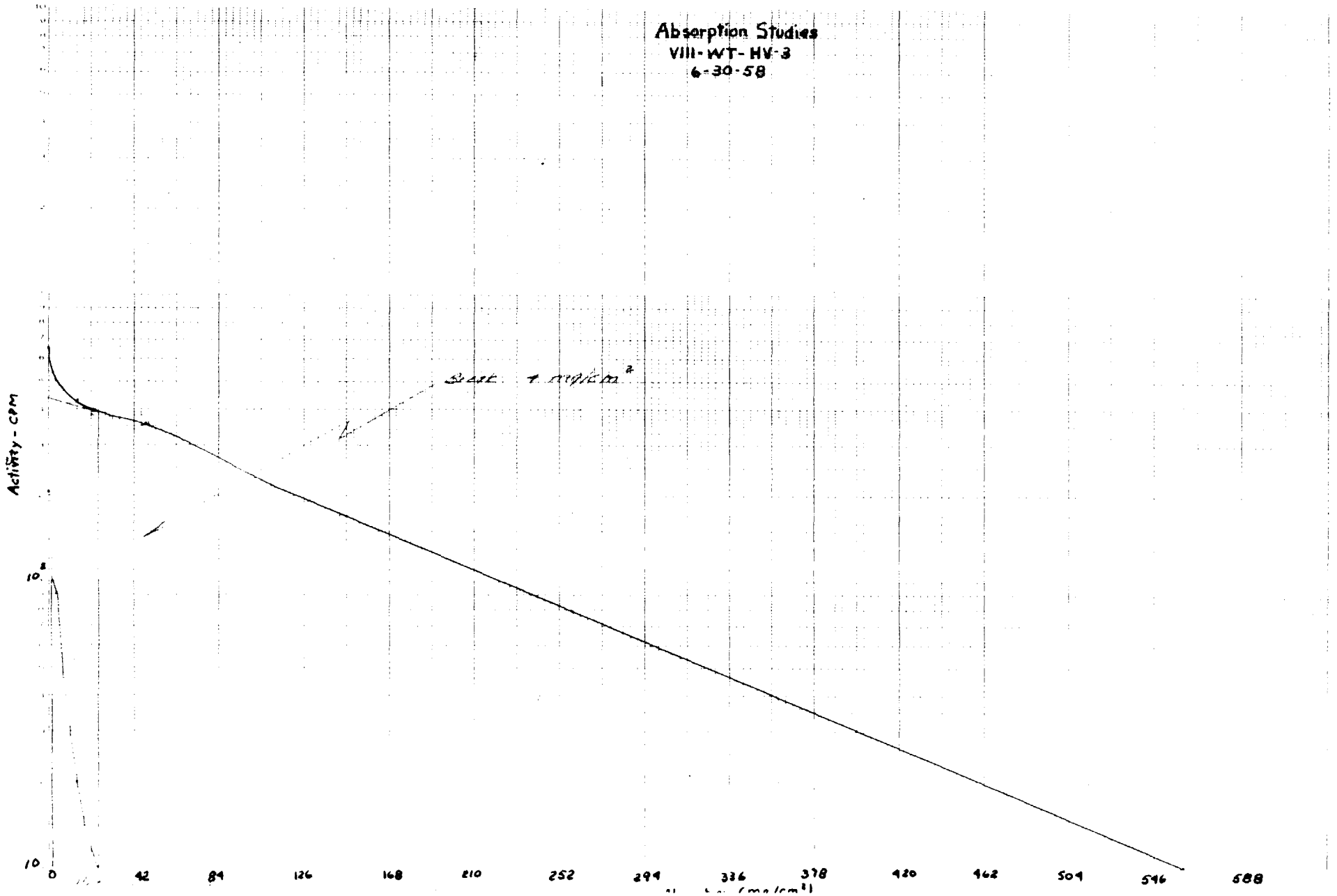

Absorption Studies
VIII-LM-NV-3
7/29/67
Activity - CPM
10^6
10^5
10^4
42
84
126
168
810
262
294
336
378
420
462
504
546
588


Absorption Studies
VIII - LM - HV - 3
7/22/57
Activity - CPM
10^6
10^5
10^4
42
84
126
168
210
252
294
336
378
420
462
504
546
588

Absorption Data

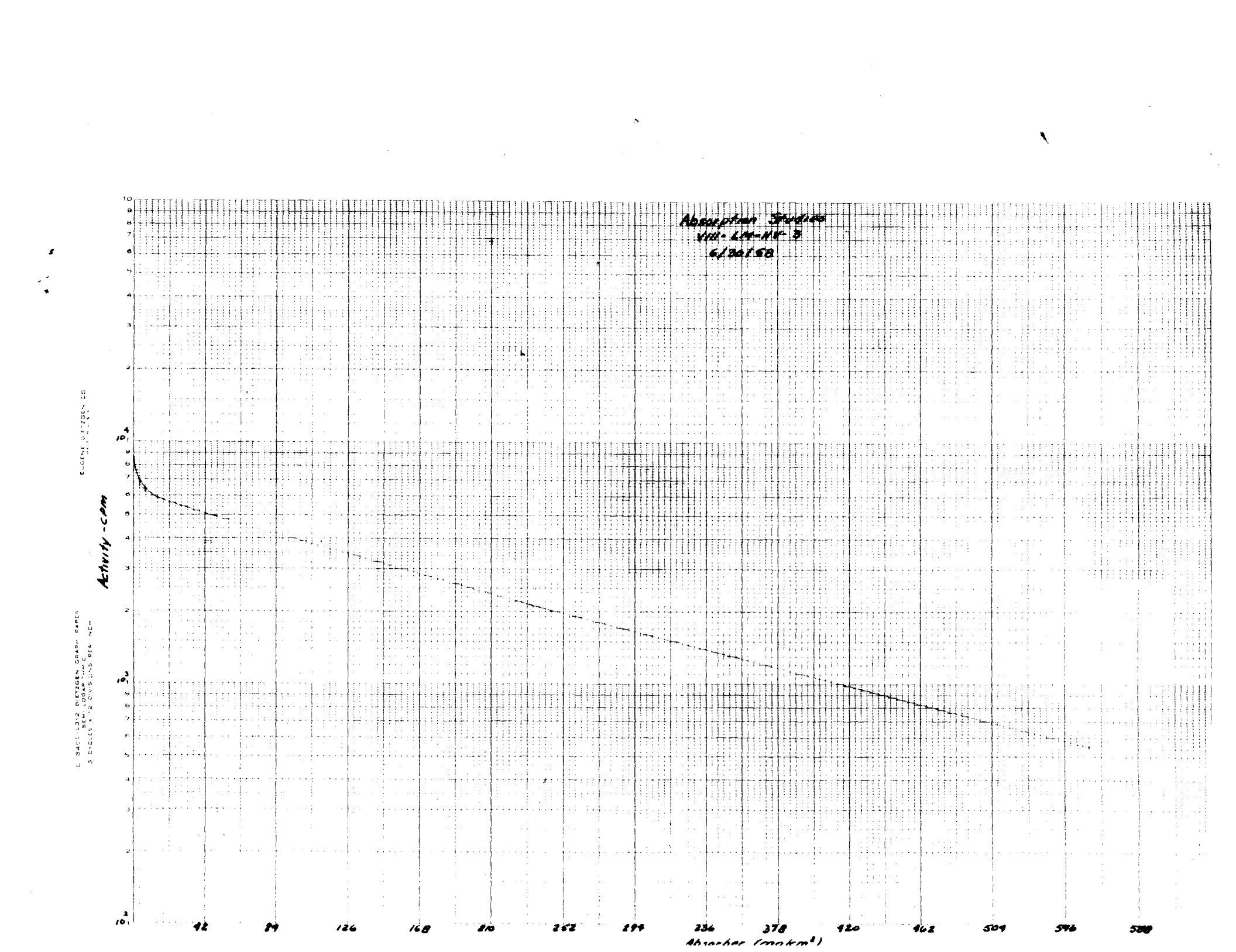
Sample	Date Counted	Time Counted	Absorber Thickness	CPM	Conversion Factor	Reduction % between thicknesses	Reduction % each thickness
VIII-WT-HV-3	10/22/57	1423	0	3,772		—	—
		1424	.00035	3,223		14.6	14.6
		1425	.0005	3,198		.8	15.2
		1430	.001	2,763		13.6	26.8
		1431	.002	2,408		12.9	36.2
		1433	.003	2,059		14.5	45.4
		1434	.007	1,343		34.8	64.5
		1436	.016	763		43.2	79.8
		1437	.034	289		62.1	92.4
		1438	.082	0		—	—
	6/30/58		0	646		—	—
			.0005	529		18.1	18.1
			.001	510		3.6	21.0
			.002	433		15.1	33.0
			.003	380		12.2	41.2
			.007	356		6.3	44.9
			.016	215		39.6	66.7
			.034	93		56.7	85.5
			.082	—		—	—

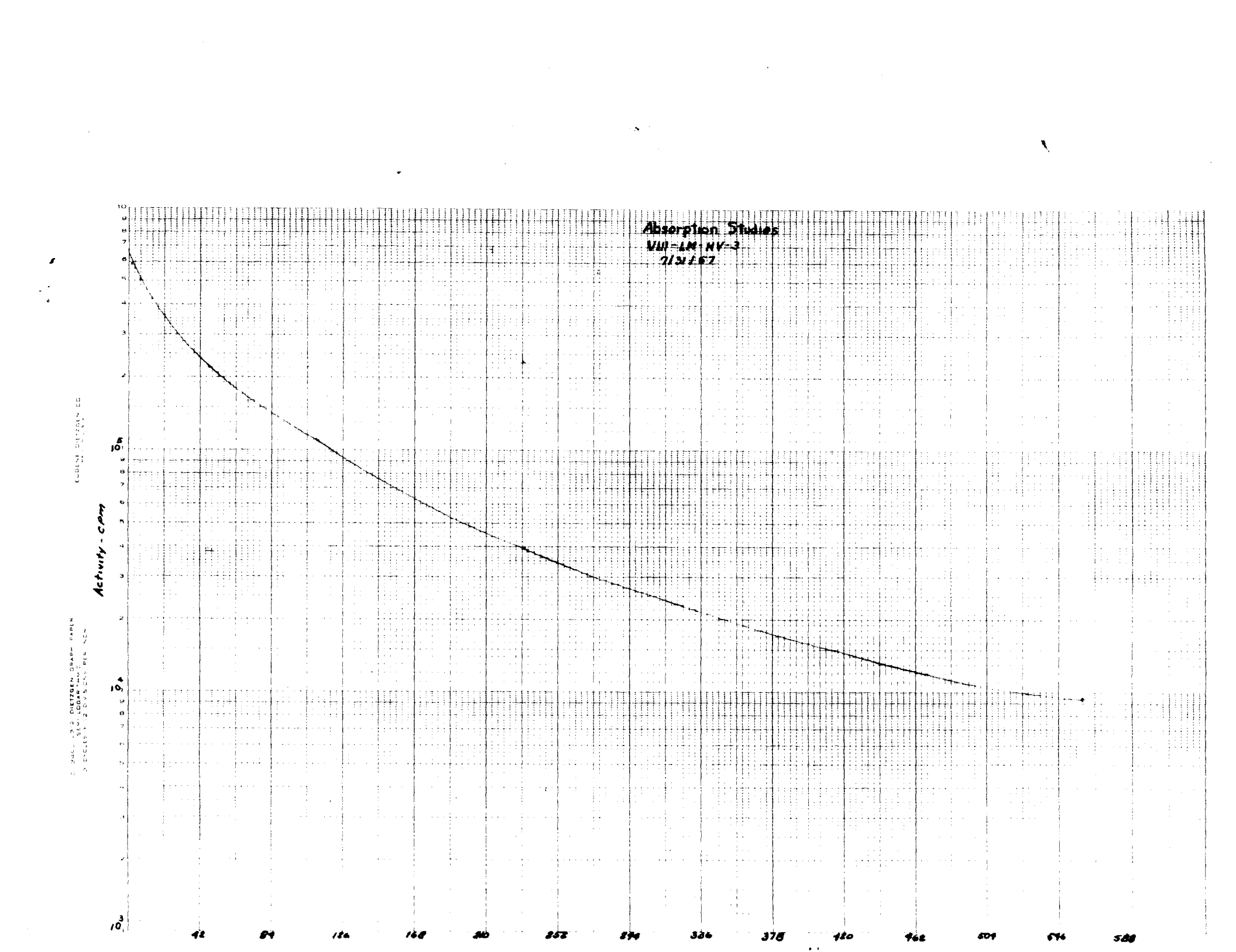

Absorption Studies
VIII - WT - HV-3
10-22-67
Activity - CPM
Break 10 mg/cm²
10³
10²
42
84
126
168
210
252
294
336
378
420
462
504
546
588

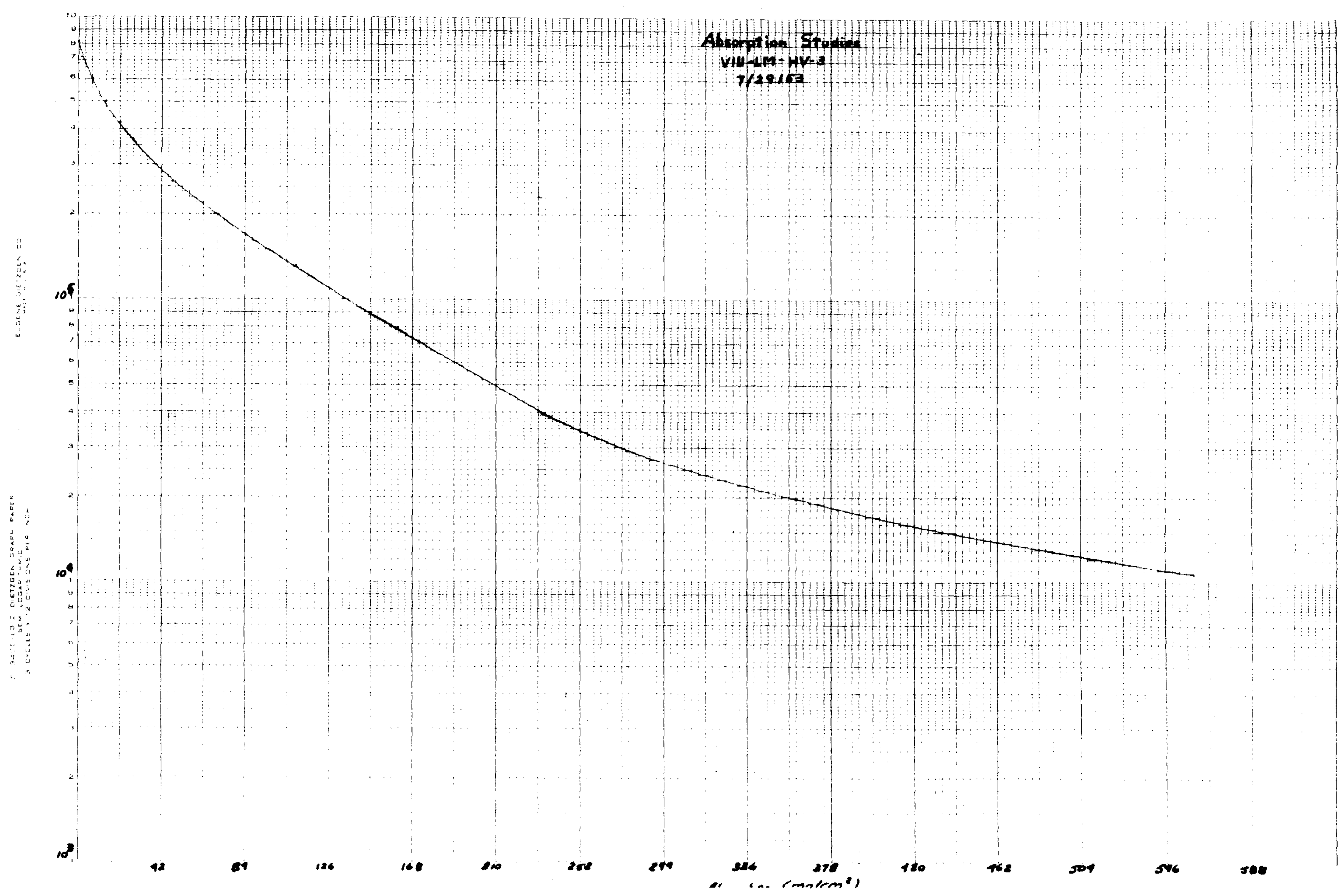

Absorption Studies
VIII-WT-HV-3
6-30-58
Activity - CPM
10³
10
0
42
84
126
168
210
252
294
336
378
420
462
504
546
588

Absorbtion Data

Sample	Date Counted	Time Counted	Absorber Thickness	CPM	Conversion Factor	Reduction % between thicknesses	Reduction % each thickness
VIII-LM-HV-3	7/29/57	1536	C	800,700		—	—
		1537	.00035	711,633		11.1	11.1
		1538	.0005	682,582		4.1	14.8
		1540	.001	608,686		10.8	24.0
		1541	.002	497,549		18.3	37.9
		1542	.003	428,786		13.8	46.5
		1543	.007	259,074		39.6	67.7
		1545	.016	132,446		48.8	83.5
		1546	.034	39,246		70.3	95.2
		1547	.082	10,835		72.5	98.8
	7/31/57	1036	0	672,559		—	—
		1227	.00035	593,142		11.8	11.8
		1229	.0005	570,093		3.9	15.2
		1230	.001	511,664		10.2	23.9
		1231	.002	419,677		18.0	37.6
		1232	.003	362,917		13.5	46.6
		1233	.007	219,670		39.5	67.4
		1234	.016	110,625		49.7	83.6
		1236	.034	39,862		64.1	94.1
		1237	.082	9,356		76.7	98.6

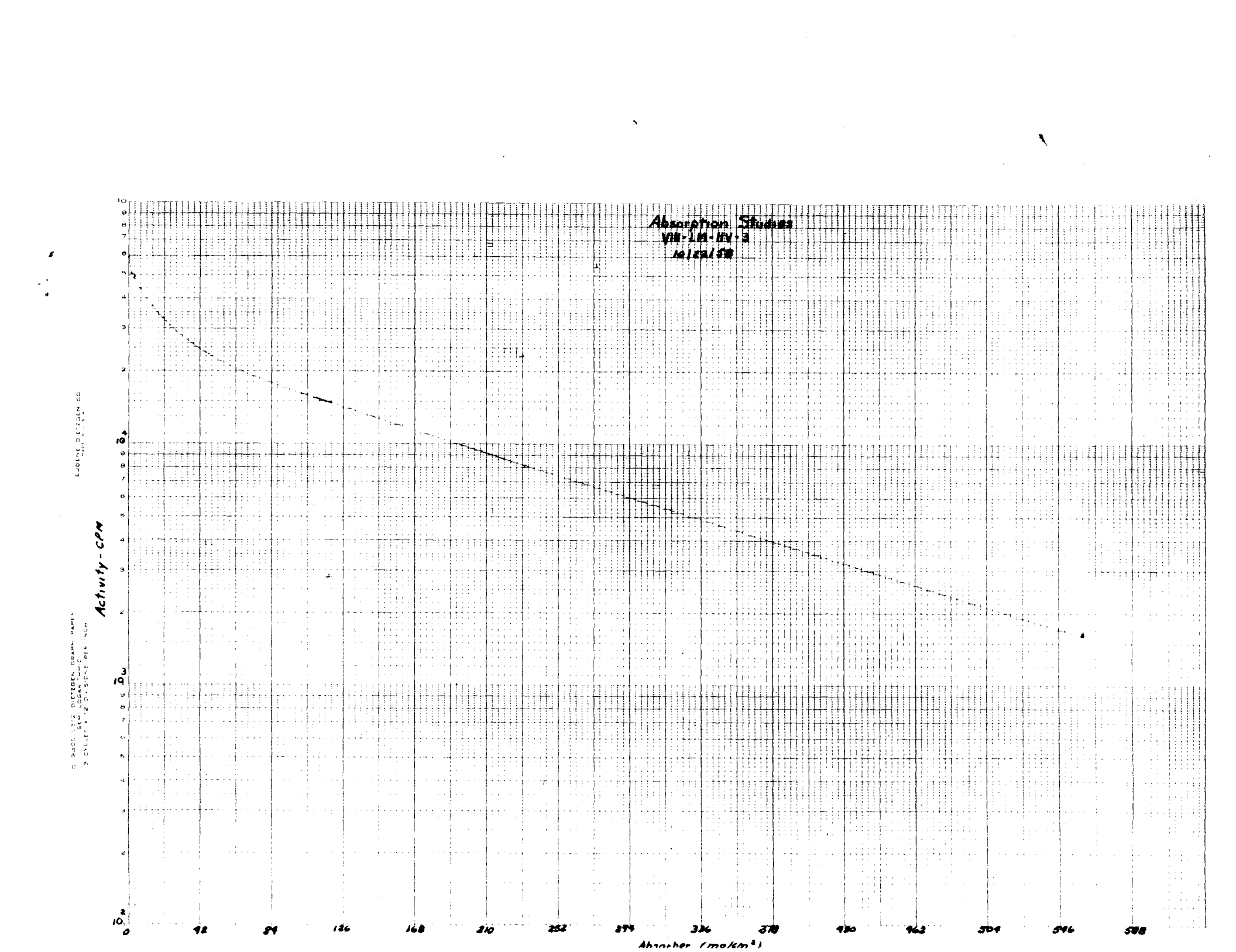

Absorption Studies
VIII-LM-MF-3
6/30/58
Activity - cpm
Absorber (mg/cm²)
42
84
126
168
210
252
294
336
378
420
462
504
546
588


Absorption Studies
VIII-LM-NV-3
7/31/67
Activity - cpm
42
84
126
168
210
252
294
336
378
420
462
504
546
588


Absorption Studies
VIII-LM-HV-3
7/29/63
42
84
126
168
210
252
294
336
378
420
462
504
546
588
(mg/cm²)

Absorbtion Data

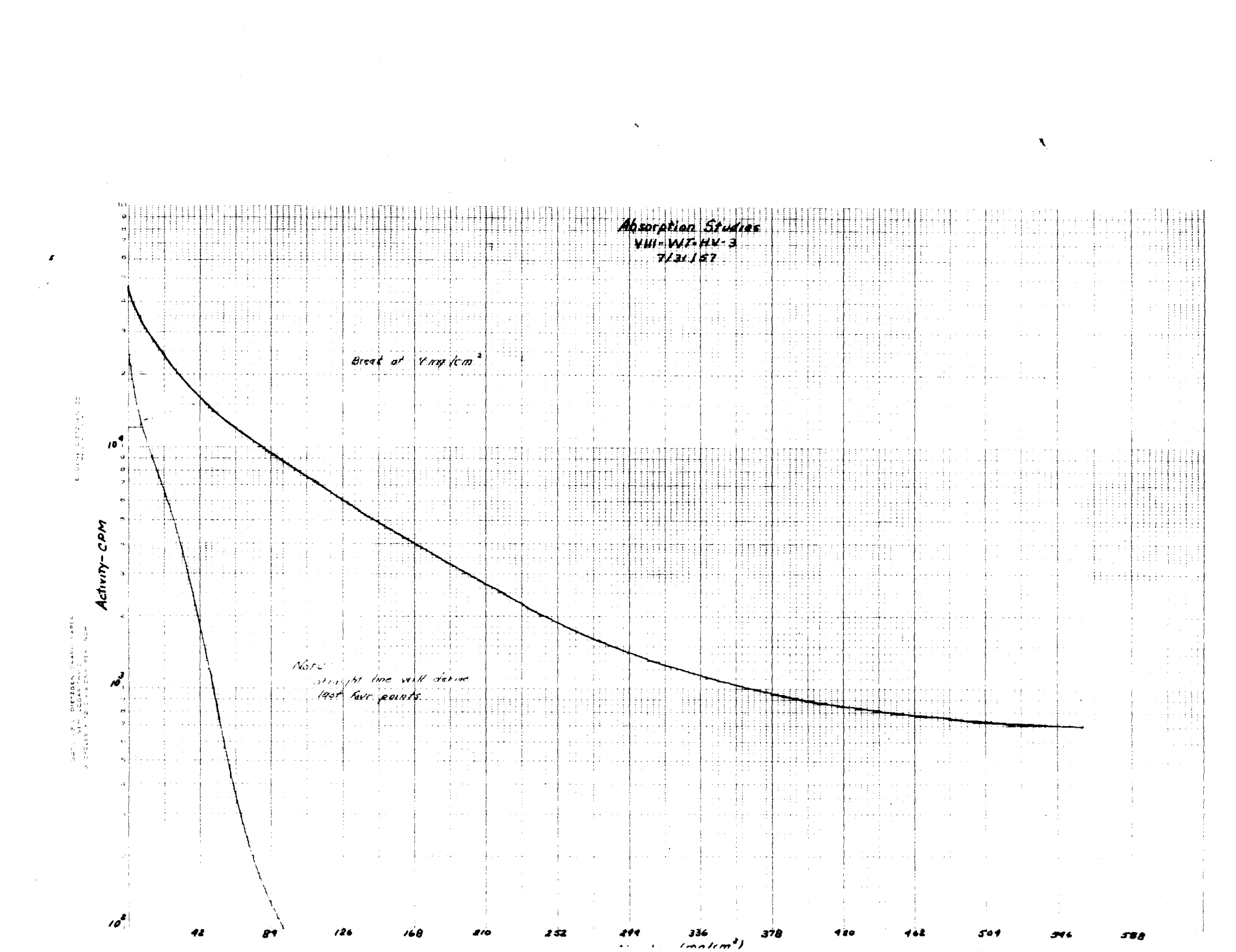
Sample	Date Counted	Time Counted	Absorber Thickness	CPM	Conversion Factor	Reduction % between thicknesses	Reduction % each thickness
VIII-LM-HV-3	10/22/57	1405	0	58,758		—	—
		1410	.00035	51,125		13.0	13.0
		1411	.0005	49,834		2.5	15.2
		1412	.001	44,337		10.0	24.6
		1414	.002	37,464		15.3	36.3
		1415	.003	33556		6.7	42.9
		1416	.007	23460		30.1	60.1
		1418	.016	15,691		33.0	73.3
		1419	.034	8,191		48.8	86.2
		1420	.082	1,602		80.5	97.2
	6/30/58	0900	0	8621		—	—
			.0005	7586		11.9	11.9
			.001	6812		10.3	21.0
			.002	6311		7.3	26.8
			.003	5986		5.1	30.6
			.007	4970		17.0	42.4
			.016	3796		23.6	56.0
			.034	2125		44.0	75.4
			.082	552		74.0	93.7


Absorption Studies
VIII-1M-HV-3
10/29/58
Activity - CPM
Absorber (mg/cm²)
0
42
84
126
168
210
252
294
336
378
420
462
504
546
588

Reduction

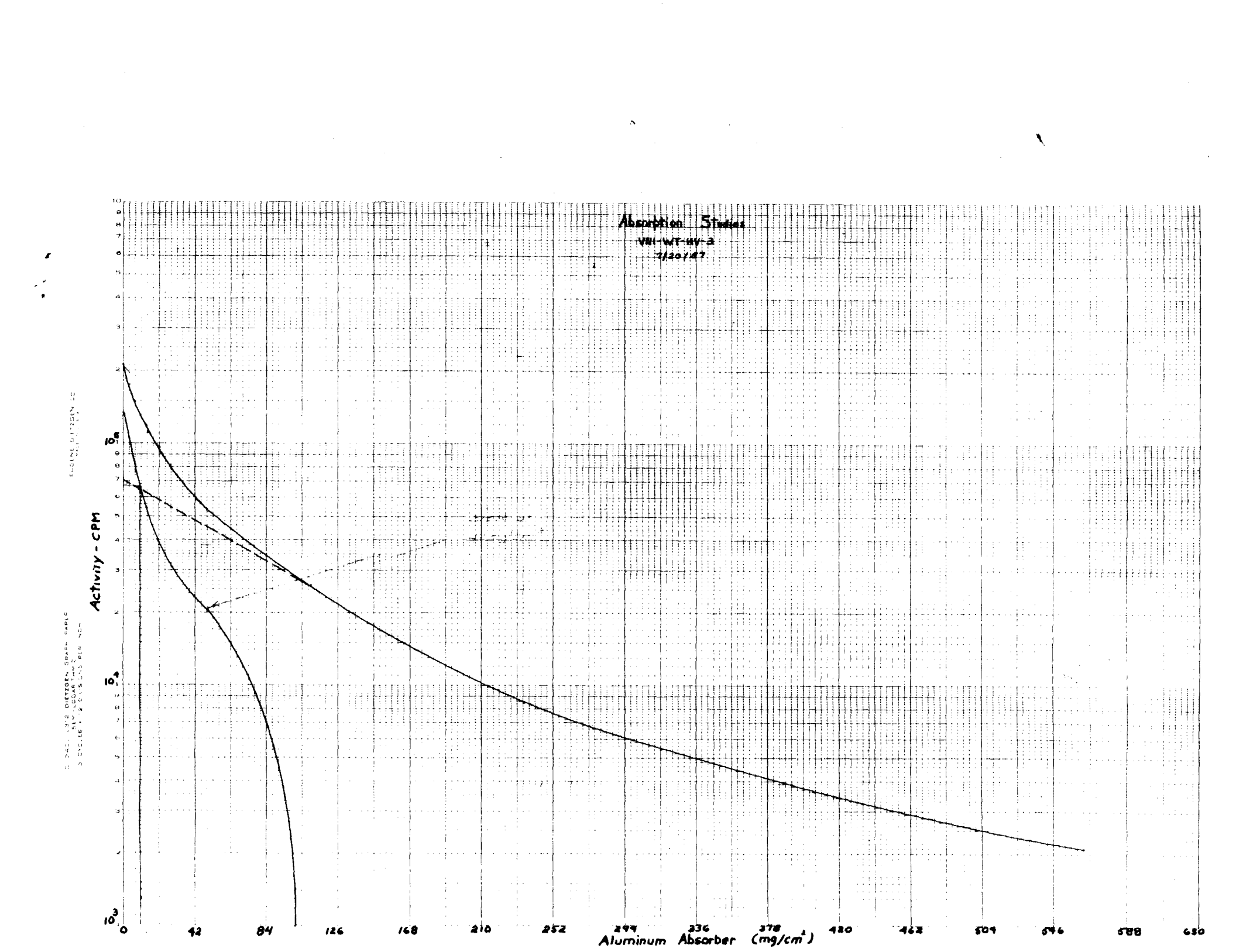
Sample	Date Counted	Time Counted	Absorber Thickness	CPM	Conversion Factor	% between thicknesses	% each thickness
VIII-WI-HV-3	7/29/57	1551	0	53,145		—	—
		1552	.00035	47,085		11.4	11.4
		1553	.0005	44,841		4.7	15.6
		1554	.001	39,594		11.7	25.5
		1556	.002	31,714		19.7	40.3
		1557	.003	27,509		13.2	48.3
		1558	.007	16,190		41.2	69.4
		1559	.016	7,962		50.8	85.0
		1603	.034	2,920		63.3	94.5
		1606	.082	770		73.7	98.4
	7/31/57	1037	0	45,941		—	—
		1241	.00035	40,445		12.0	12.0
		1243	.0005	38,599		4.6	16.0
		1244	.001	34,741		10.0	24.4
		1245	.002	28,234 ~~24,179~~		18.7	38.6
		1246	.003	24,179 ~~14,448~~		14.4	47.3
		1248	.007	14,448 ~~7,257~~		40.3	68.6
		1249	.016	7,257		49.7	84.
		1252	.034	2,252		68.9	95.0
		1253	.082	702		69.0	98.5

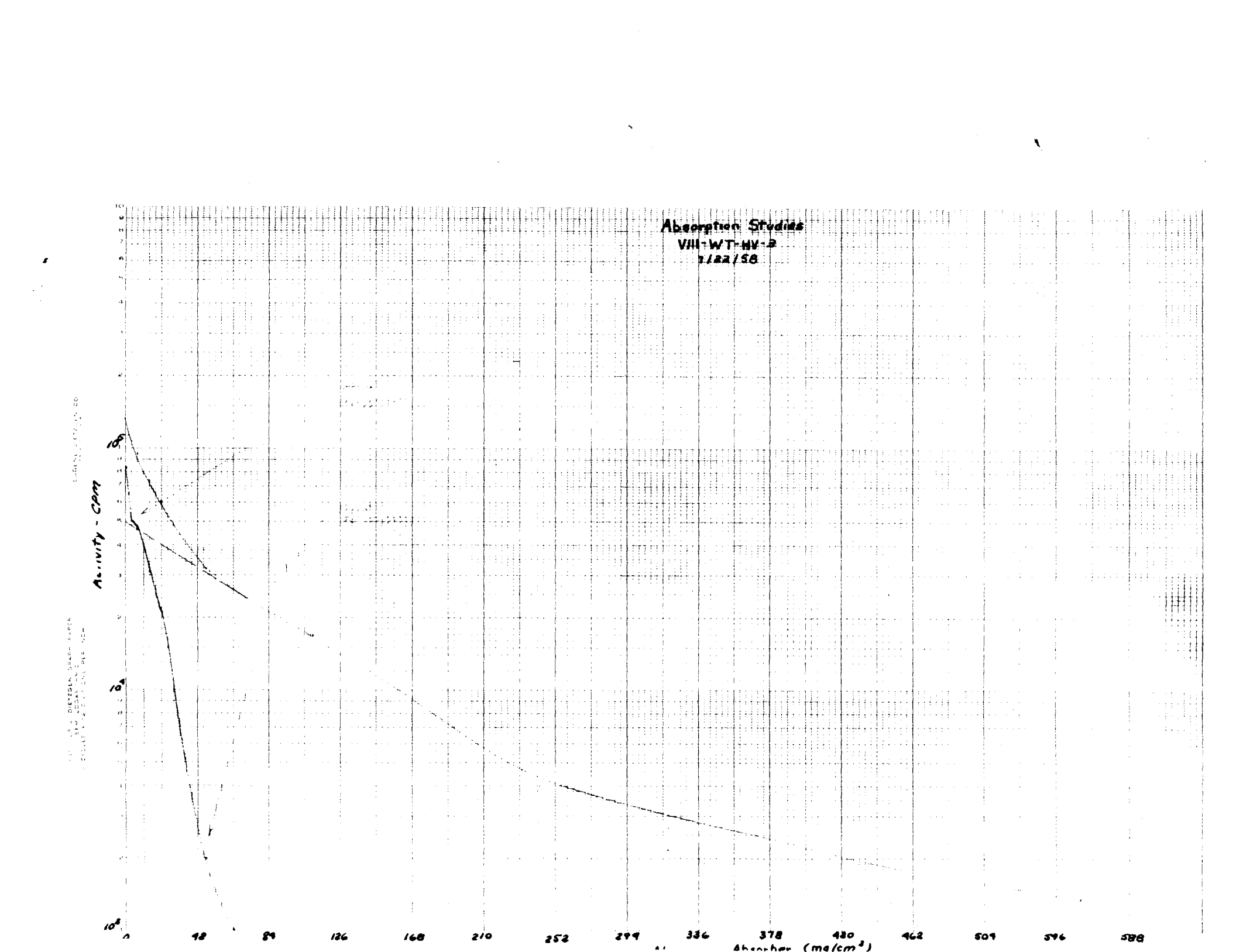
Absorption Studies
VIII-WT-MV-3
7/27/67
Activity - CPM
Absorber (mg/cm²)


Absorption Studies
VIII-WT-HV-3
7/31/57
Break at Y mg/cm²
Activity-CPM
Note:
straight line will obtain
last four points.
42
84
126
168
210
252
294
336
378
420
462
504
546
588

Absorption Data

Sample	Date Counted	Time Counted	Absorber Thickness	CPM	Conversion Factor	Reduction % between thicknesses	Reduction % each thickness
VIII-WT-HV-3	7/20/57	1220	0	214,064		—	—
		1221	.00035	184,514		13.7	13.7
		1222	.0005	174,733		5.3	18.4
		1223	.001	149,779		14.3	30.0
		1225	.002	115,887		22.3	48.6
		1226	.003	95,926		17.2	55.2
		1227	.007	53,203		44.7	75.0
		1229	.016	25,714		[illegible]	87.9
		1230	.034	8,647		[illegible]	95.8
		1234	.082	2,106		[illegible]	98.[illegible]
	7/22/57	1526	0	132,905		—	
		1527	.00035	114,309		14.0	14.0
		1528	.0005	108,957		4.7	18.0
		1529	.001	94,814		13.0	28.7
		1530	.002	73,856		22.1	44.5
		1531	.003	60,918		17.5	54.2
		1533	.007	33,818		44.5	74.6
		1534	.016	16,770		50.4	87.[illegible]
		1535	.034	4,689		72.2	96.[illegible]
		1538	.082	1,349		71.2	99.[illegible]


Absorption Studies
VIII-WT-HV-2
7/20/47
Activity - CPM
10^4
10^3
0
42
84
126
168
210
252
294
336
378
420
462
504
546
588
630
Aluminum Absorber (mg/cm²)


Absorption Studies
VIII-WT-HV-2
2/22/58
Activity - cpm
10^6
10^5
10^4
0
42
84
126
168
210
252
294
336
378
420
462
504
546
588
Absorber (mg/cm²)