

1 Oct 96 13:36

ALPHA/BETA - 1.01

Page #1

Protocol #: 1

QUENCH CURVE

User :

e: 30.00

Mode: Count Standards

Nuclide: H-16-UG

ground Subtract: None

	LL	UL	LCR	25%	BKG
Region A:	0.0 - 18.6		0	0.5	0.00

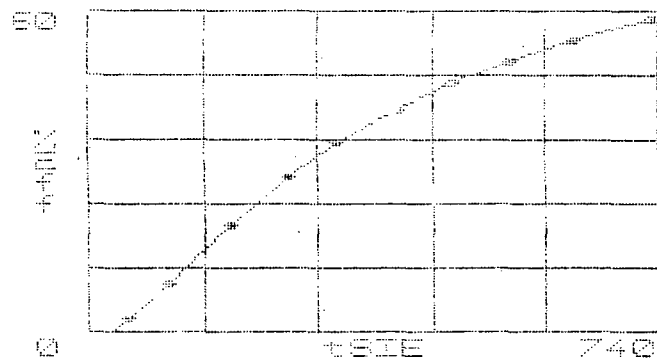
Quench Indicator: tSIE/AEC

Ext Std Terminator: Count

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tSIE	FLAG
1	1.19	134477	14.237	731.50	S
2	1.28	125784	12.636	632.50	S
3	1.38	116227	11.480	545.43	S
4	1.49	107517	10.449	472.80	S
5	1.67	95975.5	9.386	399.88	S
6	1.97	81585.8	8.310	320.97	S
7	2.40	66792.1	7.380	256.54	S
8	3.51	45627.4	6.173	179.10	S
9	7.62	21004.9	4.926	102.47	S
10	28.28	5659.02	4.149	48.770	S



tSIE	%Eff
731.50	58.42
632.50	54.65
545.43	50.49
472.80	46.71
399.88	41.70
320.97	35.44
256.54	29.02
179.10	19.82
102.47	9.13
48.77	2.46

EM NORMALIZED

LL/28h

IPA DATA PROCESSED - 01-Oct-96 14:41

14 Eff (0-156 keV) = 96.01 %

CHI SQUARE IPA DATA PROCESSED - 01-Oct-96 14:51

C14 Chi Square = 24.82

3 IPA DATA PROCESSED - 01-Oct-96 14:53

H3 Eff (0-18.6 keV) = 67.17 %

3 CHI SQUARE IPA DATA PROCESSED - 01-Oct-96 15:03

H3 Chi Square = 10.59

KG IPA DATA PROCESSED - 01-Oct-96 16:04

Bkg (0-18.6 keV) = 17.33 cpm

Bkg (0-156 keV) = 23.12 cpm

C14 E^2/B (1-156 keV) = 566.65

H3 E^2/B (1-18.6 keV) = 262.00

Protocol #: 2

QUENCH CURVE VERIFY

User :

Time: 3.00

Mode: DPM

Nuclide: H-16-UG

Quench Set: H-16-UG

ground Subtract: None

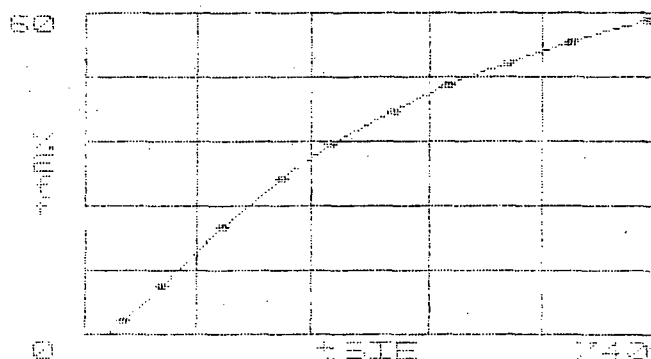
	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 18.6		0	0.0	0.00
Region B:	18.6 - 156		0	0.0	0.00
Region C:	156 - 2000		0	0.0	0.00

Quench Indicator: tSIE/AEC

Ext Std Terminator: Count

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal



tSIE	%Eff
731.50	58.42
632.50	54.65
545.43	50.49
472.80	46.71
399.88	41.70
320.97	35.44
256.54	29.02
179.10	19.82
102.47	9.13
48.77	2.46

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	3.00	134043	230652	14.326	723.42	
2	3.00	125330	231816	12.765	620.30	
3	3.00	115945	232043	11.601	535.32	
4	3.00	107410	231232	10.647	469.03	
5	3.00	95622.0	231796	9.533	394.28	
6	3.00	81332.3	232603	8.429	316.17	
7	3.00	66324.0	232533	7.469	252.37	
8	3.00	45534.0	233030	6.320	177.08	
	3.00	20706.3	233970	5.097	100.25	
	3.00	5598.33	236515	4.294	48.033	E

SYSTEM NORMALIZED

Protocol #: 1

QUENCH CURVE

User :

Time: 30.00

Data Mode: Count Standards

Nuclide: H-16-UG

Ground Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 18.6		0	0.5	0.00

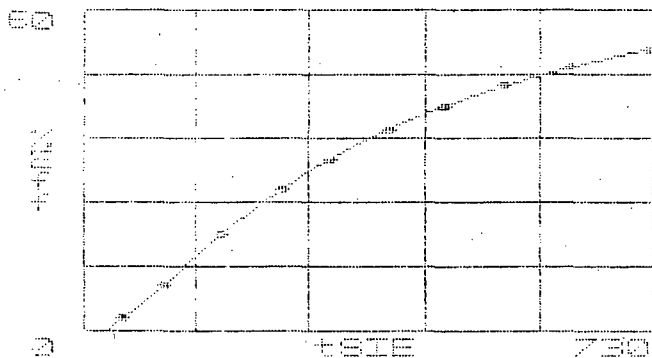
Quench Indicator: tSIE/AEC

Ext Std Terminator: Count

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tSIE	FLAG
1	1.20	133339	14.123	725.11	S
2	1.29	124812	12.581	623.16	S
3	1.38	116031	11.405	539.26	S
4	1.51	106421	10.357	464.75	S
5	1.69	95239.0	9.265	392.32	S
6	1.97	81508.6	8.286	319.64	S
7	2.40	66773.8	7.368	255.69	S
8	3.50	45797.4	6.163	180.16	S
9	7.45	21491.5	4.928	103.07	S
10	26.02	6150.69	4.131	50.431	S



tSIE	%Eff
725.11	52.66
623.16	49.29
539.26	45.83
464.75	42.03
392.32	37.61
319.64	32.19
255.69	26.37
180.16	18.09
103.07	8.49
50.43	2.43

M NORMALIZED

14 IPA DATA PROCESSED - 02-Dec-96 11:02

C14 Eff (0-156 keV) = 96.86 %

HI SQUARE IPA DATA PROCESSED - 02-Dec-96 11:12

4 Chi Square = 12.40

3 IPA DATA PROCESSED - 02-Dec-96 11:14

H3 Eff (0-18.6 keV) = 66.87 %

3 CHI SQUARE IPA DATA PROCESSED - 02-Dec-96 11:24

H3 Chi Square = 19.78

KG IPA DATA PROCESSED - 02-Dec-96 12:25

Bkg (0-18.6 keV) = 17.18 cpm

Bkg (0-156 keV) = 23.12 cpm

C14 E²/B (1-156 keV) = 588.24

H3 E²/B (1-18.6 keV) = 265.92

Protocol #: 1

QUENCH CURVE

User :

Time: 30.00

Mode: Count Standards

Nuclide: H-16-UG

Ground Subtract: None

Region A:	LL	UL	LCR	2S%	BKG
	0.0 - 18.6		0	0.5	0.00

Quench Indicator: tSIE/AEC

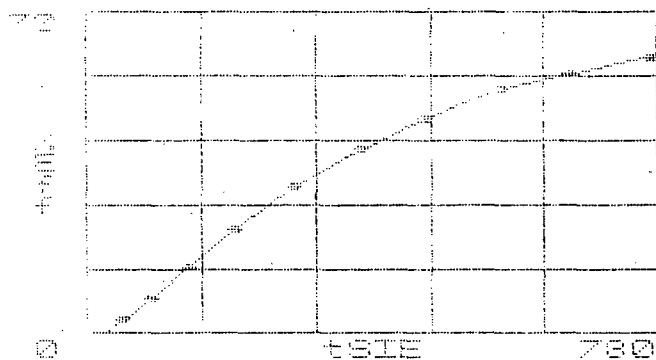
Ext Std Terminator: Count

Scintillation Correction On

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tSIE	FLAG
1	1.03	156324	14.753	770.28	S
2	1.10	145998	13.071	660.79	S
3	1.17	137135	11.850	567.45	S
4	1.34	120150	10.242	459.07	S
5	1.55	103601	9.045	372.51	S
6	1.94	82567.5	7.642	279.55	S
7	2.72	58929.8	6.504	200.25	S
8	4.25	37648.7	5.522	137.93	S
9	8.24	19418.7	4.717	88.079	S
10	23.34	6851.54	4.121	48.849	S



tSIE	%Eff
770.28	60.34
660.79	56.35
567.45	52.93
459.07	46.38
372.51	39.99
279.55	31.87
200.25	22.75
137.93	14.53
88.08	7.50
48.85	2.64

SYSTEM NORMALIZED

15 Feb 97 13:10

ALPHA/BETA - 1.01

Page #1

Protocol #: 1

QUENCH CURVE

User :

30.00

Mode: Count Standards

Nuclide: H-26-UG

Background Subtract: None

Region A:	LL	UL	LCR	2S%	BKG
	0.0	18.6	0	0.5	0.00

Quench Indicator: tSIE/AEC

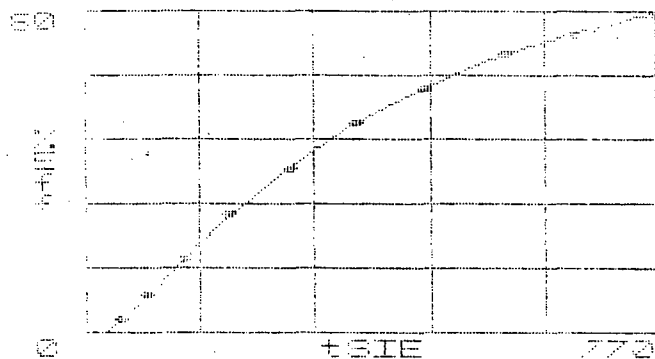
Ext Std Terminator: Count

Luminescence Correction On

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tSIE	FLAG
1	1.04	154037	14.442	760.92	S
2	1.11	144314	12.899	655.14	S
3	1.20	134237	11.678	562.62	S
4	1.36	118106	10.103	456.36	S
5	1.58	101337	8.833	364.60	S
6	2.02	79349.5	7.507	273.43	S
7	2.84	56361.6	6.375	194.29	S
8	4.56	35094.7	5.356	131.94	S
9	8.90	17983.5	4.658	84.555	S
10	25.66	6233.40	4.075	46.708	S



tSIE	%Eff
760.92	59.46
655.14	55.70
562.62	51.81
456.36	45.59
364.60	39.12
273.43	30.63
194.29	21.76
131.94	13.55
84.55	6.94
46.71	2.41

SYSTEM NORMALIZED

5 Feb 97 14:14

ALPHA/BETA - 1.01

Page #2

rotocol #: 1

QUENCH CURVE

User :

PA DATA PROCESSED - 05-Feb-97 14:14

C14 Eff (0-156 keV) = 96.43 %

14 CHI SQUARE IPA DATA PROCESSED - 05-Feb-97 14:24

C14 Chi Square = 12.77

3 IPA DATA PROCESSED - 05-Feb-97 14:25

H3 Eff (0-18.6 keV) = 67.47 %

3 CHI SQUARE IPA DATA PROCESSED - 05-Feb-97 14:36

H3 Chi Square = 13.05

KG IPA DATA PROCESSED - 05-Feb-97 15:37

Bkg (0-18.6 keV) = 17.30 cpm

Bkg (0-156 keV) = 23.73 cpm

C14 E²/B (1-156 keV) = 544.20

H3 E²/B (1-18.6 keV) = 266.23

Protocol #: 1

QUENCH CURVE

User :

Time: 30.00

Mode: Count Standards

Nuclide: H-26-U6

and Subtract: None

	LL	UL	LCR	25%	PKS
Region A:	0.0 - 18.6		0	0.5	0.00

Quench Indicator: tSIE/AEC

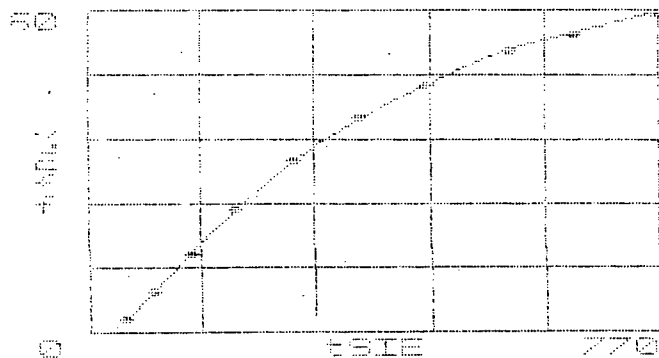
Ext Std Terminator: Count

Luminescence Correction On

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tSIE	FLAG
1	1.04	154142	14.545	760.51	S
2	1.11	144423	13.023	654.97	S
3	1.18	136472	11.842	567.26	S
4	1.34	119810	10.317	460.97	S
5	1.55	103346	8.989	369.13	S
6	1.94	82643.8	7.641	279.86	S
7	2.70	59272.6	6.511	201.93	S
8	4.25	37637.2	5.540	138.90	S
9	8.10	19753.0	4.725	88.490	S
10	22.89	6986.11	4.117	49.019	S



tSIE	%Eff
760.51	59.50
654.97	55.75
567.26	52.68
460.97	46.25
369.13	39.89
279.86	31.90
201.93	22.88
138.90	14.53
88.49	7.62
49.02	2.70

2-25

Feb 97 09:24

ALPHA/BETA - 1.01

Page #1

Scal #: 1

QUENCH CURVE

User :

Time: 30.00

Data Mode: Count Standards

Nuclide: H-26-UG

Background Subtract: None

	LL	UL	LCR	2S%	BKG
Region A:	0.0	- 18.6	0	0.5	0.00

Quench Indicator: tSIE/AEC

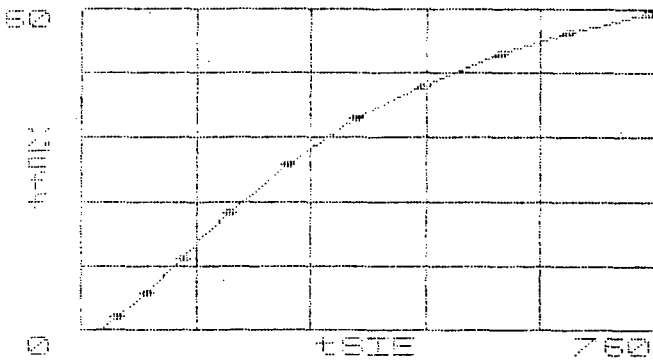
Ext Std Terminator: Count

Luminescence Correction On

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tSIE	FLAG
1	1.05	152750	14.492	750.99	S
2	1.12	143387	12.980	649.56	S
3	1.20	133395	11.770	556.44	S
4	1.36	117940	10.258	452.87	S
5	1.57	102416	8.975	364.59	S
6	2.01	79960.7	7.610	273.12	S
7	2.83	56679.5	6.395	194.10	S
8	4.54	35256.6	5.414	132.86	S
	8.82	18136.5	4.711	84.591	S
	24.92	6418.70	4.129	47.721	S



tSIE	%Eff
750.99	58.96
649.56	55.35
556.44	51.49
452.87	45.52
364.59	39.53
273.12	30.86
194.10	21.88
132.86	13.61
84.59	7.00
47.72	2.48

Feb 97 10:26

ALPHA/BETA - 1.01

Page #2

ocol #: 1

QUENCH CURVE

User :

C14 IPA DATA PROCESSED - 25-Feb-97 10:26

C14 Eff (0-156 keV) = 96.02 %

C14 CHI SQUARE IPA DATA PROCESSED - 25-Feb-97 10:37

C14 Chi Square = 15.69

H3 IPA DATA PROCESSED - 25-Feb-97 10:38

H3 Eff (0-18.6 keV) = 67.01 %

H3 CHI SQUARE IPA DATA PROCESSED - 25-Feb-97 10:49

H3 Chi Square = 24.68

BKG IPA DATA PROCESSED - 25-Feb-97 11:49

Bkg (0-18.6 keV) = 17.35 cpm

Bkg (0-156 keV) = 23.52 cpm

C14 E²/B (1-156 keV) = 571.22

H3 E²/B (1-18.6 keV) = 258.46

Protocol #: 1

QUENCH CURVE

User :

Time: 30.00

Mode: Count Standards
Background Subtract: None

Nuclide: H-26-UG

Region A:	LL	UL	LCR	2S%	BKG
	0.0	18.6	0	0.5	0.00

Quench Indicator: tSIE/AEC

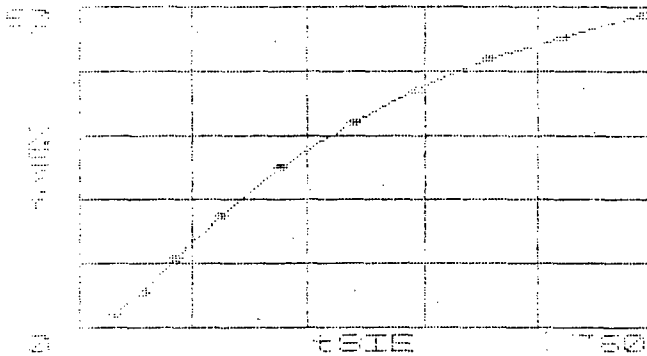
Ext Std Terminator: Count

Scintillation Correction On

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tSIE	FLAG
1	1.06	152145	14.601	752.36	S
2	1.14	140997	12.955	644.25	S
3	1.23	130484	11.635	545.20	S
4	1.39	115682	10.223	449.68	S
5	1.61	99503.7	8.974	363.44	S
6	2.06	77735.0	7.599	269.07	S
7	2.93	54644.4	6.393	191.66	S
8	4.76	33629.6	5.424	130.15	S
9	9.25	17298.5	4.737	84.631	S
10	26.44	6048.49	4.153	46.986	S



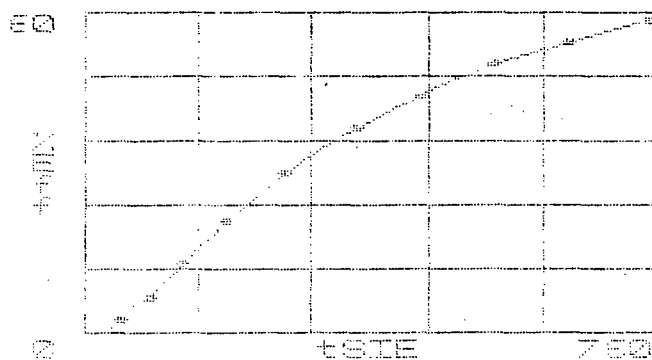
tSIE	%Eff
752.36	58.73
644.25	54.42
545.20	50.37
449.68	44.65
363.44	38.41
269.07	30.01
191.66	21.09
130.15	12.98
84.63	6.68
46.99	2.33

3. SEM NORMALIZED

Time: 1.00
 Data Mode: DPM Nuclide: H-26-UG Quench Set: H-26-UG
 Fund Subtract: 1st Vial

	LL	UL	LCR	25%	BKG
Region A:	0.0 - 18.6	0	0.0	18.90	
Region B:	18.6 - 156	0	0.0	12.00	
Region C:	156 - 2000	0	0.0	10.60	

Length Indicator: tSIE/AEC
 Ext Std Terminator: Count
 Coincidence Time(ns): 18
 Delay Before Burst(ns): Normal



tSIE	tSIE/AEC
752.36	58.73
644.25	54.42
545.50	50.36
449.65	44.65
363.44	38.41
269.07	30.00
171.65	21.09
130.35	12.98
94.63	6.67
46.99	2.33

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	10.00	18.90		44.331	460.24	B
2	3.00	92174.1	224196	9.712	400.82	

Time: 3.00

Data Mode: DPM

Nuclide: H-24-US

Quench Set: H-24-US

Fund Subtract: 1st Vial

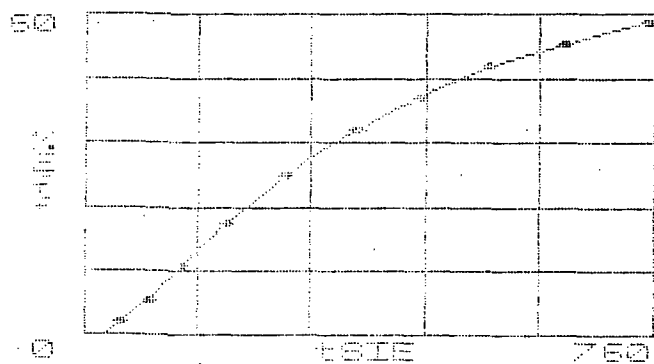
	LL	UL	LCR	23%	BKS
Region A:	0.0 - 18.6		0	0.0	19.70
Region B:	18.6 - 156		0	0.0	10.10
Region C:	156 - 2000		0	0.0	10.50

Quench Indicator: tSIE/AEC

Ext Std Terminator: Count

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal



tSIE	%Eff
752.36	58.72
644.25	54.42
545.20	50.36
449.68	44.65
363.44	38.41
269.07	30.00
191.66	21.09
130.15	12.98
84.63	6.67
46.99	2.33

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	10.00	19.70		39.564	459.58	B
2	3.00	92134.6	224866	9.651	398.89	

Time: 3.00

Data Mode: DPM

Nuclide: H-26-UG

Quench Set: H-26-UG

Background Subtract: 1st Vial

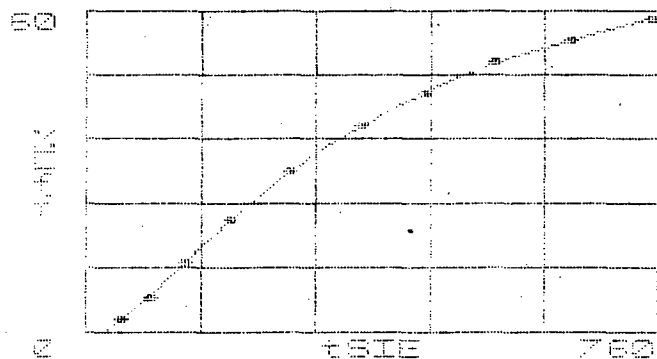
	LL	UL	LCR	2S%	BKG
Region A:	0.0 - 18.6		0	0.0	18.60
Region B:	18.6 - 156		0	0.0	11.30
Region C:	156 - 2000		0	0.0	11.80

Quench Indicator: tSIE/AEC

Ext Std Terminator: Count

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal



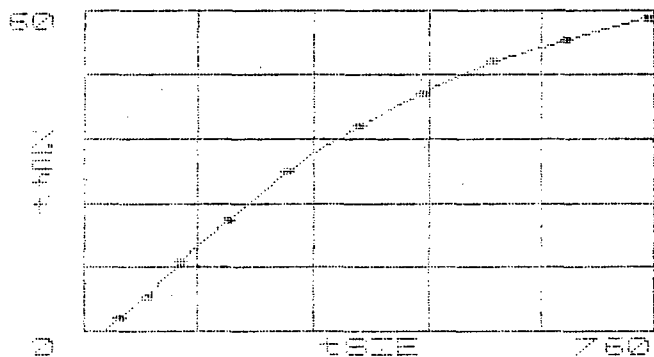
tSIE	%Eff
752.36	58.73
644.25	54.42
545.20	50.36
449.68	44.65
363.44	38.41
269.07	30.00
191.66	21.09
130.15	12.98
84.63	6.67
46.99	2.33

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	10.00	18.60		41.342	449.72	B
2	3.00	127880	222255	14.255	722.52	

ime: 3.00
 ata Mode: DPM Nuclide: H-26-UG Quench Set: H-26-UG
 Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
egion A:	0.0 - 18.6		0	0.0	20.20
egion B:	18.6 - 156		0	0.0	9.70
egion C:	156 - 2000		0	0.0	12.40

uench Indicator: tSIE/AEC
 Ext Std Terminator: Count
 oincidence Time(ns): 18
 elay Before Burst(ns): Normal



tSIE	%Eff
752.36	58.72
644.25	54.42
545.20	50.36
449.68	44.65
363.44	38.41
269.07	30.00
191.66	21.09
130.15	12.98
84.63	6.67
46.99	2.33

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	10.00	20.20		39.981	434.55	B
2	3.00	61536.5	218756	7.492	252.81	

Protocol #:21

QUENCH CURVE VERIFY

User :

Time: 7.00

Mode: DPM

Nuclide: H-26-UG

Quench Set: 4-26-UG

and Subtract: 1st Vial

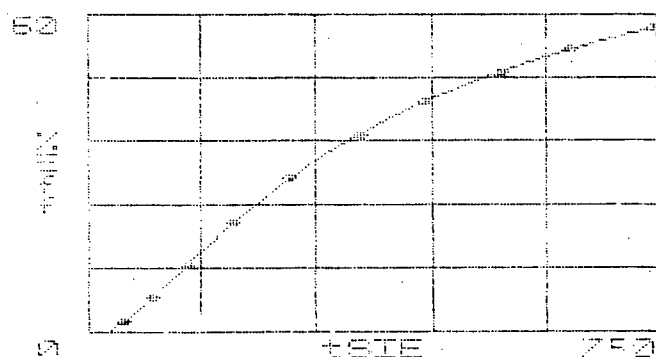
	LL	UL	LOR	25%	BKG
Region A:	0.0 - 18.6		0	0.0	19.60
Region B:	18.6 - 156		0	0.0	16.40
Region C:	156 - 2000		0	0.0	15.30

Quench Indicator: tSIE/AEC

Ext Std Terminator: Count

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal



tSIE	%Eff
743.96	57.29
634.48	53.37
540.22	49.12
441.21	43.33
355.99	37.24
264.39	28.60
191.17	20.34
130.37	12.50
83.11	6.46
45.69	2.14

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	10.00	19.60		51.528	435.03	B
2	3.00	90297.7	226070	9.614	393.82	

Protocol #: 2

QUENCH CURVE VERIFY

User :

Time: 3.00

Mode: DPM

Nuclide: H-24-UG

Quench Set: H-24-UG

Fund Subtract: 1st Vial

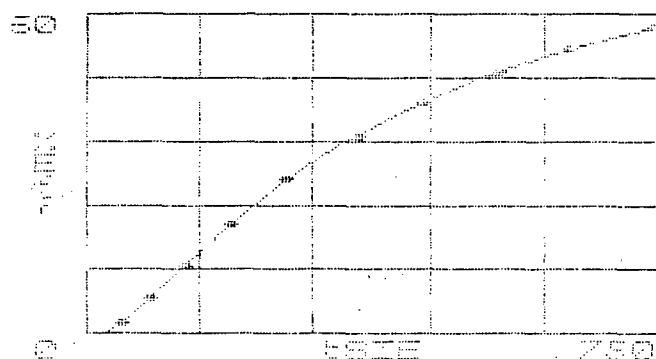
	LL	UL	LCR	25%	B4S
Region A:	0.0 - 18.6		0	0.0	19.50
Region B:	18.6 - 156		0	0.0	15.50
Region C:	156 - 2000		0	0.0	15.80

Quench Indicator: tSIE/AEC

Ext Std Terminator: Count

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal



tSIE	%Quench
743.96	57.29
634.48	53.37
540.20	49.12
441.21	43.33
355.99	37.24
244.39	28.80
191.17	20.34
130.37	12.50
83.11	6.46
45.69	2.14

S#	TIME	CPMA	DPM1	SIS	tSIE	FLAG
1	10.00	19.50		49.310	437.68	B
2	3.00	60845.2	223218	7.488	251.03	

Protocol #: 1

QUENCH CURVE

User :

Time: 30.00

Model: Count Standards

Nuclide: H-26-L6

and Subtract: None

Region #: 0.0 - 16.6 0 0.5 0.00

Quench Indicator: tSIE/AEC

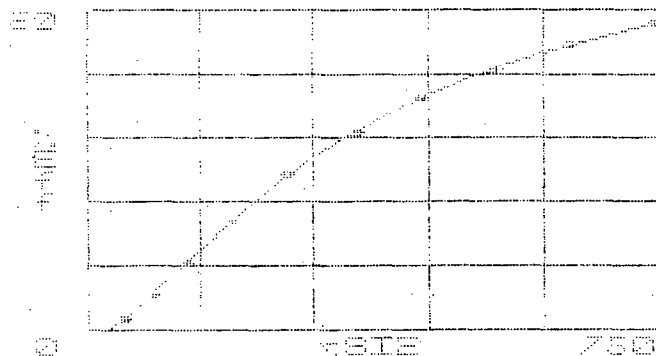
Ext Std Terminator: Count

Luminescence Correction On

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

SN	TIME	CPMA	SIS	tSIE	FLAG
1	1.08	148430	14.396	743.96	6
2	1.16	138266	12.764	634.48	6
3	1.26	127255	11.484	540.22	6
4	1.43	112269	10.088	441.21	6
5	1.66	94471.7	8.860	355.99	6
6	2.15	74620.5	7.531	264.39	6
7	3.04	52690.2	5.348	191.17	6
8	4.94	32390.6	3.405	130.37	6
9	9.36	16747.2	4.704	83.107	6
10	38.74	3562.63	4.025	45.693	6



tSIE	%Eff
743.96	57.29
634.48	53.37
540.22	49.12
441.21	43.34
355.99	37.24
264.39	28.80
191.17	20.34
130.37	12.50
83.11	6.46
45.69	2.15

Protocol #: 1

QUENCH CURVE

User :

Time: 30.00

Data Mode: Count Standards

Nuclide: 4-25-UG

Background Subtract: None

	LL	UL	LCR	29%	BKS
Reg. L.A:	0.0 - 18.6		0	0.5	0.00

Quench Indicator: tsIE/AEC

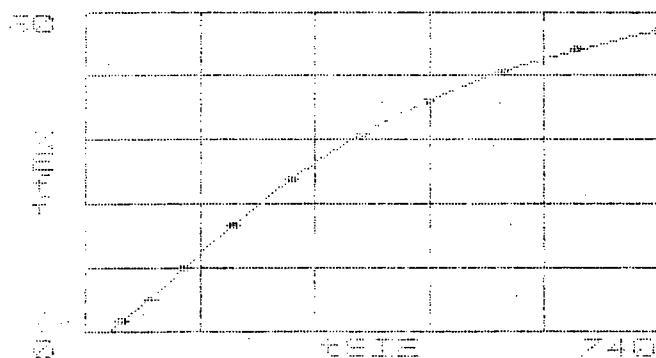
Ext Std Terminator: Count

Luminescence Correction On

Coincidence Time(ns): 18

Delay Before Burst(ns): Normal

S#	TIME	CPMA	SIS	tsIE	FLAG
1	1.10	146776	14.369	739.40	S
2	1.17	136745	12.813	636.64	S
3	1.27	126194	11.493	539.59	S
4	1.44	111272	10.125	440.73	S
5	1.68	95538.7	8.833	355.45	S
6	2.18	73526.1	7.519	263.09	S
7	3.12	51356.4	6.329	187.27	S
8	5.10	31374.9	5.401	127.64	S
9	9.96	16058.1	4.732	82.668	S
10	30.00	5327.43	4.042	45.668	S



tsIE	ZE
739.40	56.66
636.64	52.70
539.59	48.71
440.73	42.95
355.45	36.88
263.09	28.38
187.27	19.82
127.64	12.11
82.67	6.20
45.67	2.06

Protocol #: 1

QUENCH CURVE

User :

Time: 10.00

Data Mode: Count Standards

Nuclide: H-26-UG

Background Subtract: None

Region A: 0.0 - 12.6 0 0.5 0.00

Quench Indicator: tSIE/AEC

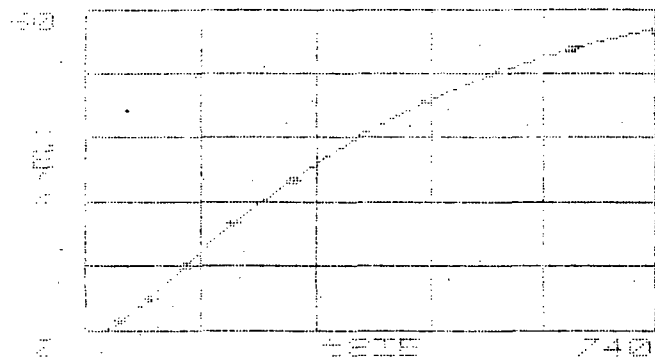
Ext Std Terminator: Count

Luminescence Correction On

Coincidence Time(ns): 18

Delay Before Bursts(ns): Normal

SN	TIME	CPMA	SIS	tSIE	FLAG
1	1.10	145725	14.348	739.70	S
2	1.18	133041	12.788	630.06	S
3	1.28	125262	11.465	537.98	S
4	1.44	111178	10.129	442.33	S
5	1.69	94675.7	8.871	355.94	S
6	2.19	73103.6	7.512	264.29	S
7	3.12	51361.9	6.342	188.28	S
8	4.12	31224.8	5.397	128.23	S
9	10.13	15795.5	4.713	83.225	S
11	30.00	3310.70	4.037	45.954	S



tSIE	%Eff
739.70	56.25
630.06	52.51
537.98	48.35
442.33	42.91
355.94	36.54
264.29	28.22
188.28	19.83
128.23	12.08
83.22	6.10
45.95	2.05