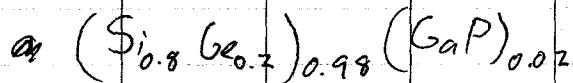


10/14/87

T -117a SiGe/GaP
 Annealed 600°C, 8 000 Hrs at JPL
 From A. Zoltan's N.B. (9-2-87)



$a_0(GaP) = 5.4505$

estimated Properties (Linear

1 = linear interpolation

2 = $Si_{0.8}Ge_{0.2}$ values

$^1a = 5.476$

$^2G = 1.030$

$^1M = 38.261$

~~$\theta = 528.6$~~

$\theta = 544.5$

$^1C_{DP} = 2.017$

$^2\alpha = 4.51$

$d = 3.095$ ^{exp} $d = 2.973$ use d^{exp}

Incorrected

Cp

Data

T	C	C/C_{DP}	T/ θ	$\frac{CM}{3R}$	T	C	C/C_{DP}	T/ θ	$\frac{CM}{3R}$
K	$\sqrt{g-K}$				1111	0.785	1.144	2.040	1.205
651	0.650	0.954	1.196	0.998	1161	0.809	1.179	2.132	1.242
705	0.667	0.978	1.295	1.024	1210	0.824	1.200	2.222	1.265
751	0.680	0.996	1.379	1.044	1254	0.847	1.232	2.303	1.300
815	0.707	1.035	1.497	1.085					
728	0.683	1.001	1.337	1.048					
783	0.695	1.018	1.438	1.067					
839	0.717	1.049	1.541	1.100					
892	0.731	1.069	1.638	1.122					
958	0.755	1.103	1.759	1.159					
1001	0.750	1.095	1.838	1.151					
1057	0.773	1.128	1.941	1.186					

T-117a SiGe/Gap

Annealed 600°C, 8000 hrs at JPL
From A. Zoltan's N.B. (9-287)

Assume $(\text{Si}_{0.8}\text{Ge}_{0.2})_{0.96}(\text{Gap})_{0.02}$

$$a_{\text{Gap}} = 5.4505$$

Estimated Properties

1 = linear interpolation, 2 = $\text{Si}_{0.8}\text{Ge}_{0.2}$ values

$$^1a = 5.476$$

$$^2G = 1.030$$

$$^1M = 37.521$$

$$^1\theta = 544.5$$

$$^2C_{DP} = 2.017$$

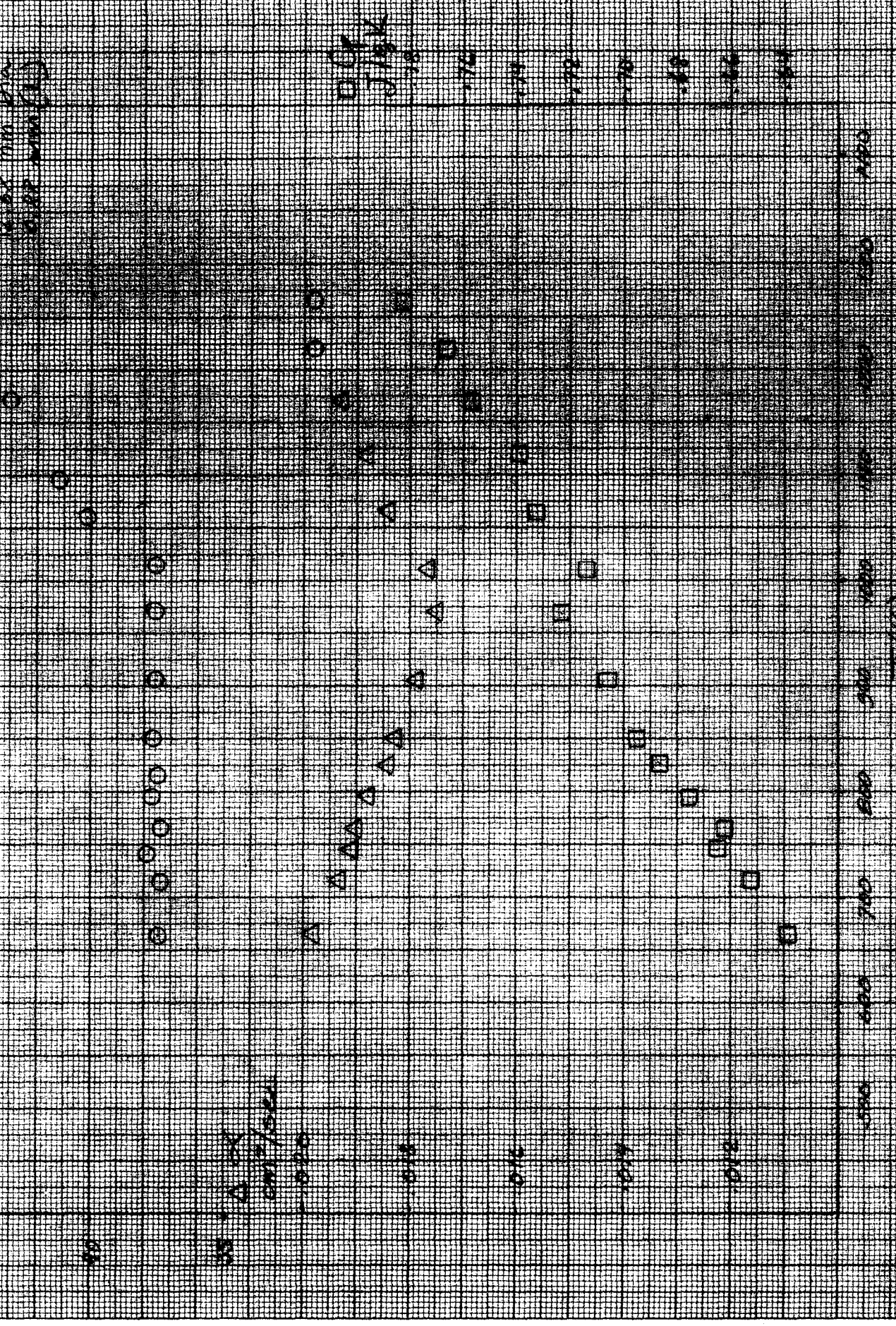
$$^2d = 4.51$$

$$d^{\text{experimental}} = 2.973 ; d^{\text{th}} = 3.035$$

T K	C J/g-K	T/ θ	CM/3R
664	0.6382	1.197	0.960
717.6	0.6520	1.294	0.981
763.4	0.6627	1.377	0.997
826.9	0.6863	1.491	1.032
740.4	0.6665	1.335	1.003
795.1	0.6767	1.434	1.018
850.8	0.6951	1.534	1.046
903.5	0.7060	1.629	1.062
969.2	0.7233	1.748	1.088
1012.2	0.7140	1.825	1.074
1067.9	0.7320	1.926	1.101
1121.7	0.7388	2.023	1.111
1171.4	0.7570	2.113	1.139
1220.2	0.7661	2.201	1.152
1264.0	0.7839	2.280	1.179

COLL. = 7.09ms

0.1 mW/cm²
 S. Becker P. F. Ma. N. J. ...
 A. ...



T(K)

1000

9-2-87

T-117a

Annealed 600°C, 8000 hrs JPL

TEMP(K)	CP(CAL	CP(JOU	DU/DT	DELTA T
651.0	.155	.650	33.99	8.10
705.0	.159	.667	34.65	7.90
751.0	.162	.680	34.14	7.75
815.0	.169	.707	32.59	7.46
728.0	.163	.683	34.49	7.72
783.0	.166	.695	33.43	7.58
839.0	.171	.717	31.97	7.35
892.0	.175	.731	30.07	7.21
958.0	.180	.755	27.77	6.98
1001.0	.179	.750	26.86	7.03
1057.0	.185	.773	26.98	6.82
1111.0	.188	.785	26.46	6.71
1161.0	.193	.809	25.82	6.52
1210.0	.197	.824	25.04	6.40
1254.0	.202	.847	24.22	6.22

AVG. CP(CAL/DEG-GM) =

.176353448594

AVG. CP(JOULES/DEG-GM) =

.738215535813

0.1388*L^2 =

.0010748672

TEMP(K)	T1/2	ALPHA	ALPHA-C
651.0	60.40	.0178	.0202
705.0	61.60	.0174	.0197
751.0	62.26	.0173	.0195
815.0	63.87	.0168	.0189
728.0	61.93	.0174	.0196
783.0	62.86	.0171	.0193
839.0	64.13	.0168	.0188
892.0	65.06	.0165	.0185
958.0	66.00	.0163	.0182
1001.0	64.80	.0166	.0186
1057.0	62.27	.0173	.0195
1111.0	61.00	.0176	.0199
1161.0	59.20	.0182	.0206
1210.0	57.60	.0187	.0213
1254.0	57.20	.0188	.0215

AVG. ALPHA. UNCORR =

1.73626592241E-2

Xcorr. = 7.09ms

D = .416 Cal

T(K)	RADC	ALPHA-CR	CPR	COND-CR
664.0	.981	.0198	.6382	.03754
717.6	.978	.0193	.6520	.03738
763.4	.975	.0190	.6627	.03743
826.9	.971	.0184	.6863	.03751
740.4	.977	.0191	.6665	.03793
795.1	.973	.0188	.6767	.03773
850.8	.969	.0183	.6951	.03775
903.5	.965	.0179	.7060	.03756
969.2	.958	.0175	.7233	.03759
1012.2	.952	.0177	.7140	.03763
1067.9	.947	.0184	.7320	.04013
1121.7	.941	.0188	.7388	.04122
1171.4	.936	.0193	.7570	.04344
1220.2	.930	.0198	.7661	.04509
1264.0	.925	.0198	.7839	.04625

9/11/87

0.1 mW/cm²
50

5160/600 T-117a 1000 TMR
Annealed 1000°C (Bismuth) at 516

PA 217709/1000

5160/600
5160/600

10 - Δ dx
cm²/sec
0.66

5160
5160

0.25

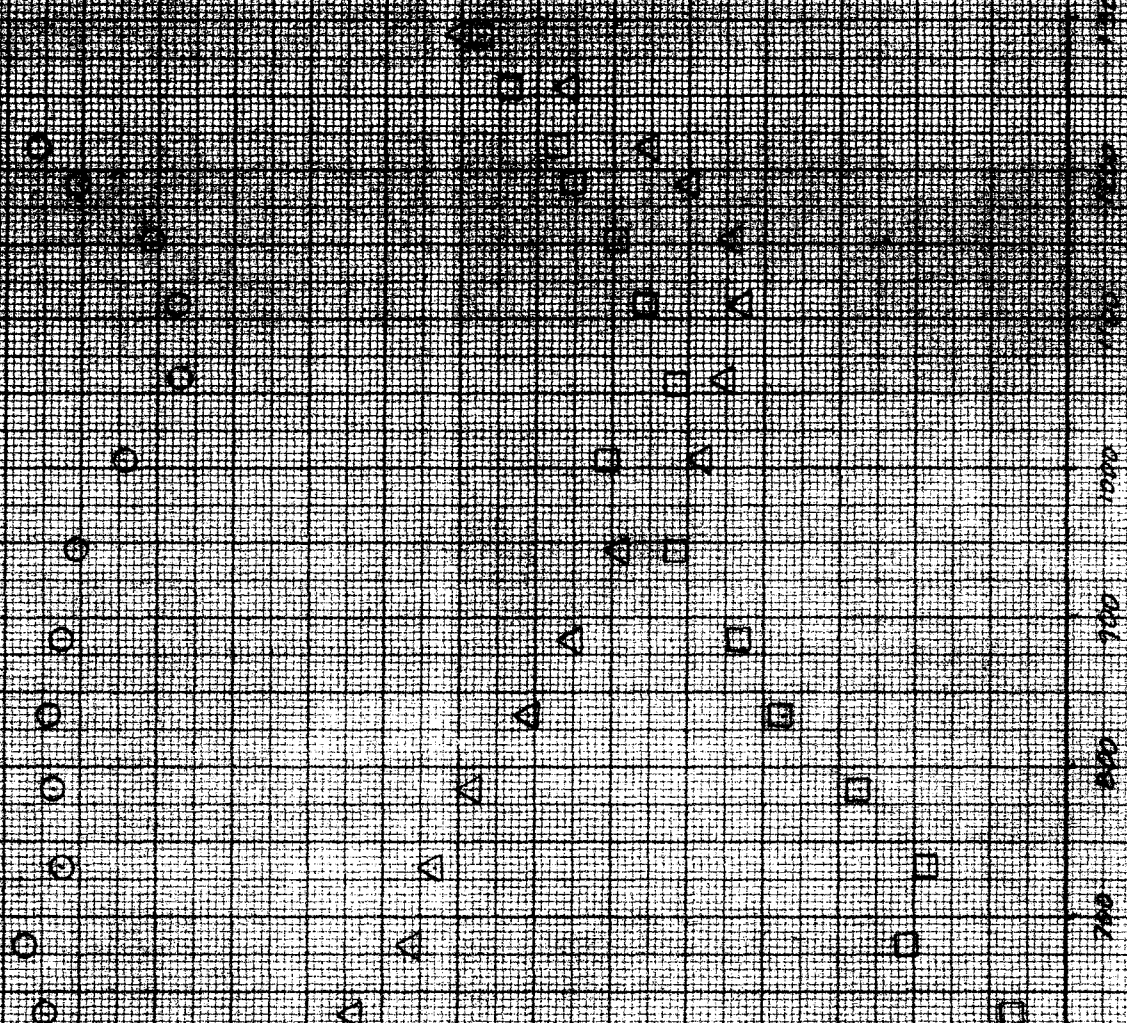
0.25

0.25

0.25

5160 600 700 800 1000

T (K)



5160 600 700 800 1000

5160 600 700 800 1000

5160 600 700 800 1000

5160 600 700 800 1000

5160 600 700 800 1000

5160 600 700 800 1000

Site 6al "N" TYPE T-117a

Annealed 1000°C (8000 hrs) JPL 9/11/87

TEMP(K)	CP(CAL)	CP(JOU)	CV/DT	DELTA T
621.0	.154	.643	32.56	10.12
665.0	.161	.674	34.33	9.67
717.0	.160	.670	34.60	9.72
768.0	.165	.691	33.78	9.43
822.0	.170	.714	32.46	9.12
873.0	.174	.729	30.74	8.94
934.0	.179	.748	28.50	8.70
993.0	.184	.771	26.77	8.44
1045.0	.181	.759	27.08	8.58
1095.0	.184	.770	26.63	8.46
1139.0	.187	.783	26.12	8.32
1175.0	.191	.798	25.61	8.16
1201.0	.192	.804	25.20	8.10
1242.0	.196	.822	24.46	7.92
1277.0	.199	.833	23.75	7.81

AVG. CP(CAL/DEG-GM) =

.178517842519

AVG. CP(JOULES/DEG-GM) =

.747275688787

0.1388*L^2 =

.0008662508

TEMP(K)	T1/2	ALPHA	ALPHA-C
621.0	40.66	.0213	.0258
665.0	41.66	.0208	.0251
717.0	42.00	.0206	.0248
768.0	42.66	.0203	.0244
822.0	43.53	.0199	.0238
873.0	44.40	.0195	.0232
934.0	45.33	.0191	.0227
993.0	47.13	.0184	.0216
1045.0	47.40	.0183	.0215
1095.0	47.53	.0182	.0214
1139.0	47.27	.0183	.0216
1175.0	45.86	.0189	.0223
1201.0	44.93	.0193	.0229
1242.0	42.87	.0202	.0242
1277.0	40.66	.0213	.0258

AVG. ALPHA UNCORR =

1.96290460997E-2

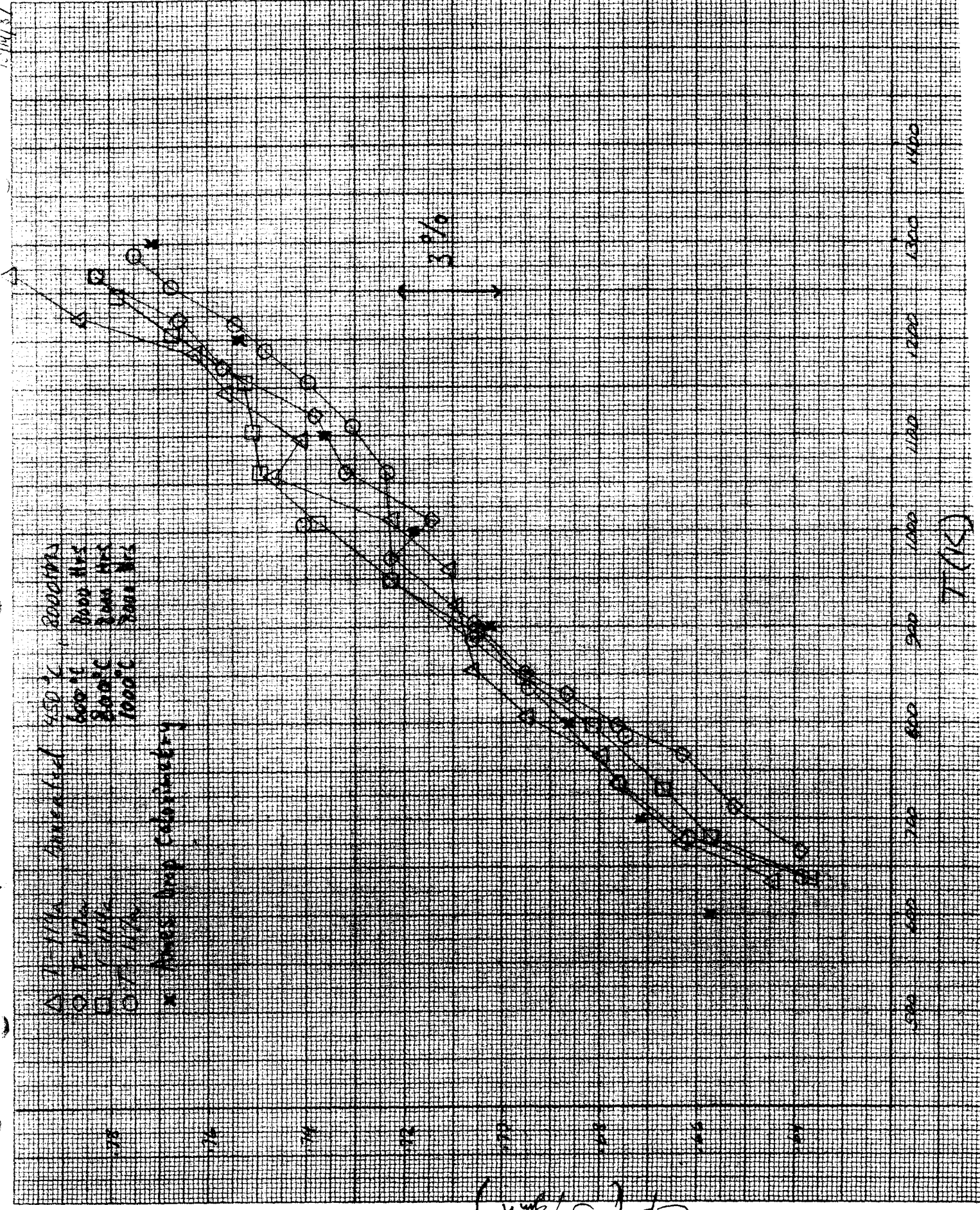
$Q = .416 \text{ cal}$

T(K) RADC ALPHA-CR C/P COND-CR

637.2	.985	.0254	.6338	.04393
680.5	.983	.0246	.6618	.04444
732.6	.979	.0243	.6561	.04349
783.1	.977	.0238	.6745	.04375
836.6	.973	.0231	.6946	.04383
887.3	.970	.0225	.7069	.04342
947.9	.966	.0219	.7225	.04310
1006.5	.960	.0208	.7405	.04194
1058.7	.953	.0205	.7235	.04039
1108.5	.948	.0203	.7302	.04045
1152.3	.944	.0204	.7393	.04104
1188.1	.941	.0210	.7504	.04301
1214.0	.938	.0215	.7546	.04419
1254.7	.934	.0226	.7675	.04732
1289.5	.930	.0240	.7750	.05072

$\alpha \text{ CORR } 7.09 \mu\text{s}$

APPROXIMATE ... SUBC/GAR



Δ 450°C
 ○ 600°C
 □ 800°C
 ⊙ 1000°C

x axes temp consistency

$C_p (5/gmK)$

(S) L
T (K)