This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-WM-DP-164

SECTION 11 **OF** 12

TITLE: Final Report for Tank 241BY104 Rotary Mode Cores 116 & 117 [Pgs 1987 Thru 2-97]

DATE: 06/25/1996

ORIGINATOR: Benar CJ

CO: WHC

RECIPIENT:

CO:

REFERENCES: ECN-629043

LABCORE Completed Worklist Report for Worklist# 5766

Analyst: knt **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine Sample Size Using Ludlum. new

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01	SR90-01	SOLID	1.23E-03	1.22E-3	99.187	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	8.86E+01	88.600	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.92E+00	1.920	% Ct. Erro
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	<5.35E-3		uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	8.89E+01	88.900	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	2.35E+02	235.000	uCi/g
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.19E+00	1.190	BLNK/BKG
4	SAMPLE	S96T000379	0	Z	@SR90-01	SR90-01	SOLID	N/A	6.42E+00	6.34e-003	uCi/g
4	SAMPLE	S96T000379	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.00E+01	1.00e-004	% Recovery
4	SAMPLE	S96T000379	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.22E+00		% Ct. Error
5	DUP	S96T000379	0	Z	@SR90-01	SR90-01	SOLID	6.42E+0	6.16E+0	4.134	RPD
5	DUP	S96T000379	0	Z	@SR90-01	SR90-01C	SOLID	100	9.01E+01	90.100	% Recovery
5	DUP	S96T000379	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.28E+00	1.280	% Cnt Err
6	SAMPLE	S96T000374	0	Z	@SR90-01	SR90-01	SOLID	N/A	3.47E+01	1.54e-002	uCi/g
6	SAMPLE	S96T000374	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.06E+01	1.00e-004	% Recovery
6	SAMPLE	S96T000374	0	Z	@SR90-01	SR90-01E	SOLID	N/A	8.17E-01		% Ct. Error
7	DUP	S96T000374	0	Z	@SR90-01	SR90-01	SOLID	3.47E+1	3.86E+1	10.641	RPD
7	DUP	S96T000374	0	Z	@SR90-01	SR90-01C	SOLID	100	9.12E+01	91.200	% Recovery
7	DUP	S96T000374	0	Z	@SR90-01	SR90-01E	SOLID	1.00	7.45E-01	0.745	% Cnt Err

Final page for worklist# 5766

Analyst Signature **Date** **Analyst Signature** **Date**

[illegible] 6/20/96
Reviewer Signature **Date**

Revision of worklist #5766 to reflect the correct % standard recovery of 99.187%.
Cheryl J. Benar 6/21/96

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 5766

Analyst: KT **Instrument:** AB00 12 **Book#** 9656

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Determine Sample Size Using Ludlum. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S96T000379	0	Z	@SR90-01	SOLID	95000229	BY-106
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S96T000379	0	Z	@SR90-01	SOLID		
6	SAMPLE	S96T000374	0	F	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S96T000374	0	F	@SR90-01	SOLID		

Final page for worklist # 5766

Kim Thomas 2-26-96
Analyst Signature **Date**

C.J. Quinn 2/27/96
Analyst Signature **Date**

M L Brown 2/27/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 5766

Analyst: knt **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine Sample Size Using Ludlum. new

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0	@SR90-01	SR90-01	SOLID	1.23E-03	1.22E-3	99.190	% Recovery
1	STD		0	@SR90-01	SR90-01C	SOLID	100	8.86E+01	88.600	% Recovery
1	STD		0	@SR90-01	SR90-01E	SOLID	1.00	1.92E+00	1.920	% Ct. Error
2	BLNK-PREP		0	@SR90-01	SR90-01	SOLID	1	<5.35E-3		uCi/g
2	BLNK-PREP		0	@SR90-01	SR90-01C	SOLID	100	8.89E+01	88.900	% Recovery
2	BLNK-PREP		0	@SR90-01	SR90-01E	SOLID	1.00	2.35E+02	235.000	% Ct. Error
3	BLNK/BKG		0	@SR90-01	SR90-01	SOLID	1	1.19E+00	1.190	uCi/g
4	SAMPLE	S96T000379	0 Z	@SR90-01	SR90-01	SOLID	N/A	6.42E+00	6.340e-003	uCi/g
4	SAMPLE	S96T000379	0 Z	@SR90-01	SR90-01C	SOLID	N/A	9.00E+01	1.000e-004	% Recovery
4	SAMPLE	S96T000379	0 Z	@SR90-01	SR90-01E	SOLID	N/A	1.22E+00	0.000	% Ct. Error
5	DUP	S96T000379	0 Z	@SR90-01	SR90-01	SOLID	6.42E+0	6.16E+0	4.130	RPD
5	DUP	S96T000379	0 Z	@SR90-01	SR90-01C	SOLID	100	9.01E+01	90.100	% Recovery
5	DUP	S96T000379	0 Z	@SR90-01	SR90-01E	SOLID	1.00	1.28E+00	1.280	% Ct. Error
6	SAMPLE	S96T000374	0 Z	@SR90-01	SR90-01	SOLID	N/A	3.47E+01	1.540e-002	uCi/g
6	SAMPLE	S96T000374	0 Z	@SR90-01	SR90-01C	SOLID	N/A	9.06E+01	1.000e-004	% Recovery
6	SAMPLE	S96T000374	0 Z	@SR90-01	SR90-01E	SOLID	N/A	8.17E-01	0.000	% Ct. Error
7	DUP	S96T000374	0 Z	@SR90-01	SR90-01	SOLID	3.47E+1	3.86E+1	10.640	RPD
7	DUP	S96T000374	0 Z	@SR90-01	SR90-01C	SOLID	100	9.12E+01	91.200	% Recovery
7	DUP	S96T000374	0 Z	@SR90-01	SR90-01E	SOLID	1.00	7.45E-01	0.750	% Ct. Error

Final page for worklist# 5766

Analyst Signature Date

Analyst Signature Date

[signature] 2/28/96
Reviewer Signature Date

See page 1987 for the correct % standard recovery of 99.187%. Cheryl J. Benar 6/21/96

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	10573	GROSS WEIGHT	(W2)		7.1829
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0943
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0886
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.08
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1053.10	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001348	TIME OF SEPARATION	(ST)	02:55	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	07:00	Sr-89/90 CONC. in µCi/L			1.2221E+00
Sample Prep	DATE OF COUNT	(DOC)	02/27/96				
N/A	STANDARD BOOK #		9B56				
Sample #	STANDARD VALUE in µCi/mL		1.2332E-03				
WL#5766							
Instrument Code							
WB27811							
Prepared By							
CJO							
Chemist							
SLF							
Analyst							
KNT							
Date Complete							
02/27/96							
Analysis Date							
02/27/96							
Analysis Time							
02:55 AM							
Sample Point							
BY-106							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.22E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.9%		2.97E-06 µCi/L
PERCENT CARRIER RECOVERY	88.6%		

Analyst:	KNT	Date:	27-Feb-96
Signature of Chemist:	SLF	Date:	2/28/96

STANDARD.WB1 REV 1.2 22010NML

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	50	GROSS WEIGHT	(W2)		7.1892
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1003
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0889
Test Code	SAMPLE VOLUME in mL	(SS)	0.200	DELTA TIME (HOURS)	(DT)		4.33
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L)	2.2848				
SOLID	SAMPLE COUNT RATE	(Rs)	0.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001348	TIME OF SEPARATION	(ST)	02:55	Rmax			2.12
Return	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	07:15	Sr-89/90 CONC in µCi/g		<	5.3511E-03
Sample Prep	DATE OF COUNT	(DOC)	02/27/96				
N/A							
Sample #							
WL#5766							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
02/27/96							
Analysis Date							DETECTION LEVEL
02/27/96	Sr-89/90 CONCENTRATION		< 5.35E-03		µCi/g		
Analysis Time	LESS THAN Value was Determined from Rmax.						
02:55 AM	RELATIVE COUNTING ERROR		235.0%				6.46E-03 µCi/g
Sample Point							
BY-106	PERCENT CARRIER RECOVERY		88.9%				

Analyst:		KNT	Date:	27-Feb-96
Signature of Chemist:		SLF	Date:	2/28/96

BLANK.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-164, REV. 1 ~~WHC-SD-WM-DP-153, REV~~ 3/13/96

WORKBOOK PAGE: SAM6

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	57632	GROSS WEIGHT	(W2)		7.2367
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1461
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0906
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		7.50
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	1.8148				
SOLID	SAMPLE COUNT RATE	(Rs)	5759.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001348	TIME OF SEPARATION	(ST)	02:55	Rmax			N/A
	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	10:25	Sr-89/90 CONC in µCi/g			3.4733E+01
	DATE OF COUNT	(DOC)	02/27/96				
FUS-ZR01							
S96T000374							

	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB27811	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
C.IO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
	NOTE: Expected weight = CVA * 0.1
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
02/27/96	
02/27/96	
02:55 AM	
BY-106	

Sr-89/90 CONCENTRATION	3.47E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.8%		1.54E-02 µCi/g
PERCENT CARRIER RECOVERY	90.6%		

Analyst:		KNT	Date:	27-Feb-96
Signature of Chemist:		SLF	Date:	2/28/96

SAMPLE.WB1 REV 1.2 22010NML

1991

I:\22010N\OUT\SR5766.WB1 02/27/96

WHC-SD-WM-DP-164, REV. 1 ~~WHC-SD-WM-DP-153, REV. 1~~ 5/23/96

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	69264	GROSS WEIGHT	(W2)		7.1864
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0952
5766	BACKGROUND in cpm	(BKG)	4.2	NET WEIGHT	(W3)		0.0912
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		7.75
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	1.9448				
SOLID	SAMPLE COUNT RATE	(Rs)	6922.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.23	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96001348	TIME OF SEPARATION	(ST)	02:55	Rmax			N/A
	DATE OF SEPARATION	(SD)	02/27/96	DETECTION LIMIT	(Ld)		2.56
0	TIME OF COUNT	(TOC)	10:40	Sr-89/90 CONC in µCi/g			3.8603E+01
	DATE OF COUNT	(DOC)	02/27/96				

FUS-ZR01

Sample #

S96T000374

Instrument ID

WB27811

Operator

CJD

Counter

SLF

Analyst

KNT

Date Complete

02/27/96

Analysis Date

02/27/96

Analysis Time

02:55 AM

Sample Point

BY-106

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	3.86E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.7%		1.43E-02 µCi/g
PERCENT CARRIER RECOVERY	91.2%		

Analyst:		KNT	Date:	27-Feb-96
Signature of Chemist:		SLF	Date:	2/28/96

SAMPLE.WB1 REV 1.2 22010NML

LABCORE Completed Worklist Report for Worklist# 6661

Analyst: dgg **Instrument:** U01 **Book#** 22856

Method: LA-925-009 **Rev/Mod** A-1

Worklist Comment: 1-10ml Sample Prep.For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		AU-01	U-02	SOLID	6.38E-02	6.08E-02	95.300	% Recovery
1	STD		0		AU-01	U-02E	SOLID	1	3.17E+00	3.170	% Inst Error
2	BLNK-PREP		0		AU-01	U-02	SOLID	1	<1.69e-1	0.000	ug/g
3	SAMPLE	S95T003650	0	Z	AU-01	U-02	SOLID	N/A	6.44E+02	0.169	ug/g
3	SAMPLE	S95T003650	0	Z	AU-01	U-02E	SOLID	N/A	3.23E+00	0.000	% Inst Error
4	DUP	S95T003650	0	Z	AU-01	U-02	SOLID	6.44E+02	5.99E+02	7.240	RPD
4	DUP	S95T003650	0	Z	AU-01	U-02E	SOLID	1	3.20E+00	3.200	% Inst Error
5	SPK	S95T003650	0	Z	AU-01	U-02	SOLID	5.69E+01	6.78E+01	119.160	% Recovery
6	SAMPLE	S95T003651	0	Z	AU-01	U-02	SOLID	N/A	6.70E+02	0.166	ug/g
6	SAMPLE	S95T003651	0	Z	AU-01	U-02E	SOLID	N/A	3.17E+00	0.000	% Inst Error
7	DUP	S95T003651	0	Z	AU-01	U-02	SOLID	6.70E+02	7.14E+02	6.360	RPD
7	DUP	S95T003651	0	Z	AU-01	U-02E	SOLID	1	3.16E+00	3.160	% Inst Error

Final page for worklist# 6661

Analyst Signature **Date** **Analyst Signature** **Date**

Reviewer Signature **Date** 3/27/96

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Completed Worklist Report for Worklist# 6661

Analyst: dgg **Instrument:** U01 **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep.For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@U-01	U-02	SOLID	6.38E-02	6.08E-02	95.300	% Recovery
1	STD		0		@U-01	U-02E	SOLID	1	3.17E+00	3.170	% Inst Error
2	BLNK-PREP		0		@U-01	U-02	SOLID	1	0.00E+00	0.000	ug/g
3	SAMPLE	S95T003650	0	Z	@U-01	U-02	SOLID	N/A	6.44E+02	0.169	ug/g
3	SAMPLE	S95T003650	0	Z	@U-01	U-02E	SOLID	N/A	3.23E+00	0.000	% Inst Error
4	DUP	S95T003650	0	Z	@U-01	U-02	SOLID	6.44E+02	5.99E+02	7.240	RPD
4	DUP	S95T003650	0	Z	@U-01	U-02E	SOLID	1	3.20E+00	3.200	% Inst Error
5	SPK	S95T003650	0	Z	@U-01	U-02	SOLID	5.69E+01	6.78E+01	119.160	% Recovery
6	SAMPLE	S95T003651	0	Z	@U-01	U-02	SOLID	N/A	6.70E+02	0.166	ug/g
6	SAMPLE	S95T003651	0	Z	@U-01	U-02E	SOLID	N/A	3.17E+00	0.000	% Inst Error
7	DUP	S95T003651	0	Z	@U-01	U-02	SOLID	6.70E+02	7.14E+02	6.360	RPD
7	DUP	S95T003651	0	Z	@U-01	U-02E	SOLID	1	3.16E+00	3.160	% Inst Error

Final page for worklist# 6661

Analyst Signature Date

Analyst Signature Date

Reviewer Signature Date

Blank-prep result incorrect. Result changed through QC Edit on 3/27/96 @ 10:00 AM.

J. L. Dupperen
3/27/96

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 6661

Analyst: DGS **Instrument:** U01 _____ **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep.For spike use: 0.1ml spk. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003650	0	Z	@U-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003650	0	Z	@U-01	SOLID		
5	SPK	S95T003650	0	Z	@U-01	SOLID		
6	SAMPLE	S95T003651	0	Z	@U-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
7	DUP	S95T003651	0	Z	@U-01	SOLID		

Final page for worklist # 6661

Donald S Suffer 3-22-96
Analyst Signature **Date**

Sharon L Walker 3-26-96
Analyst Signature **Date**

Sue Hogan 3/26/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sample ID 22034
Description LMCS STD.
Ref. Ratio 1.033
Laser Pulses 500
Lifetime 327 + 1.488 us
R2 .9991
Integrated 78502
Range: HIGH

Date/Time 03/22/96/02:29:21
Cal Y=7.06E+07X+12.41
Intensity 3781 (t= 39 us)
Conc 6.08E-05 + 1.93E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.08E-05 + 1.93E-06 g/L

Sample ID PREP-BLK
Description WL-6661
Ref. Ratio 1.051
Laser Pulses 500
Lifetime + us
R2
Integrated 0
Range: LOW
Sample <= Blank

Date/Time 03/22/96/02:33:34
Cal Y=5.70E+09X0
Intensity -879 (t= 39 us)
Conc + g/L
Dilution Factor X mL/mL

FINAL RESULT

Sample ID S95T003650
Description BY-104
Ref. Ratio 1.043
Laser Pulses 500
Lifetime 182 + .667 us
R2 .9994
Integrated 105118
Range: HIGH

Date/Time 03/22/96/02:37:16
Cal Y=7.06E+07X+12.41
Intensity 7891 (t= 39 us)
Conc 1.41E-04 + 4.55E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.41E-04 + 4.55E-06 g/L

Sample ID S95T003650-DUP
Description BY-104
Ref. Ratio 1.047
Laser Pulses 500
Lifetime 200 + .684 us
R2 .9995
Integrated 106442
Range: HIGH

Date/Time 03/22/96/02:39:27
Cal Y=7.06E+07X+12.41
Intensity 7151 (t= 39 us)
Conc 1.30E-04 + 4.16E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.30E-04 + 4.16E-06 g/L

Sample ID S95T003650-SPK
Description BY-104
Ref. Ratio 1.032
Laser Pulses 500
Lifetime 197 + .7 us
R2 .9995
Integrated 662175
Range: HIGH

Date/Time 03/22/96/02:42:36
Cal Y=7.06E+07X+12.41
Intensity 45645 (t= 39 us)
Conc 8.19E-04 + 2.62E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 8.19E-04 + 2.62E-05 g/L

Sample ID S95T003651
Description BY-104
Ref. Ratio 1.046
Laser Pulses 500
Lifetime 212 + .553 us
R2 .9997
Integrated 129972
Range: HIGH

Date/Time 03/22/96/02:44:45
Cal Y=7.06E+07X+12.41
Intensity 8352 (t= 39 us)
Conc 1.49E-04 + 4.72E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.49E-04 + 4.72E-06 g/L

Sample ID S95T003651-DUP
Description BY-104
Ref. Ratio 1.049
Laser Pulses 500
Lifetime 178 + .385 us
R2 .9998
Integrated 114597
Range: HIGH

Date/Time 03/22/96/02:47:19
Cal Y=7.06E+07X+12.41
Intensity 8652 (t= 39 us)
Conc 1.60E-04 + 5.05E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.60E-04 + 5.05E-06 g/L

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		22B56
6661	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
@U-01	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		327.00
LIQUID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002339	INSTRUMENT UNCERTAINTY	(IU)	1.93E-06
Rerun	INSTRUMENT RESULT	(IR)	6.08E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.08E-02
Sample #	VALUE OF STANDARD		6.38E-02
WL6661	%RECOVERY		95.30
Instrument Code	RELATIVE % UNCERTAINTY		3.2
U01			
Prepared By			
SLH	Result = DF * PF * IR * 1000		
Chemist			
JLS	Detection Level = 3.70 E-08 * DF * PF * 1000		
Analyst			
DGG	% Recovery = Result / Value of Standard * 100		
Date Complete			
03/26/96	Relative % Uncertainty = IU / IR * 100		
Analysis Date			
03/22/96			
Analysis Time			
02:30 AM			
Sample Point			
BY104 ROTARY			

Analyst:	DGG	Date:	26-Mar-96
Signature of Chemist:	JLS	Date:	3/26/96

STANDARD.WB1 REV 1.2 925009ML

WORKBOOK PAGE: BLANK2 WHC-SD-WM-DP-164, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6661	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.1908
Matrix	LIFETIME IN MICROSECONDS		0.00
SOLID	R2 VALUE		0.0000
Batch Number	RANGE (HIGH OR LOW)		0
96002339	INSTRUMENT UNCERTAINTY	(IU)	0.00E+00
Rerun	INSTRUMENT RESULT	(IR)	0.00E+00
0	DETECTION LEVEL µg/g		1.69E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		0.00E+00
Sample #	RESULT (µg/g)		0.00E+00
WL6661	RELATIVE % UNCERTAINTY		
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
03/26/96			
Analysis Date			
03/22/96			
Analysis Time			
02:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Result < Detection Level

Result = < 1.69E-1 µg/g

Analyst:	DGG	Date:	26-Mar-96
Signature of Chemist:	JLS	Date:	3/26/96

BLANK.WB1 REV 1.2 925009ML

1993

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6661	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.1908
Matrix	LIFETIME IN MICROSECONDS		182.00
SOLID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002339	INSTRUMENT UNCERTAINTY	(IU)	4.55E-06
Rerun	INSTRUMENT RESULT	(IR)	1.41E-04
0	DETECTION LEVEL µg/g		1.69E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.41E-03
Sample #	RESULT (µg/g)		6.44E+02
S95T003650	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
03/26/96			
Analysis Date			
03/22/96			
Analysis Time			
02:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	26-Mar-96
Signature of Chemist:	JLS	Date:	3/26/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6661	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.1700
Matrix	LIFETIME IN MICROSECONDS		200.00
SOLID	R2 VALUE		0.9995
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002339	INSTRUMENT UNCERTAINTY	(IU)	4.16E-06
Rerun	INSTRUMENT RESULT	(IR)	1.30E-04
0	DETECTION LEVEL µg/g		1.71E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.30E-03
Sample #	RESULT (µg/g)		5.99E+02
S95T003650	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
03/26/96			
Analysis Date			
03/22/96			
Analysis Time			
02:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration In Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	26-Mar-96
Signature of Chemist:	JLS	Date:	3/26/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
SPK	SPIKE BOOK #		22B55
6661	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
@U-01	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
SOLID	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
96002339	DIGEST FACTOR OF SAMPLE	(DDF)	2.1908
0	LIFETIME IN MICROSECONDS		197.00
FUS-ZR01	R2 VALUE		0.9995
S95T003650	RANGE (HIGH OR LOW)		HIGH
U01	INSTRUMENT RESULT	(IR)	8.19E-04
SLH	CONCENTRATION IN SOLUTION (g/L)	(CONC)	8.19E-03
JLS	SPIKE VALUE (g/L)	(SV)	5.69E-02
DGG	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
03/26/96	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
03/22/96	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FOR	(SR)	1.41E-03
02:30 AM			
BY104 ROTARY			

Concentration = IR * DF * PF

QC Actual (µg/mL) = SV (g/L) * 1000

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

% Recovery = QC FOUND / QC ACTUAL

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	6.78E+01	µg/mL
% SPIKE RECOVERY	=	119.2%	

Analyst:	DGG	Date:	26-Mar-96
Signature of Chemist:	JLS	Date:	3/26/96

SPIKE.WB1 REV 1.2 925009ML

2001

WORKBOOK PAGE: SAM6

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6661	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2236
Matrix	LIFETIME IN MICROSECONDS		212.00
SOLID	R2 VALUE		0.9997
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002339	INSTRUMENT UNCERTAINTY	(IU)	4.72E-06
Rerun	INSTRUMENT RESULT	(IR)	1.49E-04
0	DETECTION LEVEL µg/g		1.66E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.49E-03
Sample #	RESULT (µg/g)		6.70E+02
S95T003651	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
03/26/96			
Analysis Date			
03/22/96			
Analysis Time			
02:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	26-Mar-96
Signature of Chemist:	JLS	Date:	3/26/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: DUP7

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6661	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2396
Matrix	LIFETIME IN MICROSECONDS		178.00
SOLID	R2 VALUE		0.9998
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002339	INSTRUMENT UNCERTAINTY	(IU)	5.05E-06
Rerun	INSTRUMENT RESULT	(IR)	1.60E-04
0	DETECTION LEVEL µg/g		1.65E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.60E-03
Sample #	RESULT (µg/g)		7.14E+02
S95T003651	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U01			
Prepared By			
SLH			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
03/26/96			
Analysis Date			
03/22/96			
Analysis Time			
02:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	DGG	Date:	26-Mar-96
Signature of Chemist:	JLS	Date:	3/26/96

SAMPLE.WB1 REV 1.2 925009ML

LABCORE Completed Worklist Report for Worklist# 6665

Analyst: crj **Instrument:** U01 **Book#** 45 BSC

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep. For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@U-01	U-02	SOLID	6.39E-02	6.62E-02	103.600	% Recovery
1	STD		0		@U-01	U-02E	SOLID	1	3.16E+00	3.160	% Inst Error
2	BLNK-PREP		0		@U-01	U-02	SOLID	1	2.19E+1	21.900	ug/g
2	BLNK-PREP		0		@U-01	U-02E	SOLID	1	1.20E+00	1.200	% Inst Error
3	SAMPLE	S95T003663	0	Z	@U-01	U-02	SOLID	N/A	6.26E+03	0.170	ug/g
3	SAMPLE	S95T003663	0	Z	@U-01	U-02E	SOLID	N/A	4.26E+00	0.000	% Inst Error
4	DUP	S95T003663	0	Z	@U-01	U-02	SOLID	6.26E+3	6.09E+3	2.750	RPD
4	DUP	S95T003663	0	Z	@U-01	U-02E	SOLID	1	4.17E+00	4.170	% Inst Error
5	SPK	S95T003663	0	Z	@U-01	U-02	SOLID	5.69E+01	7.00E+00	12.300	% Recovery
6	SAMPLE	S95T003664	0	Z	@U-01	U-02	SOLID	N/A	2.40E+04	0.382	ug/g
6	SAMPLE	S95T003664	0	Z	@U-01	U-02E	SOLID	N/A	3.75E+00	0.000	% Inst Error
7	DUP	S95T003664	0	Z	@U-01	U-02	SOLID	2.40E+4	2.71E+4	12.130	RPD
7	DUP	S95T003664	0	Z	@U-01	U-02E	SOLID	1	9.40E+00	9.400	% Inst Error

Final page for worklist# 6665

Analyst Signature **Date** **Analyst Signature** **Date**

Reviewer Signature **Date** 4/9/96

S95T003663 will be rerun. Spike recovery did not meet control limits.

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 6665

cg 4/1/96

Analyst: CRJ **Instrument:** U01 U01 **Book#** ~~12B55C~~ 45B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep. For spike use: 0.1ml spk. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003663	0	Z	@U-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003663	0	Z	@U-01	SOLID		
5	SPK	S95T003663	0	Z	@U-01	SOLID		
6	SAMPLE	S95T003664	0	Z	@U-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
7	DUP	S95T003664	0	Z	@U-01	SOLID		

Final page for worklist # 6665

C Johnson 4/5/96
Analyst Signature **Date**

M G Bierman 4/9/96
Analyst Signature **Date**

Sue Hogan 4/9/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sample ID 45B56
Description STD
Ref. Ratio 1.052
Laser Pulses 500
Lifetime 252 + .751 us
R2 .9996
Integrated 76545
Range: HIGH

Date/Time 04/05/96/13:32:28
Cal Y=8.55E+07X-4.08E+02
Intensity 4409 (t= 39 us)
Conc 6.62E-05 + 2.09E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.62E-05 + 2.09E-06 g/L

WL 6/6/

Sample ID WL6665
Description BLK
Ref. Ratio 1.017
Laser Pulses 500
Lifetime 224 + 1.518 us
R2 .998
Integrated 4882
Range: HIGH

Date/Time 04/05/96/13:38:47
Cal Y=8.55E+07X-4.08E+02
Intensity 277 (t= 39 us)
Conc 9.18E-06 + 3.06E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.18E-06 + 3.06E-07 g/L

Sample ID WL6665
Description BLK
Ref. Ratio .999
Laser Pulses 500
Lifetime 227 + .588 us
R2 .9997
Integrated 378563
Range: LOW

Date/Time 04/05/96/13:39:29
Cal Y=6.04E+09X0
Intensity 23412 (t= 39 us)
Conc 4.75E-06 + 5.71E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 4.75E-06 + 5.71E-08 g/L

Sample ID S95T003663
Description SAM
Ref. Ratio 1.046
Laser Pulses 500
Lifetime 194 + 2.109 us
R2 .9949
Integrated 633119
Range: HIGH

Date/Time 04/05/96/13:41:20
Cal Y=8.55E+07X-4.08E+02
Intensity 49064 (t= 182 us)
Conc 1.36E-03 + 5.79E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.36E-03 + 5.79E-05 g/L

Sample ID S95T003663
Description DUP
Ref. Ratio 1.033
Laser Pulses 500
Lifetime 189 + 1.936 us
R2 .9955
Integrated 603403
Range: HIGH

Date/Time 04/05/96/13:43:02
Cal Y=8.55E+07X-4.08E+02
Intensity 47539 (t= 182 us)
Conc 1.36E-03 + 5.67E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.36E-03 + 5.67E-05 g/L

Sample ID S95T003663 Date/Time 04/05/96/13:44:25
Description SPK Cal Y=8.55E+07X-4.08E+02
Ref. Ratio 1.049 Intensity 49815 (t= 182 us)
Laser Pulses 500 Conc 1.43E-03 + 6.03E-05 g/L
Lifetime 189 + 2.004 us Dilution Factor 1 mL/mL
R2 .9952
Integrated 635462 FINAL RESULT 1.43E-03 + 6.03E-05 g/L
Range: HIGH

Sample ID S95T003664 Date/Time 04/05/96/13:46:30
Description SAM Cal Y=8.55E+07X-4.08E+02
Ref. Ratio 1.048 Intensity 47737 (t= 312 us)
Laser Pulses 500 Conc 2.32E-03 + 8.70E-05 g/L
Lifetime 218 + 1.547 us Dilution Factor 1 mL/mL
R2 .9978
Integrated 720995 FINAL RESULT 2.32E-03 + 8.70E-05 g/L
Range: HIGH

Sample ID S95T003664 Date/Time 04/05/96/13:47:44
Description DUP Cal Y=8.55E+07X-4.08E+02
Ref. Ratio 1.04 Intensity 54605 (t= 39 us)
Laser Pulses 500 Conc 2.51E-03 + 2.36E-04 g/L
Lifetime 35 + .47 us Dilution Factor 1 mL/mL
R2 .9958
Integrated 173441 FINAL RESULT 2.51E-03 + 2.36E-04 g/L
Range: HIGH

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			STANDARD
STD	STANDARD BOOK #		45B56
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6665	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
@U-01	LIFETIME IN MICROSECONDS		252.00
Matrix	R2 VALUE		0.9996
LIQUID	RANGE (HIGH OR LOW)		HIGH
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	2.09E-06
96002340	INSTRUMENT RESULT	(IR)	6.62E-05
Rerun	DETECTION LEVEL (µg/mL)		3.70E-05
0			
Sample Prep	RESULT (µg/mL)		6.62E-02
N/A	VALUE OF STANDARD		6.39E-02
Sample #	%RECOVERY		103.60
WL6665	RELATIVE % UNCERTAINTY		3.2
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:15 PM			
Sample Point			
BY-104 ROTARY			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

STANDARD.WB1 REV 2.0 925009ML

WORKBOOK PAGE: BLANK2 WHC-SD-WM-DP-164, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			BLANK
BLNK-PREP	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
6665	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
Test Code	DIGEST FACTOR	(Dg/L)	2.1712
@U-01	LIFETIME IN MICROSECONDS		227.00
Matrix	R2 VALUE		0.9997
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	5.71E-08
96002340	INSTRUMENT RESULT	(IR)	4.75E-06
Rerun	DETECTION LEVEL µg/g		1.70E-01
0			
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		4.75E-05
Sample #	RESULT (µg/g)		2.19E+01
WL6665	RELATIVE % UNCERTAINTY		1.2
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:15 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

BLANK.WB1 REV 2.0 925009ML

2009

I:\925009\OUT\UR6665.WB1 04/09/96 10:15:36

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SAMPLE
SAMPLE	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
6665	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
Test Code	DIGEST FACTOR	(Dg/L)	2.1712
@U-01	LIFETIME IN MICROSECONDS		194.00
Matrix	R2 VALUE		0.9949
SOLID	RANGE (HIGH OR LOW)		HIGH
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	5.79E-05
96002340	INSTRUMENT RESULT	(IR)	1.36E-03
Rerun	DETECTION LEVEL µg/g		1.70E-01
0			
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.36E-02
Sample #	RESULT (µg/g)		6.26E+03
S95T003663	RELATIVE % UNCERTAINTY		4.3
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:15 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

2010

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6665	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2336
Matrix	LIFETIME IN MICROSECONDS		189.00
SOLID	R2 VALUE		0.9955
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002340	INSTRUMENT UNCERTAINTY	(IU)	5.67E-05
Rerun	INSTRUMENT RESULT	(IR)	1.36E-03
0	DETECTION LEVEL µg/g		1.66E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.36E-02
Sample #	RESULT (µg/g)		6.09E+03
S95T003663	RELATIVE % UNCERTAINTY		4.2
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:15 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
SPK	SPIKE BOOK #		22B66
	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
6665	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.1712
	LIFETIME IN MICROSECONDS		189.00
SOLID	R2 VALUE		0.9952
	RANGE (HIGH OR LOW)		HIGH
96002340	INSTRUMENT RESULT	(IR)	1.43E-03
	CONCENTRATION IN SOLUTION (g/L)	(CONC)	1.43E-02
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
	CONCENTRATION IN SOLN (g/L) FROM SAMPLE FORM	(SR)	1.36E-02
S95T003663			
LX01	Concentration = IR * DF * PF		
MOB	QC Actual (µg/mL) = SV (g/L) * 1000		
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
CRJ	% Recovery = QC FOUND / QC ACTUAL		
04/09/96			
04/05/96	QC ACTUAL	=	5.69E+01 µg/mL
	QC FOUND	=	7.00E+00 µg/mL
01:15 PM	% SPIKE RECOVERY	=	12.3%
BY-1D4 ROTARY			

Analyst:		CRJ	Date:	09-Apr-96
Signature of Chemist:	J S Lippert	JLS	Date:	5/1/96

SPIKE.WB1 REV 2.0 925009ML

2012

WORKBOOK PAGE: SAM6

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6665	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	0.9680
Matrix	LIFETIME IN MICROSECONDS		218.00
SOLID	R2 VALUE		0.9978
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002340	INSTRUMENT UNCERTAINTY	(IU)	8.70E-05
Rerun	INSTRUMENT RESULT	(IR)	2.32E-03
0	DETECTION LEVEL µg/g		3.82E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.32E-02
Sample #	RESULT (µg/g)		2.40E+04
S95T003664	RELATIVE % UNCERTAINTY		3.8
Instrument Code			
U01			
Prepared By	Result = Conc. in Solution (g/L) * 1000000 / Dg/L		
MCB			
Chemist	Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF		
JLS			
Analyst	Relative % Uncertainty = IU / IR * 100		
CRJ			
Date Complete	Concentration in Solution (g/L) = IR * DF * PF		
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:15 PM			
Sample Point			
BY-104 ROTARY			

Analyst:		CRJ	Date: 09-Apr-96
Signature of Chemist:		JLS	Date: 5/1/96

SAMPLE.WB1 REV 2.0 925009ML

2013

WORKBOOK PAGE: DUP7

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			DUP
DUP	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
6665	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
Test Code	DIGEST FACTOR	(Dg/L)	0.9268
@U-01	LIFETIME IN MICROSECONDS		35.00
Matrix	R2 VALUE		0.9958
SOLID	RANGE (HIGH OR LOW)		HIGH
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	2.36E-04
96002340	INSTRUMENT RESULT	(IR)	2.51E-03
Rerun	DETECTION LEVEL µg/g		3.99E-01
0			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		2.51E-02
FUS-ZR01	RESULT (µg/g)		2.71E+04
Sample #	RELATIVE % UNCERTAINTY		9.4
S95T003664			
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:15 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

LABCORE Completed RadChem Report for Worklist#: 7590

Analyst: dgg **Instrument:** U01 **Book#** 45856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun 2 / jls

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	au-01	U-02	SOLID	0.0639	6.21e-2	97.183	% Recovery
1	STD			0	au-01	U-02E	SOLID	1	3.3	3.300	% Inst Error
2	BLNK-PREP			0	au-01	U-02	SOLID	1	<1.65		ug/g
2	BLNK-PREP			0	au-01	U-02E	SOLID	1	na		% Inst Error
3	SAMPLE	S95T003811	0	Z	au-01	U-02	SOLID	N/A	9.9e+2	165.0e-002	ug/g
3	SAMPLE	S95T003811	0	Z	au-01	U-02E	SOLID	N/A	1.5	0.0e+000	% Inst Error
4	DUP	S95T003811	0	Z	au-01	U-02	SOLID	9.9e+2	1.03e+3	3.960	RPD
4	DUP	S95T003811	0	Z	au-01	U-02E	SOLID	1	1.3	1.300	% Inst Error
5	SPK	S95T003811	0	Z	au-01	U-02	SOLID	100	118	118.000	% Recovery

Final page for worklist# 7590

Analyst Signature **Date** **Analyst Signature** **Date**

[signature] 4/26/96
Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 7590

Analyst: DBB **Instrument:** U01 _____ **Book#** 45B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun 2 / jls

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003811	0	Z	@U-01	SOLID	95000200	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003811	0	Z	@U-01	SOLID		
5	SPK	S95T003811	0	Z	@U-01	SOLID		

Final page for worklist # 7590

DBBuffa 4-22-96
Analyst Signature **Date**

JJ Thompson 4/26/96
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Uranium Data Collection Sheet

WHC-SD-WM-DP-164, REV. 1

Worklist Number: 7590 **Date/Time:** 6-22-96 / 0800

Spike Book Number: 22B55 **Spike Volume:** .100 ml

Sample Type	Sample Number	Digest Factor	Preparation Factor	Sample Size	Dilution Factor	Comments
STD			10-10	1	—	
BLNK			.100-10	1	—	
SAM	S95T3811	2.2420	.100-10	1	—	
DUP	S95T3811	2.2308	.100-10	1	—	
SPIKE	S95T3811		.100-10	1	—	

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			STANDARD
Type			
STANDARD	STANDARD BOOK #		45B56
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7590	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
@U-01	LIFETIME IN MICROSECONDS		296.00
Matrix	R2 VALUE		0.9980
LIQUID	RANGE (HIGH OR LOW)		HIGH
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	2.04E-06
N/A	INSTRUMENT RESULT	(IR)	6.21E-06
Rerun	DETECTION LEVEL (µg/mL)		3.70E-05
2			
Sample Prep	RESULT (µg/mL)		6.21E-02
N/A	VALUE OF STANDARD		6.39E-02
Sample #	%RECOVERY		97.18
	RELATIVE % UNCERTAINTY		3.3
Instrument Code			
U01			
Prepared By			
JLS			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
04/26/~~95~~ 96			
Analysis Date			
04/22/96			
Analysis Time			
08:00 AM			
Sample Point			
BY104 ROTARY			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:		DGG	Date: 26-Apr-~~95~~ 96
Signature of Chemist:		JLS	Date: 4/26/95

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			BLANK
BLANK	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
7590	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
Instrument	DIGEST FACTOR	(Dg/L)	2.2420
@U-01	LIFETIME IN MICROSECONDS		0.00
Matrix	R2 VALUE		0.0000
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	0.00E+00
N/A	INSTRUMENT RESULT	(IR)	0.00E+00
Rerun	DETECTION LEVEL µg/g		1.65E+00
2			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		0.00E+00
N/A	RESULT (µg/g)		0.00E+00
Sample #	RELATIVE % UNCERTAINTY		NA

Result = < 1.65 µg/g

Instrument Code: U01

Prepared By: JLS

Chemist: JLS

Analyst: DGG

Date Complete: 04/26/~~95~~ 96

Analysis Date: 04/22/96

Analysis Time: 08:00 AM

Sample Point: BY104 ROTARY

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		DGG	Date: 26-Apr-~~95~~ 96
Signature of Chemist:		JLS	Date: 4/26/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SAMPLE
Type			
SAMPLE	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
7590	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
Test Code	DIGEST FACTOR	(Dg/L)	2.2420
@U-01	LIFETIME IN MICROSECONDS		228.00
Matrix	R2 VALUE		0.9990
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	3.41E-07
N/A	INSTRUMENT RESULT	(IR)	2.22E-05
Rerun	DETECTION LEVEL µg/g		1.65E+00
2			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		2.22E-03
FUSION	RESULT (µg/g)		9.90E+02
Sample #	RELATIVE % UNCERTAINTY		1.5
S95T003811			
Instrument Code			
U01			
Prepared By			
JLS			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
04/26/~~95~~ 96			
Analysis Date			
04/22/96			
Analysis Time			
08:00 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		DGG	Date: 26-Apr-~~95~~ 96
Signature of Chemist:	J L Shepherd	JLS	Date: 4/26/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			DUPLICATE
DUPLICATE	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
7590	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
Method Code	DIGEST FACTOR	(Dg/L)	2.2308
@U-01	LIFETIME IN MICROSECONDS		231.00
Matrix	R2 VALUE		0.9996
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	3.01E-07
N/A	INSTRUMENT RESULT	(IR)	2.29E-05
Rerun	DETECTION LEVEL µg/g		1.66E+00
2			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		2.29E-03
FUSION	RESULT (µg/g)		1.03E+03
Sample #	RELATIVE % UNCERTAINTY		1.3
S95T003811			
Instrument Code			
U01			
Prepared By			
JLS			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
04/26/~~95~~ 96			
Analysis Date			
04/22/96			
Analysis Time			
08:00 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:		DGG	Date: 26-Apr-~~95~~ 96
Signature of Chemist:		JLS	Date: 4/26/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
SPIKE	SPIKE BOOK #		22B55
Workbook	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
7590	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	100.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.2420
Matrix	LIFETIME IN MICROSECONDS		207.00
SOLID	R2 VALUE		0.9995
Batch Number	RANGE (HIGH OR LOW)		HIGH
N/A	INSTRUMENT RESULT	(IR)	6.94E-04
Replicate	CONCENTRATION IN SOLUTION (g/L)	(CONC)	6.94E-02
2	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUSION	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	0.10
Sample #	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	0.0022
S95T003811			
Instrument Code			
U01	Concentration = IR * DF * PF		
Prepared By			
JLS	QC Actual (µg/mL) = SV (g/L) * 1000		
Chemist			
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
Analyst			
DGG	% Recovery = QC FOUND / QC ACTUAL		
Date Complete			
04/26/95			
Analysis Date			
04/22/96	QC ACTUAL	=	5.69E+01 µg/mL
Analysis Time	QC FOUND	=	6.72E+01 µg/mL
08:00 AM	% SPIKE RECOVERY	=	118.1%
Sample Point			
BY104 ROTARY			

Analyst:		DGG	Date: 26-Apr-~~95~~ 96
Signature of Chemist:	J L Lupperson	JLS	Date: 4/26/96

Sample ID 22B56
Description LMCS STD.
Ref. Ratio .942
Laser Pulses 500
Lifetime 296 + 2.013 us
R2 .998
Integrated 70452
Range: HIGH

Date/Time 04/22/96/07:49:52
Cal Y=6.07E+07X+425.453
Intensity 3768 (t= 39 us)
Conc 6.21E-05 + 2.04E-06 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.21E-05 + 2.04E-06 ~~ug/L~~ DSS g/L

Sample ID PREP-BLK
Description BY-104
Ref. Ratio 1.009
Laser Pulses 500
Lifetime + us
R2
Integrated 0
Range: LOW
Sample <= Blank

Date/Time 04/22/96/08:05:14
Cal Y=4.39E+09X+4.88E-04
Intensity -825 (t= 39 us)
Conc + ug/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID 9957003811
Description BY-104
Ref. Ratio 1.012
Laser Pulses 500
Lifetime 228 + 1.111 us
R2 .999
Integrated 823453
Range: LOW

Date/Time 04/22/96/08:09:01
Cal Y=4.39E+09X+4.88E-04
Intensity 50642 (t= 143 us)
Conc 2.22E-05 + 3.41E-07 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.22E-05 + 3.41E-07 ~~ug/L~~ DSS g/L

Sample ID 9957003811-DUP
Description BY-104
Ref. Ratio 1
Laser Pulses 500
Lifetime 231 + .711 us
R2 .9996
Integrated 868439
Range: LOW

Date/Time 04/22/96/08:12:28
Cal Y=4.39E+09X+4.88E-04
Intensity 51570 (t= 143 us)
Conc 2.29E-05 + 3.01E-07 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.29E-05 + 3.01E-07 ~~ug/L~~ DSS g/L

Sample ID 9957003811-SPK
Description BY-104
Ref. Ratio 1.026
Laser Pulses 500
Lifetime 207 + .699 us
R2 .9995
Integrated 510862
Range: HIGH

Date/Time 04/22/96/08:13:47
Cal Y=6.07E+07X+425.453
Intensity 34413 (t= 39 us)
Conc 6.94E-04 + 2.24E-05 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.94E-04 + 2.24E-05 ~~ug/L~~ DSS g/L

LABCORE Completed RadChem Report for Worklist#: 7591

Analyst: cjo **Instrument:** U01 **Book#** 45B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	aU-01	U-02	SOLID	6.39E-02	7.24E-02	113.302	% Recovery
1	STD			0	aU-01	U-02E	SOLID	1	3.14E+00	3.140	% Inst Error
2	BLNK-PREP			0	aU-01	U-02	SOLID	1	5.48E+1	54.800	ug/g
2	BLNK-PREP			0	aU-01	U-02E	SOLID	1	1.63E+00	1.630	% Inst Error
3	SAMPLE	S95T003663	0	Z	aU-01	U-02	SOLID	N/A	2.57E+04	170.0e-002	ug/g
3	SAMPLE	S95T003663	0	Z	aU-01	U-02E	SOLID	N/A	3.10E+00	0.0e+000	% Inst Error
4	DUP	S95T003663	0	Z	aU-01	U-02	SOLID	2.57E+4	2.35E+4	8.943	RPD
4	DUP	S95T003663	0	Z	aU-01	U-02E	SOLID	1	3.11E+00	3.110	% Inst Error
5	SPK	S95T003663	0	Z	aU-01	U-02	SOLID	5.69E+01	5.32E+01	93.497	% Recovery

Final page for worklist# 7591

Analyst Signature Date

Analyst Signature Date

5/1/96

Reviewer Signature Date

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 7591

Analyst: KNT **Instrument:** U01 _____ **Book#** 45B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003663	0	Z	@U-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003663	0	Z	@U-01	SOLID		
5	SPK	S95T003663	0	Z	@U-01	SOLID		

Final page for worklist # 7591

Kim Thomas 4-25-96
Analyst Signature **Date**

Shyron L Uulle 4-30-96
Analyst Signature **Date**
C.J. Opinen 5/1/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

URANIUM ANALYSIS

```
Sample ID  45B56
Description  STD          Date/Time  04/25/96/03:20:40
Ref. Ratio 1.013          Cal Y=8.50E+07X-1.01E+03
Laser Pulses 500          Intensity 4103      (t=  39      us)
Lifetime 230 + .742 us    Conc 7.24E-05 + 2.27E-06 g/L
R2 .9996                  Dilution Factor 1 mL/mL
Integrated 68534
Range: HIGH   FINAL RESULT  7.24E-05 + 2.27E-06 g/L
-------
Sample ID
Description  BLNK-PREP    Date/Time  04/25/96/03:28:18
Ref. Ratio 1.017          Cal Y=5.51E+09X0
Laser Pulses 500          Intensity 4854      (t=  39      us)
Lifetime 214 + 1.519 us   Conc 1.19E-06 + 1.94E-08 g/L
R2 .9978                  Dilution Factor 1 mL/mL
Integrated 60974
Range: LOW    FINAL RESULT  1.19E-06 + 1.94E-08 g/L

Sample ID  S95T003663
Description  SAM          Date/Time  04/25/96/03:33:23
Ref. Ratio 1.004          Cal Y=8.50E+07X-1.01E+03
Laser Pulses 500          Intensity 37275     (t=  39      us)
Lifetime 221 + .428 us    Conc 5.58E-04 + 1.73E-05 g/L
R2 .9999                  Dilution Factor 1 mL/mL
Integrated 594108
Range: HIGH   FINAL RESULT  5.58E-04 + 1.73E-05 g/L

Sample ID  S95T003663
Description  DUP          Date/Time  04/25/96/03:37:21
Ref. Ratio 1.001          Cal Y=8.50E+07X-1.01E+03
Laser Pulses 500          Intensity 35549     (t=  39      us)
Lifetime 241 + .691 us    Conc 5.24E-04 + 1.63E-05 g/L
R2 .9997                  Dilution Factor 1 mL/mL
Integrated 608665
Range: HIGH   FINAL RESULT  5.24E-04 + 1.63E-05 g/L
-------------
Sample ID  S95T003663
Description  SPK          Date/Time  04/25/96/03:40:48
Ref. Ratio 1.019          Cal Y=8.50E+07X-1.01E+03
Laser Pulses 500          Intensity 51206     (t= 130      us)
Lifetime 244 + .584 us    Conc 1.09E-03 + 3.41E-05 g/L
R2 .9997                  Dilution Factor 1 mL/mL
Integrated 893712
Range: HIGH   FINAL RESULT  1.09E-03 + 3.41E-05 g/L
```

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			STANDARD
STD	STANDARD BOOK #		45B56
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7591	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
@U-01	LIFETIME IN MICROSECONDS		230.00
Matrix	R2 VALUE		0.9996
LIQUID	RANGE (HIGH OR LOW)		HIGH
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	2.27E-06
96003395	INSTRUMENT RESULT	(IR)	7.24E-05
Rerun	DETECTION LEVEL (µg/mL)		3.70E-05
0			
Sample Prep			
N/A	RESULT (µg/mL)		7.24E-02
Sample #	VALUE OF STANDARD		6.39E-02
WL7591	%RECOVERY		113.30
Instrument Code	RELATIVE % UNCERTAINTY		3.1
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:30 AM			
Sample Point			
BY104 ROTARY			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

STANDARD.WB1 REV 2.0 925009ML

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7591	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.1712
Matrix	LIFETIME IN MICROSECONDS		214.00
SOLID	R2 VALUE		0.9978
Batch Number	RANGE (HIGH OR LOW)		LOW
96003395	INSTRUMENT UNCERTAINTY	(IU)	1.94E-08
Rerun	INSTRUMENT RESULT	(IR)	1.19E-06
0	DETECTION LEVEL µg/g		1.70E+00
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		1.19E-04
Sample #	RESULT (µg/g)		5.48E+01
WL7591	RELATIVE % UNCERTAINTY		1.6
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

BLANK.WB1 REV 2.0 925009ML

2023

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7591	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.1712
Matrix	LIFETIME IN MICROSECONDS		221.00
SOLID	R2 VALUE		0.9999
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003395	INSTRUMENT UNCERTAINTY	(IU)	1.73E-05
Rerun	INSTRUMENT RESULT	(IR)	5.58E-04
1	DETECTION LEVEL µg/g		1.70E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		5.58E-02
Sample #	RESULT (µg/g)		2.57E+04
S95T003663	RELATIVE % UNCERTAINTY		3.1
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7591	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2336
Matrix	LIFETIME IN MICROSECONDS		241.00
SOLID	R2 VALUE		0.9997
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003395	INSTRUMENT UNCERTAINTY	(IU)	1.63E-05
Rerun	INSTRUMENT RESULT	(IR)	5.24E-04
1	DETECTION LEVEL µg/g		1.66E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		5.24E-02
Sample #	RESULT (µg/g)		2.35E+04
S95T003663	RELATIVE % UNCERTAINTY		3.1
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:30 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

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WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPK	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
7591	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	100.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.1712
Matrix	LIFETIME IN MICROSECONDS		244.00
SOLID	R2 VALUE		0.9997
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003395	INSTRUMENT RESULT	(IR)	1.09E-03
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	1.09E-01
1	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	0.10
Sample Number	CONCENTRATION IN SOLN (g/L) FROM SAMPLE FORM	(SR)	5.58E-02
S95T003663			
Instrument Code			
U01	Concentration = IR * DF * PF		
Prepared By			
SLH2	QC Actual (µg/mL) = SV (g/L) * 1000		
Chemist			
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
Analyst			
KNT	% Recovery = QC FOUND / QC ACTUAL		
Date Complete			
04/30/96			
Analysis Date			
04/25/96	QC ACTUAL	=	5.69E+01 µg/mL
Analysis Time	QC FOUND	=	5.32E+01 µg/mL
03:30 AM	% SPIKE RECOVERY	=	93.5%
Sample Point			
BY104 ROTARY			

Analyst:		KNT	Date:	30-Apr-96
Signature of Chemist:		JLS	Date:	5/1/96

SPIKE.WB1 REV 2.0 925009ML

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LABCORE Completed RadChem Report for Worklist#: 7592

Analyst: cjo **Instrument:** U01 **Book#** 45856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	BU-01	U-02	SOLID	6.39E-02	7.23E-02	113.146	% Recovery
1	STD			0	BU-01	U-02E	SOLID	1	3.11E+00	3.110	% Inst Error
2	BLNK-PREP			0	BU-01	U-02	SOLID	1	6.10E+1	61.000	ug/g
2	BLNK-PREP			0	BU-01	U-02E	SOLID	1	2.06E+00	2.060	% Inst Error
3	SAMPLE	S95T003649	0	Z	BU-01	U-02	SOLID	N/A	1.01E+03	158.0e-002	ug/g
3	SAMPLE	S95T003649	0	Z	BU-01	U-02E	SOLID	N/A	1.30E+00	0.0e+000	% Inst Error
4	DUP	S95T003649	0	Z	BU-01	U-02	SOLID	1.01E+3	8.63E+2	15.697	RPD
4	DUP	S95T003649	0	Z	BU-01	U-02E	SOLID	1	1.40E+00	1.400	% Inst Error
5	SPK	S95T003649	0	Z	BU-01	U-02	SOLID	5.69E+01	5.64E+01	99.200	% Recovery

Final page for worklist# 7592

Analyst Signature **Date**

Analyst Signature **Date**

[signature] 5/1/96
Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Completed RadChem Report for Worklist#: 7592

Analyst: cjo **Instrument:** U01 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		aU-01	U-02	SOLID	6.39E-02	7.23E-02	113.146	% Recovery
1	STD		0		aU-01	U-02E	SOLID	1	3.11E+00	3.110	% Inst Error
2	BLNK-PREP		0		aU-01	U-02	SOLID	1	6.10E+1	61.000	ug/g
2	BLNK-PREP		0		aU-01	U-02E	SOLID	1	2.06E+00	2.060	% Inst Error
3	SAMPLE	S95T003649	0	Z	aU-01	U-02	SOLID	N/A	1.37E+03	158.0e-002	ug/g
3	SAMPLE	S95T003649	0	Z	aU-01	U-02E	SOLID	N/A	3.55E+00	0.0e+000	% Inst Error
4	DUP	S95T003649	0	Z	aU-01	U-02	SOLID	1.37E+3	8.63E+2	45.410	RPD
4	DUP	S95T003649	0	Z	aU-01	U-02E	SOLID	1	1.40E+00	1.400	% Inst Error
5	SPK	S95T003649	0	Z	aU-01	U-02	SOLID	5.69E+01	5.56E+01	97.715	% Recovery

Final page for worklist# 7592

Analyst Signature **Date** **Analyst Signature** **Date**

J J Seppen 5/1/96
Reviewer Signature **Date**

Sample result and count error and spike changed through edit functions on 5/1/96 @ 10:00 AM.

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 7592

Analyst: KNT **Instrument:** U01 _____ **Book#** 45B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003649	0	Z	@U-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003649	0	Z	@U-01	SOLID		
5	SPK	S95T003649	0	Z	@U-01	SOLID		

Final page for worklist # 7592

Kim Thomas 4-25-96
Analyst Signature **Date**

Sharon L Hagel 4-30-96
Analyst Signature **Date**

C.J. Quinn 5/1/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

URANIUM ANALYSIS

Sample ID 45B56
Description STD
Ref. Ratio .997
Laser Pulses 500
Lifetime 221 + .461 us
R2 .9998
Integrated 65604
Range: HIGH

Date/Time 04/25/96/02:18:06
Cal Y=8.50E+07X-1.01E+03
Intensity 4157 (t= 39 us)
Conc 7.23E-05 + 2.25E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 7.23E-05 + 2.25E-06 g/L

Sample ID S95T003649
Description DUP
Ref. Ratio 1.027
Laser Pulses 500
Lifetime 224 + 1.244 us
R2 .9987
Integrated 124898
Range: LOW

Date/Time 04/25/96/03:15:08
Cal Y=5.51E+09X0
Intensity 7368 (t= 39 us)
Conc 1.75E-06 + 2.45E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.75E-06 + 2.45E-08 g/L

Sample ID S95T003649
Description SPK
Ref. Ratio 1.006
Laser Pulses 500
Lifetime 201 + .545 us
R2 .9997
Integrated 569073
Range: HIGH

Date/Time 04/25/96/03:17:22
Cal Y=8.50E+07X-1.01E+03
Intensity 38924 (t= 39 us)
Conc 5.88E-04 + 1.84E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.88E-04 + 1.84E-05 g/L

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			STANDARD
STD	STANDARD BOOK #		45B56
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7592	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
@U-01	LIFETIME IN MICROSECONDS		221.00
Matrix	R2 VALUE		0.9998
LIQUID	RANGE (HIGH OR LOW)		HIGH
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	2.25E-06
96003396	INSTRUMENT RESULT	(IR)	7.23E-05
Rerun	DETECTION LEVEL (µg/mL)		3.70E-05
0			
Sample Prep	RESULT (µg/mL)		7.23E-02
N/A	VALUE OF STANDARD		6.39E-02
Sample #	%RECOVERY		113.15
WL7592	RELATIVE % UNCERTAINTY		3.1
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:00 AM			
Sample Point			
BY104 ROTARY			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

STANDARD.WB1 REV 2.0 925009ML

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			BLANK
BLNK-PREP			
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7592	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.3424
Matrix	LIFETIME IN MICROSECONDS		217.00
SOLID	R2 VALUE		0.9956
Batch Number	RANGE (HIGH OR LOW)		LOW
96003396	INSTRUMENT UNCERTAINTY	(IU)	2.95E-08
Rerun	INSTRUMENT RESULT	(IR)	1.43E-06
0	DETECTION LEVEL µg/g		1.58E+00
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		1.43E-04
Sample #	RESULT (µg/g)		6.10E+01
WL7592	RELATIVE % UNCERTAINTY		2.1
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:00 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

BLANK.WB1 REV 2.0 925009ML

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WORKBOOK PAGE: SAM3

WHC-SD-WM-DP-164, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

SAMPLE			SAMPLE
[illegible]	VOLUME OF SAMPLE (mL)	(SS)	1.00
7592	DILUTION FACTOR OF SAMPLE	(DF)	1.00
[illegible]	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.3424
[illegible]	LIFETIME IN MICROSECONDS		149.00
SOLID	R2 VALUE		0.9998
[illegible]	RANGE (HIGH OR LOW)		LOW
96003396	INSTRUMENT UNCERTAINTY	(IU)	2.98E-07
[illegible]	INSTRUMENT RESULT	(IR)	2.37E-05
1	DETECTION LEVEL µg/g		1.58E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		2.37E-03
Sample [illegible]	RESULT (µg/g)		1.01E+03
S95T003649	RELATIVE % UNCERTAINTY		1.3

Instrument Code	
U01	
Prepared By	Result = Conc. in Solution (g/L) * 1000000 / Dg/L
SLH2	
Chemist	Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF
JLS	
Analyzed By	Relative % Uncertainty = IU / IR * 100
KNT	
Data Complete	Concentration in Solution (g/L) = IR * DF * PF
04/30/96	
Analysis Date	
04/25/96	
Analysis Time	
03:00 AM	
Sample Point	
BY104 ROTARY	

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

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I:\925009\OUT\UR7592.WB1 05/01/96 09:49:36

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7592	DILUTION FACTOR OF SAMPLE	(DF)	11.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2316
Matrix	LIFETIME IN MICROSECONDS		224.00
SOLID	R2 VALUE		0.9987
Batch Number	RANGE (HIGH OR LOW)		LOW
96003396	INSTRUMENT UNCERTAINTY	(IU)	2.45E-08
Rerun	INSTRUMENT RESULT	(IR)	1.75E-06
1	DETECTION LEVEL µg/g		1.82E+01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.93E-03
Sample #	RESULT (µg/g)		8.63E+02
S95T003649	RELATIVE % UNCERTAINTY		1.4
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:00 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist: J J Scippa	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
SPK	SPIKE BOOK #		22B66
	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
7592	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	100.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.3424
	LIFETIME IN MICROSECONDS		201.00
SOLID	R2 VALUE		0.9997
	RANGE (HIGH OR LOW)		HIGH
96003396	INSTRUMENT RESULT	(IR)	5.88E-04
	CONCENTRATION IN SOLUTION (g/L)	(CONC)	5.88E-02
1	SPIKE VALUE (g/L)	(SV)	5.69E-02
	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	0.10
	CONCENTRATION IN SOLN (g/L) FROM SAMPLE FORM	(SR)	2.37E-03
S95T003649			

U01

Concentration = IR * DF * PF

SLH2

QC Actual (µg/mL) = SV (g/L) * 1000

JLS

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

KNT

% Recovery = QC FOUND / QC ACTUAL

04/30/96

04/25/96

03:00 AM

BY104 ROTARY

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	5.64E+01	µg/mL
% SPIKE RECOVERY	=	99.2%	

Analyst:		KNT	Date:	30-Apr-96
Signature of Chemist:		JLS	Date:	5/1/96

SPIKE.WB1 REV 2.0 925009ML

2040

LABCORE Completed RadChem Report for Worklist#: 7681

Analyst: cjo **Instrument:** U01 **Book#** 45856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	aU-01	U-02	SOLID	6.39E-02	7.24E-02	113.302	% Recovery
1	STD			0	aU-01	U-02E	SOLID	1	3.12E+00	3.120	% Inst Error
2	BLNK-PREP			0	aU-01	U-02	SOLID	1	4.68E+1	46.800	ug/g
2	BLNK-PREP			0	aU-01	U-02E	SOLID	1	3.71E+00	3.710	% Inst Error
3	SAMPLE	S95T003788	0	Z	aU-01	U-02	SOLID	N/A	7.55E+03	179.0e-002	ug/g
3	SAMPLE	S95T003788	0	Z	aU-01	U-02E	SOLID	N/A	3.10E+00	0.0e+000	% Inst Error
4	DUP	S95T003788	0	Z	aU-01	U-02	SOLID	7.55E+3	7.52E+3	0.398	RPD
4	DUP	S95T003788	0	Z	aU-01	U-02E	SOLID	1	3.10E+00	3.100	% Inst Error
5	SPK	S95T003788	0	Z	aU-01	U-02	SOLID	5.69E+01	5.02E+01	88.225	% Recovery

Final page for worklist# 7681

Analyst Signature Date

Analyst Signature Date

5/1/96

Reviewer Signature Date

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 7681

Analyst: KNT **Instrument:** U01 _____ **Book#** 45B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003788	0	Z	@U-01	SOLID	95000200	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003788	0	Z	@U-01	SOLID		
5	SPK	S95T003788	0	Z	@U-01	SOLID		

Final page for worklist # 7681

Kim Thomas 4-25-96
Analyst Signature Date

Shannon L Wilde 4-30-96
Analyst Signature Date

C.J. Opinen 5/1/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sample ID 45B56
Description STD
Ref. Ratio 1.017
Laser Pulses 500
Lifetime 231 + .691 us
R2 .9996
Integrated 68975
Range: HIGH

Date/Time 04/25/96/03:43:14
Cal Y=8.50E+07X-1.01E+03
Intensity 4164 (t= 39 us)
Conc 7.24E-05 + 2.26E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 7.24E-05 + 2.26E-06 g/L

Sample ID
Description BLNK-PREP
Ref. Ratio 1.029
Laser Pulses 500
Lifetime 183 + 3.152 us
R2 .9874
Integrated 54633
Range: LOW

Date/Time 04/25/96/03:49:46
Cal Y=5.51E+09X0
Intensity 3316 (t= 39 us)
Conc 9.68E-07 + 3.59E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.68E-07 + 3.59E-08 g/L

Sample ID S95T003788
Description SAM
Ref. Ratio 1.011
Laser Pulses 500
Lifetime 239 + .371 us
R2 .9999
Integrated 170031
Range: HIGH

Date/Time 04/25/96/03:53:59
Cal Y=8.50E+07X-1.01E+03
Intensity 10074 (t= 39 us)
Conc 1.56E-04 + 4.84E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.56E-04 + 4.84E-06 g/L

Sample ID S95T003788
Description DUP
Ref. Ratio 1.012
Laser Pulses 500
Lifetime 252 + .634 us
R2 .9997
Integrated 174204
Range: HIGH

Date/Time 04/25/96/03:56:35
Cal Y=8.50E+07X-1.01E+03
Intensity 9814 (t= 39 us)
Conc 1.53E-04 + 4.75E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.53E-04 + 4.75E-06 g/L

Sample ID S95T003788
Description SPK
Ref. Ratio 1.015
Laser Pulses 500
Lifetime 246 + .441 us
R2 .9998
Integrated 782502
Range: HIGH

Date/Time 04/25/96/04:01:32
Cal Y=8.50E+07X-1.01E+03
Intensity 45226 (t= 39 us)
Conc 6.58E-04 + 2.04E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.58E-04 + 2.04E-05 g/L

WHC-SD-WM-DP-164, REV. 1

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			STANDARD
STD			
Work List	STANDARD BOOK #		45B56
7681	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
@U-01	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		231.00
LIQUID	R2 VALUE		0.9996
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003499	INSTRUMENT UNCERTAINTY	(IU)	2.26E-06
Rerun	INSTRUMENT RESULT	(IR)	7.24E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		7.24E-02
Sample #	VALUE OF STANDARD		6.39E-02
WL7681	%RECOVERY		113.30
Instrument Code	RELATIVE % UNCERTAINTY		3.1
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:50 AM			
Sample Point			
BY104 ROTARY			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

STANDARD.WB1 REV 2.0 925009ML

2044

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WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			BLANK
BLNK-PREP			
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7681	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.0668
Matrix	LIFETIME IN MICROSECONDS		183.00
SOLID	R2 VALUE		0.9874
Batch Number	RANGE (HIGH OR LOW)		LOW
96003499	INSTRUMENT UNCERTAINTY	(IU)	3.59E-08
Rerun	INSTRUMENT RESULT	(IR)	9.68E-07
0	DETECTION LEVEL µg/g		1.79E+00
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		9.68E-05
Sample #	RESULT (µg/g)		4.68E+01
WL7681	RELATIVE % UNCERTAINTY		3.7
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:50 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

BLANK.WB1 REV 2.0 925009ML

WORKBOOK PAGE: SAM3 WHC-SD-WM-DP-164, REV. 1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7681	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.0668
Matrix	LIFETIME IN MICROSECONDS		239.00
SOLID	R2 VALUE		0.9999
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003499	INSTRUMENT UNCERTAINTY	(IU)	4.84E-06
Rerun	INSTRUMENT RESULT	(IR)	1.56E-04
1	DETECTION LEVEL µg/g		1.79E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.56E-02
Sample #	RESULT (µg/g)		7.55E+03
S95T003788	RELATIVE % UNCERTAINTY		3.1
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:50 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

2046

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WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			DUP
DUP			
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
7681	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
@U-01	DIGEST FACTOR	(Dg/L)	2.0348
Matrix	LIFETIME IN MICROSECONDS		252.00
SOLID	R2 VALUE		0.9997
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003499	INSTRUMENT UNCERTAINTY	(IU)	4.75E-06
Rerun	INSTRUMENT RESULT	(IR)	1.53E-04
1	DETECTION LEVEL µg/g		1.82E+00
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.53E-02
Sample #	RESULT (µg/g)		7.52E+03
S95T003788	RELATIVE % UNCERTAINTY		3.1
Instrument Code			
U01			
Prepared By			
SLH2			
Chemist			
JLS			
Analyst			
KNT			
Date Complete			
04/30/96			
Analysis Date			
04/25/96			
Analysis Time			
03:50 AM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
Type			
SPK	SPIKE BOOK #		22B65
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
7681	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	100.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.0668
Matrix	LIFETIME IN MICROSECONDS		245.00
SOLID	R2 VALUE		0.9998
Batch Number	RANGE (HIGH OR LOW)		HIGH
96003499	INSTRUMENT RESULT	(IR)	6.58E-04
Aliquot	CONCENTRATION IN SOLUTION (g/L)	(CONC)	6.58E-02
1	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	0.10
Sample Number	CONCENTRATION IN SOLN (g/L) FROM SAMPLE FORM	(SR)	1.56E-02
S95T003788			
Instrument Code			
U01	Concentration = IR * DF * PF		
Prepared By			
SLH2	QC Actual (µg/mL) = SV (g/L) * 1000		
Chemist			
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
Analyst			
KNT	% Recovery = QC FOUND / QC ACTUAL		
Date Complete			
04/30/96			
Analysis Date			
04/25/96	QC ACTUAL	=	5.69E+01 µg/mL
Analysis Time	QC FOUND	=	5.02E+01 µg/mL
03:50 AM	% SPIKE RECOVERY	=	88.2%
Sample Point			
BY104 ROTARY			

Analyst:	KNT	Date:	30-Apr-96
Signature of Chemist:	JLS	Date:	5/1/96

SPIKE.WB1 REV 2.0 925009ML

2048

LABCORE Completed Worklist Report for Worklist# 6667

Analyst: crj **Instrument:** U01 **Book#** 45856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep. For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		au-01	U-02	SOLID	6.39E-02	6.57E-02	102.820	% Recovery
1	STD		0		au-01	U-02E	SOLID	1	3.17E+00	3.170	% Inst Error
2	BLNK-PREP		0		au-01	U-02	SOLID	1	5.27E+0	5.270	ug/g
2	BLNK-PREP		0		au-01	U-02E	SOLID	1	1.33E+00	1.330	% Inst Error
3	SAMPLE	S95T003788	0	Z	au-01	U-02	SOLID	N/A	3.20E+03	0.179	ug/g
3	SAMPLE	S95T003788	0	Z	au-01	U-02E	SOLID	N/A	5.04E+00	0.000	% Inst Error
4	DUP	S95T003788	0	Z	au-01	U-02	SOLID	3.20E+3	3.19E+3	0.310	RPD
4	DUP	S95T003788	0	Z	au-01	U-02E	SOLID	1	4.86E+00	4.860	% Inst Error
5	SPK	S95T003788	0	Z	au-01	U-02	SOLID	5.69E+01	1.57E+01	27.590	% Recovery

Final page for worklist# 6667

Analyst Signature **Date** **Analyst Signature** **Date**

Reviewer Signature **Date** 4/12/96

S95T003788 will be rerun due to low spike recovery.

Units shown for QC (BLK/BKG) may not reflect the actual units.

WHC-SD-WM-DP-164, REV. 1

LABCORE Completed Worklist Report for Worklist# 6667

Analyst: crj **Instrument:** U01 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: 1-10ml Sample Prep. For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@U-01	U-02	SOLID	6.39E-02	6.57E-02	102.820	% Recovery
1	STD		0		@U-01	U-02E	SOLID	1	3.17E+00	3.170	% Inst Error
2	BLNK-PREP		0		@U-01	U-02	SOLID	1	5.27E+0	5.270	ug/g
2	BLNK-PREP		0		@U-01	U-02E	SOLID	1	1.33E+00	1.330	% Inst Error
3	SAMPLE	S95T003788	0	Z	@U-01	U-02	SOLID	N/A	3.20E+03	0.179	ug/g
3	SAMPLE	S95T003788	0	Z	@U-01	U-02E	SOLID	N/A	5.04E+00	0.000	% Inst Error
4	DUP	S95T003788	0	Z	@U-01	U-02	SOLID	3.20E+3	3.19E+3	0.310	RPD
4	DUP	S95T003788	0	Z	@U-01	U-02E	SOLID	1	4.86E+00	4.860	% Inst Error
5	SPK	S95T003788	0	Z	@U-01	U-02	SOLID	5.69E+01	1.57E+02	275.920	% Recovery

Final page for worklist# 6667

Analyst Signature **Date** **Analyst Signature** **Date**

Reviewer Signature **Date**

Spike result corrected through QC Edit function on 4/9/96 @ 1:15 pm.

J. L. Dupper

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 6667

Analyst: CRJ **Instrument:** U01 U01 **Book#** ~~B556~~ 45B56 cg 4/1/96

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep. For spike use: 0.1ml spk. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003788	0	Z	@U-01	SOLID	95000200	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003788	0	Z	@U-01	SOLID		
5	SPK	S95T003788	0	Z	@U-01	SOLID		

Final page for worklist # 6667

C Johnson 4/5/96
Analyst Signature **Date**

MCB 4/9/96
Analyst Signature **Date**
Sue Hogan 4/9/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

URANIUM ANALYSIS

Background Report

Background for LOW Range
Laser Pulses 500

First Time Gate Used (sample) 4
Date/Time 04/05/96/13:19:48

Reference	Sample
Intensity 11033	Intensity 328
Lifetime 285.76 + .67 us	
R2 .99978	
Intercept 13056.24	

WL 6667

Standard Report

Standard for LOW Range - 2.48E-06 g/L
Laser Pulses 500

Date/Time 04/05/96/13:21:25

Reference	Standard
Intensity 10877	Intensity 12886
Lifetime 287.16 + .66 us	Lifetime 281.13 + 1.08 us
R2 .99979	R2 .9994
Intercept 13018.18	Intercept 14970.61 + 1.22E+02

Sample ID 45b56
Description std
Ref. Ratio 1.033
Laser Pulses 500
Lifetime 257 + .794 us
R2 .9996
Integrated 77338
Range: HIGH

Date/Time 04/05/96/13:23:38
Cal Y=8.55E+07X-4.08E+02
Intensity 4390 (t= 39 us)
Conc 6.57E-05 + 2.08E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.57E-05 + 2.08E-06 g/L

Sample ID WL6667
Description BLK
Ref. Ratio 1.022
Laser Pulses 500
Lifetime 241 + 1.084 us
R2 .9991
Integrated 92153
Range: LOW

Date/Time 04/05/96/13:25:51
Cal Y=6.04E+09X0
Intensity 5375 (t= 39 us)
Conc 1.09E-06 + 1.45E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.09E-06 + 1.45E-08 g/L

Sample ID S95T003788
Description SAM
Ref. Ratio 1.03
Laser Pulses 500
Lifetime 176 + 3.053 us
R2 .9873
Integrated 508762
Range: HIGH

Date/Time 04/05/96/13:27:08
Cal Y=8.55E+07X-4.08E+02
Intensity 48023 (t= 65 us)
Conc 6.61E-04 + 3.33E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.61E-04 + 3.33E-05 g/L

URANIUM ANALYSIS

Sample ID S95T003788
Description DUP
Ref. Ratio 1.022
Laser Pulses 500
Lifetime 174 + 2.803 us
R2 .989
Integrated 491968
Range: HIGH

Date/Time 04/05/96/13:29:43
Cal Y=8.55E+07X-4.08E+02
Intensity 46221 (t= 65 us)
Conc 6.50E-04 + 3.16E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.50E-04 + 3.16E-05 g/L

Sample ID S95T003788
Description SPK
Ref. Ratio 1.035
Laser Pulses 500
Lifetime 191 + 2.857 us
R2 .9905
Integrated 561998
Range: HIGH

Date/Time 04/05/96/13:31:11
Cal Y=8.55E+07X-4.08E+02
Intensity 46686 (t= 104 us)
Conc 8.18E-04 + 3.79E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 8.18E-04 + 3.79E-05 g/L

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		45B56
6667	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
@U-01	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		257.00
LIQUID	R2 VALUE		0.9996
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002341	INSTRUMENT UNCERTAINTY	(IU)	2.08E-06
Rerun	INSTRUMENT RESULT	(IR)	6.57E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.57E-02
Sample #	VALUE OF STANDARD		6.39E-02
WL6667	%RECOVERY		102.82
Instrument Code	RELATIVE % UNCERTAINTY		3.2
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:30 PM			
Sample Point			
BY-104 ROTARY			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	4/9/96

STANDARD.WB1 REV 2.0 925009ML

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6667	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.0668
Matrix	LIFETIME IN MICROSECONDS		241.00
SOLID	R2 VALUE		0.9991
Batch Number	RANGE (HIGH OR LOW)		LOW
96002341	INSTRUMENT UNCERTAINTY	(IU)	1.45E-08
Rerun	INSTRUMENT RESULT	(IR)	1.09E-06
0	DETECTION LEVEL µg/g		1.79E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		1.09E-05
Sample #	RESULT (µg/g)		5.27E+00
WL6667	RELATIVE % UNCERTAINTY		1.3
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:30 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	4/9/96

BLANK.WB1 REV 2.0 925009ML

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6667	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.0668
Matrix	LIFETIME IN MICROSECONDS		176.00
SOLID	R2 VALUE		0.9873
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002341	INSTRUMENT UNCERTAINTY	(IU)	3.33E-05
Rerun	INSTRUMENT RESULT	(IR)	6.61E-04
0	DETECTION LEVEL µg/g		1.79E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		6.61E-03
Sample #	RESULT (µg/g)		3.20E+03
S95T003788	RELATIVE % UNCERTAINTY		5.0
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:30 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	4/9/96

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6667	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.0348
Matrix	LIFETIME IN MICROSECONDS		174.00
SOLID	R2 VALUE		0.9890
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002341	INSTRUMENT UNCERTAINTY	(IU)	3.16E-05
Rerun	INSTRUMENT RESULT	(IR)	6.50E-04
0	DETECTION LEVEL µg/g		1.82E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		6.50E-03
Sample #	RESULT (µg/g)		3.19E+03
S95T003788	RELATIVE % UNCERTAINTY		4.9
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/05/96			
Analysis Time			
01:30 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	4/9/96

SAMPLE.WB1 REV 2.0 925009ML

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
SPK	SPIKE BOOK #		22B66
	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
6667	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
@U-01	DIGEST FACTOR OF SAMPLE	(DOF)	2.0666
	LIFETIME IN MICROSECONDS		191.00
SOLID	R2 VALUE		0.9905
	RANGE (HIGH OR LOW)		HIGH
96002341	INSTRUMENT RESULT	(IR)	8.18E-04
	CONCENTRATION IN SOLUTION (g/L)	(CONC)	8.18E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
	CONCENTRATION IN SOLN (g/L) FROM SAMPLE FORM	(SR)	6.61E-03
S95T003788			
U01	Concentration = IR * DF * PF		
MCB	QC Actual (µg/mL) = SV (g/L) * 1000		
VCB	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
CRJ	% Recovery = QC FOUND / QC ACTUAL		
04/09/96			
04/05/96			
01:30 PM			
BY-104 ROTARY			

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	1.57E+01	µg/mL
% SPIKE RECOVERY	=	27.6%	

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	4/9/96

SPIKE.WB1 REV 2.0 925009ML

2058

THE FOLLOWING ANALYSES WERE RERUN AND INCLUDED IN THE DATA PACKAGE, BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

LABCORE Completed Worklist Report for Worklist# 6660

Analyst: crj **Instrument:** U01 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: 1-10ml Sample Prep.For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@U-01	U-02	SOLID	6.39E-02	6.25E-02	97.810	% Recovery
1	STD		0		@U-01	U-02E	SOLID	1	3.15E+00	3.150	% Inst Error
2	BLNK-PREP		0		@U-01	U-02	SOLID	1	2.23E+1	22.300	ug/g
2	BLNK-PREP		0		@U-01	U-02E	SOLID	1	1.14E+00	1.140	% Inst Error
3	SAMPLE	S95T003649	0	Z	@U-01	U-02	SOLID	N/A	4.27E+02	0.158	ug/g
3	SAMPLE	S95T003649	0	Z	@U-01	U-02E	SOLID	N/A	4.90E+00	0.000	% Inst Error
4	DUP	S95T003649	0	Z	@U-01	U-02	SOLID	4.27E+2	5.06E+2	16.930	RPD
4	DUP	S95T003649	0	Z	@U-01	U-02E	SOLID	1	4.68E+00	4.680	% Inst Error
5	SPK	S95T003649	0	Z	@U-01	U-02	SOLID	5.69E+01	2.99E+01	52.550	% Recovery

Final page for worklist# 6660

Analyst Signature **Date** **Analyst Signature** **Date**

J J Shipman 4/9/96
Reviewer Signature **Date**

Spike recovery does not meet control limits. S95T003649 will be rerun.

DATA NOT USED IN PACKAGE

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 6660

cg 4/1/96

Analyst: CRJ **Instrument:** U01 U01 **Book#** ~~12855C~~ 451356

Method: LA-925-009 **Rev/Mod** A-1 WHC-SD-WM-DP-164, REV. 1

Worklist Comment: 1-10ml Sample Prep.For spike use: 0.1ml spk. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003649	0	Z	@U-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003649	0	Z	@U-01	SOLID		
5	SPK	S95T003649	0	Z	@U-01	SOLID		

Final page for worklist # 6660

C Johnson 4/4/96
Analyst Signature **Date**

M G Brown 4/9/96
Analyst Signature **Date**

Sue Hogan 4/9/96

DATA
NOT USED
IN PACKAGE

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sample ID 45B56
Description STD
Ref. Ratio 1.02
Laser Pulses 500
Lifetime 212 + .731 us
R2 .9995
Integrated 69801
Range: HIGH

Date/Time 04/04/96/16:10:11
Cal Y=9.02E+07X+27.68
Intensity 4693 (t= 39 us)
Conc 6.25E-05 + 1.97E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.25E-05 + 1.97E-06 g/L

Sample ID WL6660
Description BLK
Ref. Ratio 1.023
Laser Pulses 500
Lifetime 241 + 2.668 us
R2 .9948
Integrated 5991
Range: HIGH

Date/Time 04/04/96/16:14:28
Cal Y=9.02E+07X+27.68
Intensity 366 (t= 39 us)
Conc 4.43E-06 + 1.57E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 4.43E-06 + 1.57E-07 g/L

Sample ID WL6660
Description BLK
Ref. Ratio 1.006
Laser Pulses 500
Lifetime 227 + .625 us
R2 .9997
Integrated 448578
Range: LOW

Date/Time 04/04/96/16:15:10
Cal Y=6.49E+09X-4.88E-04
Intensity 28300 (t= 39 us)
Conc 5.23E-06 + 5.95E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.23E-06 + 5.95E-08 g/L

Sample ID S95T003649
Description SAM
Ref. Ratio 1.049
Laser Pulses 500
Lifetime 182 + 3.32 us
R2 .9859
Integrated 98617
Range: HIGH

Date/Time 04/04/96/16:16:57
Cal Y=9.02E+07X+27.68
Intensity 8831 (t= 39 us)
Conc 1.00E-04 + 4.90E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.00E-04 + 4.90E-06 g/L

Sample ID S95T003649
Description DUP
Ref. Ratio 1.055
Laser Pulses 500
Lifetime 179 + 3.005 us
R2 .9881
Integrated 108665
Range: HIGH

Date/Time 04/04/96/16:18:13
Cal Y=9.02E+07X+27.68
Intensity 9821 (t= 39 us)
Conc 1.13E-04 + 5.29E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.13E-04 + 5.29E-06 g/L

Sample ID S95T003649
Description SPIKE
Ref. Ratio 1.059
Laser Pulses 500
Lifetime 171 + 3.026 us
R2 .9868
Integrated 368703
Range: HIGH

DATA NOT USED IN PACKAGE

Date/Time 04/04/96/16:19:40
Cal Y=9.02E+07X+27.68
Intensity 36085 (t= 39 us)
Conc 3.99E-04 + 1.99E-05 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.99E-04 + 1.99E-05 g/L

WL deleted

Background Report

Background for LOW Range
Laser Pulses 500

First Time Gate Used (sample) 4
Date/Time 04/04/96/16:03:13

Reference		Sample	
Intensity	11564	Intensity	388
Lifetime	291.99 + .81 us		
R2	.99966		
Intercept	13312.69		

Standard Report

Standard for HIGH Range - 9.90E-04 g/L
Laser Pulses 500

Date/Time 04/04/96/16:04:29

Reference		Standard	
Intensity	11728	Intensity	49993
Lifetime	293.23 + .53 us	Lifetime	290.15 + 1.11 us
R2	.99987	R2	.9994
Intercept	13627.07	Intercept	89261.57 + 2.99E+02

Standard Report

Standard for HIGH Range - 4.98E-04 g/L
Laser Pulses 500

Date/Time 04/04/96/16:05:40

Reference		Standard	
Intensity	11424	Intensity	38690
Lifetime	291.54 + .69 us	Lifetime	299.68 + 1.02 us
R2	.99977	R2	.9995
Intercept	13492.36	Intercept	44984.8 + 212.1

Standard Report

Standard for LOW Range - 2.48E-06 g/L
Laser Pulses 500

Date/Time 04/04/96/16:07:03

Reference		Standard	
Intensity	11730	Intensity	13729
Lifetime	291.78 + .92 us	Lifetime	292.72 + .67 us
R2	.9996	R2	.9998
Intercept	13711.37	Intercept	16095.55 + 1.27E+02

DATA
NOT USED
IN PACKAGE

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
STD			STANDARD
Work List	STANDARD BOOK #		45B56
6660	VOLUME OF SAMPLE (mL)	(SS)	1.00
Test Code	DILUTION FACTOR OF SAMPLE	(DF)	1.00
@U-01	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Matrix	LIFETIME IN MICROSECONDS		212.00
LIQUID	R2 VALUE		0.9995
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002337	INSTRUMENT UNCERTAINTY	(IU)	1.97E-06
Rerun	INSTRUMENT RESULT	(IR)	6.25E-05
0	DETECTION LEVEL (µg/mL)		3.70E-05
Sample Prep			
N/A	RESULT (µg/mL)		6.25E-02
Sample #	VALUE OF STANDARD		6.39E-02
WL6660	%RECOVERY		97.81
Instrument Code	RELATIVE % UNCERTAINTY		3.2
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:00 PM			
Sample Point			
BY-104 ROTARY			

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	

STANDARD.WB1 REV 2.0 925009ML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
BLNK-PREP			BLANK
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6660	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.3424
Matrix	LIFETIME IN MICROSECONDS		227.00
SOLID	R2 VALUE		0.9997
Batch Number	RANGE (HIGH OR LOW)		LOW
96002337	INSTRUMENT UNCERTAINTY	(IU)	5.95E-08
Rerun	INSTRUMENT RESULT	(IR)	5.23E-06
0	DETECTION LEVEL µg/g		1.58E-01
Sample Prep			
N/A	CONCENTRATION IN SOLUTION (g/L)		5.23E-05
Sample #	RESULT (µg/g)		2.23E+01
WL6660	RELATIVE % UNCERTAINTY		1.1
Instrument Code			
U01			
Prepared By	Result = Conc. in Solution (g/L) * 1000000 / Dg/L		
MCB			
Chemist	Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF		
JLS			
Analyst	Relative % Uncertainty = IU / IR * 100		
CRJ			
Date Complete	Concentration in Solution (g/L) = IR * DF * PF		
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:00 PM			
Sample Point			
BY-104 ROTARY			

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	

BLANK.WB1 REV 2.0 925009ML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SAMPLE			SAMPLE
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6660	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.3424
Matrix	LIFETIME IN MICROSECONDS		182.00
SOLID	R2 VALUE		0.9859
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002337	INSTRUMENT UNCERTAINTY	(IU)	4.90E-06
Rerun	INSTRUMENT RESULT	(IR)	1.00E-04
0	DETECTION LEVEL µg/g		1.58E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.00E-03
Sample #	RESULT (µg/g)		4.27E+02
S95T003649	RELATIVE % UNCERTAINTY		4.9
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:00 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 2.0 925009ML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: DUP4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
DUP			DUP
Work List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6660	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Test Code	PREPARATION FACTOR OF SAMPLE	(PF)	10.00
@U-01	DIGEST FACTOR	(Dg/L)	2.2316
Matrix	LIFETIME IN MICROSECONDS		179.00
SOLID	R2 VALUE		0.9881
Batch Number	RANGE (HIGH OR LOW)		HIGH
96002337	INSTRUMENT UNCERTAINTY	(IU)	5.29E-06
Rerun	INSTRUMENT RESULT	(IR)	1.13E-04
0	DETECTION LEVEL µg/g		1.66E-01
Sample Prep			
FUS-ZR01	CONCENTRATION IN SOLUTION (g/L)		1.13E-03
Sample #	RESULT (µg/g)		5.06E+02
S95T003649	RELATIVE % UNCERTAINTY		4.7
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:00 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	

SAMPLE.WB1 REV 2.0 925009ML

DATA NOT USED IN PACKAGE

2067

WORKBOOK PAGE: SPIKE5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
SPK	SPIKE BOOK #		22B66
	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
6660	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.3424
	LIFETIME IN MICROSECONDS		171.00
SOLID	R2 VALUE		0.9968
	RANGE (HIGH OR LOW)		HIGH
96002337	INSTRUMENT RESULT	(IR)	3.99E-04
	CONCENTRATION IN SOLUTION (g/L)	(CONC)	3.99E-03
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
FUS-ZR01	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
	CONCENTRATION IN SOLN (g/L) FROM SAMPLE FORM	(SR)	1.00E-03
S95T003649			
U01	Concentration = IR * DF * PF		
MCB	QC Actual (µg/mL) = SV (g/L) * 1000		
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
CRJ	% Recovery = QC FOUND / QC ACTUAL		
04/09/96			
04/04/96	QC ACTUAL	=	5.69E+01 µg/mL
	QC FOUND	=	2.99E+01 µg/mL
05:00 PM	% SPIKE RECOVERY	=	52.5%
BY-104 ROTARY			

Analyst:	CRJ	Date:	09-Apr-96
Signature of Chemist:	JLS	Date:	

SPIKE.WB1 REV 2.0 925009ML

DATA NOT USED IN PACKAGE

LABCORE Completed Worklist Report for Worklist# 6669

Analyst: wgb **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep. For spike use: 0.1ml spk. new

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		AU-01	U-02	SOLID	0.0638	6.72e-2	105.330	% Recovery
1	STD		0		AU-01	U-02E	SOLID	1	3.2	3.200	% Inst Error
2	BLNK-PREP		0		AU-01	U-02	SOLID	1	1.54e-1	0.150	ug/g
2	BLNK-PREP		0		AU-01	U-02E	SOLID	1	2.5	2.500	% Inst Error
3	SAMPLE	S95T003811	0	Z	AU-01	U-02	SOLID	N/A	5.8e+2	1.650e-002	ug/g
3	SAMPLE	S95T003811	0	Z	AU-01	U-02E	SOLID	N/A	4.2	0.000	% Inst Error
4	DUP	S95T003811	0	Z	AU-01	U-02	SOLID	5.8e+2	5.2e+2	10.910	RPD
4	DUP	S95T003811	0	Z	AU-01	U-02E	SOLID	1	4.6	4.600	% Inst Error
5	SPK	S95T003811	0	Z	AU-01	U-02	SOLID	100	8.8	8.800	% Recovery

Final page for worklist# 6669

Analyst Signature Date

Analyst Signature Date

Jennifer L. Stepens 3/29/96
Reviewer Signature Date

S95T003811 will be rerun. Sample concentration too high for spike concentration. Sample will be diluted and rerun.

DATA NOT USED IN PACKAGE

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 6669

Analyst: WGB **Instrument:** U01 _____ **Book#** 22B56

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10ml Sample Prep. For spike use: 0.1ml spk. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003811	0	Z	@U-01	SOLID	95000200	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003811	0	Z	@U-01	SOLID		
5	SPK	S95T003811	0	Z	@U-01	SOLID		

Final page for worklist # 6669

Wayne G. Burchardt 3-22-96
Analyst Signature **Date**

[illegible] 3/29/96
Analyst Signature **Date**

DATA NOT USED IN PACKAGE

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Wayne L Buchardt
3-22-96

Sample ID 22B56 STD
Description LMCS
Ref. Ratio 1.013
Laser Pulses 500
Lifetime 323 + 1.765 us
R2 .9987
Integrated 74139
Record 3575 of 3581

Date/Time 03/22/96/12:43:48
Cal Y=7.26E+07X-7.63E+02
Intensity 3624 (t= 39 us)
Conc 6.72E-05 + 2.17E-06 G/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.72E-05 + 2.17E-06 G/L

Range: HIGH

Sample ID S95T003811
Description BLNK-PREP
Ref. Ratio .966
Laser Pulses 500
Lifetime 270 + 4.268 us
R2 .9894
Integrated 34044
Record 3576 of 3581

Date/Time 03/22/96/16:32:49
Cal Y=6.28E+09X0
Intensity 2132 (t= 39 us)
Conc 3.45E-07 + 8.48E-09 G/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.45E-07 + 8.48E-09 G/L

Range: LOW

Sample ID S95T003811
Description SAMPLE
Ref. Ratio .966
Laser Pulses 500
Lifetime 157 + 1.556 us
R2 .9958
Integrated 560499
Record 3577 of 3581

Date/Time 03/22/96/16:36:43
Cal Y=7.26E+07X-7.63E+02
Intensity 52008 (t= 104 us)
Conc 1.30E-03 + 5.48E-05 G/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.30E-03 + 5.48E-05 G/L

Range: HIGH

Sample ID S95T003811
Description DUP.
Ref. Ratio .964
Laser Pulses 500
Lifetime 156 + 1.909 us
R2 .9936
Integrated 544864
Record 3579 of 3581

Date/Time 03/22/96/16:45:42
Cal Y=7.26E+07X-7.63E+02
Intensity 52846 (t= 91 us)
Conc 1.16E-03 + 5.33E-05 G/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.16E-03 + 5.33E-05 G/L

Range: HIGH

Sample ID S95T003811
Description SPIKE
Ref. Ratio .971
Laser Pulses 500
Lifetime 154 + 1.65 us
R2 .9951
Integrated 519228
Record 3581 of 3581

Date/Time 03/22/96/16:50:35
Cal Y=7.26E+07X-7.63E+02
Intensity 50622 (t= 117 us)
Conc 1.35E-03 + 6.03E-05 G/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.35E-03 + 6.03E-05 G/L

Range: HIGH

DATA NOT USED IN PACKAGE

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			STANDARD
STANDARD	STANDARD BOOK #		22B56
List	VOLUME OF SAMPLE (mL)	(SS)	1.00
6669	DILUTION FACTOR OF SAMPLE	(DF)	1.00
Code	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
0U-01	LIFETIME IN MICROSECONDS		323.00
Matrix	R2 VALUE		0.9987
LIQUID	RANGE (HIGH OR LOW)		HIGH
Instrument Number	INSTRUMENT UNCERTAINTY	(IU)	2.17E-06
96002342	INSTRUMENT RESULT	(IR)	6.72E-05
Vacuum	DETECTION LEVEL (µg/mL)		3.70E-05
0			
Sample Prep	RESULT (µg/mL)		6.72E-02
N/A	VALUE OF STANDARD		6.38E-02
Sample #	%RECOVERY		105.33
WL6669	RELATIVE % UNCERTAINTY		3.2
Treatment Code			
U01			
Prepared By			
JLS	Result = DF * PF * IR * 1000		
Checked			
JLS	Detection Level = 3.70 E-08 * DF * PF * 1000		
Analyst			
WGB	% Recovery = Result / Value of Standard * 100		
Date Complete			
03/29/96	Relative % Uncertainty = IU / IR * 100		
Analysis Date			
03/22/96			
Analysis Time			
04:00 PM			
Sample Point			
BY104 ROTARY			

DATA NOT USED IN PACKAGE

Analyst:		WGB	Date: 29-Mar-96
Signature of Chemist:		JLS	Date: 3/29/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			BLANK
BLANK	VOLUME OF SAMPLE (mL)	(SS)	1.00
[illegible]	DILUTION FACTOR OF SAMPLE	(DF)	1.00
6669	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
[illegible]	DIGEST FACTOR	(Dg/L)	2.2420
@U-01	LIFETIME IN MICROSECONDS		270.00
[illegible]	R2 VALUE		0.9894
SOLID	RANGE (HIGH OR LOW)		LOW
[illegible]	INSTRUMENT UNCERTAINTY	(IU)	8.48E-09
96002342	INSTRUMENT RESULT	(IR)	3.45E-07
[illegible]	DETECTION LEVEL µg/g		1.65E-02
0			
[illegible] Prep	CONCENTRATION IN SOLUTION (g/L)		3.45E-07
N/A	RESULT (µg/g)		1.54E-01
[illegible]	RELATIVE % UNCERTAINTY		2.5
WL6669			
[illegible]			
U01			
[illegible] By			
JLS			
[illegible]			
JLS			
[illegible]			
WGB			
Date Complete			
03/29/96			
Analysis Date			
03/22/96			
Analysis Time			
04:00 PM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

DATA NOT USED IN PACKAGE

Analyst:		WGB	Date: 29-Mar-96
Signature of Chemist:		JLS	Date: 3/29/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SAMPLE
SAMPLE	VOLUME OF SAMPLE (mL)	(SS)	1.00
	DILUTION FACTOR OF SAMPLE	(DF)	1.00
6669	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
	DIGEST FACTOR	(Dg/L)	2.2420
@U-01	LIFETIME IN MICROSECONDS		157.00
	R2 VALUE		0.9958
SOLID	RANGE (HIGH OR LOW)		HIGH
	INSTRUMENT UNCERTAINTY	(IU)	5.48E-05
96002342	INSTRUMENT RESULT	(IR)	1.30E-03
	DETECTION LEVEL µg/g		1.65E-02
0			
	CONCENTRATION IN SOLUTION (g/L)		1.30E-03
N/A	RESULT (µg/g)		5.80E+02
	RELATIVE % UNCERTAINTY		4.2
S95T003811			
U01			
JLS			
JLS			
WGB			
03/29/96			
03/22/96			
04:00 PM			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

DATA NOT USED IN PACKAGE

Analyst:		WGB	Date: 29-Mar-96
Signature of Chemist:		JLS	Date: 3/29/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			DUPLICATE
DUPLICATE	VOLUME OF SAMPLE (mL)	(SS)	1.00
Run List	DILUTION FACTOR OF SAMPLE	(DF)	1.00
6569	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
Code	DIGEST FACTOR	(Dg/L)	2.2308
@U-01	LIFETIME IN MICROSECONDS		156.00
Mix	R2 VALUE		0.9936
SOLID	RANGE (HIGH OR LOW)		HIGH
Sample Number	INSTRUMENT UNCERTAINTY	(IU)	5.33E-05
96002342	INSTRUMENT RESULT	(IR)	1.16E-03
ReRun	DETECTION LEVEL µg/g		1.66E-02
0			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		1.16E-03
N/A	RESULT (µg/g)		5.20E+02
Sample #	RELATIVE % UNCERTAINTY		4.6
S95T003811			
Instrument Code			
U01			
Prepared By			
JLS			
Chemist			
JLS			
Analyst			
WGB			
Date Complete			
03/29/96			
Analysis Date			
03/22/96			
Analysis Time			
04:00 PM			
Sample Point			
BY104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

DATA NOT USED IN PACKAGE

Analyst:		WGB	Date: 29-Mar-96
Signature of Chemist:		JLS	Date: 3/29/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			SPIKE
SPIKE	SPIKE BOOK #		22B55
6659	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
@U-01	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	1.00
SOLID	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	1.00
96002342	DIGEST FACTOR OF SAMPLE	(DDF)	2.2420
0	LIFETIME IN MICROSECONDS		154.00
N/A	R2 VALUE		0.9951
S95T003811	RANGE (HIGH OR LOW)		HIGH
U01	INSTRUMENT RESULT	(IR)	1.35E-03
JLS	CONCENTRATION IN SOLUTION (g/L)	(CONC)	1.35E-03
JLS	SPIKE VALUE (g/L)	(SV)	5.69E-02
WGB	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
03/29/96	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	10.00
03/22/96	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	0.0013
04:00 PM			
BY104 ROTARY			

Concentration = IR * DF * PF

QC Actual (µg/mL) = SV (g/L) * 1000

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

% Recovery = QC FOUND / QC ACTUAL

DATA NOT USED IN PACKAGE

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	5.00E+00	µg/mL
% SPIKE RECOVERY	=	8.8%	

Analyst:	WGB	Date: 29-Mar-96
Signature of Chemist:	JLS	Date: 3/29/96

LABCORE Data Entry Template for Worklist# 7111

cg 4/1/96

Analyst: CRJ **Instrument:** U01 U01 **Book#** ~~12B55C~~ 45B56

Method: LA-925-009 **Rev/Mod** A-1

Worklist Comment: 0.1 - 10 mL sample prep / 0.1 mL spike / rerun / jls

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	SOLID		
2	BLNK-PREP				@U-01	SOLID		
3	SAMPLE	S95T003811	0	Z	@U-01	SOLID	95000200	BY104 ROTARY
		Analytes Requested:			U-02	, U-02E		
4	DUP	S95T003811	0	Z	@U-01	SOLID		
5	SPK	S95T003811	0	Z	@U-01	SOLID		

Final page for worklist # 7111

CRJohnson 4/4/96
Analyst Signature **Date**

[illegible] 4/9/96
Analyst Signature **Date**

Sue Hogan 4/9/96

Results for sample and duplicate are inconsistent with original run. RPD exceeds control limits. S95T003811 will be rerun.

J L Stuppard 4/10/96

DATA NOT USED IN PACKAGE

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

			STANDARD
STANDARD	STANDARD BOOK #		45B56
WL7111	VOLUME OF SAMPLE (mL)	(SS)	1.00
@U-01	DILUTION FACTOR OF SAMPLE	(DF)	1.00
LIQUID	PREPARATION FACTOR OF SAMPLE	(PF)	1.00
N/A	LIFETIME IN MICROSECONDS		214.00
N/A	R2 VALUE		0.9988
WL7111	RANGE (HIGH OR LOW)		HIGH
U01	INSTRUMENT UNCERTAINTY	(IU)	1.91E-06
MCB	INSTRUMENT RESULT	(IR)	5.91E-05
JLS	DETECTION LEVEL (µg/mL)		3.70E-05
CRJ			
04/09/96	RESULT (µg/mL)		5.91E-02
04/04/96	VALUE OF STANDARD		6.39E-02
03:30 PM	%RECOVERY		92.49
BY-104 ROTARY	RELATIVE % UNCERTAINTY		3.2

Type: STANDARD
Work List: WL7111
Test Code: @U-01
Matrix: LIQUID
Batch Number: N/A
Rerun: N/A
Sample Prep: N/A
Sample #: WL7111
Instrument Code: U01
Prepared By: MCB
Chemist: JLS
Analyst: CRJ
Date Complete: 04/09/96
Analysis Date: 04/04/96
Analysis Time: 03:30 PM
Sample Point: BY-104 ROTARY

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

DATA NOT USED IN PACKAGE

Analyst:		CRJ	Date: 09-Apr-96
Signature of Chemist:	J S Lippein	JLS	Date: 4/10/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			BLANK
BLANK	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	11.00
WL7111	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
Test Code	DIGEST FACTOR	(Dg/L)	1.0000
@U-01	LIFETIME IN MICROSECONDS		196.00
Matrix	R2 VALUE		0.9994
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	8.54E-09
N/A	INSTRUMENT RESULT	(IR)	6.78E-07
Rerun	DETECTION LEVEL µg/g		4.07E+01
N/A			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		7.46E-04
N/A	RESULT (µg/g)		7.46E+02
Sample #	RELATIVE % UNCERTAINTY		1.3
WL7111			
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:30 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

DATA NOT USED IN PACKAGE

Analyst:		CRJ	Date: 09-Apr-96
Signature of Chemist:		JLS	Date: 4/10/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SAMPLE
SAMPLE	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work List	DILUTION FACTOR OF SAMPLE	(DF)	11.00
WL7111	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
Test Code	DIGEST FACTOR	(Dg/L)	2.2420
@U-01	LIFETIME IN MICROSECONDS		170.00
Matrix	R2 VALUE		0.9998
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	3.14E-08
N/A	INSTRUMENT RESULT	(IR)	2.71E-06
Rerun	DETECTION LEVEL µg/g		1.82E+01
N/A			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		2.98E-03
N/A	RESULT (µg/g)		1.33E+03
Sample #	RELATIVE % UNCERTAINTY		1.2
S95T003811			
Instrument Code #			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:30 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

DATA NOT USED IN PACKAGE

Analyst:		CRJ	Date: 09-Apr-96
Signature of Chemist:		JLS	Date: 4/10/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			DUPLICATE
DUPLICATE	VOLUME OF SAMPLE (mL)	(SS)	1.00
Work Lot	DILUTION FACTOR OF SAMPLE	(DF)	11.00
WL7111	PREPARATION FACTOR OF SAMPLE	(PF)	100.00
Test Code	DIGEST FACTOR	(Dg/L)	2.2308
@U-01	LIFETIME IN MICROSECONDS		287.00
Matrix	R2 VALUE		0.9995
SOLID	RANGE (HIGH OR LOW)		LOW
Batch Number	INSTRUMENT UNCERTAINTY	(IU)	1.81E-08
N/A	INSTRUMENT RESULT	(IR)	1.59E-06
Reduction	DETECTION LEVEL µg/g		1.82E+01
N/A			
Sample Prep	CONCENTRATION IN SOLUTION (g/L)		1.75E-03
N/A	RESULT (µg/g)		7.84E+02
Sample #	RELATIVE % UNCERTAINTY		1.1
S95T003811			
Instrument Code			
U01			
Prepared By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:30 PM			
Sample Point			
BY-104 ROTARY			

Result = Conc. in Solution (g/L) * 1000000 / Dg/L

Detection Level = 3.70 E-08 * DF * PF * 1000000/ DF

Relative % Uncertainty = IU / IR * 100

Concentration in Solution (g/L) = IR * DF * PF

DATA NOT USED IN PACKAGE

Analyst:		CRJ	Date: 09-Apr-96
Signature of Chemist:	J S Bu[illegible]	JLS	Date: 4/10/96

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPIKE	SPIKE BOOK #		22B55
Work Order	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
WL7111	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	11.00
Prep Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	100.00
@U-01	DIGEST FACTOR OF SAMPLE	(DDF)	2.2420
Matrix	LIFETIME IN MICROSECONDS		200.00
SOLID	R2 VALUE		0.9996
Batch Number	RANGE (HIGH OR LOW)		LOW
N/A	INSTRUMENT RESULT	(IR)	4.54E-05
Reagent	CONCENTRATION IN SOLUTION (g/L)	(CONC)	4.99E-02
N/A	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
N/A	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	0.10
Sample #	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FO	(SR)	0.0030
S95T003811			
Instrument Code			
U01			
Reported By			
MCB			
Chemist			
JLS			
Analyst			
CRJ			
Date Complete			
04/09/96			
Analysis Date			
04/04/96			
Analysis Time			
03:30 PM			
Sample Point			
BY-104 ROTARY			

Concentration = IR * DF * PF

QC Actual (µg/mL) = SV (g/L) * 1000

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

% Recovery = QC FOUND / QC ACTUAL

DATA NOT USED IN PACKAGE

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	4.70E+01	µg/mL
% SPIKE RECOVERY	=	82.5%	

Analyst:	CRJ	Date: 09-Apr-96
Signature of Chemist:	JLS	Date: 4/10/96

Sample ID 45B56
Description STD
Ref. Ratio 1.06
Laser Pulses 500
Lifetime 214 + 1.109 us
R2 .9988
Integrated 66593
Range: HIGH

Date/Time 04/04/96/16:21:29
Cal Y=9.02E+07X+27.68
Intensity 4373 (t= 39 us)
Conc 5.91E-05 + 1.91E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.91E-05 + 1.91E-06 g/L

WL 7111

WHC-SD-WM-DP-164, REV. 1

Sample ID WL7111
Description BLK
Ref. Ratio 1.043
Laser Pulses 500
Lifetime 188 + 1.552 us
R2 .9971
Integrated 8075
Range: HIGH

Date/Time 04/04/96/16:27:15
Cal Y=9.02E+07X+27.68
Intensity 566 (t= 39 us)
Conc 7.94E-06 + 2.79E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 7.94E-06 + 2.79E-07 g/L

Sample ID WL7111
Description BLK
Ref. Ratio 1.032
Laser Pulses 500
Lifetime 186 + .541 us
R2 .9996
Integrated 619746
Range: LOW

Date/Time 04/04/96/16:27:56
Cal Y=6.49E+09X-4.88E-04
Intensity 44970 (t= 39 us)
Conc 8.92E-06 + 1.07E-07 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 8.92E-06 + 1.07E-07 g/L

Sample ID S95T003811
Description SAM
Ref. Ratio 1.023
Laser Pulses 500
Lifetime 69 + .528 us
R2 .9985
Integrated 7693
Range: HIGH

Date/Time 04/04/96/16:30:04
Cal Y=9.02E+07X+27.68
Intensity 1351 (t= 39 us)
Conc 3.14E-05 + 1.29E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.14E-05 + 1.29E-06 g/L

DATA NOT USED IN PACKAGE

Sample ID S95T003811
Description SAM
Ref. Ratio 1.01
Laser Pulses 500
Lifetime 66 + .527 us
R2 .9978
Integrated 273138
Range: LOW

Date/Time 04/04/96/16:30:46
Cal Y=6.49E+09X-4.88E-04
Intensity 46398 (t= 91 us)
Conc 3.83E-05 + 1.71E-06 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.83E-05 + 1.71E-06 g/L

Sample ID WL7111
Description BLK
Ref. Ratio 1.031
Laser Pulses 500
Lifetime 238 + 13.025 us
R2 .9327
Integrated 561
Range: HIGH

Date/Time 04/04/96/16:43:08
Cal Y=9.02E+07X+27.68
Intensity 40 (t= 39 us)
Conc 2.34E-07 + 1.47E-08 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 2.34E-07 + 1.47E-08 g/L

Sample ID WL7111
Description BLK
Ref. Ratio 1.022
Laser Pulses 500
Lifetime 196 + .72 us
R2 .9994
Integrated 49827
Range: LOW

2083

Date/Time 04/04/96/16:44:20
Cal Y=6.49E+09X-4.88E-04
Intensity 3368 (t= 39 us)
Conc 6.78E-07 + 8.54E-09 g/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.78E-07 + 8.54E-09 g/L

-10

Sample ID S95T003811
Description SAM
Ref. Ratio 1.037
Laser Pulses 500
Lifetime 186 + 4.584 us
R2 .9758
Integrated 2178
Range: HIGH

Date/Time 04/04/96/16:45:45
Cal Y=9.02E+07X+27.68
Intensity 161 (t= 39 us)
Conc 1.89E-06 + 1.08E-07 g/L
Dilution Factor 1 mL/mL
FINAL RESULT 1.89E-06 + 1.08E-07 g/L

Sample ID S95T003811
Description SAM
Ref. Ratio 1.015
Laser Pulses 500
Lifetime 170 + .382 us
R2 .9998
Integrated 170071
Range: LOW

Date/Time 04/04/96/16:46:26
Cal Y=6.49E+09X-4.88E-04
Intensity 13384 (t= 39 us)
Conc 2.71E-06 + 3.14E-08 g/L
Dilution Factor 1 mL/mL
FINAL RESULT 2.71E-06 + 3.14E-08 g/L

1-10

Sample ID S95T003811
Description DUP
Ref. Ratio 1.014
Laser Pulses 500
Lifetime 302 + 6.009 us
R2 .9833
Integrated 2222
Range: HIGH

Date/Time 04/04/96/16:47:39
Cal Y=9.02E+07X+27.68
Intensity 121 (t= 39 us)
Conc 1.12E-06 + 4.47E-08 g/L
Dilution Factor 1 mL/mL
FINAL RESULT 1.12E-06 + 4.47E-08 g/L

Sample ID S95T003811
Description DUP
Ref. Ratio 1.009
Laser Pulses 500
Lifetime 287 + 1.015 us
R2 .9995
Integrated 168778
Range: LOW

Date/Time 04/04/96/16:48:21
Cal Y=6.49E+09X-4.88E-04
Intensity 8530 (t= 39 us)
Conc 1.59E-06 + 1.81E-08 g/L
Dilution Factor 1 mL/mL
FINAL RESULT 1.59E-06 + 1.81E-08 g/L

1-10

DATA NOT USED IN PACKAGE

Sample ID S95T003811
Description SPK
Ref. Ratio 1.048
Laser Pulses 500
Lifetime 192 + .908 us
R2 .999
Integrated 47364
Range: HIGH

Date/Time 04/04/96/16:49:31
Cal Y=9.02E+07X+27.68
Intensity 3258 (t= 39 us)
Conc 4.70E-05 + 1.52E-06 g/L
Dilution Factor 1 mL/mL
FINAL RESULT 4.70E-05 + 1.52E-06 g/L

Sample ID S95T003811
Description SPK
Ref. Ratio 1.045
Laser Pulses 500
Lifetime 200 + .577 us
R2 .9996
Integrated 718371
Range: LOW

2084

Date/Time 04/04/96/16:50:13
Cal Y=6.49E+09X-4.88E-04
Intensity 48685 (t= 351 us)
Conc 4.54E-05 + 6.51E-07 g/L
Dilution Factor 1 mL/mL
FINAL RESULT 4.54E-05 + 6.51E-07 g/L

1-10

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Hanford Company

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PART II

WHC-SD-WM-DP-164, REV. 0

ANALYTICAL SERVICES

45-DAY SAFETY SCREENING RESULTS FOR TANK 241-BY-104, ROTARY MODE CORES 116 AND 117

Project Coordinator: Cheryl J. Benar

Prepared for the U.S. Department of Energy
Office of Environmental Restoration
and Waste Management

by

Westinghouse Hanford Company
Box 1970
Richland, Washington

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WHC-SD-WM-DP-164, REV. 0

NARRATIVE

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WHC-SD-WM-DP-164, REV. 0

45-DAY SAFETY SCREENING RESULTS FOR TANK 241-BY-104, ROTARY MODE CORES 116 AND 117

Summary

Two rotary mode core samples were received at the 222-S Laboratories and underwent safety screening analyses - differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), total alpha analysis, and bulk density measurements - in accordance with the sampling and analysis plan (SAP) (Reference 6).

Notification letters were sent out for three BY-104 samples which exceeded the DSC notification limit. In addition, one sample exceeded the DSC notification limit with the upper limit of the one-sided 95% confidence interval. The upper limit of the one-sided 95% confidence intervals for total alpha activity results were below the notification limit. Tank headspace flammability was measured at 0 percent of the lower flammability limit (LFL).

Scope

This is the 45-day safety screening report for tank BY-104 rotary mode core samples which were taken from risers 5 and 11a. The samples were collected from riser 5 on October 31 through November 3, 1995 and from riser 11A on November 15 and 16, 1995. The samples were received, extruded, and analyzed by the 222-S Laboratory in accordance with the referenced SAP (Reference 6)

The samples underwent analyses identified in *Tank Safety Screening Data Quality Objective* (Reference 1). This report summarizes results from the safety screening analyses: differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), total alpha analyses, and density analyses. The sample data summary tables in this report summarize the analytical results associated with each subsegment of these core samples. In addition, the results of the statistical analyses (calculation of the 95% confidence limits for DSC, TGA, and total alpha analyses) are given in Tables 4, 6, and 9 on a sample by sample basis.

Vapor and Flammable Gas Data

Prior to intrusion into a tank, the flammability of the tank headspace was measured to address the vapor flammability issue of the *Tank Safety Screening Data Quality Objective* (Reference 1). This measurement is conducted in the field and is recorded in the work package (Reference 7). Reference 1 requires that the flammable gas concentration found be less than the 25% of the lower flammability limit (LFL). The combustible gas meter reading was 0 percent of the LFL, indicating no flammability concerns with this tank at the time of the sampling event.

Sample Receipt and Extrusion

Table 1 summarizes the sample extrusion results for the tank BY-104 core segments. For each segment, the solid and liquid recoveries, and a description of the material as it was extruded are included. Table 2 provides the matrix for each subsegment from tank BY-104, as well as each subsegment's associated analytical sample numbers and analyses performed, as reported in the data summary tables.

Table 1:Tank BY-104 Core Segment Extrusion Summary

Riser/Core/ Segment	Solid (g)	Liquid (g)	Sample Description
5/116/1	0	0	No sample observed. Dose rate through drill string <.5 mR/hr.
5/116/2	127.5	0	No drainable liquid. Extruded ~ 7.5 inches of solids, facies present. First 2.5 inches of upper segment dry yellowish-green solid, crystalline in texture; subsampled as quarter segment, jar # 8490. Remaining 5 inches was slightly moist, brown saltcake/sludge mixture; subsampled as upper half segment, jar # 8194. Dose rate through drill string 440 mR/hr.
5/116/3	192.5	0	No drainable liquid. Extruded ~12 inches, facies present. First 2 inches of upper segment appeared dry, crystalline in texture, yellowish-green in color; subsampled as upper half segment, jar # 8191. Remaining 10 inches were slightly moist, yellowish/brown saltcake; subsampled as lower half segment, jar # 8471. Dose rate through drill string 100 mR/hr.
5/116/4	324.3	0	No drainable liquid. First 5 inches extruded were empty. The next ~4.5 inches were moist, brown sludge, subsampled as quarter segment C, jar # 8196, followed by 4.5 inches of the same, subsampled as quarter segment B, jar # 8197. The remaining 5 inches were a dry, brown saltcake/sludge mixture, subsampled as quarter segment A, jars # 8190. Dose rate through the drill string 1.2 R/hr.
5/116/5	402.5	0	No drainable liquid. Extruded ~17 inches; solids did not retain shape. Material was damp, granular, and brown in color. Appeared to be a mixture of saltcake & sludge. Subsampled into quarter segments A, jar # 8186; B, jar # 8185; C, jar # 8176; D, jar # 8178. Dose rate through drill string 800 mR/hr.
5/116/6	467.7	0	No drainable liquid. Extruded ~17 inches; solids did not retain shape. Material was damp, granular, and brown in color. Appeared to be a mixture of saltcake & sludge. Subsampled into quarter segments A, jar # 8182; B, jar # 8181; C, jar # 8180; D, jar # 8179. Dose rate through the drill string 1.3 R/hr.

5/116/7	468.4	0	No drainable liquid. Extruded ~18 inches; solids did not retain shape. Material was damp, granular and brown in color. Appeared to be a mixture of saltcake & sludge. Subsampled into quarter segments A, jar # 8188; B, jar # 8187; C, jar # 8184; D, jar # 8183. Dose rate through the drill string 1.3 R/hr.
5/116/8	258.3	0	No drainable liquid. Extruded ~10 inches; first 2-3 inches extruded were empty, followed by 5 inches of solid, then a 9 inch gap, followed by 5 inches of solids. Solids were very wet, dark rust colored and texture resembled sludge. Subsampled into quarter segments A, jar # 8193 and D, jar # 8192. Dose rate through the drill string 1 R/hr.
11a/117/1	15.4	158.4	Collected opaque, yellowish-green liquid; subsampled in jar # 8473. Extruded ~2.5 inches of saltcake; subsampled in jar # 8584. Dose rate through drill string 1.5 R/hr.
11a/117/2	216.4	98.5	Collected opaque, black-brown liquid; subsampled in jar # 8474. Extruded ~6 inches of solid; subsampled as quarter segment D, jar # 8481. After a 7.5 inch gap, 2 inches of solid was extruded, subsampled as quarter segment A, jar # 8220. Solids were a black-brown sludge. Dose rate through drill string 1.3 R/hr.
11a/117/3	251.5	0	No drainable liquid. Extruded ~12 inches of solid, first 6 inches were dark brown chunks of sludge; subsampled into quarter segments C & D, jar # 8221. The remaining 6 inches were wet, grainy, dark brown saltcake; subsampled into upper half segment, jar # 8478. Dose rate through drill string 1.2 R/hr.
11a/117/4	169.3	0	No drainable liquid. First 13 inches extruded were empty, followed by ~6 inches of dark brown solid, chunky saltcake in texture. Subsampled into upper half segment, jar # 8480. Dose rate through drill string 350 mR/hr.
11a/117/5	98.1	0	No drainable liquid. First ~5 inches extruded were empty, followed by ~3.5 inches of dark brown solids that resembled soft sludge; subsampled as quarter segment C, jar # 8223. After a 7 inch gap, 3.5 inches of the same type of solid followed; subsampled as quarter segment A, jar # 8222. Dose rate through the drill string 50 mR/hr.

Table 2: Tank BY-104 Subsample Matrices

Sample Numbers	Matrix	Core/Segment/Subsegment	Analyses
S95T003427	Empty	116/1/WS	None
S95T003528	Sludge	116/2/QA	DSC, TGA
S95T003525	Sludge	116/2/QA	Bulk Density
S95T003530	Sludge	116/2/QA	AT
S95T003529	Saltcake	116/2/UH	DSC, TGA
S95T003703	Saltcake	116/3/UH	DSC, TGA
S95T003700	Saltcake	116/3/UH	AT
S95T003702	Saltcake	116/3/LH	DSC, TGA
S95T003632	Sludge	116/4/QA	DSC, TGA
S95T003594	Sludge	116/4/QA	Bulk Density
S95T003637	Sludge	116/4/QB	DSC, TGA
S95T003595	Sludge	116/4/QB	Bulk Density
S95T003641	Sludge	116/4/QC	DSC, TGA
S95T003651	Sludge	116/4/QC	AT
S95T003596	Sludge	116/4/QC	Bulk Density
S95T003633	Sludge	116/5/QA	DSC, TGA
S95T003597	Sludge	116/5/QA	Bulk Density
S95T003638	Sludge	116/5/QB	DSC, TGA
S95T003598	Sludge	116/5/QB	Bulk Density
S95T003642	Sludge	116/5/QC	DSC, TGA
S95T003654	Sludge	116/5/QC	AT
S95T003599	Sludge	116/5/QC	Bulk Density
S95T003645	Sludge	116/5/QD	DSC, TGA
S95T003655	Sludge	116/5/QD	AT
S95T003600	Sludge	116/5/QD	Bulk Density
S95T003634	Sludge	116/6/QA	DSC, TGA
S95T003601	Sludge	116/6/QA	Bulk Density

S95T003639	Sludge	116/6/QB	DSC, TGA
S95T003602	Sludge	116/6/QB	Bulk Density
S95T003643	Sludge	116/6/QC	DSC, TGA
S95T003658	Sludge	116/6/QC	AT
S95T003603	Sludge	116/6/QC	Bulk Density
S95T003646	Sludge	116/6/QD	DSC, TGA
S95T003659	Sludge	116/6/QD	AT
S95T003604	Sludge	116/6/QD	Bulk Density
S95T003635	Sludge	116/7/QA	DSC, TGA
S95T003605	Sludge	116/7/QA	Bulk Density
S95T003640	Sludge	116/7/QB	DSC, TGA
S95T003606	Sludge	116/7/QB	Bulk Density
S95T003644	Sludge	116/7/QC	DSC, TGA
S95T003662	Sludge	116/7/QC	AT
S95T003607	Sludge	116/7/QC	Bulk Density
S95T003647	Sludge	116/7/QD	DSC, TGA
S95T003663	Sludge	116/7/QD	AT
S95T003636	Sludge	116/8/QA	DSC, TGA
S95T003648	Sludge	116/8/QD	DSC, TGA
S95T003665	Sludge	116/8/QD	AT
S95T003713	Liquid	116/FB	DSC, TGA
S95T003761	Liquid	117/1/DL	DSC, TGA
S95T003764	Saltcake	117/1/UH	DSC, TGA
S95T003775	Liquid	117/2/DL	DSC, TGA
S95T003781	Sludge	117/2/QA	DSC, TGA
S95T003786	Sludge	117/2/QA	AT
S95T003776	Sludge	117/2/QA	Bulk Density
S95T003782	Sludge	117/2/QD	DSC, TGA
S95T003787	Sludge	117/2/QD	AT

S95T003777	Sludge	117/2/QD	Bulk Density
S95T003809	Saltcake	117/3/UH	DSC, TGA
S95T003783	Sludge	117/3/QC&D	DSC, TGA
S95T003788	Sludge	117/3/QC&D	AT
S95T003778	Sludge	117/3/QC&D	Bulk Density
S95T003810	Saltcake	117/4/UH	DSC, TGA
S95T003784	Sludge	117/5/QA	DSC, TGA
S95T003789	Sludge	117/5/QA	AT
S95T003779	Sludge	117/5/QA	Bulk Density
S95T003785	Sludge	117/5/QC	DSC, TGA
S95T003790	Sludge	117/5/QC	AT

C = Core Number
S = Segment Number
UH = Upper Half
LH = Lower Half
DL = Drainable Liquid
WS = Whole Segment

QA = Qtr. Seg A
QB = Qtr. Seg B
QC = Qtr. Seg C
QD = Qtr. Seg D
FB = Field Blank
AT = Total Alpha

Analytical Results

DIFFERENTIAL SCANNING CALORIMETRY

Differential thermal analyses were performed on 31 subsegments and one field blank from tank BY-104. The analyses were performed under a nitrogen purge using procedures LA-514-113, Rev. C-1 (Mettler[1] instrument) and LA-514-114, Rev. C-1 (Perkin-Elmer[2] instrument). Since both instruments were used during the DSC analyses, it must be noted that the two instruments produce raw data scans which present exotherms differently. On the Mettler instrument, an exotherm is represented by a peak, while the Perkin-Elmer instrument shows an exotherm as a valley.

[1] Mettler is a registered trademark of Mettler Electronics, Anaheim, California.
[2] Perkin-Elmer is a registered trademark of Perkins Research and Manufacturing Company, Inc., Canoga Park, California.

Most of the samples analyzed fell below the safety screening notification limit of 480 J/g (dry weight basis) specified in Reference 1, with the exception of samples S95T003645, S95T003647, and S95T003636. These three samples were sludge, with moisture content exceeding 17% water. Of the samples that exhibited no energetics, 4 were saltcake, 13 were sludge, and 2 were liquid. The remaining 9 samples had DSC values ranging from 0 to 300. The upper limit (UL) to the 95% confidence interval for sample S95T003528 exceeded 480 J/g.

Table 3 summarizes the DSC results for tank BY-104 samples. For each matrix (sludge, saltcake, and liquid), the lower and upper bounds of the sample results and the average results are given.

Table 3: Summary of DSC Results for Tank 241-BY-104

Matrix	Differential Scanning Calorimetry Results		
	Lower Bound (J/g dry)	Upper Bound (J/g dry)	Average of All Runs(J/g dry)
Sludge	0	1294.4	133.3
Saltcake	0	30.0	4.7
Liquid	0	0.0	0.0

In Reference 6, the acceptable accuracy range is between 90 and 110 percent. For the DSC analysis, the accuracy is determined by the Laboratory Measurement Control System (LMCS) control standard recovery. All standard recoveries of tank BY-104 samples were within the specified accuracy requirements in Reference 6.

For the safety screening analyses, the maximum desirable precision per the Sampling and Analysis Plan (SAP) (Reference 6) is a relative percent difference (RPD) of 10% between the primary and duplicate sample results. The RPD values for the DSC results ranged from 0% to 200% RPD, with 9 of the samples having RPD values which exceeded the precision allowance. Three of the 9 samples were selected for reruns because of their high DSC values. Of these 9 samples, 2 of them were saltcake, 7 were sludge.

Reruns are analyses of a sample and duplicate from the same sample material as the original sample and duplicate. The RPDs did not improve appreciably, indicating the cause of the high RPD values is most likely due to the heterogeneity of tank BY-104 waste material. Results of rerun analyses are identified in the summary tables in Attachment A, by the number "1" in the Replicate or "R" column to the right of the sample number, and are also included in the raw data.

Statistical analyses were performed on the DSC data from tank BY-104 per the requirements of Reference 1, which requires comparison of sample data to the applicable notification limit (e.g. less than 480 J/g by DSC) with a 95% confidence level. For each sample submitted for DSC analysis (except the 19 which exhibited no energetics), the sample mean and the upper limit (UL) to the 95% confidence interval are presented in Table 4.

Table 4: Statistical Analyses for Tank 241-BY-104 DSC Results

Sample #	DSC Result (J/g)	DSC Duplicate (J/g)	DSC Average (J/g)	DSC (UL)	TGA (LL)
S95T003528	0.0	138.7	69.4	507.2	14.4
	R*	R*			
S95T003529	30.5	13.6	22.1	76.2	8.0
S95T003703	0.0	12.5	6.2	46.3	6.4
S95T003638	255.8	344.7	163.1	435.7	18.4
	R 0.0	R 52.0			
S95T003645	284.9	724.6	767.8	1620.8	14.4
		TR 1294			
S95T003634	32.6	50.0	41.3	96.2	19.8
S95T003639	104.1	95.8	100	126.6	24.3
S95T003635	140.8	134.9	137.9	156.8	25.4
S95T003640	389.6	309.8	220.6	475.5	22.5
	R 75.0	R 107.8			
S95T003647	484.1	436.6	460.4	612.7	17.9
S95T003636	736.4	875.7	806.0	1252.6	26.2
S95T003782	29.4	36.9	33.1	57.1	25.3

R = Rerun
TR = Triplicate
* = Rerun analysis has not been completed.

THERMOGRAVIMETRIC ANALYSIS (Percent Moisture)

Analyses for percent water by TGA were performed on the samples using procedures LA-560-112, Rev. B-1 (Mettler[3] instrument) and LA-514-114, Rev. C-1 (Perkin-Elmer[4] instrument). All samples were run under a nitrogen atmosphere.

The TGA notification limit of 17 weight percent water is no longer required by Reference 1, however Reference 2 requires the comparison of this value to the TGA results using a one-sided 95% confidence limit. This report includes a discussion of this comparison as well as the statistical analyses of the TGA results.

Out of the 31 subsegments analyzed, 8 samples yielded percent water results below 17 weight percent water, with 2 of these samples having primary and/or duplicate results of less than one percent water. In addition to these 8 samples, 4 samples fell below 17 weight percent water with the lower limit (LL) to the 95% confidence intervals .

Out of the 8 samples with low percent water, 4 were saltcake and 4 were sludge. None of the 8 samples with low percent moisture values exceeded the DSC notification limit of 480 J/g (dry weight basis), however one sample (S95T003528) exceeded this value with the upper limit to the 95% confidence interval. Three of the 4 samples with LL values below 17 weight percent water also had DSC results significantly less than the notification limit of 480 J/g, however sample S95T003645 exceeded the DSC notification limit. Moisture analysis by gravimetric analysis has been requested for all 8 samples with low moisture values and for sample S95T003645.

Table 5 summarizes the TGA results for the tank BY-104 samples. For each matrix (sludge, saltcake, and liquid), the lower and upper bounds of the subsegments results and the average result are given.

Table 5: Summary of TGA Results for Tank 241-BY-104

Matrix	Thermogravimetric Results		Average (wt %)
	Lower Bound (wt %)	Upper Bound (wt %)	
Sludge	0.75	37.8	24.9
Saltcake	6.0	37.5	20.1
Liquid	48.8	49.1	48.9

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4 Perkin-Elmer is a registered trademark of Perkins Research and Manufacturing Company, Inc., Canoga Park, California.

In Reference 6, the acceptable accuracy range is between 90 and 110 percent. For the TGA analysis, the accuracy determined by the Laboratory Measurement Control System (LMCS) control standard recovery of tank BY-104 samples were within the specified accuracy requirements in Reference 6.

The maximum desirable precision for the TGA analysis per Reference 6 is an RPD of 10% between the primary and duplicate sample results. For TGA results, the RPD values ranged from 0% to 160%, with 10 of the samples having RPD values which exceeded the precision allowance. Reruns were performed on 3 of the 10 samples because of their low water content. Of these 10 samples, 3 of them were saltcake, 7 of them were sludge.

Statistical analyses for the 95% confidence interval were performed on the TGA data from tank BY-104, comparing the lower limit (LL) of the interval to the value of 17% water. For each sample submitted for TGA analysis, the sample mean and the lower limit (LL) to the 95% confidence interval are presented in Table 6. If the LL of any subsegment is greater than 17 weight percent water, it is assumed the subsegment's percent water is not less than or equal to 17 weight percent.

Table 6: Statistical Analyses of Tank 241-BY-104 TGA Results

Sample #	Result	Duplicate	Average	LL(mean,95%)
S95T003528	16.1	16.7	16.4	14.4
S95T003529	16.5	13.0	12.5	8.0
	R 7.3	R 13.4		
S95T003702	12.3	10.1	11.2	4.2
S95T003703	12.6	9.0	9.9	6.4
	R 11.9	R 6.1		
S95T003632	19.0	22.4	20.7	9.3
S95T003637	31.7	25.2	24.9	18.7
	R 18.7	R 24.2		
S95T003641	33.9	33.9	33.9	33.9
S95T003633	24.4	24.1	24.3	23.3
S95T003638	20.3	21.1	20.7	18.4
S95T003642	23.4	32.8	28.1	0.0
S95T003645	21.7	24.5	23.1	14.4

S95T003634	28.8	26.3	27.6	19.8
S95T003639	30.6	33.0	31.8	24.3
S95T003643	0.89	28.0	14.5	0.0
S95T003646	0.75	1.0	12.2	0.0
	R 23.0	R 24.2		
S95T003635	25.7	25.9	25.8	25.4
S95T003640	28.2	26.7	27.4	22.5
S95T003644	29.2	27.8	28.5	24.2
S95T003647	26.8	24.4	25.6	17.9
S95T003636	27.0	26.8	26.9	26.2
S95T003648	35.3	33.6	34.4	29.1
S95T003764	37.5	36.6	37.1	34.4
S95T003761	49.1	48.9	49.0	48.6
S95T003781	30.2	28.1	29.2	22.4
S95T003782	34.4	37.8	36.1	25.3
S95T003775	48.8	49.0	48.9	48.4
S95T003809	37.1	36.0	36.5	33.1
S95T003783	26.4	28.2	27.3	21.5
S95T003810	13.9	13.4	13.6	12.2
S95T003784	16.6	18.1	17.4	12.6
S95T003785	15.3	17.6	16.4	9.18

R = Rerun

BULK DENSITY

In accordance with Reference 1, measurements for bulk density were performed on the sludge samples. Procedure LO-160-103, Rev. B-0 was used to perform the bulk density measurements. Table 7 summarizes the upper and lower bounds of the density results and the average result obtained.

Table 7: Summary of Bulk Density Results for Tank 241-BY-110

Matrix	Bulk Density Results		Average (g/mL)
	Lower Bound (g/mL)[1]	Upper Bound (g/mL)[1]	
Sludge	1.63	1.83	1.75

[1] Units in attached summary tables are sometimes in grams per mass (G/M).

It should by noted that density measurements could not be made on 4 of the subsegments, generally for two reasons:

(1) Insufficient recovery was obtained for the segment. In these situations, the density analysis was not performed in order to have sufficient material with which to run the chemical and radiological analyses required.

(2) For some of the sludge samples, the material was too sticky to maneuver into the centrifuge tube, making it very difficult or impossible to perform the bulk density analysis.

In all four instances, either lack of material or the consistency of the samples was not determined until later in the process, after the analyses had been requested. The density requests were deleted, and no analyses will appear on the data summary tables of this report for these samples.

No duplicate analyses were performed as part of the bulk density measurements, so no estimate of precision can be made. Further, no standard or spike is run with this analysis, so there is no accuracy evaluation possible.

TOTAL ALPHA

The alpha total analyses were performed on the saltcake and sludge samples using procedure LA-508-101, Rev. D-2. Fusion digestions on the saltcake and sludge were prepared using procedure LA-549-141, Rev. D-0. Since tank BY-104 is on the Ferrocyanide Watch List, a zirconium crucible rather than a nickel crucible was used to perform the fusion preparation, and is identified by a "Z" in the aliquot or "A" column of the data summary tables.

In order to determine the notification limit for this analysis, the limit of 1 g/L as specified in References 1 and 6 was converted to units of microcuries per gram using the density of the BY-104 waste material. The highest density result obtained for the subsegments (1.83 g/mL) was used in this calculation, which yielded a notification limit of 33.6 uCi/g. By using the highest density result, the lowest notification limit in uCi/g was obtained, thereby

providing the most conservative estimate with respect to criticality evaluation.

Of the 31 subsegments from tank BY-104, 1 saltcake sample and 14 sludge samples were analyzed for total alpha activity. None of these 15 samples produced results which exceeded the limit of 33.6 uCi/g, with the highest result being 0.845 uCi/g. Table 8 summarizes the lower and upper bound results and the average total alpha result for each matrix.

Table 8: Summary of Total Alpha Analysis Results for Tank 241-BY-104

Matrix	Total Alpha Analysis Results		Average[1]
	Lower Bound	Upper Bound	
Sludge (μCi/g)	1.35×10^{-2}	8.45×10^{-1}	1.22×10^{-1}
Saltcake (μCi/g)	6.14×10^{-3}	6.59×10^{-3}	6.36×10^{-3}

[1] Results below the detection limit were not factored into the average values.

The range of RPD values for the 12 subsegments with results greater than the detection limit was from 3.5% to 36.4%, with 6 of the samples above the acceptable precision requirement of 10% RPD. The high RPD values are being attributed to the inhomogeneity in the tank BY-104 sample material and/or low sample activity. Since none of the sample results were greater than 0.845 uCi/g, approximately 40 times lower than the notification limit of 33.6 uCi/g), no repreparations or reruns were requested.

Statistical analyses for the 95% confidence interval were performed on the total alpha data from tank BY-104 per the requirements of Reference 1, and the UL of the interval was compared to the notification limit of 33.6 uCi/g. For each subsegment submitted for total alpha analysis, the sample mean and the UL to the 95% confidence interval are represented in Table 9. If the UL of any subsegment is less than 33.6 uCi/g of total alpha activity, the hypothesis that the subsegment's activity is greater than or equal to the notification limit is rejected. None of the 15 subsamples analyzed for total alpha activity produced upper limit results which exceeded the notification criteria, indicating that tank BY-104 may be considered "safe" from a criticality perspective.

Table 9: Statistical Analyses for Tank 241-BY-104 Total Alpha Results

Sample #	Result (uCi/g)	Duplicate (uCi/g)	Average (uCi/g)	UL(mean)
S95T003530	1.68E-02	1.37E-02	1.52E-02	2.50E-02
S95T003700	6.59E-03	6.14E-03	6.36E-03	7.78E-03
S95T003651	2.04E-02	1.97E-02	2.00E-02	2.22E-02
S95T003654	3.30E-02	3.49E-02	3.40E-02	4.00E-02
S95T003655	2.79E-02	2.59E-02	2.69E-02	3.32E-02
S95T003658	2.28E-02	2.06E-02	2.17E-02	2.86E-02
S95T003659	3.14E-02	2.50E-02	2.82E-02	4.84E-02
S95T003662	3.25E-02	3.61E-02	3.43E-02	4.57E-02
S95T003663	3.05E-01	2.11E-01	2.58E-01	5.55E-01
S95T003665	9.74E-02	1.28E-01	1.13E-01	2.10E-01
S95T003788	7.14E-01	8.45E-01	7.79E-01	1.19E-00
S95T003789	1.57E-02	1.35E-02	1.46E-02	2.15E-02

Project Coordinator: Cheryl J. Benar

References:

(1) Babad, H., J. W. Hunt, and K. S. Redus, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, dated August 31, 1995, Westinghouse Hanford Company, Richland, Washington.

(2) Buckley, L. L. and D. G. Baide, *Data Quality Objective to Support Resolution of the Organic Fuel Rich Tank Safety Issue*, WHC-SD-WM-DQO-006, Rev. 1, dated April 26, 1995, Westinghouse Hanford Company, Richland, Washington.

(3) Meacham, J. E., R. J. Cash, B. A. Pulsipher, and G. Chen, *Data Requirements for the Ferrocyanide Safety Issue Developed through the Data Quality Objectives Process*, WHC-SD-WM-DQO-007, Rev. 2, dated July 13, 1995, Westinghouse Hanford Company, Richland, Washington.

(4) Meacham, J. E., *Test Plan for Samples from Hanford Waste Tanks 241-BY-103, BY-104, BY-105, BY-106, BY-108, BY-110, TY-103, U-105, U-107, U-108, and U-109*, WHC-SD-WM-TP-378, Rev. 0, dated June 27, 1995, Westinghouse Hanford Company, Richland, Washington.

(5) Simpson, B. C., D. J. McCain, *Historical Model Evaluation Data Requirements*, WHC-SD-WM-DQO-018, Rev. 0, dated May 8, 1995, Westinghouse Hanford Company, Richland, Washington.

(6) Benar, C. J., *Tank 241-BY-104 Rotary Core Sampling and Analysis Plan*, WHC-SD-WM-TSAP-040, Rev. 0, dated September 7, 1995, Westinghouse Hanford Company, Richland, Washington.

(7) Tank Farms Operations, work package ES-95-00468, Westinghouse Hanford Company, Richland, Washington.

SAMPLE DATA SUMMARY

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INTERIM

45-Day Report
BY104 ROTARY

CORE NUMBER: 116
SEGMENT #: 2

SEGMENT PORTION: A Top Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003525			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.630	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003528			% Water by TGA on Perkin Elmer	%	None	None	101.3	n/a	16.08	16.71	16.39	3.84	n/a	n/a	n/a
S95T003528			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	99.02	n/a	0.00e+00	116.0	58.00	117	n/a	n/a	n/a
S95T003528			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	138.7	69.35	200	n/a	n/a	n/a
S95T003530	Z		Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	92.19	<6.90e-04	1.68e-02	1.37e-02	1.52e-02	20.3	30.87	1.22e-03	1.33E+01

J Upper Half of Segment: U Upper Half of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003529			% Water by TGA on Perkin Elmer	%	None	None	101.7	n/a	7.290	13.40	10.35	59.1	n/a	n/a	n/a
S95T003529			% Water by TGA using Mettler	%	None	None	100.0	n/a	16.52	12.96	14.74	24.2	n/a	n/a	n/a
S95T003529			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	30.50	13.60	22.05	76.6	n/a	n/a	n/a
S95T003529			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	102.3	n/a	26.00	11.60	18.80	76.6	n/a	n/a	n/a

=> Limit violated
=> Selected Limit

INTERIM

INTERIM

45-Day Report
BY104 ROTARY

CORE NUMBER: 116
SEGMENT #: 3

SEGMENT PORTION: U Upper Half of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003700		F	Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	111.7	<2.71e-03	6.59e-03	6.14e-03	6.36e-03	7.07	87.50	4.68e-03	6.66E+01
S95T003703	1		% Water by TGA using Mettler	%	None	None	100.3	n/a	11.86	6.130	8.995	63.7	n/a	n/a	n/a
S95T003703			% Water by TGA using Mettler	%	None	None	101.3	n/a	12.61	8.980	10.79	33.6	n/a	n/a	n/a
S95T003703			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	99.02	n/a	0.00e+00	11.14	5.570	11.1	n/a	n/a	n/a
S95T003703			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	12.48	6.240	200	n/a	n/a	n/a

Lower Half of Segment: L Lower Half of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003702			% Water by TGA using Mettler	%	None	None	101.3	n/a	12.32	10.10	11.21	19.8	n/a	n/a	n/a
S95T003702			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	98.31	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S95T003702			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

=> Limit violated
=> Selected Limit

INTERIM

INTERIM

45-Day Report
BY104 ROTARY

ORE NUMBER: 116
EGMENT #: 4

EGMENT PORTION: A Top Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003594			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.810	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003632			% Water by TGA on Perkin Elmer	%	None	None	101.3	n/a	19.00	22.41	20.70	16.5	n/a	n/a	n/a
95T003632			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	99.96	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003632			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

Second Quarter of Segment: B Second Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003595			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.790	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003637 1			% Water by TGA using Mettler	%	None	None	101.9	n/a	18.71	24.20	21.45	25.6	n/a	n/a	n/a
95T003637			% Water by TGA using Mettler	%	None	None	99.73	n/a	31.67	25.16	28.41	22.9	n/a	n/a	n/a
95T003637			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	100.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003637			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

Third Quarter of Segment: C Third Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003596			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.820	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003641			% Water by TGA using Mettler	%	None	None	99.73	n/a	33.92	33.91	33.91	0.03	n/a	n/a	n/a
95T003641			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	100.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003641			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003651		Z	Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	84.38	<6.41e-03	2.04e-02	1.97e-02	2.00e-02	3.49	69.90	9.08e-03	4.35E+01

=> Limit violated
=> Selected Limit

INTERIM

INTERIM

45-Day Report
BY104 ROTARY

)RE NUMBER: 116
:GMENT #: 5

:GMENT PORTION: A Top Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003597			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.790	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003633			% Water by TGA using Mettler	%	None	None	96.59	n/a	24.42	24.11	24.27	1.28	n/a	n/a	n/a
95T003633			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	99.96	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003633			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

Second Quarter of Segment: B Second Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003598			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.740	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003638			% Water by TGA using Mettler	%	None	None	99.77	n/a	20.34	21.08	20.71	3.57	n/a	n/a	n/a
95T003638			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	255.8	344.7	300.2	29.6	n/a	n/a	n/a
95T003638 1			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	98.77	n/a	0.00e+00	41.20	20.60	200	n/a	n/a	n/a
95T003638			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	102.6	n/a	202.8	273.3	238.1	29.6	n/a	n/a	n/a

Third Quarter of Segment: C Third Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003599			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.720	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003642			% Water by TGA using Mettler	%	None	None	100.8	n/a	23.36	32.83	28.09	33.7	n/a	n/a	n/a
95T003642			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003642			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	100.5	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003654		Z	Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	89.58	1.050	3.30e-02	3.49e-02	3.40e-02	5.60	n/a	1.06e-02	3.27E+01

Bottom Quarter of Segment: D Bottom Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003600			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.730	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003645			% Water by TGA using Mettler	%	None	None	100.8	n/a	21.70	24.45	23.07	11.9	n/a	n/a	n/a
S95T003645			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	284.9	724.6	504.8	87.1	n/a	n/a	n/a
S95T003645			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	100.5	n/a	219.2	557.4	388.3	87.1	n/a	n/a	n/a
S95T003655		Z	Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	89.58	1.050	2.79e-02	2.59e-02	2.69e-02	7.43	81.12	1.04e-02	3.61E+01

=> Limit violated
=> Selected Limit

INTERIM

45-Day Report
BY104 ROTARY

CORE NUMBER: 116
SEGMENT #: 6

SEGMENT PORTION: A Top Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003601			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.76 G/M	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003634			% Water by TGA using Mettler	%	None	None	102.1	n/a	28.77	26.33	27.55	8.86	n/a	n/a	n/a
S95T003634			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	106.2	n/a	23.60	36.20	29.90	42.1	n/a	n/a	n/a

Second Quarter of Segment: B Second Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003602			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.75 G/M	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003639			% Water by TGA using Mettler	%	None	None	101.3	n/a	30.64	33.01	31.82	7.45	n/a	n/a	n/a
S95T003639			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	95.61	n/a	71.00	65.30	68.15	8.36	n/a	n/a	n/a

Third Quarter of Segment: C Third Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003603			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.75 G/M	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003643			% Water by TGA on Perkin Elmer	%	None	None	101.3	n/a	8.94e-01	28.00	14.45	200	n/a	n/a	n/a
S95T003643			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	99.33	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S95T003643			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S95T003658		Z	Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	85.94	<6.61e-03	2.28e-02	2.06e-02	2.17e-02	10.1	n/a	9.36e-03	3.80E+01

Bottom Quarter of Segment: D Bottom Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003604			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.75 G/M	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003646			% Water by TGA on Perkin Elmer	%	None	None	101.3	n/a	7.52e-01	9.97e-01	8.75e-01	28.0	n/a	n/a	n/a
S95T003646			% Water by TGA using Mettler	%	None	None	100.3	n/a	22.97	24.24	23.60	5.38	n/a	n/a	n/a
S95T003646			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	99.33	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S95T003646			DSC Exotherm Dry Calculated	Joules/g Dry	-1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S95T003659		Z	Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	85.94	<6.61e-03	3.14e-02	2.50e-02	2.82e-02	22.7	78.32	1.01e-02	3.62E+01

=> Limit violated
=> Selected Limit

INTERIM

45-Day Report
BY104 ROTARY

ORE NUMBER: 116
EGMENT #: 7

EGMENT PORTION: A Top Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003605			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.690	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003635			% Water by TGA using Mettler	%	None	None	96.59	n/a	25.73	25.85	25.79	0.47	n/a	n/a	n/a
95T003635			DSC Exotherm on Perkin Elmer	Joules/g	*1.0e+00	480.0	99.96	n/a	104.5	100.1	102.3	4.30	n/a	n/a	n/a
95T003635			DSC Exotherm Dry Calculated	Joules/g Dry	*1.0e+00	480.0	n/a	n/a	140.8	134.9	137.9	4.28	n/a	n/a	n/a

Second Quarter of Segment: B Second Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003606			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.680	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003640			% Water by TGA using Mettler	%	None	None	99.77	n/a	28.21	26.65	27.43	5.69	n/a	n/a	n/a
95T003640			DSC Exotherm Dry Calculated	Joules/g Dry	*1.0e+00	480.0	n/a	n/a	389.6	309.8	349.7	22.8	n/a	n/a	n/a
95T003640 1			DSC Exotherm using Mettler	Joules/g	*1.0e+00	480.0	98.77	n/a	54.40	78.20	66.30	35.9	n/a	n/a	n/a
95T003640			DSC Exotherm using Mettler	Joules/g	*1.0e+00	480.0	102.6	n/a	282.7	224.8	253.8	22.8	n/a	n/a	n/a

Third Quarter of Segment: C Third Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003607			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.640	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003644			% Water by TGA using Mettler	%	None	None	100.7	n/a	29.20	27.83	28.52	4.80	n/a	n/a	n/a
95T003644			DSC Exotherm on Perkin Elmer	Joules/g	*1.0e+00	480.0	99.19	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003662	Z		Alpha of Digested Solid	uCi/g	*1.0e+00	41.00	85.42	<4.93e-03	3.25e-02	3.61e-02	3.43e-02	10.5	n/a	1.01e-02	3.33E+01

Bottom Quarter of Segment: D Bottom Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003647			% Water by TGA using Mettler	%	None	None	101.4	n/a	26.81	24.36	25.59	9.58	n/a	n/a	n/a
95T003647			DSC Exotherm Dry Calculated	Joules/g Dry	*1.0e+00	480.0	n/a	n/a	484.1	436.6	460.4	10.3	n/a	n/a	n/a
95T003647			DSC Exotherm using Mettler	Joules/g	*1.0e+00	480.0	97.72	n/a	360.2	324.9	342.5	10.3	n/a	n/a	n/a
95T003663	Z		Alpha of Digested Solid	uCi/g	*1.0e+00	41.00	85.42	<4.93e-03	3.05e-01	2.11e-01	2.58e-01	36.4	77.04	2.22e-01	5.66E+01

=> Limit violated
=> Selected Limit

2-26

INTERIM

45-Day Report
BY104 ROTARY

ORE NUMBER: 116
EGMENT #: 8

EGMENT PORTION: A Top Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003636			% Water by TGA using Mettler	%	None	None	103.2	n/a	26.96	26.76	26.86	0.74	n/a	n/a	n/a
95T003636			DSC Exotherm on Perkin Elmer	Joules/g	*1.0e+00	480.0	99.96	n/a	538.6	640.5	589.5	17.3	n/a	n/a	n/a
95T003636			DSC Exotherm Dry Calculated	Joules/g Dry	*1.0e+00	480.0	n/a	n/a	736.4	875.7	806.0	17.3	n/a	n/a	n/a

Bottom Quarter of Segment: D Bottom Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003648			% Water by TGA using Mettler	%	None	None	100.0	n/a	35.26	33.59	34.42	4.85	n/a	n/a	n/a
95T003648			DSC Exotherm Dry Calculated	Joules/g Dry	*1.0e+00	480.0	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003648			DSC Exotherm using Mettler	Joules/g	*1.0e+00	480.0	102.3	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003665		Z	Alpha of Digested Solid	uCi/g	*1.0e+00	41.00	85.42	<4.93e-03	9.74e-02	1.28e-01	1.13e-01	27.2	79.59	1.19e-01	9.17E+01

=> Limit violated
=> Selected Limit

INTERIM

2-27

45-Day Report
BY104 ROTARY

)RE NUMBER: 116
EGMENT #: n/a

EGMENT PORTION: Field Blank

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003713			% Water by TGA using Mettler	%	None	None	96.89	n/a	100.2	100.3	100.2	0.10	n/a	n/a	n/a
95T003713			DSC Exotherm on Perkin Elmer	Joules/g	1.0e+00	480.0	100.6	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

=> Limit violated
=> Selected Limit

INTERIM

45-Day Report
BY104 ROTARY

)RE NUMBER: 117
:GMENT #: 1

:GMENT PORTION: U Upper Half of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003764			% Water by TGA using Mettler	%	None	None	100.6	n/a	37.49	36.64	37.06	2.29	n/a	n/a	n/a
95T003764			DSC Exotherm using Mettler	Joules/g	1.0e+00	480.0	95.96	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

=> Limit violated
=> Selected Limit

INTERIM

45-Day Report
BY104 ROTARY

CORE NUMBER: 117
SEGMENT #: 1

SEGMENT PORTION: Drainable Liquid

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003761			% Water by TGA using Mettler	%	None	None	101.4	n/a	49.05	48.93	48.99	0.24	n/a	n/a	n/a
S95T003761			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	108.3	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

=> Limit violated
=> Selected Limit

INTERIM

45-Day Report
BY104 ROTARY

CORE NUMBER: 117
SEGMENT #: 2

SEGMENT PORTION: A Top Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003776			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.740	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003781			% Water by TGA using Mettler	%	None	None	100.6	n/a	30.24	28.11	29.17	7.30	n/a	n/a	n/a
S95T003781			DSC Exotherm using Mettler	Joules/g	≥1.0e+00	480.0	101.6	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S95T003786		Z	Alpha of Digested Solid	uCi/g	≥1.0e+00	41.00	83.77	<6.47e-02	<6.47E-02	<6.49E-2	n/a	n/a	75.26	1.47e-01	5.00E+02

Bottom Quarter of Segment: D Bottom Quarter of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003777			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.830	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T003782			% Water by TGA using Mettler	%	None	None	100.9	n/a	34.40	37.81	36.11	9.44	n/a	n/a	n/a
S95T003782			DSC Exotherm using Mettler	Joules/g	≥1.0e+00	480.0	100.5	n/a	18.80	23.60	21.20	22.6	n/a	n/a	n/a
S95T003787		Z	Alpha of Digested Solid	uCi/g	≥1.0e+00	41.00	83.77	<6.47e-02	<1.26E-01	<1.53E-1	n/a	n/a	78.06	2.87e-01	5.00E+02

=> Limit violated
=> Selected Limit

INTERIM

45-Day Report
BY104 ROTARY

CORE NUMBER: 117
SEGMENT #: 2

SEGMENT PORTION: Drainable Liquid

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003775			% Water by TGA using Mettler	%	None	None	101.4	n/a	48.80	48.95	48.88	0.31	n/a	n/a	n/a
S95T003775			DSC Exotherm using Mettler	Joules/g	1.0e+00	480.0	108.3	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

=> Limit violated
=> Selected Limit

INTERIM

45-Day Report
BY104 ROTARY

:ORE NUMBER: 117
:EGMENT #: 3

:EGMENT PORTION: U Upper Half of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003809			% Water by TGA on Perkin Elmer	%	None	None	100.3	n/a	37.06	35.97	36.52	2.99	n/a	n/a	n/a
95T003809			DSC Exotherm on Perkin Elmer	Joules/g	*1.0e+00	480.0	100.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

Third Quarter of Segment: C Third Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003778			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.780	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003783			% Water by TGA on Perkin Elmer	%	None	None	100.3	n/a	26.37	28.19	27.28	6.67	n/a	n/a	n/a
95T003783			DSC Exotherm on Perkin Elmer	Joules/g	*1.0e+00	480.0	100.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003788		Z	Alpha of Digested Solid	uCi/g	*1.0e+00	41.00	85.06	<3.64e-01	7.14e-01	8.45e-01	7.79e-01	16.8	79.34	4.44e-01	5.01E+01

=> Limit violated
=> Selected Limit

INTERIM

INTERIM

45-Day Report
BY104 ROTARY

CORE NUMBER: 117
SEGMENT #: 4

SEGMENT PORTION: U Upper Half of Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T003810			% Water by TGA using Mettler	%	None	None	100.9	n/a	13.86	13.40	13.63	3.37	n/a	n/a	n/a
S95T003810			DSC Exotherm using Mettler	Joules/g	%1.0e+00	480.0	100.5	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a

=> Limit violated
=> Selected Limit

INTERIM

INTERIM

45-Day Report
BY104 ROTARY

ORE NUMBER: 117
EGMENT #: 5

EGMENT PORTION: A Top Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003779			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.800	n/a	n/a	n/a	n/a	5.00e-01	n/a
95T003784			% Water by TGA using Mettler	%	None	None	103.2	n/a	16.61	18.13	17.37	8.75	n/a	n/a	n/a
95T003784			DSC Exotherm on Perkin Elmer	Joules/g	*1.0e+00	480.0	99.02	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003789	Z		Alpha of Digested Solid	uCi/g	*1.0e+00	41.00	85.06	<3.64e-01	1.57e-02	1.35e-02	1.46e-02	15.1	65.56	4.51e-03	3.13E+01

Third Quarter of Segment: C Third Quarter of Segment

ample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
95T003785			% Water by TGA using Mettler	%	None	None	103.2	n/a	15.26	17.55	16.41	14.0	n/a	n/a	n/a
95T003785			DSC Exotherm on Perkin Elmer	Joules/g	*1.0e+00	480.0	99.02	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
95T003790	Z		Alpha of Digested Solid	uCi/g	*1.0e+00	41.00	83.77	<6.47e-02	<6.16E-02	<7.76E-2	n/a	n/a	81.38	1.40e-01	5.00E+02

=> Limit violated
=> Selected Limit

INTERIM

INORGANIC ANALYSES

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LABCORE Data Entry Template for Worklist# 3417

Analyst: SMF **Instrument:** DSC0 3 **Book #** 12N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSC under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-03	SOLID	28.45	28.44	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003632	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003632	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003633	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003633	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g
95000180	BY104 ROTARY	6	SAMPLE	S95T003635	0		DSC-03	SOLID	N/A	104.46		Joules/g
95000180	BY104 ROTARY	7	DUP	S95T003635	0		DSC-03	SOLID	104.46	100.13	N/A	Joules/g
95000180	BY104 ROTARY	8	SAMPLE	S95T003636	0		DSC-03	SOLID	N/A	538.6		Joules/g
95000180	BY104 ROTARY	9	DUP	S95T003636	0		DSC-03	SOLID	538.6	640.5	N/A	Joules/g
		10	STD				DSC-03	SOLID	28.45	27.97	N/A	Joules/g
95000180	BY104 ROTARY	11	SAMPLE	S95T003702	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	12	DUP	S95T003702	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g

Final page for worklist # 3417

See attached for signatures

Analyst Signature **Date** **Analyst Signature** 1-12-96 **Date**

Verified by Blandina Valenzuela 1/12/96

Data Entry Comments:

S95T003632 produced two endotherms one at 104.13°C with a delta H of 581.28 J/g and the second at 277.39°C with a delta H of 76.79 J/g

S95T003633 produced 3 endotherms one at 103.2°C with a delta H of 661.9 J/g second at 291.9°C with a delta H of 66.07 J/g and third at 422.1°C with a delta H of 182.9 J/g

S95T003635 produced an endotherm at 136.15°C with a delta H of 793.55 J/g

S95T003636 produced an endotherm at 142.95°C with a delta H of 655.62 J/g

S95T003702 produced ~~two~~ two endotherms one at 104.42°C with a delta H of 190.62 J/g and second at 295.9°C with a delta H of 110.17 J/g

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 3417

Analyst: SMF **Instrument:** DSC0 1 **Book #** 12N14B

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSC under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID	28.45	28.44	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003632	0		DSC-01	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003632	0		DSC-01	SOLID	Ø	Ø	N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003633	0		DSC-01	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003633	0		DSC-01	SOLID	Ø	Ø	N/A	Joules/g
95000180	BY104 ROTARY	6	SAMPLE	S95T003635	0		DSC-01	SOLID	N/A	104.46		Joules/g
95000180	BY104 ROTARY	7	DUP	S95T003635	0		DSC-01	SOLID	104.46	100.13	N/A	Joules/g
95000180	BY104 ROTARY	8	SAMPLE	S95T003636	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	9	DUP	S95T003636	0		DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	10	SAMPLE	S95T003702	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	11	DUP	S95T003702	0		DSC-01	SOLID			N/A	Joules/g

Final page for worklist # 3417

SMFulton 1-9-96 0400
Analyst Signature **Date**

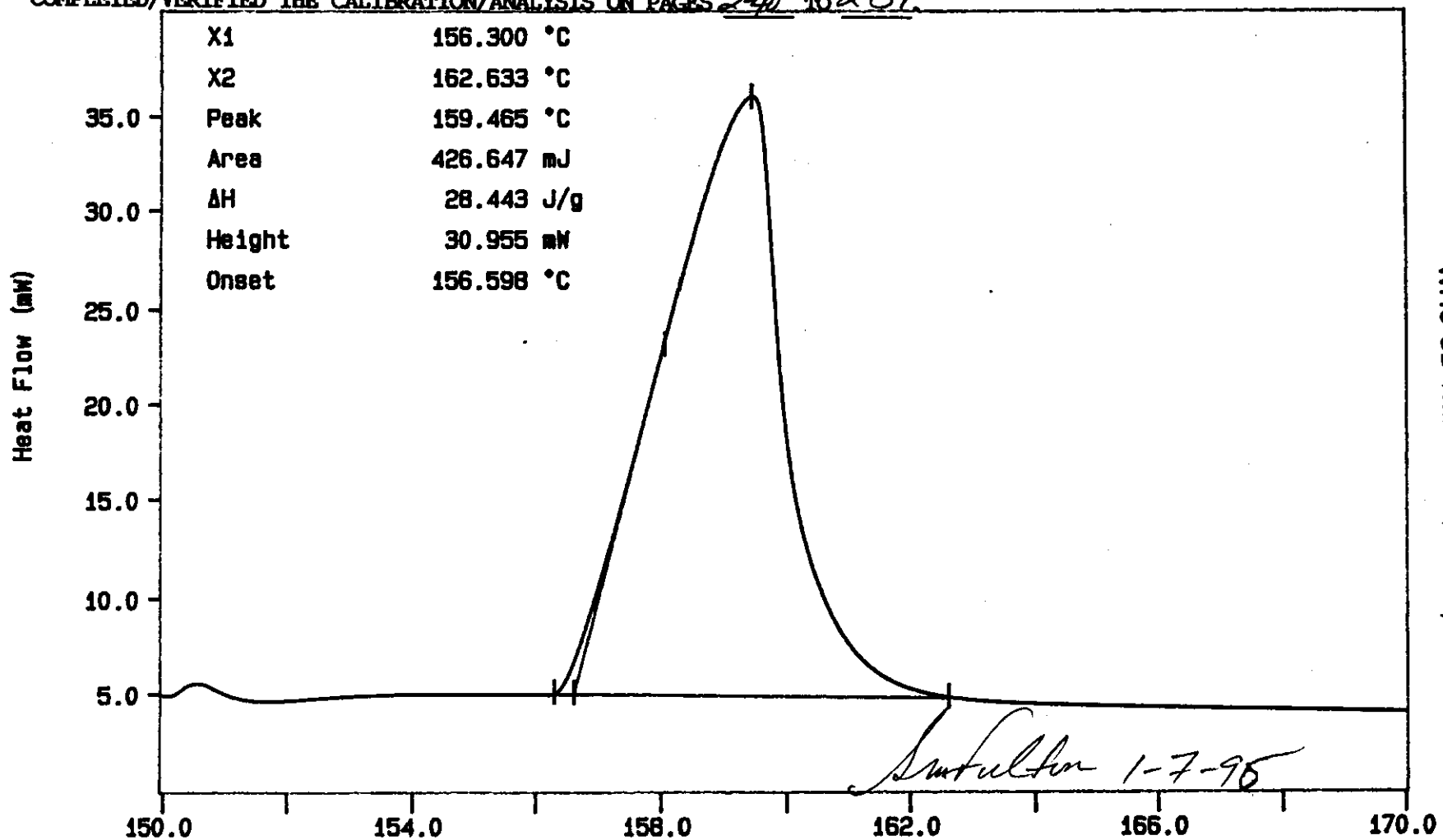
Analyst Signature **Date**

Data Entry Comments: S95T003632 produced two endotherms one at 104.13°C with a delta H of 581.28 J/g and the second at 277.39°C with a delta H of 76.79 J/g
S95T003633 produced three endotherms one at 103.22°C with a delta H of 661.9 J/g second at 291.91°C with a delta H of 66.07 J/g and third at 422.08°C with a delta H of 132.93 J/g
S95T003635 produced an endotherm at 136.15°C with a delta H of 793.55 J/g
S95T003636

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Curve 1: DSC
File info: IND010701 Sun Jan 7 18:30:51 1996
Sample Weight: 15.000 mg
12N14B Indium at 10C/min

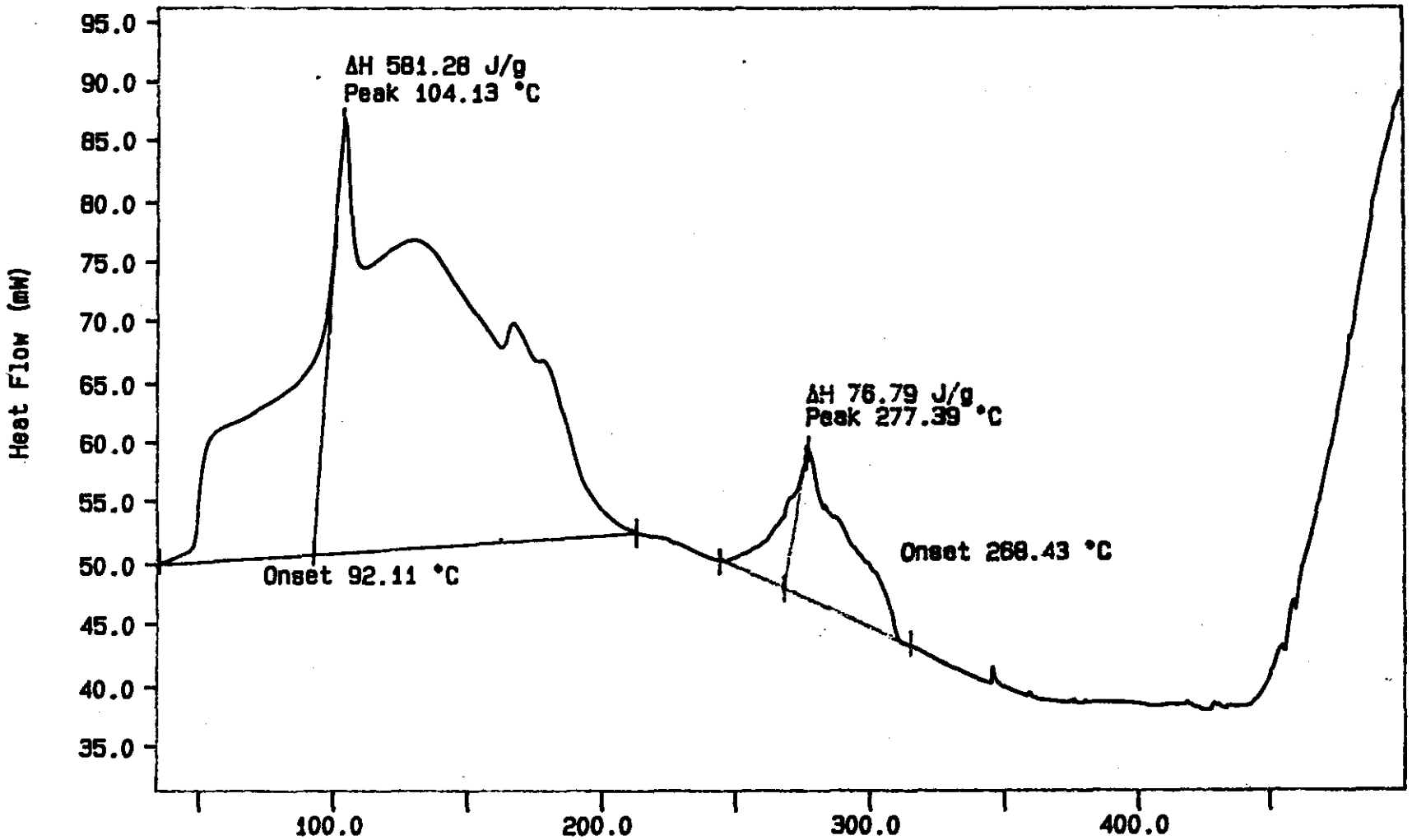
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 240 TO 251.



N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 7 18:34:52 1996

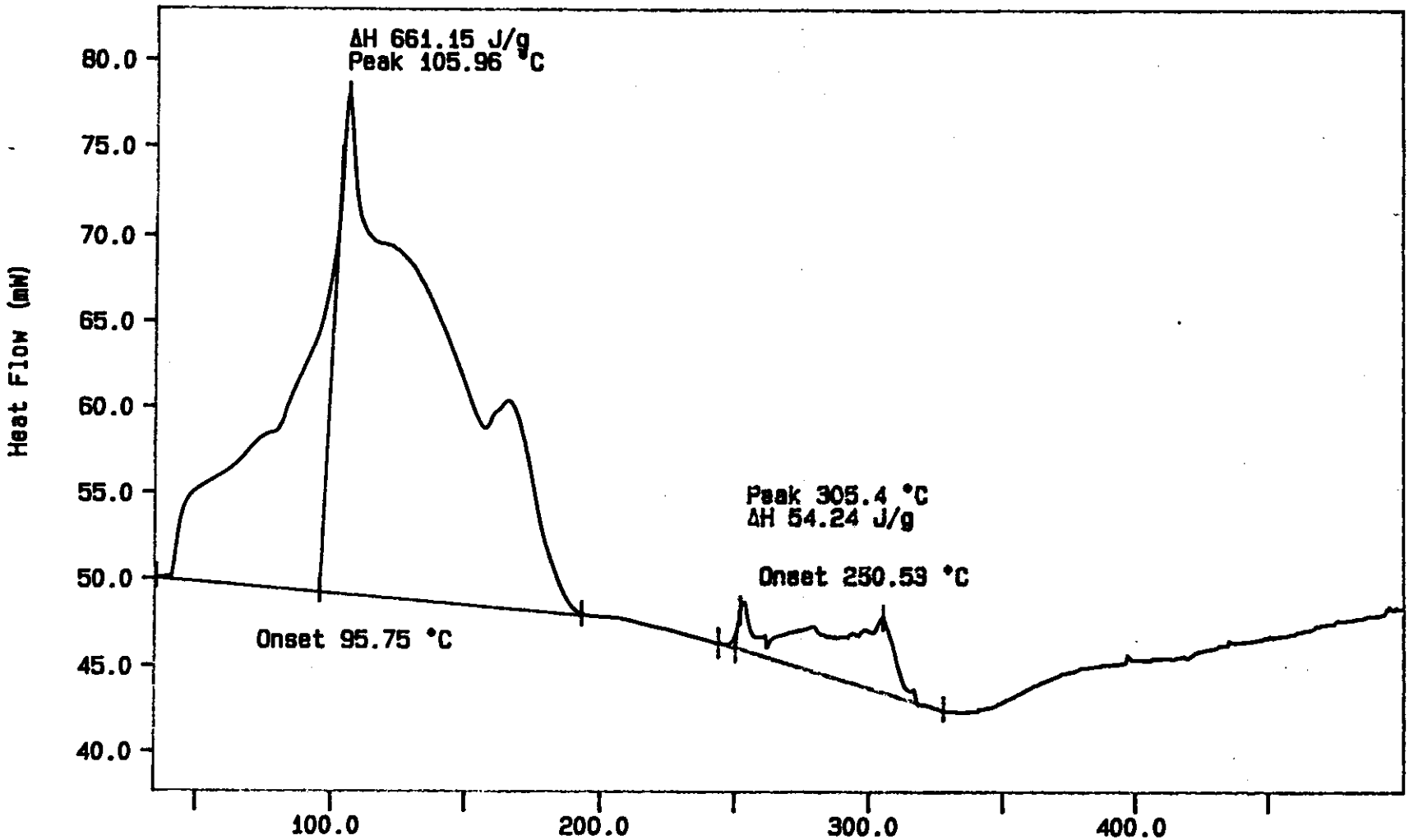
Curve 1: DSC
File info: SAM010701 Sun Jan 7 19:27:38 1996
Sample Weight: 26.740 mg
~~S95T004043~~ SMF1-7-95
S95T003632



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 7 19:29:56 1996

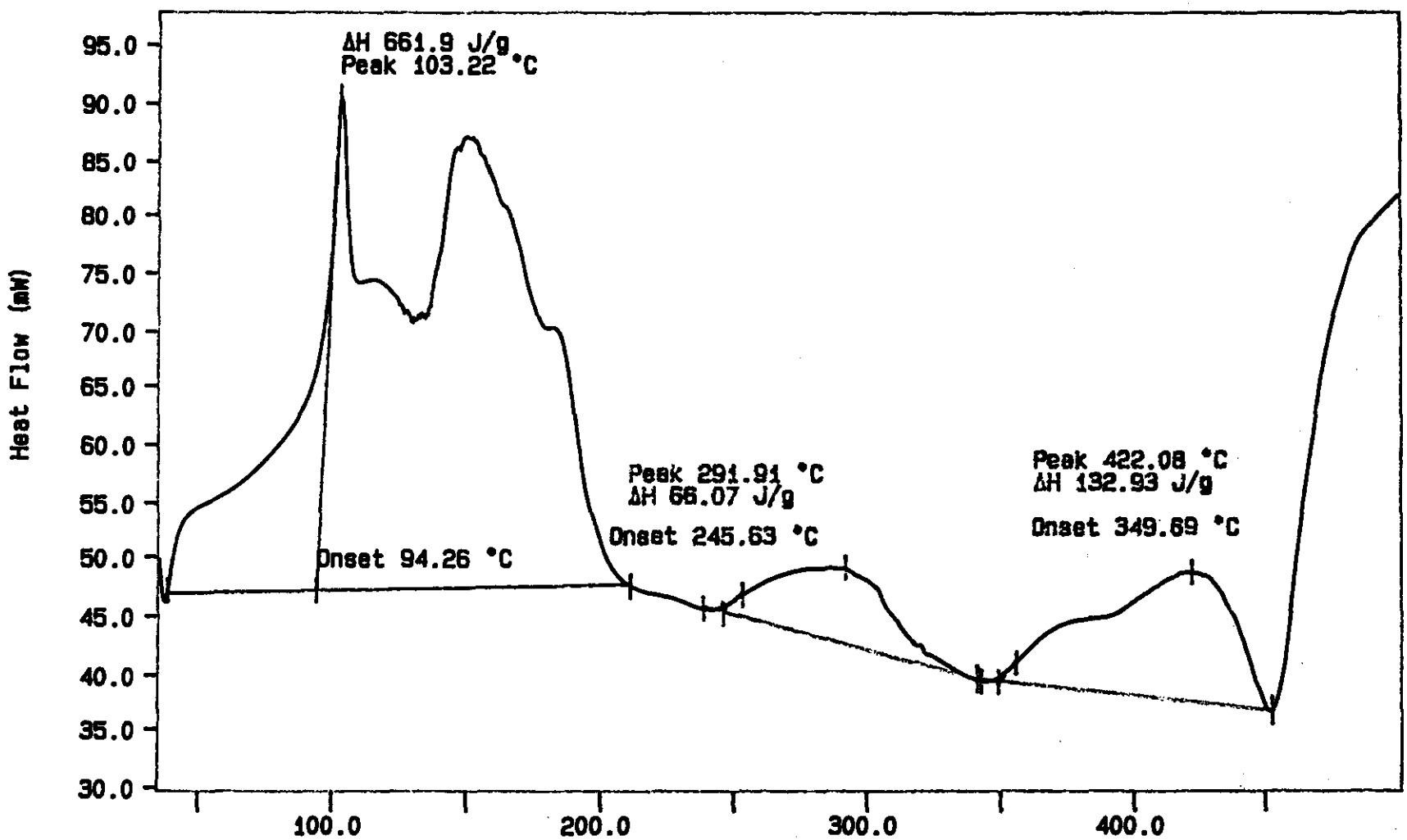
Curve 1: DSC
File info: SAM010702 Sun Jan 7 20:24:26 1996
Sample Weight: 16.510 mg
S95T003632 DUP



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 7 21:00:46 1996

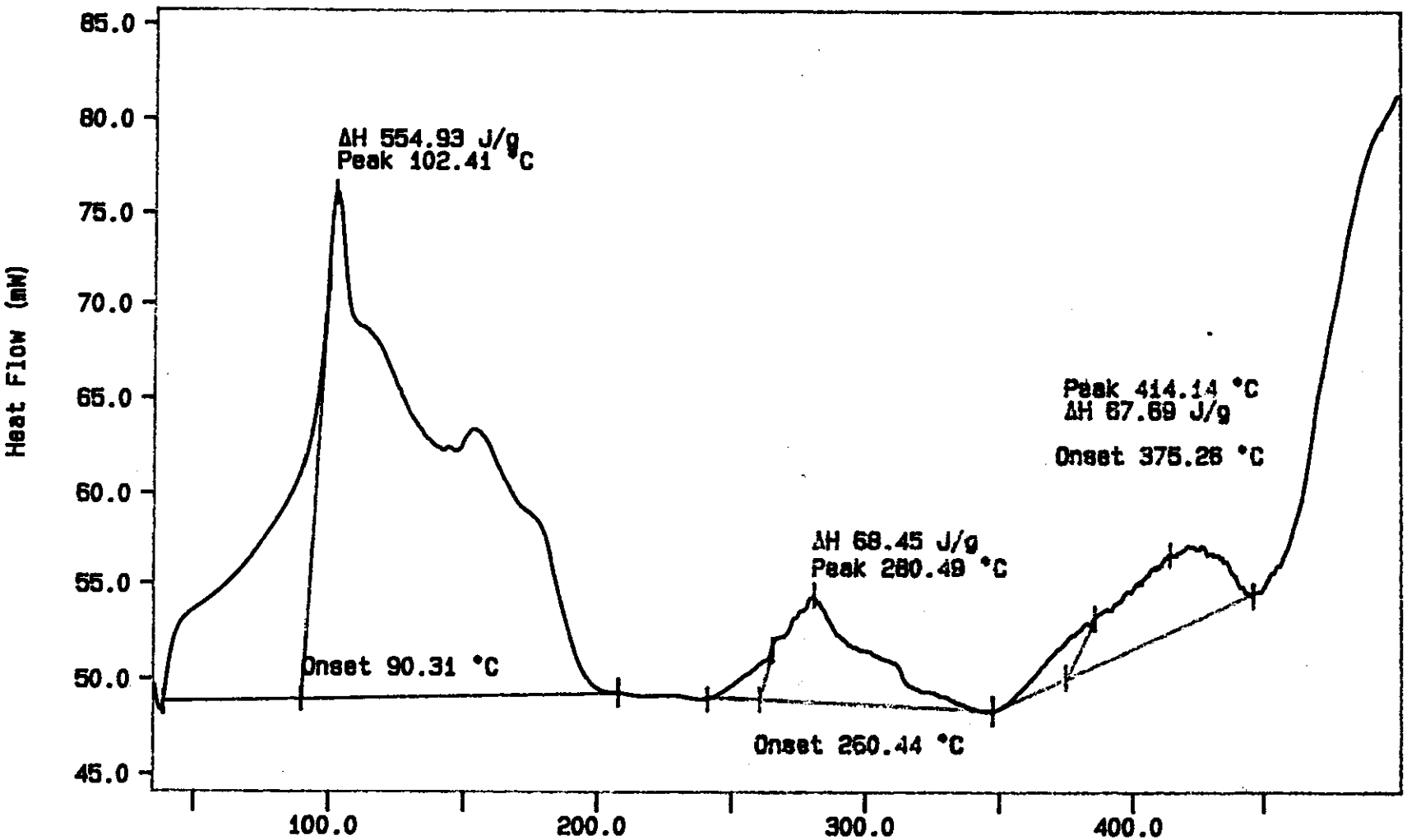
Curve 1: DSC
File info: SAM010703 Sun Jan 7 22:04:28 1996
Sample Weight: 31.310 mg
S95T003633



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Wed Jan 10 15:18:06 1996

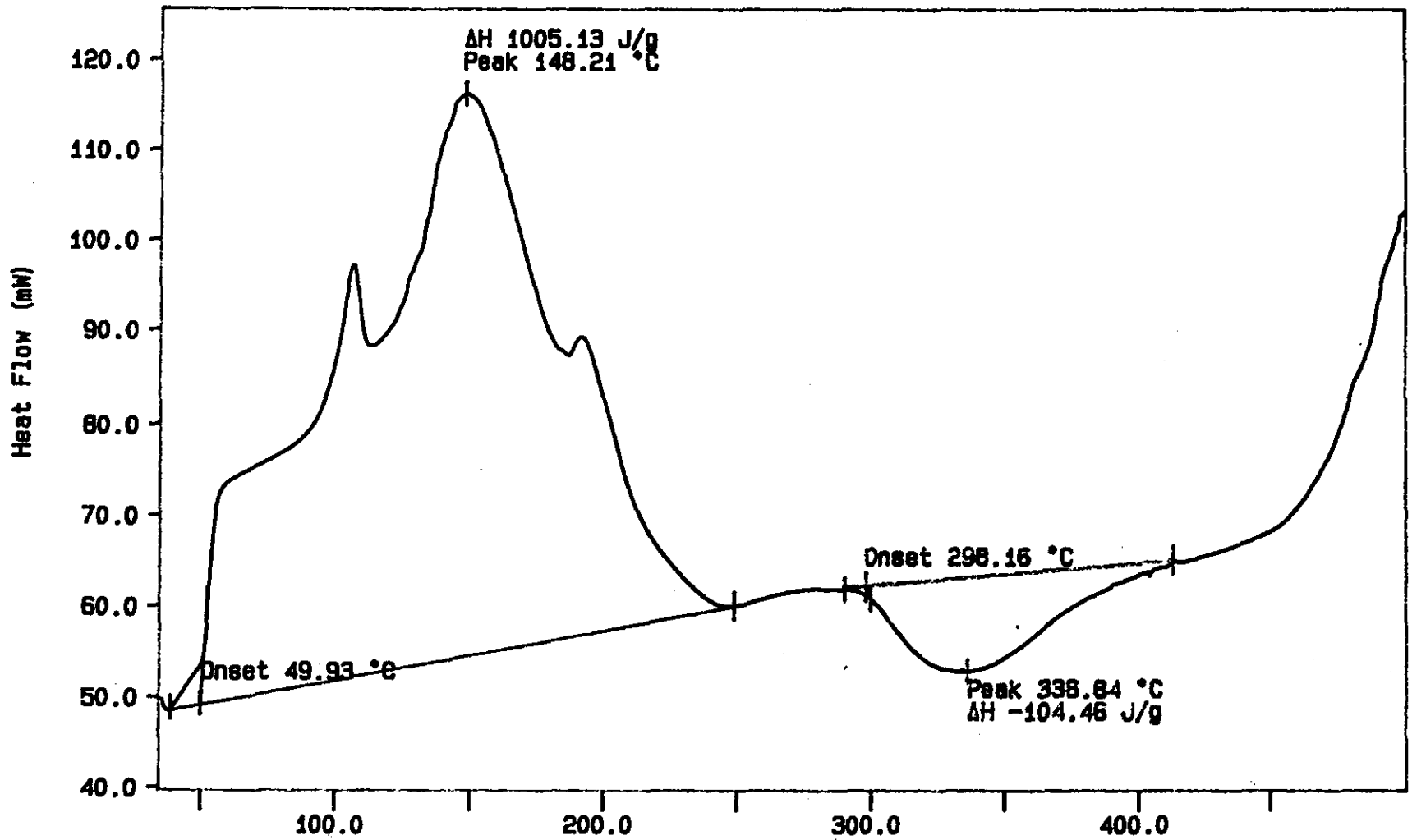
Curve 1: DSC
File info: SAM010704 Sun Jan 7 23:03:54 1996
Sample Weight: 19.670 mg
S95T003633 DUP



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Wed Jan 10 15:38:01 1996

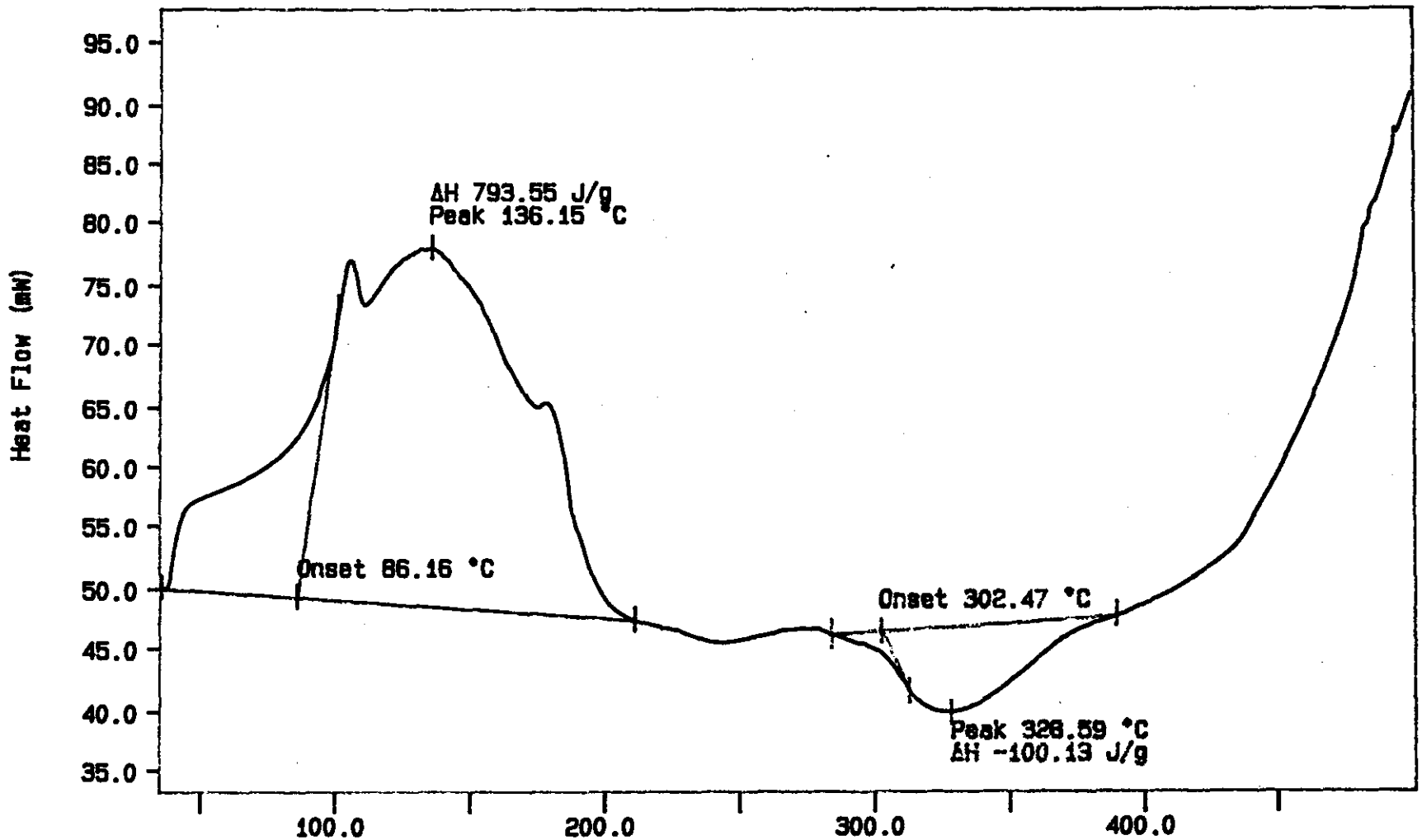
Curve 1: DSC
File info: SAM010705 Sun Jan 7 23:54:39 1996
Sample Weight: 36.000 mg
S95T03635



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Wed Jan 10 14:36:05 1996

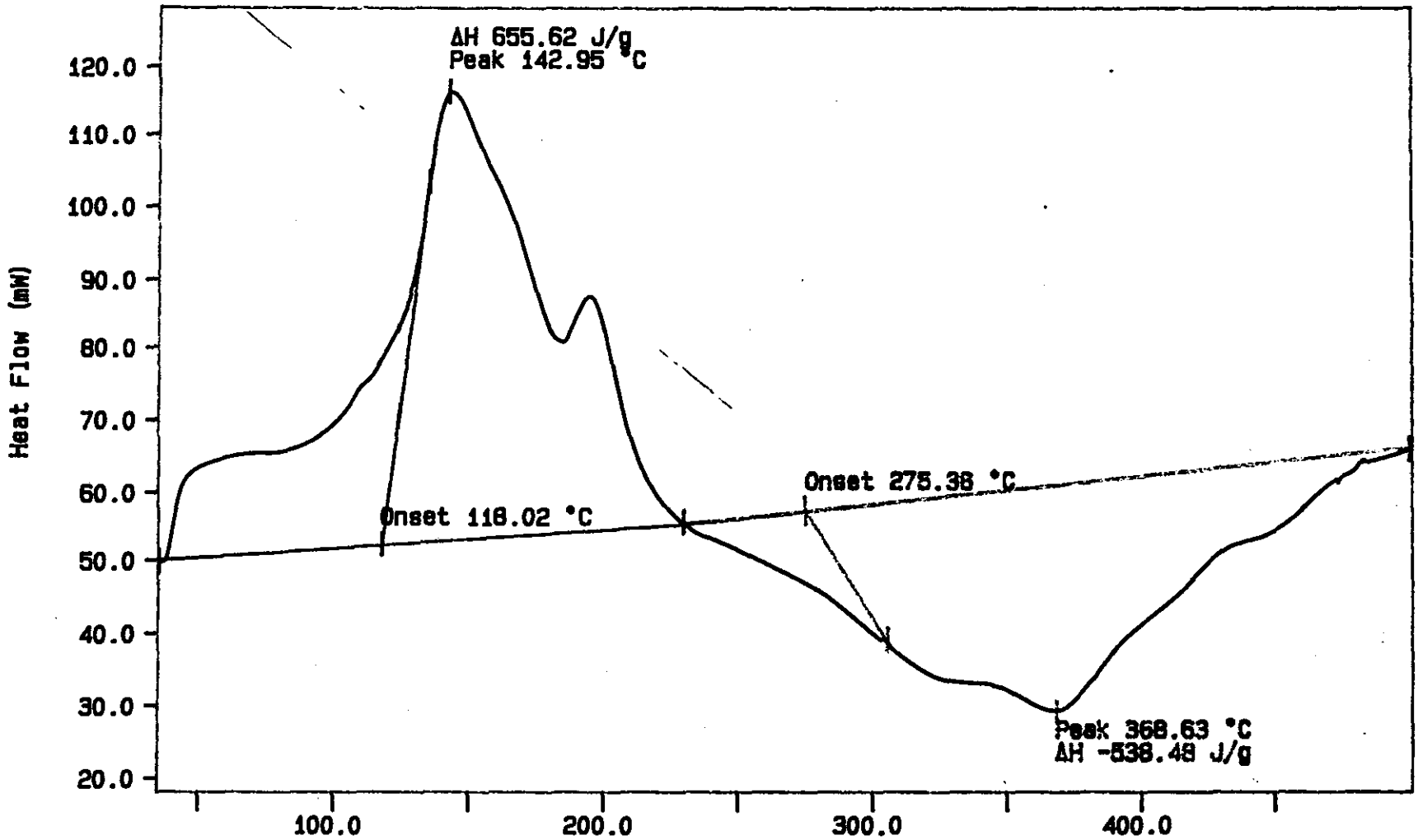
Curve 1: DSC
File info: SAM010709 Mon Jan 8 01:59:03 1996
Sample Weight: 21.300 mg
S95T003635 DUP



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Wed Jan 10 14:56:39 1996

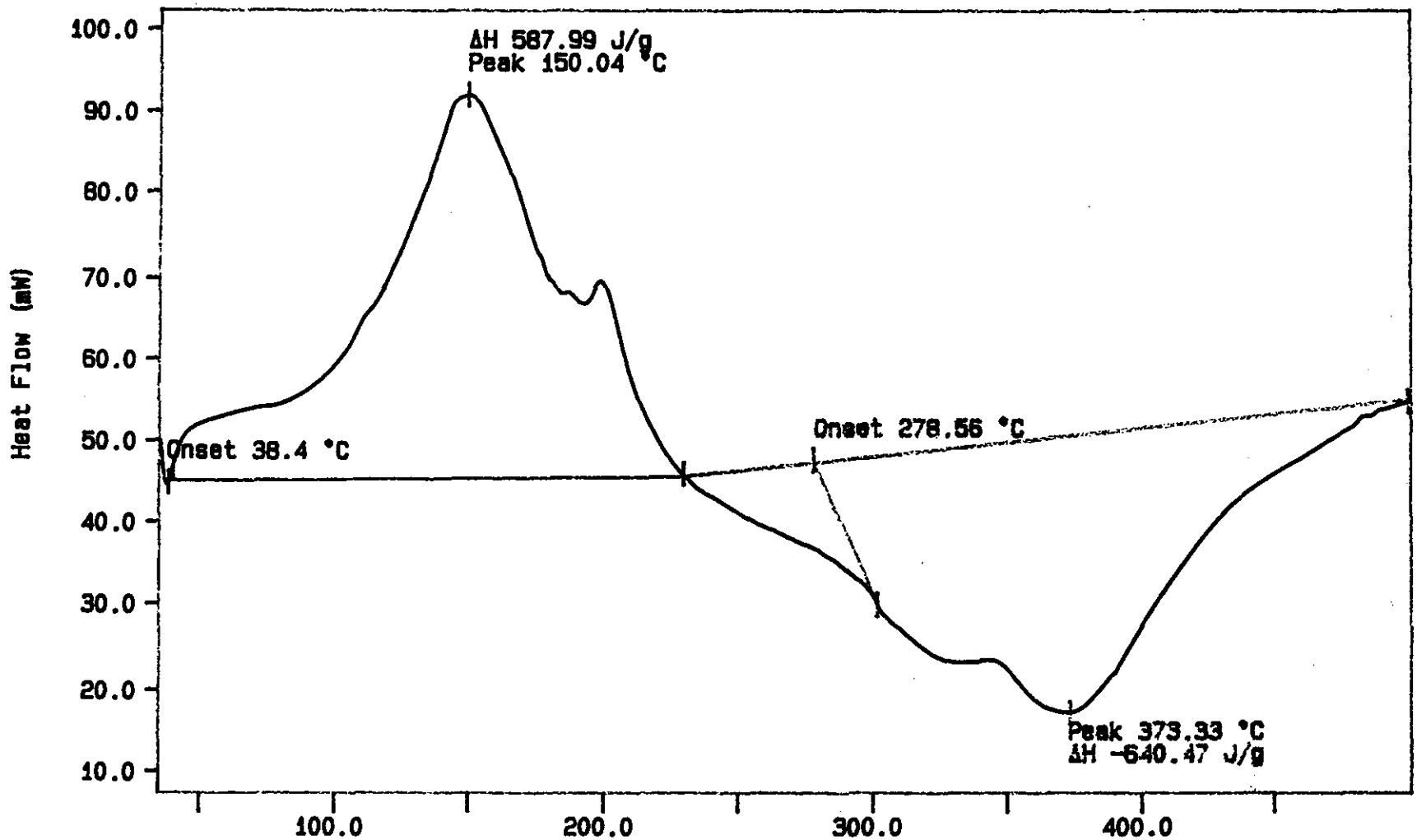
Curve 1: DSC
File info: SAM010710 Mon Jan 8 02:55:47 1996
Sample Weight: 45.500 mg
S965T003636



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 8 11:51:34 1996

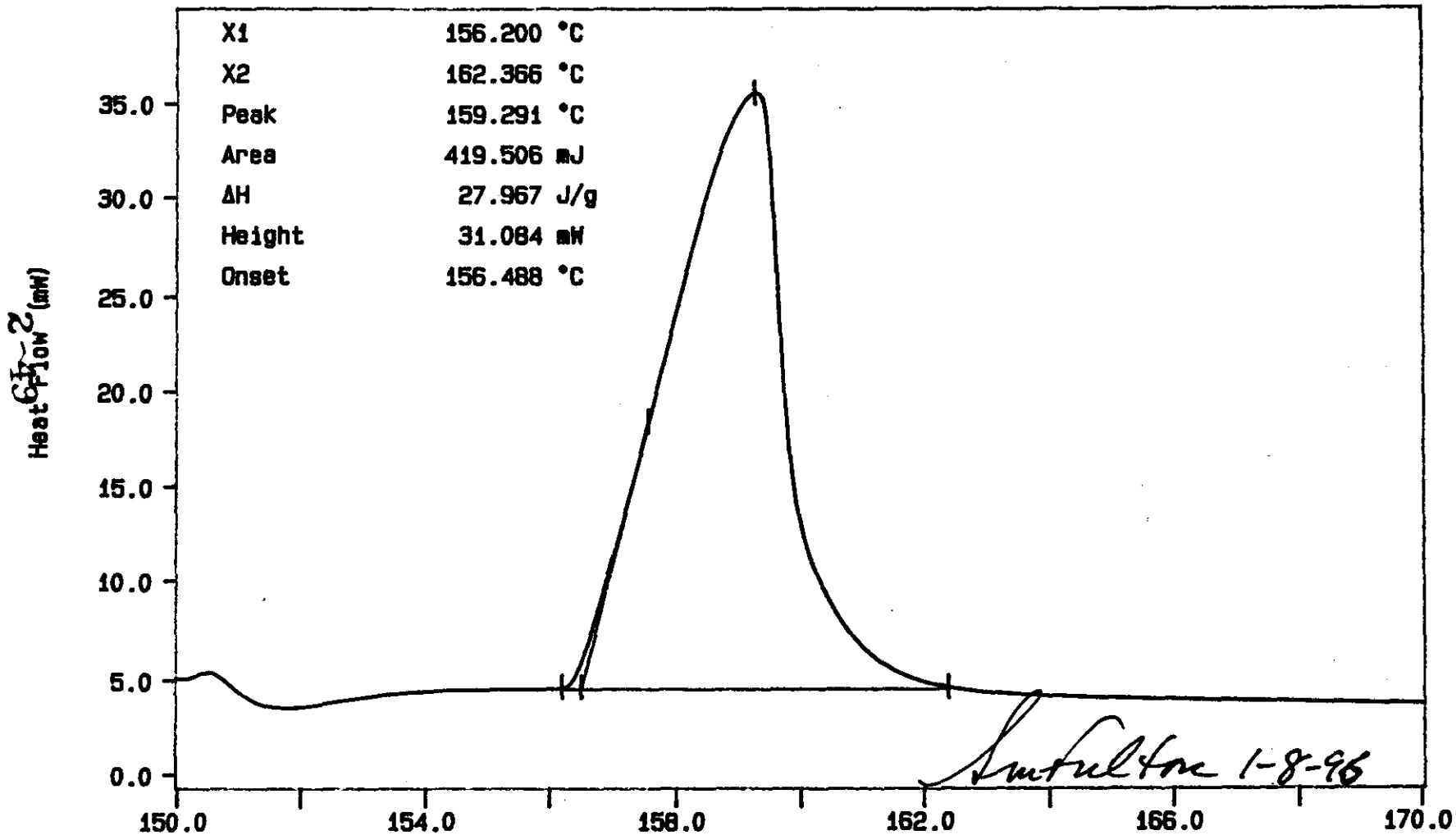
Curve 1: DSC
File info: SAM010711 Mon Jan 8 05:05:48 1996
Sample Weight: 39.150 mg
S95T003636 DUP



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 8 11:20:43 1996

Curve 1: DSC
File info: IND010801 Tue Jan 9 01:10:35 1996
Sample Weight: 15.000 mg
12N14B Indium at 10C/min

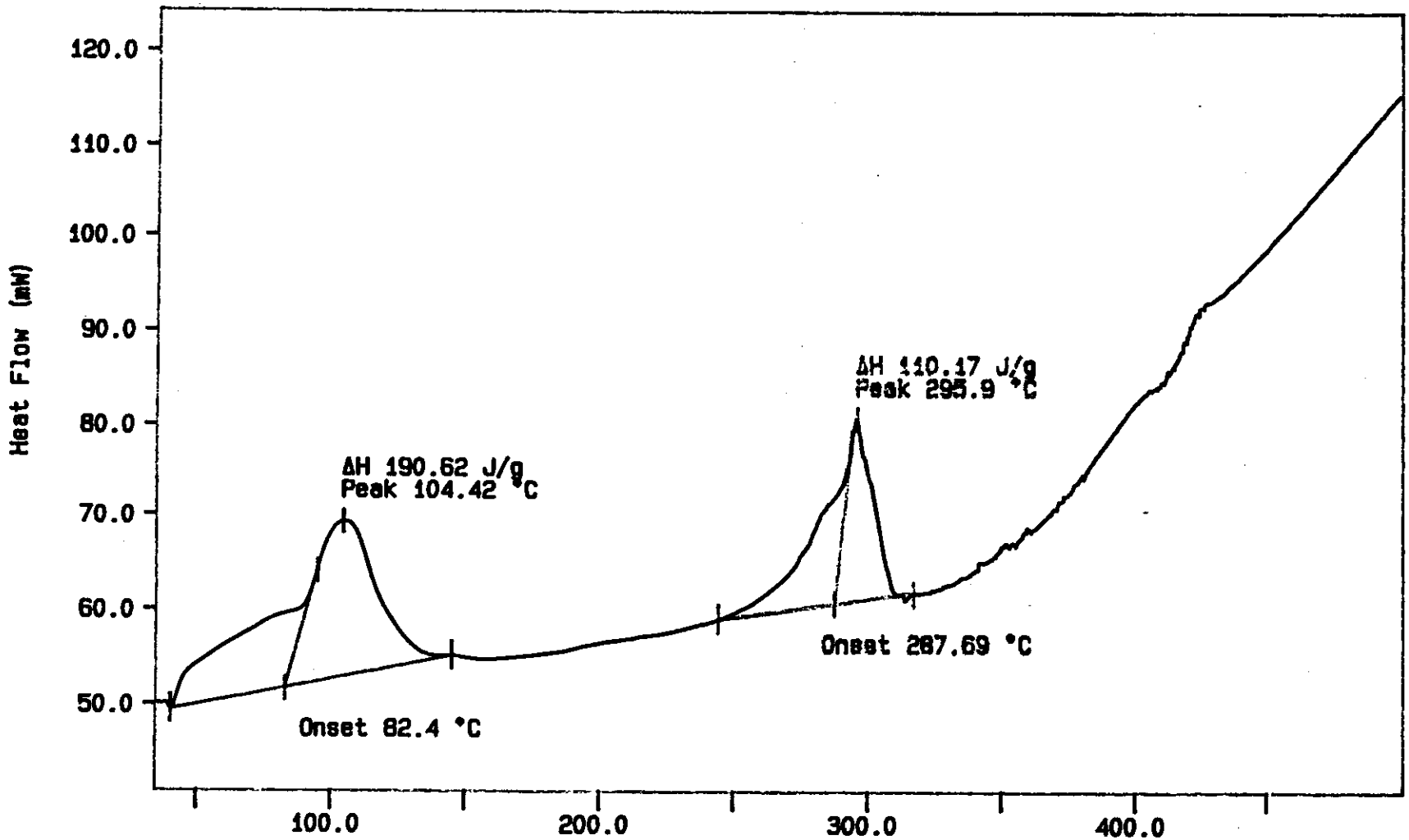


N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Jan 9 01:17:50 1996

WHC-SD-WM-DP-164, REV. 1

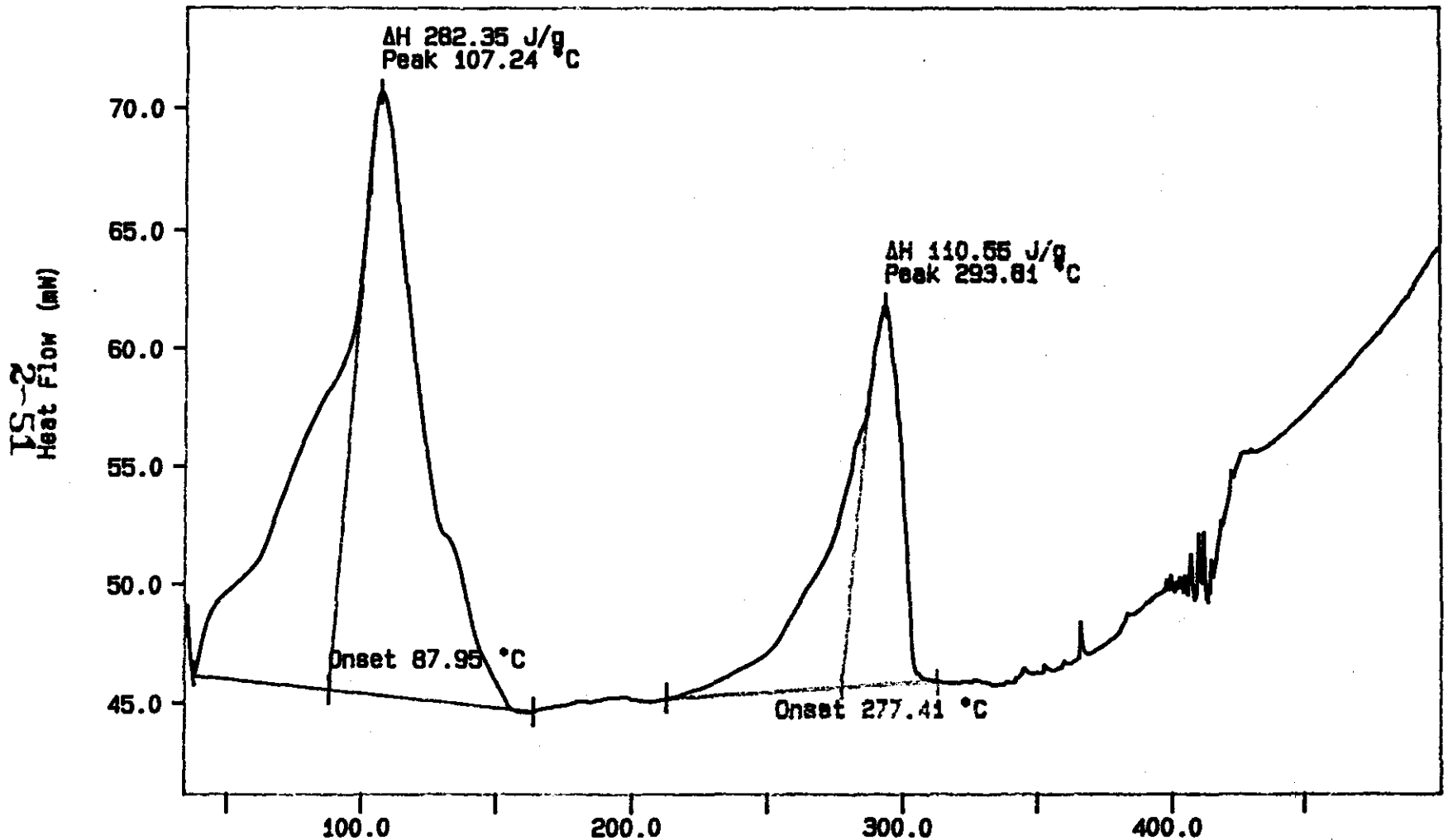
Curve 1: DSC
File info: SAM010801 Tue Jan 9 02:13:48 1996
Sample Weight: 22.870 mg
S95T003702



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Jan 9 02:33:03 1996

Curve 1: DSC
File info: SAM010802 Tue Jan 9 03:29:44 1996
Sample Weight: 23.350 mg
S95T003702 DUP



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Jan 9 04:06:46 1996

LABCORE Data Entry Template for Worklist# 3825

Analyst: PJM **Instrument:** DSC0 3 **Book #** 12N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run BY-104 rotary DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-03	LIQUID	28.45	28.63	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003713	0		DSC-03	LIQUID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003713	0		DSC-03	LIQUID	Ø	Ø	N/A	Joules/g

Final page for worklist # 3825

See attached for signatures
Analyst Signature Date 11/28/95 BDV

Sharon L Hall 11-28-95
Analyst Signature Date

Verified by Blandina Valenzuela 12/1/95
12/1/95 BDV

For data entry purposes the batch was attached to ~~2421~~ 12/1/95 BDV Worklist 2421.

Data Entry Comments: Sample produced an endotherm at 117.9 °C with a delta H of 1837.4 J/g

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 3421

Analyst: ADP **Instrument:** DSC0 _____ **Book #** _____

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	LIQUID			N/A	Joules/g
95000158	B-204	2	SAMPLE	S95T002976	0		DSC-01	LIQUID	N/A			Joules/g
95000158	B-204	3	DUP	S95T002976	0		DSC-01	LIQUID			N/A	Joules/g
95000158	B-204	4	SAMPLE	S95T002984	0		DSC-01	LIQUID	N/A			Joules/g
95000158	B-204	5	DUP	S95T002984	0		DSC-01	LIQUID			N/A	Joules/g
95000189	TX-244 GRAB	6	SAMPLE	S95T003708	0		DSC-01	LIQUID	N/A			Joules/g
95000189	TX-244 GRAB	7	DUP	S95T003708	0		DSC-01	LIQUID			N/A	Joules/g
95000189	TX-244 GRAB	8	SAMPLE	S95T003709	0		DSC-01	LIQUID	N/A			Joules/g
95000189	TX-244 GRAB	9	DUP	S95T003709	0		DSC-01	LIQUID			N/A	Joules/g
95000180	BY104 ROTARY	10	SAMPLE	S95T003713	0		DSC-01	LIQUID	N/A			Joules/g
95000180	BY104 ROTARY	11	DUP	S95T003713	0		DSC-01	LIQUID			N/A	Joules/g

Final page for worklist # 3421

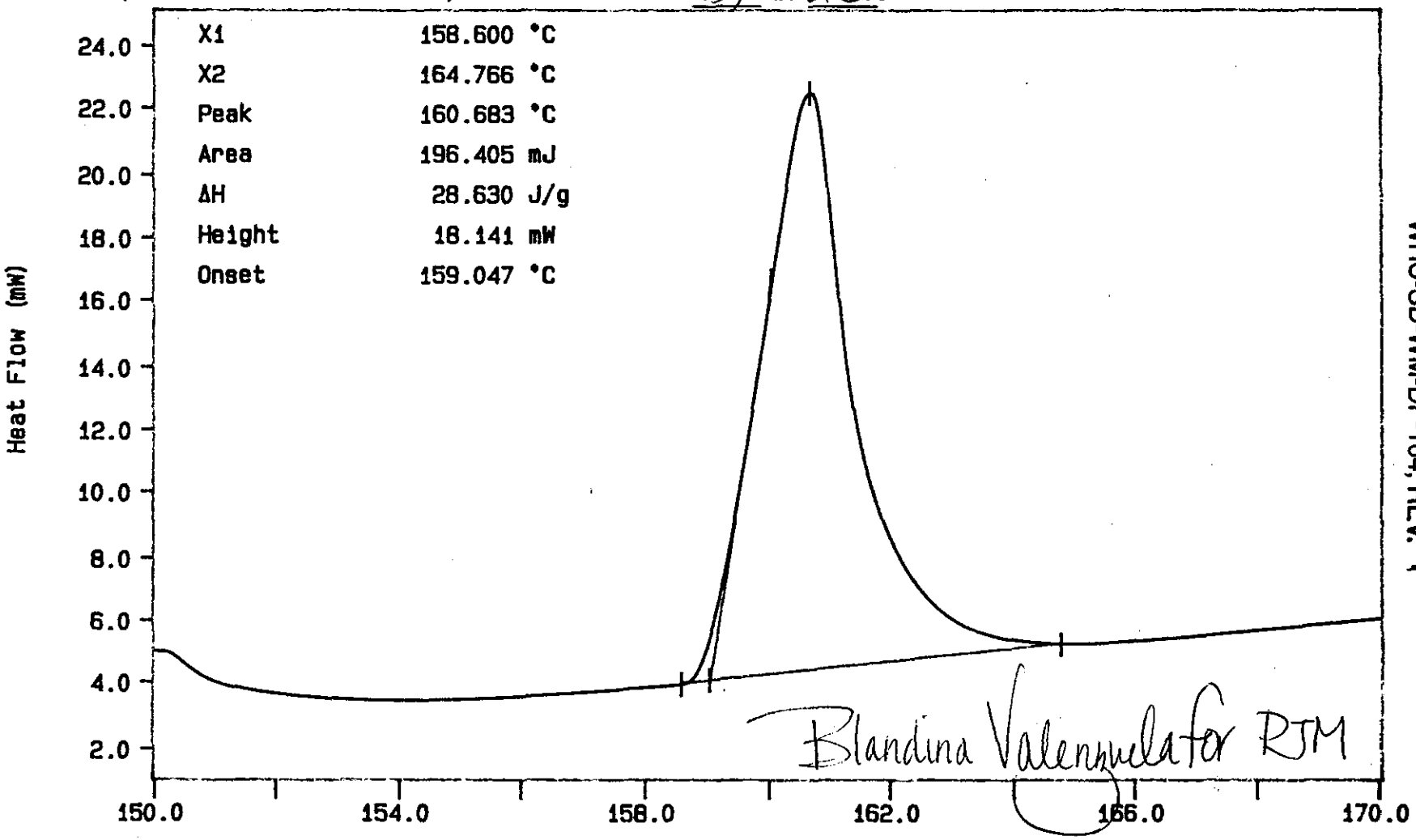
Analyst Signature	Date	Analyst Signature	Date
Susie M. Fulton	11.21.95		
RM McCown	11/25/95		
Anthony Purnton	11-22-95		

Data Entry Comments: Worklist had to be broken down to accomodate the different tanks.

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Curve 1: DSC
File info: IND112404 Fri Nov 24 22:37:54 1995
Sample Weight: 6.860 mg
12N14A Indium at 10C/min

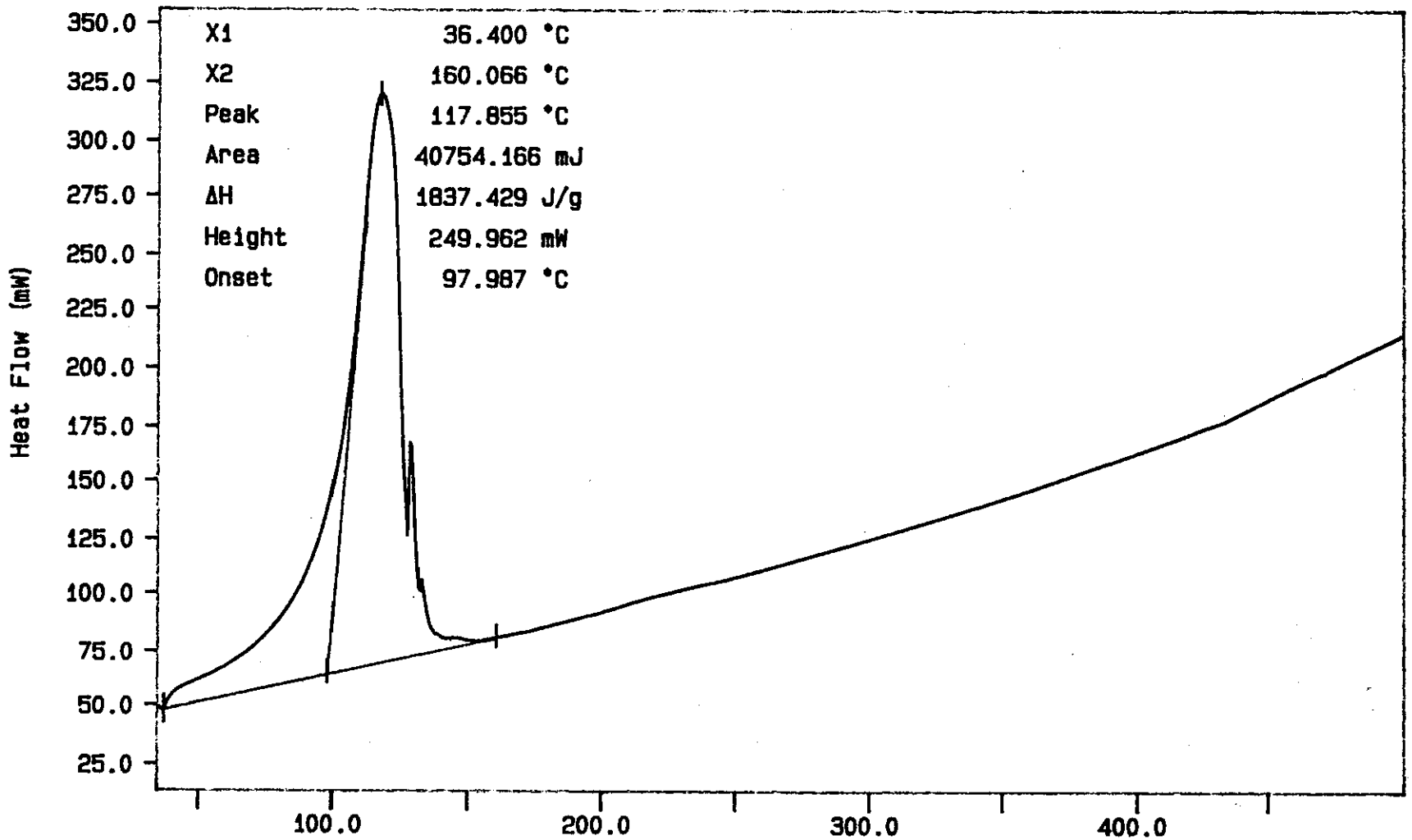
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 254 TO 259.



N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

PJ MCCOWN
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Nov 24 22:38:42 1995

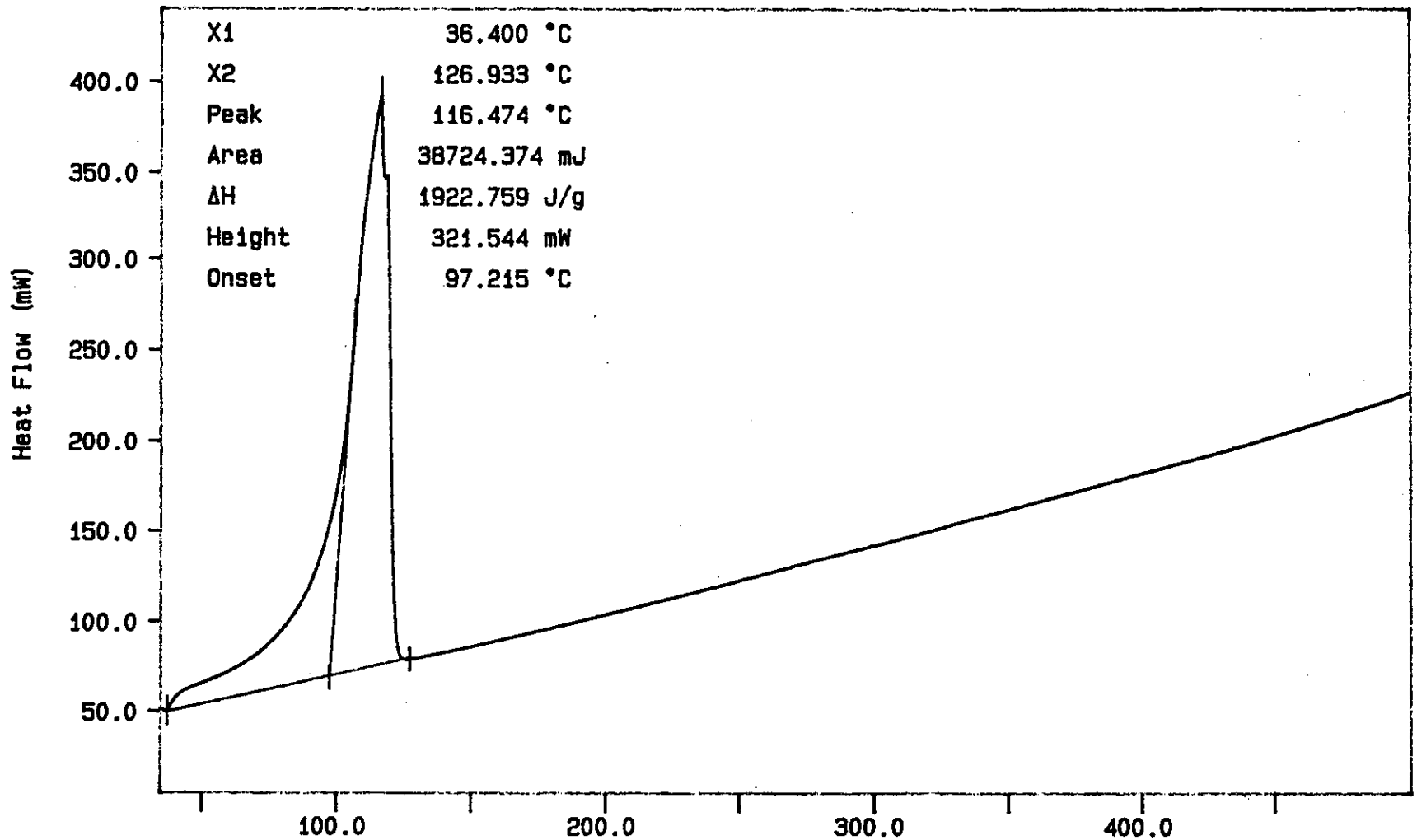
Curve 1: DSC
File info: SAM112501 Sat Nov 25 02:14:18 1995
Sample Weight: 22.180 mg
S95T003713 SAM



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

PJ MCCOWN
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Nov 25 02:14:47 1995

Curve 1: DSC
File info: SAM112502 Sat Nov 25 03:38:53 1995
Sample Weight: 20.140 mg
S95T003713 DUP



exotherm down, N2 purge gas

TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

PJ MCCOWN
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Nov 25 03:39:33 1995

LABCORE Data Entry Template for Worklist# 4112

Analyst: ADP **Instrument:** DSC0 1 **Book #** 12N14B

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID	28.45	28.6	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003642	0		DSC-01	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003642	0		DSC-01	SOLID	Ø	Ø	N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003645	0		DSC-01	SOLID	N/A	219.2		Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003645	0		DSC-01	SOLID	219.2	557.4	N/A	Joules/g
95000180	BY104 ROTARY	6	TRIPL	S95T003645	0		DSC-01	SOLID	219.2	995.7	N/A	Joules/g

Final page for worklist # 4112

See attached for signatures
Analyst Signature **Date** 12/19/95

Verified 12/21/95 JM Fuge

12-20-95
Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 4112

Analyst: ADP **Instrument:** DSC0 _____ **Book #** 12N14B

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003642	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003642	0		DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003645	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003645	0		DSC-01	SOLID			N/A	Joules/g

Final page for worklist # 4112

Anthony Purnitor 12-17-95

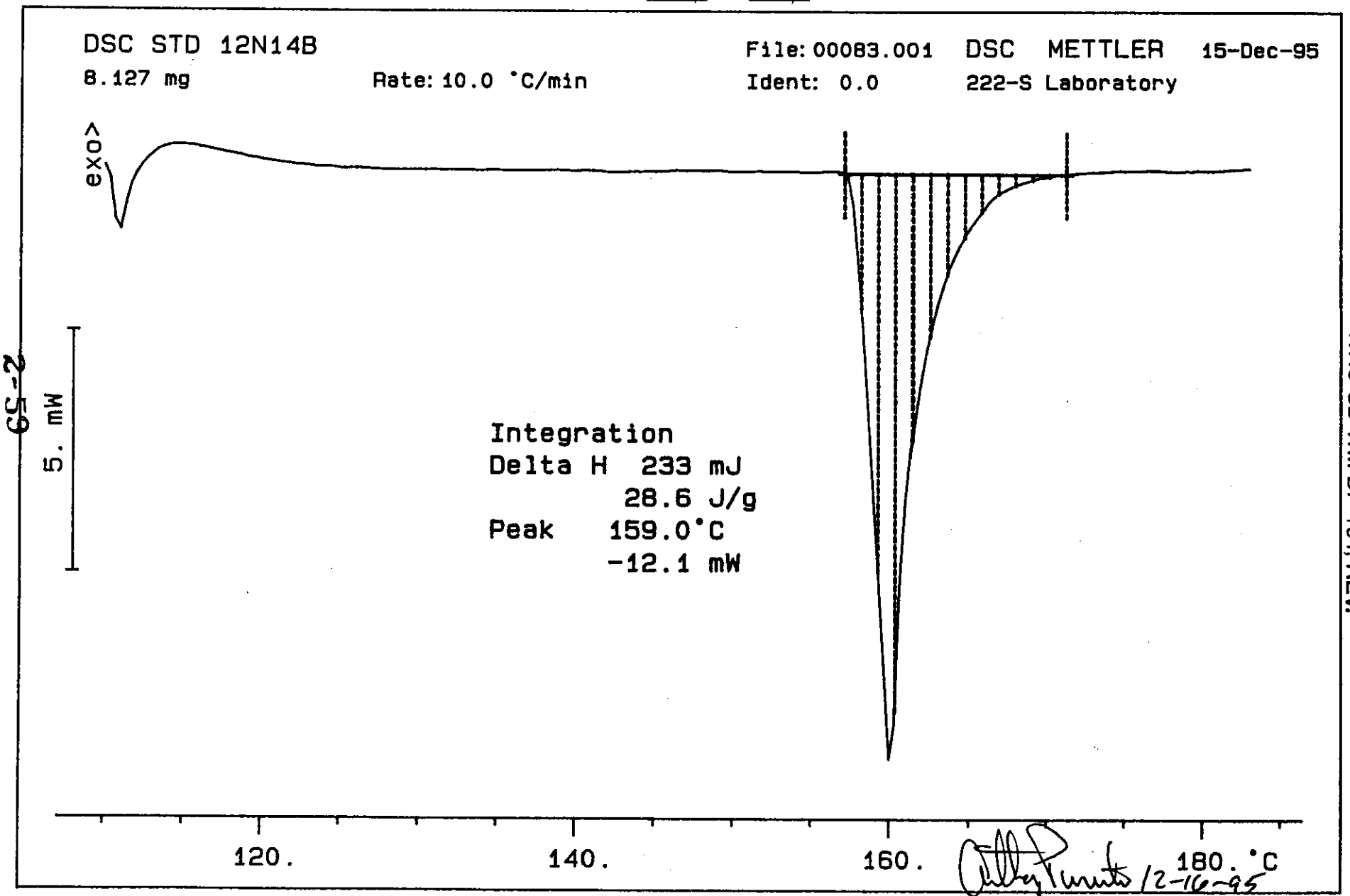
Analyst Signature **Date**

Analyst Signature **Date**

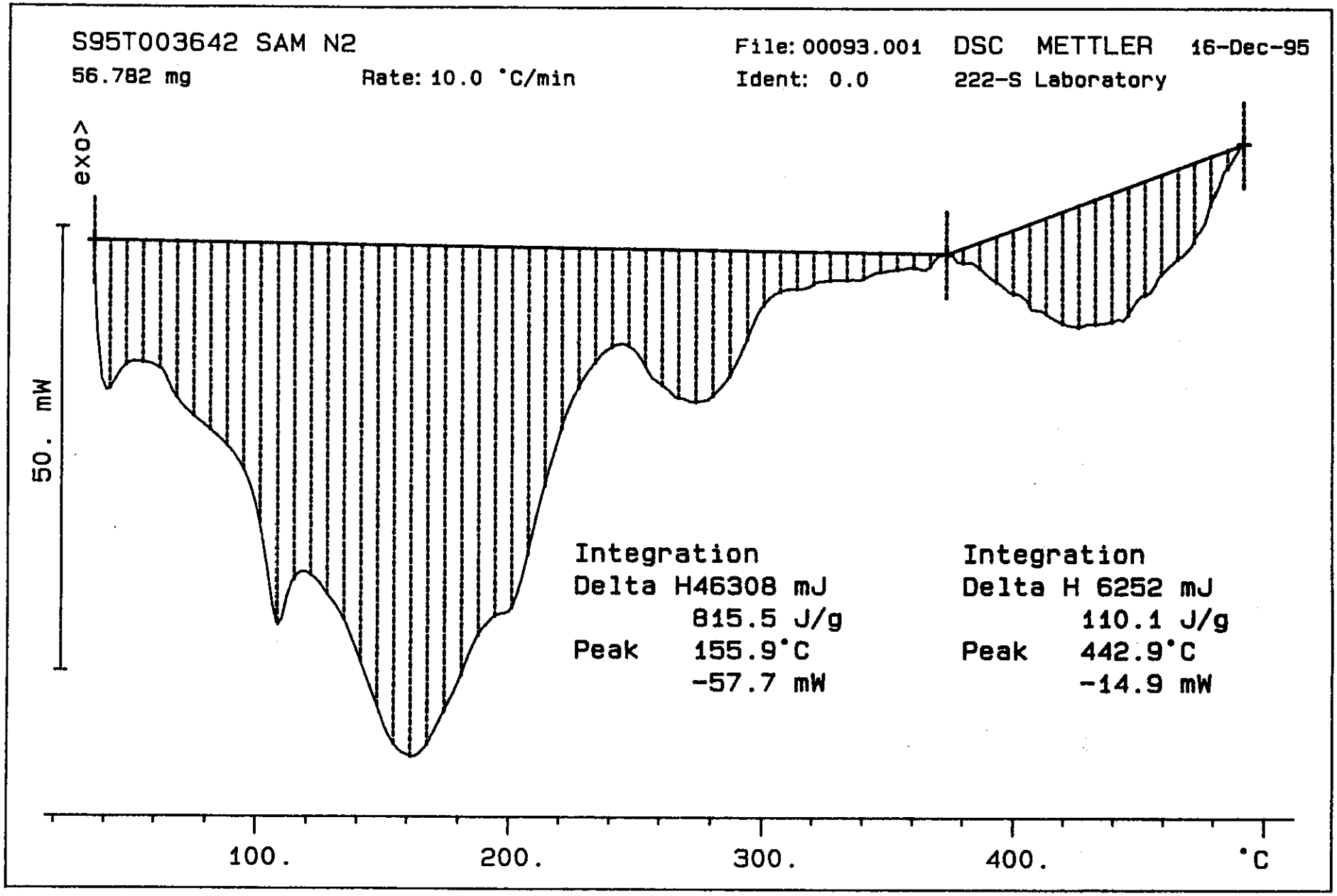
Data Entry Comments:

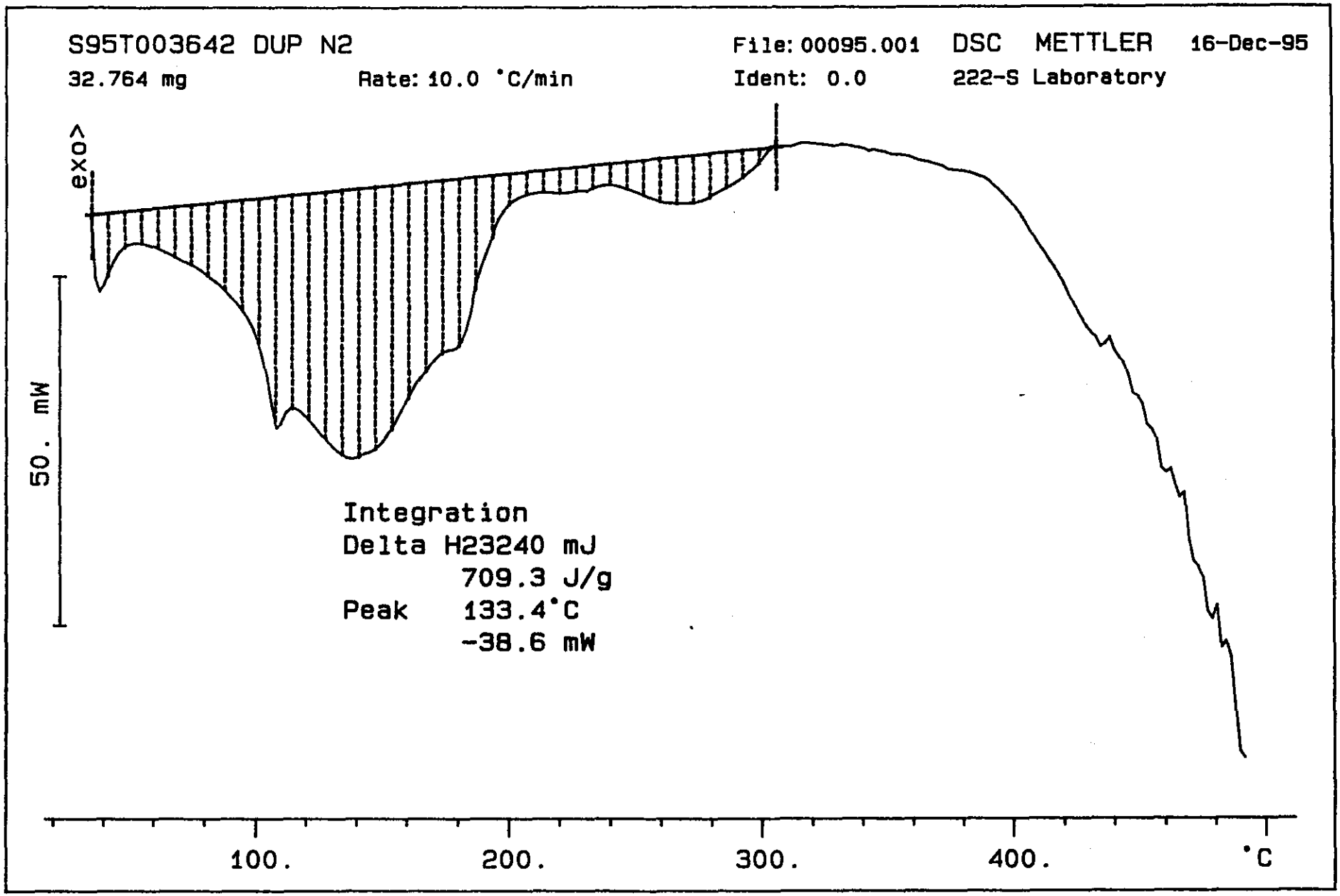
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

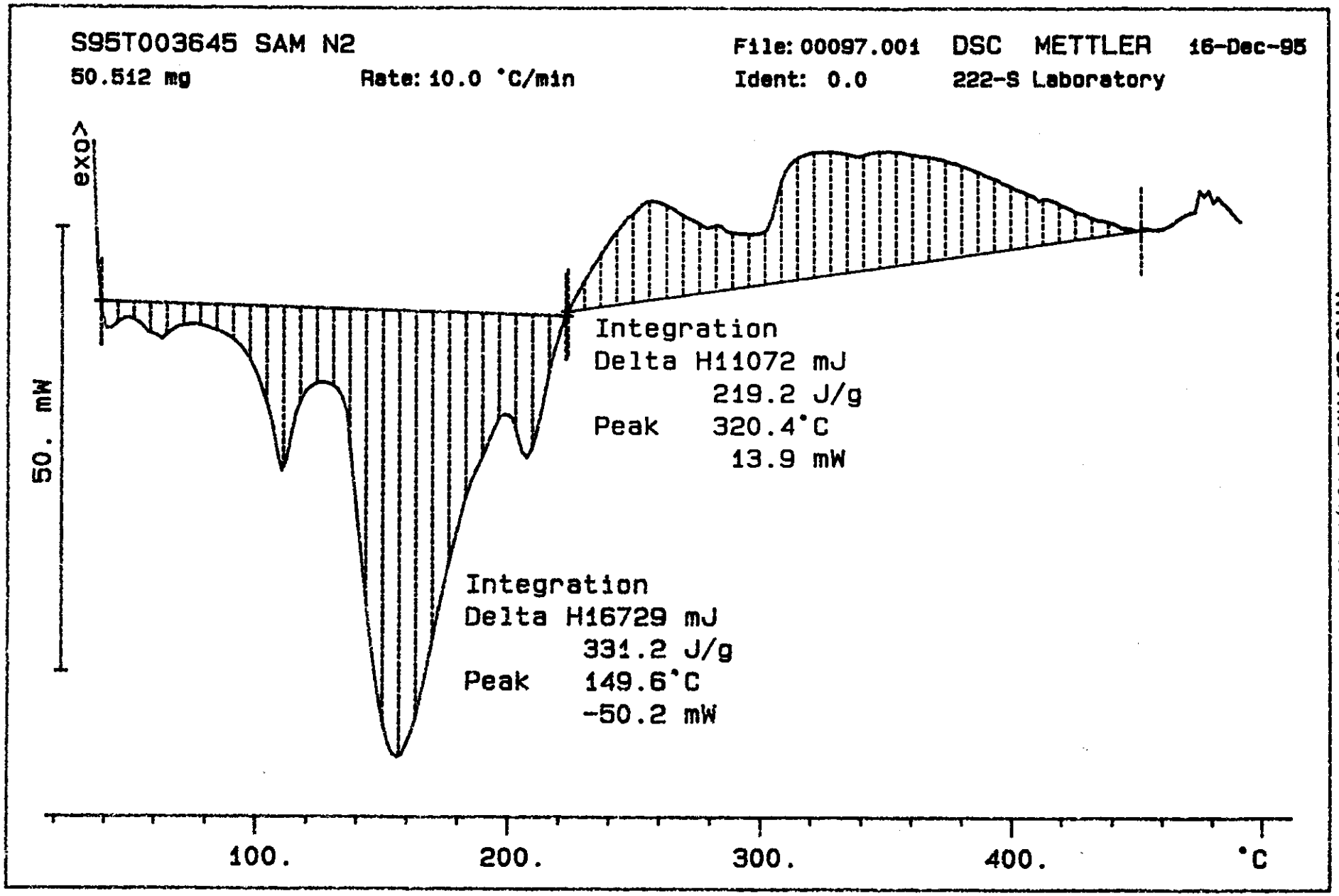
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 2-59 TO 2-64.

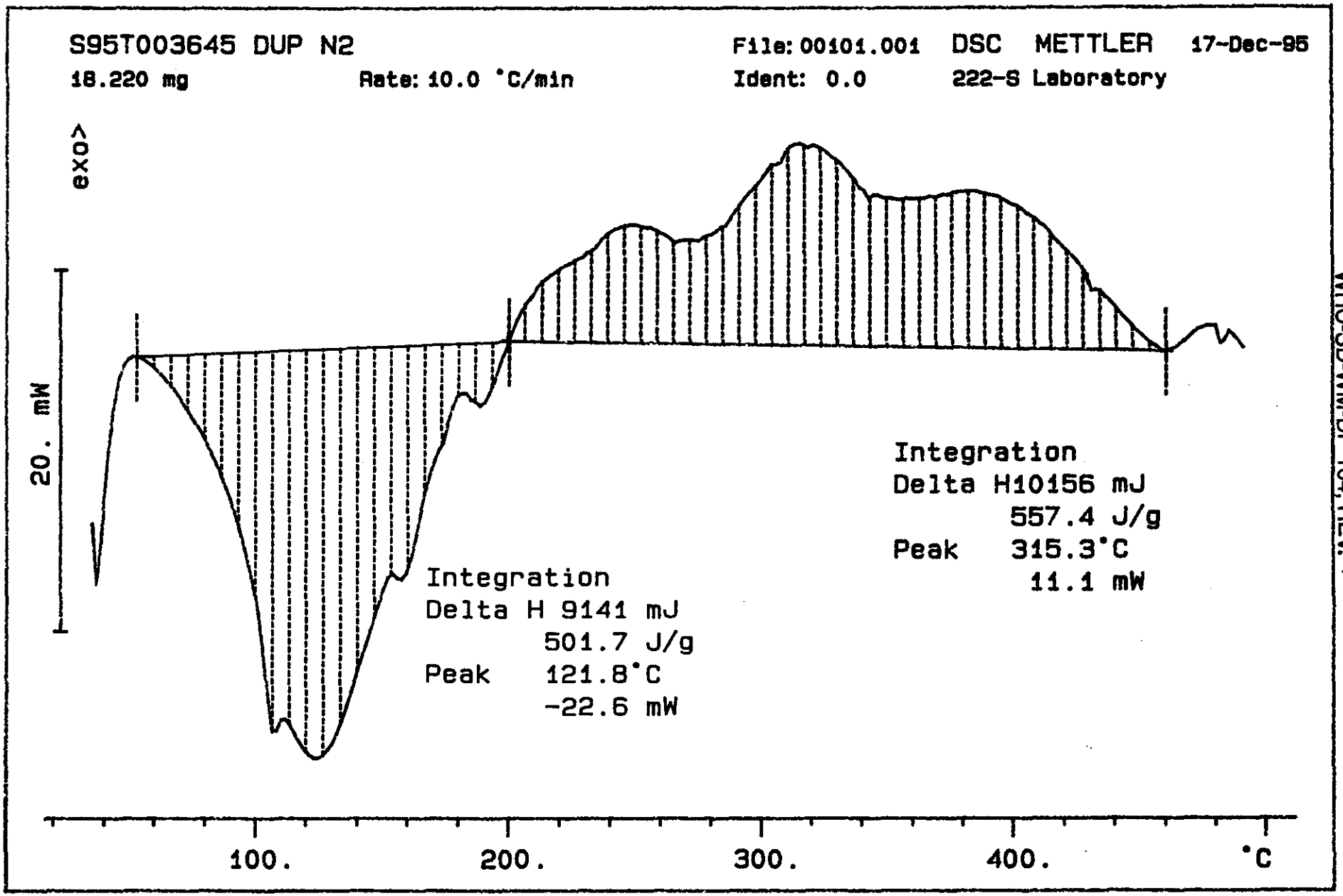


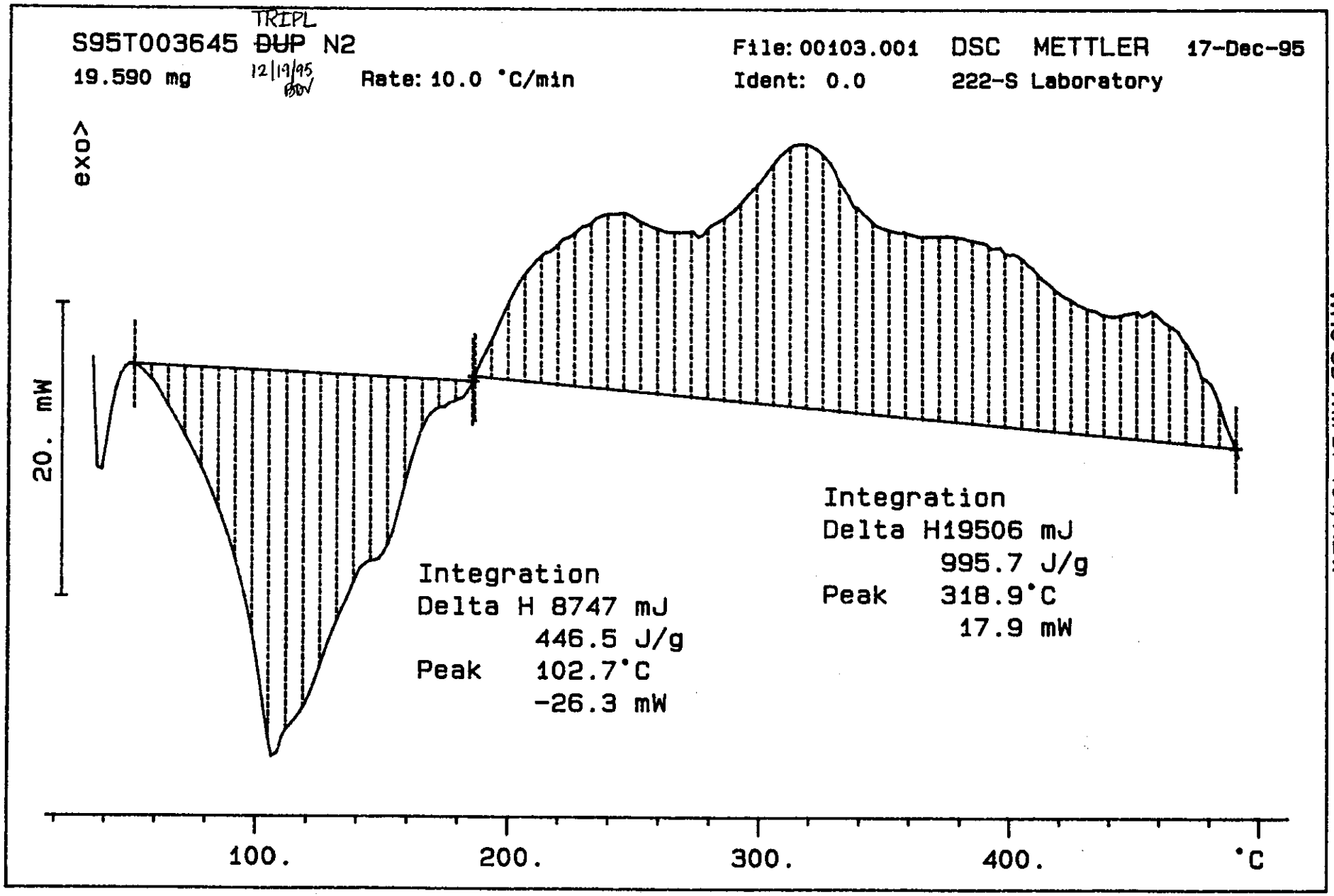
Cathy Pinnts 12-16-95


S95T003642 SAM N2
56.782 mg
Rate: 10.0 °C/min
File: 00093.001
Ident: 0.0
DSC METTLER
222-S Laboratory
16-Dec-95
exo>
50. mW
Integration
Delta H46308 mJ
815.5 J/g
Peak 155.9°C
-57.7 mW
Integration
Delta H 6252 mJ
110.1 J/g
Peak 442.9°C
-14.9 mW
100.
200.
300.
400.
°C


S95T003642 DUP N2
32.764 mg
Rate: 10.0 °C/min
File: 00095.001
Ident: 0.0
DSC METTLER
222-S Laboratory
16-Dec-95
exo>
50. mW
Integration
Delta H23240 mJ
709.3 J/g
Peak 133.4°C
-38.6 mW
100.
200.
300.
400.
°C


S95T003645 SAM N2
50.512 mg
Rate: 10.0 °C/min
File: 00097.001
Ident: 0.0
DSC METTLER
222-S Laboratory
16-Dec-95
<exo
50. mW
Integration
Delta H11072 mJ
219.2 J/g
Peak 320.4°C
13.9 mW
Integration
Delta H16729 mJ
331.2 J/g
Peak 149.6°C
-50.2 mW
100.
200.
300.
400.
°C


S95T003645 DUP N2
18.220 mg
Rate: 10.0 °C/min
File: 00101.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
20. mW
Integration
Delta H 9141 mJ
501.7 J/g
Peak 121.8°C
-22.6 mW
Integration
Delta H10156 mJ
557.4 J/g
Peak 315.3°C
11.1 mW
100.
200.
300.
400.
°C


S95T003645 TRIPL ~~DUP~~ N2
12/19/95
19.590 mg
Rate: 10.0 °C/min
File: 00103.001
DSC METTLER
17-Dec-95
Ident: 0.0
222-S Laboratory
exo>
20. mW
Integration
Delta H 8747 mJ
446.5 J/g
Peak 102.7°C
-26.3 mW
Integration
Delta H19506 mJ
995.7 J/g
Peak 318.9°C
17.9 mW
100.
200.
300.
400.
°C

LABCORE Data Entry Template for Worklist# 4113

Analyst: ADP **Instrument:** DSC0 3 **Book #** 12-N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-03	SOLID	28.45	28.22	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003644	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003644	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g
		4	STD				DSC-01	SOLID	28.45	27.8	N/A	Joules/g
95000180	BY104 ROTARY	5	SAMPLE	S95T003647	0		DSC-01	SOLID	N/A	360.2		Joules/g
95000180	BY104 ROTARY	6	DUP	S95T003647	0		DSC-01	SOLID	360.2	324.9	N/A	Joules/g

Final page for worklist # 4113

See attached for signatures
Analyst Signature **Date** 1/2/96
Verified by Blandina Valenzuela 1-8-96

[illegible] 1-4-96
Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 4113

Analyst: ADP **Instrument:** DSC0 _____ **Book #** ~~12N14A~~ 1/2/96 BDV

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003644	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003644	0		DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003647	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003647	0		DSC-01	SOLID			N/A	Joules/g

Final page for worklist # 4113

Anthony Pierantoni
Analyst Signature **Date**

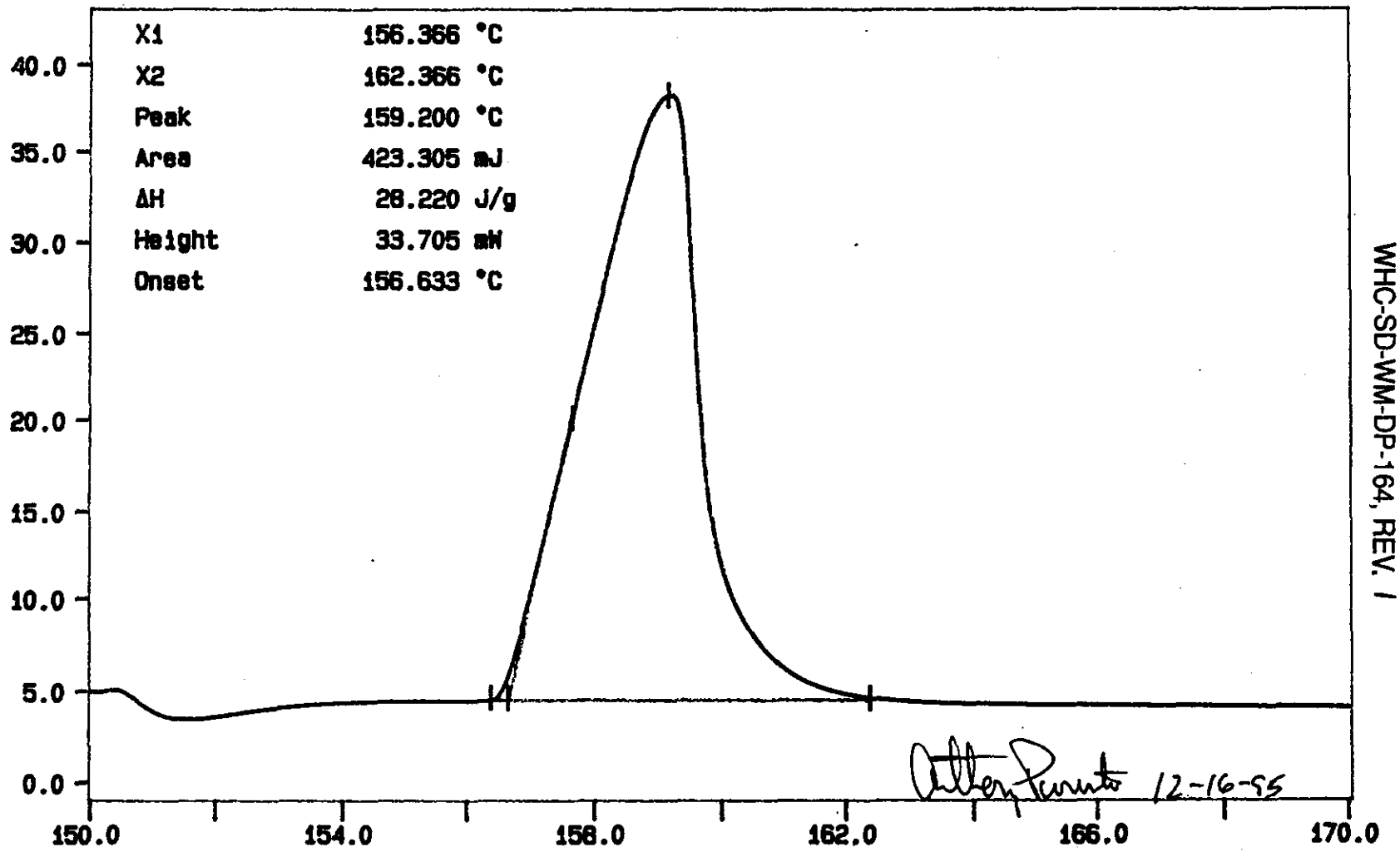
Analyst Signature **Date**

JK Spu 12-27-95

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

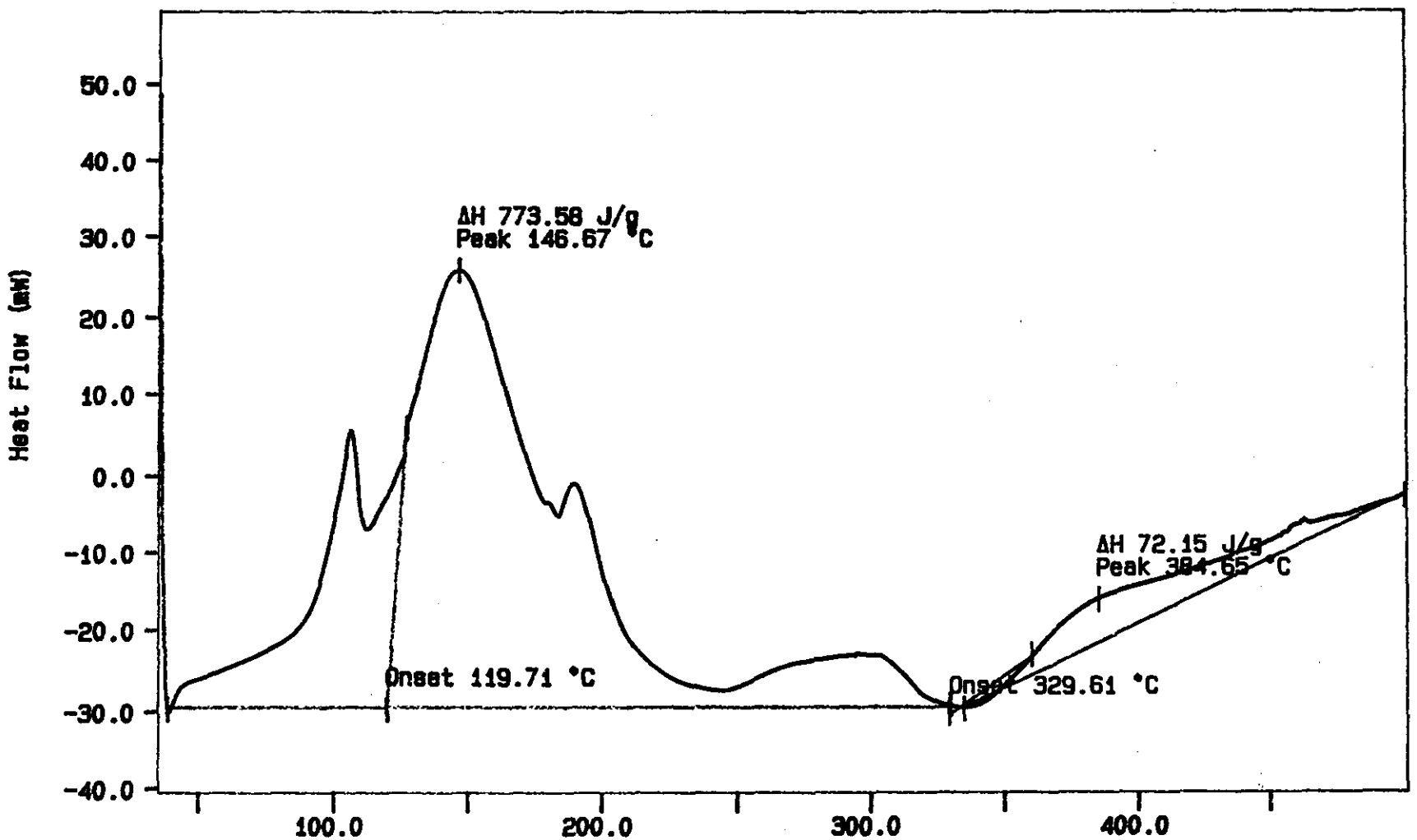
Curve 1: DSC
File info: IND121503 Fri Dec 15 23:22:35 1995
Sample Weight: 15.000 mg
1/3/96 ~~12N14A~~ Indium at 10C/min
12N14B SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 267 TO 272



N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Dec 16 01:24:50 1995

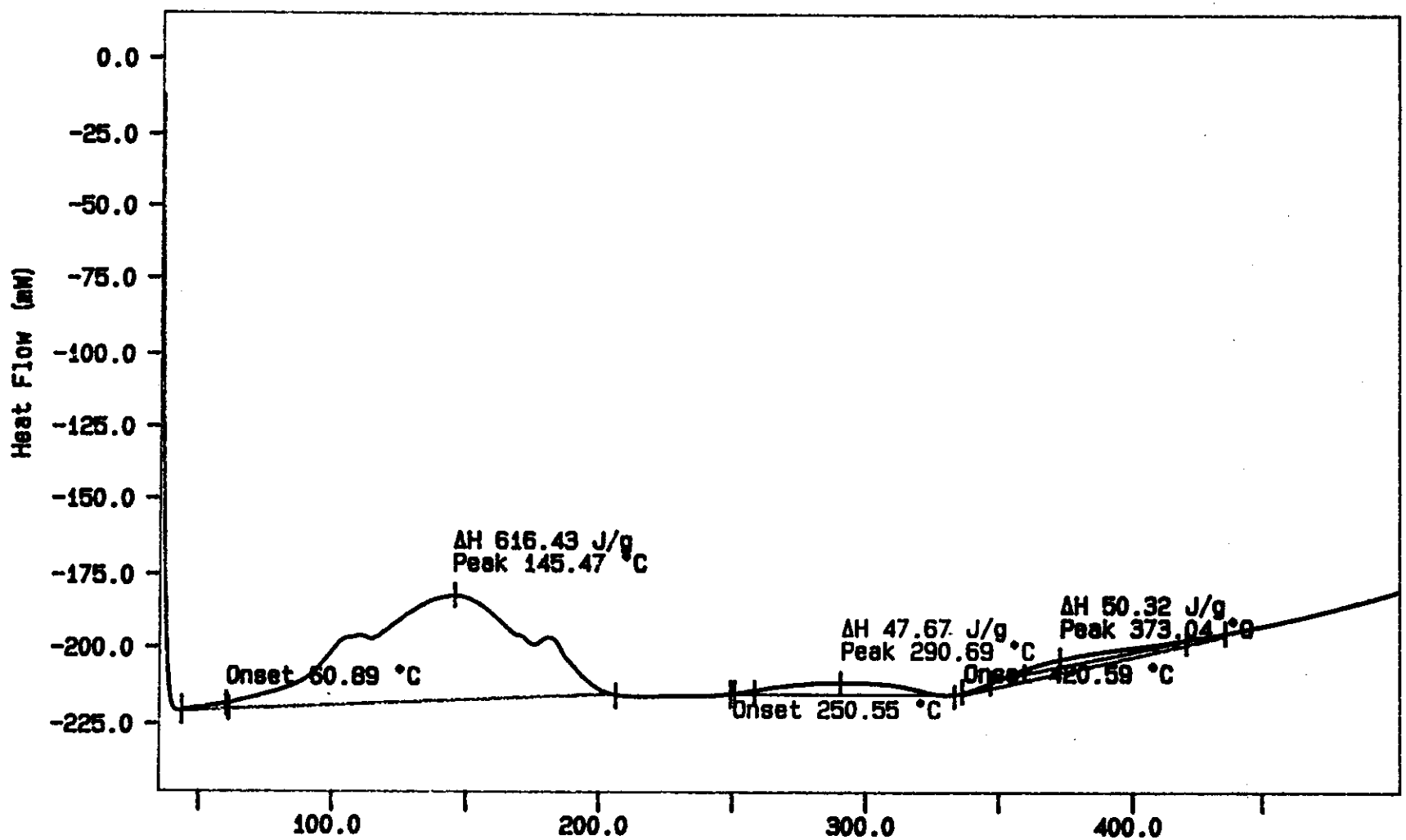
Curve 1: DSC
File info: SAM121601 Sat Dec 16 03:13:49 1995
Sample Weight: 36.210 mg
S95T003644 SAM N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

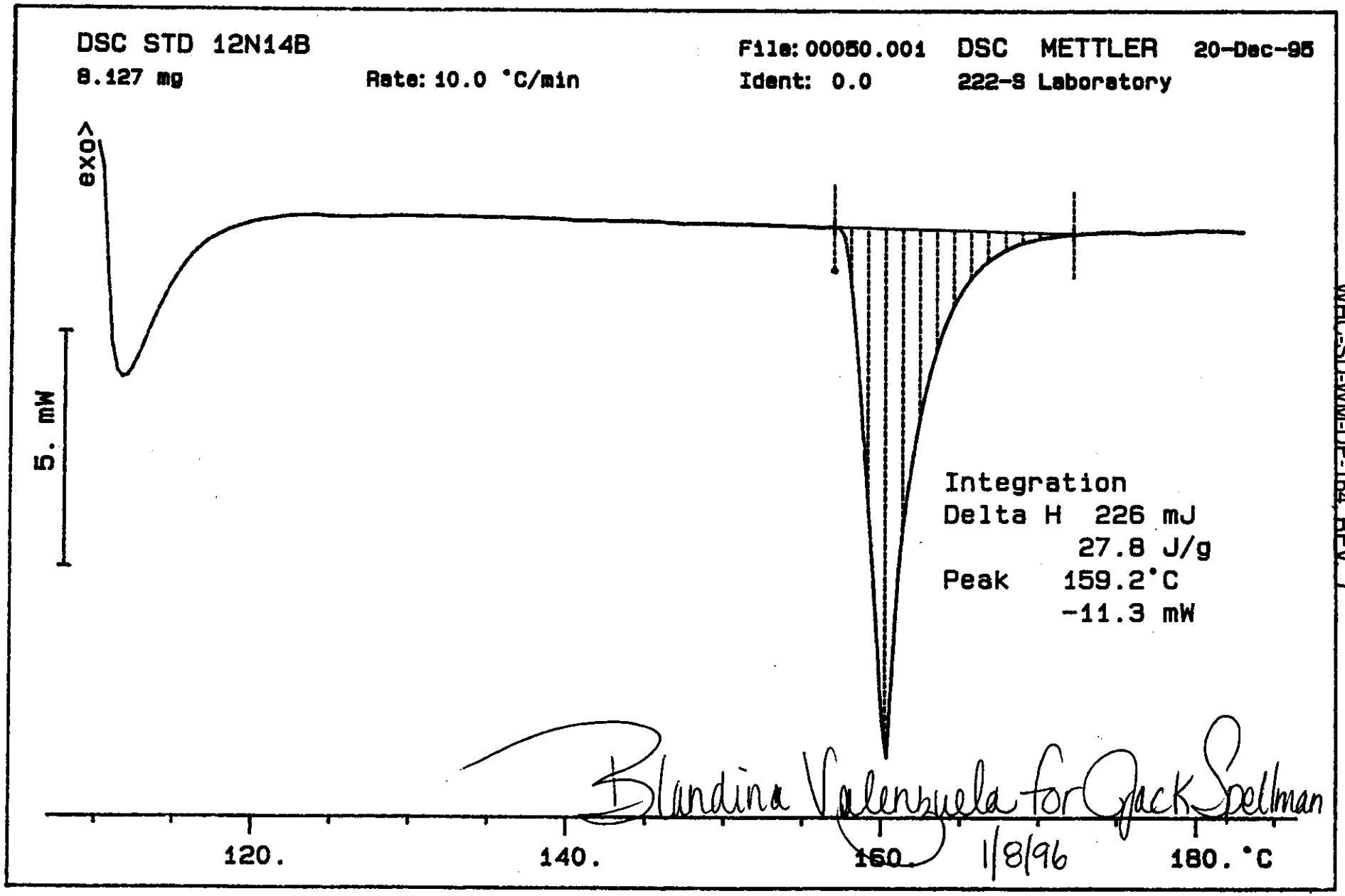
AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Dec 16 03:17:33 1995

Curve 1: DSC
File info: SAM121602 Sat Dec 16 04:14:24 1995
Sample Weight: 26.160 mg
S95T003644 DUP N2

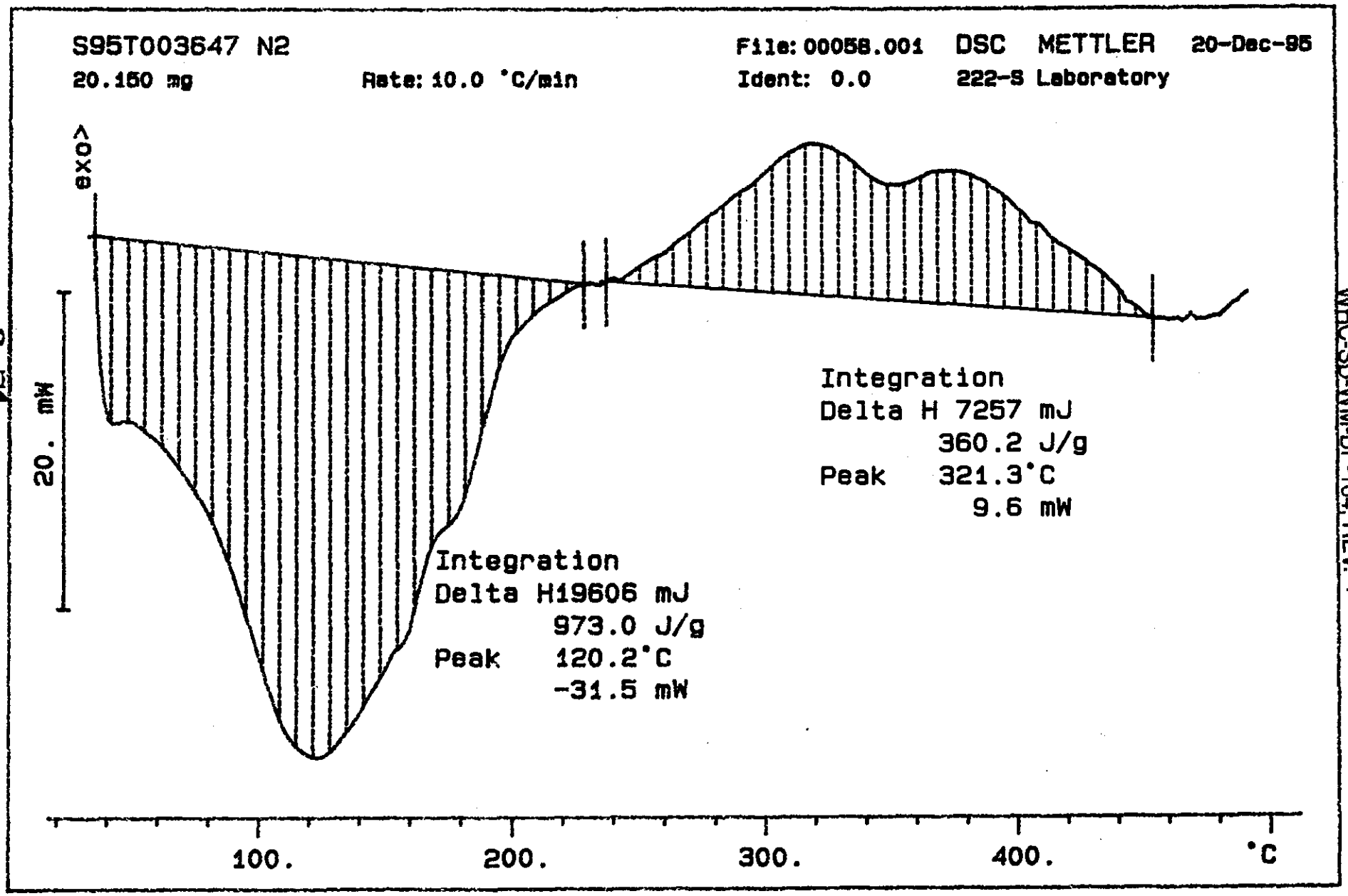


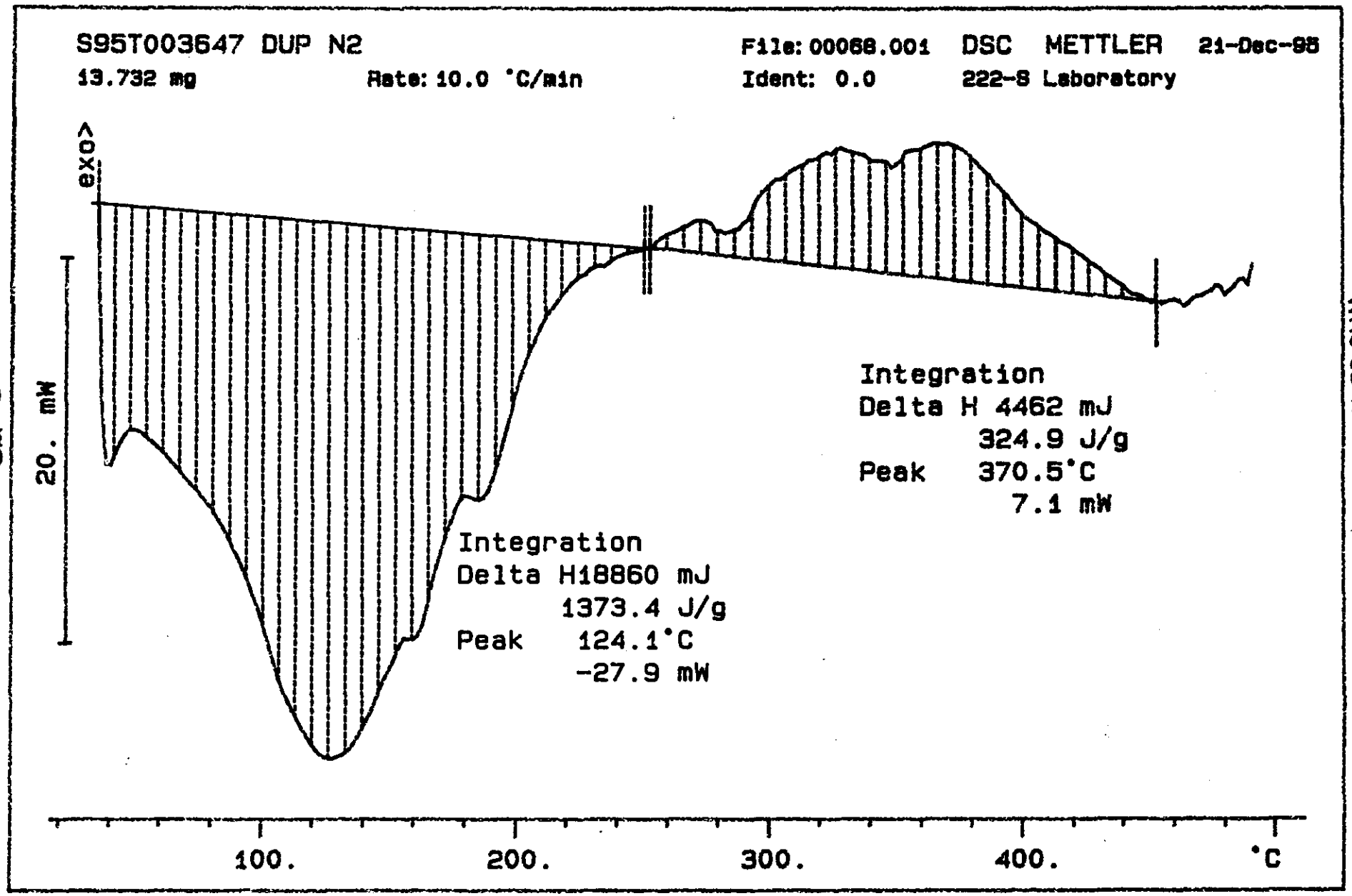
exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Dec 16 04:37:25 1995



Blandina Valenzuela for Jack Spellman 1/8/96


S95T003647 N2
20.150 mg
Rate: 10.0 °C/min
File: 00058.001
Ident: 0.0
DSC METTLER
222-S Laboratory
20-Dec-95
<exo
20. mW
Integration
Delta H 7257 mJ
360.2 J/g
Peak 321.3°C
9.6 mW
Integration
Delta H19606 mJ
973.0 J/g
Peak 120.2°C
-31.5 mW
100.
200.
300.
400.
°C


S95T003647 DUP N2
13.732 mg
Rate: 10.0 °C/min
File: 00068.001
Ident: 0.0
DSC METTLER
222-S Laboratory
21-Dec-95
<exo
20. mW
Integration
Delta H 4462 mJ
324.9 J/g
Peak 370.5°C
7.1 mW
Integration
Delta H18860 mJ
1373.4 J/g
Peak 124.1°C
-27.9 mW
100.
200.
300.
400.
°C

LABCORE Data Entry Template for Worklist# 4114

Analyst: ADP **Instrument:** DSC0 3 **Book #** 12N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-03	SOLID	28.45	28.26*	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003643	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003643	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003646	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003646	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g

Final page for worklist # 4114

See attached for signatures
Analyst Signature Date
12/19/95 BDV

Analyst Signature Date 12-20-95

Verified 12/21/95 JMFrye

S95T003643 produced two endotherms one at 153.03°C with a ΔH of 532.18J/g and second at 296.29°C with a delta H of 34.73J/g.

Data Entry Comments: S95T003646 produced two endotherms one at 159.2°C with a delta H of 450.39J/g and second at 278.54°C with a delta H of 32.88J/g

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 4114

Analyst: ADP **Instrument:** DSC0 _____ **Book #** ~~12N14A~~ 12/14/95 BDV

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003643	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003643	0		DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003646	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003646	0		DSC-01	SOLID			N/A	Joules/g

Final page for worklist # 4114

Anthony Purnatis

Analyst Signature **Date**

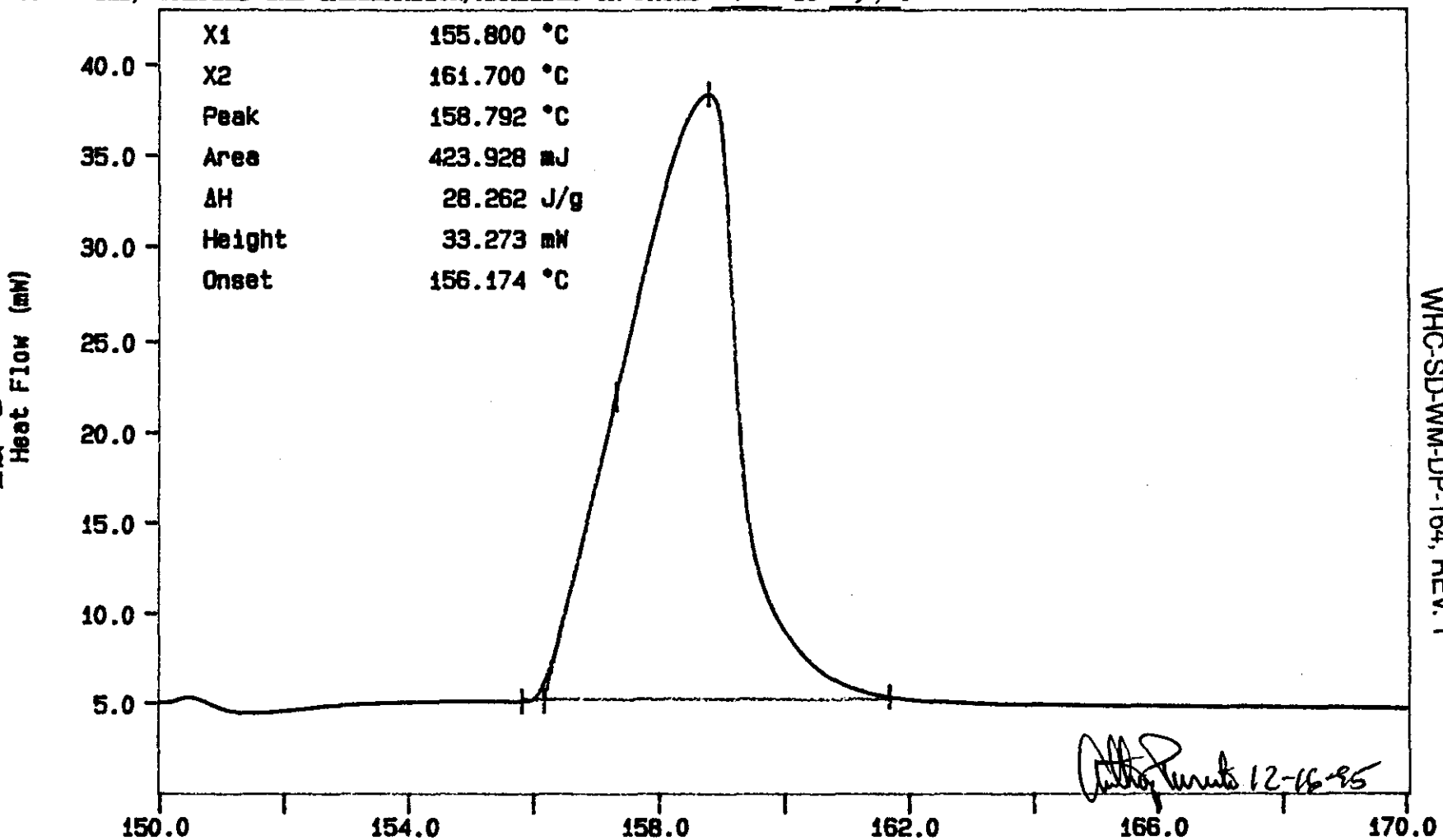
Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Curve 1: DSC
File info: IND121602 Sat Dec 16 19:59:11 1995
Sample Weight: 15.000 mg
12N14A Indium at 10C/min

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 2-75 TO 2-79.

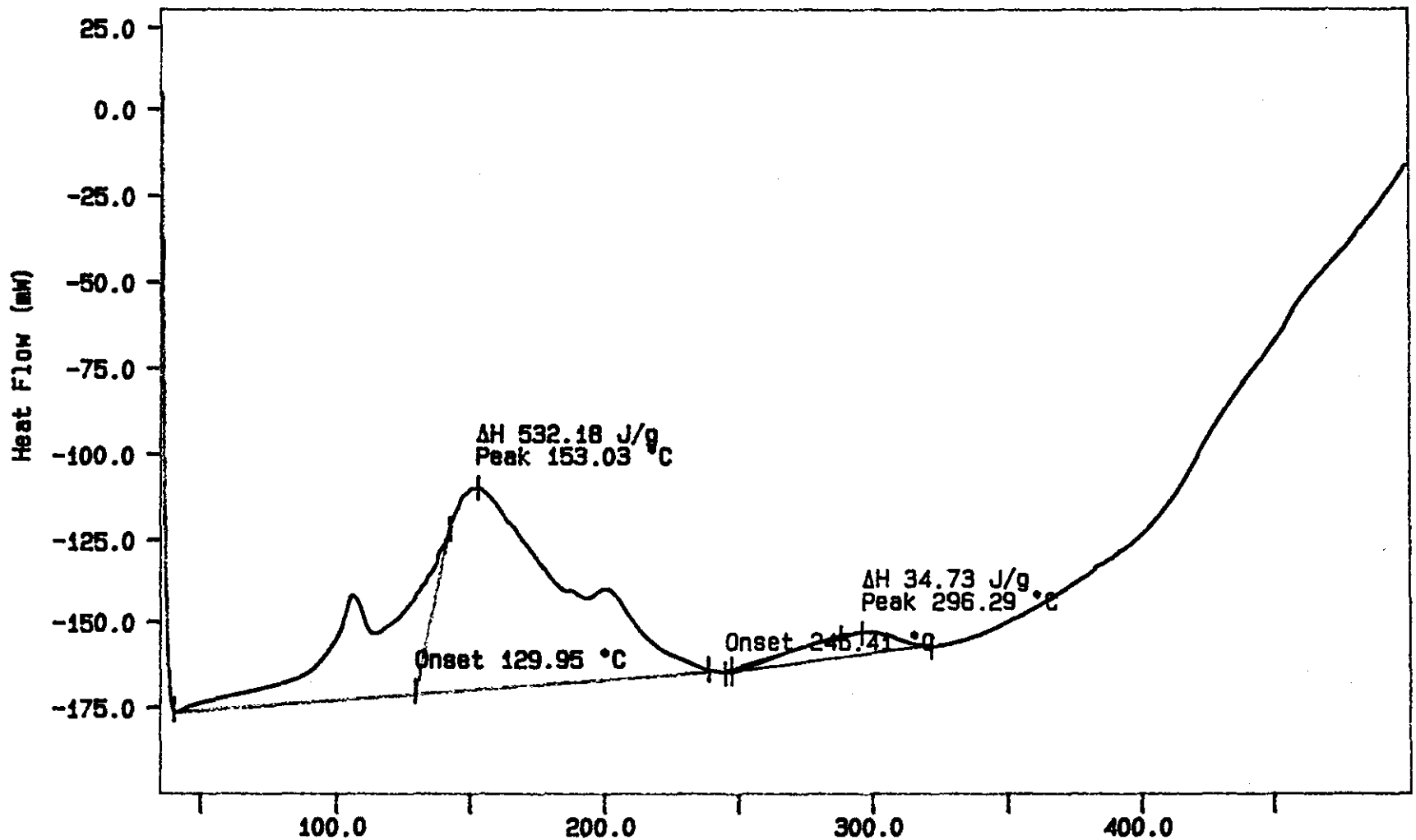


Anthony Purinto 12-16-95

N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Dec 16 20:02:10 1995

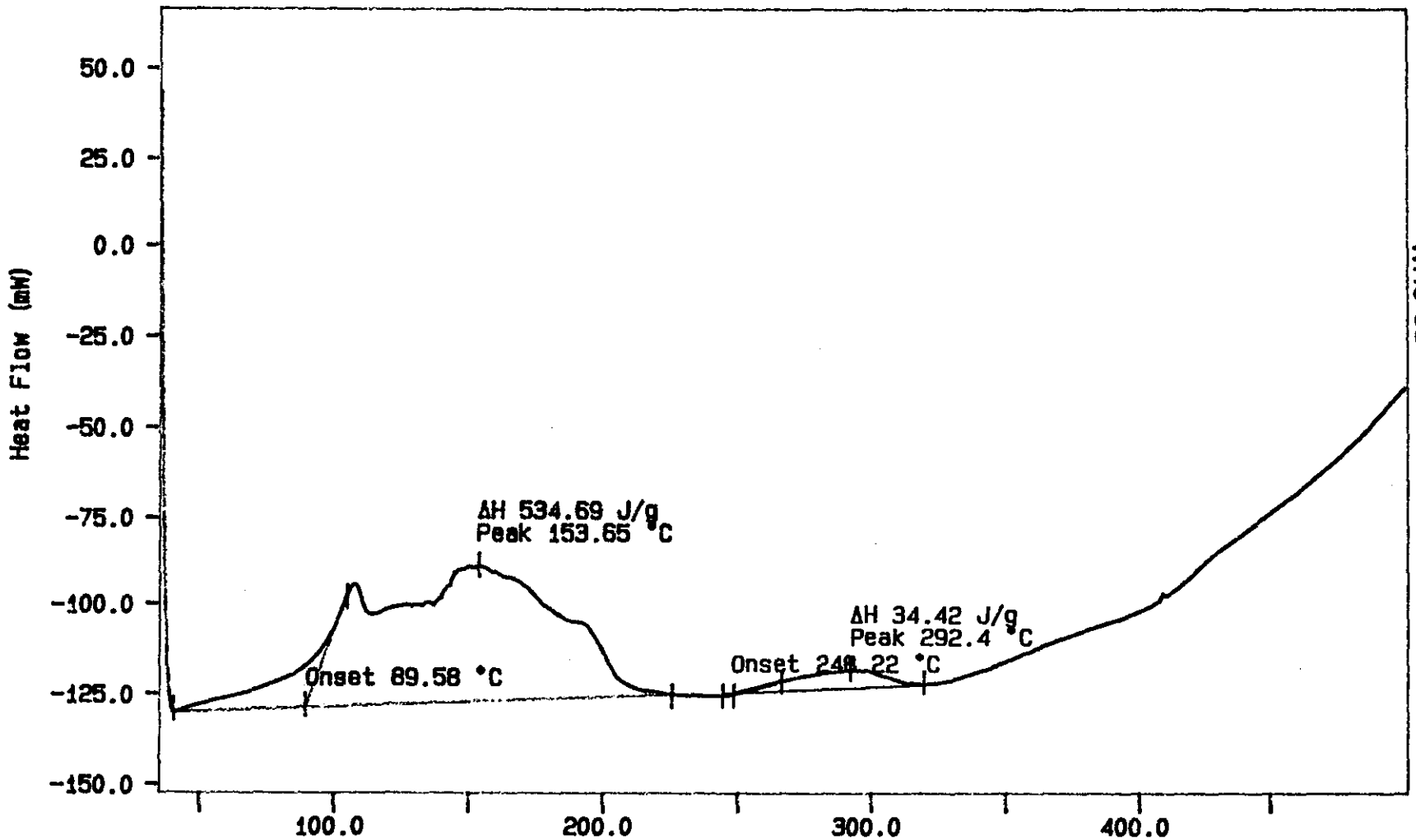
Curve 1: DSC
File info: SAM121603 Sun Dec 17 00:03:08 1995
Sample Weight: 47.630 mg
S95T003643 SAM N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 00:54:34 1995

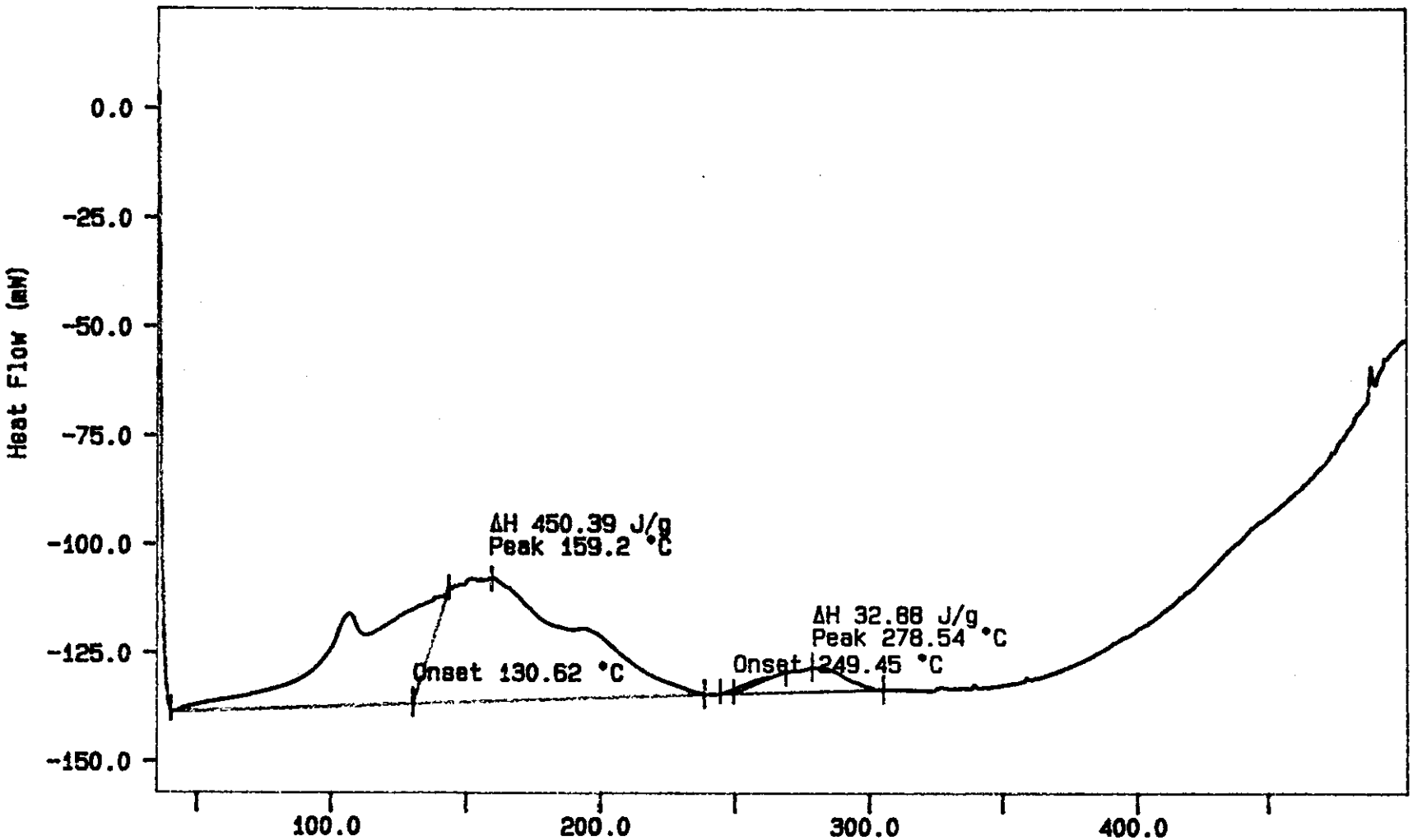
Curve 1: DSC
File info: SAM121604 Sun Dec 17 01:56:06 1995
Sample Weight: 37.710 mg
S95T003643 DUP N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 02:29:12 1995

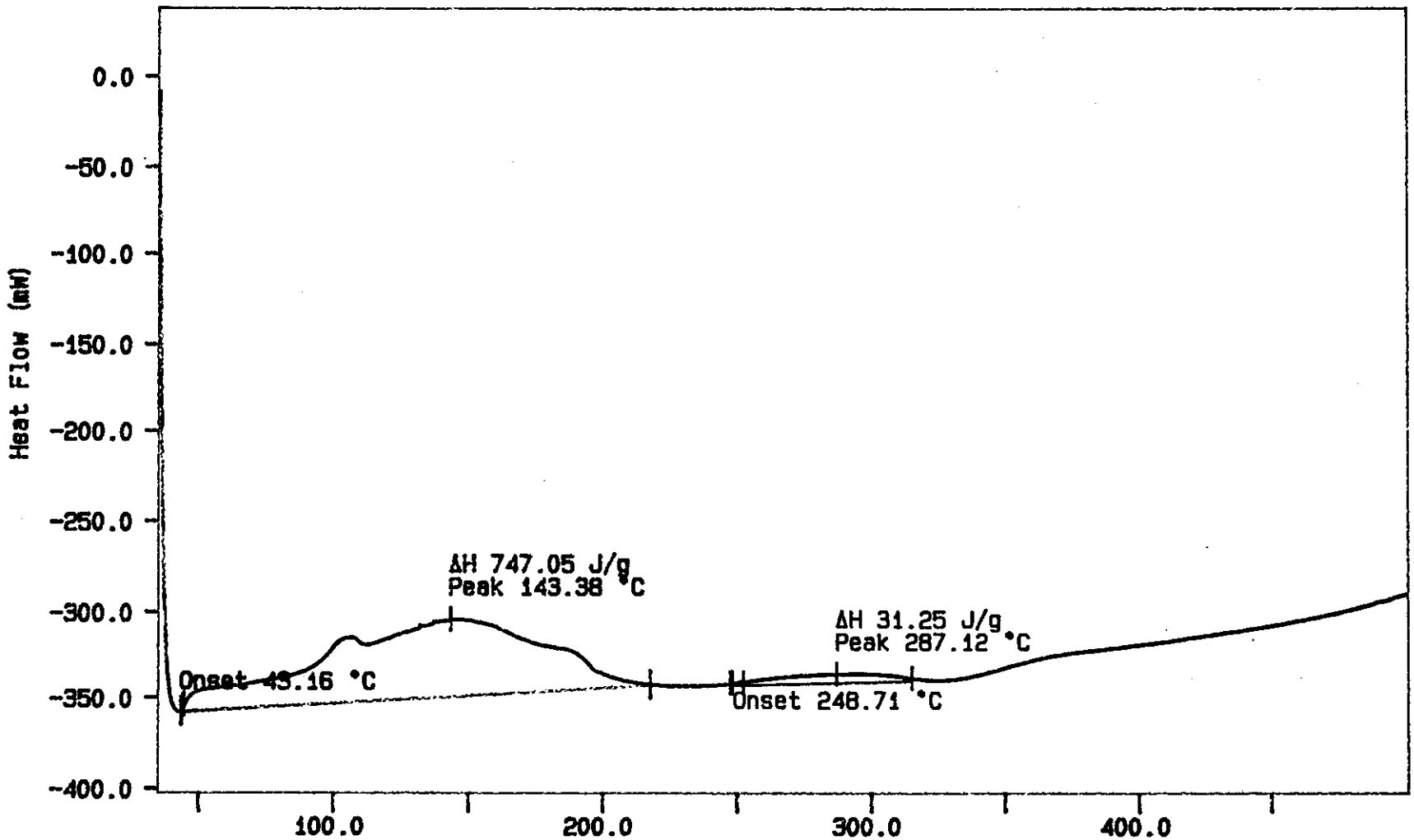
Curve 1: DSC
File info: 121605 Sun Dec 17 03:31:20 1995
Sample Weight: 34.000 mg
S95T003646 SAM N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 03:33:16 1995

Curve 1: DSC
File info: SAM121606 Sun Dec 17 04:24:40 1995
Sample Weight: 33.750 mg
S95T003646 DUP N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 04:58:20 1995

LABCORE Data Entry Template for Worklist# 4115

Analyst: SMF **Instrument:** DSC0 1 **Book #** 12N14B

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID	28.45	29.2	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003638	0		DSC-01	SOLID	N/A	202.8		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003638	0		DSC-01	SOLID	202.8	273.3	N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003640	0		DSC-01	SOLID	N/A	282.7		Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003640	0		DSC-01	SOLID	282.7	224.8	N/A	Joules/g

Final page for worklist # 4115

Susie M. Fulton 12-17-95
Analyst Signature **Date**

R. Jones 12-19-95
Analyst Signature **Date**

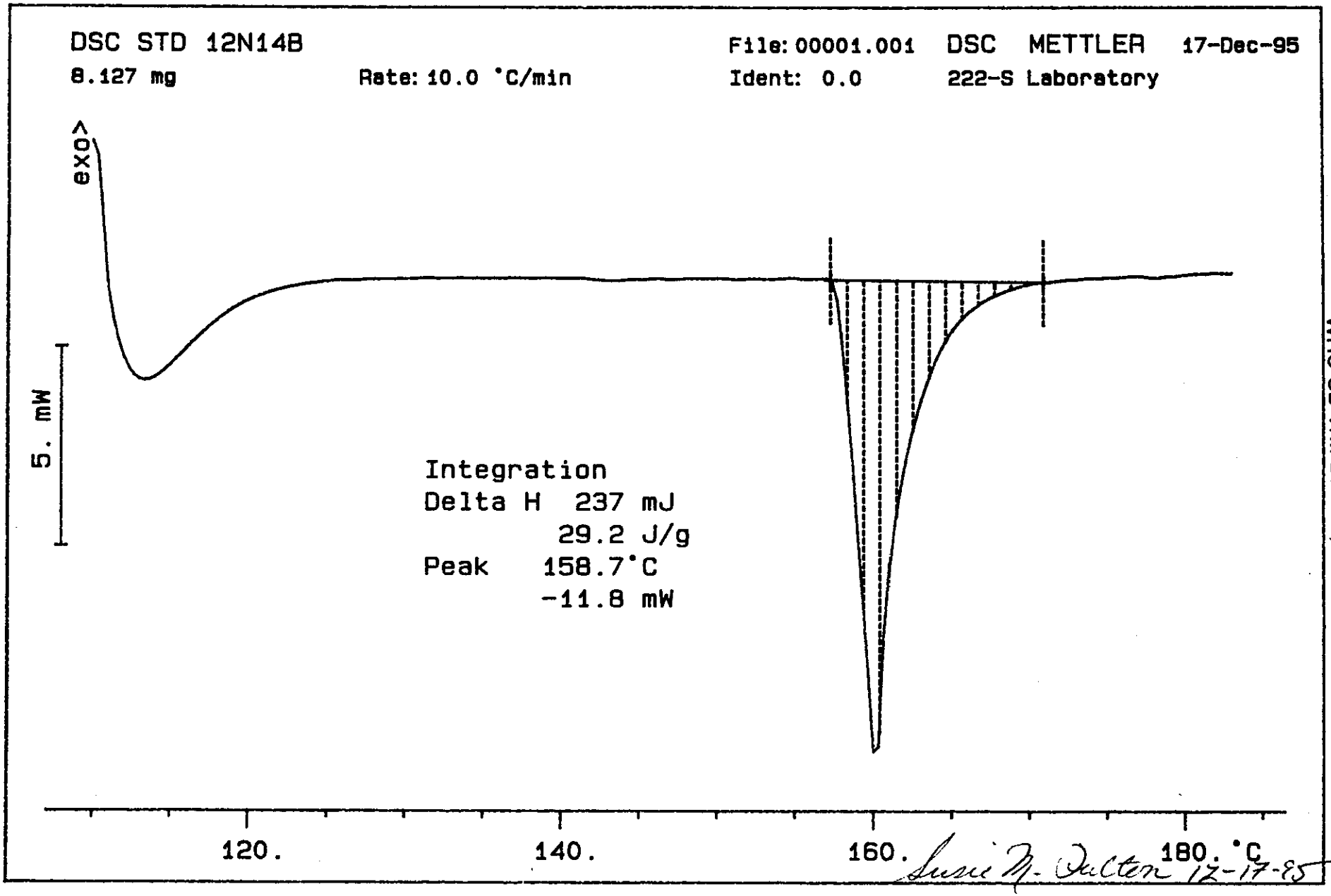
Verified 12/21/95 J. M. Luze

S95T003638 produced an endotherm at 151.4°C with a delta H of 702.9J/g.

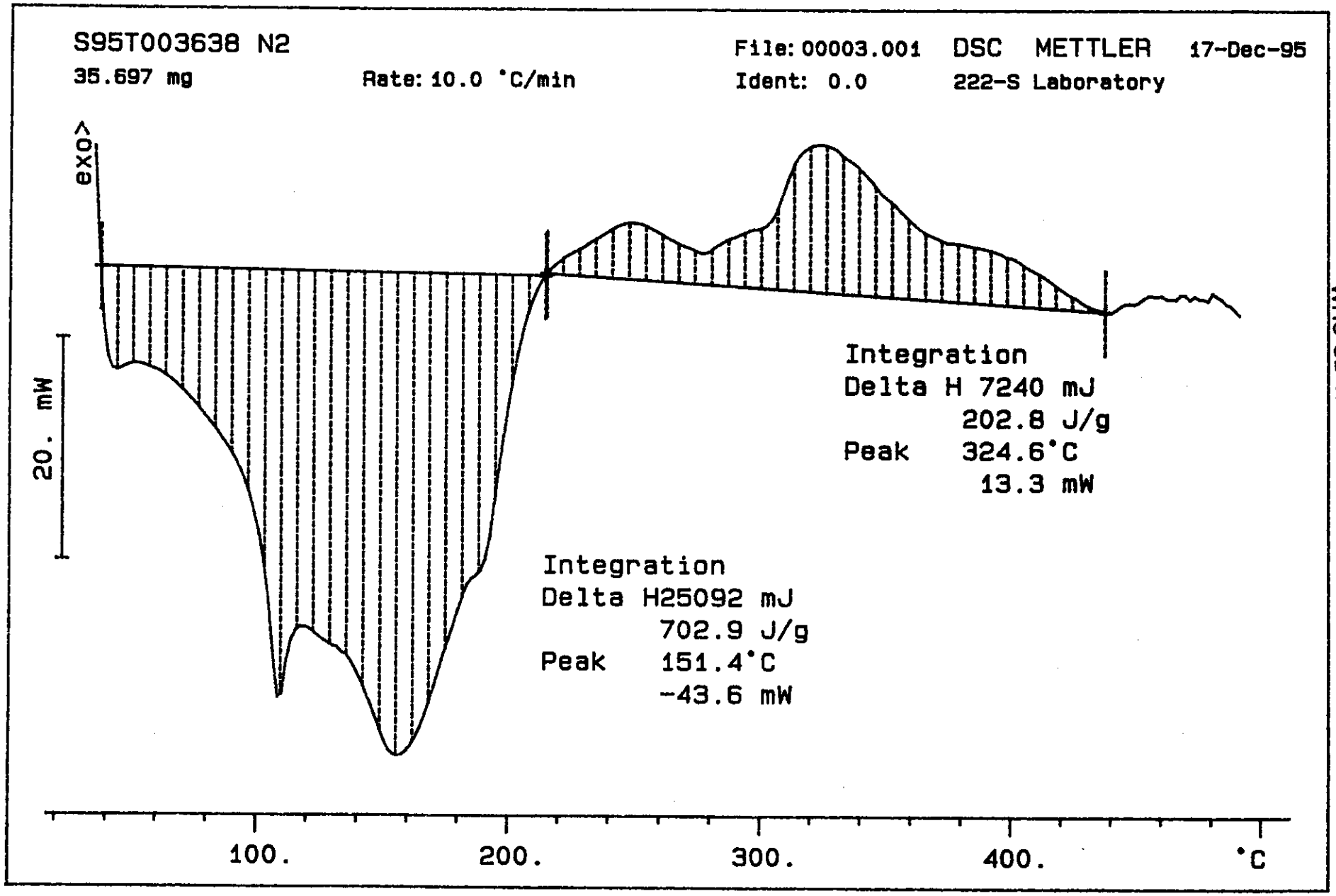
Data Entry Comments: S95T003640 produced an endotherm at 152.8°C with a delta H of 546.7J/g

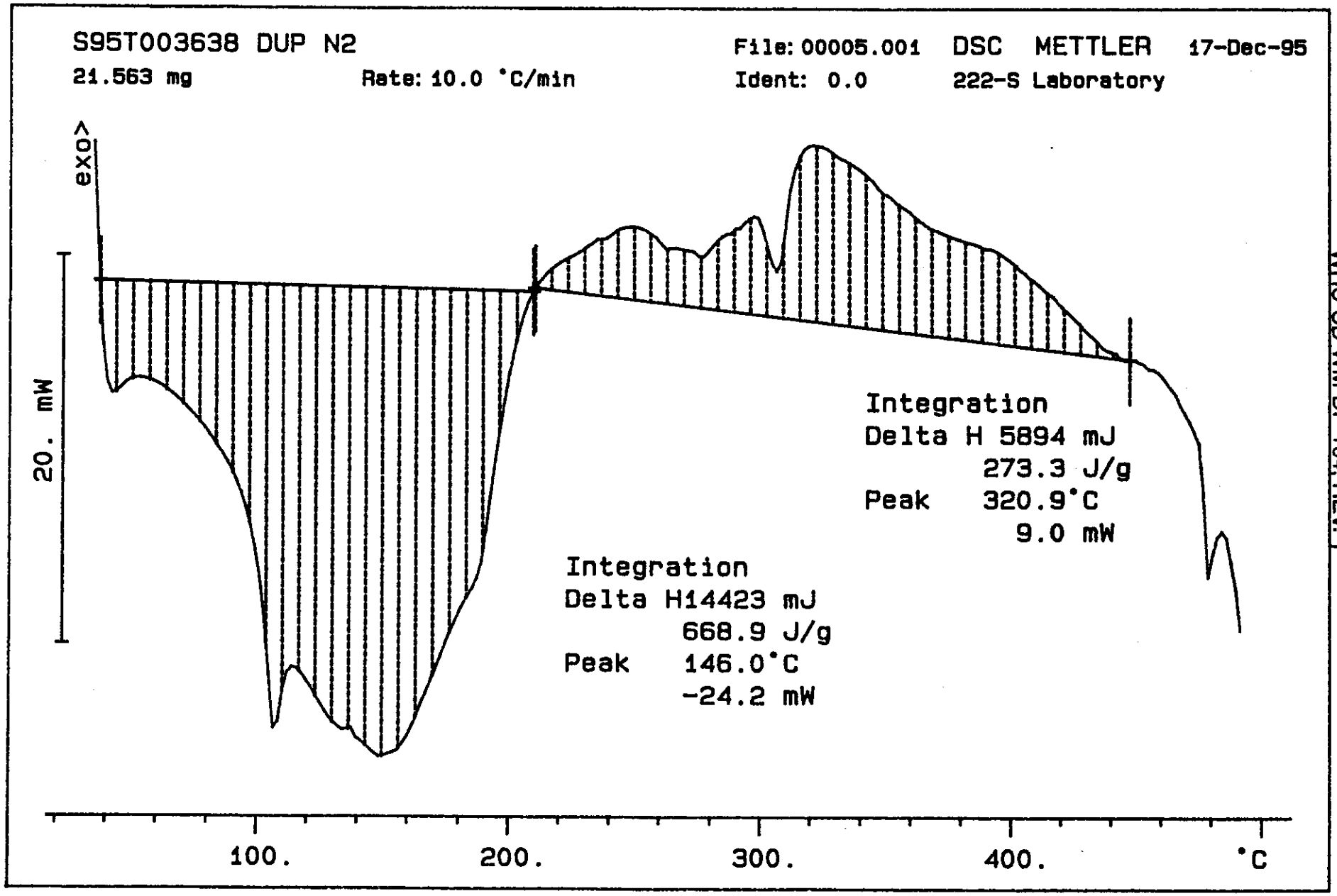
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

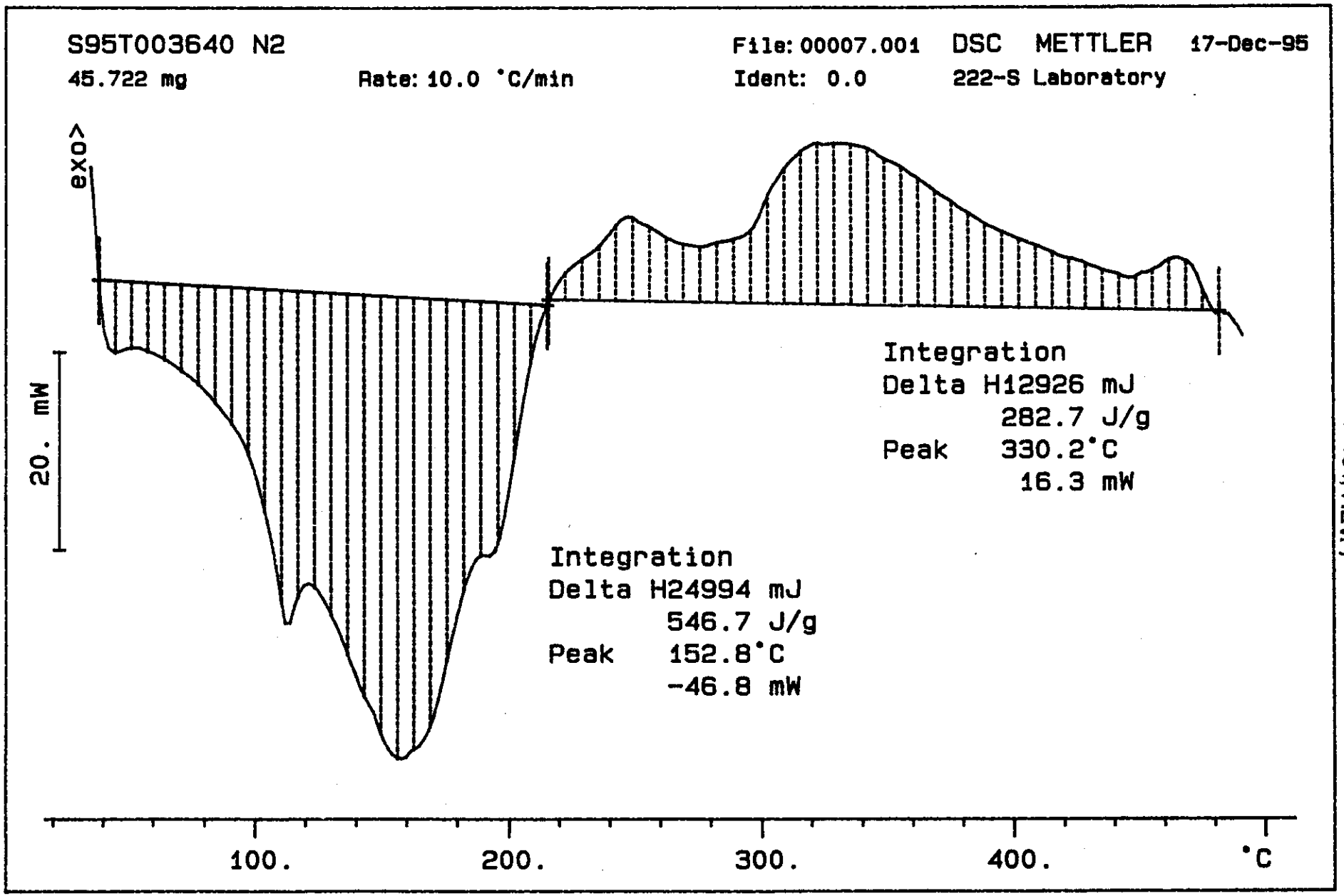
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 281 TO 285.

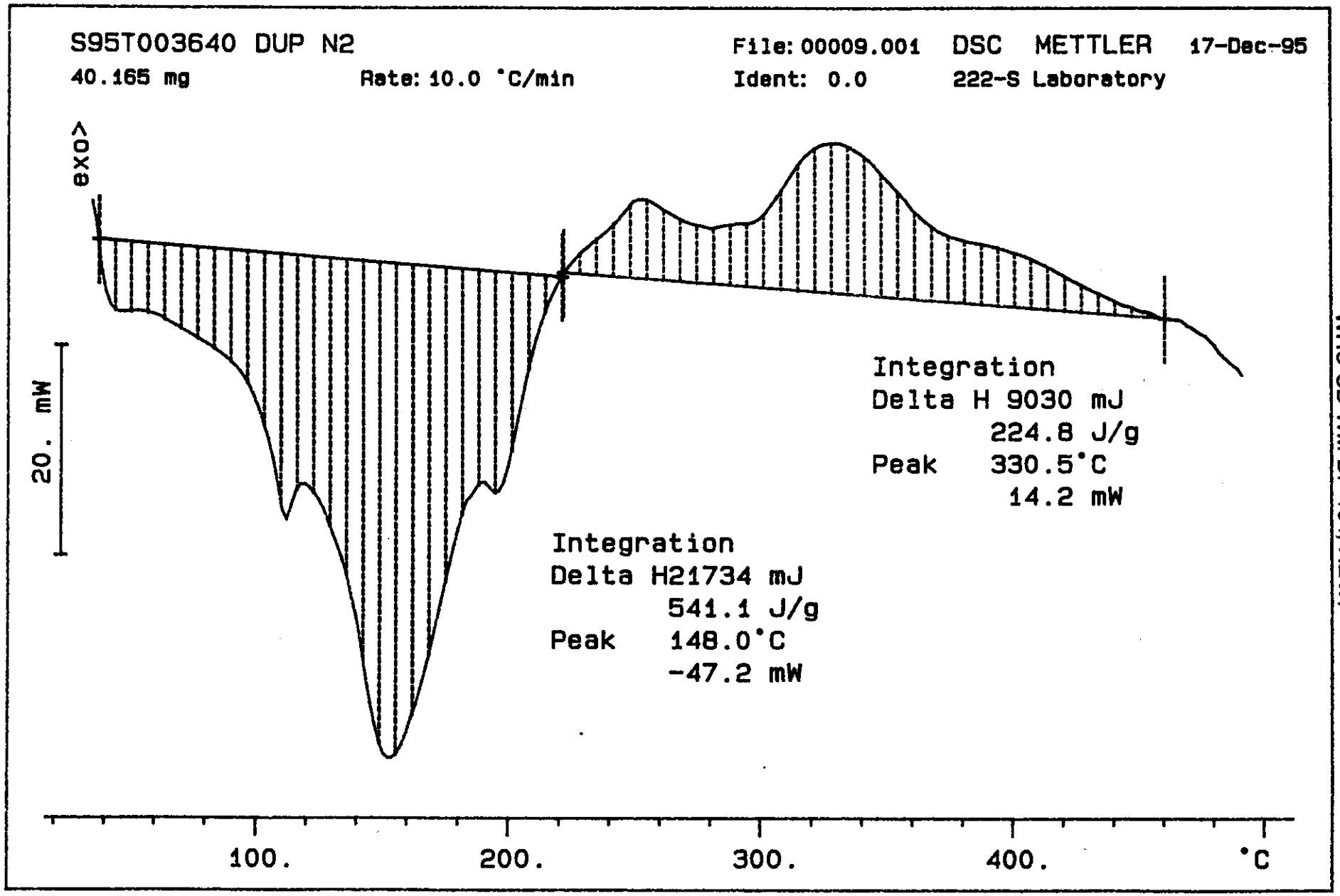


Susie M. Dalton 12-17-95


S95T003638 N2
35.697 mg
Rate: 10.0 °C/min
File: 00003.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
.02 mW
Integration
Delta H 7240 mJ
202.8 J/g
Peak 324.6°C
13.3 mW
Integration
Delta H25092 mJ
702.9 J/g
Peak 151.4°C
-43.6 mW
100.
200.
300.
400.
°C


S95T003638 DUP N2
21.563 mg
Rate: 10.0 °C/min
File: 00005.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
20. mW
Integration
Delta H 5894 mJ
273.3 J/g
Peak 320.9°C
9.0 mW
Integration
Delta H14423 mJ
668.9 J/g
Peak 146.0°C
-24.2 mW
100.
200.
300.
400.
°C


S95T003640 N2
45.722 mg
Rate: 10.0 °C/min
File: 00007.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
20. mW
Integration
Delta H12926 mJ
282.7 J/g
Peak 330.2°C
16.3 mW
Integration
Delta H24994 mJ
546.7 J/g
Peak 152.8°C
-46.8 mW
100.
200.
300.
400.
°C


S95T003640 DUP N2
40.165 mg
Rate: 10.0 °C/min
File: 00009.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
20. mW
Integration
Delta H 9030 mJ
224.8 J/g
Peak 330.5°C
14.2 mW
Integration
Delta H21734 mJ
541.1 J/g
Peak 148.0°C
-47.2 mW
100.
200.
300.
400.
°C

LABCORE Data Entry Template for Worklist# 4116

Analyst: ADP **Instrument:** DSC0 1 **Book #** 12N14B

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID	28.45	29.1	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003529	0		DSC-01	SOLID	N/A	26.0		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003529	0		DSC-01	SOLID	26.0	11.6	N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003648	0		DSC-01	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003648	0		DSC-01	SOLID	Ø	Ø	N/A	Joules/g

Final page for worklist # 4116

[signature] 12-18-95
Analyst Signature **Date**

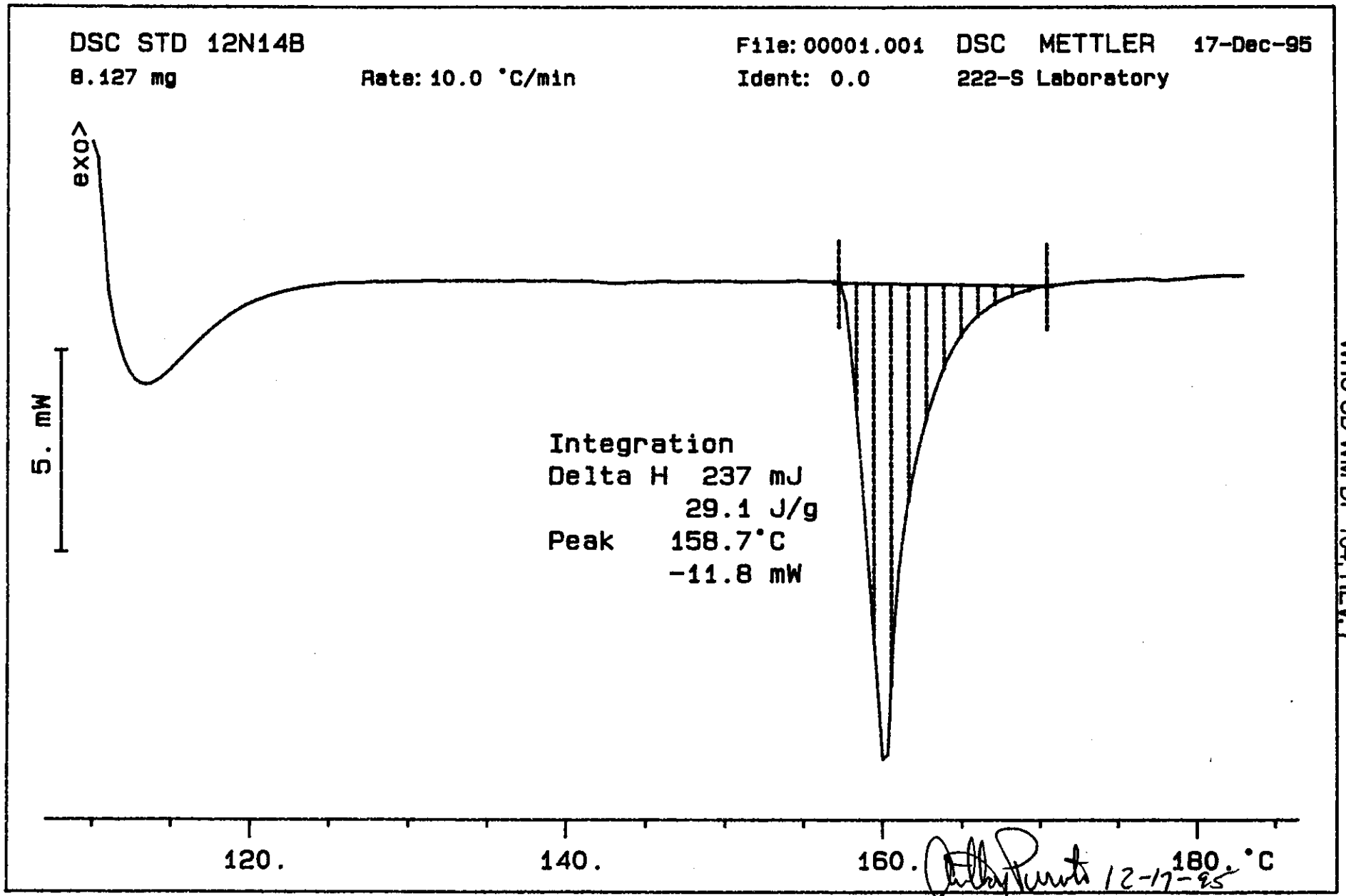
[signature] 12-19-95
Analyst Signature **Date**

Verified 12/21/95 J. M[illegible]

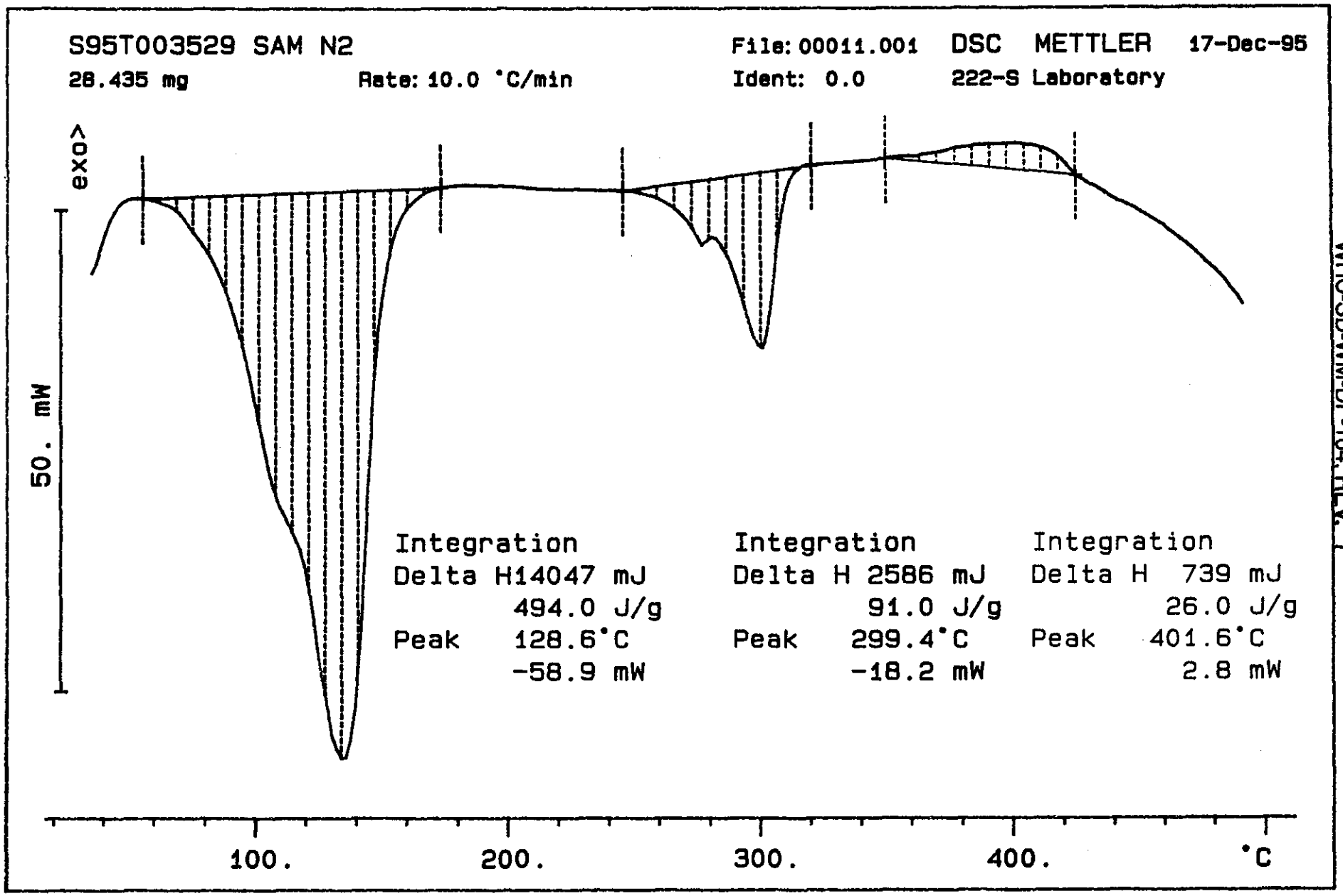
Data Entry Comments: S95T003529 produced two endotherms, one at 128.6°C with a delta H of 494.0J/g, and second at 299.4°C with a delta H of 91.0J/g.
S95T003648 produced two endotherms, one at 151.2°C with a delta H of 639.1J/g and second at 434.4°C with a delta H of 83.4J/g.

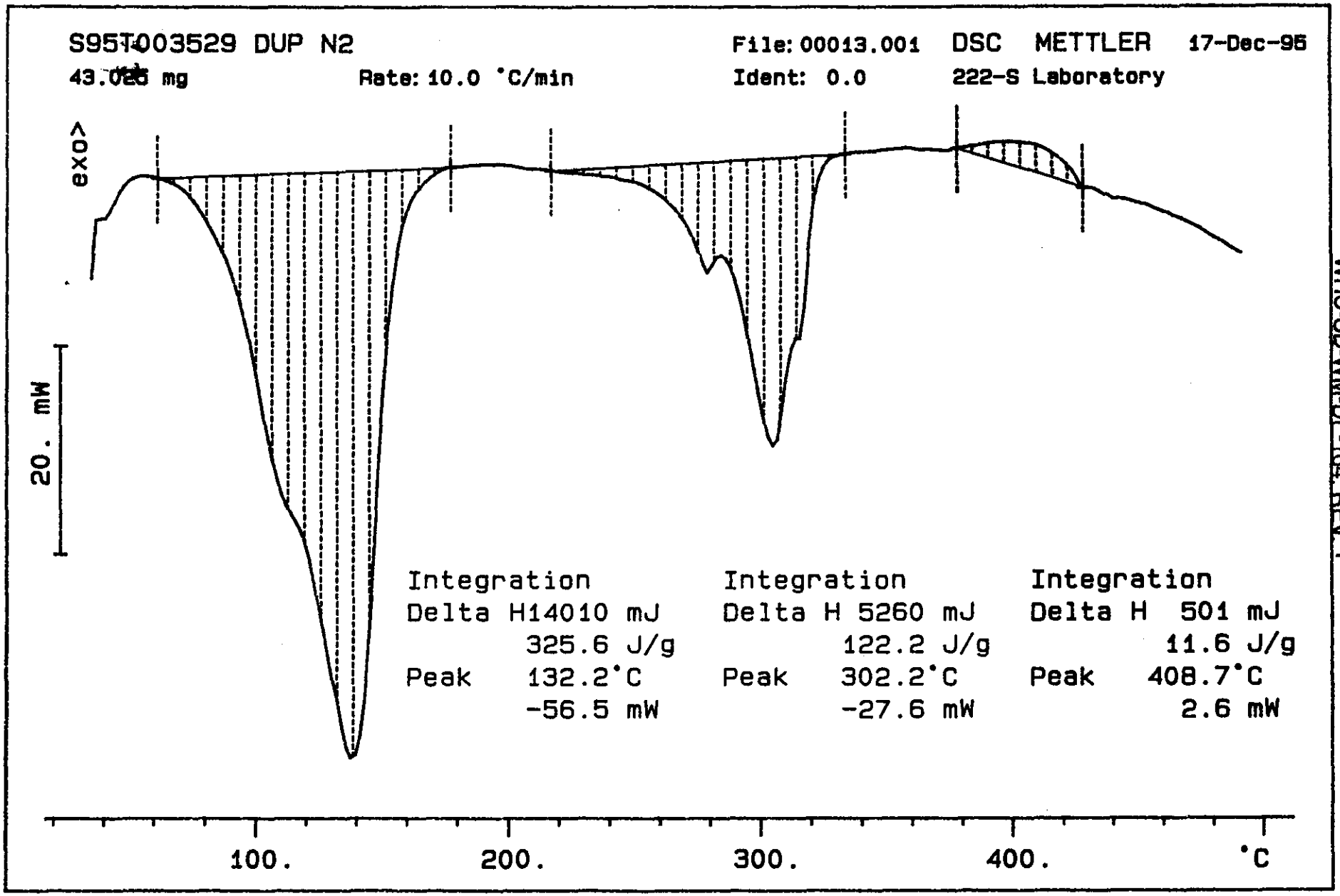
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

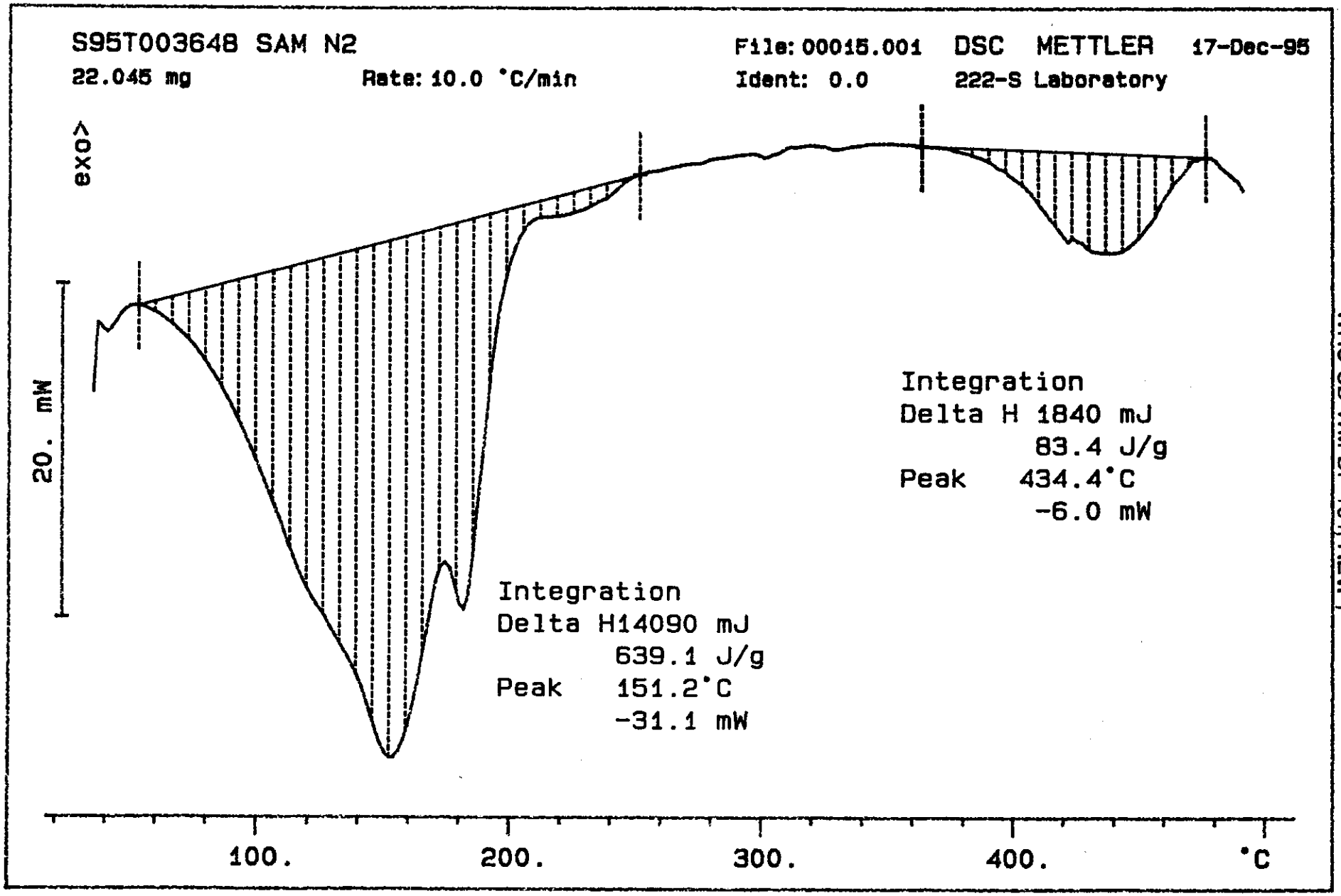
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 2-87 TO 2-91.

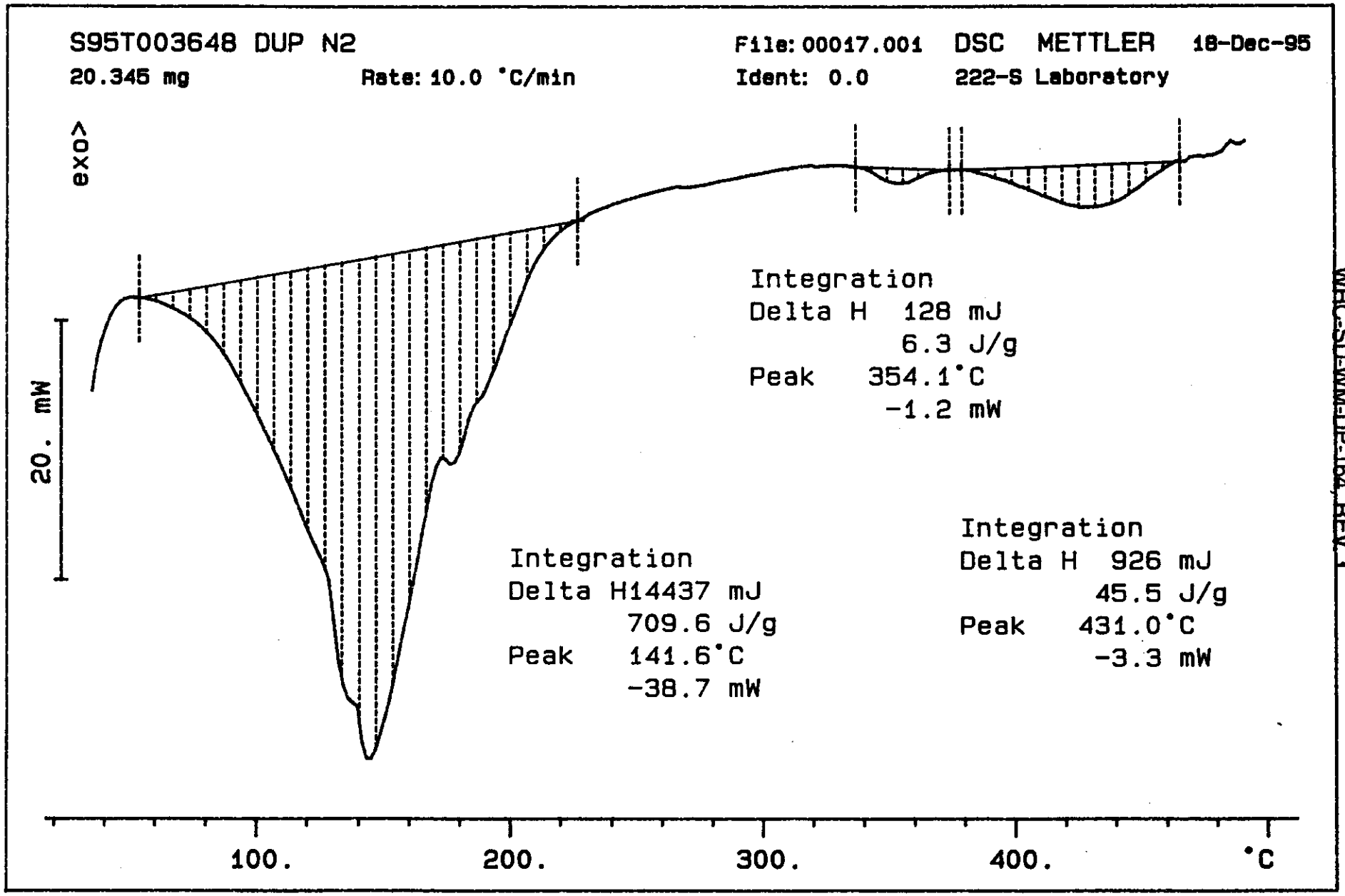


Cathy Punti 12-17-95


S95T003529 SAM N2
28.435 mg
Rate: 10.0 °C/min
File: 00011.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
50. mW
Integration
Delta H14047 mJ
494.0 J/g
Peak 128.6°C
-58.9 mW
Integration
Delta H 2586 mJ
91.0 J/g
Peak 299.4°C
-18.2 mW
Integration
Delta H 739 mJ
26.0 J/g
Peak 401.6°C
2.8 mW
100.
200.
300.
400.
°C


S95T003529 DUP N2
43.026 mg
Rate: 10.0 °C/min
File: 00013.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
20. mW
Integration
Delta H14010 mJ
325.6 J/g
Peak 132.2°C
-56.5 mW
Integration
Delta H 5260 mJ
122.2 J/g
Peak 302.2°C
-27.6 mW
Integration
Delta H 501 mJ
11.6 J/g
Peak 408.7°C
2.6 mW
100.
200.
300.
400.
°C


S95T003648 SAM N2
22.045 mg
Rate: 10.0 °C/min
File: 00015.001
Ident: 0.0
DSC METTLER
222-S Laboratory
17-Dec-95
exo>
20. mW
Integration
Delta H 1840 mJ
83.4 J/g
Peak 434.4°C
-6.0 mW
Integration
Delta H14090 mJ
639.1 J/g
Peak 151.2°C
-31.1 mW
100.
200.
300.
400.
°C


S95T003648 DUP N2
20.345 mg
Rate: 10.0 °C/min
File: 00017.001
Ident: 0.0
DSC METTLER
222-S Laboratory
18-Dec-95
exo>
20. mW
Integration
Delta H 128 mJ
6.3 J/g
Peak 354.1°C
-1.2 mW
Integration
Delta H14437 mJ
709.6 J/g
Peak 141.6°C
-38.7 mW
Integration
Delta H 926 mJ
45.5 J/g
Peak 431.0°C
-3.3 mW
100.
200.
300.
400.
°C

LABCORE Data Entry Template for Worklist# 4117

Analyst: ADP **Instrument:** DSC0 3 **Book #** 12N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-03	SOLID	28.45	28.65	N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003637	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003637	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003641	0		DSC-03	SOLID	N/A	Ø		Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003641	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g

Final page for worklist # 4117

See attached for signatures

Analyst Signature **Date**

12-20-95

Analyst Signature **Date**

Verified 12/21/95 J M Fuge

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 4117

Analyst: ABP **Instrument:** DSC0 _____ **Book #** 12N14A

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run BY-104 DSCs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	2	SAMPLE	S95T003637	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	3	DUP	S95T003637	0		DSC-01	SOLID			N/A	Joules/g
95000180	BY104 ROTARY	4	SAMPLE	S95T003641	0		DSC-01	SOLID	N/A			Joules/g
95000180	BY104 ROTARY	5	DUP	S95T003641	0		DSC-01	SOLID			N/A	Joules/g

Final page for worklist # 4117

Anthony Purnton 12-18-95

Analyst Signature **Date**

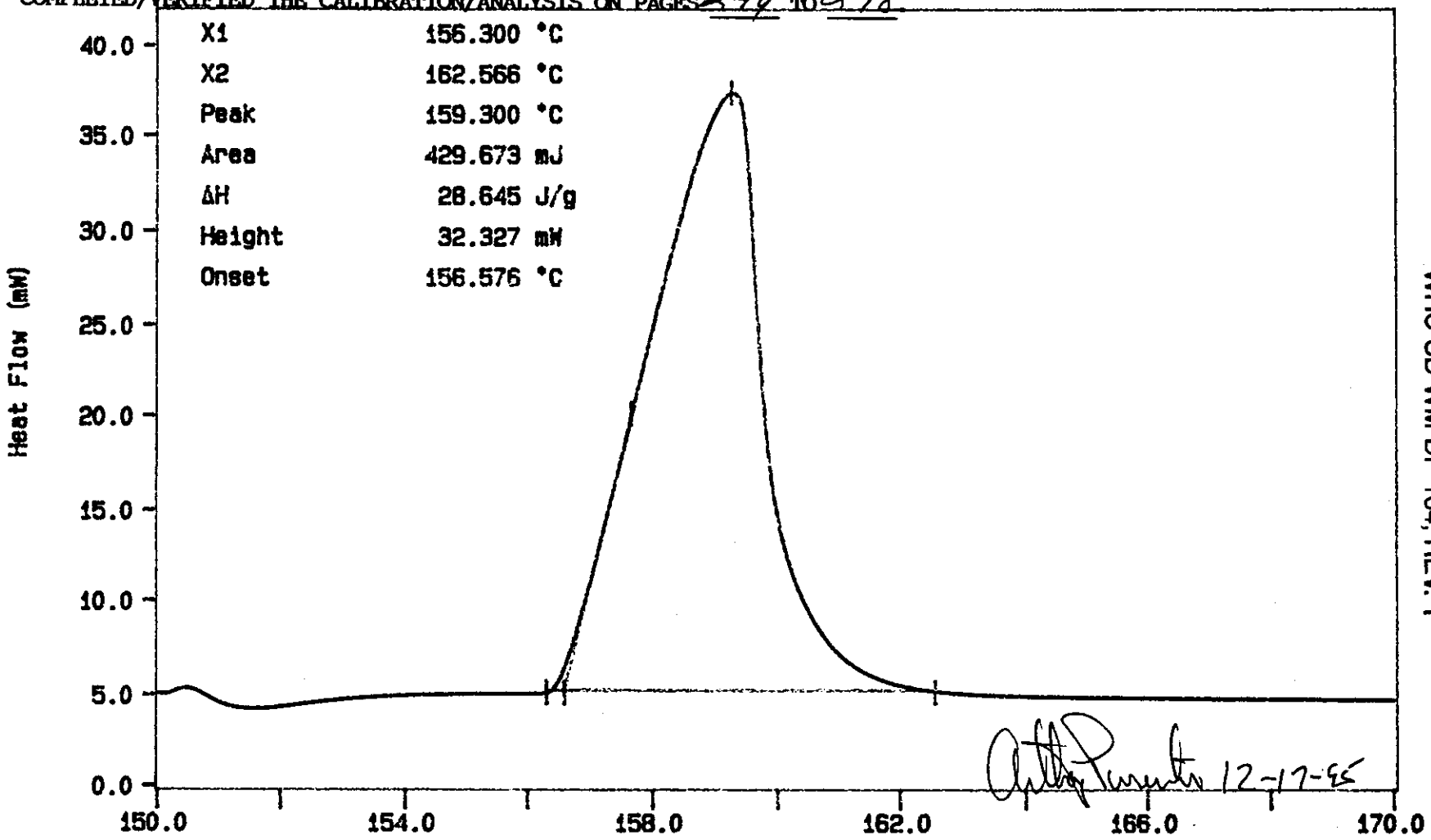
Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Curve 1: DSC
File info: IND121703 Sun Dec 17 19:35:24 1995
Sample Weight: 15.000 mg
12N14A Indium at 10C/min

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 294 TO 298

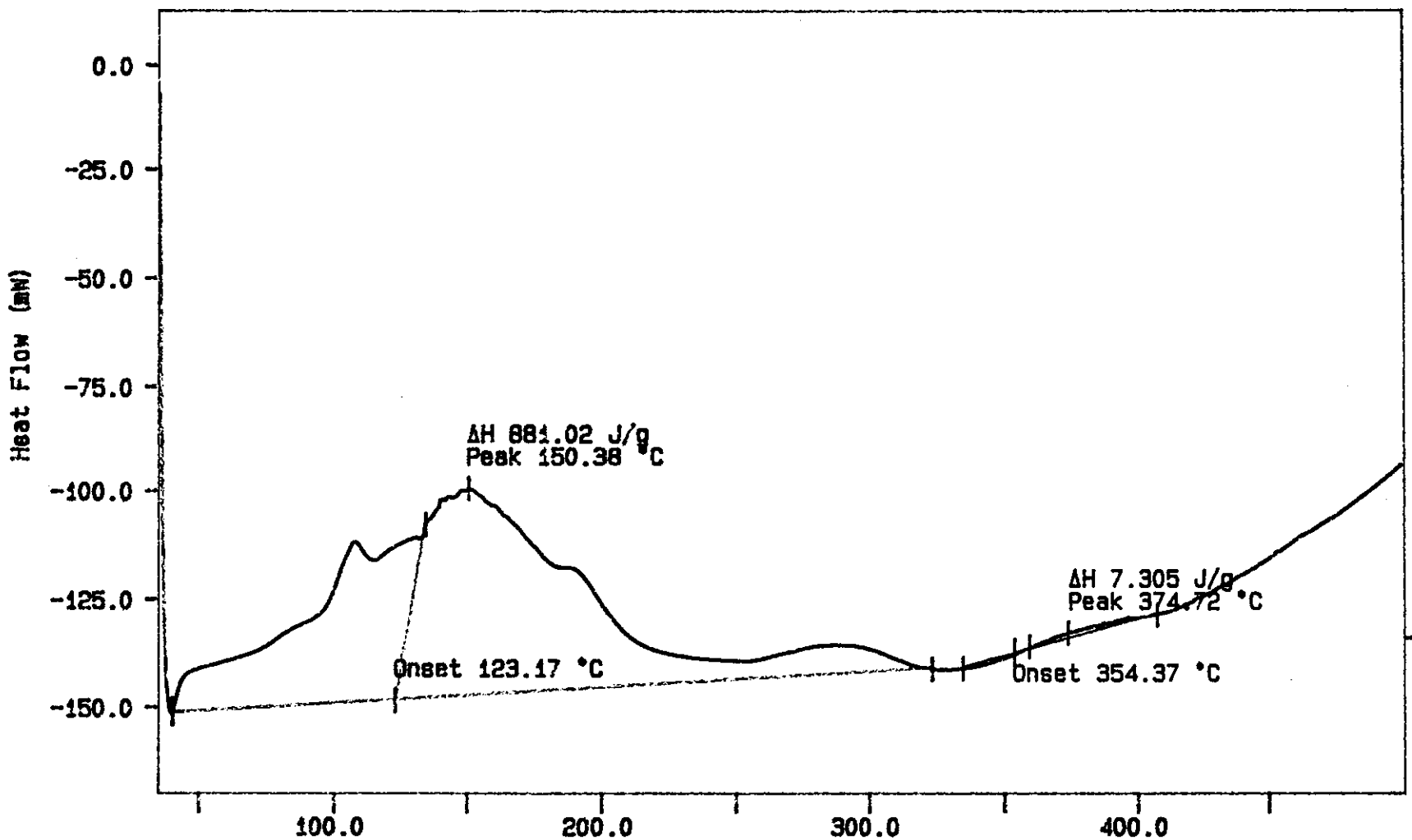


Arthy Purinton 12-17-95

N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 19:40:40 1995

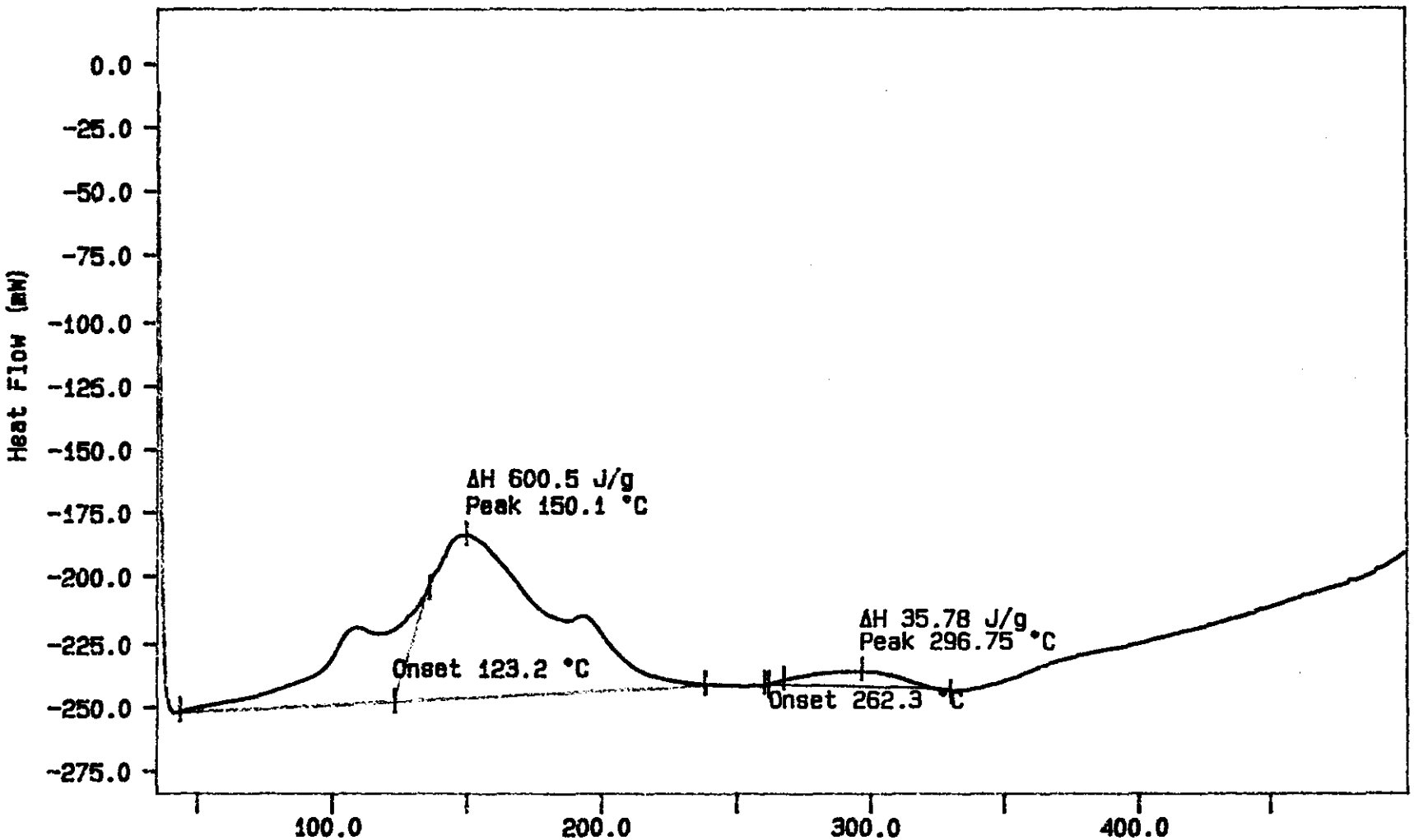
Curve 1: DSC
File info: SAM121701 Sun Dec 17 20:34:38 1995
Sample Weight: 35.990 mg
S95T003637 SAM N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 20:57:42 1995

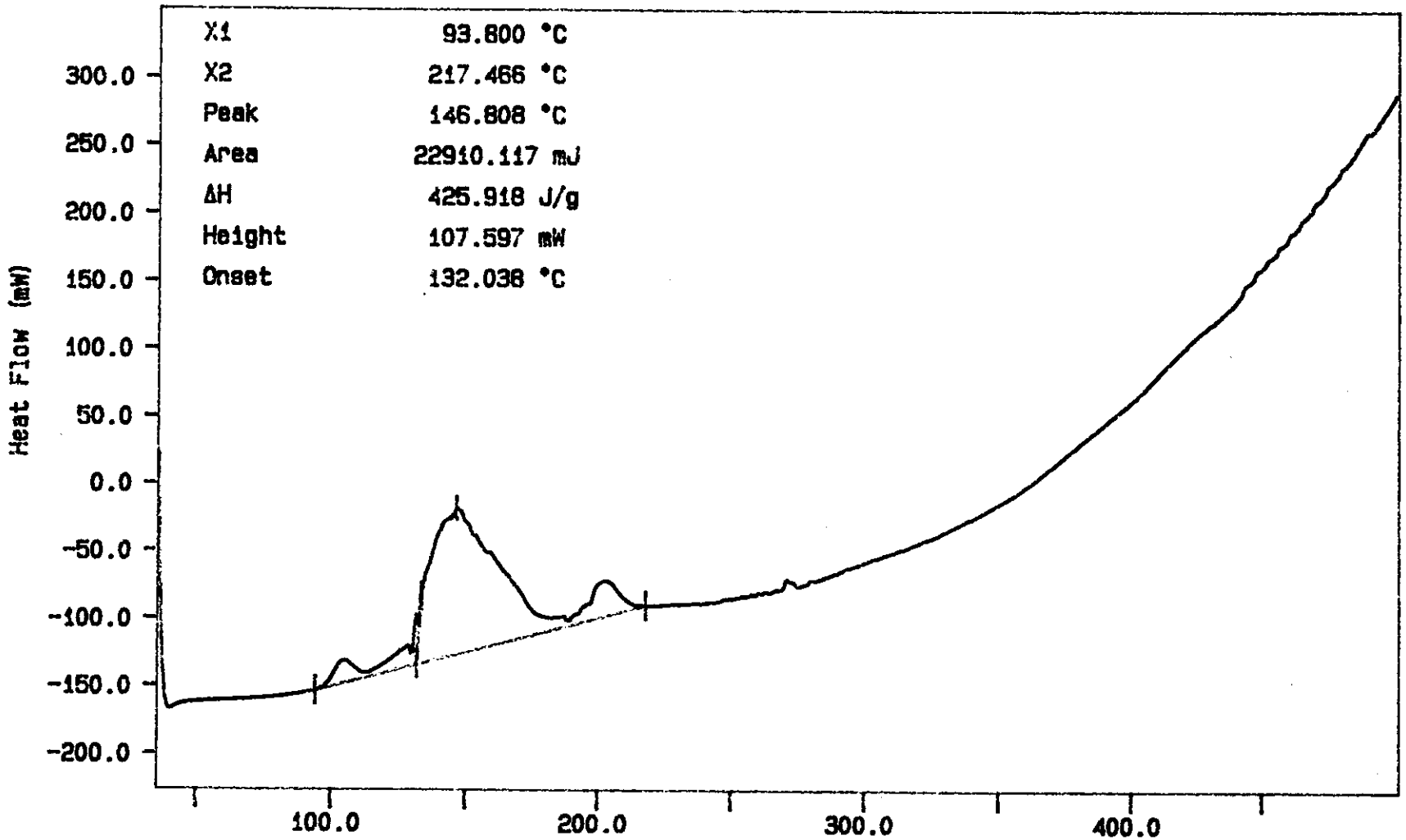
Curve 1: DSC
File info: SAM121702 Sun Dec 17 21:55:30 1995
Sample Weight: 44.100 mg
S95T003637 DUP N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 22:04:47 1995

Curve 1: DSC
File info: SAM121703 Sun Dec 17 22:58:16 1995
Sample Weight: 53.790 mg
S95T003641 SAM N2



exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Dec 17 23:02:07 1995