*** RMIS View/Print Document Cover Sheet ***

This document was retrieved from the Documentation and Records Management (DRM) ISEARCH System. It is intended for Information only and may not be the most recent or updated version. Contact a Document Service Center (see Hanford Info for locations) if you need additional retrieval information.

Accession #: D196012497

Document #: SD-WM-DP-167

Title/Desc:
45 DAY SAFETY SCREENING RESULTS & FINAL REPORT FOR TANK 241BX106 & AUGER SAMPLES 95-AUG-049 & 95-AUG-050

Pages: 55

Stu. 4

JAN 2 4 1996

ENGINEERING DATA TRANSMITTAL

1. EDT No. 614774

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Characterization Plans, Coordination and Reports	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Tank 241-BX-106/Waste Management/CPCR/Techical Basis Characterization	6. Cog. Engr.: Leela M. Sasaki	7. Purchase Order No.: N/A
8. Originator Remarks: This document is being released into the supporting document system for retrievability purposes.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: N/A
11. Receiver Remarks: For release.		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 01/22/96

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-DP-167	N/A	0	45-Day Safety Screening Results and Final Report for Tank 241-BX-106, Auger Samples 95-AUG-049 and 95-AUG-050	Q	2	1	1

16. KEY

Approval Designator (F)	Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information	4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment	4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
2	1	Cog.Eng. L. M. Sasaki	L M Sasaki	1/23/96							
2	1	Cog. Mgr. J.G. Kristofzski		1/23/96							
2	1	QA Tzu L. Tung	Tzu L. Tung	1/24/96							
		Safety									
		Env.									
2	1	Program Support A.D. Rice		1-24-96							
4	4			1/23/96							

18. L. R. Webb Signature of EDT Originator / Date 1/23/96	19. N/A Authorized Representative for Receiving Organization / Date	20. J.G. Kristofzski 1/23/96 Cognizant Manager / Date	21. DOE APPROVAL (if required) Ctrl. No. [] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (04/94) GEF097

BD-7400-172-1

45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR TANK 241-BX-106, AUGER SAMPLES 95-AUG-049 AND 95-AUG-050.

Leela M. Sasaki
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: EDT-614774 UC: 2070
Org Code: 75725 Charge Code: MD378
B&R Code: EW 3120074 Total Pages: 52

Key Words: 45-Day Safety Screening and Final Results, Auger Samples 95-AUG-049 and 95-AUG-050, Tank 241-BX-106 Final Results

Abstract: N/A

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: WHC/BCS Document Control Services, P.O. Box 1970, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

Release Approval 1/24/96 Date

DATE: HANFORD RELEASE STA: 4 ID: 3
JAN 2 4 1996
Release Stamp

Approved for Public Release

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

WHC-SD-WM-DP-167, REV. 0

ANALYTICAL SERVICES

45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR TANK 241-BX-106, AUGER SAMPLES 95-AUG-049 AND 95-AUG-050

Project Coordinator: Leela M. Sasaki

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

by

Westinghouse Hanford Company
Box 1970
Richland, Washington

54-7600-075

TABLE OF CONTENTS

Narrative 1

Sample Data Summary 7

Chain of Custody Forms 10

Photographs 13

Sample Handling 16

Bulk Density Worksheet 17
Extrusion Worklist # 4731 (Riser 6) 19
Extrusion Worklist # 4732 (Riser 2) 20

Sample Preparations 21

Fusion Digestion Worklist # 4777 22

Inorganic Analyses 23

Differential Scanning Calorimetry (DSC)
DSC Worklist # 4849 24
DSC Worklist # 5090 32

Thermogravimetric Analysis (TGA)
TGA Worklist # 4847 33

Radiochemical Analyses 39

Total Alpha Analysis (AT)
AT Worklist # 4862 40

This Document consists of pages 1 through 49 .

NARRATIVE

SUMMARY

Two auger samples from tank 241-BX-106 (BX-106) were received at the 222-S Laboratory 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) (Sasaki 1995).

No safety screening notification limits were exceeded on any of the BX-106 samples. No exotherms were observed and the upper limits of the one-sided 95-percent confidence intervals for total alpha activity results were well below the notification limit. Tank headspace flammability was measured at 0 percent of the lower flammability limit (LFL).

SCOPE

This document serves as the 45-day and final report deliverable for the tank BX-106 auger samples (95-AUG-49 and 95-AUG-50) collected between December 15 and December 18, 1995. The samples were received, extruded, and analyzed by the 222-S Laboratory in accordance with the referenced SAP (Sasaki 1995). Any exceptions to the plan are discussed in the following sections.

This report includes the safety screening results (tank headspace flammability, DSC, TGA, total alpha activity, and bulk density) and copies of all DSC and TGA raw data scans as requested per the SAP. As the final report, the following are also included: chains of custody; bulk density worksheets; sample preparation data; and total alpha analysis raw data.

SAMPLE RECEIPT AND EXTRUSION

Auger Sample 95-AUG-49, Riser 6

Auger sample 95-AUG-49 was collected from riser 6 of tank BX-106 on December 15, 1995 using a 20-inch auger bit with flutes 1 inch apart. The auger sample was received at the 222-S Laboratory on December 22, 1995 and extruded on January 5, 1996. The sample was contained on the bottom 8 flutes of the auger sampler. The solids were black in color and the texture was that of a soft, wet sludge. The sample also contained about three small pieces of white material. A total of 63.1 grams of solids were recovered from the sampler. No drainable liquids were present in the sample. Sample numbers associated with this auger sample are: S96T000110, S96T000112, and S96T000113. Details of the extrusion and subsampling are provided in the hot cell logbook for tank BX-106 (Fuller 1995).

Auger Sample 95-AUG-50, Riser 2

Auger sample 95-AUG-50 was collected from riser 6 of tank BX-106 on December 18, 1995 using a 20-inch auger bit with flutes 1/2 inch apart. The auger

sample was received at the 222-S Laboratory on December 22, 1995 and extruded on January 5, 1996. The sample was contained on the bottom 15 flutes of the auger sampler. The solids were black in color and the texture was that of a soft, wet sludge. A total of 40.9 grams of solids were recovered from the sampler. No drainable liquids were present in the sample. The sample also contained an electrical cord which was wrapped around the auger and across several flutes; the cord was removed and set aside. Sample numbers associated with this auger sample are: S96T000114, S96T000116, and S96T000117. Details of the extrusion and subsampling are provided in the hot cell logbook for tank BX-106 (Fuller 1995).

TANK HEADSPACE FLAMMABILITY

Prior to core sampling, the flammability of the tank headspace was measured to address the vapor flammability issue of the safety screening data quality objective (Dukelow, et al. 1995). The tank vapor space was sampled on December 20, 1995 in accordance with work package ES-95-00586 to determine flammability of the vapor space gasses. Sampling of the tank dome space was done through riser 2. The combustible gas meter reading was 0 percent of the LFL, indicating no flammability concerns with this tank. Other measurements made were oxygen (20.9 percent), total organic vapors (1.5 parts per million), and ammonia (2 parts per million).

ANALYTICAL RESULTS

Analytical results appear in the Sample Data Summary and a discussion of the results is presented below. Any deviations from the requirements of the SAP are noted in the following sections.

TGA (Moisture)

The weight percent water by TGA was performed under a nitrogen purge using procedure LA-560-112, Rev. B-1 on a Mettler TG 50 instrument.

The average result for auger sample 95-AUG-49 (sample S96T000112) was 36.20 percent with a relative percent difference (RPD) of 19.0 percent. The average result for auger sample 95-AUG-50 (sample S96T000116) was 41.18 percent with a RPD of 11.1 percent. Relative percent differences for the two samples were outside the $\pm$10 percent required by the SAP; reruns were not requested because the TGA results are only needed to calculate the exotherms on a dry weight basis and no exotherms were exhibited by the samples. The standard recovery was 102.9 percent, within the required 90 to 110 percent range.

DSC

Differential scanning calorimetry analyses were performed under a nitrogen purge using procedure LA-514-114, Rev. C-1 on a Perkin Elmer DSC 7 instrument. The DSC scans from the Perkin Elmer instrument show exotherms as valleys and endotherms as peaks. Using the average percent water by TGA for each sample, exotherms in J/g on a dry weight basis are calculated from the exotherms in J/g on a wet weight basis.

No exotherms were observed in either of the waste samples. Standards recoveries were 100.4 percent and 96.34 percent, within the required range of 90 to 100 percent.

Total Alpha Activity

The total alpha analyses were performed using procedure LA-508-101, Rev. D-2. The solid samples were prepared by fusion prior to the total alpha analysis; the fusion was performed using procedure LA-549-141, Rev. D-0.

The SAP specifies a total alpha notification limit of 41 μCi/g. This number is derived from the safety screening data quality objective's notification limit of 1 g/L of plutonium using the conservative assumptions that all the plutonium is plutonium-239 and the density is 1.5 g/mL. If the actual density of a sample is above 1.5 g/mL, the notification limit of 41 μCi/g was to be recalculated using the higher density number (Sasaki 1995). The highest measured density for the BX-106 auger samples was 1.68 g/mL; using this result, the notification limit would be 36.6 μCi/g.

The average results for the samples were 0.619 μCi/g and 0.560 μCi/g for auger sample 95-AUG-49 (sample S96T000113) and auger sample 95-AUG-50 (sample S96T000117), respectively. The RPDs for 95-AUG-49 and 95-AUG-50 were within the required $\pm$20 percent at 10.7 percent and 6.07 percent, respectively. The standard recovery for both samples was 90.26 percent, within the 80 to 120 percent range required by the SAP. Spike recoveries were slightly outside the required 80 to 120 percent range at 79.59 and 79.08 percent. No reruns were requested since the total alpha results were well below the notification limit.

The one-sided 95-percent upper confidence interval was calculated for the two auger samples. The upper limit of the one-sided 95-percent confidence interval was 0.827 μCi/g for 95-AUG-49 (sample S96T000113) and 0.667 μCi/g for 95-AUG-50 (sample S96T000117), both well below the notification limit of 36.6 μCi/g.

Bulk Density

Bulk density measurements were performed on the samples using procedure LO-160-103, Rev. A-7.

Bulk densities of the solids were 1.68 g/mL for auger sample 95-AUG-49 (sample S96T000113) and 1.60 g/mL for auger sample 95-AUG-50 (sample S96T000117). Due to insufficient amounts of sample, no duplicate bulk density measurements were performed.

Project Coordinator: L. M. Sasaki

REFERENCES

Dukelow, G. T., J. W. Hunt, H. Babad, and J. E. Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

Fuller, R. K., 1995, *Tank BX-106*, WHC-N-1138, Westinghouse Hanford Company, Richland, Washington.

Sasaki, L. M., 1995, *Tank 241-BX-106 Auger Sampling and Analysis Plan*, WHC-SD-WM-TSAP-068, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

SAMPLE DATA SUMMARY

45-Day Safety Screening Results for Augers 95-AUG-49 and -50
BX-106 (A)

CORE NUMBER: 95-AUG-49
SEGMENT #: 95-AUG-49

SEGMENT PORTION: W Whole Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S96T000110			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
S96T000112			% Water by TGA using Mettler	%	None	None	102.9	n/a	39.64	32.75	36.20	19.0	n/a	n/a	n/a
S96T000112			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	100.4	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000112			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
S96T000113		F	Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	90.26	<4.07e-02	6.52e-01	5.86e-01	6.19e-01	10.7	79.59	6.03e-02	1.49E+01

=> Limit violated
=> Selected Limit

45-Day Safety Screening Results for Augers 95-AUG-49 and -50
BX-106 (A)

CORE NUMBER: 95-AUG-50
SEGMENT #: 95-AUG-50

SEGMENT PORTION: W Whole Segment

Sample#	R	A#	Analyte	Unit	Action Limits Lower	Action Limits Upper	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S96T000114			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.600	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000116			% Water by TGA using Mettler	%	None	None	102.9	n/a	38.90	43.46	41.18	11.1	n/a	n/a	n/a
S96T000116			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	96.34	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000116			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
S96T000117	F		Alpha of Digested Solid	uCi/g	-1.0e+00	41.00	90.26	<4.07e-02	5.43e-01	5.77e-01	5.60e-01	6.07	79.08	6.24e-02	1.74E+01

=> Limit violated
=> Selected Limit

CHAIN OF CUSTODY FORMS

COPY

CHAIN-OF-CUSTODY RECORD FOR AUGER SAMPLING

(1) Shipment Number 200W-08-TF (2) Sample Number 95-AUG-49 (3) Supervisor R.J. Praznik

(4) Tank BX 106 (5) Riser 6 (6) Cask Serial Number 1009C

Radiation Survey Data:	(7) FIELD	(31) LABORATORY
Over Top Dose Rate	<0.5	<0.5
Side Dose Rate	8.0	7.0
Bottom Dose Rate	2.0	2.0
Smearable Contamination	<20 dpm/100cm² (Alpha)	UNABLE TO PERFORM SURVEY DUE TO LINED (Alpha)
	<1000 dpm/100cm² (Beta-Gamma)	(Beta-Gamma)
RCT*	(Signature)	RCT* (Signature)

(8) Shipment Description

A. Work Package Number	ES-95-00586-0
B. Cask Seal Number	4060
C. Date and Time Sample Removed from Tank	12-15-95 / 1240 hrs
D. Expected Liquid Content	10%
E. Expected Solid Content	* 90%
F. Dose Rate Through Drill String	150 mR/hr
G. Expected Sample Length	10½"

(9) INFORMATION (Include statement of laboratory tests to be performed.)

11

(10) Field Comments

* SAMPLE MEDIUM, Mushy solid

(32) Laboratory Comments

(11) Point of Origin	(12) Destination	(13) Sender Name (Sign and PRINT)	(14) Date/Time	(15) Sender Comments
BX 106 riser 6	PNL 222S 12-22-95	For Praznik James Sickels	12-22-95 0845	
(17) Relinquished By (Sign and PRINT)		**(18) Received By (Sign and PRINT)**	**(19) Date/Time**	**(20) Receiver Comments**
James Sickels			12-22-95	
(21) Relinquished By (Sign and PRINT)		**(22) Received By (Sign and PRINT)**	**(23) Date/Time**	**(24) Receiver Comments**
			12-22-95 09:45	
(25) Relinquished By (Sign and PRINT)		**(26) Received By (Sign and PRINT)**	**(27) Date/Time**	**(28) Receiver Comments**

(16) Seal Intact Upon Release?	(29) Seal Intact Upon Receipt?	(30) Seal Data Consistent with this Record?		
		Shipment No.	Cask Seal No.	Sample No.
☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No

WHC-SD-WM-DP-167, REV. 0

COPY

CHAIN-OF-CUSTODY RECORD FOR AUGER SAMPLING

(1) Shipment Number 200W-08-TF (2) Sample Number 95-AUG-50 (3) Supervisor R.J. Praznik

(4) Tank BX-106 (5) Riser 2 (6) Cask Serial Number C2000

Radiation Survey Data:	(7) FIELD	(31) LABORATORY
Over Top Dose Rate	<0.5	<0.5
Side Dose Rate	7.0	1.0
Bottom Dose Rate	1.0	1.0
Smearable Contamination	<20 dpm/100 cm² (Alpha)	UNABLE TO (Alpha)
	<1000 dpm/100 cm² (Beta-Gamma)	PERFORM SURVEY (WET) (Beta-Gamma)
RCT*	Tw [signature] (Signature)	RCT* SN [signature] (Signature)

(8) Shipment Description

A. Work Package Number	ES-95-00586/0
B. Cask Seal Number	4061
C. Date and Time Sample Removed from Tank	12-18-95 / 1205 hrs
D. Expected Liquid Content	10%
E. Expected Solid Content	* 90%
F. Dose Rate Through Drill String	400 mR/hr
G. Expected Sample Length	9"

(9) INFORMATION (Include statement of laboratory tests to be performed.)

12

(10) Field Comments

① SAMPLE MEDIUM, MUSHY, FREE FLOWING SOLID. THIS 95-AUG-50 SAMPLE IS THE ONE WITH SHEATH + BIT FUSED AS ONE. USE EXTREME CAUTION WHEN EXTRACTING FROM OTC. INSIDE OF OTC POSSIBILITY OF HIGH LEVELS

(32) ~~Laboratory Comments~~ FIELD COMMENTS

② T-HANDLE NIPPLE ON TOP OF DRILL BIT IS NOT ATTACHED.

(11) Point of Origin	(12) Destination	(13) Sender Name (Sign and PRINT)	(14) Date/Time	(15) Sender Comments
BX 106 riser 6	BNL 222s 12-22-95	FOR PRAZNIK James Sickels	0845 12-22-95	
(17) Relinquished By (Sign and PRINT)		(18) Received By (Sign and PRINT)	(19) Date/Time	(20) Receiver Comments
James Sickels James Sickels		[signature]	0852 12-22-95	
(21) Relinquished By (Sign and PRINT)		(22) Received By (Sign and PRINT)	(23) Date/Time	(24) Receiver Comments
[signature]			12-22-95 0955	
(25) Relinquished By (Sign and PRINT)		(26) Received By (Sign and PRINT)	(27) Date/Time	(28) Receiver Comments

(16) Seal Intact Upon Release? ☑ Yes ☐ No

(29) Seal Intact Upon Receipt? ☑ Yes ☐ No

(30) Seal Data Consistent with this Record?

Shipment No. ☑ Yes ☐ No

Cask Seal No. ☑ Yes ☐ No

Sample No. ☑ Yes ☐ No

WHC-SD-WM-DP-167, REV. 0

PHOTOGRAPHS

1-5-96

BX-106 95-AUG-049

1-5-96

BX-106 95-AUG-050

SAMPLE HANDLING

Bulk Density Worksheet

Requestor: L. Sasaki

Date: 01-09-96

Tank: BX106
Core: _____
Seg: _____
Auger: 95 AUG 49

Start Time: _____
End Time: _____

Homogenization Time (Min.): _____

Jar#: 8595 A
Jar/Vial Size: _____ mL
Initial Weight: _____ g
Final Weight: _____ g
Net Weight: _____ g

Cone#: 8595 A
Final Vol: 10.0 mL
Initial Weight: 7.60 g
Final Weight: 24.39 g
Net Weight: 16.79 g

Appearance/Narrative:
BULKWGT = 16.79/10.0 = 1.68 g/cc

Tank: BX106
Core: _____
Seg: _____
Auger: 95 AUG 49

Start Time: _____
End Time: _____

Homogenization Time (Min.): _____

Jar#: 8595 B
Jar/Vial Size: _____ mL
Initial Weight: _____ g
Final Weight: _____ g
Net Weight: _____ g

Cone#: _____
Final Vol: _____ mL
Initial Weight: _____ g
Final Weight: _____ g
Net Weight: _____ g

Appearance/Narrative:
INSUFFICIENT SAMPLE FOR DUPLICATE

Bulk Density Worksheet

Requestor: L. Sasaki

Date: 11-09-96

Tank: BX106
Core: —
Seg: —
Auger: 95-AUG-50

Start Time: ____
End Time: ____

Homogenization Time (Min.): ____

Jar#: 8596 (A)
Jar/Vial Size: ____ mL
Initial Weight: ____ g
Final Weight: ____ g
Net Weight: ____ g

Core#: 8596 (A)
Final Vol: 5.8 mL
Initial Weight: 7.68 g
Final Weight: 16.93 g
Net Weight: 9.25 g

Appearance/Narrative:
Bulk Density = 9.25/5.8 = 1.60 g/cc

Tank: ____
Core: ____
Seg: ____
Auger: ____

Start Time: ____
End Time: ____

Homogenization Time (Min.): ____

Jar#: 8596 (B)
Jar/Vial Size: ____ mL
Initial Weight: ____ g
Final Weight: ____ g
Net Weight: ____ g

Core#: ____
Final Vol: ____ mL
Initial Weight: ____ g
Final Weight: ____ g
Net Weight: ____ g

Appearance/Narrative:
Insufficient Sample For Duplicate Bulk Density.

WHC-SD-WM-DP-167, REV. 0

LABCORE Data Entry Template for Worklist# 4731

Analyst: EC **Instrument:** BA000 _____ **Book #** NA

Method: LO-160-103 Rev/Mod A-7

Worklist Comment: BX-106 95-AUG-49 RISER 6 EXTRUSION

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	INSTCHK01				EXTRUD01	SOLID	20	19.98	N/A	
		2	INSTCHK02				EXTRUD01	SOLID	500	499.47	N/A	
96000007	BX-106 (A)	3	SAMPLE	S96T000018	0		DLIQVOL1	SOLID	N/A	0		mL
96000007	BX-106 (A)	4	SAMPLE	S96T000018	0		DLIQWT01	SOLID	N/A	0		g
96000007	BX-106 (A)	5	SAMPLE	S96T000018	0		EST.G/ML	SOLID	N/A	0		g/mL
96000007	BX-106 (A)	6	SAMPLE	S96T000018	0		EXTRUD01	SOLID	N/A	complete		
96000007	BX-106 (A)	7	SAMPLE	S96T000018	0		LLIQWT01	SOLID	N/A	0		g
96000007	BX-106 (A)	8	SAMPLE	S96T000018	0		NOTEBOOK	SOLID	N/A	N-1138		
96000007	BX-106 (A)	9	SAMPLE	S96T000018	0		SLDVOL01	SOLID	N/A	NA		mL
96000007	BX-106 (A)	10	SAMPLE	S96T000018	0		SLDWT-01	SOLID	N/A	63.1		g
96000007	BX-106 (A)	11	SAMPLE	S96T000018	0		APPEAR01	SOLID	N/A	complete		
96000007	BX-106 (A)	12	SAMPLE	S96T000018	0		ORGVOL01	SOLID	N/A	0		mL

Final page for worklist # 4731

EC 1-8-96
Analyst Signature **Date**

EC 1-8-96
Analyst Signature **Date**

Reviewed by Arlen B. Bonney 1-8-96

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# 4732

Analyst: CC **Instrument:** BA000 _____ **Book #** NA

Method: LO-160-103 Rev/Mod A-7

Worklist Comment: BX-106 95-AUG-50 RISER 2 EXTRUSION

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	INSTCHK01				EXTRUD01	SOLID	20	19.98	N/A	
		2	INSTCHK02				EXTRUD01	SOLID	500	499.47	N/A	
96000008	BX-106 (A)	3	SAMPLE	S96T000019	0		DLIQVOL1	SOLID	N/A	0		mL
96000008	BX-106 (A)	4	SAMPLE	S96T000019	0		DLIQWT01	SOLID	N/A	0		g
96000008	BX-106 (A)	5	SAMPLE	S96T000019	0		EST.G/ML	SOLID	N/A	0		g/mL
96000008	BX-106 (A)	6	SAMPLE	S96T000019	0		EXTRUD01	SOLID	N/A	complete		
96000008	BX-106 (A)	7	SAMPLE	S96T000019	0		LLIQWT01	SOLID	N/A	0		g
96000008	BX-106 (A)	8	SAMPLE	S96T000019	0		NOTEBOOK	SOLID	N/A	N-1138		
96000008	BX-106 (A)	9	SAMPLE	S96T000019	0		SLDVOL01	SOLID	N/A	NA		mL
96000008	BX-106 (A)	10	SAMPLE	S96T000019	0		SLDWT-01	SOLID	N/A	40.9		g
96000008	BX-106 (A)	11	SAMPLE	S96T000019	0		APPEAR01	SOLID	N/A	complete		
96000008	BX-106 (A)	12	SAMPLE	S96T000019	0		ORGVOL01	SOLID	N/A	0		mL

Final page for worklist # 4732

[signature] 1-8-96
Analyst Signature Date

[signature] 1-8-96
Analyst Signature Date

Reviewed by [signature] 1-8-96

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.

SAMPLE PREPARATIONS

LABCORE Data Entry Template for Worklist# 4777

Analyst: JAM **Instrument:** FUS01 SN16355 **Book #** ____

Method: LA-549-141 Rev/Mod E-0

Worklist Comment: BX-106 95-AUG-049 & 95-AUG-050 Fusion Digestion rkf

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK-PREP				FUSION01	SOLID	1	.250	N/A	g/L
96000007	BX-106 (A)	2	SAMPLE	S96T000113	0	F	FUSION01	SOLID	N/A	2.1992		g/L
			.5498g → .250D									
96000007	BX-106 (A)	3	SAMPLE	S96T000113	0		DOSE-02	SOLID	N/A	60		mrad/hour
96000007	BX-106 (A)	4	DUP	S96T000113	0	F	FUSION01	SOLID	2.1992	2.3032	N/A	g/L
			.5758g → .250D									
96000007	BX-106 (A)	5	DUP	S96T000113	0		DOSE-02	SOLID	60	50	N/A	mrad/hour
96000008	BX-106 (A)	6	SAMPLE	S96T000117	0	F	FUSION01	SOLID	N/A	2.1248		g/L
			.5312g → .250D									
96000008	BX-106 (A)	7	SAMPLE	S96T000117	0		DOSE-02	SOLID	N/A	65		mrad/hour
96000008	BX-106 (A)	8	DUP	S96T000117	0	F	FUSION01	SOLID	2.1248	2.0440	N/A	g/L
			.5110g → .250D							JAM 1-12-96		
96000008	BX-106 (A)	9	DUP	S96T000117	0		DOSE-02	SOLID	65	650	N/A	mrad/hour

Final page for worklist # 4777

JAMurphy 1-10-96
Analyst Signature Date

Keith Fuller 1/12/96
Analyst Signature Date

S96T000112 ---> 113

S96T000116 ---> 117

Data Entry Comments: All samples & QC - 40ml HNO3, <1% solids

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.

INORGANIC ANALYSES

LABCORE Data Entry Template for Worklist# 4849

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

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

Worklist Comment: Please run BX-106 ~~TGAs~~ DSCs under N2. bdv

LAP 1-22-96

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-03	SOLID	28.45	28.55 *	N/A	Joules/g
96000007	BX-106 (A)	2	SAMPLE	S96T000112	0		DSC-03	SOLID	N/A	Ø		Joules/g
96000007	BX-106 (A)	3	DUP	S96T000112	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g
		4	STD				DSC-03	SOLID	28.45	27.41 *	N/A	Joules/g
96000008	BX-106 (A)	5	SAMPLE	S96T000116	0		DSC-03	SOLID	N/A	Ø		Joules/g
96000008	BX-106 (A)	6	DUP	S96T000116	0		DSC-03	SOLID	Ø	Ø	N/A	Joules/g

Final page for worklist # 4849

See attached for signatures

Analyst Signature Date 1/16/96

Analyst Signature Date 1-16-96

Verified by Blandina Valenzuela BDV 1/17/96

Data Entry Comments: 1/17/96 BDV ~~S96T~~ S96T000112 produced ~~at~~ 1/17/96 BDV three endotherms one at 130.53°C with a delta H of 671.82 J/g, second at 278.3°C with a delta H of 404.3 J/g and third at 451.96°C with a delta H of .828 J/g 1/17/96 BDV

S96T000116 produced two endotherms ~~at~~ one at 131.96°C with a delta H of 811.57 J/g and second at 315.84°C with a delta H of 270.7 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# 4849

Analyst: ADP **Instrument:** DSC0 _____ **Book #** 12N14B

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

Worklist Comment: Please run BX-106 ~~TGAs~~ DSC's under N2. bdv

LAD 1-22-96

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	SOLID			N/A	Joules/g
96000007	BX-106 (A)	2	SAMPLE	S96T000112	0		DSC-01	SOLID	N/A			Joules/g
96000007	BX-106 (A)	3	DUP	S96T000112	0		DSC-01	SOLID			N/A	Joules/g
96000008	BX-106 (A)	4	SAMPLE	S96T000116	0		DSC-01	SOLID	N/A			Joules/g
96000008	BX-106 (A)	5	DUP	S96T000116	0		DSC-01	SOLID			N/A	Joules/g

Final page for worklist # 4849

Anthony Purnitor 01-14-96
Analyst Signature **Date**

Analyst Signature **Date**

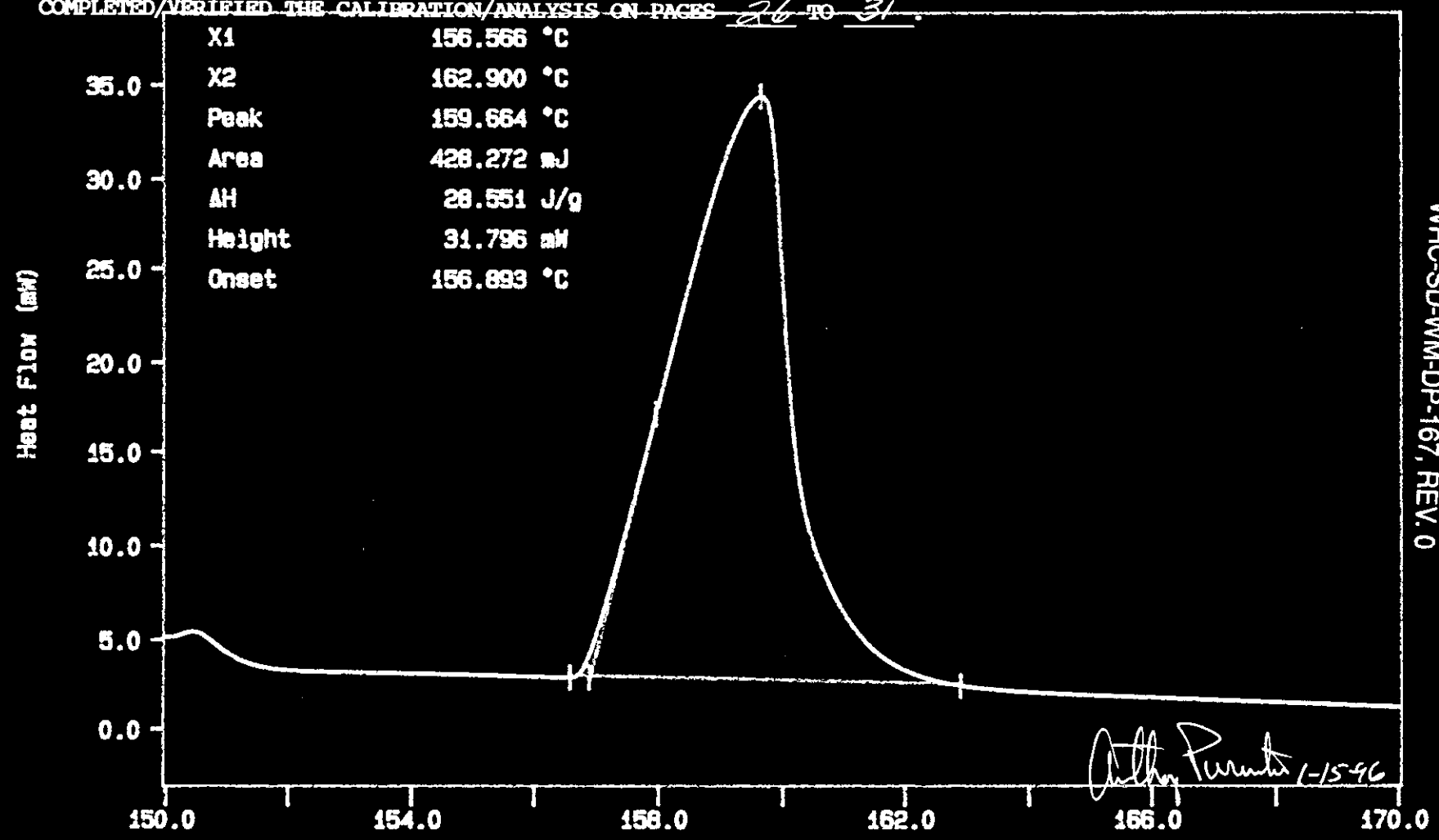
Data Entry Comments:

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: IND011403 Sun Jan 14 18:42:09 1996
Sample Weight: 15.000 mg
12N14B Indium at 10C/min

BEST AVAILABLE COPY

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 26 TO 31.



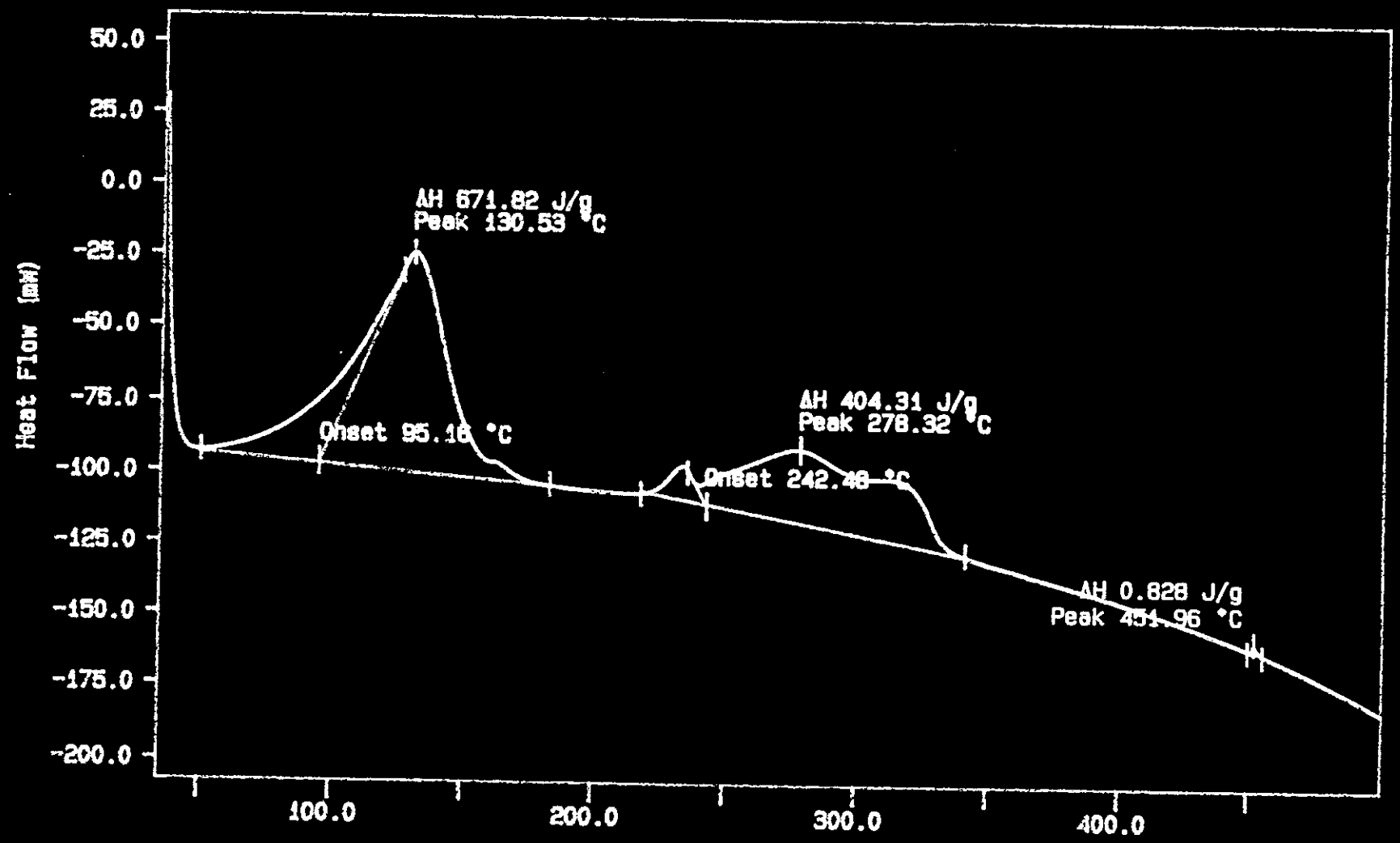
N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 18:58:29 1996

WHC-SD-WM-DP-167, REV. 0

Curve 1: DSC
File info: SAM011503 Mon Jan 15 04:28:27 1996
Sample Weight: 28.520 mg
S96T000112 SAM

BEST AVAILABLE COPY

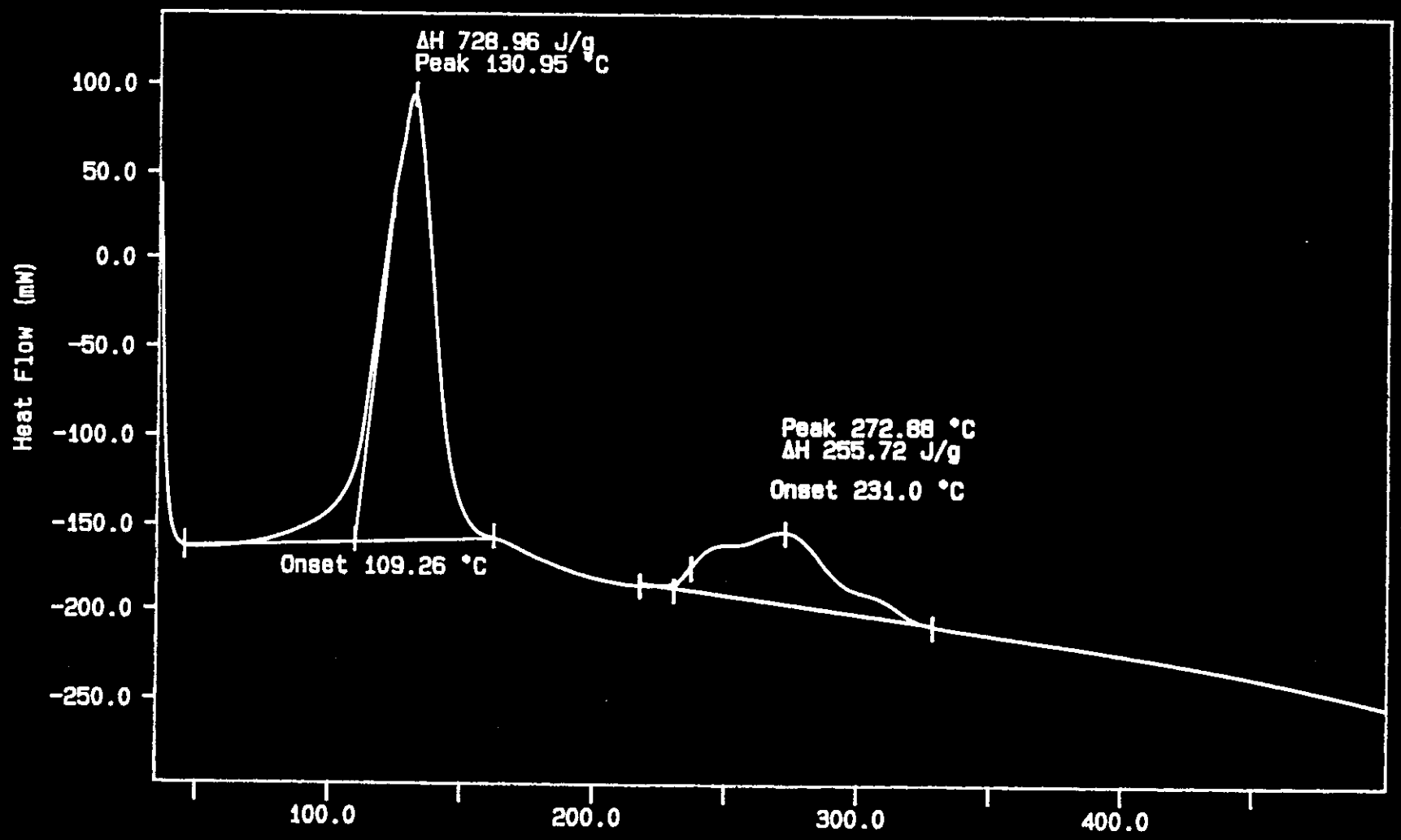


exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 15 04:31:09 1996

Curve 1: DSC
File info: SAM011504 Mon Jan 15 05:30:19 1996
Sample Weight: 50.960 mg
S96T000112 DUP

BEST AVAILABLE COPY



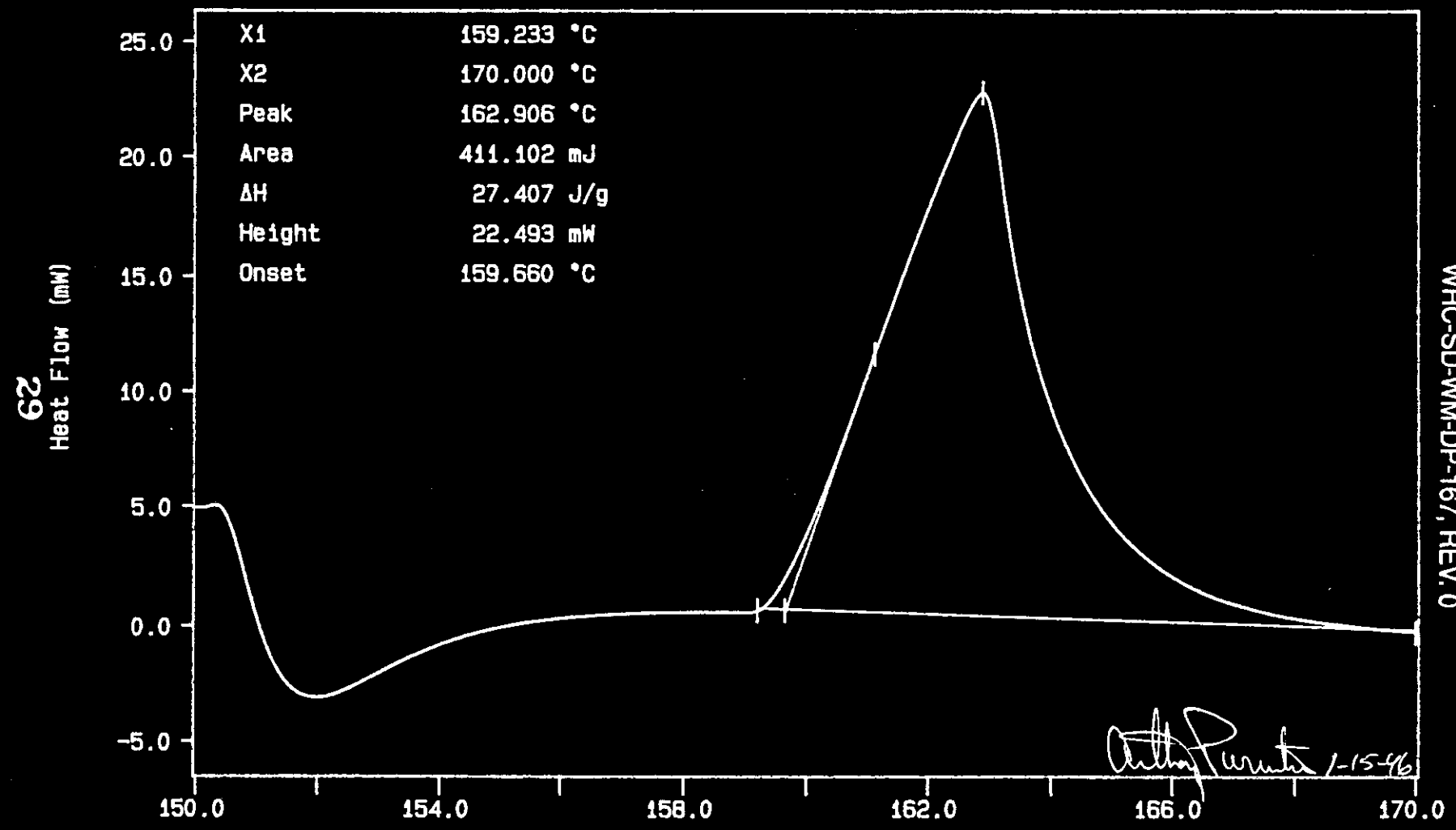
exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Jan 16 15:13:22 1996

WHC-SD-WM-DP-167, REV. 0

Curve 1: DSC
File info: IND011502 Mon Jan 15 19:25:55 1996
Sample Weight: 15.000 mg
12N14B Indium at 10C/min

BEST AVAILABLE COPY



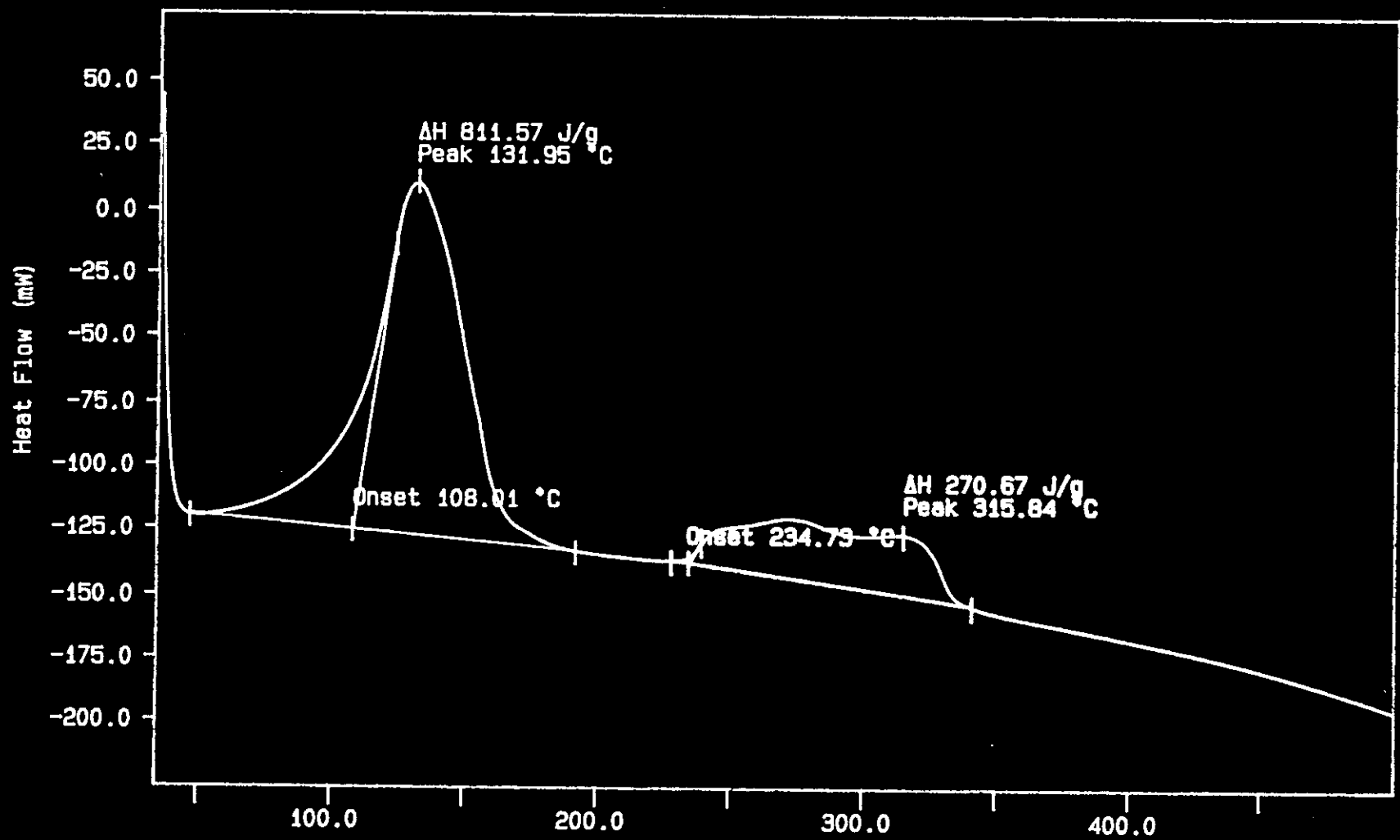
N2, EXOTHERM DOWN
TEMP1: 150.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 170.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 15 19:26:29 1996

WHC-SD-WM-DP-167, REV. 0

Curve 1: DSC
File info: SAM011506 Mon Jan 15 20:25:05 1996
Sample Weight: 42.740 mg
S96T000116 SAM

BEST AVAILABLE COPY

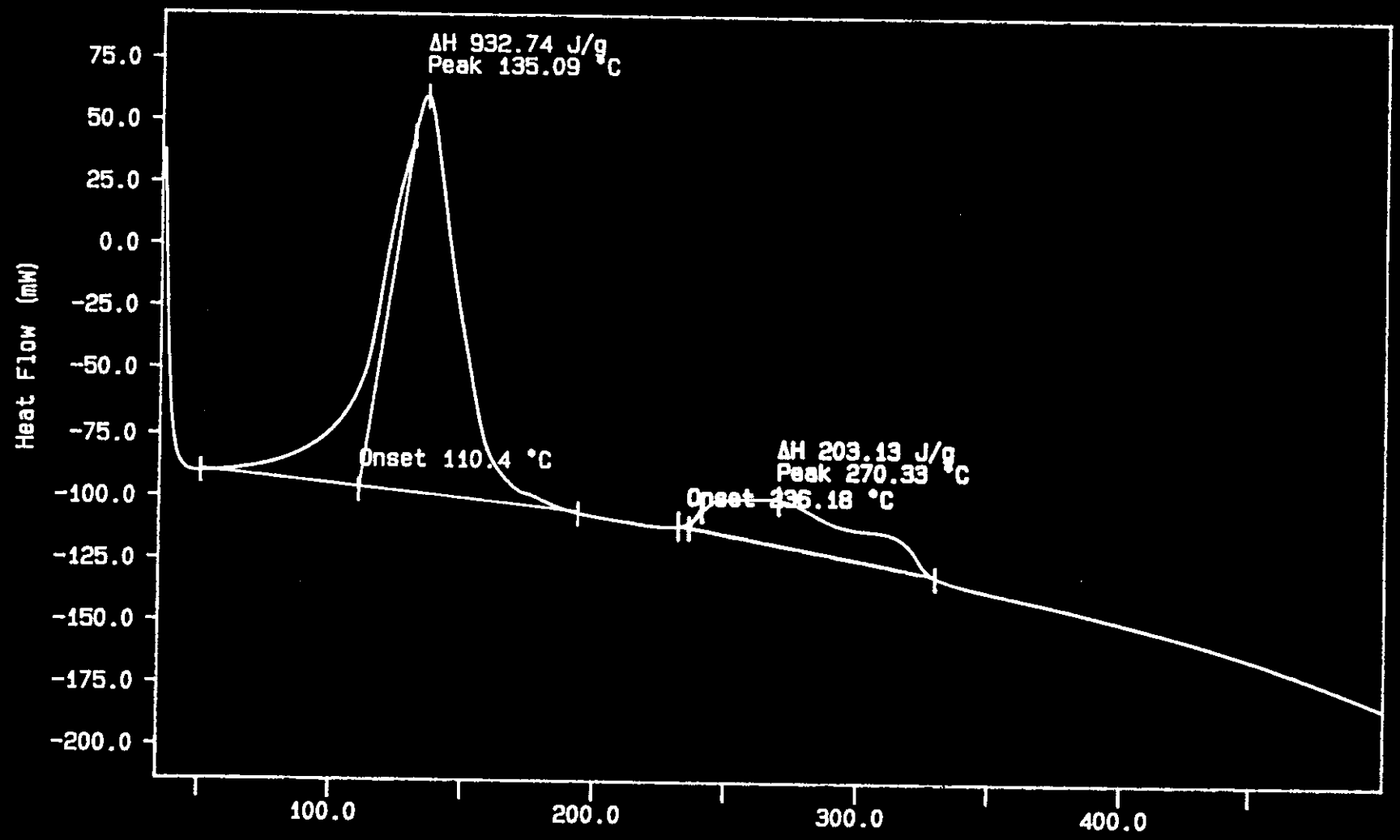


exotherm down, N2 purge gas
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 15 20:47:00 1996

Curve 1: DSC
File info: SAM011507 Mon Jan 15 21:44:41 1996
Sample Weight: 35.960 mg
S96T000116 DUP

BEST AVAILABLE COPY



exotherm down, N2 purge gas
TEMP1: 30.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 600.0 C

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Jan 15 21:46:04 1996

LABCORE Data Entry Template for Worklist# 5090

Analyst: BDV **Instrument:** DSC01 **Book #** —

Method: LA-514-113 Rev/Mod —

Worklist Comment: Dry DSC for BX-106. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
96000007	BX-106 (A)	1 SAMPLE	S96T000112	0		DSC-02	SOLID	N/A	Ø		Joules/g Dry
96000007	BX-106 (A)	2 DUP	S96T000112	0		DSC-02	SOLID	Ø	Ø	N/A	Joules/g Dry
96000008	BX-106 (A)	3 SAMPLE	S96T000116	0		DSC-02	SOLID	N/A	Ø		Joules/g Dry
96000008	BX-106 (A)	4 DUP	S96T000116	0		DSC-02	SOLID	Ø	Ø	N/A	Joules/g Dry

Data entered + verified by **Final page for worklist # 5090**

Blandina Valenzuela 1/22/96

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.

LABCORE Data Entry Template for Worklist# 4847

Analyst: SMF **Instrument:** TGA0 1 **Book #** 7/85N87 1/15/96 BDV

Method: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run BX-106 TGAs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				TGA-01	SOLID	59.2	60.93	N/A	%
96000007	BX-106 (A)	2	SAMPLE	S96T000112	0		TGA-01	SOLID	N/A	39.64		%
96000007	BX-106 (A)	3	DUP	S96T000112	0		TGA-01	SOLID	39.64	32.75	N/A	%
96000008	BX-106 (A)	4	SAMPLE	S96T000116	0		TGA-01	SOLID	N/A	38.90		%
96000008	BX-106 (A)	5	DUP	S96T000116	0		TGA-01	SOLID	38.90	43.46	N/A	%

Final page for worklist # 4847

Susie M. Dutton 1-14-96
Analyst Signature Date

[illegible] 1-16-96
Analyst Signature Date

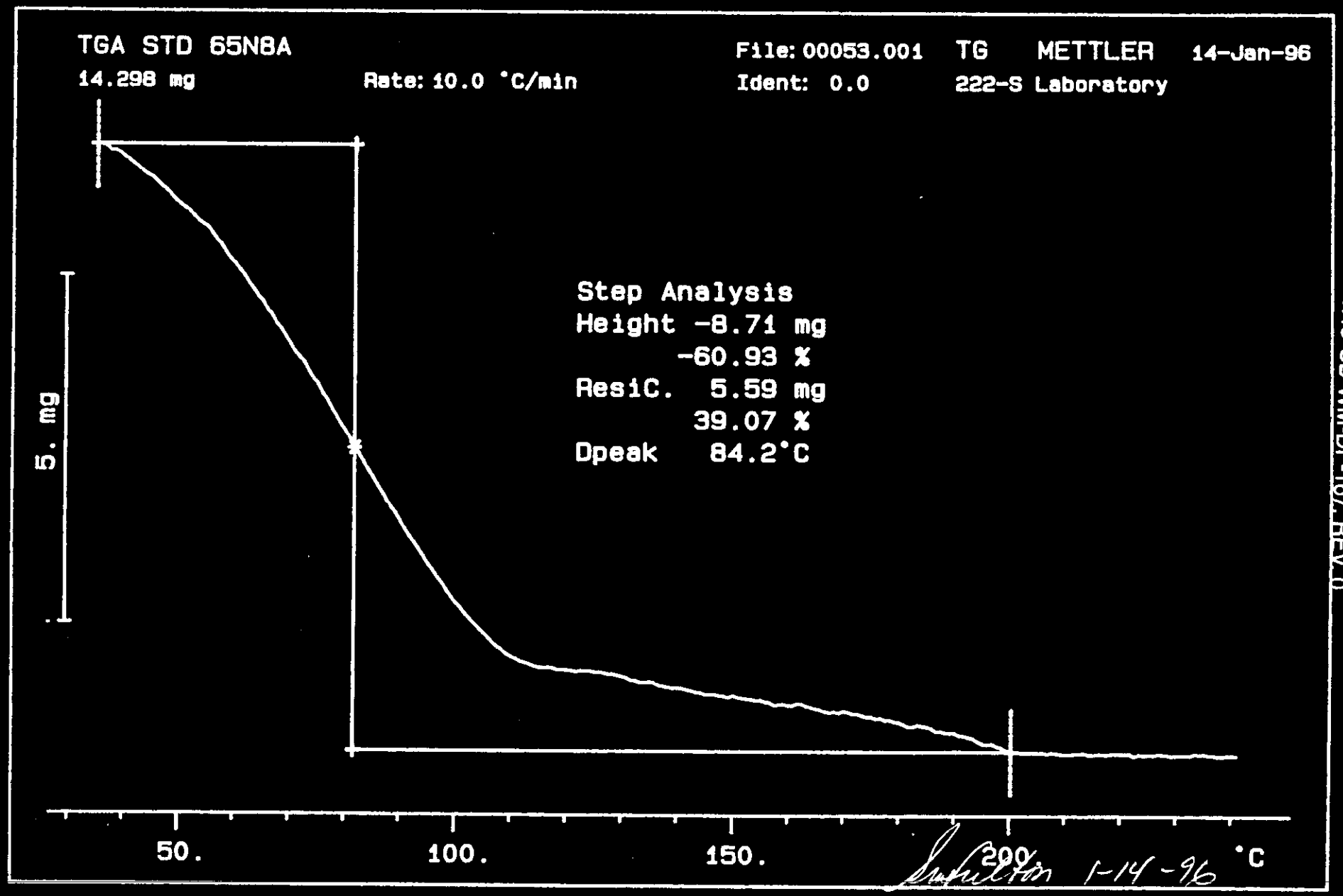
Verified by Blandina Valenzuela 1-18-96

Data Entry Comments: S96T000112 ~~S95T00~~ 1/15/96 BDV produced a second weight loss step of 9.40% at approximately 260°C

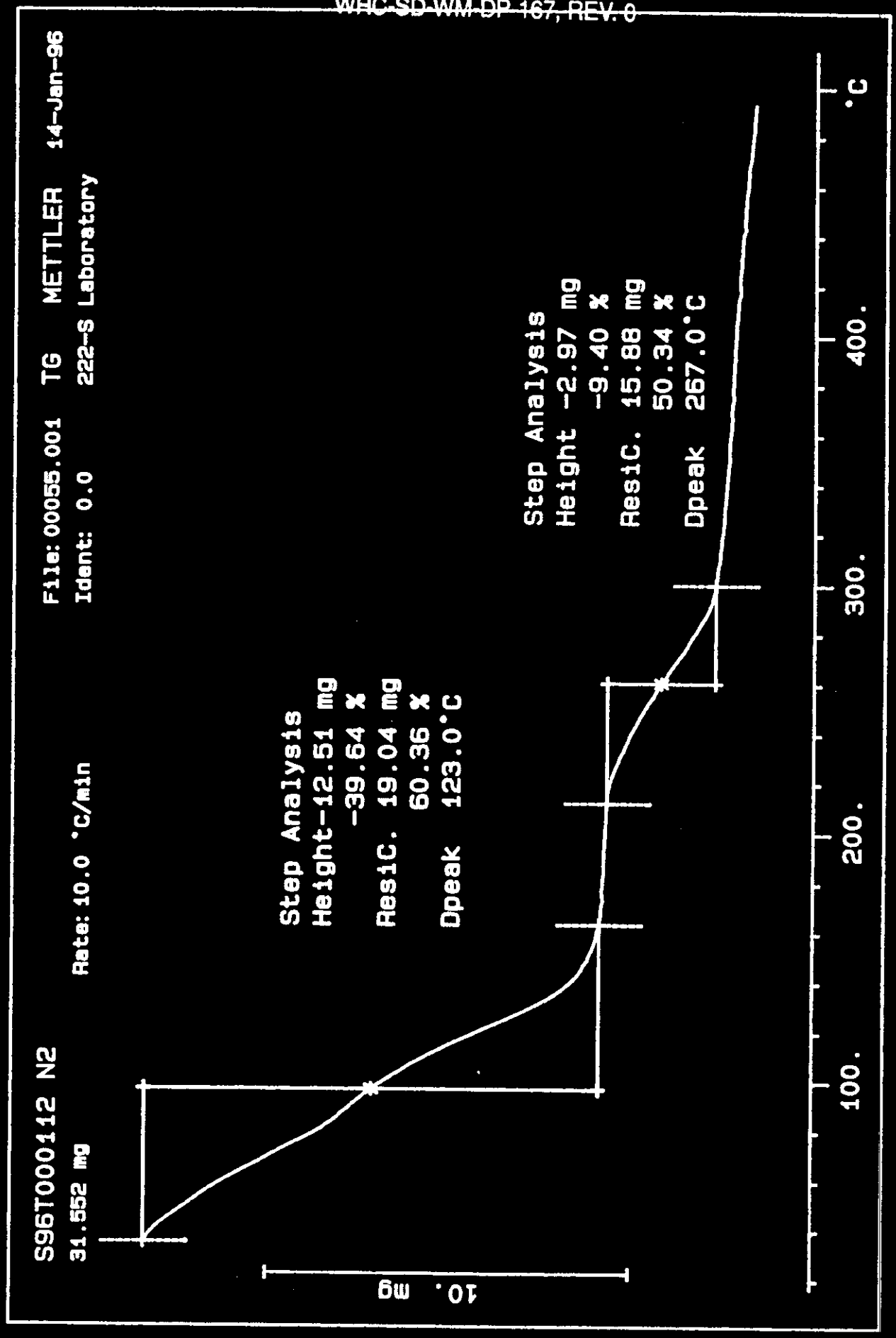
S96T000116 produced a second weight loss step of 9.13% at approximately 260°C

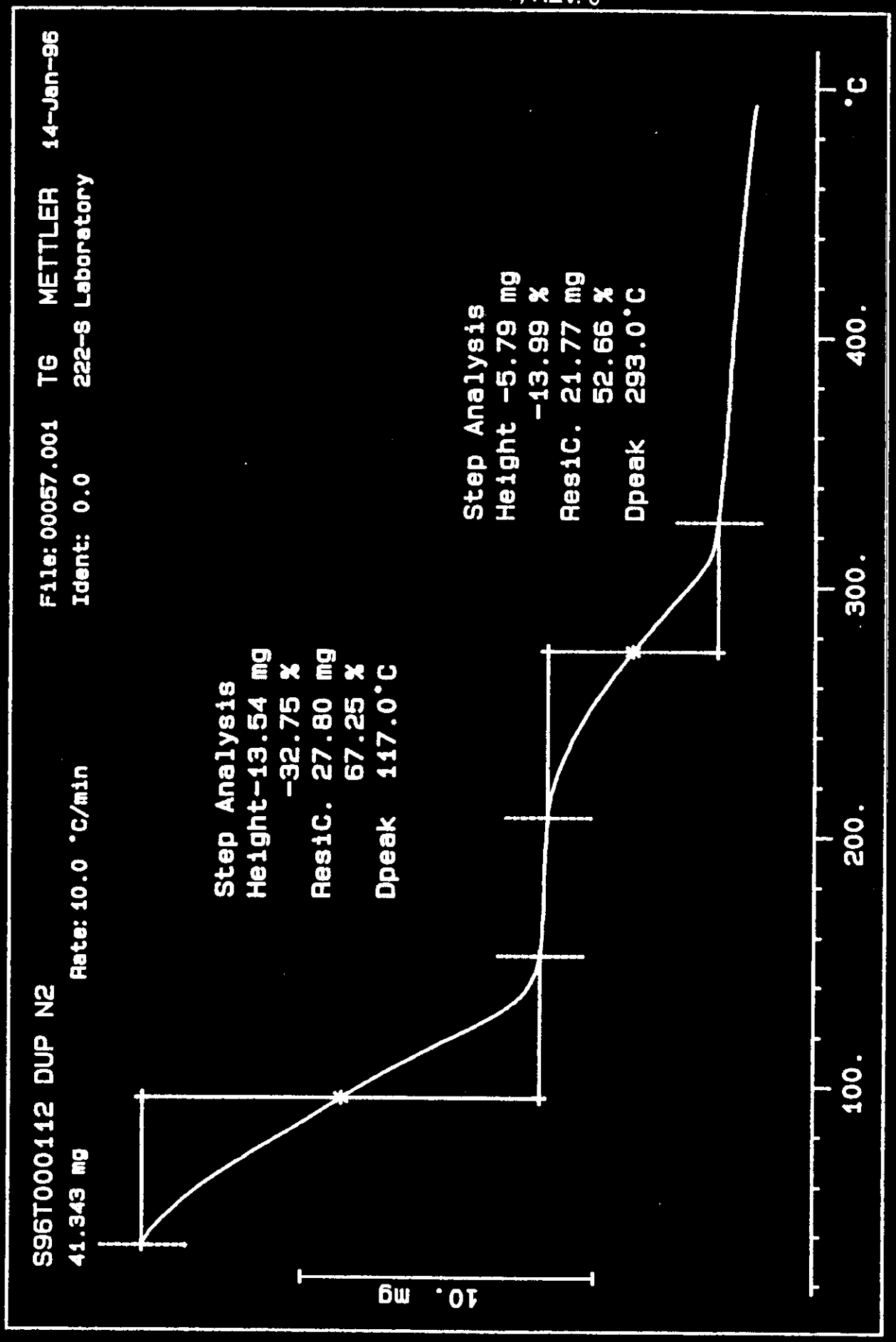
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

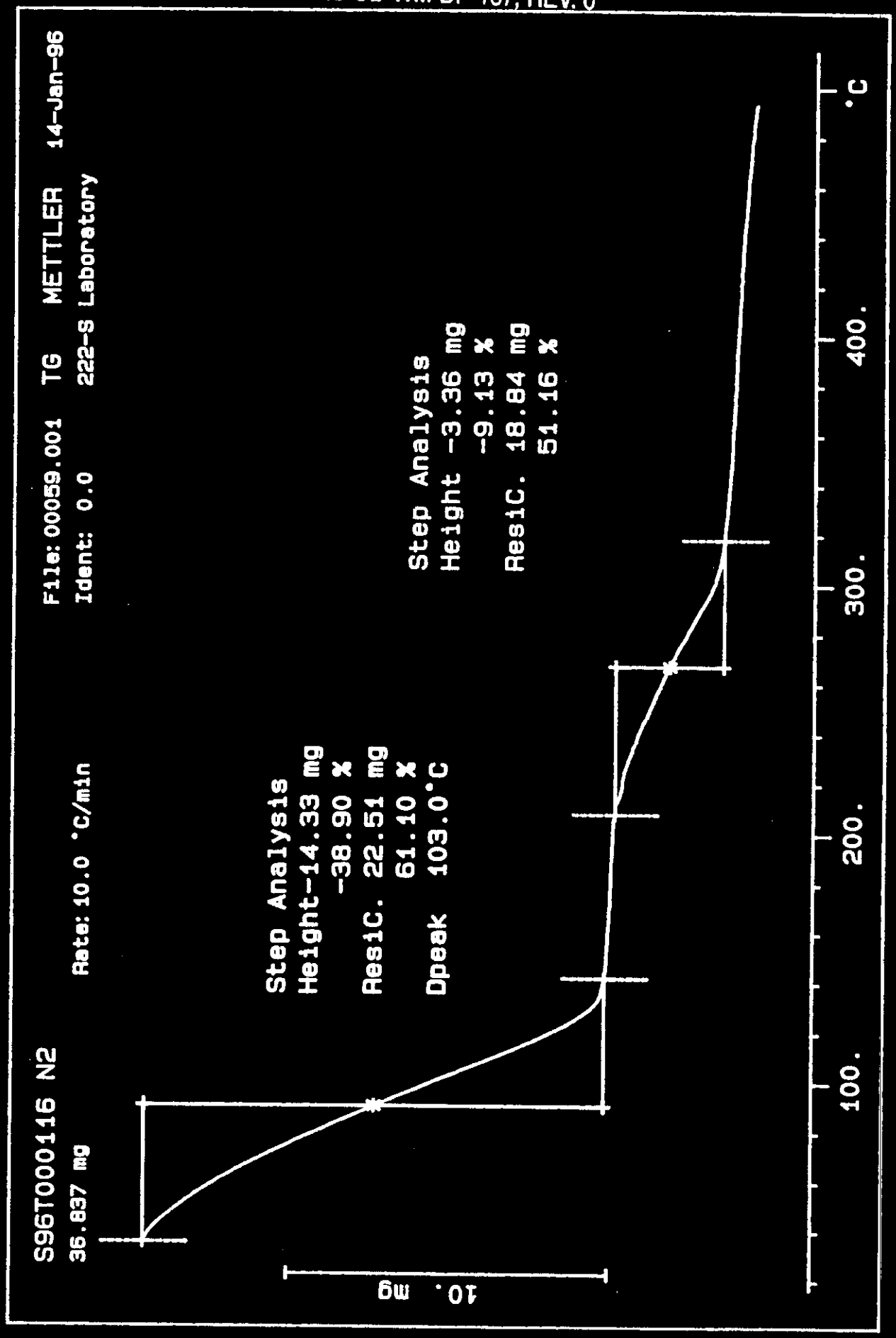
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 34 TO 38.

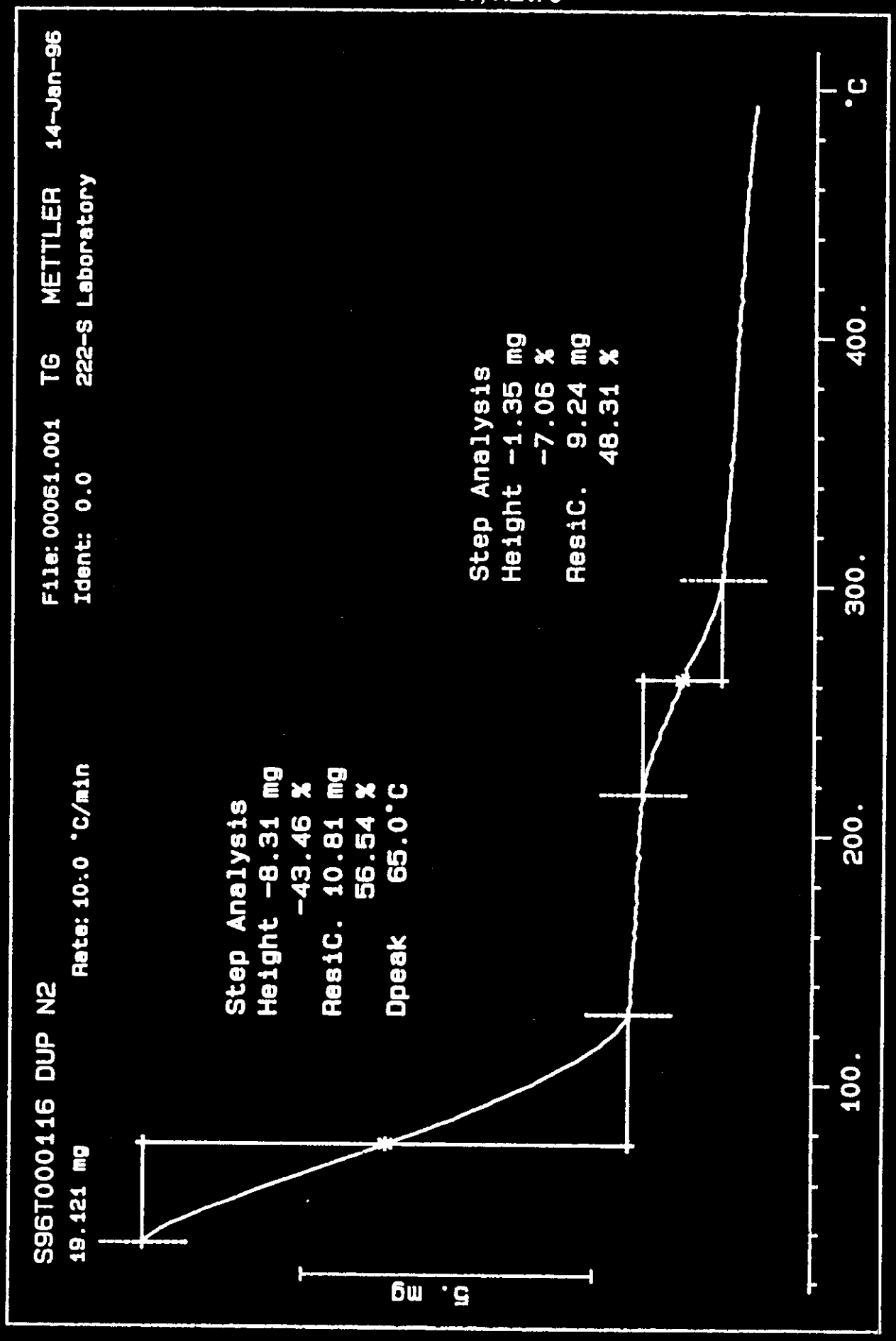


1-14-96


S96T000112 N2
31.552 mg
Rate: 10.0 °C/min
File: 00055.001 TG METTLER 14-Jan-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -12.51 mg
-39.64 %
Resic. 19.04 mg
60.36 %
Dpeak 123.0°C
Step Analysis
Height -2.97 mg
-9.40 %
Resic. 15.88 mg
50.34 %
Dpeak 267.0°C
10. mg
100.
200.
300.
400.
°C


S96T000112 DUP N2
41.343 mg
Rate: 10.0 °C/min
File: 00057.001 TG METTLER 14-Jan-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -13.54 mg
-32.75 %
Resic. 27.80 mg
67.25 %
Dpeak 117.0°C
Step Analysis
Height -5.79 mg
-13.99 %
Resic. 21.77 mg
52.66 %
Dpeak 293.0°C
10. mg
100.
200.
300.
400.
°C


S96T000116 N2
36.837 mg
Rate: 10.0 °C/min
File: 00059.001 TG METTLER 14-Jan-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -14.33 mg
-38.90 %
ResiC. 22.51 mg
61.10 %
Dpeak 103.0°C
Step Analysis
Height -3.36 mg
-9.13 %
ResiC. 18.84 mg
51.16 %
10. mg
100.
200.
300.
400.
°C


S96T000116 DUP N2
19.121 mg
Rate: 10.0 °C/min
File: 00061.001 TG METTLER 14-Jan-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -8.31 mg
-43.46 %
ResiC. 10.81 mg
56.54 %
Dpeak 65.0°C
Step Analysis
Height -1.35 mg
-7.06 %
ResiC. 9.24 mg
48.31 %
5. mg
100.
200.
300.
400.
°C

RADIOCHEMICAL ANALYSES

LABCORE Data Entry Template for Worklist# 4862

Analyst: DPB **Instrument:** AB00 14 **Book#** 14B56

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@ALPHA01	SOLID		
2	BLNK-PREP				@ALPHA01	SOLID		
3	BLNK/BKG				@ALPHA01	SOLID		
4	SAMPLE	S96T000113	0	F	@ALPHA01	SOLID	96000007	BX-106 (A)
	Analytes Requested:				ALPHA01 , ALPHA01E			
5	DUP	S96T000113	0	F	@ALPHA01	SOLID		
6	SPK	S96T000113	0	F	@ALPHA01	SOLID		
7	SAMPLE	S96T000117	0	F	@ALPHA01	SOLID	96000008	BX-106 (A)
	Analytes Requested:				ALPHA01 , ALPHA01E			
8	DUP	S96T000117	0	F	@ALPHA01	SOLID		
9	SPK	S96T000117	0	F	@ALPHA01	SOLID		

Final page for worklist # 4862

Jamal P. Bromley 1/13/96 1620
Analyst Signature / Date

C.J. Jones 1/15/96
Analyst Signature Date

M S Brei 1/16/96

Data Entry Comments:

Low SPK recoveries are acceptable due to low sample alpha activity. No rerun requested.

1/16/96

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

LABCORE Completed Worklist Report for Worklist# 4862

Analyst: dpb **Instrument:** AB14 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@ALPHA01	ALPHA01	SOLID	1.54E-05	1.39E-5	90.260	% Recovery
1	STD		0		@ALPHA01	ALPHA01E	SOLID	1.00	4.30E+00	4.300	% Ct. Error
2	BLNK-PREP		0		@ALPHA01	ALPHA01	SOLID	1	<4.07E-2		uCi/g
2	BLNK-PREP		0		@ALPHA01	ALPHA01E	SOLID	1.00	5.00E+02	500.000	% Ct. Error
3	BLNK/BKG		0		@ALPHA01	ALPHA01	SOLID	1.00E+00	1.22E+00	1.220	uCi/g
4	SAMPLE	S96T000113	0	F	@ALPHA01	ALPHA01	SOLID	N/A	6.52E-01	6.030e-002	uCi/g
4	SAMPLE	S96T000113	0	F	@ALPHA01	ALPHA01E	SOLID	N/A	1.49E+01	0.000	% Ct. Error
5	DUP	S96T000113	0	F	@ALPHA01	ALPHA01	SOLID	6.52E-1	5.86E-1	10.660	RPD
5	DUP	S96T000113	0	F	@ALPHA01	ALPHA01E	SOLID	1.00	1.53E+01	15.300	% Ct. Error
6	SPK	S96T000113	0	F	@ALPHA01	ALPHA01	SOLID	3.92E-02	3.12E-02	79.590	% Recovery
7	SAMPLE	S96T000117	0	F	@ALPHA01	ALPHA01	SOLID	N/A	5.43E-01	6.240e-002	uCi/g
7	SAMPLE	S96T000117	0	F	@ALPHA01	ALPHA01E	SOLID	N/A	1.74E+01	0.000	% Ct. Error
8	DUP	S96T000117	0	F	@ALPHA01	ALPHA01	SOLID	5.43E-1	5.77E-1	6.070	RPD
8	DUP	S96T000117	0	F	@ALPHA01	ALPHA01E	SOLID	1.00	1.67E+01	16.700	% Ct. Error
9	SPK	S96T000117	0	F	@ALPHA01	ALPHA01	SOLID	3.92E-02	3.10E-02	79.080	% Recovery

Final page for worklist# 4862

Analyst Signature Date

Analyst Signature Date

1/22/96

Reviewer Signature Date

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

WORKBOOK PAGE: STD1

AT : LA-508-101 (D-2) STANDARD

			STANDARD	REPLICATE
DETECTOR NUMBER			14	14
DISH SIZE (1 , 2 , or 5)	(MS)		2	2
GROSS COUNTS	(GC)		2133	2106
COUNT TIME in MINUTES	(CT)		30	30
BACKGROUND in cpm	(BKG)		0.37	0.37
SAMPLE SIZE in mL	(SS)		10.000	10.000
DILUTION FACTOR	(DF)		1	1
STANDARD BOOK NUMBER	(Std BN)		14B56	14B56
EFFICIENCY FACTOR	(EFF)		0.2274	0.2274
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE			70.730	69.830
Standard Value in µCi/mL			1.54E-05	
Concentration in µCi/L		=	1.40E-02	
Replicate Concentration in µCi/L		=	1.38E-02	
AVERAGE CONCENTRATION in µCi/L		=	1.3922E-02	

Type	STD
Work List	4862
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	LIQUID
Batch Number	96000313
Rerun	0
Sample Prep	N/A
Sample #	WL#4862
Instrument Code	WB27807
Prepared By	CJO
Chemist	SLF
Analyst	DPB
Date Complete	01/15/96
Analysis Date	01/13/96
Analysis Time	04:20 PM
Sample Point	BX-106

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100

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

			DETECTION LEVEL
ALPHA TOTAL CONCENTRATION in µCi/mL		1.39E-05	1.21E-07 µCi/mL
RELATIVE COUNTING ERROR	=	4.3%	

Analyst:	CJO	Date: 15-Jan-96	
Signature of Chemist:	SLF	Date: 1/16/96	

STANDARD.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: BLANK2

AT : LA-508-101 (D-2) SOLIDS

			BLNK-PREP	REPLICATE
DETECTOR NUMBER			14	14
DISH SIZE (1 , 2 , or 5)		(MS)	2	2
GROSS COUNTS		(GC)	12	15
COUNT TIME in MINUTES		(CT)	30	30
BACKGROUND in cpm		(BKG)	0.37	0.37
SAMPLE SIZE in mL		(SS)	0.100	0.100
DILUTION FACTOR		(DF)	11	11
DIGEST GRAMS of SOLIDS / L		(Dg/L)	2.1992	2.1992
EFFICIENCY FACTOR		(EFF)	0.2274	0.2274
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE			0.294	0.411

Blank Concentration in µCi/g	<	2.92E-02
Replicate Concentration in µCi/g	<	4.07E-02
Maximum Concentration in µCi/g	<	4.0720E-02

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/g = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/µCi)

Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100

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

v RESULTS v

ALPHA TOTAL	in µCi/g	< 4.07E-02	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.			
RELATIVE COUNTING ERROR		500.0%	6.03E-02 µCi/g

Type	BLNK-PREP
Work List	4862
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	SOLID
Batch Number	96000313
Rerun	0
Sample Prep	N/A
Sample #	WL#4862
Instrument Code	WB27807
Prepared By	CJO
Chemist	SLF
Analyst	DPB
Date Complete	01/15/96
Analysis Date	01/13/96
Analysis Time	04:20 PM
Sample Point	BX-108

Analyst: CJO Date: 15-Jan-96

Signature of Chemist: SLF Date: 1/16/96

BLANK.WB1 Rev. 1.0 5081Q1ML

WORKBOOK PAGE: SAM4

AT : LA-508-101 (D-2) SOLIDS

			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		14	14
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	214	203
4862	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.37	0.37
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Test Code	DILUTION FACTOR	(DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L	(Dg/L)	2.1992	2.1992
Matrix	EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		6.763	6.397

Blank Concentration in µCi/g	6.70E-01
Replicate Concentration in µCi/g	6.34E-01
Average Concentration in µCi/g	6.5194E-01

Batch Number: 96000313
Rerun: 0
Sample Prep: FUSION01
Sample #: S96T000113
Instrument Code: WB27807
Prepared By: CJO
Chemist: SLF
Analyst: DPB
Date Complete: 01/15/96
Analysis Date: 01/13/96
Analysis Time: 04:20 PM
Sample Point: BX-106

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/g = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/µCi)

Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100

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

v RESULTS v

			DETECTION LEVEL
ALPHA TOTAL	in µCi/g	6.52E-01	6.03E-02 µCi/g
RELATIVE COUNTING ERROR		14.9%	

Analyst: CJO Date: 15-Jan-96

Signature of Chemist: SLF Date: 1/16/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: DUP5

AT : LA-508-101 (D-2) SOLIDS

			DUP	REPLICATE
DETECTOR NUMBER			14	14
DISH SIZE (1 , 2 , or 5)		(MS)	2	2
GROSS COUNTS		(GC)	194	200
COUNT TIME in MINUTES		(CT)	30	30
BACKGROUND in cpm		(BKG)	0.37	0.37
SAMPLE SIZE in mL		(SS)	0.100	0.100
DILUTION FACTOR		(DF)	11	11
DIGEST GRAMS of SOLIDS / L		(Dg/L)	2.3032	2.3032
EFFICIENCY FACTOR		(EFF)	0.2274	0.2274
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE			6.097	6.297

Blank Concentration in µCi/g	5.77E-01
Replicate Concentration in µCi/g	5.96E-01
Average Concentration in µCi/g	5.8624E-01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/g = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/µCi)

Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100

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

v RESULTS v

			DETECTION LEVEL
ALPHA TOTAL	in µCi/g	5.86E-01	5.76E-02 µCi/g
RELATIVE COUNTING ERROR		15.3%	

Type	DUP
Work List	4862
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	SOLID
Batch Number	96000313
Rerun	0
Sample Prep	FUSION01
Sample #	S96T000113
Instrument Code	WB27807
Prepared By	CJO
Chemist	SLF
Analyst	DPB
Date Complete	01/15/96
Analysis Date	01/13/96
Analysis Time	04:20 PM
Sample Point	BX-106

Analyst:		CJO	Date: 15-Jan-96
Signature of Chemist:		SLF	Date: 1/16/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SPIKE6

AT : LA-508-101 (D-2) SPIKED SAMPLE

			SPIKE	REPLICATE
Type	DETECTOR NUMBER		14	14
SPK	DISH SIZE 1 , 2 , or 5	(MS)	2	2
Work List	TOTAL COUNTS	(TC)	49072	45991
4862	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.37	0.37
AT	SAMPLE VOLUME in mL (Spiked Vial)	(SS)	0.100	0.100
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial)	(DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L	(Dg/L)	2.1992	2.1992
Matrix	SPIKE VOLUME in mL	(SVol)	0.100	0.100
SOLID	SPIKE DILUTION FACTOR	(SDF)	1	1
Batch Number	SPIKE BOOK NUMBER	(Spk BN)	119B43	119B43
96000313	SPIKE VALUE in µCi/mL	(SVal)	3.9211E-02	3.9211E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
0	SAMPLE + SPIKE µCi/g	(S+S)	1.62E+02	1.52E+02
Sample Prep	AVERAGE or MAXIMUM µCi/g in SAMPLE		6.5194E-01	
FUSION01				
Sample #				
S96T000113				
Instrument Code				
WB27807				
Prepared By				
CJO				
Chemist				
SLF				
Analyst				
DPB				
Date Complete				
01/15/96				
Analysis Date				
01/13/96				
Analysis Time				
04:20 PM				
Sample Point				
BX-106				

Rs (Sample Count Rate) = (TC / CT) - BKG

SAMPLE + SPIKE µCi/g = Rs * 1000mL/L * DF / (EFF * SS * Dg/L *2220000dpm/µCi)

QC ACTUAL = SVal

QC FOUND = (((S+S µCi/g - SAMPLE µCi/g) * ((SDF/(SVol*1000))/(DF/SS/Dg/L))))

PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) *100

QC ACTUAL	=	3.92E-02
QC FOUND	=	3.12E-02
AVG. PERCENT SPIKE RECOVERY	=	79.7%

Analyst:	CJO	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/16/96

SPIKE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SAM7

AT : LA-508-101 (D-2) SOLIDS

			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		14	14
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	158	182
4862	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.37	0.37
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Test Code	DILUTION FACTOR	(DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L	(Dg/L)	2.1248	2.1248
Matrix	EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		4.897	5.697

Batch Number	
96000313	Blank Concentration in µCi/g 5.02E-01
Rerun	Replicate Concentration in µCi/g 5.84E-01
0	Average Concentration in µCi/g 5.4317E-01
Sample Prep	
FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL µCi/g = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/µCi)
S96T000117	
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
CJO	
Chemist	v RESULTS v
SLF	ALPHA TOTAL in µCi/g 5.43E-01
Analyst	
DPB	
Date Complete	
01/15/96	RELATIVE COUNTING ERROR 17.4%
Analysis Date	
01/13/96	
Analysis Time	
04:20 PM	
Sample Point	
BX-106	

DETECTION LEVEL
6.24E-02 µCi/g

Analyst:		CJO	Date: 15-Jan-96
Signature of Chemist:		SLF	Date: 1/16/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: DUP8

AT : LA-508-101 (D-2) SOLIDS

			DUP	REPLICATE
Type	DETECTOR NUMBER		14	14
DUP	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	178	169
4862	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.37	0.37
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Test Code	DILUTION FACTOR	(DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L	(Dg/L)	2.044	2.044
Matrix	EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
SOLID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		5.563	5.263

Batch Number	
96000313	Blank Concentration in µCi/g 5.93E-01
Rerun	Replicate Concentration in µCi/g 5.61E-01
0	Average Concentration in µCi/g 5.7708E-01
Sample Prep	
FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL µCi/g = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/µCi)
S96T000117	
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
CJO	
Chemist	v RESULTS v
SLF	ALPHA TOTAL in µCi/g 5.77E-01
Analyst	
DPB	
Date Complete	
01/15/96	RELATIVE COUNTING ERROR 16.7%
Analysis Date	
01/13/96	
Analysis Time	
04:20 PM	
Sample Point	
BX-106	

DETECTION LEVEL
6.49E-02 µCi/g

Analyst:		CJO	Date: 15-Jan-96
Signature of Chemist:		SLF	Date: 1/16/96

SAMPLE.WB1 Rev. 1.0 508101ML

AT : LA-508-101 (D-2) SPIKED SAMPLE

			SPIKE	REPLICATE
DETECTOR NUMBER			14	14
DISH SIZE 1 , 2 , or 5		(MS)	2	2
TOTAL COUNTS		(TC)	48316	46054
COUNT TIME in MINUTES		(CT)	30	30
BACKGROUND in cpm		(BKG)	0.37	0.37
SAMPLE VOLUME in mL	(Spiked Vial)	(SS)	0.100	0.100
SAMPLE DILUTION FACTOR	(Spiked Vial)	(DF)	11	11
DIGEST GRAMS of SOLIDS / L		(Dg/L)	2.1248	2.1248
SPIKE VOLUME in mL		(SVol)	0.100	0.100
SPIKE DILUTION FACTOR		(SDF)	1	1
SPIKE BOOK NUMBER		(Spk BN)	119B43	119B43
SPIKE VALUE in µCi/mL		(SVal)	3.9211E-02	3.9211E-02
INSTRUMENT EFFICIENCY FACTOR		(EFF)	0.2274	0.2274
SAMPLE + SPIKE µCi/g		(S+S)	1.65E+02	1.57E+02
AVERAGE or MAXIMUM µCi/g in SAMPLE			5.4317E-01	

Type	SPK
Work List	4862
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	SOLID
Batch Number	96000313
Rerun	0
Sample Prep	FUSION01
Sample #	S96T000117
Instrument Code	WB27807
Prepared By	CJO
Chemist	SLF
Analyst	DPB
Date Complete	01/15/96
Analysis Date	01/13/96
Analysis Time	04:20 PM
Sample Point	BX-106

Rs (Sample Count Rate) = (TC / CT) - BKG

SAMPLE + SPIKE µCi/g = Rs * 1000mL/L * DF / (EFF * SS * Dg/L *2220000dpm/µCi)

QC ACTUAL = SVal

QC FOUND = (((S+S µCi/g - SAMPLE µCi/g) * ((SDF/(SVol*1000))/(DF/SS/Dg/L))))

PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) *100

QC ACTUAL	=	3.92E-02
QC FOUND	=	3.10E-02
AVG. PERCENT SPIKE RECOVERY	=	79.2%

Analyst:		CJO	Date: 15-Jan-96
Signature of Chemist:		SLF	Date: 1/16/96

SPIKE.WB1 Rev. 1.0 508101MQ

DISTRIBUTION SHEET

To Distribution	From Characterization Plans, Coordination and Reports	Page 1 of 1
		Date: 01-22-96
Project Title/Work Order WHC-SD-WM-DP-167, REV. 0, "45-Day Safety Screening Results and Final Report for Tank 241-BX-106, Auger Samples 95-AUG-049 and 95-AUG-050"		EDT NO.: 614774
		ECN NO.: N/A

Name	MSIN	Text With all Attach	EDT/ECN ONLY
Pacific Northwest Laboratory			
J. R. Gormsen	K7-28		X
S. J. Harris	K7-22	X	
K. L. Silvers	P7-27		X
U.S. Department of Energy, RL			
C. A. Babel	S7-54	X	
Westinghouse Hanford Company			
J. N. Appel	G3-21		X
H. Babad	S7-30	X	
S. D. Estey	R2-11	X	
G. D. Forehand	S7-31		X
V. W. Hall	T6-03	X	
J. E. Hyatt	S3-31	X	
D. C. Hetzer	S6-31		X
L. Jensen	R2-12	X	
N. W. Kirch	R2-11	X	
M. J. Kupfer	H5-49	X	
J. E. Meacham	S7-15	X	
K. L. Powell	T6-04		X
L. M. Sasaki	R2-12	X	
L. W. Shelton	H5-49	X	
B. C. Simpson	R2-12		X
M. J. Sutey	T4-07	X	
J. A. Voogd	H5-03		X
Central Files	A3-88	2	
EDMC	H6-08	X	
LTIC	T6-03		X
TCRC	R2-12	X	
TFIC (Tank Farm Information Center)	R1-20		X
Washington State Department of Ecology			
Single-Shell Tank Unit Manager			
A. B. Stone	B5-18	X	
U. S. Department of Energy			
Jim Poppiti 12800 Middlebrook Rd. Trevion II, EM-36 Germantown, MD 20874			X
Los Alamos Technical Associates			
T. T. Tran 309 Bradley Blvd. Richland, WA 99352		X	