142

0025698
13718



P.O. Box 1970 Richland, WA 99352

# 222-S Analytical Laboratory

**Project:** 242-A EVAPORATOR FEED CHARACTERIZATION

**Tank:** 103AP

**Customer Id. Number:** 3AP891-8

**Report Revision:** 0

**Date Printed:** June 9, 1992

BEST AVAILABLE COPY



Hanford Operations and Engineering Contractor for the US Department of Energy

THIS PAGE INTENTIONALLY
LEFT BLANK

# TABLE OF CONTENTS

**Cover Page** . . . . . 1
**Table of Contents** . . . . . 2
**Signature Page** . . . . . 3
**Narrative** . . . . . 4
**Detection Limits** . . . . . 5.3
**Sampling and Custody Data** . . . . . 7
**Sample Data Summary** . . . . . 21
Summary Data Report . . . . . 22
**Undigested Sample Analysis Results** . . . . . 24
Specific Gravity Analysis . . . . . 26
Differential Thermal Analysis . . . . . 29
Total Organic Carbon Analysis . . . . . 40
Total Inorganic Carbon Analysis . . . . . 46
Ammonia Analysis . . . . . 52
Determination of Hydroxide Ions in Solution Analysis . . . . . 54
Cyanide Analysis . . . . . 60
Atomic Absorption Analysis
Arsenic . . . . . 64
Mercury . . . . . 69
Selenium . . . . . 75
Ion Chromatographic Analysis
Chloride . . . . . 80
Fluoride . . . . . 82
Nitrate . . . . . 84
Nitrite . . . . . 86
Phosphate . . . . . 88
Sulfate . . . . . 90
Gamma Energy Analysis . . . . . 112
**Acid Digestion Analysis Results** . . . . . 132
Acid Digestion . . . . . 134
Inductively Coupled Plasma Spectrographic Analysis . . . . . 136

**This report consists of pages 1 through 198, plus pages 5.1-5.23, and 6.1-6.3.**

THIS PAGE INTENTIONALLY
LEFT BLANK

# S I G N A T U R E  P A G E

I have reviewed the Inorganic and Radiochemistry results reported in this data package (when applicable). The results meet the requirements of "242-A Evaporator Feed Characterization Project - Statement of Work" - WHC-SOW-91-0002. This data is an accurate representation of the data generated for the requested laboratory analyses performed.

J. H. Tillman — 9/5/92
J. H. Tillman
242-A Evaporator Project Manager
Date

I have reviewed the compiled report and certify that this data package meets the document standards of the RCRA Data Packaging Procedure LO-150-151. This data package is complete and contains the data generated from the requested laboratory analysis performed on this sample.

L. R. Webb — 9/5/92
L. R. Webb
Records Management Specialist
Data Coordinator
Date

I have reviewed this report and certify that this data package meets the requirements of "Quality Assurance Project Plan for the Chemical Analysis of Highly Radioactive Samples in Support of Environmental Activities on the Hanford Site" - WHC-SD-CP-QAPP-002, unless superseded by the Statement of Work or Waste Characterization Plan. This data package is a complete and accurate representation of the data generated from the requested laboratory analyses performed on this sample based on the QA Review Process.

L. P. Markel — 9/14/92
L. P. Markel
Laboratory Q.A. Officer
Date

The data contained in this hardcopy data package has been approved and authorized for release by the Laboratory Manager or Manager's designee as verified by the following signature.

M. A. Bell — 9/15/92
M. A. Bell
Manager
Processing and Analytical Laboratories
Date

THIS PAGE INTENTIONALLY
LEFT BLANK

# NARRATIVE

9 3 1 2 8 3 2 9 0 9

THIS PAGE INTENTIONALLY
LEFT BLANK

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

# 242-EVAPORATOR FEED CHARACTERIZATION

## INORGANIC CASE NARRATIVE

### Introduction

The analysis of samples in support of the 242-A Evaporator Feed Characterization Project for Fiscal Year 1991, was performed by the 222-S Laboratory during the last quarter of 1991 and completed during the first quarter of 1992. Samples received and analyzed for the inorganic and conventional parameters were performed using methods specified in the Statement of Work (SOW), WHC-SOW-91-0002 Westinghouse Hanford Company, 242-A Evaporator Feed Characterization Project Fiscal Year 1991, September 1991.

Samples submitted to the laboratory were identified as:

1. TK-102-AW (referred to as 102AW in the remainder of this report) the feed tank prior to the evaporator.

2. TK-106-AW (referred to as 106AW in the remainder of this report) one of the candidate feed tanks into 102AW.

3. TK-103-AP (referred to as 103AP in the remainder of this report) the other candidate feed tank into 102AW.

The inorganic constituents requested for analysis on the three tanks were divided into the following categories; metals by Inductively Coupled Plasma (ICP), metals by Atomic Absorption Spectroscopy (AAS), and conventional parameters by specified methods. The results were obtained using approved methods as specified in Table I of the SOW. Quality analyses, including number and frequency, were performed in accordance to guidance found in Table 2 of the SOW. The parameters analyzed for from the three tanks are:

### Metals by ICP

| | |
|---|---|
| Silver | Ag |
| Aluminum | Al |
| Barium | Ba |
| Cadmium | Cd |
| Chromium | Cr |
| Iron | Fe |
| Magnesium | Mg |
| Manganese | Mn |
| Sodium | Na |
| Lead | Pb |
| Zinc | Zn |



9 3 1 2 3 3 2 9 1 0

Metals (AAS)

| | |
|---|---|
| Arsenic | As |
| Selenium | Se |
| Mercury | Hg |

Conventionals (IC)

| | |
|---|---|
| Fluoride | F |
| Chloride | Cl |
| Nitrite | NO2 |
| Nitrate | NO3 |
| Phosphate | PO4 |
| Sulfate | SO4 |

Conventional (Specified Methods)

| | |
|---|---|
| Total Organic Carbon | TOC |
| Total Inorganic Carbon | TIC |
| Cyanide | CN |
| Hydroxide | OH |
| Ph | |
| Specific Gravity | SpG |
| Differential Scanning Calorimetry | DSC |

The analysis of the samples for Cyanide, Total Ammonia, Total Inorganic Carbon (TIC), Specific Gravity, and Differential Scanning Calorimetry (DSC) were performed using methods traceable to ASTM or EPA. All other analytes were determined based on EPA SW-846 methods or current approved WHC golden rod procedures.

The Quality Objectives and requirements for this work effort were set to achieve the highest quality data. Factors relevant to sample matrix and the applicability of the methods to these complex matrices of samples from the evaporator candidate and feed tanks may have lead to biased results for some analytes of concern. The Quality Objectives were:

1. Matrix Spike and Matrix Spike Duplicate per batch or for no more than 20 samples which ever is less. The calculated Percent Recovery for these analyses to be within 75 to 125% and the Relative Percent Difference (RPD) must not exceed ± 20%.

2. One sample in twenty was to be analyzed in duplicate where specified. The duplicate results must agree with an RPD of ± 20%.

3. A blank must be run for each batch or for every 20 samples.

John H. Tillman 9/5/92

J. H. Tillman, Manager
Inorganic Chemistry PAL

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

# 242-EVAPORATOR FEED CHARACTERIZATION

## INORGANICS CASE NARRATIVE

**Problems encountered:**

Samples from the two candidate and one feed tank into the evaporator were received into the 222-S laboratory during the laboratory's transition period from process to environmental analysis. This transition period signaled a change in the analytical protocols required to meet different, and in some cases, more stringent conditions. Most of the problems encountered during this work effort can be attributed to the response of the laboratory to these changing requirements. Nevertheless, the data generated for these samples was obtained using the best available laboratory practice at the time of sample analysis. The following problems were observed to have occurred throughout the samples submitted from tanks 102AW, 103AP, and 106AW:

(1) In a few cases, the analytical data cards are not corrected with one line, an initial and a date. Also, due to insufficient training, the chemists signed the analytical data card in the incorrect location. Though the analytical data cards were signed by the cognizant chemists, they were often signed in the inappropriate location on the card. This indicated the need for appropriate training to address this problem. This training effort has begun.

The Extension "1621" on the data cards represent an old extension which specifically denotes "TOC" analysis.

(2) <u>Instrument Detection Limits (IDL).</u> Detection limits for the parameters determined were obtained using the method prescribed by the US EPA. The instrument detection limits for the metals determined by Inductively Coupled Plasma (ICP), Atomic Absorption (AA), Ion Chromatograph (IC) and classical methods are obtained from an aqueous matrix. The instrument detection limits for the analytes on actual evaporator feed or candidate tanks would probably be higher due to matrix efforts. The standards used to prepare the solutions for the detection limit determinations were obtained from bonifide and reliable sources. The procedure basically requires the analysis of seven replicates of the analyte at a concentration two times the noise level for the instrument. Following this protocol, the instrument detection limits were met or exceeded when compared to the IDC's in the Request for Special Analyses (RSA). Typical instrument detection limits obtained during this work effort are listed below:



Hanford Operations and Engineering Contractor for the US Department of Energy

| Analyte | Detection Limit (ppm) Required | Actual |
|---|---|---|
| Arsenic (As) | 5 | .005 |
| Cyanide (CN) | .10 | .010 |
| Mercury (Hg) | .20 | .002 |
| Ammonia (NH4) | 500 | .100 |
| Hydroxide (OH-) | 1700 | 17.000 |
| Selenium (Se) | 1 | .005 |
| Total Inorganic Carbon (TIC) | 5000 | 5.000 |
| Total Organic Carbon (TOC) | 500 | 5.500 |
| Fluoride (F) | 6000 | .090 |
| Nitrate (NO3) | 5000 | .240 |
| Chloride (Cl) | 4000 | .040 |
| Nitrite (NO2) | 5000 | .180 |
| Phosphate (PO4) | 10000 | .130 |
| Sulfate (SO4) | 10000 | .130 |
| Aluminum (Al) | 50 | .075 |
| Barium (Ba) | 2 | .003 |
| Cadmium (Cd) | 1 | .004 |
| Chromium (Cr) | 5 | .004 |
| Iron (Fe) | 10 | .007 |
| Lead (Pb) | 5 | .030 |
| Magnesium (Mg) | 1 | .0001 |
| Manganese (Mn) | 2 | .001 |
| Silver (Ag) | 5 | .018 |
| Sodium (Na) | 60 | .048 |
| Zinc (Zn) | 2 | .002 |

Detection limits for the analytes required in the Statement of Work are listed for each set of samples. These instrument detection limits vary according to the analyte and instrument and were generated in accordance with the Request for Special Analysis (RSA), the internal memo, "Recommendations for Tank Farm Waste Analysis" by T. D. Blankenship, dated November 26, 1990, and references the document, "Detection Limit Package, Appendix B" for the 241-U-110 Single Shell Tank Waste Characterization data package, dated August 9, 1991. The detection limit study performed for Core 5 followed recommended EPA protocol.

J. H. Tillman 9/5/92

J. H. Tillman, Manager
Inorganic Chemistry PAL



5.3

## Detection Limits of Radionuclides

Listed below are the detection limits for indicated radionuclides for sample R943.

| Radionuclide | DL uCi/L |
|---|---|
| Co-60 | $1.3 \times 10^{+1}$ |
| Cs-134 | $9.0 \times 10^{+0}$ |
| Cs-137 | $1.4 \times 10^{+1}$ |
| Ce-144 | $7.8 \times 10^{+1}$ |
| Eu-154 | $2.6 \times 10^{+1}$ |
| Eu-155 | $2.5 \times 10^{+1}$ |
| Nb-94 | $9.0 \times 10^{+0}$ |
| Ra-226* | $1.5 \times 10^{+1}$ |
| Ru-106 | $1.4 \times 10^{+2}$ |
| Sn-113 | $1.0 \times 10^{+1}$ |

*Based on the gamma peak of daughter Bi-204

These limits are based on the background spectrum of the Ge detector which was used for counting of the above mentioned sample. The data reduction of the background gamma spectrum was done under the same parameters (sample size, sample geometry, and counting time) as used for the sample. Note that the limits will change in the sample depending on the presence of other radionuclides, their gamma-ray energies, intensities, and their levels of activity.

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

# 242-EVAPORATOR FEED CHARACTERIZATION

## INORGANICS CASE NARRATIVE

## TANK: 103AP

**Problems encountered:**

A Non-Conformance Report (NCR) was generated for three samples from Tank 103AP. The samples involved were 3AP891-1, 3AP891-2 and 3AP891-3. Sample 3AP891-1 and 3AP891-2 were received into the laboratory with the custody seal improperly attached. The client reviewed these sample containers and granted permission to proceed with the analysis for 3AP891-1 and 3AP891-2 because the custody seals were over the locking pin, indicating sample integrity was preserved. Sample 3AP891-3 was resampled and replaced by Sample 3AP1191-1. This sample was analyzed for the parameters stated. Please reference NCR #B06110, dated September 19, 1991. In addition, the custody seal for Sample 3AP891-1 (R933) was not on properly. This sample was approved for analysis after consideration and review by the client.

3AP891-8 (R943)

The value for Eu 155 as >4.74E+1 on the analytical card should read <4.74E+1. The data reported on page 22 is correct.

The percent deviations for Aluminum, Sodium and Silver were outside the control limits of ±25%.

| Analyte | Percent Deviation | |
|---|---|---|
| | Initial | Final |
| Aluminum | -- | 133 |
| Sodium | 148.8 | 180 |
| Silver | 38.2 | -- |

John H. Tillman 9/12/92

John Tillman, Manager
Inorganic Chemistry PAL

5.4

Westinghouse
Hanford Company

Internal
Memo

From: Office of Sample Management 16500-90-090
Phone: 3-3869 MO-346/200W T6-08
Date: November 26, 1990
Subject: RECOMMENDATIONS FOR TANK FARM WASTE ANALYSES

To: T. D. Blankenship R1-62

cc: J. D. Briggs JEA for T6-14
J. A. Eacker R1-51
D. L. Halgren R1-51
J. H. Kessner T6-08
E. J. Kosiancic SO-61
C. R. Stroup T6-07
RLW File/LB

Reference: Internal Memo, T. D. Blankenship to E. J. Kosiancic, "Tank Farm Waste Analysis Requirements," dated September 10, 1990.

The referenced Internal Memo requests information regarding laboratory analytical capacity for a variety of analytes to support Tank Farm and Evaporator operations. Specific comments and suggestions for each have been prepared along with information on suggested minimum quantitation limits (MQLs) for the needed analyses and recommended reporting formats. With the exception of $Nb^{94}$, all requested analyses are currently performed on-site. Laboratory capacity exists to support these programs if sufficient prescheduling of activities is done to coordinate with times of high sample throughput in the laboratory (e.g., single shell tank sampling).

The discussions that follow are based on the assumption that the laboratory will be performing "standard" regulatory type analysis. Analysis MQLs are based on proven laboratory experience, turnaround times are based on requirements in the Tri-Party agreement, and reporting/validation formats based on WHC-CM-5-3, Section 2.0, "Data Validation for RCRA Analyses." This information is summarized in the following attached tables:

| | |
|---|---|
| Table 1 | MQLs for Inorganic Analysis |
| Table 2 | MQLs for Radionuclide Analysis |
| Table 3 | MQLs for Organic Analysis (these are CLP requirements but will form the basis for all organic analysis) |
| Table 4 | Sample Turnaround Times |
| Table 5 | Result Reporting/Validation |
| Table 6 | Validation Criteria - Generic Data Quality Objectives (DQOs) |

If specific needs different from this standard are required for a given program, these needs must be defined in the program's Waste Analysis Plan (WAP) or equivalent documentation and negotiated with the laboratory to assure

TPZ 9-12-92
~~5.4~~
5.5

9412 2 5 3 2 9 1 5

compliance. While it is expected that in most cases specific needs will be more stringent, if less stringent requirements are appropriate, these should also be defined in the WAP. This could significantly reduce analytical costs and turnaround times.

Characterization of Waste Streams Discharged to Double Shell Tanks (DSTs):

These streams are from ongoing operations of the site and will need analysis for two requirements; verification of compliance to tank farm storage specifications (processing parameters), and determination of composition for regulatory based designation of the waste (hazardous waste designation). Processing parameter based analysis will be equivalent to current practice and should be predefined using laboratory "routine set" analysis. The analysis will be performed under the quality assurance requirements of NQA-1 with typical result turnarounds of 1 to 5 days. Results will be available via the laboratory reporting system (LCCS).

Analysis of the samples to meet the needs for hazardous waste designation will require more stringent quality assurance than for processing parameters. Those components that fall under both needs will likely be required to be analyzed by both protocols. Unfortunately, analysis turnaround times for designation will likely exceed needs for normal processing parameters. If processing parameter analysis results show a component to significantly exceed a hazardous waste designation limit (e.g., a sample is sufficiently caustic to qualify as a extremely hazardous waste based on corrosiveness) reanalysis of the sample under the more stringent protocols would not be necessary. In no case will analysis performed to processing parameter protocols be suitable for designation as an intermediate level or as nonhazardous waste.

DST Characterization Analysis:

All of these analyses will be required to be performed to hazardous waste designation protocols. Currently, no analytical capacity exists to perform $Nb^{94}$ analysis. This long lived ($2x10^4$ y) beta emitter is not expected to be present in significant quantities and will require development efforts to analyze for. Addition of total beta (TB) analysis to the analysis request should allow for screening for significant levels of unaccounted for beta activity and assessment of the needs for additional specific beta emitting radionuclide component quantification.

Analysis for $Pu^{238}$ at the 222-S Laboratory is complicated by the presence of this isotope in the spike ($Pu^{236}$) added to the analysis to allow correction for overall yield in the procedure. For most expected samples, $Pu^{238}$ activity will be only a small fraction of the $Pu^{239/240}$ activity and may be approximated using isotopic ratios based on historical irradiated uranium processing.

TFL
9-12-92
~~5.5~~
5.6

Samples having greater than normal $Pu^{238}$ (e.g., associated with previous irradiated thorium processing) activity will be detectable using the current procedures. In these cases, $Pu^{238}$ activity can be quantified either using a special analysis or through determination of isotopic ratios based on mass spectral analysis.

Analysis of Samples for the 242-A Evaporator:

All analyses identified in the Internal Memo appear to be for hazardous waste designation needs. It should be noted that analysis of the vent stack will require the installation of specialized gas sampling equipment.

General Comments:

Analysis of two major hazardous waste designation groups were not requested for any of the streams; semivolatile organics and Toxicity Characteristic Leaching Procedure (TCLP). If these analyses have not been assessed for inclusion in the requested analysis, it is recommended that they are reviewed for inclusion.

The current schedule for implementation of organic analysis capacity at 222-S Laboratory is for early in 1991, most probably after March 1, 1991. Until capacity becomes available at 222-S Laboratory, organic analyses (VOA and TOX) will be performed by the Pacific Northwest Laboratories (PNL). This will require transhipping of samples sent to 222-S Laboratory, but should not seriously affect result turnaround or quality.

Estimated cost information for the requested analyses is shown in Table 7. These costs are based on analysis of organic components at PNL. When organic capability is available at 222-S Laboratory, costs will be reduced slightly. Addition of semivolatile organic analysis to the lists would increase costs $2000 per analysis. Addition of TCLP to the list would increase analysis costs $1500 for those samples containing greater than 1% solids. For liquid only samples, no additional preparation is required for TCLP and the analytes of concern are already included in the analysis requests.

TP2
9-12-92
~~5.6~~
5.7

16500-90-090

If you need any additional information or have any questions, please call me on 3-3869.

Richard L. Weiss

R. L. Weiss, Principal Scientist
Office of Sample Management

jmd

Attachments - 7

CONCURRENCE:

Curtis R. Stroup Date 11/28/90
C. R. Stroup, Manager
Analytical Laboratories

J. D. Briggs for Date 11/29/90
J. D. Briggs, Manager
222-S Analytical Laboratory Complex

TP2
972-92
~~5.7~~
5.8

# TABLE 1
## RECOMMENDED ANALYSIS MINIMUM QUANTITATION LEVELS for TANK FARM WASTE ANALYSES

| Analyte | High Salt Liquid or Solid/Slurry | Low Salt Liquid | Analyte | High Salt Liquid or Solid/Slurry | Low Salt Liquid |
|---|---|---|---|---|---|
| **Analyzed by Inductively Coupled Plasma Spectroscopy (ICP)** | | | | | |
| Al | 50 | 0.5 | As | 20 | 0.2 |
| Ba | 2 | 0.02 | Bi | 100 | 0.5 |
| B | 20 | 0.05 | Cd | 2 | 0.02 |
| Ca | 0.2 | 0.002 | Ce | 100 | 1 |
| Cr | 5 | 0.05 | Co | 20 | 0.2 |
| Cu | 20 | 0.2 | Eu | 2 | 0.02 |
| Fe | 10 | 0.01 | La | 20 | 0.2 |
| Pb | 30 | 0.3 | Li | 3 | 0.03 |
| Mg | 0.1 | 0.001 | Mn | 2 | 0.02 |
| Hg | 5 | 0.05 | Mo | 5 | 0.05 |
| Nd | 250 | 2.5 | Ni | 20 | 0.2 |
| P | 50 | 0.5 | K | 250 | 2.5 |
| Sm | 200 | 2 | Se | 100 | 1 |
| Si | 100 | 0.5 | Ag | 30 | 0.3 |
| Na | 60 | 0.6 | Sr | 2 | 0.02 |
| S | 60 | 0.6 | Ta | 50 | 0.5 |
| Th | 20 | 0.2 | Sn | 2 | 0.02 |
| Ti | 30 | 0.06 | W | 200 | 0.5 |
| U | 1500 | 15 | Zn | 2 | 0.02 |
| Zr | 80 | 0.1 | | | |
| **Analyzed by Specific Atomic Absorption Techniques** | | | | | |
| As | 5 | 0.05 | Hg | 3 | 0.03 |
| Se | 5 | 0.05 | | | |
| **Anion Analysis by DIONEX** | | | | | |
| F | 6000 | 10 | Cl | 4000 | 5 |
| $NO_3$ | 20000 | 10 | $NO_2$ | 20000 | 10 |
| $PO_4$ | 10000 | 10 | $SO_4$ | 10000 | 10 |
| **Specific Analysis** | | | | | |
| $CO_3$ | 5000 | 50 | TOC(carbon) | 5000 | 50 |
| CN | 0.1 | 0.01 | $NH_4$ | 5000 | 50 |
| U | 100 | 1 | TOX(chlorine) | 100 | 10 |
| OH | 0.2 | 0.002 | DSC | * | * |

Values for solids are as ug/g
Values for liquids are as ug/ml
*DSC will be used to screen for the presence of exothermic reactions. Specific quantitation limits are not required for this screening

TFZ 9-12-92
~~5.8~~
5.9

# TABLE 2
## RECOMMENDED ANALYSIS MINIMUM QUANTITATION LEVELS for TANK FARM WASTE ANALYSES

| Analyte | Solid/Slurry | High Salt Liquid | Low Salt Liquid |
|---|---|---|---|
| Alpha Total | 100 | 1 | 0.01 |
| Beta Total | 350 | 3.5 | 0.035 |
| **Radionuclides Analyzed by Gamma Energy Analysis** | | | |
| $Co^{60}$ | 4 | 4 | 0.04 |
| $Cs^{137}$ | 5 | 5 | 0.05 |
| $RuRh^{106}$ | 50 | 50 | 0.5 |
| **Radionuclides Analyzed by Separation with Beta Counting** | | | |
| $H^{3}$ | 75 | 1.5 | 1.5 |
| $C^{14}$ | 50 | 0.5 | 0.25 |
| $Nb^{94}$ | * | * | * |
| $Se^{79}$ | 50 | 0.5 | 0.25 |
| $Sr^{90}$ | 150 | 1.5 | 0.015 |
| $Tc^{99}$ | 250 | 2.5 | 0.025 |
| $I^{129}$ | 900 | 9 | 0.09 |
| **Radionuclides Analyzed by Separation with Alpha Counting/Alpha Energy Analysis** | | | |
| $Pu^{238}$ | 200[1] | 2[1] | 0.02[1] |
| $Pu^{239/240}$ | 50 | 0.5 | 0.005 |
| $Am^{241}$ | 100 | 1 | 0.01 |
| $Cm^{244}$ | 100 | 1 | 0.01 |

Values for solids are as pCi/g
Values for liquids are as pCi/ml

* No current analysis capacity for $Nb^{94}$
[1]Potential interferrence on $Pu^{238}$ analysis from contamination in $Pu^{236}$ spike added to the analysis

TP2 9-12-92
~~5.9~~

# TABLE 3

## TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

| Pesticides/Aroclors | CAS Number | Quantitation Limits* Water ug/L | Soil ug/Kg | On Column (pg) |
|---|---|---|---|---|
| 98. alpha-BHC | 319-84-6 | 0.05 | 1.7 | 5 |
| 99. beta-BHC | 319-85-7 | 0.05 | 1.7 | 5 |
| 100. delta-BHC | 319-86-8 | 0.05 | 1.7 | 5 |
| 101. gamma-BHC (Lindane) | 58-89-9 | 0.05 | 1.7 | 5 |
| 102. Heptachlor | 76-44-8 | 0.05 | 1.7 | 5 |
| 103. Aldrin | 309-00-2 | 0.05 | 1.7 | 5 |
| 104. Heptachlor epoxide | 1024-57-3 | 0.05 | 1.7 | 5 |
| 105. Endosulfan I | 959-98-8 | 0.05 | 1.7 | 5 |
| 106. Dieldrin | 60-57-1 | 0.10 | 3.3 | 10 |
| 107. 4,4'-DDE | 72-55-9 | 0.10 | 3.3 | 10 |
| 108. Endrin | 72-20-8 | 0.10 | 3.3 | 10 |
| 109. Endosulfan II | 33213-65-9 | 0.10 | 3.3 | 10 |
| 110. 4,4'-DDD | 72-54-8 | 0.10 | 3.3 | 10 |
| 111. Endosulfan sulfate | 1031-07-8 | 0.10 | 3.3 | 10 |
| 112. 4,4'-DDT | 50-29-3 | 0.10 | 3.3 | 10 |
| 113. Methoxychlor | 72-43-5 | 0.50 | 17.0 | 50 |
| 114. Endrin ketone | 53494-70-5 | 0.10 | 3.3 | 10 |
| 115. Endrin aldehyde | 7421-36-3 | 0.10 | 3.3 | 10 |
| 116. alpha-Chlordane | 5103-71-9 | 0.05 | 1.7 | 5 |
| 117. gamma-Chlordane | 5103-74-2 | 0.05 | 1.7 | 5 |
| 118. Toxaphene | 8001-35-2 | 5.0 | 170.0 | 500 |
| 119. Aroclor-1016 | 12674-11-2 | 1.0 | 33.0 | 100 |
| 120. Aroclor-1221 | 11104-28-2 | 1.0 | 33.0 | 100 |
| 121. Aroclor-1232 | 11141-16-5 | 2.0 | 67.0 | 200 |
| 122. Aroclor-1242 | 53469-21-9 | 1.0 | 33.0 | 100 |
| 123. Aroclor-1248 | 12672-29-6 | 1.0 | 33.0 | 100 |
| 124. Aroclor-1254 | 11097-69-1 | 1.0 | 33.0 | 100 |
| 125. Aroclor-1260 | 11096-82-5 | 1.0 | 33.0 | 100 |

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Pesticides/Aroclors.

TFZ
9-12-92
~~5.10~~
5.11

TABLE 3 (cont)

(continued)

| Semivolatiles | CAS Number | Quantitation Limits* Water ug/L | Low Soil ug/Kg | Med. Soil ug/Kg | On Column (ng) |
|---|---|---|---|---|---|
| 69. Dibenzofuran | 132-64-9 | 10 | 330 | 10000 | (20) |
| 70. 2,4-Dinitrotoluene | 121-14-2 | 10 | 330 | 10000 | (20) |
| 71. Diethylphthalate | 84-66-2 | 10 | 330 | 10000 | (20) |
| 72. 4-Chlorophenyl-phenyl ether | 7005-72-3 | 10 | 330 | 10000 | (20) |
| 73. Fluorene | 86-73-7 | 10 | 330 | 10000 | (20) |
| 74. 4-Nitroaniline | 100-01-6 | 50 | 1700 | 50000 | (100) |
| 75. 4,6-Dinitro-2-methylphenol | 534-52-1 | 50 | 1700 | 50000 | (100) |
| 76. N-nitrosodiphenylamine | 86-30-6 | 10 | 330 | 10000 | (20) |
| 77. 4-Bromophenyl-phenylether | 101-55-3 | 10 | 330 | 10000 | (20) |
| 78. Hexachlorobenzene | 118-74-1 | 10 | 330 | 10000 | (20) |
| 79. Pentachlorophenol | 87-86-5 | 50 | 1700 | 50000 | (100) |
| 80. Phenanthrene | 85-01-8 | 10 | 330 | 10000 | (20) |
| 81. Anthracene | 120-12-7 | 10 | 330 | 10000 | (20) |
| 82. Carbazole | 86-74-8 | 10 | 330 | 10000 | (20) |
| 83. Di-n-butylphthalate | 84-74-2 | 10 | 330 | 10000 | (20) |
| 84. Fluoranthene | 206-44-0 | 10 | 330 | 10000 | (20) |
| 85. Pyrene | 129-00-0 | 10 | 330 | 10000 | (20) |
| 86. Butylbenzylphthalate | 85-68-7 | 10 | 330 | 10000 | (20) |
| 87. 3,3'-Dichlorobenzidine | 91-94-1 | 10 | 330 | 10000 | (20) |
| 88. Benzo(a)anthracene | 56-55-3 | 10 | 330 | 10000 | (20) |
| 89. Chrysene | 218-01-9 | 10 | 330 | 10000 | (20) |
| 90. bis(2-Ethylhexyl)phthalate | 117-81-7 | 10 | 330 | 10000 | (20) |
| 91. Di-n-octylphthalate | 117-84-0 | 10 | 330 | 10000 | (20) |
| 92. Benzo(b)fluoranthene | 205-99-2 | 10 | 330 | 10000 | (20) |
| 93. Benzo(k)fluoranthene | 207-08-9 | 10 | 330 | 10000 | (20) |
| 94. Benzo(a)pyrene | 50-32-8 | 10 | 330 | 10000 | (20) |
| 95. Indeno(1,2,3-cd)pyrene | 193-39-5 | 10 | 330 | 10000 | (20) |
| 96. Dibenz(a,h)anthracene | 53-70-3 | 10 | 330 | 10000 | (20) |
| 97. Benzo(g,h,i)perylene | 191-24-2 | 10 | 330 | 10000 | (20) |

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits caltulated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TFZ
9-12-92
~~5.11~~

5.12

TABLE 3 (cont)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

| Semivolatiles | CAS Number | Quantitation Limits* Water ug/L | Low Soil ug/Kg | Med. Soil ug/Kg | On Column (ng) |
|---|---|---|---|---|---|
| 34. Phenol | 108-95-2 | 10 | 330 | 10000 | (20) |
| 35. bis(2-Chloroethyl) ether | 111-44-4 | 10 | 330 | 10000 | (20) |
| 36. 2-Chlorophenol | 95-57-8 | 10 | 330 | 10000 | (20) |
| 37. 1,3-Dichlorobenzene | 541-73-1 | 10 | 330 | 10000 | (20) |
| 38. 1,4-Dichlorobenzene | 106-46-7 | 10 | 330 | 10000 | (20) |
| 39. 1,2-Dichlorobenzene | 95-50-1 | 10 | 330 | 10000 | (20) |
| 40. 2-Methylphenol | 95-48-7 | 10 | 330 | 10000 | (20) |
| 41. 2,2'-oxybis (1-Chloropropane)# | 108-60-1 | 10 | 330 | 10000 | (20) |
| 42. 4-Methylphenol | 106-44-5 | 10 | 330 | 10000 | (20) |
| 43. N-Nitroso-di-n-dipropylamine | 621-64-7 | 10 | 330 | 10000 | (20) |
| 44. Hexachloroethane | 67-72-1 | 10 | 330 | 10000 | (20) |
| 45. Nitrobenzene | 98-95-3 | 10 | 330 | 10000 | (20) |
| 46. Isophorone | 78-59-1 | 10 | 330 | 10000 | (20) |
| 47. 2-Nitrophenol | 88-75-5 | 10 | 330 | 10000 | (20) |
| 48. 2,4-Dimethylphenol | 105-67-9 | 10 | 330 | 10000 | (20) |
| 49. bis(2-Chloroethoxy) methane | 111-91-1 | 10 | 330 | 10000 | (20) |
| 50 2,4-Dichlorophenol | 120-83-2 | 10 | 330 | 10000 | (20) |
| 51. 1,2,4-Trichlorobenzene | 120-82-1 | 10 | 330 | 10000 | (20) |
| 52. Naphthalene | 91-20-3 | 10 | 330 | 10000 | (20) |
| 53. 4-Chloroaniline | 106-47-8 | 10 | 330 | 10000 | (20) |
| 54. Hexachlorobutadiene | 87-68-3 | 10 | 330 | 10000 | (20) |
| 55. 4-Chloro-3-methylphenol | 59-50-7 | 10 | 330 | 10000 | (20) |
| 56. 2-Methylnaphthalene | 91-57-6 | 10 | 330 | 10000 | (20) |
| 57. Hexachlorocyclopentadiene | 77-47-4 | 10 | 330 | 10000 | (20) |
| 58. 2,4,6-Trichlorophenol | 88-06-2 | 10 | 330 | 10000 | (20) |
| 59. 2,4,5-Trichlorophenol | 95-95-4 | 50 | 1700 | 50000 | (100) |
| 60. 2-Chloronaphthalene | 91-58-7 | 10 | 330 | 10000 | (20) |
| 61. 2-Nitroaniline | 88-74-4 | 50 | 1700 | 50000 | (100) |
| 62. Dimethylphthalate | 131-11-3 | 10 | 330 | 10000 | (20) |
| 63. Acenaphthylene | 208-96-8 | 10 | 330 | 10000 | (20) |
| 64. 2,6-Dinitrotoluene | 606-20-2 | 10 | 330 | 10000 | (20) |
| 65. 3-Nitroaniline | 99-09-2 | 50 | 1700 | 50000 | (100) |
| 66. Acenaphthene | 83-32-9 | 10 | 330 | 10000 | (20) |
| 67. 2,4-Dinitrophenol | 51-28-5 | 50 | 1700 | 50000 | (100) |
| 68. 4-Nitrophenol | 100-02-7 | 50 | 1700 | 50000 | (100) |

# Previously known by the name bis(2-Chloroisopropyl) ether

## TABLE 3 (cont)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

| Volatiles | CAS Number | Quantitation Limits* Water ug/L | Low Soil ug/Kg | Med. Soil ug/Kg | On Column (ng) |
|---|---|---|---|---|---|
| 1. Chloromethane | 74-87-3 | 10 | 10 | 1200 | (50) |
| 2. Bromomethane | 74-83-9 | 10 | 10 | 1200 | (50) |
| 3. Vinyl Chloride | 75-01-4 | 10 | 10 | 1200 | (50) |
| 4. Chloroethane | 75-00-3 | 10 | 10 | 1200 | (50) |
| 5. Methylene Chloride | 75-09-2 | 10 | 10 | 1200 | (50) |
| 6. Acetone | 67-64-1 | 10 | 10 | 1200 | (50) |
| 7. Carbon Disulfide | 75-15-0 | 10 | 10 | 1200 | (50) |
| 8. 1,1-Dichloroethene | 75-35-4 | 10 | 10 | 1200 | (50) |
| 9. 1,1-Dichloroethane | 75-34-3 | 10 | 10 | 1200 | (50) |
| 10. 1,2-Dichloroethene (total) | 540-59-0 | 10 | 10 | 1200 | (50) |
| 11. Chloroform | 67-66-3 | 10 | 10 | 1200 | (50) |
| 12. 1,2-Dichloroethane | 107-06-2 | 10 | 10 | 1200 | (50) |
| 13. 2-Butanone | 78-93-3 | 10 | 10 | 1200 | (50) |
| 14. 1,1,1-Trichloroethane | 71-55-6 | 10 | 10 | 1200 | (50) |
| 15. Carbon Tetrachloride | 56-23-5 | 10 | 10 | 1200 | (50) |
| 16. Bromodichloromethane | 75-27-4 | 10 | 10 | 1200 | (50) |
| 17. 1,2-Dichloropropane | 78-87-5 | 10 | 10 | 1200 | (50) |
| 18. cis-1,3-Dichloropropene | 10061-01-5 | 10 | 10 | 1200 | (50) |
| 19. Trichloroethene | 79-01-6 | 10 | 10 | 1200 | (50) |
| 20. Dibromochloromethane | 124-48-1 | 10 | 10 | 1200 | (50) |
| 21. 1,1,2-Trichloroethane | 79-00-5 | 10 | 10 | 1200 | (50) |
| 22. Benzene | 71-43-2 | 10 | 10 | 1200 | (50) |
| 23. trans-1,3-Dichloropropene | 10061-02-6 | 10 | 10 | 1200 | (50) |
| 24. Bromoform | 75-25-2 | 10 | 10 | 1200 | (50) |
| 25. 4-Methyl-2-pentanone | 108-10-1 | 10 | 10 | 1200 | (50) |
| 26. 2-Hexanone | 591-78-6 | 10 | 10 | 1200 | (50) |
| 27. Tetrachloroethene | 127-18-4 | 10 | 10 | 1200 | (50) |
| 28. Toluene | 108-88-3 | 10 | 10 | 1200 | (50) |
| 29. 1,1,2,2-Tetrachloroethane | 79-34-5 | 10 | 10 | 1200 | (50) |
| 30. Chlorobenzene | 108-90-7 | 10 | 10 | 1200 | (50) |
| 31. Ethyl Benzene | 100-41-4 | 10 | 10 | 1200 | (50) |
| 32. Styrene | 100-42-5 | 10 | 10 | 1200 | (50) |
| 33. Xylenes (Total) | 1330-20-7 | 10 | 10 | 1200 | (50) |

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TFL
9-12-92
~~5.13~~

5.14

## TABLE 4
## SAMPLE RESULT TURNAROUND TIMES

Laboratory analysis and quality assurance documentation, excluding validation, shall be limited to the following schedule:

Transuranic and hot cell analyses - 100 days annual average, but not to exceed 140 days

Low-level and mixed waste (up to 100 mr/hr) analyses - 75 days annual average, but not to exceed 90 days

Nonradioactive waste analyses - 50 days

Validated data packages will be issued within 21 days of receipt of the results by the Office of Sample Management.

# TABLE 5
# RESULT REPORTING/VALIDATION

The RCRA validation documentation package consists of the Office of Sample Management Data Validation cover sheet (different sheets for Level A, B, or C validation), supplemental Quality Control (QC) attachment pages, a copy of the Chain of Custody, and all sample data. One documentation package is completed for each sample or delivery group.

Three levels of validation are offered:

Level A The minimum requirement for all RCRA data. The primary application is for data used in waste designation/disposal. The additional QC required by SW-846 will be assessed through laboratory audits and Performance Evaluation (PE) samples.

Review Requirements:

- o Requested Versus Reported Analyses
- o Analysis Holding Times

Level B Provides a more in-depth review for programs whose data are compiled for use in later reports.

Review Requirements in Addition to Those Listed for Level A:

- o Matrix Spike/Matrix Spike Duplicate Analysis
- o Surrogate Recoveries
- o Duplicate Analysis
- o Analytical Blank Analysis

Level C Requires that the data be reported in Sample Delivery Group (SDG) data packages and is applicable to RCRA governed programs requiring Contract Laboratory Program (CLP) quality data from analytical work done in non-CLP laboratories

Review Requirements in Addition to Those Above:

- o Initial and Continuing Instrument Calibrations
- o Gas Chromatography - Mass Spectrograph (GC/MS) Tune Criteria
- o Internal Standards for Gas Chromatograph Analysis
- o Laboratory Control Samples
- o Interference Check Samples (for ICP analysis)
- o Any Other QC Checks Performed or Required by the Methods of Analysis

TFZ 9-12-92

# TABLE 6
## VALIDATION CRITERIA - GENERIC DATA QUALITY OBJECTIVES

1. REQUESTED VERSUS REPORTED ANALYSES

   All requested analyses shall be reported of accounted for.

2. HOLDING TIMES

   Holding times shall be equivalent to RCRA defined times. If no RCRA holding time exists, holding times will be 6 months unless specifically defined in project specific documentation.

3. SURROGATE RECOVERY

   Sample and blank surrogate recoveries must be between 80 and 120%.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

   A matrix spike or matrix spike duplicate must be analyzed with every analytical batch of every 20 samples, whichever is more frequent. Control limits will be between 75 and 125% with ±20% relative percent differences.

5. DUPLICATE ANALYSIS

   Duplicate analysis must be performed with every analytical batch or every 20 samples, whichever is more frequent. Control limits will be ±20%. If both sample and duplicate results are below the method detection limit of sample quantitation limit, then no control limit applies.

6. ANALYTICAL BLANKS

   A minimum of one analytical blank must be analyzed for every batch or every 20 samples, whichever is more frequent. No contaminants should be detected in the blanks.

7. INITIAL AND CONTINUING CALIBRATION

   Analytical instrumentation shall be calibrated in accordance with requirements specific to the instrumentation and methods of procedures employed.

8. GC/MS TUNE

   Ion abundance results and tuning frequency requirements must be as specified in the method employed for analysis.

9. INTERNAL STANDARDS

   Internal Standard area counts and retention time differences from the associated calibration standard must be within the control limits specified by the methods or procedure used. TFZ 9-12-92 ~~5.16~~ 5.17

TABLE 6 (cont)

10. LABORATORY CONTROL SAMPLE

All Laboratory Control Sample recoveries must be within 80-120% for all sample matrices.

11. INTERFERENCE CHECK SAMPLE

Frequency of analysis and all Interference Check Sample solution results must meet the requirements specified in the procedure used.

12. OTHER QUALITY CONTROL CHECKS

As specified in project specific documentation.

TPR
9-12-92
~~5.17~~

5.18

## TABLE 7
## ESTIMATED COSTS

| | |
|---|---|
| **CHARACTERIZATION OF WASTE STREAMS DICHSRGED TO DOUBLE SHELL TANKS** | |
| Analysis for processing parameters | $500/sample |
| Analysis for hazwaste designation | $5000/sample |
| **DOUBLE SHELL TANK CHARACTERIZATION** | |
| Analysis for hazewaste designation | $10000/sample |
| **ANALYSIS OF SAMPLES FROM 242-A EVAPORTOR** | |
| Analysis of feed tank | $5000/sample |
| Analysis of Process Condensate | $2500/sample |
| Analysis of Slurry Product | $5000/sample |
| Analysis of Steam Condensate | $4000/sample |
| Analysis of Cooling Water | $4000/sample |
| Analysis of Vent Gases | $2000/sample |

TPL 9-12-92
~~5.18~~

5.19

For info only

Westinghouse Hanford Company

Hanford Operations and Engineering Contractor for the US Department of Energy
P.O. Box 1970 Richland, Wa. 99352

# NONCONFORMANCE REPORT

Page 1 of 12 | No. B 06110

MFR/ORG: TANK FARMS OPERATIONS
200E / AP Farm

ITEM/MATERIAL NAME: 3 samples from TK-103-AP | PART NO.: N/A
DRAWING/SPEC. NO.: N/A | REV.: N/A
PROGRAM/PROJECT: Evaporator Restart | P.O./W.O. NO.: 1WIT6CØE
SYSTEM/END USE: Waste Characterization | DATE: 9/19/91

UNUSUAL OCCURRENCE REPORT REQUIRED: ☐ YES ☒ NO

**2. DESCRIPTION OF NONCONFORMANCE**

Custody seals placed improperly, so that recipient was unable to detect if there was evidence of tampering with 3 samples. (222-S Laboratories will not breakdown or analyze samples until this NCR is resolved.)

HW-27
PN-003 PRIORITY/SEVERITY: D3

**3. REQUIREMENT VIOLATED**

Attach seal on cask such that seal must be broken to remove sample.

| DOCUMENT | REV | ZONE/PAR |
|---|---|---|
| TO-080-030 | C-2 | B.20. |

Deborah Y. Bisenius | 28600 | 9/26/91
ORIGINATOR D.Y. Bisenius | ORGANIZATION | DATE

**4. ASME CODE ITEM(s)** ☒ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR

**5. CAUSE OF NONCONFORMANCE**

☐ PROCEDURES ☒ PERSONNEL ☐ MATERIALS
☐ EQUIPMENT ☐ OTHERS

REMARKS:
proper placement of custody seal for environmental samples.

**6. CORRECTIVE ACTION TO ELIMINATE CAUSE**

~~Operations personnel that retrieve samples shall be reminded of the importance of proper custody seal placement.~~ T.W. 11/26/91

See page 2.

INITIATION DATE ____ SERIAL NO. ____

RESPONSIBLE ORG. REP. | TITLE: Engineer | DATE: 03 DEC 91

**7. RECOMMENDED DISPOSITION** ☐ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☒ OTHER

**8A. DISPOSITION JUSTIFICATION AND INSTRUCTIONS**

See page 2.

**9. ADDITIONAL REVIEWS REQUIRED (WHC ONLY)** ☒ YES ☐ NO

IF YES, IDENTIFY:
Vida Johansen

**8B. SUPPLIER ENG.** N/A | **SUPPLIER QA** N/A

**10. DISPOSITION APPROVAL (WHC ONLY)**

☒ APPROVED ☐ DISAPPROVED
☐ OTHER (SEE CONTINUATION SHEET)

P. G. Haigh | 03 NOV 91
COGNIZANT ENGINEER 78420 | DATE

J. J. Verderber | 11/21/91
COGNIZANT QA ENGINEER 32200 | DATE

AUTHORIZED INSPECTOR REVIEW | DATE

**11. ADDITIONAL APPROVALS**

| NAME | TITLE | DATE | NAME | TITLE | DATE |
|---|---|---|---|---|---|
| Vida Johansen | Sample Custodian | 12-5-91 | | | |

TFF 9-12-92
~~5.19~~

**12. DISPOSITION ACTION COMPLETE**

NAME ____ DATE ____ QTY. ACCEPT ____ QTY. REJ. ____

FOLLOW ON NCR

~~5.20~~

QA LOG NO.

FOLLOW-UP A ☐ B ☐

... acceptance of this request in no way limits or affects the warranty provisions of the order.

| NONCONFORMANCE REPORT (CONTINUATION SHEET) | Page 2 of 2 | Part No. | NCR No. B06110 |
|---|---|---|---|

IDENTIFY EACH CONTINUATION BY THE BLOCK NUMBER FROM THE FIRST PAGE

8A. DISPOSITION JUSTIFICATION AND INSTRUCTIONS

Samples 3AP891-1 and 3A891-2 will be accepted because the custody seals were over the locking pins. The seals would have to be broken to open the sample pig. Sample 3AP891-3 is rejected because the seal was place flat on top of the pig. A new sample will be taken for analysis.

Sample 3AP891-3 shall be disposed of by laboratory personnel in accordance with their approved procedures. Upon disposal, laboratory personnel shall notify Quality Assurance via DSI that the action has been completed for NCR closure.

6. CORRECTIVE ACTION TO ELIMINATE CAUSE

Have supervision verify that each worker is capable of applying custody seals through demonstration. T.W. 11/26/91

TFZ
9-12-92
~~5.20~~

5.21

COPY

| LABORATORY ID | Date Sampled | Time Sampled |
|---|---|---|
| ~~R0419~~ R933 | 9-19-91 | 0500 |

| Sample Site or Sampling ID | Date Received at 222-S | Time Received at 222-S |
|---|---|---|
| 3AP891-1 103-AP | 9-21-91 | 0610 |

| Delivered by (Signature) | RPT Release (Signature) | Dose Rate |
|---|---|---|
| [signature] | [signature] | <0.5 |

| Custodian (Signature) | Date Analysis Complete | Disposal Date |
|---|---|---|
| Raymond Akita | | |

Comments
R-SER #1 SEAL # R003 C of C

| Payroll No. | Tech/Receiver (Signature) | Date | Entry Code | Comments |
|---|---|---|---|---|
| 9/22/91 | Sample seal not on properly | | | |
| | Debbie Bejinian put an NCR | | | |
| | on sample. Sample integrity | | | |
| | could have been violated. Paul | | | |
| | Haigh notified | | | |
| 11.1.91 | Paul Haigh examined seal | | | |
| 11.5.91 | QA. lifted NCR - will accept | | | |
| | sample as is - | | | |
| | | | | |
| | Sample is archived in Room 2B 4/21/92 | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | ~~5.21~~ TPL 9-12-92 |

BD-6000-347 (10/89)

WHC-SD-WM-DP-025
Addendum 12 Rev 0

# SAMPLE CHECK IN LIST

Date/Time Received 9/21/91 0610 Sample ID 3AP891-1

Project TK 103AP Client 241 Tank farm

Shipping Container ID# TF-6 Shipping # R0119

1. Condition of Shipping container? Good
2. Custody Seals on container intact? Yes [ ] No [X]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Custody Seals ID # 3003
5. Condition of Samples: _____ in good condition
   _____ broken
   _____ leaking
6. Samples have: _____ custody seals
   _____ appropriate sample labels
7. The following paperwork should be accounted for (N/A if not applicable):
   Chain of Custody #(s) Yes
   Request for Special Analysis #(s) N
8. Have any anomalies been identified? Yes [X] No [ ]
9. Memos have been initiated for all anomalies identified? Yes [ ]

Printed Name VIDA JOHANSEN

Signature Vida Johansen

Date/Time 10/2/91 0800

Please send copy to Office of Sample Management Data Administrator, T6-08

9/23/91 Custody seal not attached properly: to 'p16' making the sample integrity questionable Paul Haigh was notified and an NCR generated by Debbie Business

TFZ 9-12-92 ~~5.22~~

10/2/91 C.C. mail sent to Debbie Business

11-5-91 - telephone mess.: Paul Haigh: ~~Allow~~ VJ accept sample for analysis

5.23

9312032934

THIS PAGE INTENTIONALLY LEFT BLANK

# SINGLE SHELL TANK PROJECT
## Analytical Detection Limits
## October 12, 1990

The following detection limits are derived on ideal matrices. These values were derived by using either calibration standards or pure matrix standards. Detection limits on actual single shell tank samples are likely to be much higher. No information regarding procedure detection limits is available for procedures not listed in this report.

**Procedure LA-355-131**
Arsenic Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

**Procedure LA-325-102**
Mercury Analysis by Atomic Absorption Manual Cold Vapor Technique

Detection Limit = 0.002 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.
Solids were analyzed directly.

**Procedure LA-362-131**
Selenium Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

Procedure LA-533-105
Anion Analysis on Dionex Model 4000i

Typical sample dilution was 0.000099g/mL

Fluoride
Detection Limit in solution = 0.09 ppm.

Chloride
Detection Limit in solution = 0.04 ppm.

Nitrate
Detection Limit in solution = 0.24 ppm.

Phosphate
Detection Limit in solution = 0.13 ppm.

Sulfate
Detection Limit in solution = 0.13 ppm.

Procedure LA-622-102
Determination of Carbonate in Solutions by Coulometry

Detection Limit = 5 ppm in solution
Typical sample dilution was 0.01g/mL

Procedure LA-344-105
Total Organic Carbon
Determination of Carbon Insolation by Combustion and Coulometry

Detection Limit = 5.5 ppm in solution
Typical sample dilution was 0.01 g/mL

Procedure LA-695-101
Cyanide = 0.1 ppm CN in solution
Spectrophotometric Determination of Cyanide

Procedure LA-634-102
Ammonia = 0.1 ppm $NH_4^+$ in solution
Ammonia by Kjeldahl

Procedure LA-645-001
Nitrite = 0.184 ppm $NO_2$ in solution
Spectrophotometric Determination of Nitrite

Procedure LA-265-101
Chromium VI = 0.1004 ppm $Cr^{6+}$ in solution
Spectrophotometric Determination of Hexavalent Chromium

Procedure: LA-505-151 (Nominal Detection Limits)

Inductively Coupled Plasma (ICP) Emission Spectrometer Operations and Analysis.

Typical sample dilution for the Fusion Dissolution was 0.00019 g/mL.

Typical sample dilution for the Water Digestion was 0.000476 g/mL.

Typical sample dilution for the Acid Digestion was 0.000476 g/mL

Instrument Detection Limit ppm.

| | | | |
|---|---|---|---|
| Aluminum | 0.0745 | Antimony | 0.1424 |
| Arsenic | 0.0223 | Barium | 0.0026 |
| Beryllium | 0.0006 | Bismuth | 0.0839 |
| Boron | 0.0083 | Cadmium | 0.0039 |
| Calcium | 0.0002 | Cerium | 0.1359 |
| Chromium | 0.0039 | Cobalt | 0.0246 |
| Copper | 0.0158 | Europium | 0.0024 |
| Iron | 0.0073 | Lanthanum | 0.0141 |
| Lead | 0.0273 | Lithium | 0.0032 |
| Magnesium | 0.0001 | Manganese | 0.0011 |
| Mercury | 0.0036 | Molybdenum | 0.0049 |
| Neodymium | 0.2130 | Nickel | 0.0147 |
| Phosphorous | 0.0308 | Potassium | 0.2122 |
| Samarium | 0.1525 | Selenium | 0.0631 |
| Silicon | 0.0314 | Silver | 0.0183 |
| Sodium | 0.0483 | Strontium | 0.0010 |
| Sulfur | 0.0163 | Tantalum | 0.0273 |
| Thallium | 0.0646 | Thorium | 0.0122 |
| Tin | 0.0144 | Titanium | 0.0035 |
| Tungsten | 0.0273 | Uranium | 1.1405 |
| Vanadium | 0.0186 | Zinc | 0.0017 |
| Zirconium | 0.0141 | | |

# SAMPLING AND CUSTODY DATA

# TANK FARM PLANT OPERATING PROCEDURE

## CHAIN OF CUSTODY

| | | | |
|---|---|---|---|
| Company Contact | Paul Haigh | Telephone | 373-4655 |
| Bill of Lading No. | N/A | Offsite Property No. | N/A |
| Method of Shipment | B-Plant Sample Truck | | |
| Shipped to | 222-S Lab | | |

### SAMPLING INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| Sample Collected by | J. Tuckser J. Payne | Date | 10-9-91 | Time | 0608 |
| Sample Locations | TK 103-AP, Riser #28 | | Custody Seal # | 3031 | |
| Remarks | 21' 0" | | | | |
| Ice Chest or Sample Pig No. | TF-7 | Field Logbook and Page No. | N/A | | |

SUPERVISION REVIEW: RF Wright DATE: 10-9-91

### SAMPLE IDENTIFICATION

| Sample Number | Sample Schedule Number |
|---|---|
| 3AP891-8 | 242-A Statement of Work WHC-SOW-91-0002 |
| R-126 (R943) | |

### CHAIN OF POSSESSION

| | | |
|---|---|---|
| Relinquished by: [signature] | Received by: [signature] | Date/Time: 10-11-91/1955 |
| Relinquished by: [signature] | Received by: Raymond Akita | Date/Time: 10-11-91/2225 |
| Relinquished by: | Received by: | Date/Time: |
| Relinquished by: | Received by: | Date/Time: |

SAMPLE CHECK IN LIST

Date/Time Received 10/11/91 @ 2225 Sample ID ~~R126~~ VJ 3A0891-8

Project 242A SOW 91-0002 Client Paul Haigh

Shipping Container ID# TE-7 Shipping # R126

1. Condition of Shipping container? ok
2. Custody Seals on container intact? Yes [✓] No [ ]
3. Custody Seals dated and signed? Yes [✓] No [ ]
4. Custody Seals ID # 3031
5. Condition of Samples: OK in good condition
   _____ broken
   _____ leaking
6. Samples have: ~~N/A~~ custody seals
   _____ appropriate sample labels
7. The following paperwork should be accounted for (N/A if not applicable):
   Chain of Custody #(s) yes
   Request for Special Analysis #(s) no
8. Have any anomalies been identified? Yes VJ [X] No [X]
9. Memos have been initiated for all anomalies identified? Yes [ ]

Printed Name VIDA JOHANSEN

Signature Vida Johansen

Date/Time 10/17/91 0900

Please send copy to Office of Sample Management Data Administrator, T6-08

US 8/31/91

R ~~126~~ R043

**LABORATORY ID**

| Date Sampled | Time Sampled |
|---|---|
| | |

| Sample Site or Sampling ID | Date Received at 222-S | Time Received at 222-S |
|---|---|---|
| 103AP Riser 28 | 10-11-91 | 2225 |

| Delivered by (Signature) | RPT Release (Signature) | Dose Rate |
|---|---|---|
| B. A. Shoehe | [illegible] | <0.5 |

| Custodian (Signature) | Date Analysis Complete | Disposal Date |
|---|---|---|
| Raymond Akita | | |

Comments

3AP891-8 SEAL # 3031 C of C

| Payroll No. | Tech/Receiver (Signature) | Date | Entry Code | Comments |
|---|---|---|---|---|
| | Sample archived | 2B | 4/21/92 | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

BD-6000-347 (10/89)

COPY

# SAMPLE IN/OUT LOG

23

| DATE | TIME OUT | TIME IN | UNIT # | SAMPLE ID. | TECHNOLOGIST SIGNATURE | PAYROLL NUMBER |
|---|---|---|---|---|---|---|
| 12-28-91 | 18:00 | 1120 | 7 | R753, 754 | Valerie L Massai | 82016 |
| 1-28-92 | 1000 | 1030 | 24 | R-985 | Ed Cole | 80028 |
| 1-28-92 | 1030 | 1230 | COLD | R-785 | Ed Cole | 80028 |
| ~~1-28-92~~ | ~~1300~~ | | | ~~W-13~~ | ~~[illegible]~~ | ~~[illegible]~~ |
| 1/28/92 | 1620 | 2000 | 35 | J183-89 Digest | Teresa L. Frazier | 67768 |
| 1-28-92 | 1640 | 2000 | 18 | R941, R942, R943 R944, R945 | Linda Conlin | 6C949 |
| 1-28-92 | 1640 | 2315 | 17 | N-8, N-9, N-10 | [illegible] | 82577 |
| 1-28-92 | 1640 | 2000 | 18 | R-941, R-942, R-943 R-944 R-945 | Jeff Solberg | 82020 |
| 1-29-92 | 1635 | 2245 | 17 | N-16, N-17, N-18 | [illegible] | 82577 |
| 1-30-92 | 0730 | 0830 | 24 | R-933-934 | Ed Cole | 80028 |
| 1-30-92 | 0730 | 0830 | 18 | R-935-937 | Ed Cole | 80028 |
| 1-30-92 | 13:30 | 13:50 | Ref. #5 | R1141 DR 5 1-24-92 | [illegible] | 6C275 |
| 1-30-92 | 1:30 | 10:20 2-11-92 | 54 | R-1152 | [illegible] | 64483 |
| 1-30-92 | 1425 | | 35 | J230-242 | Teresa L. Frazier | 67768 |
| 1-30-92 | 1425 | | 35 | J223-229 | Teresa L. Frazier | 67768 |
| 1-30-92 | 08:15 | 14:10 | 18 | R144, R145 | [illegible] | 6C916 |
| 2-1-92 | 0045 | 0230 | Frig 3 | R1141 | Jerry M. Kunkel | 80518 |
| 2-1-92 | 18:35 | 22:30 | 28 | T8895 | Valerie L Massai | 82016 |
| 2-3-92 | 0730 | 0800 | 18 | R-941-945 | Ed Cole | 80028 |
| 2-3-92 | 0745 | 0750 | 28 | T8852 Fus 2 T8864 Fus | [illegible] | 64965 |
| 2-3-92 | 0745 | 1400 | Frig 5 | R1141 | [illegible] | 6C823 |
| 2-3-92 | 08:05 | 15:00 | DH 2-3-92 | R423, 424, 425 | [illegible] | 6C916 |
| 2/3/92 | 1310 | 1335 | 40 | J84, J245 | Teresa L. Frazier | 67768 |
| 2/3/92 | 1350 | 1430 | 46 | R1141 | Teresa L. Frazier | 67768 |
| 2-3-92 | 17:15 | 18:50 | 17 | N-61 | Valerie L Massai | 82016 |
| 2-3-92 | 18:50 | 21:15 | 17 | N-62 | Valerie L Massai | 82016 |
| 2-3-92 | 21:15 | 23:00 | 17 | N-63 | Valerie L Massai | 82016 |
| 2-4-92 | 0800 | 1308 | 17 | N-28, 29 | [illegible] | 6C823 |
| 2-4-92 | 08:40 | 14:30 | 17 | N 35, 43, 44 | [illegible] | 6C916 |
| 2-4-92 | 10 00 | 10 40 | 40 | DH 2-4-92 S163-S158 | S. B. Kunkler | 60368 |
| 2/4/92 | 10:15 | 13:05 | 32 | 31XC0110 31XC0310 | [illegible] | 6B090 |

COPY

WHC-SD-WM-DP-025
Addendum 12 Rev 0

# SAMPLE IN/OUT LOG

| DATE | TIME OUT | TIME IN | UNIT # | SAMPLE ID. | TECHNOLOGIST SIGNATURE | PAYROLL NUMBER |
|---|---|---|---|---|---|---|
| 1-14-92 | | 17:50 | 28 | T-8760 | [illegible] | 82370 |
| 1-15-92 | 02:10 | 02:40 | 20 | R-1067 | Valerie L Massey | 82016 |
| 1-15-92 | 0730 | 1230 | COLD | R-607-610 R-994 | Ed Cohen | 80028 |
| ~~[illegible]~~ DH 8-27-92 | | | | | | |
| 1/15/92 | 08:00 | 13:10 | 32 | 57XC0110 57XC0310 | [illegible] | 68090 |
| 1/15/92 | 0800 | 0825 | 20 | R1067, R1076 R1080 | [illegible] | 6C823 |
| 1/15/92 | 10:30 | 13:25 | 20 | R 1067 | Sue Lai | 6C916 |
| 1-15-92 | 1115 | 1135 | 30 | T 8852 | Jerry M. Kunkel | 80518 |
| 1-15-92 | 1140 | 1305 | 28 | T-8760 | [illegible] | 82577 |
| 1-15-92 | 1230 | 1430 | 20 | R 1023, 1069, 1083 DH 8-27-92 | Mary Fraser | 6C269 |
| 1-15-92 | 11:00 | 13:10 | 22 | R 1086 | Sue Lai | 6C916 |
| 1-15-92 | 13:10 | 13:20 | 16 | R 1070 | Sue Lai | 6C916 |
| 1-15-92 | 13:20 | 13:25 | 28 | T-8760 | Jeff Sollmann | 82020 |
| 1/15/92 | 1400 | 1500 | 20 | T 1076 | [illegible] | 6C559 |
| 1-15-92 | 1700 | 1900 | shelf | P 303 | Sandra L Hood | 82372 |
| 1-15-92 | 1700 | 1900 | shelf | B6508-15 | Sandra L Hood | 82372 |
| DH 8-27-92 1-15-92 | 17:35 | 17:40 | shelf | B6502 | Sandra L Hood | 82372 |
| 1-16-92 | 00:10 | | 28 | T 8852 | Valerie L Massey | 82016 |
| 1-16-92 | 10:15 | 13:30 | 22 | R 1085, 1086, 1094 | Sue Lai | 6C916 |
| 1-16-92 | 1000 | ALL SAMPLE USED | COLD | R-994 | Ed Cohen | 80028 |
| 1-16-92 | 10:30 | 11:15 | Frig. DRS 8-27-92 | B959-961 R 965-967 | [illegible] | 6C275 DRS 8-27-92 |
| 1-16-92 | 10:45 | 11:00 | 24 | R933-934 | [illegible] | 6C275 |
| 1-16-92 | 10:45 | 11:00 | 18 | R73 5-937 DRS 8-27-92 | [illegible] | 6C275 |
| 1/16/92 | 1045 | 1115 | 20 | R-1080 | [illegible] | 6C559 |
| 1-16-92 | 1100 | 1105 | DH 8-27-92 28 | R8852 Fusion | [illegible] | 64965 |
| 1-16-92 | 11:00 | 11:50 | 18 | R9 41-945 DRS 8-27-92 | [illegible] | 6C275 |
| 1-16-92 | 11:10 | 11:25 | 29 | B676 | [illegible] | 6C275 |
| 1-16-92 | 11:10 | 11:25 | 25 DRS 8-27-92 | B612 b, B6157 B620, B6233 | [illegible] | 6C275 |
| 1-16-92 | 11:10 | 11:25 | 25 | B6408, B6444 B6481 | [illegible] | 6C275 |
| 1-16-92 | 11:15 | 11:35 | 28 | B8852 | [illegible] | 82577 |
| 1-16-92 | 1315 | 1370 | 30 | B8852 | Jerry M. Kunkel | 80518 |

J.R. 1-16-92

COPY



# SAMPLE IN/OUT LOG

| DATE | TIME OUT | TIME IN | UNIT # | SAMPLE ID. | TECHNOLOGIST SIGNATURE | PAYROLL NUMBER |
|---|---|---|---|---|---|---|
| 1-2-92 | 08:10 | 11:00 | # 44 | J213 ~ J215 | Sue Lei | 6C916 |
| 1-2-92 | 08:15 | 1415 | Frig 5 | R904-906 R965-7 9967 | Melanie Meyer | 6C823 |
| 1-2-92 | 0840 | 1415 | " | R959-7 961 | Melanie Meyer | 6C823 |
| ~~1-2-92~~ | ~~08:45~~ (SL) 8-24-92 | | | ~~R994 ~~ R999~~ | (SL) 8-24-92 | |
| 1-2-92 | 08:45 | 15:00 | shelf | R994 ~ R999 | Sue Lei | 6C916 |
| 1-2-92 | 10:55 | 11:05 | shelf | S-988 | Sandra L Hood | 82372 |
| 1-2-92 | 13:30 | 15:05 | Shelf | U4552 U4553 | Teresa L Frazier | 67768 |
| 1-2-92 | 1330 | 15:05 | Shelf | (SL) 8.28.92 B1002-7 | Teresa L Frazier | 67768 |
| 1-2-92 | 13:30 | 15:05 | 25 | B6494, B6408 | Teresa L Frazier | 67768 |
| 1-3-92 | 0745 | 0900 | Frig 5 | R902 thru 906 959 thru 961 965 → 967 | Melanie Meyer | 6C823 |
| 1-3-92 | 0744 | 0830 | COLD | R-1010-1012 | Ed Cobb | 80028 |
| 1-3-92 | 0800 | 0830 | 18 | R949 | SL Cobb | 64965 |
| 1-3-96 | 0900 | 1500 | Frig 5 | R959-7 61 | Melanie Meyer | 6C823 |
| 1-3-96 | 0915 | 0940 | 14 | R551 | Melanie Meyer | 6C823 |
| 1-3-92 | 15:30 | 22:10 | Frig 5 | R 961, 963, 970, 857 | A. Lee | 82580 |
| 01-03-92 | 1800 | 1815 | 18 | R949 | SL Cobb | 82583 |
| 1-3-92 | 18 30 | 22:10 | 18 | R949 | A. LEE | 82580 |
| 1-4-92 | 0010 | 0030 | 18 | R949 | Jerry M. Kunkel | 80518 |
| 1-4-92 | 0030 | 0615 | Shelf | R994-999 | Jerry M. Kunkel | 80518 |
| 1-4-92 | 0030 | 0130 | 19 | R941-945 | [illegible] | 81808 |
| 1-4-92 | 0245 | 0310 | 18 | R949 | Jeff Sellback | 82020 |
| 1-4-92 | 1800 | 1830 | 18 | R949 | SL Cobb | 82583 |
| 01-04-92 | 1930 | 2045 | 24 | R935, 936, 937 | SL Cobb | 82583 |
| 01-04-92 | 1930 | 2045 | 18 | R934 | SL Cobb | 82583 |
| 1-5-92 | 0015 | 0645 | Refrig 5 | R 902-906 | Jerry M. Kunkel | 80518 |
| 1-05-92 | 0020 | 0125 | REFRIG 5 | R965-967 | [illegible] | 82577 |
| 01-05-92 | 0025 | 0335 | 35 | S-213, 14, 15 | Jeff Sellback | 82020 |
| 1-5-92 | 16:30 | 18:40 | Refrig #5 | R959 9.29.92 | Valerie L Massie | 82016 |
| 1-5-92 | 18:40 | 19:15 | Refrig #5 | R-960, 961 | Valerie L Massie | 82016 |
| 1-6-92 | 0012 | 0020 | REFRIG #5 | R 1015 | [illegible] | 82577 |
| 1-6-92 | ~~0012~~ | 0600 | Refrig 5 | R965-967 | Jerry M. Kunkel | 80518 |

0215 J.K. 1-6-92

SAMPLE LOG IN/OUT
storage unit #___
date 4-1-92 to 4-2-92

Ref. 1 thru 3 Sample Group

| SAMPLE IN/OUT | SAMPLE DATE | SAMPLE TIME | SAMPLE ID | TECHNICIAN SIGNATURE | PAYROLL NUMBER | CUSTODIAN SIGNATURE |
|---|---|---|---|---|---|---|
| ✓ | 4/1/92 | 1325 | R 943 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R 944 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R 945 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R933 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R934 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R935 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R936 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R937 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R941 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1325 | R942 | Robert Ray | 82627 | |
| ✓ | 4/1/92 | 1655 | R943 R944 | Robert Ray | 82627 | R Abeita |
| ✓ | 4/1/92 | 1655 | R945 R933 | Robert Ray | 82627 | R Abeita |
| ✓ | 4/1/92 | 1655 | R934 R935 | Robert Ray | 82627 | R Abeita |
| ✓ | 4/1/92 | 1655 | R936 R937 | Robert Ray | 82627 | R Abeita |
| | 4/1/92 | 1655 | R941 R942 | Robert Ray | 82627 | R Abeita |
| ✓ | 4/2/92 | 0900 | R1291 R1292 | Robert Ray | 82627 | Vida Johansen |
| ✓ | 4/2/92 | 0900 | R1293 R1294 | Robert Ray | 82627 | Vida Johansen |
| ✓ | 4/2/92 | 0900 | R1295 R1296 | Robert Ray | 82627 | Vida Johansen |
| ✓ | 4/2/92 | 0900 | R1287 R1288 | Robert Ray | 82627 | Vida Johansen |
| ✓ | 4/2/92 | 0900 | R1285 R1286 | Robert Ray | 82627 | Vida Johansen |
| ✓ | 4/2/92 | 0900 | R1289 R1290 | Robert Ray | 82627 | Vida Johansen |
| ✓ | 4/2/92 | 1020 | R1380-81 | Keith Fuller | 67528 | REJ |
| ✓ | 4/2/92 | 1040 | R1291 R1292 | Robert Ray | 82627 | REJ |
| ✓ | 4/2/92 | 1040 | R1293 R1294 | Robert Ray | 82627 | REJ |
| ✓ | 4/2/92 | 1040 | R1295 R1296 | Robert Ray | 82627 | REJ |
| ✓ | 4/2/92 | 1040 | R1287 R1288 | Robert Ray | 82627 | REJ |
| ✓ | 4/2/92 | 1040 | R1285 R1286 | Robert Ray | 82627 | REJ |
| ✓ | 4/2/92 | 1040 | R1289 R1290 | Robert Ray | 82627 | REJ |
| ✓ | 4-2-92 | 1250 | R1380-81 | Keith Fuller | 67528 | REJ |
| ✓ | 4-2-92 | 1327 | R1375-76 R1380-81 | R E Sheda | 81524 | REJ |
| ✓ | 4-2-92 | 1337 | R1375-76 R1381-81 | R E Sheda | 81524 | REJ |

SAMPLE LOG IN/OUT
storage unit #___
date 3/9/92 to 4-1-92

Sample Group
Refrigerator COPY

| SAMPLE IN | SAMPLE OUT | SAMPLE DATE | SAMPLE TIME | SAMPLE ID | TECHNICIAN SIGNATURE | PAYROLL NUMBER | CUSTODIAN SIGNATURE |
|---|---|---|---|---|---|---|---|
| ✓ | ✓ | 3/09/92 | 1330 | R9593 | R. J. Ray | 82627 | [illegible] |
| | ✓ | 3/09/92 | 1330 | R9591 | R. J. Ray | 82627 | [illegible] |
| ✓ | | 3/09/92 | 1630 | R9591 | R. J. Ray | 82627 | Diane M Jones |
| ✓ | | 3/09/92 | 1630 | R9597 | R. J. Ray | 82627 | D M Jones |
| ✓ | | 3-10-92 | 16:50 | MB-87-A | Mark A. Beck | 82628 | D M Jones |
| ✓ | | 3-10-92 | 16:50 | MB-87-B MB-87-C | Mark A. Beck | 82628 | [illegible] |
| | ✓ | 3-23-92 | 1031 | R1226 - R1227 R330 | R. J. RAY | 82627 | [illegible] |
| ✓ | | 3/23/92 | 1440 | R330 R1226, R1227 | R. J. Ray | 82627 | Vida Johansen |
| ✓ | ✓ | 3/24/92 | 820 | R933 - 937 R941 - 945 | T. H. Bellus | 82703 | [illegible] |
| ✓ | | 3/24/92 | 1025 | R933 - 937 R941 - 945 | T. H. Bellus | 82703 | [illegible] |
| | ✓ | 3/26/92 | 855 | R1344 R1349 R1346 R1350 | Keith Fuller | 67528 | Vida Johansen |
| | ✓ | 3/26/92 | 855 | R1351 R1352 | RKF | 67528 | Vida Johansen |
| | ✓ | 3/26/92 | 0855 | R1355 R1356 | RKF | 67528 | Vida Johansen |
| | ✓ | 3/26/92 | 0855 | R1360-61 R1365-66 | RKF | 67528 | Vida Johansen |
| | ✓ | 3/26/92 | 0855 | R1370-71 R1375-76 | RKF | 67528 | Vida Johansen |
| | ✓ | 3/26/92 | 0855 | R1380-81 | RKF | 67528 | Vida Johansen |
| ✓ | | 3/26/92 | 1430 | R1344 R1349 R1346 R1350 | Keith Fuller | 67528 | [illegible] |
| ✓ | | 3/26/92 | 1430 | R1351-52 R1355-56 | Keith Fuller | 67528 | [illegible] |
| ✓ | | 3/26/92 | 1430 | R1360-61 R1365-66 R1370-71 | Keith Fuller | 67528 | [illegible] |
| ✓ | | 3/26/92 | 1430 | R1375-76 R1380-81 | Keith Fuller | 67528 | [illegible] |
| | ✓ | 3/30/92 | 1300 | R933-937 R941-945 | T. H. Bellus | 82703 | [illegible] |
| ✓ | | 3/30 | 1435 | R933-937 R941-945 | T. H. Bellus | 82703 | Vida Johansen |
| | ✓ | 3-31-92 | 0945 | R1344 R1349 R1346 R1350 | Keith Fuller | 67528 | Vida Johansen |
| | ✓ | 3-31-92 | 0945 | R1351-52 R1355-56 | Keith Fuller | 67528 | Vida Johansen |
| | ✓ | 3-31-92 | 0945 | R1360-61 R1365-66 R1370-71 | Keith Fuller | 67528 | Vida Johansen |
| | ✓ | 3-31-92 | 0945 | R1375-76 R1380-81 | Keith Fuller | 67528 | Vida Johansen |
| ✓ | | 3-31-92 | 1125 | R1344 R1349 R1346 R1350 | Keith Fuller | 67528 | Vida Johansen |
| ✓ | | 3-31-92 | 1125 | R1351-52 R1355-56 | Keith Fuller | 67528 | Vida Johansen |
| ✓ | | 3-31-92 | 1125 | R1360-61 R1365-66 R1370-71 | Keith Fuller | 67528 | Vida Johansen |
| | | 3-31-92 | 1125 | R1375-76 R1380-81 | Keith Fuller | 67528 | Vida Johansen |
| | ✓ | 4-1-92 | 1003 | R1380-81 | Keith Fuller | 67528 | [illegible] |
| ✓ | | 4-1-92 | 1427 | R1380-81 | Keith Fuller | 67528 | Vida Johansen |

103AP

WHC-SD-WM-DP-025
Addendum 12 Rev 0
SAMPLE LOG IN/OUT
storage unit 7___
date_____to_____

Refrigerator

Sample Group
_____ COPY

| SAMPLE IN | SAMPLE OUT | DATE | TIME | SAMPLE ID | TECHNICIAN SIGNATURE | PAYROLL NUMBER | CUSTODIAN SIGNATURE |
|---|---|---|---|---|---|---|---|
| | ✓ | 12/16/91 | 1050 | CEL-5,6a-E-80 | E.V. Allerson | 82712 | Vida Johansen |
| | ✓ | 12/16/91 | 1052 | CEL-5,6a-E-20 | E.V. Allerson | 82712 | Vida Johansen |
| | ✓ | 12/16/91 | 1053 | CEL-6,5a-E-60 | E.V. Allerson | 82712 | Vida Johansen |
| | ✓ | 12/16/91 | 1055 | CEL-6,5a-E-4 | E.V. Allerson | 82712 | Vida Johansen |
| | ✓ | 12/16/91 | 1059 | KPFE-1,1,2,2 R927 | E.V. Allerson | 82712 | Vida Johansen |
| | ✓ | 12/6/91 | 11:30 | ~~R933, R941, R944~~ JH 8-18-92 | Sue C Lai | 6C916 | Vida Johansen Sue |
| ✓ | | 12/6/91 | 14:05 | R933, R941 | Sue C Lai | 6C916 | Vida Johansen |
| | ✓ | 12/26/91 | 10:50 | L991 | Todd M Colbert | 81805 | Vida Johansen |
| ✓ | | 12/26/91 | 1310 | L991 | Todd M Colbert | 81805 | Vida Johansen |
| ✓ | ✓ | 12-30-91 | 1340 | R944, 945, 946, 997, 998, 999 | S. Cobb | 82583 | [illegible] |
| ✓ | ✓ | 12-31-91 | 1530 | 903, 3, 4, 6, ~~934~~ | J. Soldrack | 82020 | [illegible] |
| ✓ | ✓ | 1-2-92 | 8:20 | 933, 934, 935, 936, 937 | David R. Jackson | 6C275 | Vida Johansen |
| ✓ | ✓ | 1-2-92 | 8:20 | 941, 942, 943, 944, 945 | David R. Jackson | 6C275 | Vida Johansen |
| | ✓ | 1-2-92 | 10:55 | 933 | DE Nelson | 62059 | V Johansen |
| | | 1-2-92 | 14:20 | R933 | DE Nelson | 62059 | V. Johansen |
| | ✓ | 1-2-92 | 14:25 | R934 R935 | DE Nelson | 62059 | V Johansen |
| ✓ | | 1-2-92 | 1917 | R934 R935 | DE Nelson | 62059 | V Johansen |
| | JH 8-18-92 | 1-3-92 | 0745 | ~~R902-7, 6, R959-7, 6, R965-7, 6~~ | Melanie Meyer | ~~62023~~ | [illegible] |
| | ✓ | 1-7-92 | 1005 | R936 R937 | DE Nelson | 62059 | V Johansen |
| ✓ | | 1-7-92 | 1433 | R936 R937 | E.V. Allerson | 82712 | V Johansen |
| | ✓ | 1-7-92 | 1434 | R941 R942 | E.V. Allerson | 82712 | V Johansen |
| ✓ | | 1-7-92 | 1710 | R941 | E.V. Allerson | 82712 | V Johansen |
| | ✓ | 1-7-92 | 1712 | R943 | E.V. Allerson | 82712 | V Johansen |
| ✓ | | 1-7-92 | 1901 | R943 R942 | E.V. Allerson | 82712 | V Johansen |
| | ~~✓~~ | ~~1-8-92~~ | ~~0730~~ | ~~R959, 960~~ 961 | ~~[illegible]~~ JH 8-18-92 | ~~65231~~ | [illegible] |
| | ✓ | 1-8-92 | 1311 | R944 R945 | E.V. Allerson | 82712 | Vida Johansen |
| ✓ | | 1-8-92 | 1601 | R944 R945 | E.V. Allerson | 82712 | Vida Johansen |
| ✓ | ✓ | 1-29-92 | 1036 | R1121 R1122 R1125 | RE Skoda | 81524 | Vida Johansen |
| ✓ | | 1-29-92 | 1055 | R1121 1125 1122 | RE Skoda | 81524 | Vida Johansen |
| | ✓ | 1/30/92 | 0715 | R1121 1125 1122 | D.J. Ottmar | 82768 | Vida Johansen |
| ✓ | | 1/30/92 | 0910 | R1121 1125 1122 | D.J. Ottmar | 82768 | Vida Johansen |

# SAMPLE IN/OUT LOG

| DATE | TIME OUT | TIME IN | UNIT # | SAMPLE ID. | TECHNOLOGIST SIGNATURE | PAYROLL NUMBER |
|---|---|---|---|---|---|---|
| 1-6-91 | 0800 | 11:20 | 18 | R941-945 | [illegible] | 65731 |
| 1-6-91 | 0800 | 1430 | 25 | B 6481 | Sandra L Hood | 82372 |
| 1-6-91 | 0800 | 1400 | Cold | R954-959 | Mary Tracy | 6C269 |
| 1-6-92 | 0800 | 1030 | 5 | R-902-906 | [illegible] | 80028 |
| 1/6/92 | 0850 | 1300 | 24 & 18 | C933 → 937 | [illegible] | 81805 |
| 1/6/92 | 10:00 | 11:00 | 20 | R551 | Sue Lai | 6C916 |
| 1/6/92 | 11:46 | 12:00 | 18 | R941-945 | [illegible] | 6C775 |
| 1/6/92 | 1415 | 1450 | 18 | R949 | [illegible] | 64965 |
| 01-06-92 | 1630 | 1700 | 5 | R960,961 | SL Cobb | 82583 |
| 01-06-92 | 1830 | 20:30 | 5 | R1015 | SL Cobb | 82583 |
| 01-6-92 | 20:00 | 20:10 | 25 | B 6481 | Valerie L Massie | 82016 |
| 01-06-92 | 18:00 | 22:45 | FRIDGE 5 | R-959-967 | [illegible] | 82580 |
| 01-07-92 | 0100 | 0415 | FRIDGE #2 | R-941-5 | [illegible] | 82577 |
| 1-7-92 | 0820 | 1030 | 49 | R-929 | S. B. Kunkler | 60368 |
| 7-92 | 0830 | 1430 | 24 & 48 | R933 → R937 | [illegible] | 81805 |
| 1-7-92 | 1030 | 1400 | 40 | 54.-786 & 55 651 | S. B. Kunkler | 60368 |
| 1-7-92 | 14:30 | 14:50 | 20 | R551 | Sue Lai | 6C916 |
| 1-8-92 | 0008 | 0032 | 18 | R919 | [illegible] | 81808 |
| 1-8-92 | 0015 | 0030 | 7 | R 783 | Jerry M. Kunkel | 80518 |
| 1-8-92 | 0015 | 0030 | 28 | T8526, T8519 | Jerry M. Kunkel | 80518 |
| 1-8-92 | 0015 | 0030 | Refrig 5 | R 1015 | Jerry M. Kunkel | 80518 |
| 1-8-92 | 0020 | 0230 | 18 | R-941 | Jeff Sollrack | 82020 |
| 1-8-92 | 0730 | 0930 | 5 | R-1021 | [illegible] | 80027 |
| 1-8-92 | 0730 | 1020 | 5 | R959, 60, 61 | [illegible] | 65731 |
| 1-8-92 | 0830 | 0900 | 24/48 | R933 → 37 | [illegible] | 6C823 |
| 1-8-92 | 0845 | 0850 | 18 | R-949 | [illegible] | 81805 |
| 1-8-92 | 0900 | 11:00 | 24/18 | R933 → 37 | Sue Lai | 6C916 |
| 1-8-92 | 0900 | 0915 | 28 | R941 → 47 | [illegible] | 6C823 |
| 1-8-92 | 1100 | 1210 | 18 | R943 → 44 | [illegible] | 6C823 |
| ~~8-92~~ | ~~0900~~ | ~~11:00~~ | ~~24/18~~ | ~~R933 → 937~~ | ~~[illegible]~~ 8-18-92 | |
| 1-8-92 | 1315 | 1510 | 40 | 786 — 651 | S. B. Kunkler | 60368 |

# REQUEST FOR SPECIAL ANALYSIS (RSA)

| (1) Sample Point | (2) Date/Time Issued | (3) Date/Time Required | (4) Charge Code |
|---|---|---|---|
| FD-A 54 Set No. 2 | | 11/26/91 | (5) Work Package: 1N1A16ØLØ1 |

| (6) Number of Samples | Dose Rate mRad/Hr | (7) Customer I.D. | (8) Laboratory I.D. | (9) Requester Name/Phone |
|---|---|---|---|---|
| 10 | 3-18-92 3AP1191-1 | 3AP891-1, 3AP891-2, ~~3AP891-3~~, 3AP891-4, 3AP891-5, 3AP891-6, 3AP891-7, 3AP891-8, 3AP891-9, 3AP891-10 | | P.G. Haigh 3-4655 |

(10) Release: RPT

(11) Volume of Sample: 100 mL

| (12) Determination | (13) Expected Range | (14) Minimum Detection Level | (15) Method |
|---|---|---|---|
| Selenium (Se) | | 1 mg/L | |
| Arsenic (As) | | 5 mg/L | |
| Mercury (Hg) | | 0.2 mg/L | |
| Differential Scanning Calorimetry (DSC) | | Exotherm | |
| Specific Gravity | | 1.0 mg/L | |
| Tritium (H-3) | | 1.5E-3 µCi/L | 103 APR 3APR Comp R949 |
| Total Uranium | | 100 mg/L | |
| Sr-90 | | 1.5E-3 µCi/L | |
| Am-241 | | 1E-3 µCi/L | |
| Pu-239/240 | | 0.5E-3 µCi/L | |
| I-129 | | 9E-3 µCi/L | |
| Cs-134/137 | | 5E-3 µCi/L | |

(16) Matrix (Other Metals or Anions Present)
Liquid mixed waste. Radioactive contamination: natural, activation products and reactor fission products. Possible detectable halogenated and non-halogenated organic compounds. Hydroxide - pH = 12.5 or greater. Anions - sodium salts of nitrate, nitrite, phosphate, carbonate and sulfate. Metals - calcium and potassium salts, lead, chromium, cadmium.

(17) Radioactivity Level (Actual ☐ Estimated ☐)
Total Alpha _____ µ Ci/L
Total Beta _____ µ Ci/L
Total Gamma _____ µ Ci/L

(18) Additional Information (Measurement Uncertainty or Other Pertinent Information) ± 25% Precision + Accuracy

(19) Estimated Cost

(20) Samples Received

| By | From | Date | Time |
|---|---|---|---|
| | | | |

Laboratory Manager

(21) Distribution of Final Results/Sample Disposal Instructions
Minimum storage time - until April, 1992. Customer will direct OSM re: sample disposal



BC-6700-181 (1/87)

# REQUEST FOR SPECIAL ANALYSIS (RSA)

| (1) Sample Point | (2) Date/Time Issued | (3) Date/Time Required | (4) Charge Code |
|---|---|---|---|
| CD-A 54 Set No. 2 | | 11-26-91 | (5) Work Package: 1N1A16ØLØ1 |

| (6) Number of Samples | Dose Rate mRad/Hr | (7) Customer I.D. | (8) Laboratory I.D. | (9) Requester Name/Phone |
|---|---|---|---|---|
| 10 | JL 8-18-92 3AP1191-1 | 3AP891-1, 3AP891-2, ~~3AP891-3~~ 3, 3AP891-4, 3AP891-5, 3AP891-6, 3AP891-7, 3AP891-8, 3AP891-9, 3AP891-10 | | P.G. Haigh 3-4655 |

| (10) Release | (11) Volume of Sample |
|---|---|
| RPT | 100 mL |

| (12) Determination | (13) Expected Range | (14) Minimum Detection Level | (15) Method |
|---|---|---|---|
| Silver (Ag) | | 5 mg/L | |
| Aluminum (Al) | | 50 mg/L | |
| Barium (Ba) | | 2 mg/L | |
| Cadmium (Cd) | | 1 mg/L | |
| Chromium (Cr) | | 5 mg/L | |
| Iron (Fe) | | 10 mg/L | |
| Magnesium (Mg) | | 1 mg/L | |
| Manganese (Mn) | | 2 mg/L | |
| Sodium (Na) | | 60 mg/L | |
| Lead (Pb) | | 5 mg/L | |
| Zinc (Zn) | | 2 mg/L | |
| Total Inorganic Carbon | | 5000 mg/L | |

(16) Matrix (Other Metals or Anions Present)
Liquid mixed waste. Radioactive contamination; natural, activation products and reactor fission products. Possible detectable halogenated and non-halogenated organic compounds. Hydroxide - pH = 12.5 or greater. Anions - sodium salts of nitrate, nitrite, phosphate, carbonate and sulfate. Metals - calcium and potassium salts, lead, chromium, cadmium.
JL 9-15-92

(17) Radioactivity Level (Actual ☐ Estimated ☐)

Total Alpha _____ µ Ci/L

Total Beta _____ µ Ci/L

Total Gamma _____ µ Ci/L

(18) Additional Information (Measurement Uncertainty or Other Pertinent Information) ±25% Precision + Accuracy

(20) Samples Received

| Estimated Cost | By | From | Date | Time |
|---|---|---|---|---|
| | | | | |

Laboratory Manager

(21) Distribution of Final Results/Sample Disposal Instructions
Minimum storage time - until April, 1992. Customer will direct OSM re: sample

# REQUEST FOR SPECIAL ANALYSIS (RSA)

| (1) Sample Point | (2) Date/Time Issued | (3) Date/Time Required | (4) Charge Code |
|---|---|---|---|
| FD-A54 Set No.2 | | 11-26-91 | (5) Work Package: IN1A16ØLØ1 |

| (6) Number of Samples | Dose Rate mRad/Hr | (7) Customer I.D. | (8) Laboratory I.D. | (9) Requester Name/Phone |
|---|---|---|---|---|
| 10 | | 3AP891H, 3AP891-2, 3AP891-1, 3AP891-4, 3AP891-5, 3AP891-6, 3AP891-7, 3AP891-8, 3AP891-9, 3AP891-10 | | P.G. Haigh 3-4655 |

(10) Release: RPT — gh 8-18-92

(11) Volume of Sample: 100 mL

| (12) Determination | (13) Expected Range | (14) Minimum Detection Level | (15) Method |
|---|---|---|---|
| Total Ammonia | | 500 mg/L | 3AP891-1-R933 |
| Fluoride by IC | | 6,000 mg/L | 3AP891-2-R934 |
| Chloride by IC | | 4,000 mg/L | 3AP891-3-R935 |
| Nitrite by IC | | 5000 mg/L | 3AP891-4-R936 |
| Nitrate by IC | | 5000 mg/L | 3AP891-5-R937 |
| Phosphate by IC | | 10,000 mg/L | 3AP891-6-R941 |
| Sulfate by IC | | 10,000 mg/L | 3AP891-7-R942 |
| Hydroxide | | 0.1 M | 3AP891-8-R943 |
| Total Organic Carbon | | 500 mg/L | 3AP891-9-R944 |
| Volatile Organic Analysis | | Exhibit C, CLP-SOW Organics 3/90 | 3AP891-10-R945 |
| Semi-Volatile (A/B/N) | | Exhibit C, CLP-SOW Organics 3/90 | |
| Cyanide (CN-) | | 0.01 mg/L | |

(16) Matrix (Other Metals or Anions Present)
Liquid mixed waste. Radioactive contamination: natural, activation products and reactor fission products. Possible detectable halogenated and non-halogenated organic compounds. Hydroxide - pH = 12.5 or greater. Anions - sodium salts of nitrate, nitrite, phosphate, carbonate and sulfate. Metals - calcium and potassium salts, lead, chromium, cadmium.

(17) Radioactivity Level (Actual ☐ Estimated ☐)
Total Alpha _____ µ Ci/L
Total Beta _____ µ Ci/L
Total Gamma _____ µ Ci/L

(18) Additional Information (Measurement Uncertainty or Other Pertinent Information) ± 25% Precision & Accuracy

(20) Samples Received

| Estimated Cost | | From | Date | Time |
|---|---|---|---|---|
| | | | | |

Laboratory Manager

(21) Distribution of Final Results/Sample Disposal Instructions
Minimum storage time - until April 1992. Customer will direct OSM re: sample

# SAMPLE DATA SUMMARY

# SUMMARY DATA REPORT

Project: 242-A EVAPORATOR FEED CHARACTERIZATION
Tank: 103AP
Customer ID: 3AP891-8

Undigested Sample Results

| | Sample R943 | | Sample Duplicate NA |
|---|---|---|---|
| SpG | 0.992 | | NA |
| DSC | NO EXOTHERM | | NA |
| TOC | 8.77E+1 | ppm | NA |
| TIC | 5.30E+2 | ppm | NA |
| NH4 | <9.00E+1 | ppm | NA |
| OH | 1.29E+1 | ppm | NA |
| CN | 5.11E-1 | ppm | NA |
| ATOMIC ABSORPTION | | | |
| As | 2.80E-2 | ppm | NA |
| Hg | <5.00E-3 | ppm | NA |
| Se | <5.00E-3 | ppm | NA |
| ION CHROMATOGRAPHIC | | | |
| Cl | 3.83E+1 | ppm | NA |
| F | 6.06E+1 | ppm | NA |
| NO3 | 1.62E+3 | ppm | NA |
| NO2 | 1.12E+3 | ppm | NA |
| PO4 | 1.12E+2 | ppm | NA |
| SO4 | 4.18E+2 | ppm | NA |
| GEA | | | |
| Cs 137 | 6.59E+3 | uCi/L | NA |
| Cs 134 | <9.17E+0 | uCi/L | NA |
| Eu 155 | <4.74E+1 | uCi/L | NA |

# SUMMARY DATA REPORT

Project: 242–A EVAPORATOR FEED CHARACTERIZATION
Tank: 103AP
Customer ID: 3AP891–8

Acid Digestion Sample Results

| | Sample R943 | | Sample Duplicate NA |
|---|---|---|---|
| Acid Digestion | Complete | | |
| ICP | | | |
| Al | 1.04E+5 | ug/L | NA |
| Ba | <6.50E+1 | ug/L | NA |
| Cd | 8.10E+1 | ug/L | NA |
| Cr | 3.53E+3 | ug/L | NA |
| Fe | 6.30E+2 | ug/L | NA |
| Pb | <4.00E+2 | ug/L | NA |
| Mg | <2.55E+2 | ug/L | NA |
| Mn | <1.50E+1 | ug/L | NA |
| Ag | <4.00E+1 | ug/L | NA |
| Na | 3.70E+6 | ug/L | NA |
| Zn | <2.00E+1 | ug/L | NA |

# UNDIGESTED SAMPLE ANALYSIS RESULTS

# UNDIGESTED SAMPLE RESULTS

Tank: 103AP
Sample No.: R943
Customer ID: 3AP891-8

| | Check Standard | | Blank | | Sample | | Duplicate Sample | | Spike of Sample | | Check Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Lab ID:** | **R939** | | **R940** | | **R943** | | **NA** | | **NA** | | **R946** | |
| Specific Gravity (01-04-92) | 98.37 | % | 0.983 | | 0.992 | | NA | | NA | | 98.16 | % |
| **Lab ID:** | **R939** | | **NA** | | **R943** | | **NA** | | **NA** | | **R946** | |
| DSC (01-08-92) | Exotherm | | NA | | No Exotherm | | NA | | NA | | Exotherm | |
| **Lab ID:** | **S599** | | **R940** | | **R943** | | **NA** | | **NA** | | **R946** | |
| Total Organic Carbon (01-28-92) | 99.7 | % | 3.60E+0 | ug | 8.77E+1 | ppm | NA | | NA | | 97.7 | % |
| **Lab ID:** | **R939** | | **R940** | | **R943** | | **NA** | | **NA** | | **R946** | |
| Total Inorganic Carbon (01-28-92) | 99.4 | % | 2.20E+0 | ug | 5.30E+2 | ppm | NA | | NA | | 102.8 | % |
| Ammonia (01-13-92) | 98.62 | % | <9.00E+1 | ppm | <9.00E+1 | ppm | NA | | NA | | 97.02 | % |
| OH (01-07-92) | 99.8 | % | Complete | | 1.29E+1 | ppm | NA | | NA | | 102.1 | % |
| Cyanide (02-03-92) | 99.1 | % | <2.00E-2 | ppm | 5.11E-1 | ppm | NA | | NA | | 98.7 | % |
| **ATOMIC ABSORPTION** | | | | | | | | | | | | |
| Arsenic (01-07-92) | 105.6 | % | 6.00E-4 | ppm | 2.80E-2 | ppm | NA | | NA | | 111.6 | % |
| Mercury (01-21-92) | 107.4 | % | <5.00E-4 | ppm | <5.00E-3 | ppm | NA | | NA | | 90.7 | % |
| Selenium (01-29-92) | 114.38 | % | <5.00E-4 | ppm | <5.00E-3 | ppm | NA | | NA | | 112.06 | % |
| **ION CHROMATOGRAPHIC** | | | | | | | | | | | | |
| Chloride (01-08-92) | 92.9 | % | <1.00E-1 | ppm | 3.83E+1 | ppm | NA | | NA | | 100.65 | % |
| Fluoride (01-10-92) | 98.8 | % | <1.00E-1 | ppm | 6.06E+1 | ppm | NA | | NA | | 102.9 | % |
| Nitrate (01-10-92) | 106.1 | % | <1.00E+0 | ppm | 1.62E+3 | ppm | NA | | NA | | 102.8 | % |
| Nitrite (01-10-92) | 107.3 | % | <1.00E+0 | ppm | 1.12E+3 | ppm | NA | | NA | | 108.4 | % |
| Phosphate (01-08-92) | 97.3 | % | <1.00E+0 | ppm | 1.12E+2 | ppm | NA | | NA | | 100.52 | % |
| Sulfate (01-08-92) | 92.8 | % | <1.00E+0 | ppm | 4.18E+2 | ppm | NA | | NA | | 100.12 | % |
| **GEA (01-04-92)** | | | | | | | | | | | | |
| Cs137 | 107.9 | % | 5.83E-3 | uCi/L | 6.59E+3 | uCi/L | NA | | NA | | 106.4 | % |
| Cs134 | NA | | NA | | <9.17E+0 | uCi/L | NA | | NA | | NA | |
| Eu 155 | NA | | NA | | <4.74E+1 | uCi/L | NA | | NA | | NA | |

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: SPECIFIC GRAVITY | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: WA96787 | Procedure/Rev: LA-510-112/C-2 |
| Technologist: R. D. MEYERS | Date: 01-04-92 |
| Starting Time: NA | Temperature: NA |
| Ending Time: NA | Chemist: R. K. FULLER |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5506 | 11 | | |
| 2 | REAGENT BLANK | R940-5606 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5706 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5506 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 15C11BJ/.20012 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

R939-5506

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5506 | 105AP | 12-16-91 | 16: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SPG | LA-510-112 | % RECOVERY | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| *200.1241 | STD |

Remarks, Calculations, Results
S332 ZNCL2
STD# 15211 BJ RESULT 1.4152
STD VAL. 1.4586 %REC 98.37%

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 82371 | | | | RX Fuller 1-6-92 |
| | His | His | His | His |
| Date 1/4/92 | Time Completed | Lab Unit Mgr | | |

54-6600-081 (R-10-83)

STD2
2.1843
1.9068
~~.256~~ .2775
.20012 = 1.4117

STD1
2.1771
1.8932
.2839
.20012 = 1.4186

AVE = 1.4152

R940-5606

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5606 | 105AP | 12-16-91 | 16: 2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SPG | LA-510-112 | | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| *200.1241 | BLK |

Remarks, Calculations, Results
REAGENT BLANK
0.9829

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 82371 | | | | RX Fuller 1-6-92 |
| | His | His | His | His |
| Date 1/4/92 | Time Completed | Lab Unit Mgr | | |

54-6600-081 (R-10-83)

2
2.0844
1.8874
.1970
.20012 = .9844

1
2.0866
1.8902
.1964
.20012 = .9814

AVE = .9829

R943-5706

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5706 | 105AP | 12-16-91 | 16: 9 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SPG | LA-510 | | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| *200.12 | SMPB91-8 |

Remarks, Calculations, Results
0.9924

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 82371 | | | | RX Fuller 1-6-92 |
| | His | His | His | His |
| Date 1/4/92 | Time Completed | Lab Unit Mgr | | |

54-6600-081 (R-10-83)

2
2.0758
1.8776
.1982
.20012 = .9944

1
2.0783
1.8793
.1990
.20012 = .9944

AVG = .9924

# SPECIFIC GRAVITY ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Received | Priority |
|---|---|---|---|---|
| R 946-5506 | 10,000 | 12-15-91 | 1521 | 2 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SPG | LA-510-112 | % RECOVERY | 11A-MW | 0 |

| Sample Size | Customer ID |
|---|---|
| 200.12 | STD |

Remarks, Calculations, Results:
5332 ZHCL2
STD# 15211 BJ RESULT 1.41215
STD VAL 1.4386 %REC 98.16%

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 82371 | | | | RA Fuller 1-6-92 |
| Robert D Meyer | Hrs | Hrs | Hrs | Hrs |
| Date 1/4/92 | Time Completed | Lab Unit Mgr | | |

54-8800-061 (R-10-63)

R 946-5506

1
2.1533
1.8682
.2851
.20012 = 1.42465

2
2.1724
1.8923
.2801
.2002 = 1.39966

AVG = 1.41215 ✓
1.4122

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: DIFFERENTIAL THERMAL | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: WC16134, WC16129 | Procedure/Rev: LA-514-113/A-0 |
| Technologist: M. MYERS | Date: 01-08-92 |
| Starting Time: NA | Temperature: NA |
| Ending Time: NA | Chemist: D. HERT |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5511 | 11 | | |
| 2 | SAMPLE 3AP891-8 | R943-5711 | 12 | | |
| 3 | FINAL LMCS CHECK STD | R946-5511 | 13 | | |
| 4 | | | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 27C11-BH/.010 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# DIFFERENTIAL THERMAL ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5511 | 103AP | 12-16-91 | 16: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| DSC | LA-514-113 | % RECOVERY | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| ? .010 mL | STD |

Remarks, Calculations, Results

27C118H

Exotherm OK

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Initials | | | | |
| Pts | Pts | Pts | Pts | Pts |
| 60823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-8-92 | | | | |

54-6800-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5711 | 103AP | 12-15-91 | 16: | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| DSC | LA-514-113 | EXOTHERMS | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| ? .010 mL | 3AFU91-U |

Remarks, Calculations, Results

No exotherm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Initials | | | | |
| Pts | Pts | Pts | Pts | Pts |
| 60873 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-8-92 | | | | |

54-6800-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5511 | 103AP | 12-16-91 | 16:13 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| DSC | LA-514-113 | % RECOVERY | N124W | |

| Sample Size | Customer ID |
|---|---|
| ? 10 ~ | STD |

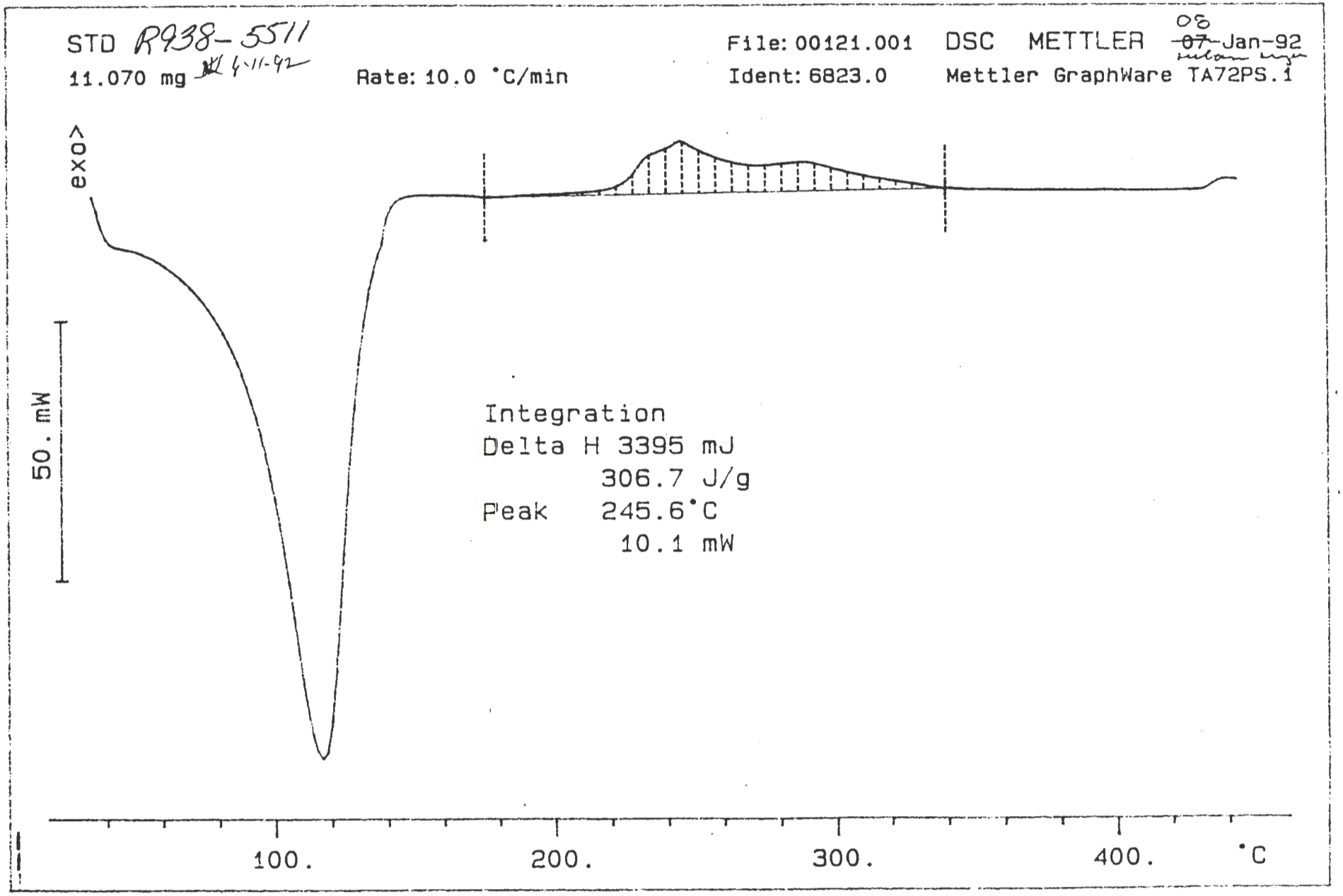
Remarks, Calculations, Results

11.127 ~

Exotherm OK

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Initials | | | | |
| Pts | Pts | Pts | Pts | Pts |
| 82020 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 01-08-92 | | | | |

54-6800-061 (R-10-83)

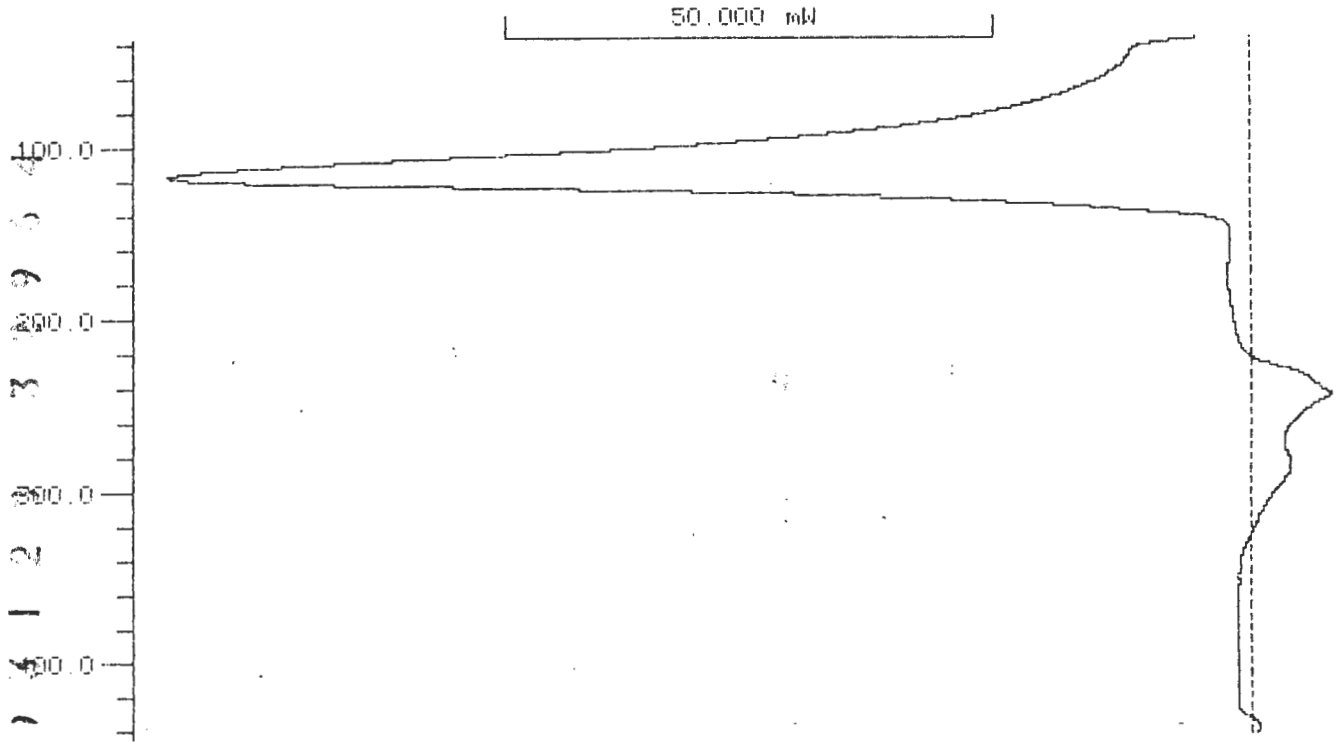

STD R938-5511
11.070 mg 4-11-92
Rate: 10.0 °C/min
File: 00121.001
Ident: 6823.0
DSC METTLER 08 Jan-92
Mettler GraphWare TA72PS.1
exo>
50. mW
Integration
Delta H 3395 mJ
306.7 J/g
Peak 245.6°C
10.1 mW
100.
200.
300.
400.
°C

R938-5511
DK 6-11-92

END SCREEN °C 445.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->

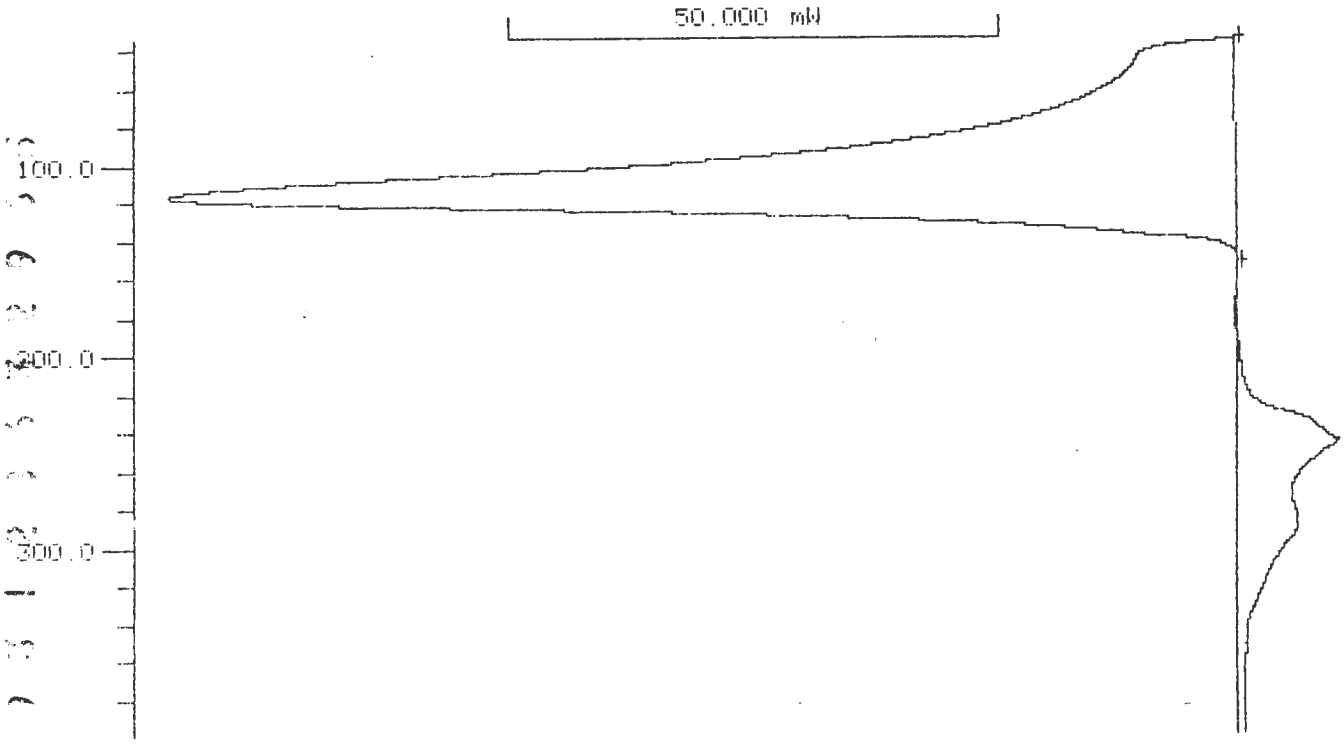



******** METTLER TA4000 SYSTEM *********

R938-5511
4-11-92

AUTOLIMITS
WARNING 8
END TEMP. °C 151.7

TEMPERATURE °C HEAT FLOW
EXOTHERMAL-->

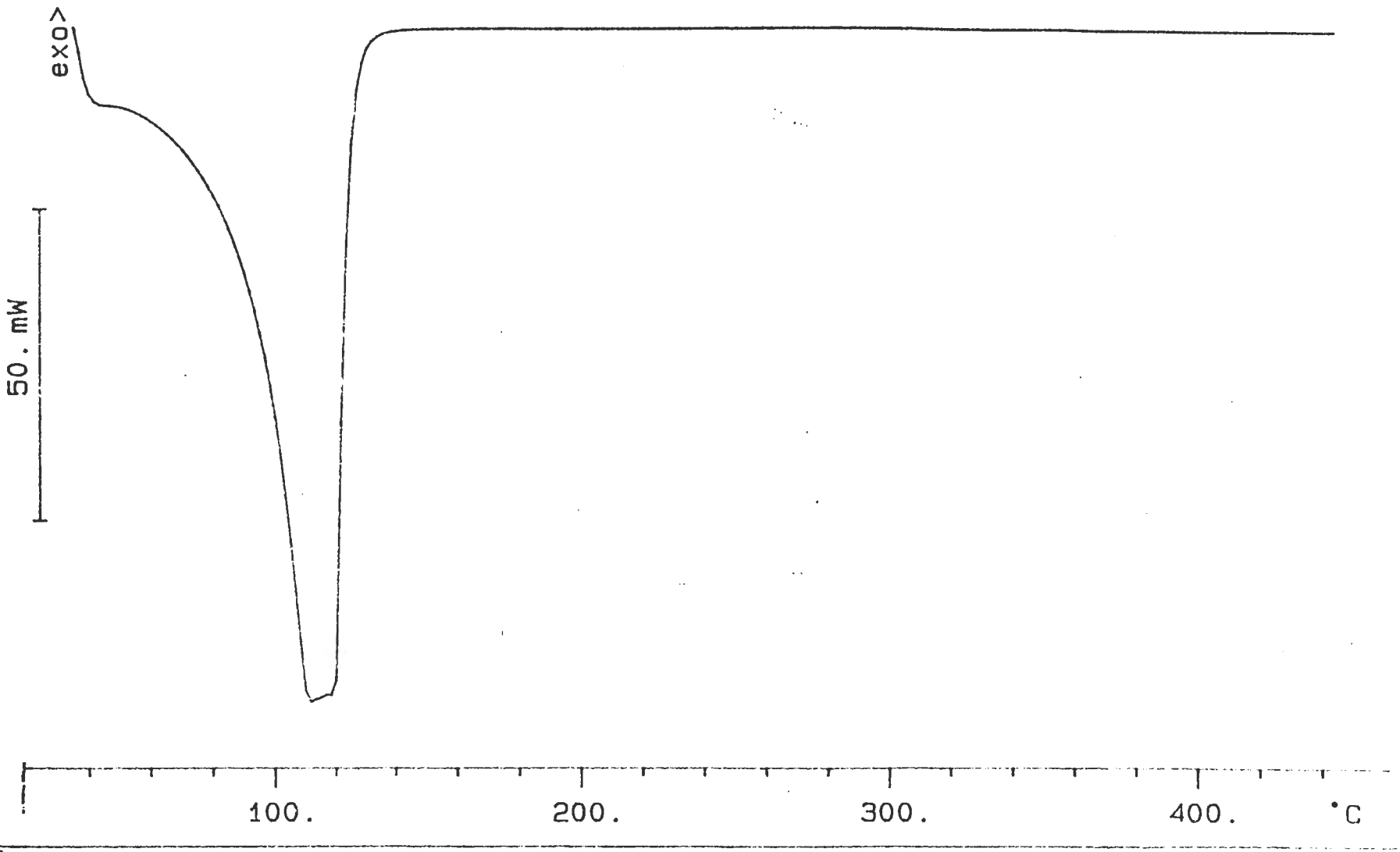



WARNING 1
ΔH ENDO mJ 23907
ΔH J/G 2159.7
PEAK TEMP. °C 106.6

******** METTLER TA4000 SYSTEM *********

DK 6-11-92

R943SAMPLE
9.766 mg
Rate: 10.0 °C/min
File: 00124.001
Ident: 6823.0
DSC METTLER 08 07-Jan-92
Mettler GraphWare TA72PS.1



R943-5711
4-11-92

# PEAK INTEGRATION

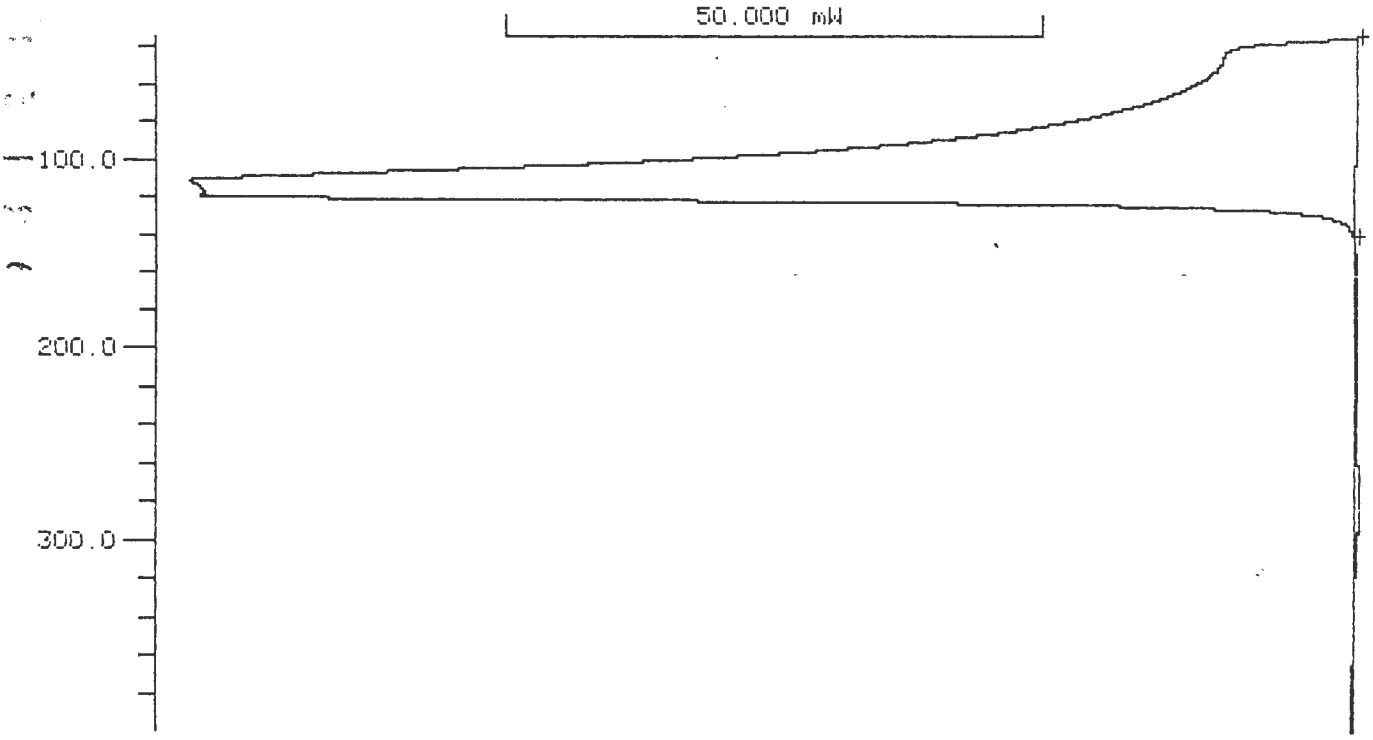
7-JAN-92 18:25

7-JAN-92 17:41 **

| | |
|---|---|
| PEAK INTEGRATION | |
| DYN/ISO 1/2 | 1 |
| AUTOLIMIT 0/1 | 1 |
| START | 35 |
| END | 400 |
| BASELINE TYPE | 8 |
| PLOT CM | 10 |
| PLOT MODE | 101 |
| FILE NO. | 00124.001 |
| IDENT. NO. | 6823 |
| RATE K/MIN. | 10 |
| WEIGHT mG | 9.7660 |
| AUTOLIMITS | |
| WARNING | 8 |
| END TEMP. °C | 140.7 |

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->



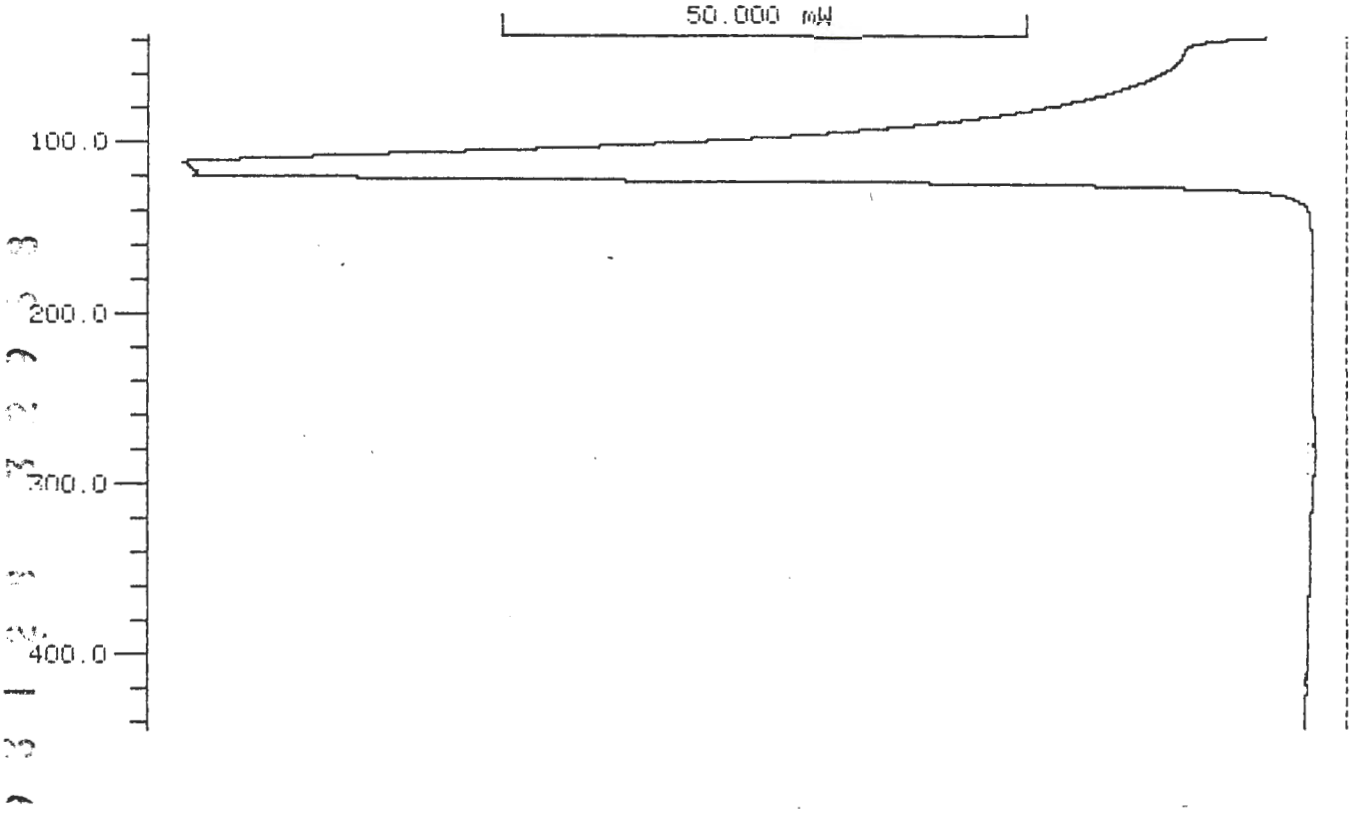

| | |
|---|---|
| WARNING | 1 |
| ΔH ENDO mJ | 22266 |
| ΔH J/G | 2279.9 |
| PEAK TEMP. °C | 102.8 |

R943-5711
DK 4-11-92

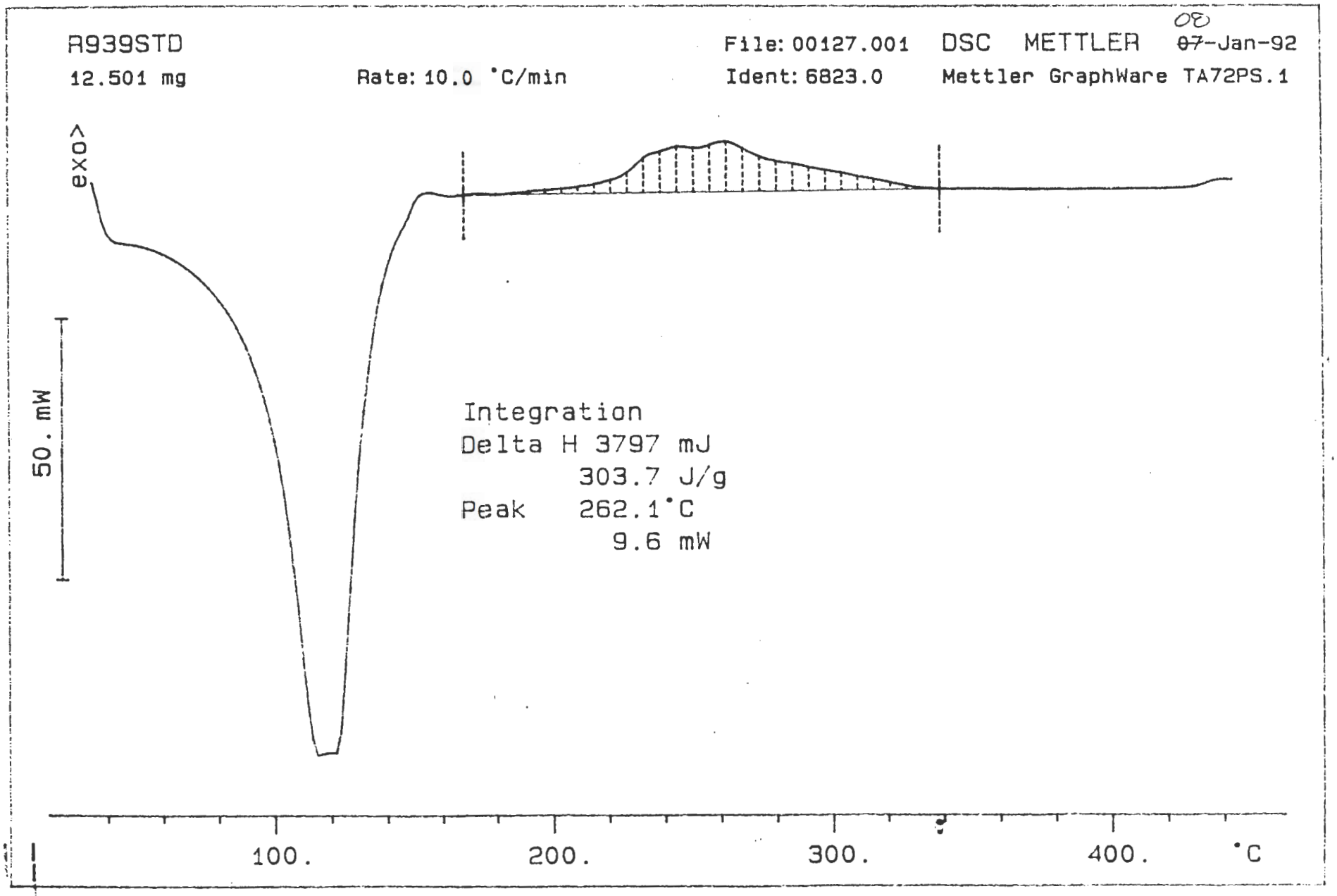
END SCREEN °C 445.0

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->




******** METTLER TA4000 SYSTEM *********


R939STD
12.501 mg
Rate: 10.0 °C/min
File: 00127.001
Ident: 6823.0
DSC METTLER
08 ~~07~~-Jan-92
Mettler GraphWare TA72PS.1
<exo
50. mW
Integration
Delta H 3797 mJ
303.7 J/g
Peak 262.1°C
9.6 mW
100.
200.
300.
400.
°C

# PEAK INTEGRATION

7-JAN-92 22:01

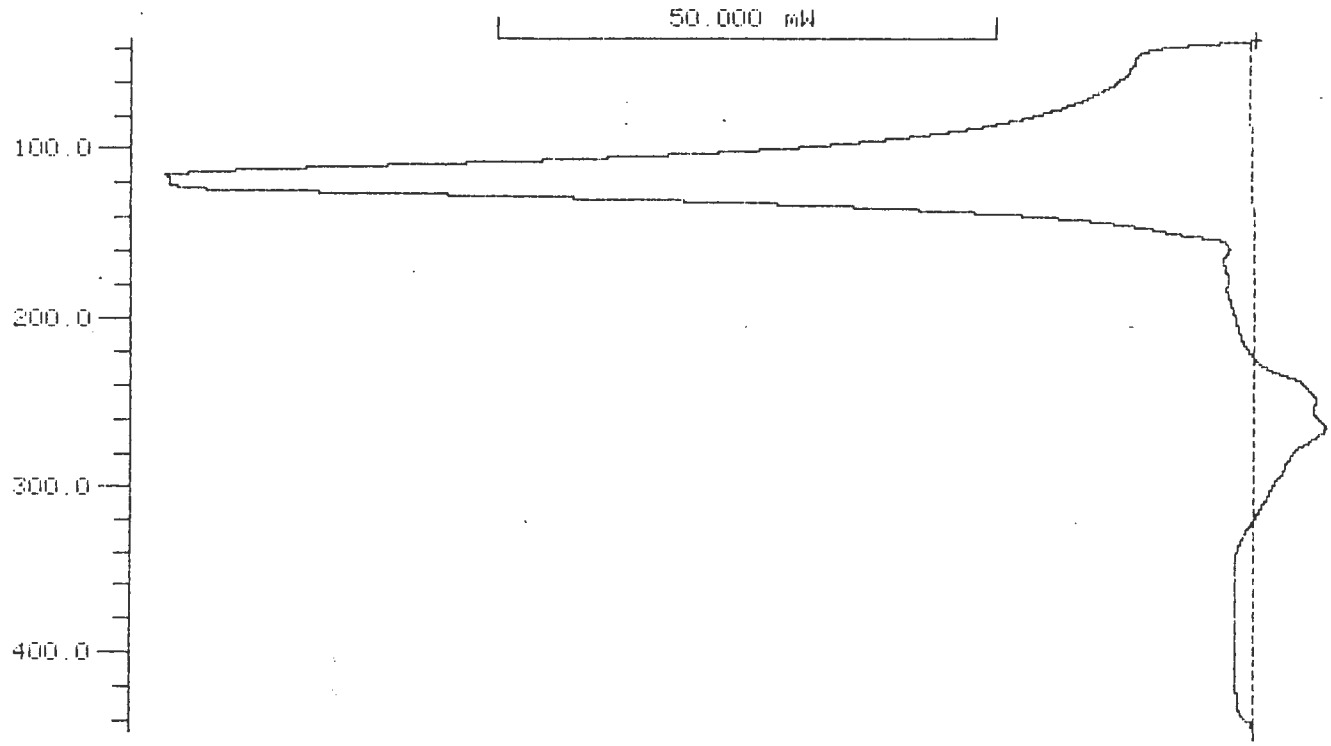
7-JAN-92 21:14 **

R939-5511
6-11-92

| | |
|---|---|
| PEAK INTEGRATION | |
| DYN/ISO 1/2 | 1 |
| AUTOLIMIT 0/1 | 0 |
| START | 35 |
| END | 450 |
| START B. LINE | 35 |
| END B. LINE | 450 |
| BASELINE TYPE | 8 |
| PLOT CM | 10 |
| PLOT MODE | 101 |
| FILE NO. | 00127.001 |
| IDENT. NO. | 6823 |
| RATE K/MIN. | 10 |
| WEIGHT mG | 12.501 |
| END SCREEN °C | 445.2 |

TEMPERATURE °C

HEAT FLOW
EXOTHERMAL-->




| | |
|---|---|
| WARNING | 1 |
| ΔH ENDO mJ | 25640 |
| ΔH J/G | 2051.0 |
| PEAK TEMP. °C | 105.8 |

******** METTLER TA4000 SYSTEM *********

26. NOV. 91
[illegible]

DSC

Calibrated Nov 26, 91

ONFIGURATION

26-NOV-91 11:24

| | |
|---|---|
| E INDIUM | 255 |
| DSC SIGN ICTA | 1 |
| TAU LAG | 12 |
| TAU SIGNAL | 0 |
| E DIMIN. FACT. | .93 |
| S | 2400 |
| TAU LAG 2 | 16 |
| TAU SIGNAL 2 | 0 |
| E DIMIN. F. 2 | .93 |
| S 2 | 1850 |
| . TEMP. | 600. |
| MIN. TEMP. | -50. |
| A PT100 | .21437 |
| B PT100 | .74509 |
| C PT100 | -.10370 |
| HEAT P | 3000 |
| HEAT I | 250 |
| HEAT D | 30 |
| COOL 1 | 0 |
| COOL 2 | 0 |
| COOL 3 | 0 |
| A1 | 10773 |
| B1 | 58.121 |
| C1 | .14689 |
| T1 | -100 |
| A2 | 8940 |
| B2 | 17.884 |
| C2 | -.072 |
| T2 | 363 |
| A3 | 9360.3 |
| B3 | -15.043 |
| C3 | .01538 |

******** METTLER TA4000 SYSTEM *********

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: TOTAL ORGANIC CARBON | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: MODEL 5011 WC16130 | Procedure/Rev: LA-344-105/B-1 |
| Technologist: L. CONLIN | Date: 01-28-92 |
| Starting Time: 16:30 | Temperature: NA |
| Ending Time: 23:00 | Chemist: D. BISENIUS |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | S599-1621 | 11 | | |
| 2 | REAGENT BLANK | R940-5626* | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5726* | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5526* | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 70C11-J/.200 mL | | | NA |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| *SAMPLES RERUN. | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| S 599.-1621 | STD | 11-29-91 | 23:35 | 21 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| TOC | LA-344-105 | GM/L.C | S1D | 0 |

Sample Size: 200-2ML-200 IN .5M H2SO4
Customer ID:

Remarks, Calculations, Results:
S356 CO3TOC
STDH 70C11J RESULT 2.99 g/L C
STD VAL 3.000 g/LC %REC 99.7%
$\%Rec = \frac{2.99\ g/L}{3.000\ g/L} \times 100 = 99.7\%$

Analyst 1: 16C949 D
Analyst 2:
Analyst 3:
Analyst 4:
Analyst 5:
Date: 1-28-92
Time Completed:
Lab Unit Mgr: DY Bisenius

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 990.-5626 | 103AP | 12-16-91 | 16: 2 | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| TOC | LA-344-105 | ug Carbon | N124W | 1 |

Sample Size: ?
Customer ID: BLK

Remarks, Calculations, Results:
REAGENT BLANK
.5 M $H_2SO_4$
RERUN
3.60 mg C

Analyst 1: 16C949 D
Analyst 2:
Analyst 3:
Analyst 4:
Analyst 5:
Date: 1-28-92
Time Completed:
Lab Unit Mgr: DY Bisenius

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 993.-5726 | 103AP | 12-16-91 | 16: 9 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| TOC | LA-344-105 | G/L | N124W | 1 |

Sample Size: ? 1 ML + 500 ul $H_2SO_4$
Customer ID: 3AP891-8

Remarks, Calculations, Results:
RERUN
8.77 E-2 g/L C

Analyst 1: 16C949 D
Analyst 2:
Analyst 3:
Analyst 4:
Analyst 5:
Date: 1-28-92
Time Completed:
Lab Unit Mgr: DY Bisenius

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 996.-5526 | 103AP | 12-16-91 | 16:13 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| TOC | LA-344-105 | % RECOVERY | N124W | 1 |

Sample Size: ? 200ul + 2ML $H_2SO_4$
Customer ID: STD

Remarks, Calculations, Results:
RERUN
S356 CO3TOC
STDH 70C11J RESULT 2.93 g/LC
STD VAL 3.000 g/LC %REC 97.7%
$\%Rec = \frac{2.93\ g/L}{3.000\ g/L} \times 100 = 97.7\%$

Analyst 1: 16C949 D
Analyst 2:
Analyst 3:
Analyst 4:
Analyst 5:
Date: 1-28-92
Time Completed:
Lab Unit Mgr: DY Bisenius

Beginning Std.

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

S 599

Sample: 70C11J  Date: 01/28/92  Time: 19:03:14

Sample Size = 200 uL  Analyst : L CONLIN
Dil Factor = 11  Min Readings = 14
Blank ID # = BLANK  Max Readings = 14
Blank Value = .5140706 ug/minute C  % Difference = 10

| == Reading | ==== Analysis Time | ==== Coulometer | ==== % Difference == |
|---|---|---|---|
| 1 | 0.51 | 0.10 | 0.00 |
| 2 | 1.01 | 2.40 | 95.83 |
| 3 | 1.51 | 31.70 | 92.43 |
| 4 | 2.01 | 44.60 | 28.92 |
| 5 | 2.51 | 50.60 | 11.86 |
| 6 | 3.00 | 54.00 | 6.30 |
| 7 | 3.51 | 55.30 | 2.35 |
| 8 | 4.00 | 56.00 | 1.25 |
| 9 | 4.50 | 56.50 | 0.88 |
| 10 | 5.00 | 57.00 | 0.88 |
| 11 | 5.50 | 57.30 | 0.52 |
| 12 | 6.00 | 57.50 | 0.35 |
| 13 | 6.50 | 57.80 | 0.52 |
| 14 | 7.00 | 58.00 | 0.34 |

BEST AVAILABLE COPY

BLANK VALUE = 3.6 micrograms carbon
BLANK FACTOR = 3.6 / 7.00293 = +5.1E-01 ug/min Carbon

SAMPLE RESULTS:
( 58 - 3.6 )(11)/(200) = +2.99E+00 g/L Carbon
( 58 - 3.6 )(11)/(200)(12) = +2.49E-01 Molar Carbon

OK Calculated by D.Y. Bisenius 81787 1/30/92

Sample Run By: _____
L CONLIN 6C949

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED THE ANALYSIS RUN ON PAGES 42 TO 45 .

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

R940

Sample: BLANK  Date: 01/28/92  Time: 18:53:09

Sample Size = 200 ul
Dil Factor = 1
Blank ID # = BLANK
Blank Value = N/A

Analyst : L CONLIN
Min Readings = 14
Max Readings = 14
% Difference = 10

| == Reading | ==== Analysis Time | ==== Coulometer | ==== % Difference == |
|---|---|---|---|
| 1 | 0.51 | 0.00 | 0.00 |
| 2 | 1.01 | 0.40 | 100.00 |
| 3 | 1.51 | 0.90 | 55.56 |
| 4 | 2.00 | 1.30 | 30.77 |
| 5 | 2.50 | 1.60 | 18.75 |
| 6 | 3.00 | 1.80 | 11.11 |
| 7 | 3.50 | 2.10 | 14.29 |
| 8 | 4.00 | 2.30 | 8.70 |
| 9 | 4.50 | 2.50 | 8.00 |
| 10 | 5.00 | 2.80 | 10.71 |
| 11 | 5.50 | 2.90 | 3.45 |
| 12 | 6.00 | 3.10 | 6.45 |
| 13 | 6.50 | 3.40 | 8.82 |
| 14 | 7.00 | 3.60 | 5.56 |

BEST AVAILABLE COPY

BLANK VALUE = 3.6 micrograms carbon
BLANK FACTOR = 3.6 / 7.00293 = +5.1E-01 ug/min Carbon

OK Calculated by D.Y. Bisenius 81787 1/30/92

Sample Run By: L CONLIN 6C949

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R943 Date: 01/28/92 Time: 22:15:33

Sample Size = 200 uL
Dil Factor = 1.5
Blank ID # = BLANK
Blank Value = .5140706 ug/minute C

Analyst : L CONLIN
Min Readings = 14
Max Readings = 14
% Difference = 10

| Reading | Analysis Time | Coulometer | % Difference |
|---|---|---|---|
| 1 | 0.51 | 0.00 | 0.00 |
| 2 | 1.01 | 2.20 | 100.00 |
| 3 | 1.51 | 9.30 | 76.34 |
| 4 | 2.01 | 10.70 | 13.08 |
| 5 | 2.51 | 12.10 | 11.57 |
| 6 | 3.01 | 12.60 | 3.97 |
| 7 | 3.51 | 13.20 | 4.55 |
| 8 | 4.01 | 13.50 | 2.22 |
| 9 | 4.50 | 13.90 | 2.88 |
| 10 | 5.00 | 14.20 | 2.11 |
| 11 | 5.50 | 14.50 | 2.07 |
| 12 | 6.00 | 14.80 | 2.03 |
| 13 | 6.50 | 15.00 | 1.33 |
| 14 | 7.00 | 15.30 | 1.96 |

BEST AVAILABLE COPY

BLANK VALUE = 3.6 micrograms carbon
BLANK FACTOR = 3.6 / 7.00293 = +5.1E-01 ug/min Carbon

SAMPLE RESULTS:
( 15.3 - 3.600502 )(1.5)/(200) = +8.77E-02 g/L Carbon
( 15.3 - 3.600502 )(1.5)/(200)(12) = +7.31E-03 Molar Carbon

Sample Run By: _____
L CONLIN 60949

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R946 Date: 01/28/92 Time: 22:53:04

Sample Size = 200 ul. Analyst : L CONLIN
Dil Factor = 11 Min Readings = 14
Blank ID # = BLANK Max Readings = 14
Blank Value = .5140706 ug/minute C % Difference = 10

| == Reading | ==== Analysis Time | ==== Coulometer | ==== % Difference == |
|---|---|---|---|
| 1 | 0.51 | 0.00 | 0.00 |
| 2 | 1.01 | 5.50 | 100.00 |
| 3 | 1.51 | 33.20 | 83.43 |
| 4 | 2.01 | 45.10 | 26.39 |
| 5 | 2.51 | 51.00 | 11.57 |
| 6 | 3.01 | 53.50 | 4.67 |
| 7 | 3.50 | 54.90 | 2.55 |
| 8 | 4.00 | 55.40 | 0.90 |
| 9 | 4.50 | 55.90 | 0.89 |
| 10 | 5.00 | 56.10 | 0.36 |
| 11 | 5.50 | 56.30 | 0.36 |
| 12 | 6.00 | 56.40 | 0.18 |
| 13 | 6.50 | 56.60 | 0.35 |
| 14 | 7.00 | 56.80 | 0.35 |

BEST AVAILABLE COPY

BLANK VALUE = 3.6 micrograms carbon
BLANK FACTOR = 3.6 / 7.00293 = +5.1E-01 ug/min Carbon

SAMPLE RESULTS:
( 56.8 - 3.599561 )(11)/(200) = +2.93E+00 g/L Carbon
( 56.8 - 3.599561 )(11)/(200)(12) = +2.44E-01 Molar Carbon

Sample Run By: _____
L CONLIN 6C949

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: TOTAL INORGANIC CARBON | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: WB39927 | Procedure/Rev: LA-622-102/B-1 |
| Technologist: J. SOLBRACK | Date: 1-28-92 |
| Starting Time: 16:30 | Temperature: NA |
| Ending Time: 11:45 | Chemist: D. BISENIUS |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5527 | 11 | | |
| 2 | REAGENT BLANK | R940-5627 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5727 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5527 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 69C11-L/.50 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# TOTAL INORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

| | | | | |
|---|---|---|---|---|
| Sample No. K 946.-5527 | Sample Date 10-24 | Date 12-16-91 | Time Received 1811 | Page 25 |
| Determination TIC | Method Number LA-622-102 | Result Units % RECOVERY | Charge Code N124W | Analyst 0 |
| Sample Size ? .50 g | | | Customer ID STD | |

Remarks, Calculations, Results:
D223 LO3
STD# 69C11-L RESULT 1.988 E-1 M
STD VAL 2.000E-1M: REC 99.4%

$$\%Rec = \frac{1.988E-1\,M}{2.000E-1\,M} \times 100 = 99.4\%$$

| | | | | |
|---|---|---|---|---|
| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
| 82020 | | | | |
| Date 1-28-92 | Time Completed | Lab Unit Mgr D4 Bisenius | | |

| | | | | |
|---|---|---|---|---|
| Sample No. K 946.-5527 | Sample Date 10-24 | Date 12-16-91 | Time Received 1811 | Page 25 |
| Determination TIC | Method Number LA-622-102 | Result Units ug Carbon | Charge Code N124W | Analyst 0 |
| Sample Size ? .50 g | | | Customer ID BLK | |

Remarks, Calculations, Results:
REAGENT BLANK

2.2 ug C

| | | | | |
|---|---|---|---|---|
| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
| 82020 | | | | |
| Date 1-28-92 | Time Completed | Lab Unit Mgr D4 Bisenius | | |

| | | | | |
|---|---|---|---|---|
| Sample No. K 946.-5527 | Sample Date 10-24 | Date 12-16-91 | Time Received 1811 | Page 25 |
| Determination TIC | Method Number LA-622-102 | Result Units g/L | Charge Code N124W | Analyst 0 |
| Sample Size ? 200 mL | | | Customer ID 3APB49-8 | |

Remarks, Calculations, Results:

5.295 E-1 g/L

| | | | | |
|---|---|---|---|---|
| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
| 82020 | | | | |
| Date 1-28-92 | Time Completed | Lab Unit Mgr D4 Bisenius | | |

| | | | | |
|---|---|---|---|---|
| Sample No. K 946.-5527 | Sample Date 10-24 | Date 12-16-91 | Time Received 1811 | Page 25 |
| Determination TIC | Method Number LA-622-102 | Result Units % RECOVERY | Charge Code N124W | Analyst 0 |
| Sample Size ? .50 g | | | Customer ID STD | |

Remarks, Calculations, Results:
D223 LO3
STD# 69C11-L RESULT 2.055 E-1 M
STD VAL 2.000E-1M: REC 102.8%

$$\%Rec = \frac{2.055E-1\,M}{2.000E-1\,M} \times 100 = 102.8\%$$

| | | | | |
|---|---|---|---|---|
| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
| 82020 | | | | |
| Date 1-28-92 | Time Completed | Lab Unit Mgr D4 Bisenius | | |

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R-939 69C11-L  Date: 01/28/92  Time: 19:01:19

Sample Size = 50 uL  Analyst : JI SOLBRACK
Dil Factor = 1  Min Readings = 14
Blank ID # = BLK  Max Readings = 14
Blank Value = .3141542 ug/minute C  % Difference = 10

| == Reading | ==== Analysis Time | ==== Coulometer | ==== % Difference == |
|---|---|---|---|
| 1 | 0.51 | 0.30 | 0.00 |
| 2 | 1.01 | 15.50 | 98.06 |
| 3 | 1.51 | 51.60 | 69.96 |
| 4 | 2.01 | 82.90 | 37.76 |
| 5 | 2.51 | 101.90 | 18.65 |
| 6 | 3.01 | 111.00 | 8.20 |
| 7 | 3.51 | 116.10 | 4.39 |
| 8 | 4.00 | 118.10 | 1.69 |
| 9 | 4.50 | 119.70 | 1.34 |
| 10 | 5.00 | 120.10 | 0.33 |
| 11 | 5.50 | 120.80 | 0.58 |
| 12 | 6.00 | 120.90 | 0.08 |
| 13 | 6.50 | 121.30 | 0.33 |
| 14 | 7.00 | 121.50 | 0.16 |

BEST AVAILABLE COPY

BLANK VALUE = 2.2 micrograms carbon
BLANK FACTOR = 2.2 / 7.00293 = +3.1E-01 ug/min Carbon

SAMPLE RESULTS:
( 121.5 - 2.200038 )(1)/(50) = +2.386E+00 g/L Carbon
( 121.5 - 2.200038 )(1)/(50)(12) = +1.988E-01 Molar Carbon

OK Calculated by D.Y. Bisenius 81787 1/30/92

Sample Run By: _____
JI SOLBRACK 82020

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST
THAT COMPLETED THE ANALYSIS RUN ON PAGES 48 TO 51 .

TOC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BLK R-940 Date: 01/28/92 Time: 18:48:20

Sample Size = 50 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = N/A

Analyst : JI SOLBRACK
Min Readings = 14
Max Readings = 14
% Difference = 10

| == Reading | ==== Analysis Time | ==== Coulometer | ==== % Difference == |
|---|---|---|---|
| 1 | 0.51 | 0.00 | 0.00 |
| 2 | 1.01 | 0.10 | 100.00 |
| 3 | 1.51 | 0.20 | 50.00 |
| 4 | 2.01 | 0.40 | 50.00 |
| 5 | 2.51 | 0.60 | 33.33 |
| 6 | 3.01 | 0.80 | 25.00 |
| 7 | 3.51 | 0.90 | 11.11 |
| 8 | 4.01 | 1.00 | 10.00 |
| 9 | 4.50 | 1.20 | 16.67 |
| 10 | 5.00 | 1.40 | 14.29 |
| 11 | 5.50 | 1.60 | 12.50 |
| 12 | 6.00 | 1.80 | 11.11 |
| 13 | 6.50 | 2.00 | 10.00 |
| 14 | 7.00 | 2.20 | 9.09 |

BEST AVAILABLE COPY

BLANK VALUE = 2.2 micrograms carbon
BLANK FACTOR = 2.2 / 7.00293 = +3.1E-01 ug/min Carbon

OK Calculated by D.Y. Bisenius 81787 1/30/92

Sample Run By: JI SOLBRACK 82020

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R-943 Date: 01/28/92 Time: 21:51:30

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3141542 ug/minute C

Analyst : JI SOLBRACK
Min Readings = 14
Max Readings = 14
% Difference = 10

| == Reading | ==== Analysis Time | ==== Coulometer | ==== % Difference == |
|---|---|---|---|
| 1 | 0.51 | 0.40 | 0.00 |
| 2 | 1.01 | 10.80 | 96.30 |
| 3 | 1.51 | 34.90 | 69.05 |
| 4 | 2.01 | 59.00 | 40.85 |
| 5 | 2.50 | 76.60 | 22.98 |
| 6 | 3.00 | 88.50 | 13.45 |
| 7 | 3.50 | 95.80 | 7.62 |
| 8 | 4.00 | 100.70 | 4.87 |
| 9 | 4.50 | 103.40 | 2.61 |
| 10 | 5.00 | 105.20 | 1.71 |
| 11 | 5.50 | 106.30 | 1.03 |
| 12 | 6.00 | 107.00 | 0.65 |
| 13 | 6.50 | 107.60 | 0.56 |
| 14 | 7.00 | 108.10 | 0.46 |

BEST AVAILABLE COPY

BLANK VALUE = 2.2 micrograms carbon
BLANK FACTOR = 2.2 / 7.00293 = +3.1E-01 ug/min Carbon

SAMPLE RESULTS:
( 108.1 - 2.200307 )(1)/(200) = +5.295E-01 g/L Carbon
( 108.1 - 2.200307 )(1)/(200)(12) = +4.412E-02 Molar Carbon

Sample Run By: _____
JI SOLBRACK 82020

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R-946 Date: 01/28/92 Time: 22:39:44

Sample Size = 50 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3141542 ug/minute C

Analyst : JI SOLBRACK
Min Readings = 14
Max Readings = 14
% Difference = 10

| == Reading | ==== Analysis Time | ==== Coulometer | ==== % Difference == |
|---|---|---|---|
| 1 | 0.51 | 0.90 | 0.00 |
| 2 | 1.01 | 28.00 | 96.79 |
| 3 | 1.50 | 60.70 | 53.87 |
| 4 | 2.00 | 83.30 | 27.13 |
| 5 | 2.50 | 97.40 | 14.48 |
| 6 | 3.00 | 106.40 | 8.46 |
| 7 | 3.50 | 112.50 | 5.42 |
| 8 | 4.00 | 116.50 | 3.43 |
| 9 | 4.50 | 119.40 | 2.43 |
| 10 | 5.00 | 121.40 | 1.65 |
| 11 | 5.50 | 122.90 | 1.22 |
| 12 | 6.00 | 123.70 | 0.65 |
| 13 | 6.50 | 124.70 | 0.80 |
| 14 | 7.00 | 125.50 | 0.64 |

BEST AVAILABLE COPY

BLANK VALUE = 2.2 micrograms carbon
BLANK FACTOR = 2.2 / 7.00293 = +3.1E-01 ug/min Carbon

SAMPLE RESULTS:
( 125.5 - 2.199693 )(1)/(50) = +2.466E+00 g/L Carbon
( 125.5 - 2.199693 )(1)/(50)(12) = +2.055E-01 Molar Carbon

Sample Run By: _____
JI SOLBRACK 82020

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: AMMONIA | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: NA | Procedure/Rev: LA-634-102/D-0 |
| Technologist: S. LAI | Date: 01-13-92 |
| Starting Time: NA | Temperature: NA |
| Ending Time: NA | Chemist: D. BISENIUS |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5528 | 11 | | |
| 2 | REAGENT BLANK | R940-5628 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5728 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5528 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 4C11-QX/0.250 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| SAMPLES RERUN. | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# AMMONIA ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 948.-5529 | 102AP | 12-16-91 | 16: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NH4 | LA-634-102 | % RECOVERY | N124W | 1 |

Sample Size: ? 250λ 0.0994/17 HCl
Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL 4C11-8X
STDH 4C11QX RESULT 0.0493[M]
STD VAL 5x10⁻² M %REC 98.62%
(152λ-28λ)(0.0994/17) / 250λ = 0.0493[M]
RERUN
Blank: 28λ
STD: 152λ
1-13-92

Analyst-1: Sue Li
Analyst-2:
Analyst-3: Leslie Dray
Analyst-4:
Analyst-5: RK Tilk 1-14-92
Hrs: 1c916
Date: 1-13-92
Time Completed:
Lab Unit Mgr:

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5628 | 103AP | 12-16-91 | 16: 2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NH4 | LA-634-102 | PPM | N124W | 1 |

Sample Size: ? 1000λ 0.0994/14 HCl
Customer ID: BLK

Remarks, Calculations, Results:
REAGENT BLANK
< 5x10⁻⁶ moles x 18g NH4/mole x 1000mg/g = 0.09mg Blank: 28λ
0.09mg/1mL x 1000mL/g = < 90ppm (Reg) Blank: 29λ
RERUN

Analyst-1: Sue Li
Analyst-2:
Analyst-3:
Analyst-4: Leslie Dray
Analyst-5: RK Tilk 1-14-92
Hrs: 6c916
Date: 1-13-92
Time Completed:
Lab Unit Mgr:

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5728 | 103AP | 12-16-91 | 16: 9 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NH4 | LA-634-102 | PPM | N124W | 1 |

Sample Size: ? 1000λ 0.0994/14 HCl
Customer ID: 3AP891-8

Remarks, Calculations, Results:
< 5x10⁻⁶ moles x 18g NH4/mole x 1000mg/g = 0.09mg Blank: 28λ
0.09mg/1mL x 1000mL/g = < 90ppm Sample: 35λ

Analyst-1: Sue Li
Analyst-2:
Analyst-3:
Analyst-4: Leslie Dray
Analyst-5: RK Tilk 1-14-92
Hrs: 1c916
Date: 1-13-92
Time Completed:
Lab Unit Mgr:

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5528 | 103AP | 12-16-91 | 16:13 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NH4 | LA-634-102 | % RECOVERY | N124W | 1 |

Sample Size: ? 250λ 0.0994/17
Customer ID: STD

Remarks, Calculations, Results:
S235 NH4CL 4C11-8X
STDH 4C11-8X RESULT 0.0485[M]
STD VAL 5.0x10⁻²[M] %REC 97.02%
(150λ-28λ)(0.0994/17) / 250λ = 0.0485[M]
RERUN
Blank: 28λ
STD: 150λ

Analyst-1: Sue Li
Analyst-2:
Analyst-3: Leslie Dray
Analyst-4:
Analyst-5: RK Tilk 1-14-92
Hrs: 1c916
Date: 1-13-92
Time Completed:
Lab Unit Mgr:

54-6600-061 (R-10-83)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: DETERMINATION OF HYDROXIDE ION IN SOLUTION | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: AL10636, WB55123 | Procedure/Rev: LA-661-102/F-1 |
| Technologist: J. MIDDLETON | Date: 01-07-92 |
| Starting Time: 00:15 | Temperature: NA |
| Ending Time: 04:05 | Chemist: S. ISAACSON |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5529 | 11 | | |
| 2 | REAGENT BLANK | R940-5629 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5729 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5529 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 9C11AG/.100 mL | | | N/A |

A-6000-881 (03/92)

# DETERMINATION OF HYDROXIDE ION IN SOLUTION - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 940.-5629 | 103NP | 12-16-91 | 18: 1 | 2A |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| OH | LM-681-102 | % RECOVERY | N12NW | 0 |

| Sample Size | Customer ID |
|---|---|
| 3ml 100% | STD |

Remarks, Calculations, Results: S273 115-OH .1899= $HNO_3$

STD# 9C11AG RESULT $8.55E^{-1}$

STD VAL $8.57E^{-1}$ %REC 99.8%

$$\frac{(460-10)(.1899)}{100} =$$

| Analyst-1 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5 |
|---|---|---|---|---|
| 82577 | Hrs | Hrs | Hrs | Hrs |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | | Stacie Isaacson |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 940.-5629 | 103NP | 12-16-91 | 18: 2 | |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| OH | LM-681-102 | M | N12NW | |

| Sample Size | Customer ID |
|---|---|
| 3ml | LK |

Remarks, Calculations, Results: REAGENT BLANK .1899= $HNO_3$

Complete

| Analyst-1 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5 |
|---|---|---|---|---|
| 82577 | Hrs | Hrs | Hrs | Hrs |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | | |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 940.-5629 | 103NP | 12-16-91 | 18: 4 | 2A |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| OH | LM-681-102 | M | N12NW | 0 |

| Sample Size | Customer ID |
|---|---|
| 1ml 100% SPIKE | SNP891-B |

Remarks, Calculations, Results: .1899= $HNO_3$

SPIKE# 9C11AG,

$$\frac{(464-460)(.1899)}{1000} = 7.60E^{-1}$$

| Analyst-1 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5 |
|---|---|---|---|---|
| 82577 | Hrs | Hrs | Hrs | Hrs |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | | Stacie Isaacson |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 940.-5629 | 103NP | 12-16-91 | 18: 3 | |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| OH | LM-681-102 | % RECOVERY | N12NW | |

| Sample Size | Customer ID |
|---|---|
| 100% | STD |

Remarks, Calculations, Results: S273 115-OH .1899= $HNO_3$

STD# 9C11AG RESULT $8.75E^{-1}$

STD VAL $8.57E^{-1}$ %REC 102.1%

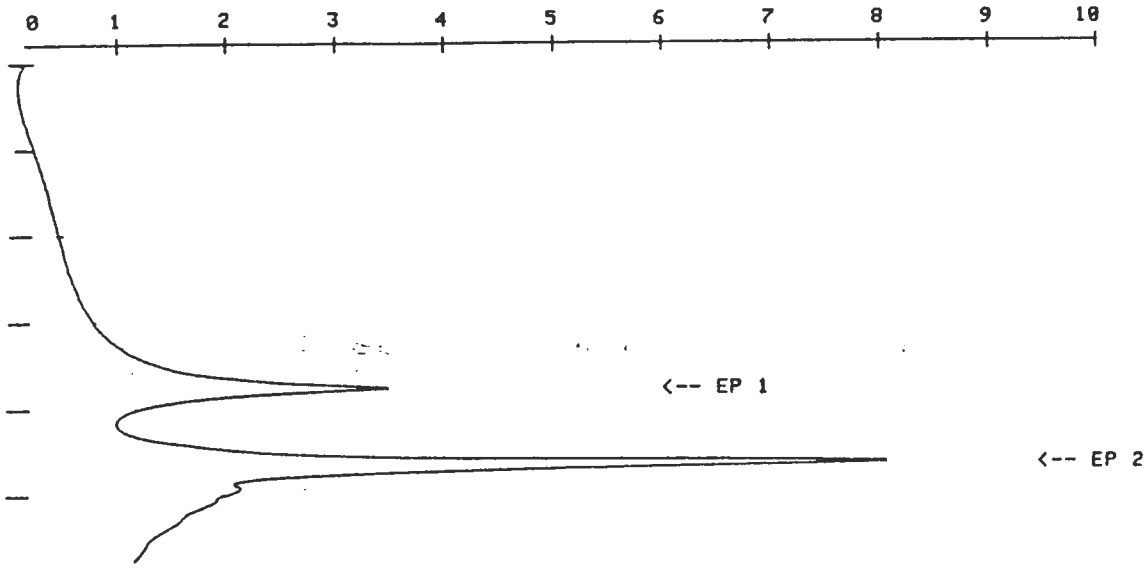
$$\frac{(471-10)(.1899)}{100} = 8.75E^{-1}$$

| Analyst-1 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5 |
|---|---|---|---|---|
| 82577 | Hrs | Hrs | Hrs | Hrs |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | | Stacie Isaacson |

SAMPLE NUMBER: 31
SAMPLE DATA: 821.
DIRECT READ PH: 12.136

DERIVATIVE OUTPUT, dE/dV




DRV TITRATION:

| EQUIVALENCE PH | TITRANT VOLUME | COMPUTATION |
|---|---|---|
| 9.72 | 0.471 | 0.0000 |
| 6.08 | 0.581 | 0.0000 |

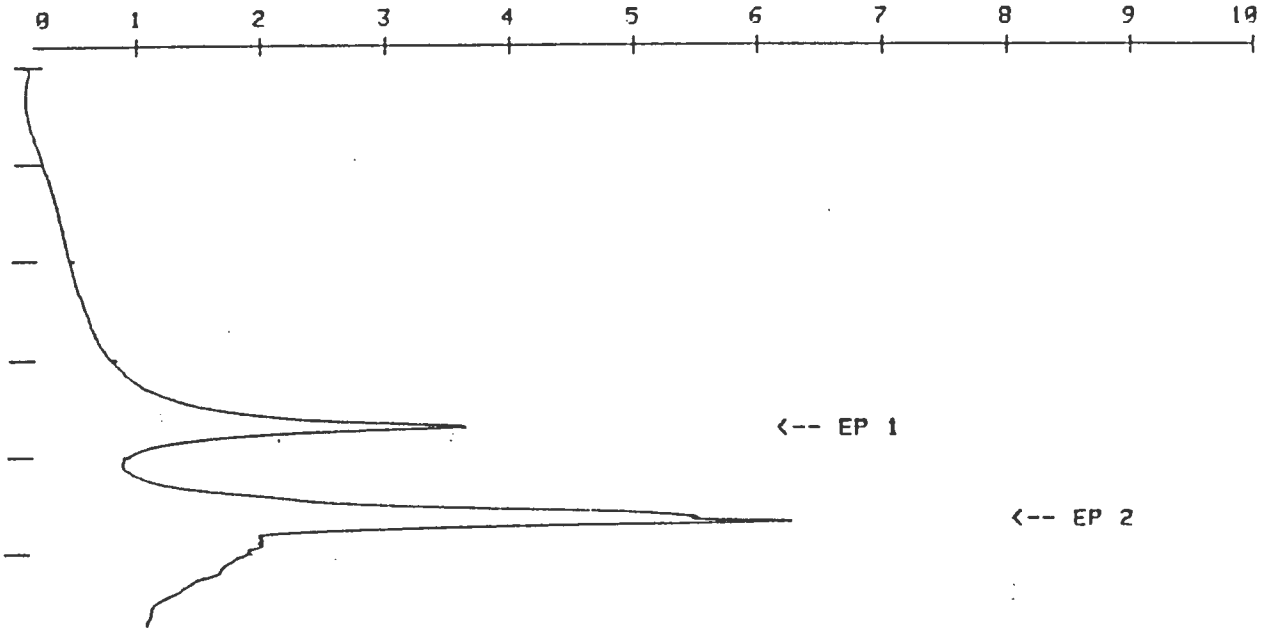
TITRATION TERMINATED BY PH LIMIT.

JAN 7 1992 3:59 AM

STD

SAMPLE NUMBER: 20
SAMPLE DATA: 897.
DIRECT READ PH: 12.209

DERIVATIVE OUTPUT, dE/dV




DRV TITRATION:

| EQUIVALENCE PH | TITRANT VOLUME | COMPUTATION |
|---|---|---|
| 9.78 | 0.460 | 0.0000 |
| 6.20 | 0.578 | 0.0000 |

TITRATION TERMINATED BY PH LIMIT.

JAN 7 1992 1:09 AM

---

SAMPLE NUMBER: 6
SAMPLE DATA: 897.
DIRECT READ PH: 4.416

DERIVATIVE OUTPUT, dE/dV

.010

0 1 2 3 4 5 6 7 8 9 10

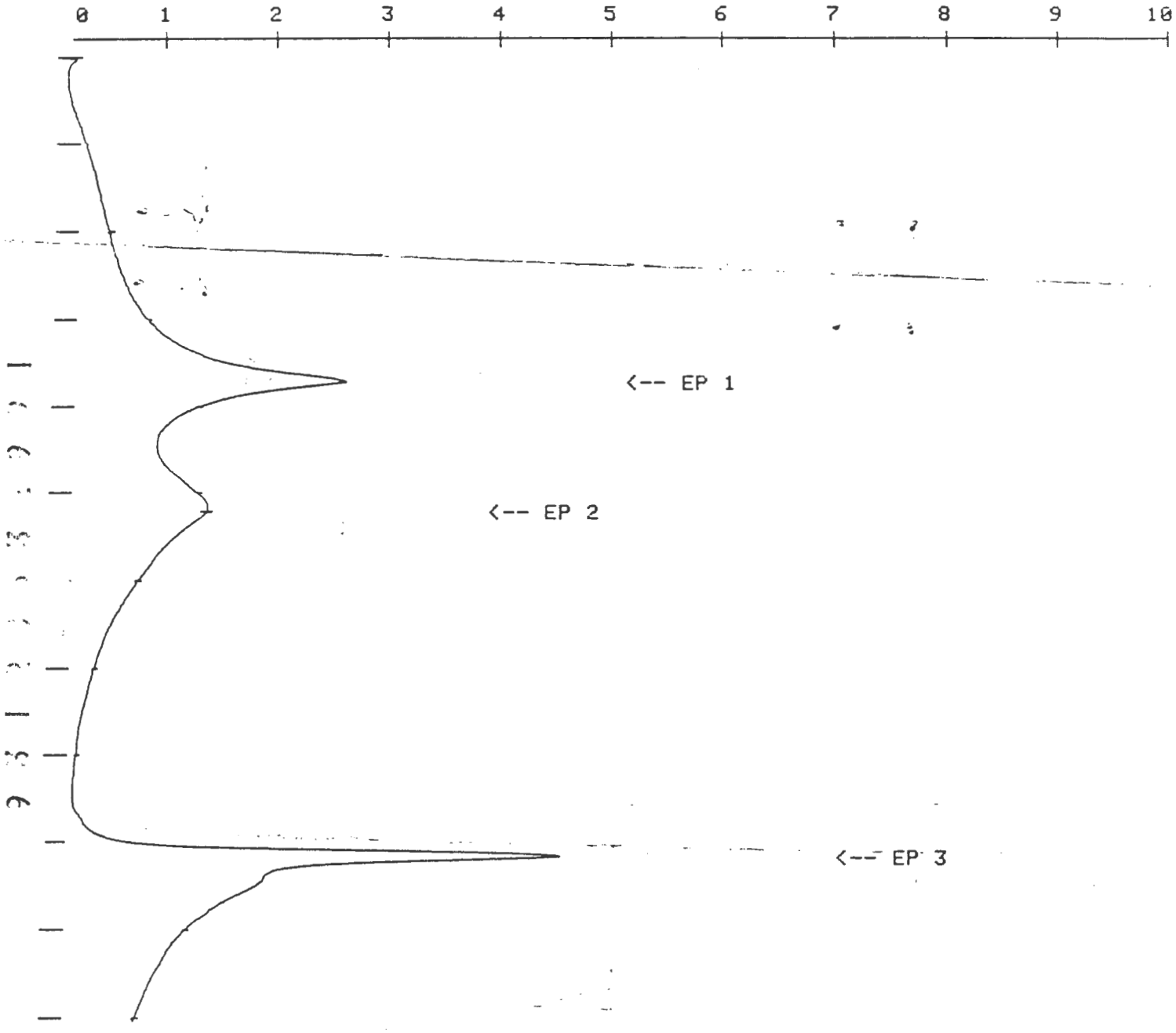
DRV TITRATION:

TITRATION TERMINATED BY PH LIMIT.

JAN 7 1992 12:47 AM

SAMPLE NUMBER: 25
SAMPLE DATA: 579.
DIRECT READ PH: 11.695

DERIVATIVE OUTPUT, dE/dV




DRV TITRATION:

| EQUIVALENCE PH | TITRANT VOLUME | COMPUTATION |
|---|---|---|
| 9.58 | 0.464 | 0.0000 |
| 8.11 | 0.651 | 0.0000 |
| 5.73 | 1.144 | 0.0000 |

TITRATION TERMINATED BY PH LIMIT.

JAN 7 1992 3:04 AM

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: CYANIDE | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: MILTON ROY SPEC 301 AL10724 | Procedure/Rev: LA-695-102/B-0 |
| Technologist: E. COLVIN | Date: 02-03-92 |
| Starting Time: N/A | Temperature: N/A |
| Ending Time: N/A | Chemist: D. BISENIUS |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5578 | 11 | | |
| 2 | REAGENT BLANK | R940-5678 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5778 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5578 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 75C11-X/0.100 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# CYANIDE ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 939.-557B | 105AP | 12-16-91 | 16: 2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Report |
|---|---|---|---|---|
| CN | LA-695-102 | % RECOVERY | N124W | |

Sample Size: ? 100uL-10mL-500uL

Customer ID: STD

Remarks, Calculations, Results:
5244 KCN
STD# 75C11-X RESULT 8.90E2 ppm
STD VAL 8.98E2 ppm %REC (99.1%)
%Rec = 8.90E2 ppm / 8.98E2 ppm x100 = 99.1%
(.724-.004)-(-.004303) / .162726 = 4.45 ug CN⁻
4.45 ug CN x 100 / 0.5 mL = 890 ppm
ABS .724
Blank = .004
D.F. = 10mL / 0.1mL x100

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 80028 | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Ed Cobi | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 2-3-92 | | D4 Bisenius |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 940.-557B | 105AP | 12-16-91 | 16: | |

| Determination | Method/Standard | Result Units | Charge Code | Report |
|---|---|---|---|---|
| CN | LA-695-102 | PPM | N124W | 0 |

Sample Size: ? Customer ID: BLK

Remarks, Calculations, Results:
REAGENT BLANK
< 0.1 ug CN⁻ / 5 mL = (< 25-2 ppm)
.004 - (-.004303) / .162726 = .051 ug CN⁻ = < 0.1 ug CN⁻
ABS .004

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 80028 | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Ed Cobi | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 2-3-92 | | D4 Bisenius |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 943.-557B | 105AP | 12-16-91 | 16: 9 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Report |
|---|---|---|---|---|
| CN | LA-695-102 | PPM | N124W | 0 |

Sample Size: ? 750uL Customer ID: SHPBY1-B

Remarks, Calculations, Results:
3.83E-1 ug CN⁻ / 0.75 mL = (5.11E-1 ppm)
(.062-.004)-(-.004303) / .162726 = 3.83E-1 ug CN⁻
ABS .062
Blank = .004

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 80028 | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Ed Cobi | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 2-3-92 | | D4 Bisenius |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 946.-557B | 105AP | 12-16-91 | 16: | |

| Determination | Method/Standard | Result Units | Charge Code | Report |
|---|---|---|---|---|
| CN | LA-695-102 | % RECOVERY | N124W | 0 |

Sample Size: ? 100uL-10mL-500uL Customer ID: STD

Remarks, Calculations, Results:
5244 KCN
STD# 75C11-X RESULT 886E2 ppm CN⁻
STD VAL 8.98E2 ppm %REC 98.7%
(0.721-0.004)-(-0.004303) / .162726 = 4.43 ug CN⁻
886 / 898 x100 = (98.7%)
ABS .721
BLANK = 0.004
DF = 10mL / 0.1mL = 100
4.43 / 0.5mL x100 = 886 ug/L CN⁻

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 80028 | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Ed Cobi | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 2-3-92 | | J. S. Lachut |

)DAYS DATE: 02-03-1992

ROLL NO.: 80028

Y-INTERCEPT= -.004303
SLOPE= .162726

SAMPLE ID#: R-940 BLANK
SAMPLE SIZE: 0
WVL AND ABS= 580NM 0.004 A

SAMPLE ID#: R-939 75C11-X STD
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.724 A

SAMPLE ID#: R-941
SAMPLE SIZE: 750UL
WVL AND ABS= 580NM 0.073 A

SAMPLE ID#: R-941 DUPLICATE
SAMPLE SIZE: 750UL
WVL AND ABS= 580NM 0.074 A

SAMPLE ID#: R-941 + SPIKE
SAMPLE SIZE: 750UL + 100UL-10ML-500UL 75C11-X SPIKE
AND ABS= 580NM 0.790 A

SAMPLE ID#: R-942
SAMPLE SIZE: 750UL
WVL AND ABS= 580NM 0.075 A

SAMPLE ID#: R-943
SAMPLE SIZE: 750UL
WVL AND ABS= 580NM 0.062 A

SAMPLE ID#: R-744
SAMPLE SIZE: 750UL
WVL AND ABS= 580NM 0.067 A

SAMPLE ID#: R-745
SAMPLE SIZE: 750UL
WVL AND ABS= 580NM 0.074 A

SAMPLE ID#: R-946 75C11-X STD
SAMPLE SIZE: 100UL-10ML-500UL
WVL AND ABS= 580NM 0.721 A

TECHNOLOGIST SIGNATURE: Ed Cohen

E SIGNED: 2-3-1992

CALIBRATION CURVE LACHAT NON-DISTILLED 25ML

CYANIDE DATE: 12-02-1991

CALIBRATION STANDARD # 351-R, 998 MG/ML CYANIDE

DILUTION FACTOR = 10/.1 = 100, WORKING STANDARD = 998 /100 = 9.9800

| PIPET SIZE | MICROGRAMS CYANIDE | TOTAL ABS | NET ABS |
|---|---|---|---|
| BLANK | 0 | .012 | 0 |
| 50UL | .499 | .0900 | .0780 |
| 500UL | 4.990 | .8090 | .7970 |
| 1000UL | 9.980 | 1.6370 | 1.6250 |

Y INTERCEPT =-.004303
SLOPE = .162726
C C = .999953

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ARSENIC | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: PERKIN ELMER WA77479 | Procedure/Rev: LA-355-131/B-0 |
| Technologist: D. R. JACKSON | Date: 01-07-92 |
| Starting Time: 8:00 | Temperature: N/A |
| Ending Time: 3:00 | Chemist: R. K. FULLER |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5595 | 11 | | |
| 2 | REAGENT BLANK | R940-5695 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5795 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5595 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 129B38C/.500 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# ARSENIC ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5595 | 103AP | 12-16-91 | 15: 2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| AS | LA-355-131 | % RECOVERY | N124W | 0 |

Sample Size: .500 ml
Customer ID: STD

Remarks, Calculations, Results
EDP R741 AS/HYDRD
STDH129836C RESULT 105.6 ~~52.78~~ 0.1056 ppm
STD VAL 0.10 ppm %REC 105.6%
0.819 = PKHt

$\frac{0.819 - 0.0326}{0.0149} = 52.78$ ngs

$\frac{52.78 \text{ ngs}}{500 \lambda} = 0.1056$ ppm

$\frac{0.1056 \text{ ppm}}{0.10 \text{ ppm}} \times 100 = 105.6\%$

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C225 | | Leslie Diaz | Leslie Diaz | RK Tillo 1-7-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Date: 1-7-92 | Time Completed | Lab Unit Mgr | | |

54-5600-051 (R-10-63)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5595 | 103AP | 12-16-91 | 15: 5 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| AS | LA-355-131 | PPM | N124W | 0 |

Sample Size: 10.0 ml
Customer ID: BLK

Remarks, Calculations, Results
REAGENT BLANK
0.124 = PKHt

$\frac{0.124 - 0.0326}{0.0149} = 6.13$ ngs

$\frac{6.134 \text{ ngs}}{10000 \lambda} = 0.0006$ ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C225 | | Leslie Diaz | | RK Tillo 1-7-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Date: 1-7-92 | Time Completed | Lab Unit Mgr | | |

54-5600-051 (R-10-63)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5595 | 103AP | 12-16-91 | 15: 7 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| AS | LA-355-131 | PPM | N124W | 0 |

Sample Size: 1.0 ml
Customer ID: SAPB91-B

Remarks, Calculations, Results
0.443 = PKHt

$\frac{0.443 - 0.0326}{0.0149} = 27.54$ ngs

$\frac{27.54 \text{ ngs}}{1000 \lambda} = 0.028$ ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C225 | | Leslie Diaz | | RK Tillo 1-7-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Date: 1-7-92 | Time Completed | Lab Unit Mgr | | |

54-5600-051 (R-10-63)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5595 | 103AP | 12-16-91 | 15: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| AS | LA-355-131 | % RECOVERY | N124W | 0 |

Sample Size: .500 ml
Customer ID: STD

Remarks, Calculations, Results
EDP R741 AS/HYDRD
STDH129836C RESULT 111.6
STD VAL 0.10 ppm %REC 111.6%
0.864 = PKHt

$\frac{0.864 - 0.0326}{0.0149} = 55.80$ ngs

$\frac{55.80 \text{ ngs}}{500 \lambda} = 0.1116$ ppm

$\frac{0.116 \text{ ppm}}{0.10 \text{ ppm}} \times 100 = 111.60\%$

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C225 | | Leslie Diaz | Leslie Diaz | RK Tillo 1-7-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Date: 1-7-92 | Time Completed | Lab Unit Mgr | | |

54-5600-051 (R-10-63)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

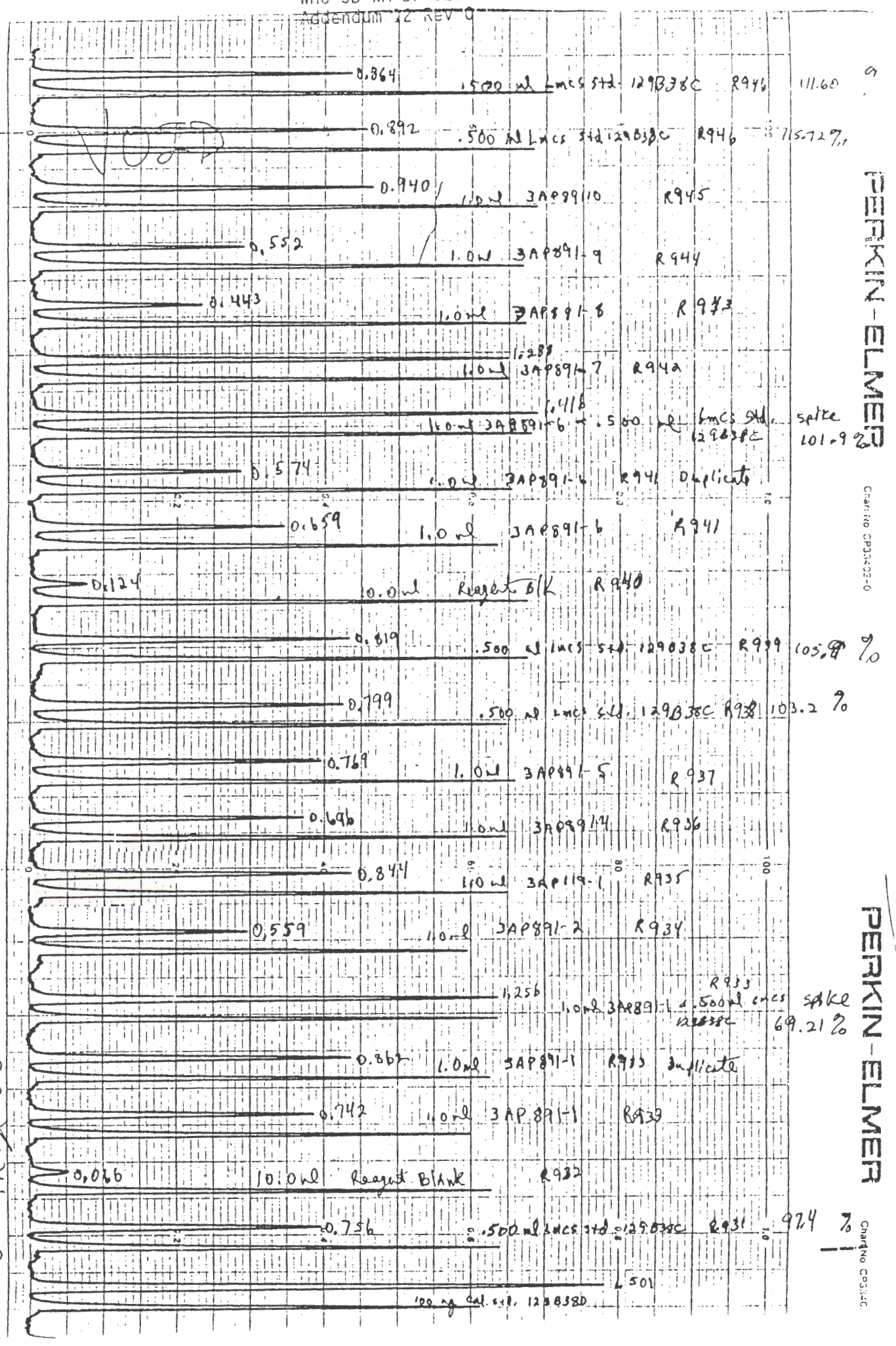
| | | | | | |
|---|---|---|---|---|---|
| Analyte: | As | | | | |
| Procedure: | LA-355-131 | Revision: | B-0 | | |
| Instrument: | PERKIN ELMER | Property No.: | WA77479 | | |
| Technologist: | D. R. JACKSON | Payroll No.: | 6C275 | Date: | 01-07-92 |

Calibration Standard: 128B38C
Analyte Concentration: 0.100 ppm
Type of Calibration: LINEAR

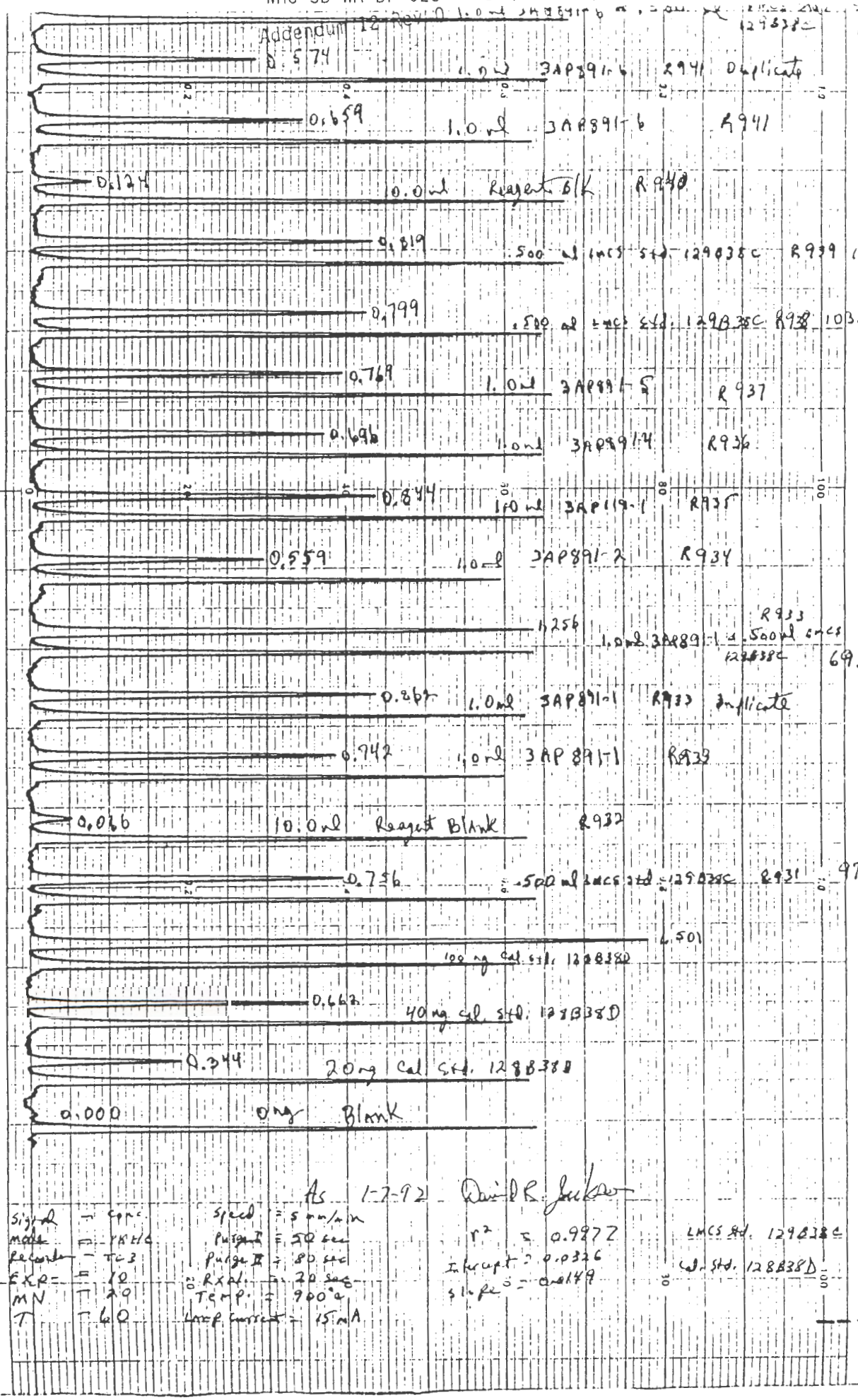
| | Dilution | Concentration | Instrument Reading Unit |
|---|---|---|---|
| 1 | 0.000 mL | 0.0 ng | 0.000 |
| 2 | 0.200 mL | 20.0 ng | 0.344 |
| 3 | 0.400 mL | 40.0 ng | 0.662 |
| 4 | 1.000 mL | 100.0 ng | 1.501 |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |

Comments:

A-6000-882 (03/92)




Dan R. Parker 1-7-92




PERKIN-ELMER

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: MERCURY | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: PERKIN ELMER WA77479 | Procedure/Rev: LA-325-102/B-0 |
| Technologist: D. R. JACKSON | Date: 01-21-92 |
| Starting Time: 8:00 | Temperature: N/A |
| Ending Time: 3:30 | Chemist: R. K. FULLER |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5597 | 11 | | |
| 2 | REAGENT BLANK | R940-5697 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5797 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5597 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 129B38D/.300 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# MERCURY ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939-5597 | 1USAP | 12-16-91 | 16:2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Returns |
|---|---|---|---|---|
| Hg | LA-325-102 | % RECOVERY | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| 300 ml | STD |

Remarks, Calculations, Results
EDF R/16 HG/HYDRD
STDH129838D RESULT 0.1074 ppm
STD VAL 0.100 ppm %REC 107.4 %
~~PKHt = 0.178~~ DRJ 1-21-92
PKHt = 0.194
over

$\frac{0.178 - 0.0036}{0.0057} = 31.86$ ngl

$\frac{31.86 \text{ ng}}{300 \lambda} = 0.1062$ ppm

$\frac{0.1074 \text{ ppm}}{0.100 \text{ ppm}} \times 100 = 107.2$ %

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RK Tiller 1-22-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Date 1-21-92 | Time Completed | Lab Unit Mgr | | |

PKHt = 0.194 R939-5597

$\frac{0.194 - 0.0007}{0.0060} = 32.22$ ngl

$\frac{32.22 \text{ ngl}}{300 \lambda} = 0.1074$ ppm

$\frac{0.1074 \text{ ppm}}{0.1000 \text{ ppm}} \times 100 = 107.4$ %

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940-5697 | 1USAP | 12-16-91 | 16:3 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Returns |
|---|---|---|---|---|
| Hg | LA-325-102 | PPM | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| 10.0 ml | BLK |

Remarks, Calculations, Results
REAGENT BLANK
~~PKHt = 0.015~~ DRJ 1-21-92
PKHt = 0.006
over

$\frac{0.015 - 0.0036}{0.0057} = 0.69$ ngl

DRJ 1-21-92

$= < 5$ ngl

$\frac{< 5 \text{ ngl}}{10000 \lambda} = < 0.0005$ ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RK Tiller 1-22-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Date 1-21-92 | Time Completed | Lab Unit Mgr | | |

PKHt = 0.006 R940-5697

$\frac{0.006 - 0.0007}{0.0060} = 0.88$ ngl $= < 5$ ngl DRJ 1-21-92

$\frac{< 5 \text{ ngl}}{10000 \lambda} = < 0.0005$

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943-5797 | 1USAP | 12-16-91 | 16:10 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Returns |
|---|---|---|---|---|
| Hg | LA-325-102 | PPM | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| ~~100 ml~~ 3.0 ml | JAF891-B |

Remarks, Calculations, Results
PKHt = 0.012 DRJ 1-21-92
PKHt = 0.014
over

$\frac{0.012 - 0.0036}{0.0057} = 2.74$ ngl $= < 5$ ngl

$\frac{< 5 \text{ ngl}}{1000 \lambda} = < 0.005$ ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RK Tiller 1-22-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| Date 1-21-92 | Time Completed | Lab Unit Mgr | | |

PKHt = 0.014 R943-5797

$\frac{0.014 - 0.0007}{0.0060} = 2.22$ ngl $= < 5$ ngl

$\frac{< 5 \text{ ngl}}{3000 \lambda} = < 0.0017$ ppm

# MERCURY ANALYSIS - UNDIGESTED SAMPLE

| Sample No. | Sample Point | Date | Time Sampled | Phase(s) |
|---|---|---|---|---|
| R946-5597 | [illegible] | 12-16-91 | 1537 | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Remarks |
|---|---|---|---|---|
| Hg | LH-325-102 | % RECOVERY | TH2-HW | |

| Sample Size | Customer ID |
|---|---|
| 300 ml | STD |

Remarks, Calculations, Results

EDP R/16 HG/HYDRD

STD# 129638D RESULT 0.0907 ppm

STD VAL 0.100 ppm %REC 90.70 %

DRJ

~~RKH = 0.172~~ 5-28-92

PKH = 0.164

$\frac{0.172 - 0.0036}{0.0057} = 30.81$ ng

$\frac{30.81 \text{ ng}}{300 \lambda} = 0.1027$ ppm

DRJ 5-28-92

$\frac{0.1027 \text{ ppm}}{0.1000 \text{ ppm}} \times 100 = 102.7\%$

over

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RKHilley 1-22-92 |
| Initials | Initials | Initials | Initials | Initials |
| | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-21-92 | | | | |

54-5600-061 (R-10/83)

PKH = 0.164 R946-5597

$\frac{0.164 - 0.0007}{0.0060} = 27.22$ ng

$\frac{27.22 \text{ ng}}{300 \lambda} = 0.0907$ ppm

$\frac{0.0907 \text{ ppm}}{0.1000 \text{ ppm}} \times 100 = 90.70\%$

# WESTINGHOUSE HANFORD COMPANY
## 222-S LABORATORY
## CALIBRATION RECORD

| | | | | | |
|---|---|---|---|---|---|
| Analyte: | Hg | | | | |
| Procedure: | LA-325-102 | Revision: | B-0 | | |
| Instrument: | PERKIN ELMER | Property No.: | WA77479 | | |
| Technologist: | D. R. JACKSON | Payroll No.: | 6C275 | Date: | 01-21-92 |

Calibration Standard: 129B38D
Analyte Concentration: 0.1000 ppm
Type of Calibration: LINEAR

| | Dilution | Concentration | Instrument Reading Unit |
|---|---|---|---|
| 1 | 0.000 mL | 0.0 ng | 0.000 |
| 2 | 0.100 mL | 15.2 ng | 0.090 |
| 3 | 0.250 mL | 38.0 ng | 0.236 |
| 4 | 0.500 mL | 76.0 ng | 0.458 |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |

Comments:

A-6000-882 (03/92)

0.134 .300 ml LiCS std 129838D R946 90.70%

0.008 3.0 ml 3AP891-10 R945

0.000 3.0 ml 3AP891-9 R944

0.014 3.0 ml 3AP891-8 R943

0.009 3.0 ml 3AP891-7 R942

0.201 3.0 ml 3AP891-6 .300 ml LiCS std 129838D R941 Spike 103.87%

0.005 3.0 ml 3AP891-6 R941 Duplicate

0.014 3.0 ml 3AP891-6 R941

0.006 10.0 ml reagent blank R940

0.199 .300 ml LiCS std 129838D R939 107.97%

0.190 .300 ml LiCS std 129838D R938 105.17%

0.006 3.0 ml 3AP891-5 R937

0.005 3.0 ml 3AP891-4 R936

0.003 3.0 ml 3AP119-1 R935

0.019 3.0 ml 3AP891-2 R934

0.203 3.0 ml 3AP891-2 .300 ml LiCS std 129838D Spike R933 96.12%

0.031 3.0 ml 3AP891-1 Duplicate R932

0.010 3.0 ml 3AP891-1 R933

0.007 10.0 ml reagent blank R932

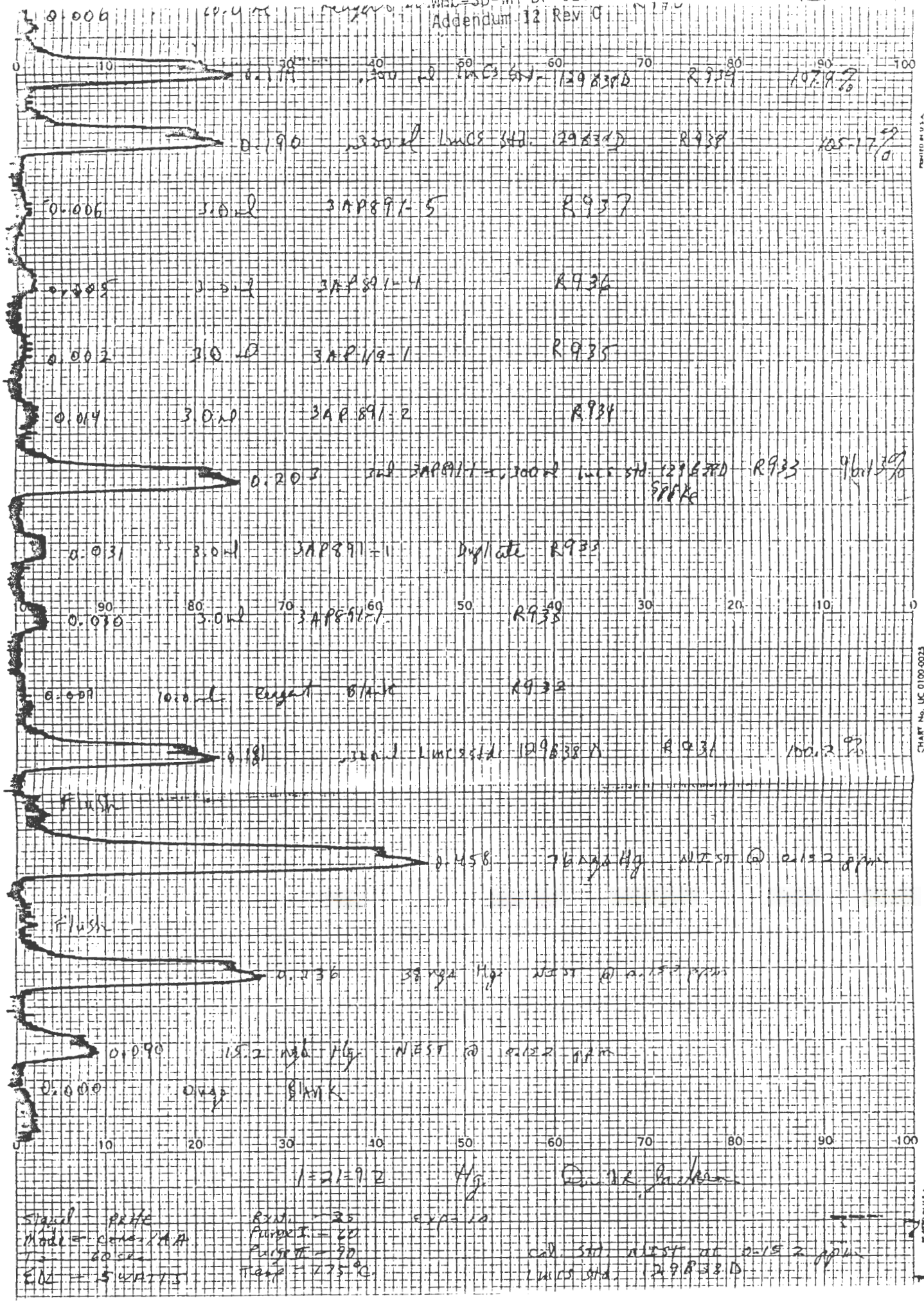
CHART No. UC 0100-0023

PRINTED IN U.S.A.

JET No. UC 0100-0023

E. Lake 1-21-92 EL

Addendum 12 Rev 0



WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial #: R943 | Customer ID: 3AP891-8 |
| Analysis: SELENIUM | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: PERKIN ELMER WA77479 | Procedure/Rev: LA-365-131/B-1 |
| Technologist: D. R. JACKSON | Date: 01-29-92 |
| Starting Time: 8:00 | Temperature: NA |
| Ending Time: 2:00 | Chemist: R. K. FULLER |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5596 | 11 | | |
| 2 | REAGENT BLANK | R940-5696 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5796 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5596 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 133B38A/0.500 mL | | | NA |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# SELENIUM ANALYSIS - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5596 | 103AP | 12-16-91 | 16:2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SE | LA-365-131 | % RECOVERY | H124W | 0 |

| Sample Size | Customer ID |
|---|---|
| 0.500 ml | STD |

Remarks, Calculations, Results
EDF R/43 SE/HYDRD
STD# 133835A RESUL 0.1144 ppm
STD VAL. 0.100 ppm %REC 114.38%
PKHt = 0.663

$\frac{0.663 - 0.0225}{0.0112} = 57.19$ ngp

$\frac{57.19 ngp}{500 l} = 0.1144$ ppm

$\frac{0.1144 ppm}{0.1000 ppm} \times 100 = 114.38\%$

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RK Miller 1-30-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-29-92 | | | | |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5596 | 103AP | 12-16-91 | [illegible] | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SE | LA-365-131 | PPM | [illegible] | [illegible] |

| Sample Size | Customer ID |
|---|---|
| 10.0 ml | BLK |

Remarks, Calculations, Results
REAGENT BLANK
PKHt = -0.021

-0.021 = < 5 ngp

$\frac{< 5 ngp}{10000 l}$ = < 0.0005 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RK Miller 1-30-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-29-92 | | | | |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5596 | 103AP | 12-16-91 | 16:10 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SE | LA-365-131 | PPM | H124W | 0 |

| Sample Size | Customer ID |
|---|---|
| 1.0 ml | SAP891-8 |

Remarks, Calculations, Results
PKHt = -0.002

-0.002 = < 5 ngp

$\frac{< 5 ngp}{1000}$ = < 0.005 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RK Miller 1-30-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-29-92 | | | | |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5596 | 103AP | 12-16-91 | 16:15 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SE | LA-365-131 | % RECOVERY | H124W | 0 |

| Sample Size | Customer ID |
|---|---|
| 0.500 ml | STD |

Remarks, Calculations, Results
EDF R/43 SE/HYDRD
STD# 133835A RESUL 0.1121 ppm
STD VAL. 0.100 ppm %REC 112.06%
PKHt = 0.650

$\frac{0.650 - 0.0225}{0.0112} = 56.03$ ngp

$\frac{56.03 ngp}{500 l} = 0.1121$ ppm

$\frac{0.1121 ppm}{0.1000 ppm} \times 100 = 112.06\%$

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 6C275 | | | | RK Miller 1-30-92 |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-29-92 | | | | |

# WESTINGHOUSE HANFORD COMPANY
## 222-S LABORATORY
## CALIBRATION RECORD

| | | | | | |
|---|---|---|---|---|---|
| Analyte: | Se | | | | |
| Procedure: | LA-365-131 | Revision: | B-1 | | |
| Instrument: | PERKIN ELMER | Property No.: | WA77479 | | |
| Technologist: | D. R. JACKSON | Payroll No.: | 6C275 | Date: | 01-29-92 |

Calibration Standard: 132B38A
Analyte Concentration: 0.100 ppm
Type of Calibration: LINEAR

| | Dilution | Concentration | Instrument Reading Unit |
|---|---|---|---|
| 1 | 0.000 mL | 0.0 ng | 0.000 |
| 2 | 0.200 mL | 20.0 ng | 0.274 |
| 3 | 0.400 mL | 40.0 ng | 0.468 |
| 4 | 1.000 mL | 100.0 ng | 1.132 |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |

Comments:

A-6000-882 (03

| | | | | | | |
|---|---|---|---|---|---|---|
| 0.016 | 0.0250 ml | 25-2 | | 86542 | | |
| 0.016 | 0.0250 ml | 25-2 | | 86481 | | |
| -0.002 | 0.0250 ml | 25-2 | | 86444 | | |
| -0.003 | 0.0250 ml | 25-2 | | 86408 | | |
| 0.450 | .500 ml LMCS Std. 133B38A | | | R946 | 112.06 % | |
| VOID 0.709 | .500 ml LMCS Std. 133B38A | | | R946 | 122.6 % | Too High |
| 0.089 | 1.0 ml | 3AP89110 | | R945 | | |
| 0.009 | 1.0 ml | 3AP891-9 | | R944 | | |
| -0.002 | 1.0 ml | 3AP891-8 | | R943 | | |
| 0.103 | 1.0 ml | 3AP891-7 | | R942 | | |
| 0.710 | 0.250 ml 3AP891-6 | + .500 ml LMCS Std. 133B38A | | R941 | Spike | 122.76% |
| -0.018 | 0.250 ml ~~1.0 ml~~ DCJ 1-29-92 | 3AP891-6 | Duplicate | R941 | | |
| 0.003 | 0.250 ml ~~1.0 ml~~ DCJ 1-29-92 | 3AP891-6 | | R941 | | |
| -0.021 | 0.0 ml | Reagent Blank | | R940 | | |
| 0.663 | .500 ml LMCS Std | 133B38A | | R939 | 114.38% | |
| 0.646 | .500 ml LMCS Std | 133B38A | | R938 | 111.34% | |
| 0.029 | 1.0 ml | 3AP891-5 | | R937 | | |
| 0.004 | 1.0 ml | 3AP891-4 | | R936 | | |
| 0.046 | 1.0 ml | 3AP119-1 | | R935 | | |
| 0.018 | 1.0 ml | 3AP891-2 | | R934 | | |
| 0.648 | 0.250 ml | 3AP891-1 | + .500 ml LMCS 133B38A | R933 | Spike Test | |
| 0.674 | 0.250 ml | 3AP891-1 | + .500 ml LMCS Std. 133B38A | R933 | Spike | 114.3% |
| 0.010 | 0.250 ml | 3AP891-1 | Duplicate | R933 | | |

Se 9 3 1 3 3 Dan 1-29-92

PERKIN-ELMER

Cnerl NC CP3340-C

PERKI

| | | | | | |
|---|---|---|---|---|---|
| 0.102 | 1.0 ml | 3AP891 | | R942 | |
| 0.710 | 0.250 ml 3AP891-6 | + .500 ml LNCS std. 133B38A | | R941 | Spike 122.76% |
| -0.018 | 0.250 ml | 3AP891-6 | Duplicate | R941 | |
| 0.003 | 0.250 ml | 3AP891-6 | | R941 | |
| -0.021 | 10.0 ml | Reagent Blank | | R940 | |
| 0.663 | .500 ml | LNCS std | 133B38A | R939 | 114.38% |
| 0.646 | .500 ml | LNCS std. | 133B38A | R938 | 111.34% |
| 0.029 | 1.0 ml | 3AP891-5 | | R937 | |
| 0.004 | 1.0 ml | 3AP891-4 | | R936 | |
| 0.046 | 1.0 ml | 3AP1197 | | R935 | |
| 0.018 | 1.0 ml | 3AP891-2 | | R934 | |
| 0.648 | 0.250 ml | 3AP891-1 | + .500 ml LNCS 133B38A | R933 | Spike TEST |
| 0.674 | 0.250 ml | 3AP891-1 | + .500 ml LNCS std. 133B38A | R933 | Spike 116.39% |
| 0.010 | 0.250 ml | 3AP891-1 | Duplicate | R933 | |
| -0.008 | 0.250 ml | 3AP891-1 | | R933 | |
| -0.008 | 10.0 ml | Reagent Blank | | R932 | |
| 0.658 | .500 ml | LNCS std. | 133B38A | R931 | 113.5% |
| 1.132 | 100 ngp Se | cal. std. | 132B38A | | |
| 0.464 | 40 ngp Se | Cal. | Std. 132B38A | | |
| 0.274 | 20 ngp | cal. std. | 132B38A | | |
| 0.000 | 0 ngp | Blank | | | |

Se 1-29-92 David K. Jackson

Blnd-conc. Exp = 8 Purge I = 50 λ - 196.3 nm Temp. = 975 °C 1-29-92 DKJ
Mode - PKHT N V = 20 Purge II = 85 Slit width - 2.0 nm Lamp current = 6
Recalc - TCS T = 50 Rx1 - 20 Bkgd corr - AA Lamp # 9
Speed = 5 mm/min

LNCS std. # 133 B38A Cal. std # 132 B38A

r = 0.9981 Intercept -- 0.0225 Slope = 0.0112

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ION CHROMATOGRAPHIC - CHLORIDE | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: DIONEX 4000, WB54428 | Procedure/Rev: LA-533-105/B-1 |
| Technologist: M. MYERS | Date: 01-08-92 |
| Starting Time: N/A | Temperature: N/A |
| Ending Time: N/A | Chemist: D. HERT |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5572 | 11 | | |
| 2 | REAGENT BLANK | R940-5672 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5772 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5572 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 73C11DC/.100 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# ION CHROMATOGRAPHIC ANALYSIS (CHLORIDE) - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-55/2 | 10SAP | 12-16-91 | 16: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| CL | LA-533-105 | % RECOVERY | N124W | 0 |

Sample Size: ? .100ml - 10ml
Customer ID: STD

Remarks, Calculations, Results:
EDF R9/2 DIONEX
STDH 73C11DC RESULT 6.97E1 ppm
STD VAL 7.50E1 %REC 92.9
ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Helen Hugo | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-8-92 | | | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-55/2 | 10SAP | 12-16-91 | 16:5 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| CL | LA-533-105 | PPM | N124W | 0 |

Sample Size: ? DIRECT
Customer ID: BLK

Remarks, Calculations, Results:
REAGENT BLANK
2.10ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Helen Hugo | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-8-92 | | | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-55/2 | 10SAP | 12-16-91 | 16:7 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| CL | LA-533-105 | PPM | N124W | 0 |

Sample Size: ? .250ml - 10ml
Customer ID: SHFB91-8

Remarks, Calculations, Results:
3.83E1 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Helen Hugo | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-8-92 | | | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-55/2 | 10SAP | 12-16-91 | 16:15 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| CL | LA-533-105 | % RECOVERY | N124W | 0 |

Sample Size: ? .100ml - 10ml
Customer ID: STD

Remarks, Calculations, Results:
EDF R9/2 DIONEX
STDH 73C11DC RESULT 7.55E1
STD VAL 7.50E1 %REC 100.65

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Helen Hugo | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-8-92 | | | | |

54-6600-051 (R-10-83)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ION CHROMATOGRAPHIC - FLUORIDE | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: DIONEX 4000, WB54428 | Procedure/Rev: LA-533-105/B-1 |
| Technologist: M. MYERS | Date: 01-10-92 |
| Starting Time: N/A | Temperature: N/A |
| Ending Time: N/A | Chemist: D. HERT |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5571 | 11 | | |
| 2 | REAGENT BLANK | R940-5671 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5771 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5571 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 73C11DC/.100 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)



9 3 1 2 2 3 3 0 1 4

# ION CHROMATOGRAPHIC ANALYSIS (FLUORIDE) - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5571 | 103AP | 12-16-91 | 15: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| F | LA-533-105 | % RECOVERY | N124W | 0 |

Sample Size: ? .100ml-10ml
Customer ID: STD

Remarks, Calculations, Results:
EDP R974 DIONEX
STD# 73C11DC RESULT 5.53 E1 ppm
STD VAL 5.60E1 ppm %REC 98.8

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Melanie Hyde | | | | |
| POS | POS | POS | POS | POS |
| 6C823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5671 | 103AP | 12-16-91 | 15: [illegible] | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| F | LA-533-105 | PPM | [illegible] | [illegible] |

Sample Size: ? DIRECT
Customer ID: BLK

Remarks, Calculations, Results:
REAGENT BLANK
DJW 5/24/92
~~21.0ppm~~
20.1 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Melanie Hyde | | | | |
| POS | POS | POS | POS | POS |
| 6C823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5771 | 103AP | 12-16-91 | 16: 7 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| F | LA-533-105 | G/G | N124W | 0 |

Sample Size: ? .250ml-10ml
Customer ID: SAP891-8

Remarks, Calculations, Results:
6.06 E1 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Melanie Hyde | | | | |
| POS | POS | POS | POS | POS |
| 6C823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5571 | 103AP | 12-16-91 | 15:1[illegible] | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| F | LA-533-105 | % RECOVERY | N124W | 0 |

Sample Size: ? .100ml-10ml
Customer ID: STD

Remarks, Calculations, Results:
EDP R974 DIONEX
STD# 73C11DC RESULT 5.76 E1 ppm
STD VAL 5.60E1 ppm %REC 102.9%

BATCH WITH R939-5673

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Melanie Hyde | | | | |
| POS | POS | POS | POS | POS |
| 6C823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ION CHROMATOGRAPHIC - NITRATE | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: DIONEX 4000, WB54428 | Procedure/Rev: LA-533-105/B-1 |
| Technologist: M. MYERS | Date: 01-10-92 |
| Starting Time: N/A | Temperature: N/A |
| Ending Time: N/A | Chemist: D. HERT |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5573 | 11 | | |
| 2 | REAGENT BLANK | R940-5673 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5773 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5573 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 73C11DC/.100 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)



9 3 1 2 2 3 3 0 1 6

# ICN CHROMATOGRAPHIC ANALYSIS (NITRATE) - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5573 | 105AP | 12-16-91 | 13:1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO3 | LA-533-105 | % RECOVERY | N12NW | |

| Sample Size | Customer ID |
|---|---|
| ? .100ml - 10ml | STD |

Remarks, Calculations, Results
EDP R978 DIONEX
STD #73C11DC RESULT 6.71E2ppm
STD VAL 6.33E2ppm %REC 106.1 %

BATCH WITH R941.-5571 + 5576

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| LC823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5573 | 105AP | 12-16-91 | 13:3 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO3 | LA-533-105 | PPM | N12NW | 0 |

| Sample Size | Customer ID |
|---|---|
| ? DIRECT | BLNK |

Remarks, Calculations, Results
REAGENT BLANK
~~<10.0ppm~~ DSH 5/27/92
<1.0 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| LC823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5573 | 105AP | 12-16-91 | 13:9 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO3 | LA-533-105 | PPM | N12NW | 0 |

| Sample Size | Customer ID |
|---|---|
| ? .05ml - 10ml | SAP891-8 |

Remarks, Calculations, Results
1.62E3ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| LC823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5573 | 105AP | 12-16-91 | 13:15 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO3 | LA-533-105 | % RECOVERY | N12NW | 0 |

| Sample Size | Customer ID |
|---|---|
| ? .100ml - 10ml | STD |

Remarks, Calculations, Results
EDP R978 DIONEX
STD #73C11DC RESULT 6.51E2ppm
STD VAL 6.33E2ppm %REC 102.8

BATCH W/ R938-5574

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| | | | | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| LC823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-10-92 | | |

54-6600-051 (R-10-83)

9312303017

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ION CHROMATOGRAPHIC - NITRITE | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: DIONEX 4000, WB54428 | Procedure/Rev: LA-533-105/B-1 |
| Technologist: M. MYERS | Date: 01-10-92 |
| Starting Time: N/A | Temperature: N/A |
| Ending Time: N/A | Chemist: D. HERT |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5576 | 11 | | |
| 2 | REAGENT BLANK | R940-5676 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5776 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5576 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 73C11DC/.100 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)



9 3 1 2 3 3 3 0 1 3

# ION CHROMATOGRAPHIC ANALYSIS (NITRITE) - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5576 | 105AP | 12-16-91 | 16: 2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO2 | LA-505-105 | % RECOVERY | NT24W | 0 |

| Sample Size | Customer ID |
|---|---|
| 7 .100ml - 10ml | STD |

Remarks, Calculations, Results
EDP KY68 DIONEX
STDH 73C11DC RESULT 5.2762ppm
STD VAL 4.912ppm %REC 107.5%

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-10-92 | | | | |

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5576 | 105AP | 12-16-91 | 12: | |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO2 | LA-505-105 | PPM | | 0 |

| Sample Size | Customer ID |
|---|---|
| 7 DIRECT | MK |

Remarks, Calculations, Results
REAGENT BLANK
DH 9/24/92
~~<10.0ppm~~
<1.0 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-10-92 | | | | |

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5576 | 105AP | 12-16-91 | 15: | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO2 | LA-505-105 | PPM | NT24W | |

| Sample Size | Customer ID |
|---|---|
| 7 .250ml - 10ml | SMP891-8 |

Remarks, Calculations, Results
1.123ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-10-92 | | | | |

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5576 | 105AP | 12-16-91 | 16:15 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| NO2 | LA-505-105 | % RECOVERY | NT24W | |

| Sample Size | Customer ID |
|---|---|
| 7 .100ml - 10ml | STD |

Remarks, Calculations, Results
EDP KY68 DIONEX
STDH 73C11DC RESULT 5.326ppm
STD VAL 4.912ppm %REC 108.4%

BATCH WITH R939-5573

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 6C823 | | | | |
| Date | Time Completed | Lab Unit Mgr | | |
| 1-10-92 | | | | |

54-6600-061 (R-10-83)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ION CHROMATOGRAPHIC - PHOSPHATE | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: DIONEX 4000, WB54428 | Procedure/Rev: LA-533-105/B-1 |
| Technologist: M. MYERS | Date: 01-08-92 |
| Starting Time: N/A | Temperature: N/A |
| Ending Time: N/A | Chemist: D. HERT |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5574 | 11 | | |
| 2 | REAGENT BLANK | R940-5674 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5774 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5574 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 73C11DC/.100 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)



9 3 1 2 3 3 3 0 2 0

# ION CHROMATOGRAPHIC ANALYSIS (PHOSPHATE) - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-5574 | 103AP | 12-16-91 | 16: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| PO4 | LA-533-105 | % RECOVERY | N124W | 0 |

Sample Size: ? .100ml - 10ml
Customer ID: STD

Remarks, Calculations, Results:
EDP R976 DIONEX
STD# 73C110C RESULT 5.0182 ppm
STD VAL 5.1682 %REC 97.3
ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hulam Hayes | | Leslie Day | | Alvin Albert |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 60823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-6800-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-5574 | 103AP | 12-16-91 | 16: [illegible] | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| PO4 | LA-533-105 | PPM | N124W | 0 |

Sample Size: ? DIRECT
Customer ID: MBK

Remarks, Calculations, Results:
REAGENT BLANK
< 1.0ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hulam Hayes | | | | Alvin Albert |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 60823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-6800-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-5574 | 103AP | 12-16-91 | 16: 9 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| PO4 | LA-533-105 | PPM | N124W | 0 |

Sample Size: ? .250ml - 10ml
Customer ID: SAP891-8

Remarks, Calculations, Results:
1.1262ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hulam Hayes | | | | Alvin Albert |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 60823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-6800-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946.-5574 | 103AP | 12-16-91 | [illegible] | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| PO4 | LA-533-105 | % RECOVERY | N124W | 0 |

Sample Size: ? .100ml - 10ml
Customer ID: STD

Remarks, Calculations, Results:
EDP R976 DIONEX
STD# 73C10C RESULT 5.0982ppm
STD VAL 5.1682 %REC 100.52

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Hulam Hayes | | Leslie Day | | Alvin Albert |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 60823 | | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-6800-061 (R-10-83)

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ION CHROMATOGRAPHIC - SULFATE | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: DIONEX 4000, WB54428 | Procedure/Rev: LA-533-105/B-1 |
| Technologist: M. MYERS | Date: 01-08-92 |
| Starting Time: N/A | Temperature: N/A |
| Ending Time: N/A | Chemist: D. HERT |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5575 | 11 | | |
| 2 | REAGENT BLANK | R940-5675 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5775 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5575 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 73C11DC/.100 mL | | | N/A |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)



9 3 1 2 3 3 0 2 2

# ION CHROMATOGRAPHIC ANALYSIS (SULFATE) - UNDIGESTED SAMPLE

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 739.-55/5 | 10SAP | 12-16-91 | 16: 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SO4 | LA-533-105 | % RECOVERY | N124W | 0 |

Sample Size: ? .100ml - 10ml

Customer ID: STD

Remarks, Calculations, Results:
EDF K970 DIONEX
STDN 78C110C RESULT 5.6682 ppm
STD VAL 6.0982 %REC 92.8
ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Lulam Lugo | | Leslie Diaz | Virginia Hart | |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 1608Z3 | | | Leslie Diaz | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-5600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 740.-56/5 | 10SAP | 12-16-91 | 16: 3 | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SO4 | LA-533-105 | PPM | N124W | [illegible] |

Sample Size: ? DIRECT

Customer ID: MK

Remarks, Calculations, Results:
REAGENT BLANK
< 1.0ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Lulam Lugo | | | | Virginia Hart |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 1608Z3 | | | | Leslie Diaz |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-5600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 745.-57/5 | 10SAP | 12-16-91 | 16: 9 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SO4 | LA-533-105 | PPM | N124W | 0 |

Sample Size: ? .250ml - 10ml

Customer ID: SAP891-8

Remarks, Calculations, Results:
4.1882 ppm

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Lulam Lugo | | | | Virginia Hart |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 1608Z3 | | | | Leslie Diaz |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-5600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 746.-58/5 | 10SAP | 12-16-91 | 16:1[illegible] | [illegible] |

| Determination | Method/Standard | Result Units | Charge Code | Reruns |
|---|---|---|---|---|
| SO4 | LA-533-105 | % RECOVERY | N124W | [illegible] |

Sample Size: ? .100ml - 10ml

Customer ID: STD

Remarks, Calculations, Results:
EDF K970 DIONEX
STDN 78C110C RESULT 6.1082 ppm
STD VAL 6.0982 %REC 100.12

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| Lulam Lugo | | | | Virginia Hart |
| Hrs | Hrs | Hrs | Hrs | Hrs |
| 1608Z3 | | | | Leslie Diaz |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-8-92 | | |

54-5600-061 (R-10-83)

# DIONEX METHOD PARAMETERS - SYSTEM1.MET

## System Parameters

System Name : system1/qpm
Number of Detectors..... 1
Detector 1 Type..... CDM-1
Detector 1 real time plot scale (uS)..... 20.00
Run Time (minutes)..... 6.00
Sampling Rate (seconds)..... 0.20

## -- DETECTOR 1 PARAMETERS --

### Report Options

Save Data File..... Yes
Data File Name: c:\dx\data\91010801.D07
Create ASCII Report File..... No
Print Report..... Yes
List Peaks Not Found in this run..... No
Report Unknowns Found in this run..... Yes
Print Chromatogram..... Yes
AutoScale Chromatogram to Highest Peak..... Yes
Fill Peaks with Color ..... Yes
Draw Grid Lines on Chromatogram..... No
Label with Peak Number..... Yes
Label with Retention Times on Chromatogram..... No
Label with Component Name..... Yes
Format File Name: c:\dx\method\default.prt

### Integration Parameters

Starting Peak Width (seconds)..... 10.0
Peak Threshold (mV or uS/data pt interval)..... 0.500
Peak Area Reject..... 1000
Area Reject for Reference Peaks..... 1000
Percent Retention Time Window for Reference Peaks..... 5.0

### Integration Timed Events

| Time | Description |
|---|---|
| 1.26 | Start peak detection |
| 1.28 | Start peak detection |

### Calibration Parameters

Number Of Levels for Calibration..... 6
Calibration Fit Type..... Quadratic
Replace Or Average Calibrations..... Replace
External or Internal Calibration..... External
Calibrate by Area or Height..... Area
Default Injection Volume..... 1.0
Default Dilution Factor..... 101.0
Response Factor for Unknown Peaks..... 1.0
Calibration Standard Volume ..... 1.0
Internal Standard Volume ..... 1.0
Sample Unit ..... PPM

BEST AVAILABLE COPY

Reference Peak FLUORIDE Window Size

Amount = K0 + K1*Area + K2*Area**2

K0 = 6.84259E-002
K1 = 5.41881E-005
K2 = -6.00022E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.10000E-001 | 1902 | 349 |
| 2 | 2.80000E-001 | 4256 | 848 |
| 3 | 5.60000E-001 | 8846 | 1706 |
| 4 | 1.12000E+000 | 17365 | 3475 |
| 5 | 2.19000E+000 | 42679 | 7321 |
| 6 | 4.22000E+000 | 84175 | 12636 |

Component # 2 CHLORIDE Retention Time 1.42
Reference Peak FLUORIDE Window Size 7.00%

Amount = K0 + K1*Area + K2*Area**2

BEST AVAILABLE COPY

K0 = 3.42635E-002
K1 = 9.53630E-005
K2 = -6.22379E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.30000E-001 | 1239 | 252 |
| 2 | 3.30000E-001 | 3208 | 567 |
| 3 | 6.60000E-001 | 6502 | 1337 |
| 4 | 1.31000E+000 | 12886 | 2429 |
| 5 | 2.58000E+000 | 27623 | 5058 |
| 6 | 5.00000E+000 | 53889 | 9322 |

Component # 3 NITRITE Retention Time 1.65
Reference Peak FLUORIDE Window Size 7.00%

Amount = K0 + K1*Area + K2*Area**2

K0 = 4.41934E-001
K1 = 1.39994E-004
K2 = -2.77337E-012

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.25000E+000 | 7115 | 1213 |
| 2 | 3.10000E+000 | 19523 | 3097 |
| 3 | 6.18000E+000 | 39962 | 5860 |
| 4 | 1.22300E+001 | 81819 | 12982 |
| 5 | 2.40000E+001 | 170965 | 24711 |
| 6 | 4.62200E+001 | 328741 | 45930 |

Component # 4 NITRATE Retention Time 2.35
Reference Peak FLUORIDE Window Size 10.00%

Amount = K0 + K1*Area + K2*Area**2

K0 = 2.98060E-001
K1 = 1.56421E-004
K2 = -7.17711E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.10000E+000 | 6165 | 724 |
| 2 | 2.75000E+000 | 15858 | 1829 |
| 3 | 5.47000E+000 | 32863 | 3596 |
| 4 | 1.08200E+001 | 68086 | 6938 |
| 5 | 2.12300E+001 | 144490 | 14096 |
| 6 | 4.08900E+001 | 300858 | 26722 |

Component # 5 BROMIDE Retention Time 2.55
Reference Peak FLUORIDE Window Size 1.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 8.78746E-002
K1 = 1.81945E-004
K2 = 5.81300E-010

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.26000E+000 | 9418 | 543 |
| 2 | 3.14000E+000 | 10041 | 957 |
| 3 | 6.26000E+000 | 45736 | 2477 |
| 4 | 1.23900E+001 | 47855 | 4298 |
| 5 | 2.43100E+001 | 98344 | 8521 |
| 6 | 4.68100E+001 | 167809 | 8473 |

Component # 6 PHOSPHATE Retention Time 3.85
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.99318E-001
K1 = 3.17750E-004
K2 = -3.28707E-010

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.14000E+000 | 2718 | 229 |
| 2 | 2.83000E+000 | 8086 | 626 |
| 3 | 5.63000E+000 | 16751 | 1277 |
| 4 | 1.15600E+001 | 34757 | 2630 |
| 5. | 2.18800E+001 | 74341 | 5560 |
| 6 | 4.21500E+001 | 156618 | 11077 |

Component # 7 SULFATE Retention Time 4.90
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.93833E-001
K1 = 1.23085E-004
K2 = -4.10577E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.26000E+000 | 8321 | 546 |
| 2 | 3.14000E+000 | 21548 | 1429 |
| 3 | 6.26000E+000 | 46141 | 2990 |
| 4 | 1.23900E+001 | 97737 | 6333 |
| 5 | 2.43100E+001 | 210064 | 13628 |
| 6 | 4.68100E+001 | 440811 | 27239 |

BEST AVAILABLE COPY

IC Control File: C:\DX\METHOD\SYSTEM1.TE

| Step | Time | Description |
|---|---|---|
| Init | | CDM-1 AutoOffset Off |
| Init | | CDM-1 Recorder Mark OFF |
| Init | | CDM-1 Temp. Comp. = 1.7 / Deg C |
| Init | | CDM-1 Recorder Range = 0.1 uS |
| Init | | CDM-1 Cell ON |
| Init | | CHA Heater = 25 Deg. C |
| Init | | Valve A ON |
| Init | | Valve B ON |
| Init | | Inject Valve OFF |
| Init | | ACI Autosmp OFF |
| Init | | ACI RLY 2 OFF |
| Init | | ACI TTL 1 OFF |
| Init | | ACI TTL 2 OFF |
| Init | | ACI AC 1 ON |
| Init | | GPM Start |
| Init | | GPM Hold Gradient Clock |
| Init | | GPM Reset ON |
| 1 | 0.0 | CDM-1 AutoOffset ON |
| 1 | 0.0 | Start Sampling |
| 1 | 0.0 | GPM Reset OFF |
| 2 | 0.1 | CDM-1 Recorder Range = 10.0 uS |
| 2 | 0.1 | Inject Valve ON |
| 2 | 0.1 | GPM Run Gradient Clock |
| 3 | 2.6 | Inject Valve OFF |
| 4 | 3.0 | ACI Autosmp ON |

GpmFile: C:\DX\METHOD\SYSTEM1.GPM
Lo Pressure Limit = 200
Hi Pressure Limit = 2000
Eluant 1 - DI WATER
Eluant 2 - SODIUM CARBONATE
Eluant 3 - SODIUM BICARBONATE
Eluant 4 - Eluant 4

| Time | Flow | %1 | %2 | %3 | %4 | V5 | V6 | Comment |
|---|---|---|---|---|---|---|---|---|
| 0.0 | 2.0 | 84 | 8 | 8 | 0 | 0 | 0 | |

BEST AVAILABLE COPY

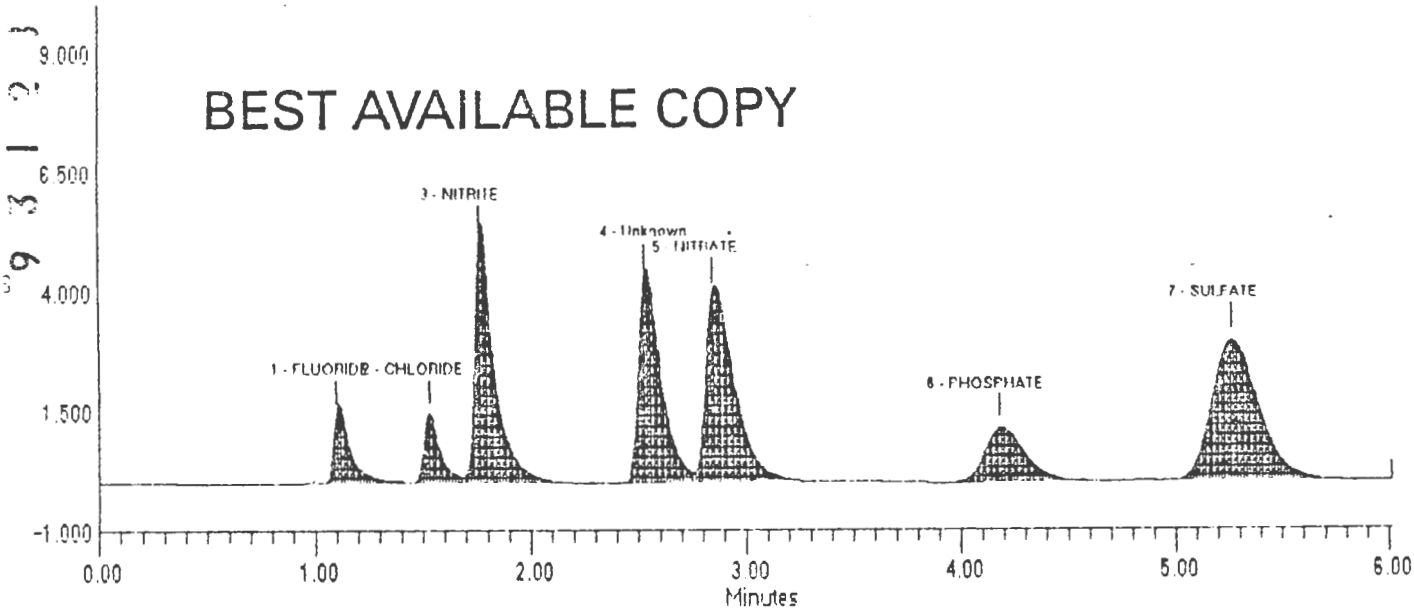
[illegible]

Sample Name: LMCS73C11DC  Date: Wed Jan 08 [illegible]
Data File : C:\DX\DATA\91010851.D02
Method : C:\DX\METHOD\SYSTEM1.MET
ICI Address: 1  Column : 1  Inject#: 2  Detector: [illegible]

| [illegible] | VOLUME | DILUTION | FOLDING | [illegible] | START | STOP | [illegible] |
|---|---|---|---|---|---|---|---|
| Normal | 1 | 101 | 1000 | [illegible] | 0.00 | 6.00 | 1000 |

| Ret. Time | Peak Type | Compound Name | | Concentration | Height | Area | Ret. Index | [illegible] |
|---|---|---|---|---|---|---|---|---|
| [illegible] | 1.12 | FLUORIDE | | 51.232 | 1328 | 8731 | [illegible] | [illegible] |
| [illegible] | 1.53 | CHLORIDE | 100.65 | 25.482 | 1444 | 7515 | [illegible] | [illegible] |
| [illegible] | 1.77 | NITRITE | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | | | 326443.413 | 4371 | [illegible] | [illegible] | |
| [illegible] | [illegible] | NITRATE | | [illegible] | 4020 | [illegible] | [illegible] | [illegible] |
| [illegible] | 4.13 | PHOSPHATE | 100.52 | 505.461 | 1145 | [illegible] | [illegible] | [illegible] |
| [illegible] | 5.27 | SULFATE | 100.12 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

*File: C:\DX\DATA\91010851.D02 Sample: LMCS73C11DC*

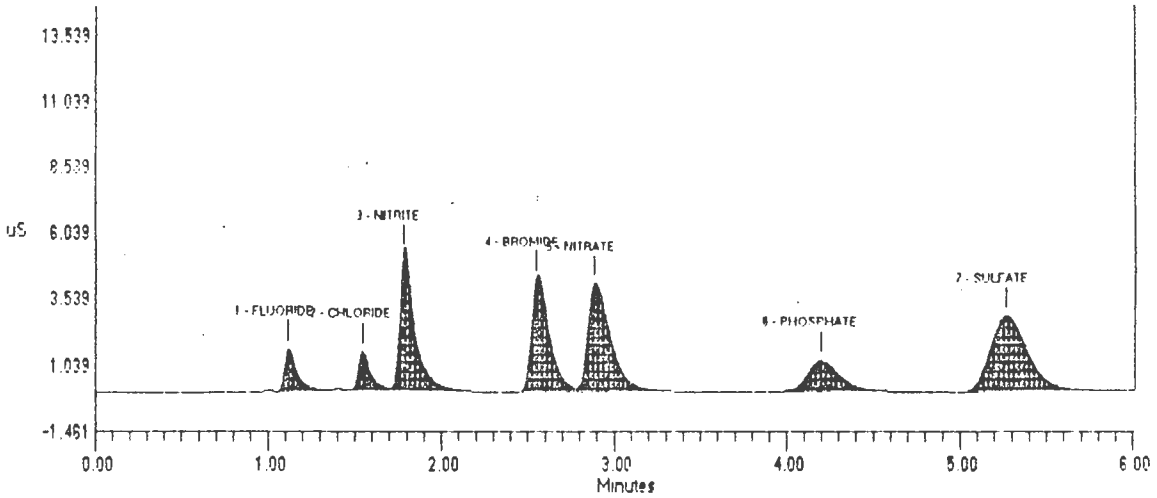



SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED THE ANALYSIS RUN ON PAGES 96 TO 99.

Melanie Myers 1/8/92

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 1.12 | FLUORIDE | | [illegible] | 1550 | [illegible] | [illegible] |
| 2 | 1.55 | CHLORIDE | 92.93 | [illegible] | 1411 | [illegible] | [illegible] |
| 3 | 1.79 | NITRITE | | [illegible] | [illegible] | [illegible] | [illegible] |
| 4 | 2.55 | BROMIDE | | [illegible] | [illegible] | [illegible] | [illegible] |
| 5 | 2.92 | NITRATE | | [illegible] | [illegible] | [illegible] | [illegible] |
| 6 | 4.20 | PHOSPHATE | 97.25 | [illegible] | 1137 | [illegible] | [illegible] |
| 7 | 5.37 | SULFATE | 92.78 | [illegible] | [illegible] | [illegible] | [illegible] |

*File: c:\dx\data\91010801.D21 Sample: LMCS/73C11DC*



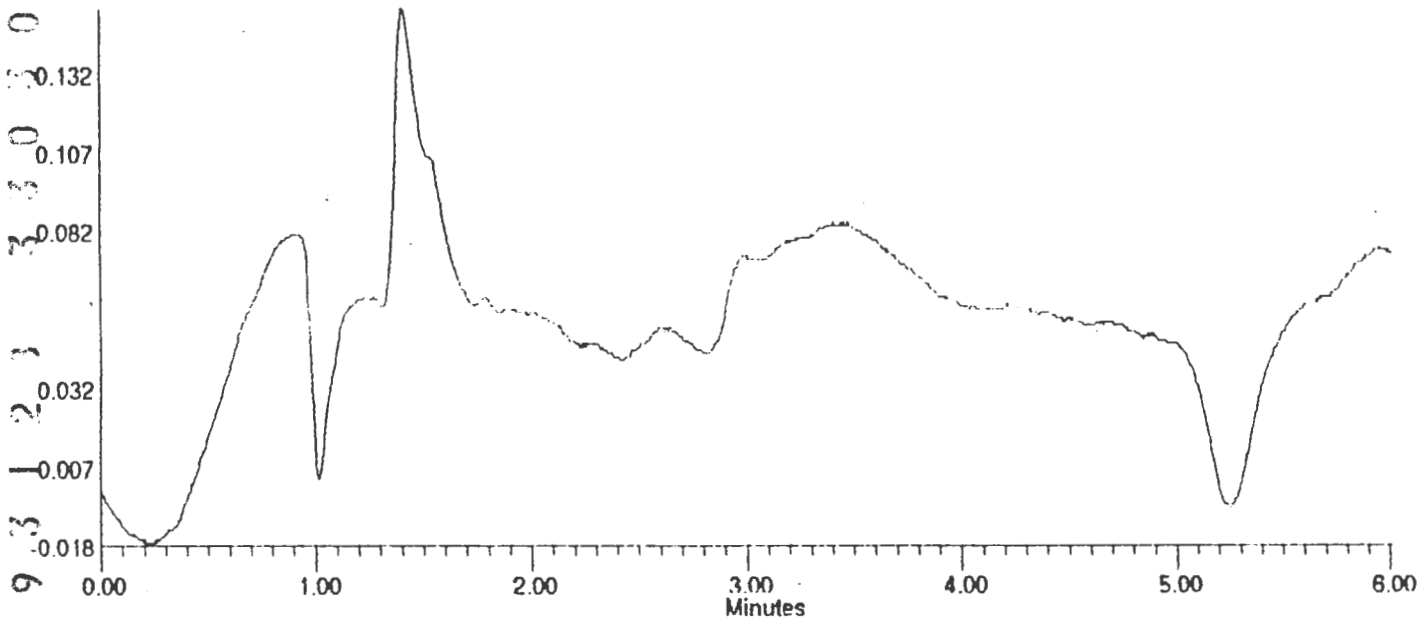

BEST AVAILABLE COPY

Sample Name: REAG BLANK R940 Date: Wed Jan 08 10:01:51 199
Data File : c:\dx\data\91010801.D22
Method : c:\dx\method\SYSTEM1.met
ACI Address: 1 System : 1 Injection#: 22 Detector : CDM-1

| CROSS | VOLUME | DILUTION | POINTS | RATE | START | STOP | CPEG | REJ |
|---|---|---|---|---|---|---|---|---|
| Normal | 1 | 1 | 1005 | 50: | 0.00 | 6.02 | 1000 | |

| Pk. Num | Ret Component Time Name | Concentration | Height | Area | Mk. Code | %Delta |
|---|---|---|---|---|---|---|

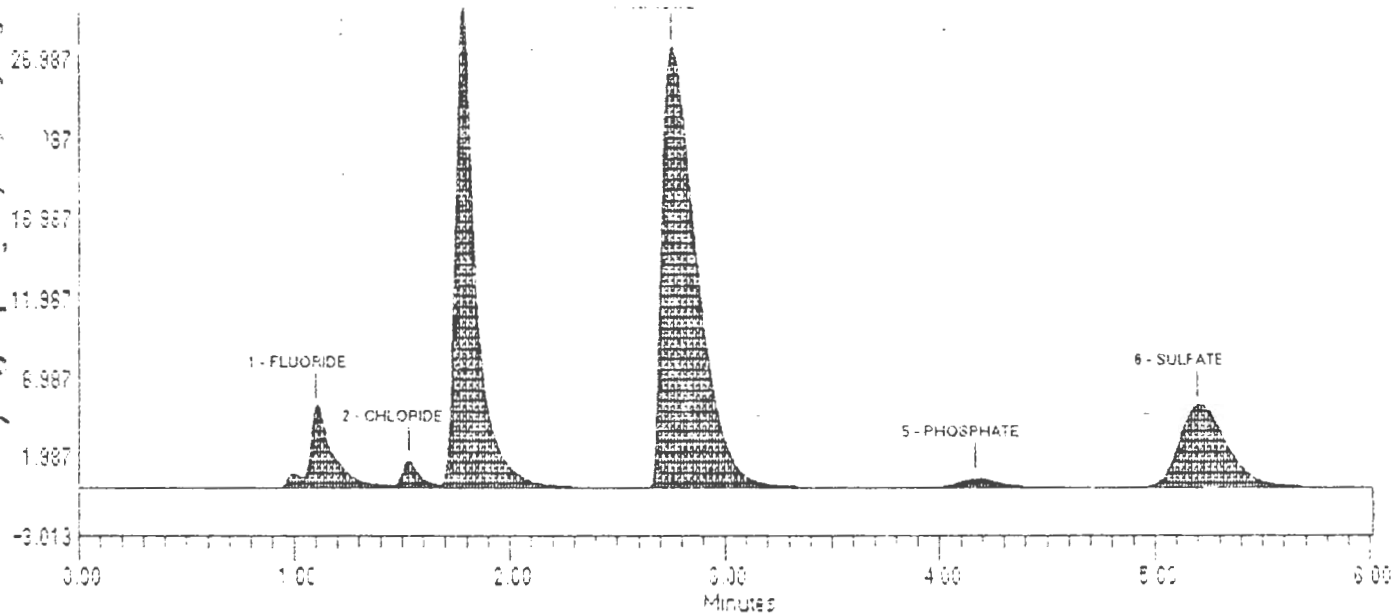
*File: c:\dx\data\91010801.D22 Sample: REAG BLANK R940*




BEST AVAILABLE COPY

08/27/92
R 943

File: c:\dx\data\91010801.D37 Sample: R944




BEST AVAILABLE COPY

# DIONEX METHOD PARAMETERS - SYSTEM1.MET

## System Parameters

System Name : system1/qpm
Number of Detectors..... 1
Detector 1 Type..... CDM-1
Detector 1 real time plot scale (uS)..... 20.00
Run Time (minutes)..... 6.00
Sampling Rate (seconds)..... 0.20

## -- DETECTOR 1 PARAMETERS --

### Report Options

Save Data File..... Yes
Data File Name: c:\dx\data\91010801.D07
Create ASCII Report File..... No
Print Report..... Yes
List Peaks Not Found in this run..... No
Report Unknowns Found in this run..... Yes
Print Chromatogram..... Yes
AutoScale Chromatogram to Highest Peak..... Yes
Fill Peaks with Color ..... Yes
Draw Grid Lines on Chromatogram..... No
Label with Peak Number..... Yes
Label with Retention Times on Chromatogram..... No
Label with Component Name..... Yes
Format File Name: c:\dx\method\default.prf

### Integration Parameters

Starting Peak Width (seconds)..... 10.0
Peak Threshold (mV or uS/data pt interval)..... 0.500
Peak Area Reject..... 1000
Area Reject for Reference Peaks..... 1000
Percent Retention Time Window for Reference Peaks..... 5.0

### Integration Timed Events

| Time | Description |
|---|---|
| 1.26 | Start peak detection |
| 1.28 | Start peak detection |

### Calibration Parameters

Number Of Levels for Calibration..... 6
Calibration Fit Type..... Quadratic
Replace Or Average Calibrations..... Replace
External or Internal Calibration..... External
Calibrate by Area or Height..... Area
Default Injection Volume..... 1.0
Default Dilution Factor..... 101.0
Response Factor for Unknown Peaks..... 1.0
Calibration Standard Volume ..... 1.0
Internal Standard Volume ..... 1.0
Sample Unit ..... PPM

BEST AVAILABLE COPY

Reference Peak FLUORIDE
Amount = K0 + K1*Area + K2*Area**2
K0 = 6.84259E-002
K1 = 5.41881E-005
K2 = -6.00022E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.10000E-001 | 1902 | 349 |
| 2 | 2.80000E-001 | 4256 | 848 |
| 3 | 5.60000E-001 | 8846 | 1706 |
| 4 | 1.12000E+000 | 17365 | 3475 |
| 5 | 2.19000E+000 | 42679 | 7321 |
| 6 | 4.22000E+000 | 84175 | 12636 |

Component # 2 CHLORIDE Retention Time 1.42
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.42635E-002
K1 = 9.53630E-005
K2 = -6.22379E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.30000E-001 | 1239 | 252 |
| 2 | 3.30000E-001 | 3208 | 567 |
| 3 | 6.60000E-001 | 6502 | 1337 |
| 4 | 1.31000E+000 | 12886 | 2429 |
| 5 | 2.58000E+000 | 27623 | 5058 |
| 6 | 5.00000E+000 | 53889 | 9322 |

Component # 3 NITRITE Retention Time 1.65
Reference Peak FLUORIDE Window Size 7.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.41934E-001
K1 = 1.39994E-004
K2 = -2.77337E-012

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.25000E+000 | 7115 | 1213 |
| 2 | 3.10000E+000 | 19523 | 3097 |
| 3 | 6.18000E+000 | 39962 | 5860 |
| 4 | 1.22300E+001 | 81819 | 12982 |
| 5 | 2.40000E+001 | 170965 | 24711 |
| 6 | 4.62200E+001 | 328741 | 45930 |

Component # 4 NITRATE Retention Time 2.35
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 2.98060E-001
K1 = 1.56421E-004
K2 = -7.17711E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.10000E+000 | 6165 | 724 |
| 2 | 2.75000E+000 | 15858 | 1829 |
| 3 | 5.47000E+000 | 32863 | 3596 |
| 4 | 1.08200E+001 | 68086 | 6938 |
| 5 | 2.12300E+001 | 144490 | 14096 |
| 6 | 4.08900E+001 | 300858 | 26722 |

BEST AVAILABLE COPY

Component # 5 BROMIDE Retention Time 2.55
Reference Peak FLUORIDE Window Size 1.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 8.78746E-002
K1 = 1.81945E-004
K2 = 5.81300E-010

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.26000E+000 | 9418 | 543 |
| 2 | 3.14000E+000 | 10041 | 957 |
| 3 | 6.26000E+000 | 45736 | 2477 |
| 4 | 1.23900E+001 | 47855 | 4298 |
| 5 | 2.43100E+001 | 98344 | 8521 |
| 6 | 4.68100E+001 | 167809 | 8473 |

Component # 6 PHOSPHATE Retention Time 3.85
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 3.99318E-001
K1 = 3.17750E-004
K2 = -3.28707E-010

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.14000E+000 | 2718 | 229 |
| 2 | 2.83000E+000 | 8086 | 626 |
| 3 | 5.63000E+000 | 16751 | 1277 |
| 4 | 1.15600E+001 | 34757 | 2630 |
| 5 | 2.18800E+001 | 74341 | 5560 |
| 6 | 4.21500E+001 | 156618 | 11077 |

Component # 7 SULFATE Retention Time 4.90
Reference Peak FLUORIDE Window Size 10.00%
Amount = K0 + K1*Area + K2*Area**2
K0 = 4.93833E-001
K1 = 1.23085E-004
K2 = -4.10577E-011

| Level | Amount | Area | Height |
|---|---|---|---|
| 1 | 1.26000E+000 | 8321 | 546 |
| 2 | 3.14000E+000 | 21548 | 1429 |
| 3 | 6.26000E+000 | 46141 | 2990 |
| 4 | 1.23900E+001 | 97737 | 6333 |
| 5 | 2.43100E+001 | 210064 | 13628 |
| 6 | 4.68100E+001 | 440811 | 27239 |

BEST AVAILABLE COPY

IC Control File: C:\DX\METHOD\SYSTEM1.TE

| Step | Time | Description |
|---|---|---|
| Init | | CDM-1 AutoOffset Off |
| Init | | CDM-1 Recorder Mark OFF |
| Init | | CDM-1 Temp. Comp. = 1.7 / Deg C |
| Init | | CDM-1 Recorder Range = 0.1 uS |
| Init | | CDM-1 Cell ON |
| Init | | CHA Heater = 25 Deg. C |
| Init | | Valve A ON |
| Init | | Valve B ON |
| Init | | Inject Valve OFF |
| Init | | ACI Autosmp OFF |
| Init | | ACI RLY 2 OFF |
| Init | | ACI TTL 1 OFF |
| Init | | ACI TTL 2 OFF |
| Init | | ACI AC 1 ON |
| Init | | GPM Start |
| Init | | GPM Hold Gradient Clock |
| Init | | GPM Reset ON |
| 1 | 0.0 | CDM-1 AutoOffset ON |
| 1 | 0.0 | Start Sampling |
| 1 | 0.0 | GPM Reset OFF |
| 2 | 0.1 | CDM-1 Recorder Range = 10.0 uS |
| 2 | 0.1 | Inject Valve ON |
| 2 | 0.1 | GPM Run Gradient Clock |
| 3 | 2.6 | Inject Valve OFF |
| 4 | 3.0 | ACI Autosmp ON |

GpmFile: C:\DX\METHOD\SYSTEM1.GPM
Lo Pressure Limit = 200
Hi Pressure Limit = 2000
Eluant 1 - DI WATER
Eluant 2 - SODIUM CARBONATE
Eluant 3 - SODIUM BICARBONATE
Eluant 4 - Eluant 4

| Time | Flow | %1 | %2 | %3 | %4 | V5 | V6 | Comment |
|---|---|---|---|---|---|---|---|---|
| 0.0 | 2.0 | 84 | 8 | 8 | 0 | 0 | 0 | |

BEST AVAILABLE COPY

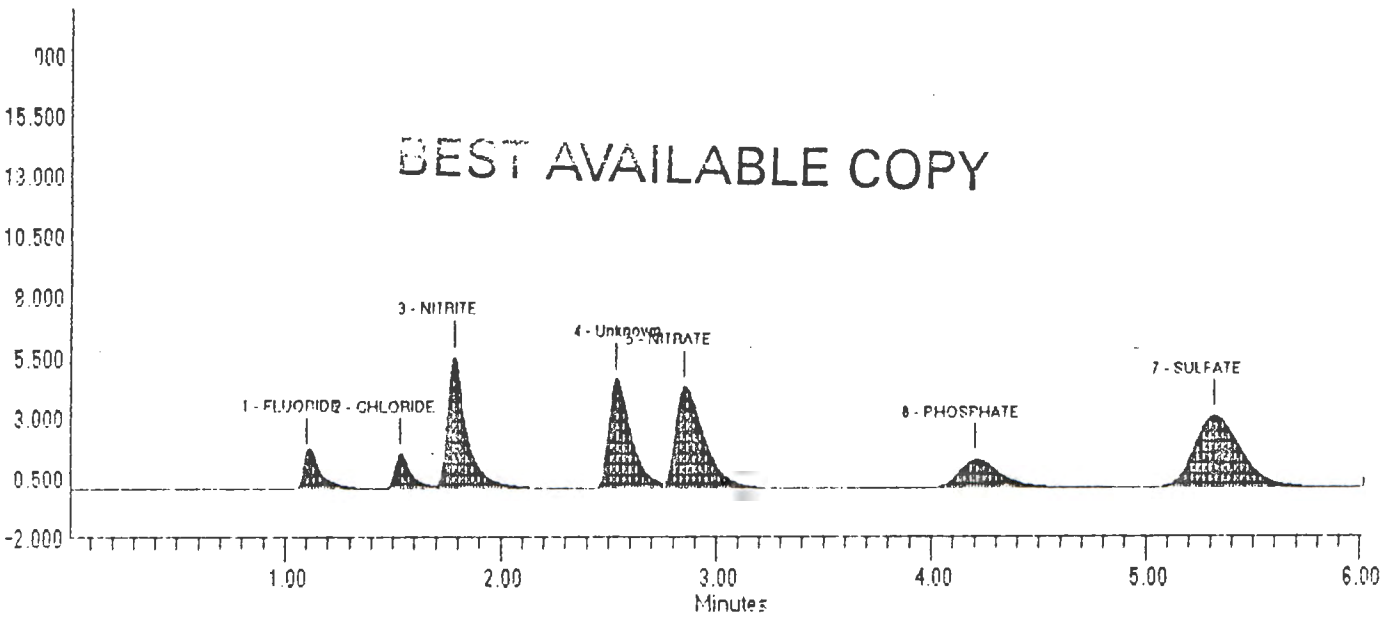
R939-5571 -5576

Date: Thu Jan 09 13:21:47 199

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Internal | 1 | 101 | 1805 | 3H5 | 3.00 | 6.07 | 1000 |

| Pk. Num | Ret Time | Component Name | Concentration | Height | Area | Pk. Code | Delta |
|---|---|---|---|---|---|---|---|
| 1 | 1.10 | FLUORIDE | 55.261 | 1475 | 8922 | 1 | 0.00 |
| 2 | 1.53 | CHLORIDE | 72.853 | 1474 | 7659 | 2 | [illegible] |
| 3 | 1.[illegible] | NITRITE | 537.038 | 5496 | 34140 | 2 | [illegible] |
| 4 | 2.53 | | 3497[illegible].446 | [illegible] | 33756 | 2 | |
| 5 | 2.[illegible] | NITRATE | -12.454 | 4745 | 37869 | 2 | -1.00 |
| 6 | 4.2[illegible] | PHOSPHATE | 52.[illegible] | 1181 | 15497 | 1 | [illegible] |
| 7 | 5.52 | SULFATE | 407.[illegible] | 2502 | 45543 | 1 | [illegible] |

File: C:\DX\DATA\91010861.D01 Sample: LMCS/73C11DC




BEST AVAILABLE COPY

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED THE ANALYSIS RUN ON PAGES 104 TO 111.

Lulane Myers 1-10-92

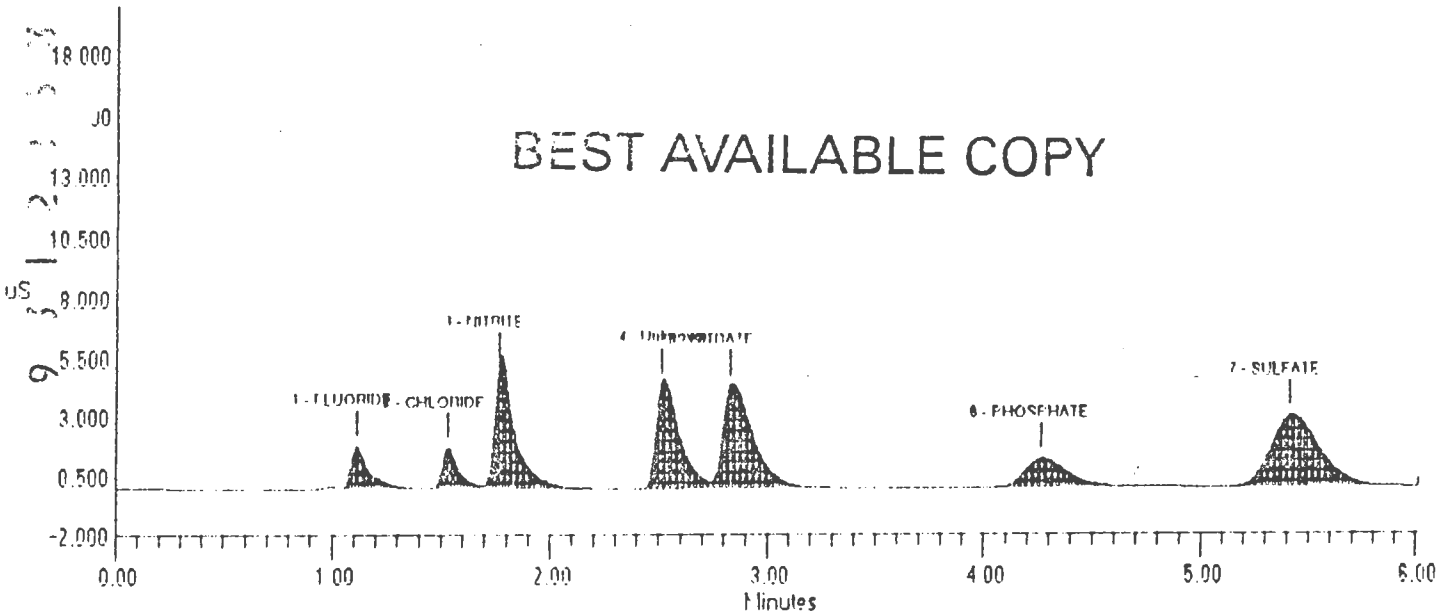
DATA REPROCESSED ON Sun Jan 12 19:35:14 1992

R946

Data Name: LMCS/73C11DB (5573 5576 5571) $NO_3$ Date: Fri Jan 10 02:51:26 199
Data File : C:\DX\DATA\91011001.D10 $NO_2$
Method : C:\DXMETHOD\SYSTEM.MET F
Vial Number: 1 Sample : 1 Injection: 1 Detector: CDM-1

| Peak | Time | Component Name | Concentration | Height | Area | Sel. Code | Det. Code |
|---|---|---|---|---|---|---|---|
| 1 | 1.12 | FLUORIDE | [illegible] | 1698 | 2346 | 1 | [illegible] |
| 2 | 1.33 | CHLORIDE | [illegible] | 1684 | 8543 | 2 | [illegible] |
| 3 | 1.77 | NITRITE | [illegible] | 5018 | [illegible] | 2 | [illegible] |
| 4 | [illegible] | | [illegible] | 4396 | [illegible] | 2 | |
| 5 | 1.83 | NITRATE | [illegible] | [illegible] | 41390 | 2 | [illegible] |
| 6 | [illegible] | PHOSPHATE | 129.061 | 1164 | 15420 | 1 | [illegible] |
| 7 | 5.12 | SULFATE | 418.495 | [illegible] | 46450 | 1 | [illegible] |

File: C:\DX\DATA\91011001.D10 Sample: LMCS/73C11DB




BEST AVAILABLE COPY

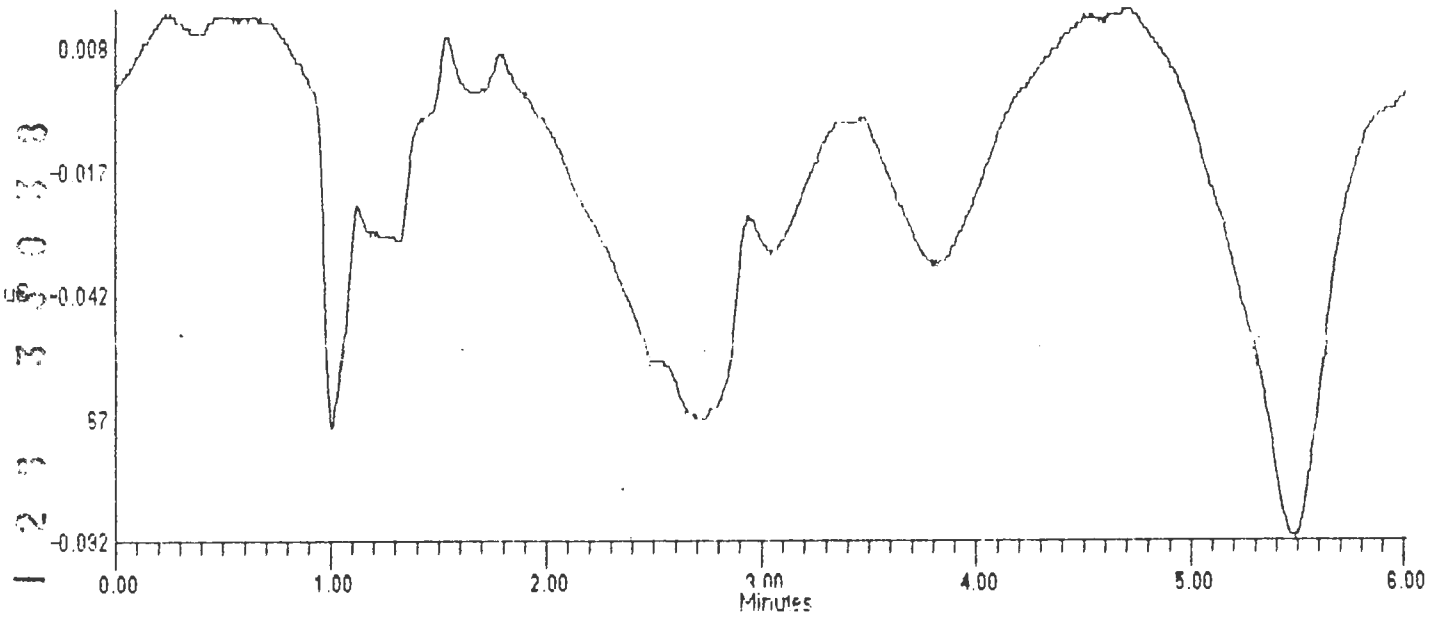
DH 3-24-92 R940 NO3 5673

Sample Name: REAGENT BLANK R940 Date: [illegible]
Data File : c:\dx\data\91011001.D12
Method : c:\dx\method\reg1001.met
Injection : 1 Sample : Data Set : DMI-1

| REPORT | VOLUME | DILUTION | POINTS | RATE | START | STOP | AREA | RED |
|---|---|---|---|---|---|---|---|---|
| External | 1 | 1 | 1025 | 5Hz | 0.00 | 6.00 | 1000 | |

| Ret. Time | Ret. Time Mins | Component | Concentration | Height | Area | Rt. Code | [illegible] |
|---|---|---|---|---|---|---|---|

File: c:\dx\data\91011001.D12 Sample: REAGANT BLANK R932




BEST AVAILABLE COPY

R940-5676

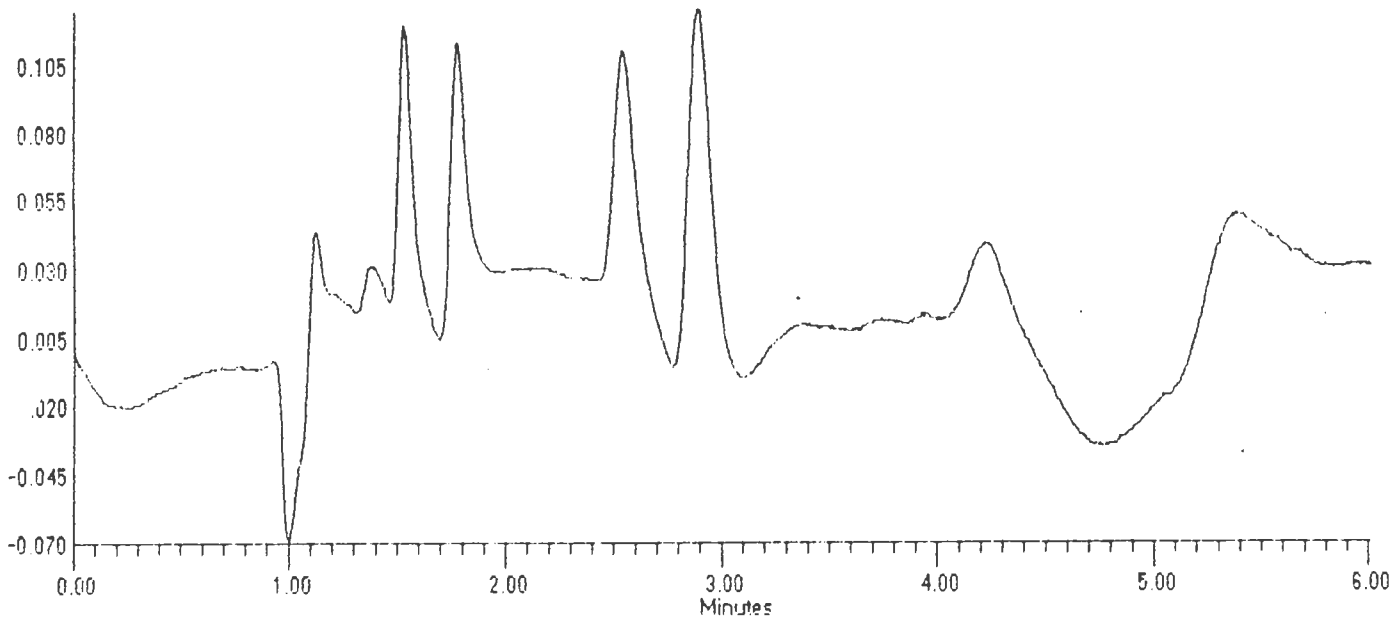
5671
F
$NO_2$

Sample Name: BLANK
Data File : c:\dx\data\91011001.D02
Method : c:\dx\methods\91EN1.mtl
Column : J
Date: Fri Jan 10 11:50:33 1992
Inj #: 2 Detector: CDM-1

| Method | Volume | Pulsed Points | Rate | Start | Stop | Area Rej |
|---|---|---|---|---|---|---|
| Normal | 1 | 1005 | 5Hz | 0.00 | 6.02 | 1000 |

| Pk. Num | Ret Time | Component Name | Concentration | Height | Area | Pk. Code | %Delta |
|---|---|---|---|---|---|---|---|

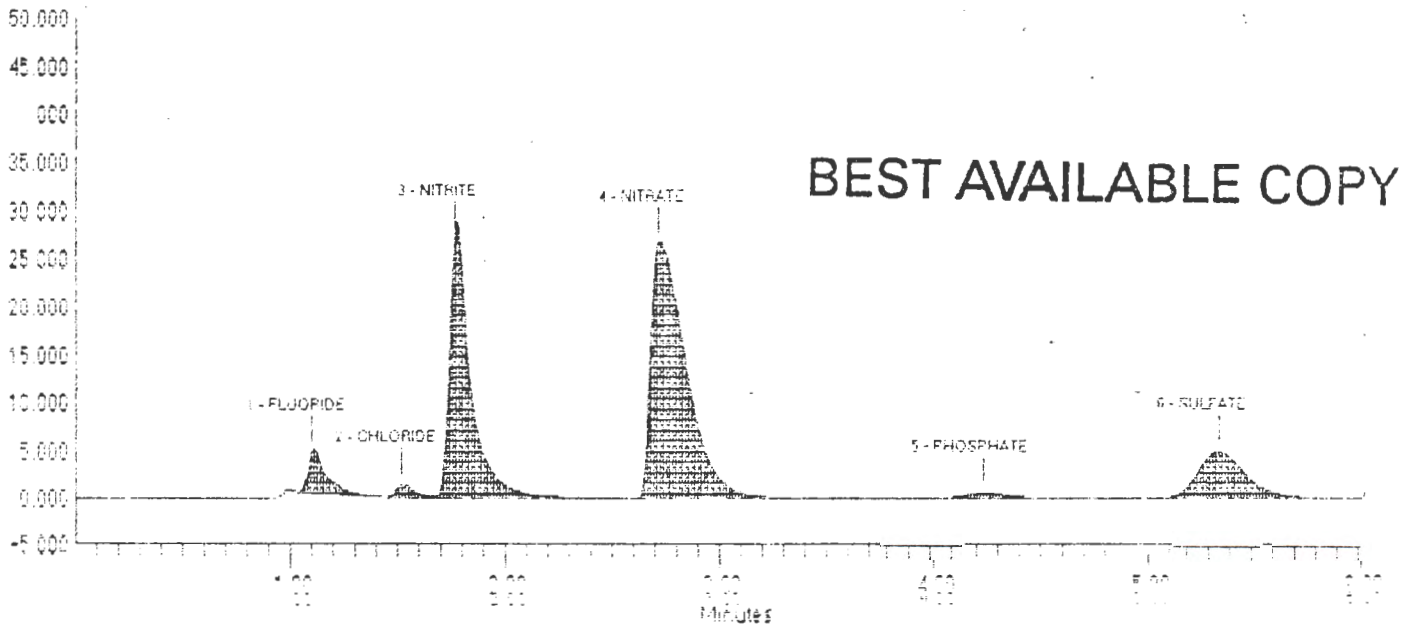
File: c:\dx\data\91011001.D02 Sample: BLANK




BEST AVAILABLE COPY

5771+5776 F+NO2

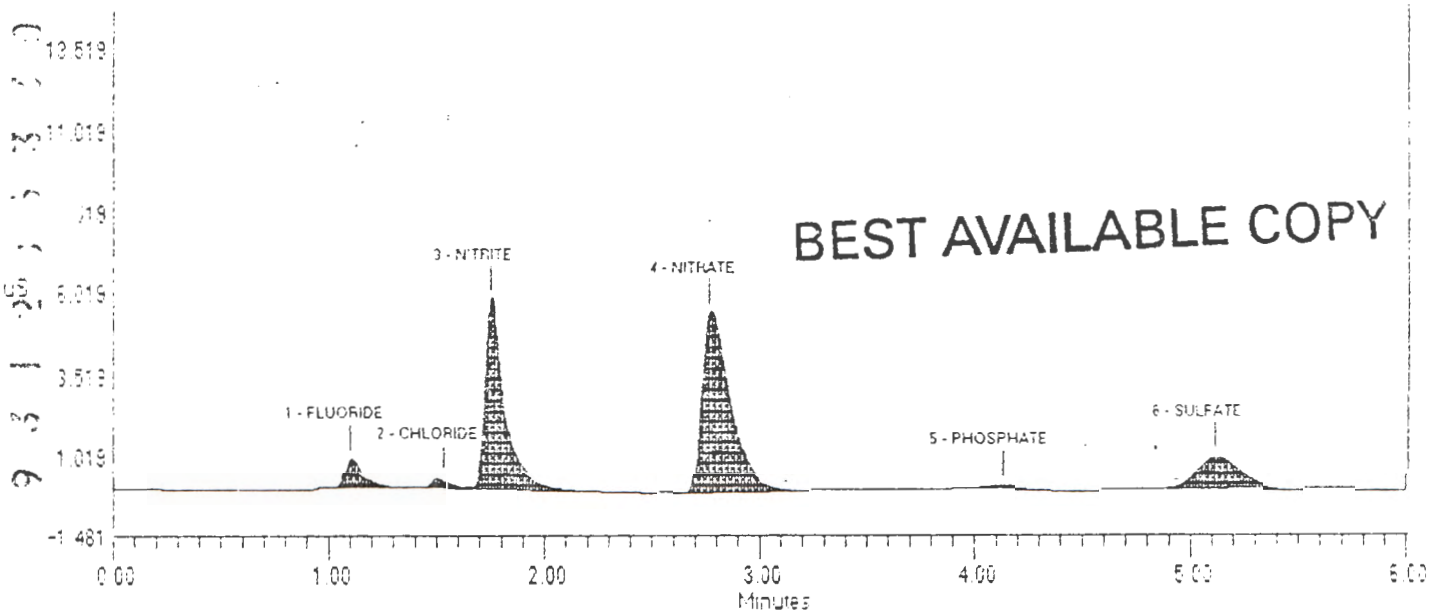
File: C:\DX\DATA\91011001.D07 Sample: R943




BEST AVAILABLE COPY

-5773 $NO_3$

File: c:\dx\data\91011001.D17 Sample: R943

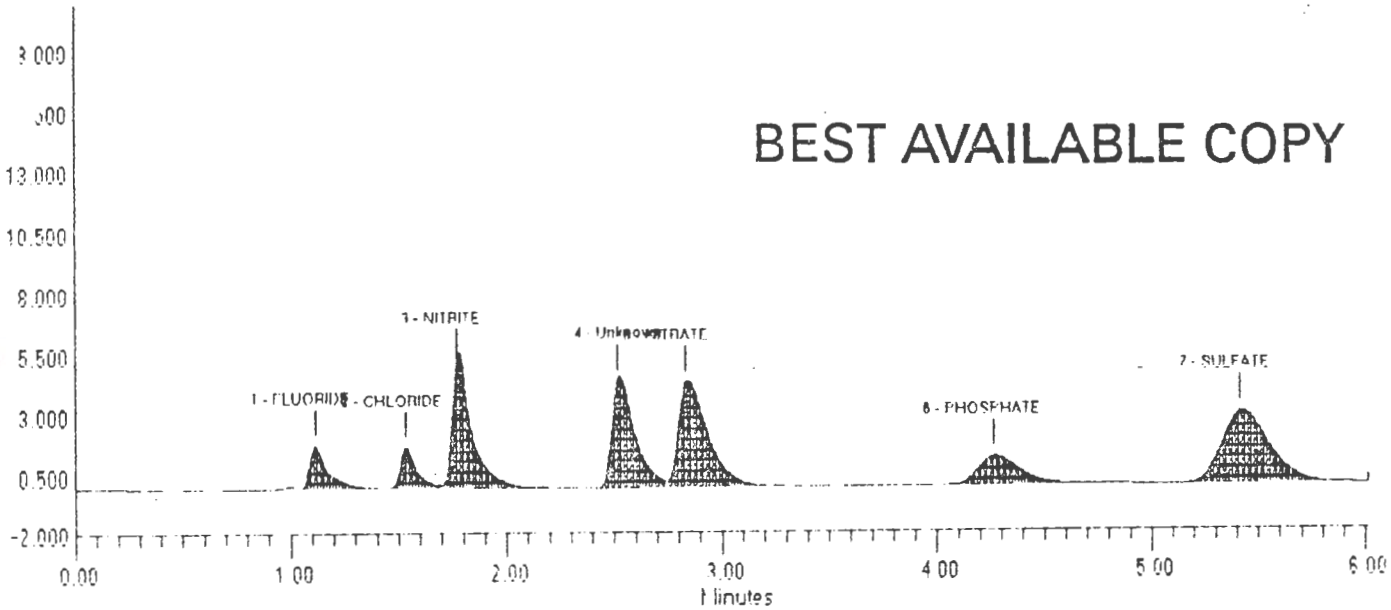



BEST AVAILABLE COPY

R946
5573 5576 5571 $NO_3$
$NO_2$
F

| Peak Number | Peak Component Name | Concentration | Height | Area | Area Code | Width Code |
|---|---|---|---|---|---|---|
| 1 | FLUORIDE | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 2 | CHLORIDE | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 3 | NITRITE | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 4 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 5 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 6 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 7 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

*File: C:\DX\DATA\91011001.D10 Sample: LMCS/73C11DB*




BEST AVAILABLE COPY

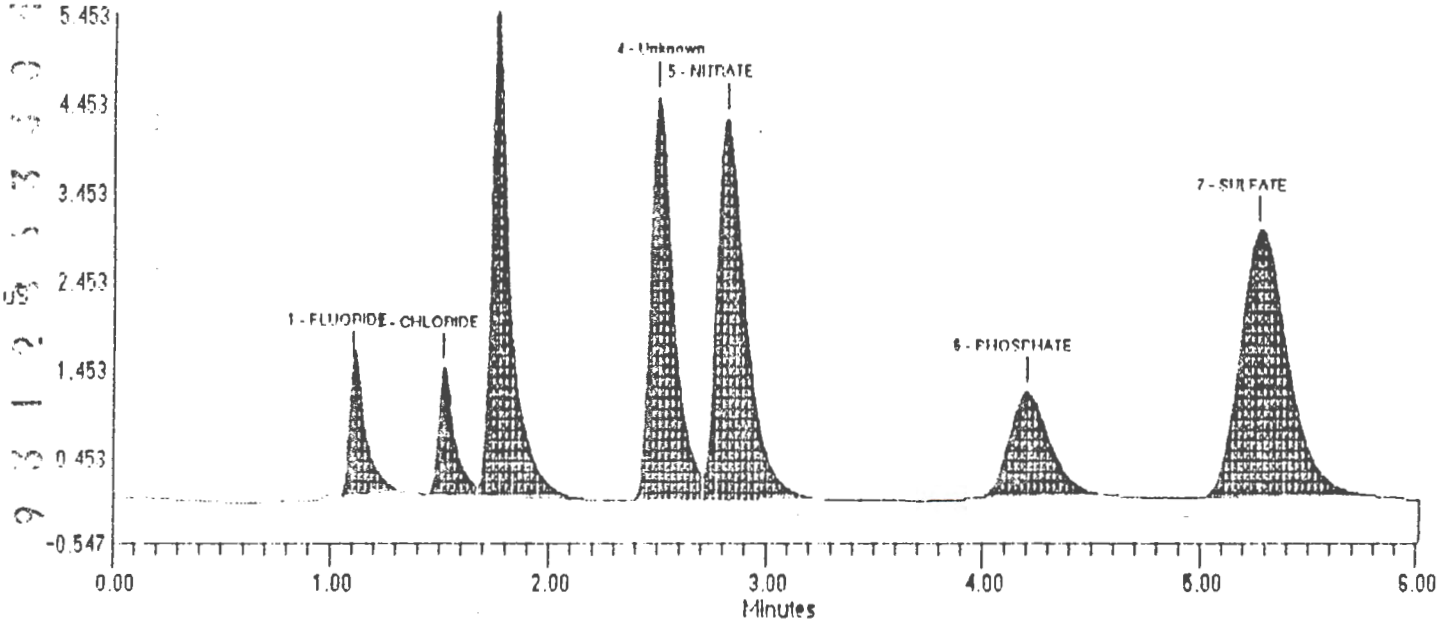
R946-5571, 5573, 5574

Sample Name: LMCS/73C11DC  Date: Fri Jan 10 01:06:17 1992
Data File : c:\dxidata\91011001.D20
Method : c:\dximethod\SYSTEM1.met
ACI address: 1  System : 1  Inject#: 20  Detector: CDM-1

| REPORT | VOLUME | DILUTION | POINTS | RATE | START | STOP | AREA REJ |
|---|---|---|---|---|---|---|---|
| External | 1 | 101 | 1805 | 5Hz | 0.00 | 6.02 | 1000 |

| Pk. Num | Ret Time | Component Name | | Concentration | Height | Area | Pk. Code | Resid. |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.10 | FLUORIDE | 91.8 | 31.406 | 1442 | 8207 | 1 | 0.00 |
| 2 | 1.52 | CHLORIDE | | 24.035 | 1121 | 7363 | 2 | 1.11 |
| 3 | 1.75 | NITRITE | | 517.124 | 5090 | 33439 | 2 | 0.00 |
| 4 | 2.50 | | | 3462734.456 | 4542 | 33690 | 2 | |
| 5 | 2.82 | NITRATE | 102.9 | 451.172 | 4231 | 40048 | 2 | 0.40 |
| 6 | 4.20 | PHOSPHATE | 101.8 | 525.058 | 1181 | 15348 | 1 | -2.78 |
| 7 | 5.37 | SULFATE | | 517.751 | 2994 | 46338 | 1 | -3.95 |

*File: c:\dxi\data\91011001.D20 Sample: LMCS/73C11DC*




BEST AVAILABLE COPY

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: GAMMA ENERGY | Sample Prep: UNDIGESTED |

| | |
|---|---|
| Instrument: WB57237, WB57265 | Procedure/Rev: LA-548-121/D-0 |
| Technologist: L. TEMPLE | Date: 01-04-92 |
| Starting Time: 00:30 | Temperature: NA |
| Ending Time: 01:20 | Chemist: S. CATLOW |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-5530 | 11 | | |
| 2 | REAGENT BLANK | R940-5630 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-5730 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-5530 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | 48B49/.100 mL | | | NA |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)

# GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

2905 Need Long Form GEA

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 939.-5530 | 103AP | 12-16-91 | 161 1 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| GEA | LA-548-121 | % RECOVERY | N124W | 0 |

Sample Size: ? 100ml
Customer ID: STD

Remarks, Calculations, Results
COLX STD# 48849
R901 STD VAL 7.06E1 Cs137 → 8.01 x10¹ → 101.4%
RESULT % REC 1017 Ru106
R905 STD VAL 7.76¹ Nb94
RESULT % REC 1022 Ce144
Eu 154/155 } NA Ra226
Sn 113
Co60 → 6.03 x10¹ → 101.1%
NA

Analyst 1: 81808 | Analyst 2: 69347 | Analyst 3 | Analyst 4 | Analyst 5
Date: 1-4-92 | Time Completed | Lab Unit Supv: A.K. 01/08/92

2906 Need Long Form GEA

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 940.-5630 | 103AP | 12-16-91 | 161 2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| GEA | LA-548-121 | uCI/L | N124W | 0 |

Sample Size: ? 22ml $H_2O$
Customer ID: M.K

Remarks, Calculations, Results
COUNT AS uCI/L
LASER PRINTOUT
Eu 154/155 → 6.5 x10⁻³ uC/L
Sn 113 → 6.6 x10⁻³ "
Co 60 → 3.1 x10⁻³ "
Cs137 → 6.9 x10⁻³ uC/L
Ru106 → 3.1 x10⁻³ uC/L
Nb94 → 1.9 x10⁻³ "
Ce144 → 1.8 x10⁻² "
Ra 226 → 3.4 x10⁻³ "

Analyst 1: 81808 | Analyst 2: 69347 | Analyst 3 | Analyst 4 | Analyst 5
Date: 1-4-92 | Time Completed | Lab Unit Supv: A.K. 01/08/92

2913 Need Long Form GEA

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 943.-5730 | 103AP | 12-16-91 | 161 4 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| GEA | LA-548-121 | uCI/L | N124W | 0 |

Sample Size: ? 100ml - 10ml - 500ml
Customer ID: 3APB91-B

Remarks, Calculations, Results
COUNT AS uCI/L
LASER PRINTOUT
Eu 155 → 2.7 x10¹ uC/L
Sm113 → 2.7 x10¹ "
Co60 → [illegible] uC/L
Cs137 → 6.59 x10³ uC/L
Ru106 → 3.8 x10⁻³ uC/L
Nb94 → 7.1 uC/L
Ce144 → 1.6 x10⁻² "
Ra226 → 3.8 x10¹ "
Cs BY N124 2.17 uCi/L 2.15 uCi/L

Analyst 1: 81808 | Analyst 2: 62820 | Analyst 3 | Analyst 4 | Analyst 5
Date: 1-4-92 | Time Completed | Lab Unit Supv: A.K. 01/08/92

R943 - 5730
Eu-155 → 7.74 x10¹ uC/L

2917 Need Long Form GEA

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| K 946.-5530 | 103AP | 12-16-91 | 1613 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| GEA | LA-548-121 | % RECOVERY | N124W | 0 |

Sample Size: ? 100ml
Customer ID: STD

Remarks, Calculations, Results
COLX STD# 48849
R901 STD VAL
Cs-137 → 7.42 x10¹
RESULT % REC 105.4%
R905 STD VAL 5.98 x10¹
RESULT % REC 101%
Eu 154/155 } NA
Sn 113
Co60 → 6.98 x10¹
Cs137 → 7.49 x10¹
Ru106
Nb94
Ce144
Ra226
NA

Analyst 1: 81808 | Analyst 2: 62820 | Analyst 3 | Analyst 4 | Analyst 5
Date: 1-4-92 | Time Completed | Lab Unit Supv: A.K. 01/08/92

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                         *
*              G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                         *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM                                    04-JAN-92  03:04:56

                    A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:    1      /      ADC UNIT NUMBER: 2.0
DETECTOR NUMBER:     2     /      GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:          69549

SAMPLE DESCRIPTION: R939-5530
GEOMETRY DESCRIPTION:  22ML LIQ
SAMPLE SIZE:    1.0000E-03 LI        / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON  4-JAN-92 AT 02:14:40

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3002. SECONDS
        DEAD TIME:      0.07 %

 DECAYED TO       0. DAYS;  0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 17-MAR-89
EFFICIENCY CALIBRATION PERFORMED 16-MAY-91
```

9 3 1 2 1 3 3 0 4 6

BEST AVAILABLE COPY

BEST AVAILABLE COPY

222-S COUNTING ROOM 04-JAN-92 03:04:56

SAMPLE: R939-5530
DATA COLLECTED ON 4-JAN-92 AT 02:14:40
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

| NUCLIDE | ACTIVITY CONCENTRATION IN uCI/LI MEASURED | ERROR | DECAY CORRECTED | ERROR | ENERGY COMPARISON (MEV) EXPECT | DIFF |
|---|---|---|---|---|---|---|
| AC-228 | LLD<4.55E+00 | | LLD<4.55E+00 | | 911.07 | |
| AC-228A | LLD<4.56E+00 | | LLD<4.56E+00 | | 911.10 | |
| AC-228B | LLD<5.68E+00 | | LLD<5.68E+00 | | 338.40 | |
| AG-108M | LLD<9.64E-01 | | LLD<9.64E-01 | | 433.94 | |
| AG-110M | LLD<4.56E+00 | | LLD<4.56E+00 | | 657.76 | |
| AM-241 | LLD<5.27E+00 | | LLD<5.27E+00 | | 59.54 | |
| AM-243 | LLD<1.34E+00 | | LLD<1.34E+00 | | 74.67 | |
| AM-243A | LLD<1.34E+00 | | LLD<1.34E+00 | | 74.67 | |
| AM-243B | LLD<1.49E+02 | | LLD<1.49E+02 | | 43.10 | |
| AR-41 | LLD<6.95E-01 | | LLD<6.95E-01 | | 1293.64 | |
| AU-198 | LLD<9.31E-01 | | LLD<9.31E-01 | | 411.80 | |
| BA-133 | LLD<1.26E+00 | | LLD<1.26E+00 | | 356.02 | |
| BA-139 | LLD<2.77E+00 | | LLD<2.77E+00 | | 165.85 | |
| BA-140 | LLD<3.69E+00 | | LLD<3.69E+00 | | 537.27 | |
| BA-141 | LLD<2.48E+00 | | LLD<2.48E+00 | | 190.23 | |
| BE-7 | LLD<8.56E+00 | | LLD<8.56E+00 | | 477.59 | |
| BI-207 | LLD<9.80E-01 | | LLD<9.80E-01 | | 569.70 | |
| BI-212 | LLD<7.81E+00 | | LLD<7.81E+00 | | 727.27 | |
| BI-214 | LLD<5.83E+00 | | LLD<5.83E+00 | | 609.32 | |
| BI-214A | LLD<5.83E+00 | | LLD<5.83E+00 | | 609.32 | |
| BI-214B | LLD<7.93E+00 | | LLD<7.93E+00 | | 1120.28 | |
| BI-214C | LLD<2.37E+00 | | LLD<2.37E+00 | | 1764.51 | |
| CD-109 | LLD<1.74E+01 | | LLD<1.74E+01 | | 88.03 | |
| CE-139 | LLD<6.26E-01 | | LLD<6.26E-01 | | 165.85 | |
| CE-141 | LLD<9.72E-01 | | LLD<9.72E-01 | | 145.44 | |
| CEPR144 | LLD<7.59E+00 | | LLD<7.59E+00 | | 133.51 | |
| CO-56 | LLD<1.05E+00 | | LLD<1.05E+00 | | 846.76 | |
| CO-57 | LLD<4.93E-01 | | LLD<4.93E-01 | | 122.06 | |
| CO-58 | LLD<1.05E+00 | | LLD<1.05E+00 | | 810.75 | |
| CO-60 | 6.05E+01 | +-3.04E+00 | 6.05E+01 | +-3.04E+00 | 1332.50 | -0.73 |
| | | | | | 1173.24 | -0.70 |
| CR-51 | LLD<6.76E+00 | | LLD<6.76E+00 | | 320.09 | |
| CS-134 | 6.14E+01 | +-3.24E+00 | 6.14E+01 | +-3.24E+00 | 795.84 | -0.56 |
| | | | | | 604.70 | -0.44 |
| CS-136 | LLD<1.03E+00 | | LLD<1.03E+00 | | 818.51 | |
| CS-137 | 8.01E+01 | +-3.23E+00 | 8.01E+01 | +-3.23E+00 | 661.65 | -0.48 |
| CS-138 | LLD<1.32E+00 | | LLD<1.32E+00 | | 1435.86 | |
| EU-152 | LLD<2.77E+00 | | LLD<2.77E+00 | | 1408.01 | |
| EU-154 | LLD<2.10E+00 | | LLD<2.10E+00 | | 1274.45 | |
| EU-155 | LLD<2.27E+00 | | LLD<2.27E+00 | | 105.31 | |
| FE-59 | LLD<2.38E+00 | | LLD<2.38E+00 | | 1099.25 | |
| HF-181 | LLD<1.07E+00 | | LLD<1.07E+00 | | 482.20 | |
| HG-203 | LLD<6.92E-01 | | LLD<6.92E-01 | | 279.20 | |
| I-131 | LLD<9.58E-01 | | LLD<9.58E-01 | | 364.48 | |
| I-132 | LLD<1.41E+00 | | LLD<1.41E+00 | | 667.69 | |
| I-133 | LLD<9.92E-01 | | LLD<9.92E-01 | | 529.87 | |
| I-134 | LLD<1.63E+00 | | LLD<1.63E+00 | | 847.03 | |
| I-135 | LLD<2.60E+00 | | LLD<2.60E+00 | | 1260.41 | |
| K-40 | LLD<4.94E+00 | | LLD<4.94E+00 | | 1460.75 | |
| KR-85 | LLD<2.07E+02 | | LLD<2.07E+02 | | 513.99 | |
| KR-85M | LLD<6.34E-01 | | LLD<6.34E-01 | | 151.17 | |

| | | | | |
|---|---|---|---|---|
| KR-89 | LLD<2.98E+01 | LLD<2.98E+01 | | 220.90 |
| LA-140 | LLD<5.31E-01 | LLD<5.31E-01 | | 1596.20 |
| LA-142 | LLD<2.08E+00 | LLD<2.08E+00 | | 641.83 |
| MN-54 | LLD<9.74E-01 | LLD<9.74E-01 | R939-5530 | 834.83 |
| MN-56 | LLD<1.19E+00 | LLD<1.19E+00 | | 846.76 |
| NA-22 | LLD<7.45E-01 | LLD<7.45E-01 | 6-11-92 | 1274.55 |
| NA-24 | LLD<1.00E+00 | LLD<1.00E+00 | | 1368.60 |
| NB-94 | LLD<8.99E-01 | LLD<8.99E-01 | | 702.63 |
| NB-95 | LLD<9.91E-01 | LLD<9.91E-01 | | 765.78 |
| NB-97 | LLD<5.16E+00 | LLD<5.16E+00 | | 657.92 |
| NP-237 | LLD<4.98E+00 | LLD<4.98E+00 | | 86.50 |
| NP-238 | LLD<4.45E+00 | LLD<4.45E+00 | | 984.45 |
| NP-239 | LLD<4.36E+00 | LLD<4.36E+00 | | 277.60 |
| PA-233 | LLD<1.71E+00 | LLD<1.71E+00 | | 311.98 |
| PA-234M | LLD<2.06E+02 | LLD<2.06E+02 | | 1001.03 |
| PB-210 | LLD<1.40E+02 | LLD<1.40E+02 | | 46.50 |
| PB-212 | LLD<1.32E+00 | LLD<1.32E+00 | | 239.00 |
| PB-212A | LLD<1.32E+00 | LLD<1.32E+00 | | 239.00 |
| PB-212B | LLD<2.00E+01 | LLD<2.00E+01 | | 300.10 |
| PB-214 | LLD<1.84E+00 | LLD<1.84E+00 | | 351.92 |
| PB-214A | LLD<1.84E+00 | LLD<1.84E+00 | | 351.92 |
| PB-214B | LLD<3.25E+00 | LLD<3.25E+00 | | 295.21 |
| PO-210 | LLD<8.75E+04 | LLD<8.75E+04 | | 804.00 |
| PO-214 | LLD<4.00E+04 | LLD<4.00E+04 | | 799.70 |
| PO-216 | LLD<7.37E+04 | LLD<7.37E+04 | | 804.90 |
| PU-239 | LLD<7.36E+03 | LLD<7.36E+03 | | 129.30 |
| PU-241 | LLD<2.33E+05 | LLD<2.33E+05 | | 148.37 |
| RA-224 | LLD<1.45E+01 | LLD<1.45E+01 | | 240.99 |
| RA-226 | LLD<1.37E+01 | LLD<1.37E+01 | | 186.10 |
| RB-88 | LLD<5.64E+00 | LLD<5.64E+00 | | 1836.00 |
| RB-89 | LLD<5.14E+00 | LLD<5.14E+00 | | 1031.88 |
| RN-220 | LLD<7.91E+02 | LLD<7.91E+02 | | 549.73 |
| RU-103 | LLD<9.13E-01 | LLD<9.13E-01 | | 497.08 |
| RURH106 | LLD<1.86E+01 | LLD<1.86E+01 | | 621.80 |
| SB-124 | LLD<1.26E+00 | LLD<1.26E+00 | | 602.72 |
| SB-125 | LLD<7.49E+00 | LLD<7.49E+00 | | 176.33 |
| SC-46 | LLD<1.19E+00 | LLD<1.19E+00 | | 1120.45 |
| SE-75 | LLD<1.08E+00 | LLD<1.08E+00 | | 264.66 |
| SN-113 | LLD<1.29E+00 | LLD<1.29E+00 | | 391.67 |
| SR-85 | LLD<9.07E-01 | LLD<9.07E-01 | | 513.99 |
| SR-91 | LLD<1.75E+00 | LLD<1.75E+00 | | 555.60 |
| SR-92 | LLD<6.66E-01 | LLD<6.66E-01 | | 1383.94 |
| TA-182 | LLD<3.64E+00 | LLD<3.64E+00 | | 1121.30 |
| TC-99M | LLD<5.12E-01 | LLD<5.12E-01 | | 140.51 |
| TE-123M | LLD<5.66E-01 | LLD<5.66E-01 | | 159.00 |
| TE-125M | LLD<1.59E+02 | LLD<1.59E+02 | | 109.27 |
| TE-132 | LLD<6.18E-01 | LLD<6.18E-01 | | 228.16 |
| TH-228 | LLD<5.64E+01 | LLD<5.64E+01 | | 84.37 |
| TH-234 | LLD<1.01E+01 | LLD<1.01E+01 | | 92.50 |
| TH-234A | LLD<1.01E+01 | LLD<1.01E+01 | | 92.50 |
| TH-234B | LLD<3.65E+01 | LLD<3.65E+01 | | 63.30 |
| TL-208 | LLD<1.20E+00 | LLD<1.20E+00 | | 583.14 |
| U-235 | LLD<9.72E-01 | LLD<9.72E-01 | | 185.71 |
| U-235A | LLD<9.72E-01 | LLD<9.72E-01 | | 185.71 |
| U-235B | LLD<4.54E+00 | LLD<4.54E+00 | | 143.76 |
| U-237 | LLD<2.58E+00 | LLD<2.58E+00 | | 208.00 |
| W-187 | LLD<3.43E+00 | LLD<3.43E+00 | | 685.74 |
| XE-131M | LLD<2.53E+01 | LLD<2.53E+01 | | 163.98 |
| XE-133 | LLD<1.94E+00 | LLD<1.94E+00 | | 81.00 |
| XE-133M | LLD<5.57E+00 | LLD<5.57E+00 | | 233.21 |
| XE-135 | LLD<6.39E-01 | LLD<6.39E-01 | | 249.79 |
| XE-138 | LLD<4.89E+00 | LLD<4.89E+00 | | 253.41 |
| Y-88 | LLD<5.35E-01 | LLD<5.35E-01 | | 1836.06 |
| Y-91 | LLD<3.22E+02 | LLD<3.22E+02 | | 1204.90 |
| Y-91M | LLD<1.32E+00 | LLD<1.32E+00 | | 555.60 |

9 3 1 2 3 3 4 0 1 3

BEST AVAILABLE COPY

| | | | |
|---|---|---|---|
| ZR-95 | LLD<1.64E+00 | LLD<1.64E+00 | 756.73 |
| ZR-97 | LLD<1.01E+00 | LLD<1.01E+00 | 743.33 |
| TOTAL | 2.02E+02 +-5.50E+00 | 2.02E+02 +-5.50E+00 | |

R 939-5530
4-11-92

STANDARD DEVIATION = 0.13

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.30E-09 UC/LI
TOTAL MEASURED ACTIVITY = 2.02E+02 (+-5.50E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

| CENTROID CHANNEL | ENERGY KEV | NET AREA COUNTS | ERROR % | GAMMAS/SEC |
|---|---|---|---|---|
| 1126.19 | 562.73 | 252. | 20.9 | 1.49E+01 |
| 1138.50 | 568.88 | 482. | 17.6 | 2.88E+01 |
| 1603.53 | 801.36 | 195. | 12.8 | 1.60E+01 |
| 2729.65 | 1364.37 | 66. | 28.2 | 8.24E+00 |

BEST AVAILABLE COPY

```
*****************************************************************
*                                                               *
*                  G A M M A   S P E C T R U M   A N A L Y S I S *
*                                                               *
*****************************************************************

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM                                   04-JAN-92  04:05:18

                    A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:    1      /      ADC UNIT NUMBER: 2.0
DETECTOR NUMBER:    2      /      GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:         69549

SAMPLE DESCRIPTION: R940-5630
GEOMETRY DESCRIPTION:  22ML LIQ
SAMPLE SIZE:   2.2000E-02 L1        / CONVERSION FACTOR: 1.0000E+00
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON  4-JAN-92 AT 03:15:36

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3000. SECONDS
        DEAD TIME:     00.00 %

 DECAYED TO       0. DAYS,  0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 17-MAR-89
EFFICIENCY CALIBRATION PERFORMED 13-MAY-91
```

BEST AVAILABLE COPY

4-11-92

222-S COUNTING ROOM R940-5630 04-JAN-92 04:00:00

P E A K  A N A L Y S I S

| PK | CENTROID CHANNEL | ENERGY KEV | FWHM KEV | BACKGND COUNTS | NET AREA COUNTS | ERROR % | NUCLIDES |
|---|---|---|---|---|---|---|---|
| 1 | 1323.20 | 661.21 | 1.83 | 32. | 95. | 27.3 | CS-137 |
| 1B | | 661.85 | | | 66. | 13.9 | |
| 2 | 2921.66 | 1460.37 | 1.96 | 8. | 147. | 17.4 | K-40 |
| 2B | | 1460.85 | | | 136. | 3.8 | |

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0012
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 30-AUG-88 AT 16:46:00
BACKGROUND LIVE TIME: 60000. SECONDS

BEST AVAILABLE COPY

BEST AVAILABLE COPY

222-S COUNTING ROOM 04-JAN-92 04:05:48

SAMPLE: R940-5630
DATA COLLECTED ON 4-JAN-92 AT 03:15:36
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

| NUCLIDE | ACTIVITY CONCENTRATION IN uCI/LI MEASURED | ERROR | DECAY CORRECTED | ERROR | ENERGY COMPARISON (KEV) EXPECT | DIFF |
|---|---|---|---|---|---|---|
| AC-228 | LLD<6.05E-03 | | LLD<6.05E-03 | | 911.07 | |
| AC-228A | LLD<4.61E-03 | | LLD<4.61E-03 | | 911.10 | |
| AC-228B | LLD<1.00E-02 | | LLD<1.00E-02 | | 338.40 | |
| AG-108M | LLD<1.69E-03 | | LLD<1.69E-03 | | 433.94 | |
| AG-110M | LLD<3.62E-03 | | LLD<3.62E-03 | | 657.76 | |
| AM-241 | LLD<1.19E-02 | | LLD<1.19E-02 | | 59.54 | |
| AM-243 | LLD<3.30E-03 | | LLD<3.30E-03 | | 74.67 | |
| AM-243A | LLD<3.30E-03 | | LLD<3.30E-03 | | 74.67 | |
| AM-243B | LLD<3.26E-01 | | LLD<3.26E-01 | | 43.10 | |
| AR-41 | LLD<3.03E-03 | | LLD<3.03E-03 | | 1293.64 | |
| AU-198 | LLD<1.33E-03 | | LLD<1.33E-03 | | 411.80 | |
| BA-133 | LLD<2.22E-03 | | LLD<2.22E-03 | | 356.02 | |
| BA-139 | LLD<5.88E-03 | | LLD<5.88E-03 | | 165.85 | |
| BA-140 | LLD<6.09E-03 | | LLD<6.09E-03 | | 537.27 | |
| BA-141 | LLD<5.33E-03 | | LLD<5.33E-03 | | 190.23 | |
| BE-7 | LLD<1.42E-02 | | LLD<1.42E-02 | | 477.59 | |
| BI-207 | LLD<1.81E-03 | | LLD<1.81E-03 | | 569.70 | |
| BI-212 | LLD<1.33E-02 | | LLD<1.33E-02 | | 727.27 | |
| BI-214 | LLD<4.17E-03 | | LLD<4.17E-03 | | 609.32 | |
| BI-214A | LLD<4.17E-03 | | LLD<4.17E-03 | | 609.32 | |
| BI-214B | LLD<1.26E-02 | | LLD<1.26E-02 | | 1120.28 | |
| BI-214C | LLD<1.29E-02 | | LLD<1.29E-02 | | 1764.51 | |
| CD-109 | LLD<4.15E-02 | | LLD<4.15E-02 | | 88.03 | |
| CE-139 | LLD<1.33E-03 | | LLD<1.33E-03 | | 165.85 | |
| CE-141 | LLD<2.27E-03 | | LLD<2.27E-03 | | 145.44 | |
| CEPR144 | LLD<1.79E-02 | | LLD<1.79E-02 | | 133.51 | |
| CO-56 | LLD<1.81E-03 | | LLD<1.81E-03 | | 846.76 | |
| CO-57 | LLD<1.15E-03 | | LLD<1.15E-03 | | 122.06 | |
| CO-58 | LLD<1.95E-03 | | LLD<1.95E-03 | | 810.75 | |
| CO-60 | LLD<2.14E-03 | | LLD<2.14E-03 | | 1332.50 | |
| CR-51 | LLD<1.21E-02 | | LLD<1.21E-02 | | 320.09 | |
| CS-134 | LLD<2.00E-03 | | LLD<2.00E-03 | | 795.84 | |
| CS-136 | LLD<1.98E-03 | | LLD<1.98E-03 | | 818.51 | |
| CS-137 | 5.83E-03 | +-2.62E-03 | 5.83E-03 | +-2.62E-03 | 661.65 | -0.14 |
| CS-138 | LLD<6.27E-03 | | LLD<6.27E-03 | | 1435.86 | |
| EU-152 | LLD<1.32E-02 | | LLD<1.32E-02 | | 1408.01 | |
| EU-154 | LLD<7.77E-03 | | LLD<7.77E-03 | | 1274.45 | |
| EU-155 | LLD<5.01E-03✓ | | LLD<5.01E-03 | | 105.31 | |
| FE-59 | LLD<3.67E-03 | | LLD<3.67E-03 | | 1099.25 | |
| HF-181 | LLD<1.69E-03 | | LLD<1.69E-03 | | 482.20 | |
| HG-203 | LLD<1.41E-03 | | LLD<1.41E-03 | | 279.20 | |
| I-131 | LLD<1.46E-03 | | LLD<1.46E-03 | | 364.48 | |
| I-132 | LLD<2.20E-03 | | LLD<2.20E-03 | | 667.69 | |
| I-133 | LLD<1.64E-03 | | LLD<1.64E-03 | | 529.69 | |
| I-134 | LLD<2.74E-03 | | LLD<2.74E-03 | | 847.03 | |
| I-135 | LLD<7.89E-03 | | LLD<7.89E-03 | | 1260.41 | |
| K-40 | LLD<1.92E-02 | | LLD<1.92E-02 | | 1460.75 | |
| KR-85 | LLD<5.43E-01 | | LLD<5.43E-01 | | 513.99 | |
| KR-85M | LLD<1.44E-03 | | LLD<1.44E-03 | | 151.17 | |
| KR-87 | LLD<3.75E-03 | | LLD<3.75E-03 | | 402.58 | |
| KR-89 | LLD<6.48E-02 | | LLD<6.48E-02 | | 220.90 | |

120

9 3 1 2 3 3 3 0 3 2

BEST AVAILABLE COPY

| | | | | |
|---|---|---|---|---|
| LA-142 | LLD<4.07E-03 | LLD<4.07E-03 | | 641.83 |
| MN-54 | LLD<2.05E-03 | LLD<2.05E-03 | | 834.85 |
| MN-56 | LLD<2.04E-03 | LLD<2.04E-03 | | 846.76 |
| NA-22 | LLD<2.76E-03 | LLD<2.76E-03 | R-940-5630 | 1274.55 |
| NA-24 | LLD<1.91E-03 | LLD<1.91E-03 | | 1368.60 |
| NB-94 | LLD<1.87E-03 | LLD<1.87E-03 | 6-11-92 | 702.63 |
| NB-95 | LLD<1.80E-03 | LLD<1.80E-03 | | 765.78 |
| NB-97 | LLD<4.08E-03 | LLD<4.08E-03 | | 657.92 |
| NP-237 | LLD<1.22E-02 | LLD<1.22E-02 | | 86.50 |
| NP-238 | LLD<8.05E-03 | LLD<8.05E-03 | | 984.45 |
| NP-239 | LLD<8.21E-03 | LLD<8.21E-03 | | 277.60 |
| PA-233 | LLD<3.40E-03 | LLD<3.40E-03 | | 311.96 |
| PA-234M | LLD<4.06E-01 | LLD<4.06E-01 | | 1001.03 |
| PB-210 | LLD<2.98E-01 | LLD<2.98E-01 | | 46.50 |
| PB-212 | LLD<2.40E-03 | LLD<2.40E-03 | | 239.00 |
| PB-212A | LLD<2.39E-03 | LLD<2.39E-03 | | 239.00 |
| PB-212B | LLD<4.14E-02 | LLD<4.14E-02 | | 300.10 |
| PB-214 | LLD<3.37E-03 | LLD<3.37E-03 | | 351.92 |
| PB-214A | LLD<3.37E-03 | LLD<3.37E-03 | | 351.92 |
| PB-214B | LLD<6.48E-03 | LLD<6.48E-03 | | 295.21 |
| PO-210 | LLD<1.45E+02 | LLD<1.45E+02 | | 604.00 |
| PO-214 | LLD<1.85E+01 | LLD<1.85E+01 | | 799.70 |
| PO-216 | LLD<9.03E+01 | LLD<9.03E+01 | | 804.90 |
| PU-239 | LLD<1.56E+01 | LLD<1.56E+01 | | 129.30 |
| PU-241 | LLD<5.26E+02 | LLD<5.26E+02 | | 148.57 |
| RA-224 | LLD<2.83E-02 | LLD<2.83E-02 | | 240.99 |
| RA-226 | LLD<2.75E-02 | LLD<2.75E-02 | | 186.10 |
| RB-88 | LLD<1.40E-02 | LLD<1.40E-02 | | 1836.00 |
| RB-89 | LLD<9.79E-03 | LLD<9.79E-03 | | 1031.88 |
| RN-220 | LLD<1.47E+00 | LLD<1.47E+00 | | 549.73 |
| RU-103 | LLD<1.61E-03 | LLD<1.61E-03 | | 497.08 |
| RURH106 | LLD<3.78E-02 | LLD<3.78E-02 | | 621.80 |
| SB-124 | LLD<1.92E-03 | LLD<1.92E-03 | | 602.72 |
| SB-125 | LLD<1.64E-02 | LLD<1.64E-02 | | 176.33 |
| SC-46 | LLD<1.90E-03 | LLD<1.90E-03 | | 1120.45 |
| SE-75 | LLD<2.01E-03 | LLD<2.01E-03 | | 264.66 |
| SN-113 | LLD<2.01E-03 | LLD<2.01E-03 | | 391.67 |
| SR-85 | LLD<2.38E-03 | LLD<2.38E-03 | | 513.99 |
| SR-91 | LLD<3.22E-03 | LLD<3.22E-03 | | 553.60 |
| SR-92 | LLD<3.20E-03 | LLD<3.20E-03 | | 1383.94 |
| TA-182 | LLD<5.11E-03 | LLD<5.11E-03 | | 1121.30 |
| TC-99M | LLD<1.14E-03 | LLD<1.14E-03 | | 140.51 |
| TE-123M | LLD<1.22E-03 | LLD<1.22E-03 | | 159.00 |
| TE-125M | LLD<3.71E-01 | LLD<3.71E-01 | | 109.27 |
| TE-132 | LLD<1.24E-03 | LLD<1.24E-03 | | 228.16 |
| TH-228 | LLD<1.38E-01 | LLD<1.38E-01 | | 84.37 |
| TH-234 | LLD<2.29E-02 | LLD<2.29E-02 | | 92.50 |
| TH-234A | LLD<2.29E-02 | LLD<2.29E-02 | | 92.50 |
| TH-234B | LLD<8.89E-02 | LLD<8.89E-02 | | 83.30 |
| TL-208 | LLD<2.20E-03 | LLD<2.20E-03 | | 583.14 |
| U-235 | LLD<1.93E-03 | LLD<1.93E-03 | | 185.71 |
| U-235A | LLD<1.93E-03 | LLD<1.93E-03 | | 185.71 |
| U-235B | LLD<1.05E-02 | LLD<1.05E-02 | | 143.76 |
| U-237 | LLD<5.10E-03 | LLD<5.10E-03 | | 208.00 |
| W-187 | LLD<6.41E-03 | LLD<6.41E-03 | | 685.74 |
| XE-131M | LLD<5.68E-02 | LLD<5.68E-02 | | 163.98 |
| XE-133 | LLD<4.29E-03 | LLD<4.29E-03 | | 81.00 |
| XE-133M | LLD<1.13E-02 | LLD<1.13E-02 | | 233.21 |
| XE-135 | LLD<1.21E-03 | LLD<1.21E-03 | | 249.79 |
| XE-138 | LLD<9.54E-03 | LLD<9.54E-03 | | 258.41 |
| Y-88 | LLD<1.33E-03 | LLD<1.33E-03 | | 1836.00 |
| Y-91 | LLD<8.95E-01 | LLD<8.95E-01 | | 1204.90 |
| Y-91M | LLD<2.43E-03 | LLD<2.43E-03 | | 555.60 |
| ZN-65 | LLD<6.72E-03 | LLD<6.72E-03 | | 1115.55 |
| ZR-95 | LLD<2.91E-03 | LLD<2.91E-03 | | 756.73 |

R940-5630
JC 4-11-92

| | | |
|---|---|---|
| TOTAL | 5.83E-03 +-2.62E-03 | 5.83E-03 +-2.62E-03 |

ERAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.16E-08 UC/LI
TAL MEASURED ACTIVITY = 5.83E-03 (+-2.62E-03) UC/LI
TCH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

9 3 1 2 3 3 3 0 5 4

BEST AVAILABLE COPY

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                           *
*              G A M M A   S P E C T R U M   A N A L Y S I S                *
*                                                                           *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM                                    04-JAN-92  11:13:19


                A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:    1      /      ADC UNIT NUMBER: 2.0
DETECTOR NUMBER:     2     /      GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER ONLY
ANALYZED BY:         62820

  MPLE DESCRIPTION: R943-5730
 OMETRY DESCRIPTION:  22ML LIQ
SAMPLE SIZE:   1.0000E-03 LI        / CONVERSION FACTOR: 4.9500E-03
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON  4-JAN-92 AT 10:23:07

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3002. SECONDS
        DEAD TIME:      0.07 %

 DECAYED TO       0. DAYS,  0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 17-MAR-89
EFFICIENCY CALIBRATION PERFORMED 16-MAY-91
```

BEST AVAILABLE COPY

# P E A K  A N A L Y S I S

| PK | CENTROID CHANNEL | ENERGY KEV | FWHM KEV | BACKGND COUNTS | NET AREA COUNTS | ERROR % | NUCLIDES |
|---|---|---|---|---|---|---|---|
| 1 | 1323.15 | 661.19 | 1.66 | 122. | 14912. | 1.6 | CS-137 |
| 1B | | 661.85 | | | 36. | 13.9 | |
| 2 | 2921.79 | 1460.43 | 2.69 | 12. | 167. | 16.7 | K-40 |
| 2B | | 1460.85 | | | 156. | 3.8 | |

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0012
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 30-AUG-88 AT 16:46:00
BACKGROUND LIVE TIME: 60000. SECONDS

9 3 1 2 3 3 0 1 6

BEST AVAILABLE COPY

SAMPLE: R943-5730
DATA COLLECTED ON 4-JAN-92 AT 10:23:07
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

| NUCLIDE | ACTIVITY CONCENTRATION IN uCi/LI MEASURED | ERROR | DECAY CORRECTED | ERROR | ENERGY COMPARISON (KEV) EXPECT | DIFF |
|---|---|---|---|---|---|---|
| AC-228 | LLD<3.81E+01 | | LLD<3.81E+01 | | 911.07 | |
| AC-228A | LLD<3.81E+01 | | LLD<3.81E+01 | | 911.10 | |
| AC-228B | LLD<1.08E+02 | | LLD<1.08E+02 | | 338.40 | |
| AG-108M | LLD<2.39E+01 | | LLD<2.39E+01 | | 433.94 | |
| AG-110M | LLD<1.82E+02 | | LLD<1.82E+02 | | 657.76 | |
| AM-241 | LLD<1.07E+02 | | LLD<1.07E+02 | | 59.54 | |
| AM-243 | LLD<2.91E+01 | | LLD<2.91E+01 | | 74.67 | |
| AM-243A | LLD<2.91E+01 | | LLD<2.91E+01 | | 74.67 | |
| AM-243B | LLD<3.20E+03 | | LLD<3.20E+03 | | 43.10 | |
| AR-41 | LLD<1.40E+01 | | LLD<1.40E+01 | | 1293.64 | |
| AU-198 | LLD<1.98E+01 | | LLD<1.98E+01 | | 411.80 | |
| BA-133 | LLD<2.50E+01 | | LLD<2.50E+01 | | 356.02 | |
| BA-139 | LLD<5.89E+01 | | LLD<5.89E+01 | | 163.83 | |
| BA-140 | LLD<6.53E+01 | | LLD<6.53E+01 | | 537.27 | |
| BA-141 | LLD<5.40E+01 | | LLD<5.40E+01 | | 190.23 | |
| BE-7 | LLD<2.04E+02 | | LLD<2.04E+02 | | 477.59 | |
| BI-207 | LLD<1.40E+01 | | LLD<1.40E+01 | | 569.70 | |
| BI-212 | LLD<6.65E+01 | | LLD<6.65E+01 | | 727.27 | |
| BI-214 | LLD<3.66E+01 | | LLD<3.66E+01 | | 609.32 | |
| BI-214A | LLD<3.66E+01 | | LLD<3.66E+01 | | 609.32 | |
| BI-214B | LLD<8.06E+01 | | LLD<8.06E+01 | | 1120.28 | |
| BI-214C | LLD<6.58E+01 | | LLD<6.58E+01 | | 1764.51 | |
| CD-109 | LLD<3.54E+02 | | LLD<3.54E+02 | | 88.03 | |
| CE-139 | LLD<1.33E+01 | | LLD<1.33E+01 | | 165.85 | |
| CE-141 | LLD<1.97E+01 | | LLD<1.97E+01 | | 145.44 | |
| CEPR144 | LLD<1.60E+02 | | LLD<1.60E+02 | | 133.51 | |
| CO-56 | LLD<9.18E+00 | | LLD<9.18E+00 | | 846.76 | |
| CO-57 | LLD<1.01E+01 | | LLD<1.01E+01 | | 122.06 | |
| CO-58 | LLD<9.50E+00 | | LLD<9.50E+00 | | 810.75 | |
| CO-60 | LLD<8.19E+00 | | LLD<8.19E+00 | | 1332.50 | |
| CR-51 | LLD<1.40E+02 | | LLD<1.40E+02 | | 320.09 | |
| CS-134 | LLD<9.17E+00 | | LLD<9.17E+00 | | 795.84 | |
| CS-136 | LLD<9.94E+00 | | LLD<9.94E+00 | | 818.51 | |
| CS-137 | 6.59E+03 | +-1.72E+02 | 6.59E+03 | +-1.72E+02 | 661.65 | -0.46 |
| CS-138 | LLD<2.26E+01 | | LLD<2.26E+01 | | 1435.86 | |
| EU-152 | LLD<5.30E+01 | | LLD<5.30E+01 | | 1408.01 | |
| EU-154 | LLD<2.75E+01 | | LLD<2.75E+01 | | 1274.43 | |
| EU-155 | LLD<4.74E+01 | | LLD<4.74E+01 | | 105.31 | |
| FE-59 | LLD<1.63E+01 | | LLD<1.63E+01 | | 1099.25 | |
| HF-181 | LLD<2.38E+01 | | LLD<2.38E+01 | | 482.20 | |
| HG-203 | LLD<1.48E+01 | | LLD<1.48E+01 | | 279.20 | |
| I-131 | LLD<2.00E+01 | | LLD<2.00E+01 | | 364.48 | |
| I-132 | LLD<4.26E+01 | | LLD<4.26E+01 | | 667.69 | |
| I-133 | LLD<1.84E+01 | | LLD<1.84E+01 | | 529.69 | |
| I-134 | LLD<1.43E+01 | | LLD<1.43E+01 | | 847.03 | |
| I-135 | LLD<4.23E+01 | | LLD<4.23E+01 | | 1260.41 | |
| K-40 | LLD<2.03E+02 | | LLD<2.03E+02 | | 1460.75 | |
| KR-85 | LLD<4.63E+03 | | LLD<4.63E+03 | | 513.99 | |
| KR-85M | LLD<1.28E+01 | | LLD<1.28E+01 | | 151.17 | |
| KR-87 | LLD<4.52E+01 | | LLD<4.52E+01 | | 402.58 | |
| KR-88 | LLD<6.30E+02 | | LLD<6.30E+02 | | 220.00 | |

9312137

BEST AVAILABLE COPY

R943-5730
JK 6-11-92

| | | | |
|---|---|---|---|
| MN-54 | LLD<9.07E+00 | LLD<9.07E+00 | [illegible] |
| MN-56 | LLD<1.04E+01 | LLD<1.04E+01 | 818.76 |
| NA-22 | LLD<9.78E+00 | LLD<9.78E+00 | 1294.33 |
| NA-24 | LLD<1.11E+01 | LLD<1.11E+01 | 1368.60 |
| NB-94 | LLD<7.15E+00 | LLD<7.15E+00 | 702.63 |
| NB-95 | LLD<7.59E+00 | LLD<7.59E+00 | 765.73 |
| NB-97 | LLD<2.06E+02 | LLD<2.06E+02 | 607.92 |
| NP-237 | LLD<1.09E+02 | LLD<1.09E+02 | 86.50 |
| NP-238 | LLD<3.47E+01 | LLD<3.47E+01 | 984.45 |
| NP-239 | LLD<9.33E+01 | LLD<9.33E+01 | 277.60 |
| PA-233 | LLD<3.45E+01 | LLD<3.45E+01 | 311.98 |
| PA-234M | LLD<1.16E+03 | LLD<1.16E+03 | 1001.03 |
| PB-210 | LLD<2.84E+03 | LLD<2.84E+03 | 46.50 |
| PB-212 | LLD<2.81E+01 | LLD<2.81E+01 | 239.00 |
| PB-212A | LLD<2.80E+01 | LLD<2.80E+01 | 239.00 |
| PB-212B | LLD<4.25E+02 | LLD<4.25E+02 | 300.10 |
| PB-214 | LLD<3.79E+01 | LLD<3.79E+01 | 351.92 |
| PB-214A | LLD<3.79E+01 | LLD<3.79E+01 | 351.92 |
| PB-214B | LLD<7.18E+01 | LLD<7.18E+01 | 295.21 |
| PO-210 | LLD<7.65E+05 | LLD<7.65E+05 | 804.00 |
| PO-214 | LLD<8.20E+04 | LLD<8.20E+04 | 799.70 |
| PO-216 | LLD<4.91E+05 | LLD<4.91E+05 | 804.90 |
| PU-239 | LLD<1.47E+05 | LLD<1.47E+05 | 129.30 |
| PU-241 | LLD<4.77E+06 | LLD<4.77E+06 | 148.57 |
| RA-224 | LLD<3.00E+02 | LLD<3.00E+02 | 240.99 |
| RA-226 | LLD<2.93E+02 | LLD<2.93E+02 | 186.10 |
| RB-88 | LLD<8.35E+01 | LLD<8.35E+01 | 1836.00 |
| RB-89 | LLD<4.35E+01 | LLD<4.35E+01 | 1031.88 |
| RN-220 | LLD<1.39E+04 | LLD<1.39E+04 | 549.73 |
| RU-103 | LLD<2.02E+01 | LLD<2.02E+01 | 497.08 |
| RURH106 | LLD<3.01E+02 | LLD<3.01E+02 | 621.80 |
| -124 | LLD<1.64E+01 | LLD<1.64E+01 | 602.72 |
| SB-125 | LLD<1.54E+02 | LLD<1.54E+02 | 176.33 |
| SC-46 | LLD<1.21E+01 | LLD<1.21E+01 | 1120.45 |
| SE-75 | LLD<2.22E+01 | LLD<2.22E+01 | 264.66 |
| SN-113 | LLD<2.69E+01 | LLD<2.69E+01 | 391.67 |
| SR-85 | LLD<2.03E+01 | LLD<2.03E+01 | 513.99 |
| SR-91 | LLD<2.66E+01 | LLD<2.66E+01 | 555.60 |
| SR-92 | LLD<1.18E+01 | LLD<1.18E+01 | 1383.94 |
| TA-182 | LLD<2.85E+01 | LLD<2.85E+01 | 1121.30 |
| TC-99M | LLD<1.02E+01 | LLD<1.02E+01 | 140.51 |
| TE-123M | LLD<1.20E+01 | LLD<1.20E+01 | 159.00 |
| TE-125M | LLD<3.45E+03 | LLD<3.45E+03 | 109.27 |
| TE-132 | LLD<1.36E+01 | LLD<1.36E+01 | 228.16 |
| TH-228 | LLD<1.17E+03 | LLD<1.17E+03 | 84.37 |
| TH-234 | LLD<2.16E+02 | LLD<2.16E+02 | 92.50 |
| TH-234A | LLD<2.16E+02 | LLD<2.16E+02 | 92.50 |
| TH-234B | LLD<7.93E+02 | LLD<7.93E+02 | 63.30 |
| TL-208 | LLD<1.88E+01 | LLD<1.88E+01 | 383.14 |
| U-235 | LLD<2.07E+01 | LLD<2.07E+01 | 185.71 |
| U-235A | LLD<2.07E+01 | LLD<2.07E+01 | 185.71 |
| U-235B | LLD<9.16E+01 | LLD<9.16E+01 | 143.76 |
| U-237 | LLD<5.46E+01 | LLD<5.46E+01 | 208.00 |
| W-187 | LLD<2.98E+01 | LLD<2.98E+01 | 683.74 |
| XE-131M | LLD<5.41E+02 | LLD<5.41E+02 | 163.98 |
| XE-133 | LLD<3.98E+01 | LLD<3.98E+01 | 81.00 |
| -133M | LLD<1.17E+02 | LLD<1.17E+02 | 233.21 |
| -135 | LLD<1.32E+01 | LLD<1.32E+01 | 249.79 |
| XE-138 | LLD<1.02E+02 | LLD<1.02E+02 | 258.41 |
| Y-88 | LLD<7.93E+00 | LLD<7.93E+00 | 1836.06 |
| Y-91 | LLD<3.72E+03 | LLD<3.72E+03 | 1204.90 |
| Y-91M | LLD<2.01E+01 | LLD<2.01E+01 | 555.60 |
| ZN-65 | LLD<2.48E+01 | LLD<2.48E+01 | 1115.55 |
| ZR-95 | LLD<1.45E+01 | LLD<1.45E+01 | 706.73 |

BEST AVAILABLE COPY

TOTAL 6.59E+03 +-1.72E+02 6.59E+03 +-1.72E+02

EBAR = ***** MEV/DISINTEGRATION

R941-5730
6-11-92

MAXIMUM PERMISSABLE ACTIVITY = 1.16E-08 UC/LI
TOTAL MEASURED ACTIVITY = 6.59E+03 (+-1.72E+02) UC/LI
% TECH. SPEC. = ***** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 95.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

| CENTROID CHANNEL | ENERGY KEV | NET AREA COUNTS | ERROR % | GAMMAS/SEC |
|---|---|---|---|---|
| 2921.79 | 1460.43 | 167. | 16.7 | 2.19E+01 |

9 3 1 2 3 1 3 3 0 9

BEST AVAILABLE COPY

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                           *
*              G A M M A   S P E C T R U M   A N A L Y S I S                *
*                                                                           *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM                                    04-JAN-92  14:42:05


                    A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:    1      /      ADC UNIT NUMBER: 2.0
DETECTOR NUMBER:     2     /      GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AND:
ANALYZED BY:         62820

SAMPLE DESCRIPTION: R946-5530
GEOMETRY DESCRIPTION:  22ML LIQ
SAMPLE SIZE:   1.0000E-03 LI        / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON  4-JAN-92 AT 13:51:52

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3006. SECONDS
        DEAD TIME:      0.10 %

 DECAYED TO       0. DAYS,  0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 17-MAR-89
EFFICIENCY CALIBRATION PERFORMED 16-MAY-91
```

9 3 1 2 3 3 5 0 6 0

BEST AVAILABLE COPY

BEST AVAILABLE COPY

222-S COUNTING ROOM 04-JAN-92 14:11:05

SAMPLE: R946-5530
DATA COLLECTED ON 4-JAN-92 AT 13:51:52
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

| NUCLIDE | ACTIVITY CONCENTRATION IN uCi/LI MEASURED | ERROR | DECAY CORRECTED | ERROR | ENERGY COMPARISON (KEV) EXPECT | DIFF |
|---|---|---|---|---|---|---|
| AC-228 | LLD<4.46E+00 | | LLD<4.46E+00 | | 911.07 | |
| AC-228A | LLD<4.46E+00 | | LLD<4.46E+00 | | 911.10 | |
| AC-228B | LLD<5.55E+00 | | LLD<5.55E+00 | | 338.40 | |
| AG-108M | LLD<1.03E+00 | | LLD<1.03E+00 | | 433.94 | |
| AG-110M | LLD<4.55E+00 | | LLD<4.55E+00 | | 657.76 | |
| AM-241 | LLD<5.28E+00 | | LLD<5.28E+00 | | 59.54 | |
| AM-243 | LLD<1.37E+00 | | LLD<1.37E+00 | | 74.67 | |
| AM-243A | LLD<1.37E+00 | | LLD<1.37E+00 | | 74.67 | |
| AM-243B | LLD<1.43E+02 | | LLD<1.43E+02 | | 43.10 | |
| AR-41 | LLD<8.42E-01 | | LLD<8.42E-01 | | 1293.64 | |
| AU-198 | LLD<8.71E-01 | | LLD<8.71E-01 | | 411.80 | |
| BA-133 | LLD<1.21E+00 | | LLD<1.21E+00 | | 356.02 | |
| BA-139 | LLD<2.78E+00 | | LLD<2.78E+00 | | 165.85 | |
| BA-140 | LLD<3.59E+00 | | LLD<3.59E+00 | | 537.27 | |
| BA-141 | LLD<2.49E+00 | | LLD<2.49E+00 | | 190.23 | |
| BE-7 | LLD<8.65E+00 | | LLD<8.65E+00 | | 477.59 | |
| BI-207 | LLD<9.24E-01 | | LLD<9.24E-01 | | 569.70 | |
| BI-212 | LLD<8.12E+00 | | LLD<8.12E+00 | | 727.27 | |
| BI-214 | LLD<6.04E+00 | | LLD<6.04E+00 | | 609.32 | |
| BI-214A | LLD<6.04E+00 | | LLD<6.04E+00 | | 609.32 | |
| BI-214B | LLD<9.18E+00 | | LLD<9.18E+00 | | 1120.28 | |
| BI-214C | LLD<4.47E+00 | | LLD<4.47E+00 | | 1764.51 | |
| CD-109 | LLD<1.75E+01 | | LLD<1.75E+01 | | 88.03 | |
| CE-139 | LLD<6.30E-01 | | LLD<6.30E-01 | | 165.85 | |
| CE-141 | LLD<9.76E-01 | | LLD<9.76E-01 | | 145.44 | |
| CEPR144 | LLD<7.66E+00 | | LLD<7.66E+00 | | 133.51 | |
| CO-56 | LLD<9.60E-01 | | LLD<9.60E-01 | | 846.76 | |
| CO-57 | LLD<5.05E-01 | | LLD<5.05E-01 | | 122.06 | |
| CO-58 | LLD<9.53E-01 | | LLD<9.53E-01 | | 810.75 | |
| CO-60 | 5.98E+01 | +-3.04E+00 | 5.98E+01 | +-3.04E+00 | 1332.50 | -0.66 |
| | | | | | 1173.24 | -0.65 |
| CR-51 | LLD<6.89E+00 | | LLD<6.89E+00 | | 320.07 | |
| CS-134 | 5.91E+01 | +-3.19E+00 | 5.91E+01 | +-3.19E+00 | 795.84 | -0.56 |
| | | | | | 604.70 | -0.42 |
| CS-136 | LLD<1.08E+00 | | LLD<1.08E+00 | | 818.51 | |
| CS-137 | 7.89E+01 | +-3.21E+00 | 7.89E+01 | +-3.21E+00 | 661.65 | 0.50 |
| CS-138 | LLD<7.61E-01 | | LLD<7.61E-01 | | 1435.86 | |
| EU-152 | LLD<3.29E+00 | | LLD<3.29E+00 | | 1408.01 | |
| EU-154 | LLD<1.89E+00 | | LLD<1.89E+00 | | 1274.45 | |
| EU-155 | LLD<2.45E+00 | | LLD<2.45E+00 | | 105.31 | |
| FE-59 | LLD<2.38E+00 | | LLD<2.38E+00 | | 1099.25 | |
| HF-181 | LLD<1.11E+00 | | LLD<1.11E+00 | | 482.20 | |
| HG-203 | LLD<7.43E-01 | | LLD<7.43E-01 | | 279.20 | |
| I-131 | LLD<9.41E-01 | | LLD<9.41E-01 | | 364.48 | |
| I-132 | LLD<1.40E+00 | | LLD<1.40E+00 | | 667.69 | |
| I-133 | LLD<9.80E-01 | | LLD<9.80E-01 | | 529.69 | |
| I-134 | LLD<1.48E+00 | | LLD<1.48E+00 | | 847.03 | |
| I-135 | LLD<2.40E+00 | | LLD<2.40E+00 | | 1260.41 | |
| K-40 | LLD<1.09E+01 | | LLD<1.09E+01 | | 1460.75 | |
| KR-85 | LLD<2.16E+02 | | LLD<2.16E+02 | | 513.99 | |
| KR-85M | LLD<6.10E-01 | | LLD<6.10E-01 | | 151.17 | |

| | | | |
|---|---|---|---|
| KR-89 | LLD<3.01E+01 | LLD<3.01E+01 | 320.90 |
| LA-140 | LLD<4.79E-01 | LLD<4.79E-01 | 1596.20 |
| LA-142 | LLD<2.13E+00 | LLD<2.13E+00 | 641.53 |
| MN-54 | LLD<9.88E-01 | LLD<9.88E-01 | 834.83 |
| MN-56 | LLD<1.08E+00 | LLD<1.08E+00 | 846.76 |
| NA-22 | LLD<6.70E-01 | LLD<6.70E-01 | 1274.55 |
| NA-24 | LLD<9.55E-01 | LLD<9.55E-01 | 1368.60 |
| NB-94 | LLD<9.41E-01 | LLD<9.41E-01 | 702.63 |
| NB-95 | LLD<9.25E-01 | LLD<9.25E-01 | 765.76 |
| NB-97 | LLD<5.15E+00 | LLD<5.15E+00 | 637.92 |
| NP-237 | LLD<4.97E+00 | LLD<4.97E+00 | 86.50 |
| NP-238 | LLD<4.60E+00 | LLD<4.60E+00 | 984.45 |
| NP-239 | LLD<4.48E+00 | LLD<4.48E+00 | 277.60 |
| PA-233 | LLD<1.72E+00 | LLD<1.72E+00 | 311.98 |
| PA-234M | LLD<1.96E+02 | LLD<1.96E+02 | 1001.05 |
| PB-210 | LLD<1.40E+02 | LLD<1.40E+02 | 46.50 |
| PB-212 | LLD<1.36E+00 | LLD<1.36E+00 | 239.00 |
| PB-212A | LLD<1.35E+00 | LLD<1.35E+00 | 239.00 |
| PB-212B | LLD<1.98E+01 | LLD<1.98E+01 | 300.10 |
| PB-214 | LLD<1.86E+00 | LLD<1.86E+00 | 351.92 |
| PB-214A | LLD<1.86E+00 | LLD<1.86E+00 | 351.92 |
| PB-214B | LLD<3.51E+00 | LLD<3.51E+00 | 295.21 |
| PO-210 | LLD<9.15E+04 | LLD<9.15E+04 | 804.00 |
| PO-214 | LLD<3.90E+04 | LLD<3.90E+04 | 799.70 |
| PO-216 | LLD<7.71E+04 | LLD<7.71E+04 | 804.90 |
| PU-239 | LLD<7.26E+03 | LLD<7.26E+03 | 129.30 |
| PU-241 | LLD<2.27E+05 | LLD<2.27E+05 | 148.57 |
| RA-224 | LLD<1.44E+01 | LLD<1.44E+01 | 240.99 |
| RA-226 | LLD<1.35E+01 | LLD<1.35E+01 | 186.10 |
| RB-88 | LLD<4.14E+00 | LLD<4.14E+00 | 1836.00 |
| RB-89 | LLD<5.54E+00 | LLD<5.54E+00 | 1031.88 |
| RN-220 | LLD<8.71E+02 | LLD<8.71E+02 | 549.73 |
| RU-103 | LLD<8.87E-01 | LLD<8.87E-01 | 497.08 |
| RURH106 | LLD<1.84E+01 | LLD<1.84E+01 | 621.80 |
| SB-124 | LLD<1.31E+00 | LLD<1.31E+00 | 602.72 |
| SB-125 | LLD<7.26E+00 | LLD<7.26E+00 | 176.33 |
| SC-46 | LLD<1.38E+00 | LLD<1.38E+00 | 1120.45 |
| SE-75 | LLD<1.06E+00 | LLD<1.06E+00 | 264.66 |
| SN-113 | LLD<1.26E+00 | LLD<1.26E+00 | 391.67 |
| SR-85 | LLD<9.50E-01 | LLD<9.50E-01 | 513.99 |
| SR-91 | LLD<1.72E+00 | LLD<1.72E+00 | 555.60 |
| SR-92 | LLD<8.95E-01 | LLD<8.95E-01 | 1383.94 |
| TA-182 | LLD<3.63E+00 | LLD<3.63E+00 | 1121.30 |
| TC-99M | LLD<4.99E-01 | LLD<4.99E-01 | 140.51 |
| TE-123M | LLD<5.81E-01 | LLD<5.81E-01 | 159.00 |
| TE-125M | LLD<1.63E+02 | LLD<1.63E+02 | 109.27 |
| TE-132 | LLD<6.35E-01 | LLD<6.35E-01 | 228.16 |
| TH-228 | LLD<5.96E+01 | LLD<5.96E+01 | 84.37 |
| TH-234 | LLD<9.56E+00 | LLD<9.56E+00 | 92.50 |
| TH-234A | LLD<9.56E+00 | LLD<9.56E+00 | 92.50 |
| TH-234B | LLD<3.74E+01 | LLD<3.74E+01 | 63.30 |
| TL-208 | LLD<1.15E+00 | LLD<1.15E+00 | 583.14 |
| U-235 | LLD<9.59E-01 | LLD<9.59E-01 | 185.71 |
| U-235A | LLD<9.59E-01 | LLD<9.59E-01 | 185.71 |
| U-235B | LLD<4.38E+00 | LLD<4.38E+00 | 143.76 |
| U-237 | LLD<2.44E+00 | LLD<2.44E+00 | 208.00 |
| W-187 | LLD<3.26E+00 | LLD<3.26E+00 | 635.74 |
| XE-131M | LLD<2.72E+01 | LLD<2.72E+01 | 163.98 |
| XE-133 | LLD<2.01E+00 | LLD<2.01E+00 | 81.00 |
| XE-133M | LLD<5.57E+00 | LLD<5.57E+00 | 233.21 |
| XE-135 | LLD<6.46E-01 | LLD<6.46E-01 | 219.79 |
| XE-138 | LLD<5.20E+00 | LLD<5.20E+00 | 258.41 |
| Y-88 | LLD<3.92E-01 | LLD<3.92E-01 | 1836.06 |
| Y-91 | LLD<2.74E+02 | LLD<2.74E+02 | 1204.90 |
| Y-91M | LLD<1.30E+00 | LLD<1.30E+00 | 555.60 |

R 946-5530
6-11-92

9312133052

| | | | |
|---|---|---|---|
| ZR-95 | LLD<1.74E+00 | LLD<1.74E+00 | 756.73 |
| ZR-97 | LLD<9.65E-01 | LLD<9.65E-01 | 743.33 |
| TOTAL | 1.98E+02 +-5.45E+00 | 1.98E+02 +-5.45E+00 | |

STANDARD DEVIATION 0.10

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.31E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.98E+02 (+-5.45E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

R 946-5530
6-11-92

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

| CENTROID CHANNEL | ENERGY KEV | NET AREA COUNTS | ERROR % | GAMMAS/SEC |
|---|---|---|---|---|
| 1126.30 | 562.78 | 229. | 26.3 | 1.33E+01 |
| 1138.50 | 568.88 | 499. | 19.0 | 2.98E+01 |
| 1603.59 | 801.39 | 206. | 12.1 | 1.69E+01 |
| 2918.36 | 1458.72 | 33. | 33.6 | 4.39E+00 |

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

| CENTROID CHANNEL | ENERGY KEV | NET AREA COUNTS | ERROR % | GAMMAS/SEC |
|---|---|---|---|---|
| 2921.78 | 1460.43 | 118. | 19.2 | 1.53E+01 |

BEST AVAILABLE COPY

# ACID DIGESTION ANALYSIS RESULTS

9 3 1 2 3 3 5 0 5 4

# ACID DIGESTION RESULTS

Tank: 103AP
Sample No.: R943
Customer ID: 3AP891-8

| | Check Standard | | Blank | | Sample | | Duplicate Sample | | Spike of Sample | | Check Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab ID: | R939 | | R940 | | R943 | | NA | | NA | | R946 | |
| Acid Digestion (01-07-92) | Complete | | Complete | | Complete | | NA | | NA | | Complete | |
| ICP (01-23-92) | | | | | | | | | | | | |
| Aluminum | 116 | % | 9.97E+1 | ug/L | 1.04E+5 | ug/L | NA | | NA | | 133 | % |
| Barium | 97.75 | % | <1.30E+1 | ug/L | <6.50E+1 | ug/L | NA | | NA | | 102 | % |
| Cadmium | 96.05 | % | <4.00E+0 | ug/L | 8.10E+1 | ug/L | NA | | NA | | 93 | % |
| Chromium | 101.3 | % | <8.00E+0 | ug/L | 3.53E+3 | ug/L | NA | | NA | | 101 | % |
| Iron | 103.5 | % | <8.70E+1 | ug/L | 6.30E+2 | ug/L | NA | | NA | | 103 | % |
| Lead | 102.6 | % | <8.00E+1 | ug/L | <4.00E+2 | ug/L | NA | | NA | | 95.9 | % |
| Magnesium | 102.8 | % | <5.10E+1 | ug/L | <2.55E+2 | ug/L | NA | | NA | | 101 | % |
| Manganese | 97.8 | % | <3.00E+0 | ug/L | <1.50E+1 | ug/L | NA | | NA | | 96.5 | % |
| Silver | 37.2 | % | <8.00E+0 | ug/L | <4.00E+1 | ug/L | NA | | NA | | 113 | % |
| Sodium | 148.8 | % | 1.12E+3 | ug/L | 3.70E+6 | ug/L | NA | | NA | | 180 | % |
| Zinc | 97.75 | % | <4.00E+0 | ug/L | <2.00E+1 | ug/L | NA | | NA | | 96 | % |

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: ACID DIGESTION | Sample Prep: ACID DIGESTION |

| | |
|---|---|
| Instrument: METTLER BAL. SNF04495 | Procedure/Rev: LA-505-158/A-2 |
| Technologist: L. MORRISON | Date: 01-07-92 |
| Starting Time: NA | Temperature: NA |
| Ending Time: NA | Chemist: L. OTTMAR |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-8505 | 11 | | |
| 2 | REAGENT BLANK | R940-8605 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-8705 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-8505 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | ICP1-1B48AA/50 mL | ICP2-2B48AB/50 mL | ICP3-3B48AB/50 mL | N/A |

A-6000-881 (03/92)



9 3 1 2 3 3 0 5 6

# ACID DIGESTION ANALYSIS

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 945.-8505 | 103AP | 12-16-91 | 15:2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| ACD-D1G | LA-505-158 | % RECOVERY | N124W | |

| Sample Size | Customer ID |
|---|---|
| 7 10 mL SA in 50 mL | STD |

Remarks, Calculations, Results
LMCS CHECK SAMPLE
LMCS ID
1848MA
2848MB
3848MB

Complete

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 65731 | 82768 | | | |
| | Laurine J. Ottman | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | 1/8/92 | 1-9-92 |

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 945.-8505 | 103AP | 12-16-91 | 15:2 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| ACD-D1G | LA-505-158 | G/G | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| 7 | RR |

Remarks, Calculations, Results
REAGENT BLANK
VOLUME ON
COMPLETION 50 mL

Complete

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 65731 | 82768 | | | |
| | Laurine J. Ottman | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | 1/8/92 | 1-9-92 |

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 945.-8505 | 103AP | 12-16-91 | 16:10 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| ACD-D1G | LA-505-158 | G/G | N124W | 0 |

| Sample Size | Customer ID |
|---|---|
| 7 10 mL in 50 mL | SAPB91-B |

Remarks, Calculations, Results

Complete

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 65731 | 82768 | | | |
| | Laurine J. Ottman | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | 1/8/92 | 1-9-92 |

54-6600-061 (R-10-83)

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 945.-8505 | 103AP | 12-16-91 | 15:14 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Rerun |
|---|---|---|---|---|
| ACD-D1G | LA-505-158 | % RECOVERY | N124W | |

| Sample Size | Customer ID |
|---|---|
| 7 10 mL SA in 50 mL | STD |

Remarks, Calculations, Results
LMCS CHECK SAMPLE
LMCS ID
1848MA
2848MB
3848MB

Complete

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 65731 | 82768 | | | |
| | Laurine J. Ottman | | | |

| Date | Time Completed | Lab Unit Mgr |
|---|---|---|
| 1-7-92 | 1/8/92 | 1-9-92 |

54-6600-061 (R-10-83)

9 3 1 2 3 3 3 3 5 7

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

# ANALYTICAL BATCH

| | |
|---|---|
| Lab Segment Serial No.: R943 | Customer ID: 3AP891-8 |
| Analysis: INDUCTIVELY COUPLED PLASMA | Sample Prep: ACID DIGESTION |

| | |
|---|---|
| Instrument: WB39939 | Procedure/Rev: LA-505-151/B-0 |
| Technologist: T. FRAZIER | Date: 01-23-92 |
| Starting Time: 11:20 | Temperature: NA |
| Ending Time: 14:26 | Chemist: L. OTTMAR |

| | Description | Lab ID | | Description | Lab ID |
|---|---|---|---|---|---|
| 1 | INITIAL LMCS CHECK STD | R939-8550 | 11 | | |
| 2 | REAGENT BLANK | R940-8650 | 12 | | |
| 3 | SAMPLE 3AP891-8 | R943-8750 | 13 | | |
| 4 | FINAL LMCS CHECK STD | R946-8550 | 14 | | |
| 5 | | | 15 | | |
| 6 | | | 16 | | |
| 7 | | | 17 | | |
| 8 | | | 18 | | |
| 9 | | | 19 | | |
| 10 | | | 20 | | |

| Standard Type | Primary Book No. and Aliquot Vol. | Second Book No. and Aliquot Vol. | Third Book No. and Aliquot Vol. | Final Vol. of Standard |
|---|---|---|---|---|
| LMCS CHECK STD | ICP1-1B48AA/10 mL | ICP2-2B48AB/10 mL | ICP3-3B48AB/10 mL | NA |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

A-6000-881 (03/92)



9 3 1 2 3 3 3 0 5 3

# ICP ANALYSIS - ACID DIGESTION

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 939.-8550 | 105AP | 12-16-91 | 16:2 | 25 |

| Determination | Method/Standard | Report Units | Charge Code | Revision |
|---|---|---|---|---|
| ICP | LA-505-151 | % RECOVERY | N124W | |

Sample Size: 10mL on 50mL

Customer ID: STD

Remarks, Calculations, Results:
1st STD Digested STD
1040AA, 3848AB, 3848AB

2nd STD CEV OR LMCS

AG, AL, BA, CD, CR, FE, MG, MN, NA, PB, ZN

| Analyst 1 | Analyst 2 | Analyst 3 | Analyst 4 | Analyst 5 |
|---|---|---|---|---|
| 67768 | 82768 | | | |

Date: 1-23-92 Time Completed: 1/23/92 Lab Unit Mgr

DIGESTED LMCS 50mL

| | | | |
|---|---|---|---|
| Al | 1.160 x 5 = 5.80 | 116.0% Rec | |
| Zn | 1.955 x 5 = 9.775 | 97.75% Rec. | |
| Fe | 1.035 x 5 = 5.175 | 103.5% | |
| Cr | 1.013 x 5 = 5.065 | 101.3% | |
| Ba | 1.955 x 5 = 9.775 | 97.75% | |
| Mg | 1.028 x 5 = 5.14 | 102.8% | |
| Na | 2.975 x 5 = 14.875 | 148.8% | |
| Ag | .372 x 5 = 1.86 | 37.2% | |
| Pb | 1.026 x 5 = 5.13 | 102.6% | |
| Cd | 1.921 x 5 = 9.605 | 96.05% | |
| Mn | .978 x 5 = 4.89 | 97.8% | |

R939-8550

UNDIGESTED 1040AC 3848AD 3848AD

| | | |
|---|---|---|
| Zn | 9.83 ppm | 98.3% |
| Fe | 4.91 ppm | 98.2% |
| Cr | 5.06 ppm | 101.2% |
| Ba | 9.95 ppm | 99.5% |
| Mg | 5.00 ppm | 100.0% |
| Na | 9.84 ppm | 98.4% |
| Cd | 9.59 ppm | 95.9% |
| Mn | 4.85 ppm | 97.0% |
| Ag | 5.13 ppm | 102.6% |
| Pb | 4.85 ppm | 97.0% |
| Al | 4.75 ppm | 95.0% Rec. |

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 940.-8650 | 105AP | 12-16-91 | 16:3 | 25 |

| Determination | Method/Standard | Report Units | Charge Code | Revision |
|---|---|---|---|---|
| ICP | LA-505-151 | PPB | N124W | |

Sample Size: 50mL

Customer ID: BLK

Remarks, Calculations, Results:
REAGENT BLANK

AG, AL, BA, CD, CR, FE, MG, MN, NA, PB, ZN

over

| Analyst 1 | Analyst 2 | Analyst 3 | Analyst 4 | Analyst 5 |
|---|---|---|---|---|
| 67768 | 82768 | | | |

Date: 1-23-92 Time Completed: 1/23/92 Lab Unit Mgr

R940-8650

Al 9.97 E1 ug/l
Zn <4.0 ug/l
Fe <8.70E1 ug/l
Cr <8.0 ug/l
Ba <1.30E1 ug/l
Mg <5.10E1 ug/l
Na 1.12 E3 ug/l
Ag <8.0 ug/l
Pb <8.0E1 ug/l
Cd <4.0 ug/l
Mn <3.0 ug/l

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 943.-8750 | 105AP | 12-16-91 | 16:10 | 25 |

| Determination | Method/Standard | Report Units | Charge Code | Revision |
|---|---|---|---|---|
| ICP | LA-505-151 | PPB | N124W | 0 |

Sample Size: 10mL on 50mL

Customer ID: SAPD91-8

Remarks, Calculations, Results:

AG, AL, BA, CD, CR, FE, MG, MN, NA, PB, ZN

over

| Analyst 1 | Analyst 2 | Analyst 3 | Analyst 4 | Analyst 5 |
|---|---|---|---|---|
| 67768 | 82768 | | | |

Date: 1-23-92 Time Completed: 1/23/92 Lab Unit Mgr

R943-8750

Al (2.08E4)(5) = 1.04E5 ug/l
Zn (<4.0)(5) = <2.0E1 ug/l
Fe (1.26E2)(5) = 6.30E2 ug/l
Cr (7.07E2)(5) = 3.53 E3 ug/l
Ba (<1.3 E1)(5) = <6.50E1 ug/l
Mg (<5.1E1)(5) = <2.55E2 ug/l
Na (7.41E5)(5) = 3.70 E6 ug/l
Ag (<8.0)(5) = <4.0 E1 ug/l
Pb (<8.0E1)(5) = <4.0 E2 ug/l
Cd (1.62E1)(5) = 8.10E1 ug/l
Mn (<3.0)(5) = <1.50E1 ug/l

# ICP ANALYSIS - ACID DIGESTION

| Serial No | Sample Point | Date | Time Issued | Priority |
|---|---|---|---|---|
| R 946-8550 | 103AP | 12-16-91 | 16:14 | 25 |

| Determination | Method/Standard | Result Units | Charge Code | Returns |
|---|---|---|---|---|
| ICP | LA-505-151 | % RECOVERY | N124W | 0 |

Sample Size: 2 10ml aliq in 50ml

Customer ID: STD

Remarks, Calculations, Results

1st STD Digested STD
184BAA, 2A4BAB, 384AB

2nd STD CCV OR LMCS

OVER →

| Analyst - 1 | Analyst - 2 | Analyst - 3 | Analyst - 4 | Analyst - 5 |
|---|---|---|---|---|
| 67768 | 82768 | | | |

Date: 1-23-92 Time Completed: 1/23/92 Lab Unit Mgr

DIGESTED LMCS STDS

| | | | |
|---|---|---|---|
| Al | 1.33x5 = 6.65 | 133.0% Rec. | |
| Zn | 1.92x5 = 9.60 | 96.0% Rec. | |
| Fe | 1.03x5 = 5.15 | 103.0% Rec. | |
| Cr | 1.01x5 = 5.05 | 101.0% Rec. | |
| Ba | 2.04x5 = 10.20 | 102.0% Rec. | |
| Mg | 1.01x5 = 5.05 | 101.0% Rec. | |
| Na | 3.60x5 = 18.0 | 180.0% Rec. | |
| Ag | 1.13x5 = 5.65 | 113.0% Rec. | |
| Pb | .959x5 = 4.80 | 95.90% Rec. | |
| Cd | 1.86x5 = 9.30 | 93.0% Rec. | |
| Mn | .9655x5 = 4.83 | 96.5% Rec. | |

UNDIGESTED LMCS STDS 184BAB 2A4BAD 384AD

| | | |
|---|---|---|
| Al | 4.86ppm | 97.2% Rec. |
| Zn | 9.78 ppm | 97.8% Rec. |
| Fe | 4.87 ppm | 97.4% Rec. |
| Cr | 5.02 ppm | 100.4% Rec. |
| Ba | 10.00ppm | 100.0% Rec. |
| Mg | 4.97ppm | 99.4% Rec. |
| Na | 10.01 ppm | 100.1% Rec. |
| Ag | 4.85ppm | 97.0% Rec. |
| Pb | 5.25ppm | 105.0% Rec. |
| Cd | 9.43ppm | 94.3% Rec. Mg 0.015 |
| Mn | 4.82ppm | 96.4% Rec. |

R946-8550

93123 33070

R939-R946
1/23/92
Teresa L. Frazier

rrected Counts Statistics 11:20 AM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|
| 1 | -0.033 | 0.005 | |
| 2 | 245.906 | 1.532 | |
| 3 | -0.080 | 0.023 | |
| 5 | -0.010 | 0.005 | |
| 6 | 1.535 | 0.010 | |
| 7 | 21.186 | 0.235 | |
| 8 | 0.069 | 0.007 | |
| 9 | 0.059 | 0.011 | |
| 10 | 0.583 | 0.051 | |
| 11 | 110.588 | 0.733 | |
| 12 | 20.978 | 0.107 | |
| 14 | 96.849 | 0.439 | |
| 15 | 41.277 | 0.237 | |
| 16 | 20.475 | 0.162 | |
| 17 | -0.005 | 0.001 | |
| 18 | -0.069 | 0.003 | |
| 19 | 15.029 | 0.142 | |
| 20 | 56.989 | 0.366 | |
| 21 | 12.109 | 0.079 | |
| 22 | 0.332 | 0.076 | |
| 24 | 0.073 | 0.005 | |
| 25 | -0.362 | 0.003 | |
| 26 | 163.222 | 1.066 | |
| 27 | 0.181 | 0.004 | |
| 28 | 0.128 | 0.009 | |
| 29 | 22.844 | 0.157 | |
| 30 | -0.000 | 0.011 | |
| 31 | 16.044 | 0.047 | |
| 32 | 0.006 | 0.007 | |
| 33 | 0.410 | 0.002 | |
| 34 | 1.082 | 0.009 | |
| 35 | 0.015 | 0.013 | |
| 36 | -0.114 | 0.004 | |
| 37 | 228.240 | 1.784 | |
| 38 | 24.324 | 0.180 | |
| 39 | 0.838 | 0.012 | |
| 40 | 48.352 | 0.318 | |
| 42 | 0.884 | 0.019 | |
| 43 | 0.018 | 0.003 | |
| 44 | -0.006 | 0.001 | |
| 45 | -0.072 | 0.005 | |

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED THE ANALYSIS RUN ON PAGES 139 TO 198.

dentity 1: SST1 STD 1B48AC Identity 2: Direct 11:20 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| Zr | Sr | Ni | Ta | Hg | Sn | Si | Al |
|---|---|---|---|---|---|---|---|

| | (ppb) | (ppb) | (ppb) | (ppb) | (ppm) | (ppb) | (ppb) | (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -34.948 | 9897.465 | -62.488 | -15.945 | -21.739 | 5003.279 | -34.759 | -180.284 |
| .D. | 2.350 | 61.668 | 24.254 | 2.876 | 680.890 | 55.362 | 4.774 | 4.557 |
| o c n | 6.724 | 0.623 | 38.814 | 18.038 | 3132.092 | 1.107 | 13.736 | 2.528 |

| | Y | Zn | Cu | Li | Co | Ni | La | Eu |
|---|---|---|---|---|---|---|---|---|
| | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| ean | 778.140 | 9826.821 | 4853.330 | 9861.106 | 9746.507 | 4895.589 | -5.433 | -0.694 |
| .D. | 72.376 | 65.450 | 24.756 | 44.668 | 56.064 | 38.542 | 4.075 | 0.188 |
| R.S.D. | 9.301 | 0.666 | 0.510 | 0.453 | 0.575 | 0.787 | 75.007 | 27.062 |

| | Fe | Ca | Cr | Nd | Ce | Sm | Ba | P |
|---|---|---|---|---|---|---|---|---|
| | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| ean | 4906.087 | 9585.664 | 5064.381 | -19.614 | 25.637 | -1132.575 | 9953.229 | 1183.709 |
| .D. | 46.333 | 61.838 | 33.072 | 34.502 | 13.362 | 10.317 | 65.012 | 28.030 |
| R.S.D. | 0.944 | 0.645 | 0.653 | 175.905 | 52.120 | 0.911 | 0.653 | 2.368 |

| | S | Mg | As | Na | Mo | Se | Ag | Pb |
|---|---|---|---|---|---|---|---|---|
| | (pph) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| ean | 40.244 | 5000.962 | -11.410 | 9843.647 | -0.211 | 216.929 | 374.408 | 35.617 |
| .D. | 10.149 | 34.336 | 14.198 | 29.333 | 2.289 | 11.437 | 2.848 | 24.049 |
| R.S.D. | 25.220 | 0.687 | 124.438 | 0.298 | 1085.242 | 5.272 | 0.761 | 67.522 |

| | Ti | Cd | B | K | Mn | Sb | V | Be |
|---|---|---|---|---|---|---|---|---|
| | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) | (ppb) |
| ean | -5.556 | 9592.813 | 4839.135 | 5265.494 | 4851.103 | 4835.758 | 0.234 | 0.311 |
| .D. | 0.513 | 74.968 | 35.788 | 75.465 | 31.954 | 102.159 | 2.234 | 0.187 |
| R.S.D. | 9.234 | 0.782 | 0.740 | 1.433 | 0.659 | 2.113 | 954.825 | 59.996 |

| | Tl |
|---|---|
| | (ppb) |
| ean | -78.995 |
| .D. | 31.710 |
| R.S.D. | 40.142 |

---

orrected Counts Statistics 11:22 AM January 23, 1992
a name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | -0.140 | 0.008 | |
| r | 2 | 0.014 | 0.011 | |
| i | 3 | 4.796 | 0.025 | |
| a | 5 | -0.039 | 0.034 | |
| g | 6 | 1.553 | 0.014 | |
| n | 7 | -0.080 | 0.018 | |
| i | 8 | 0.014 | 0.006 | |
| l | 9 | 1.176 | 0.039 | |
| | 10 | -0.001 | 0.007 | |
| n | 11 | 0.111 | 0.013 | |
| r | 12 | 0.095 | 0.003 | |
| | 14 | -0.015 | 0.001 | |
| | 15 | -0.015 | 0.011 | |

| | | |
|---|---|---|
| 16 | -0.071 | 0.010 |
| 17 | 1.251 | 0.006 |
| 18 | 78.068 | 0.196 |
| 19 | 0.005 | 0.013 |
| 20 | 0.528 | 0.003 |
| 21 | -0.006 | 0.007 |
| 22 | 11.692 | 0.103 |
| 24 | 1.822 | 0.012 |
| 25 | 1.763 | 0.007 |
| 26 | -0.419 | 0.014 |
| 27 | 0.018 | 0.003 |
| 28 | 0.005 | 0.008 |
| 29 | 0.011 | 0.002 |
| 30 | 0.080 | 0.003 |
| 31 | 0.076 | 0.015 |
| 32 | 0.018 | 0.003 |
| 33 | -0.053 | 0.006 |
| 34 | 16.041 | 0.030 |
| 35 | 2.672 | 0.015 |
| 36 | -0.136 | 0.009 |
| 37 | -0.045 | 0.038 |
| 38 | 0.005 | 0.009 |
| 39 | -0.064 | 0.020 |
| 40 | 0.000 | 0.003 |
| 42 | -0.018 | 0.013 |
| 43 | 0.057 | 0.005 |
| 44 | -0.005 | 0.002 |
| 45 | -0.055 | 0.004 |

---

dentity : SST2 STD 2B48AD Identity 2: Direct 11:23 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -84.252 | -0.416 | 5044.073 | -34.443 | 1173.913 | -17.155 | -70.618 | 283.580 |
| .D. | 3.437 | 0.430 | 26.000 | 21.728 | 913.820 | 4.159 | 3.810 | 16.264 |
| R.S.D. | 4.079 | 103.478 | 0.515 | 63.083 | 77.844 | 24.243 | 5.396 | 5.735 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -21.649 | -36.475 | 6.345 | -2.648 | -1.180 | -3.336 | 5112.874 | 5080.546 |
| .D. | 10.026 | 1.189 | 0.670 | 0.118 | 2.681 | 2.316 | 24.788 | 12.758 |
| R.S.D. | 46.312 | 3.259 | 10.559 | 4.441 | 227.172 | 69.427 | 0.485 | 0.251 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -5.012 | 39.525 | -6.278 | 5155.984 | 4972.773 | 5196.930 | -27.548 | 53.187 |
| .D. | 4.341 | 0.429 | 2.849 | 46.456 | 34.203 | 19.377 | 0.828 | 17.454 |
| R.S.D. | 86.612 | 1.086 | 45.380 | 0.901 | 0.688 | 0.373 | 3.006 | 32.817 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -17.668 | -2.776 | 90.726 | -31.949 | 3.586 | 12.008 | 5127.584 | 4847.065 |
| .D. | 8.821 | 0.380 | 3.942 | 9.468 | 0.967 | 18.911 | 9.491 | 26.679 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R.S.D. | 49.923 | 13.674 | 4.345 | 29.634 | 26.956 | 157.480 | 0.185 | 0.550 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| | -8.446 | 1.079 | 2.983 | -184.430 | -0.631 | -141.575 | 27.101 | 0.435 |
| | 1.281 | 1.600 | 1.715 | 121.293 | 0.253 | 73.456 | 3.184 | 0.285 |
| R.S.D. | 15.163 | 148.354 | 57.478 | 65.767 | 40.060 | 51.885 | 11.749 | 65.462 |

| | Tl (ppb) |
|---|---|
| an | 38.209 |
| D. | 30.653 |
| R.S.D. | 80.225 |

---

rrected Counts Statistics 11:24 AM January 23, 1992
sk name : ALL_SIM
ple Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 22.566 | 0.035 | |
| 2 | 0.011 | 0.003 | |
| 3 | -1.801 | 0.034 | |
| 5 | 15.552 | 0.046 | |
| 6 | 26.580 | 0.035 | |
| 7 | 0.099 | 0.021 | |
| 8 | 12.380 | 0.011 | |
| 9 | 11.929 | 0.024 | |
| 10 | 30.832 | 0.129 | |
| 11 | 0.070 | 0.006 | |
| 12 | 0.062 | 0.002 | |
| 14 | -0.020 | 0.002 | |
| 15 | -0.069 | 0.005 | |
| 16 | 0.255 | 0.028 | |
| 17 | -0.008 | 0.001 | |
| 18 | -0.149 | 0.004 | |
| 19 | 0.022 | 0.007 | |
| 20 | 0.143 | 0.001 | |
| 21 | 0.013 | 0.005 | |
| 22 | -0.117 | 0.058 | |
| 24 | 0.021 | 0.001 | |
| 25 | -0.096 | 0.005 | |
| 26 | -0.014 | 0.002 | |
| 27 | 1.508 | 0.010 | |
| 28 | 4.544 | 0.008 | |
| 29 | 0.010 | 0.001 | |
| 30 | 3.904 | 0.018 | |
| 31 | 0.072 | 0.004 | |
| 32 | 31.232 | 0.104 | |
| 33 | 1.458 | 0.021 | |
| 34 | -0.053 | 0.028 | |
| 35 | -0.087 | 0.002 | |
| 36 | 35.915 | 0.051 | |
| 37 | -0.268 | 0.042 | |

| | | |
|---|---|---|
| 38 | 0.048 | 0.008 |
| 39 | -0.058 | 0.006 |
| 40 | 0.012 | 0.005 |
| 42 | 0.045 | 0.015 |
| 43 | 14.023 | 0.023 |
| 44 | 52.314 | 0.077 |
| 45 | 0.622 | 0.002 |

---

dentity 1: SSTS STD 3B48AD Identity 2: Direct 11:25 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 10313.976 | -0.564 | -1864.865 | 9910.061 | 1633326.087 | 25.182 | 8090.681 | 4750.379 |
| .D. | 16.134 | 0.129 | 35.736 | 29.379 | 2297.776 | 4.946 | 7.270 | 10.073 |
| R.S.D. | 0.156 | 22.961 | 1.916 | 0.296 | 0.141 | 19.643 | 0.090 | 0.212 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 43573.456 | -40.166 | -1.469 | -3.157 | -14.007 | 74.392 | -19.017 | -5.939 |
| D. | 182.756 | 0.558 | 0.536 | 0.156 | 1.165 | 6.720 | 4.706 | 0.228 |
| R.S.D. | 0.419 | 1.388 | 36.492 | 4.928 | 8.314 | 9.033 | 24.744 | 3.845 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 0.436 | -25.591 | 1.814 | -151.429 | -120.449 | -341.387 | -2.826 | 10385.091 |
| D. | 2.288 | 0.166 | 2.175 | 26.018 | 2.827 | 13.429 | 0.106 | 68.309 |
| R.S. | 524.363 | 0.648 | 119.899 | 17.182 | 2.347 | 3.934 | 3.738 | 0.658 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 5223.611 | -2.922 | 5022.719 | -34.630 | 9881.434 | 4403.638 | 13.782 | -149.113 |
| D. | 9.259 | 0.127 | 23.159 | 2.474 | 32.989 | 60.572 | 8.927 | 3.770 |
| R.S.D. | 0.177 | 4.330 | 0.461 | 7.144 | 0.334 | 1.376 | 64.772 | 2.528 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 4876.468 | -8.305 | 11.534 | -146.163 | 0.554 | 207.776 | 9730.940 | 9760.897 |
| D. | 6.971 | 1.766 | 1.656 | 36.917 | 0.506 | 83.473 | 15.850 | 14.332 |
| R.S.D. | 0.143 | 21.266 | 14.356 | 25.258 | 91.300 | 40.175 | 0.163 | 0.147 |

| | Tl (ppb) |
|---|---|
| an | 4801.375 |
| D. | 16.240 |
| R.S.D. | 0.338 |

---

rrected Counts Statistics 11:27 AM January 23, 1992
sk name : ALL_SIM
aple t : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Ipulses | S.D. Ipulses | %R.S.D. Ipulses |
|---|---|---|---|
| 1 | 0.008 | 0.009 | |
| 2 | 0.011 | 0.006 | |
| 3 | -0.398 | 0.031 | |
| 5 | 0.008 | 0.005 | |
| 6 | 1.569 | 0.015 | |
| 7 | 0.072 | 0.017 | |
| 8 | 1.332 | 0.007 | |
| 9 | 2.686 | 0.061 | |
| 10 | 0.099 | 0.010 | |
| 11 | 11.348 | 0.033 | |
| 12 | 4.262 | 0.013 | |
| 14 | -0.018 | 0.005 | |
| 15 | 4.263 | 0.010 | |
| 16 | 4.104 | 0.034 | |
| 17 | -0.005 | 0.000 | |
| 18 | -0.092 | 0.012 | |
| 19 | 3.030 | 0.054 | |
| 20 | 5.990 | 0.020 | |
| 21 | 2.449 | 0.009 | |
| 22 | -0.018 | 0.068 | |
| 24 | 0.010 | 0.011 | |
| 25 | -0.073 | 0.010 | |
| 26 | 16.195 | 0.042 | |
| 27 | 0.015 | 0.003 | |
| 28 | 0.023 | 0.003 | |
| 29 | 4.658 | 0.020 | |
| 30 | 0.808 | 0.016 | |
| 31 | 1.646 | 0.011 | |
| 32 | 3.115 | 0.009 | |
| 33 | 0.371 | 0.008 | |
| 34 | 3.149 | 0.005 | |
| 35 | 0.556 | 0.012 | |
| 36 | 7.221 | 0.031 | |
| 37 | 23.723 | 0.157 | |
| 38 | 4.666 | 0.048 | |
| 39 | 1.631 | 0.003 | |
| 40 | 9.873 | 0.032 | |
| 42 | 0.173 | 0.003 | |
| 43 | 1.457 | 0.007 | |
| 44 | 5.168 | 0.022 | |
| 45 | 0.091 | 0.010 | |

dentity 1: ICV Identity 2: ICV 11:27 AM January 23, 1992
ask name : ALL_SIM
aaple Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -16.478 | -0.537 | -395.525 | -4.889 | 2173.913 | 18.808 | 799.014 | 910.973 |
| | 4.255 | 0.229 | 32.690 | 2.876 | 945.840 | 3.901 | 4.620 | 25.180 |
| | 25.823 | 42.647 | 8.265 | 58.830 | 43.509 | 20.740 | 0.578 | 2.764 |

| | Y (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 114.111 | 966.761 | 973.359 | -2.953 | 1008.723 | 992.265 | -5.433 | -2.189 |
| D. | 14.708 | 2.904 | 2.984 | 0.513 | 2.252 | 7.998 | 0.000 | 0.795 |
| R.S.D. | 12.889 | 0.300 | 0.307 | 17.336 | 0.223 | 0.806 | 0.000 | 36.297 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 983.593 | 961.996 | 1021.219 | -113.959 | -150.609 | -272.890 | 985.792 | 32.380 |
| D. | 17.797 | 3.322 | 3.608 | 30.549 | 29.700 | 30.997 | 2.535 | 22.295 |
| R.S.D. | 1.809 | 0.345 | 0.353 | 26.807 | 19.720 | 11.359 | 0.257 | 68.854 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -5.745 | 1015.576 | 1029.354 | 938.664 | 983.745 | 1013.016 | 1031.268 | 1014.810 |
| D. | 3.320 | 4.399 | 21.210 | 6.785 | 2.900 | 22.410 | 1.681 | 20.886 |
| R.S.D. | 57.786 | 0.433 | 2.061 | 0.723 | 0.295 | 2.212 | 0.163 | 2.058 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 988.347 | 999.729 | 929.909 | 10058.848 | 990.738 | 915.672 | 1000.102 | 965.481 |
| D. | 4.177 | 6.593 | 9.612 | 19.422 | 3.227 | 17.732 | 4.730 | 4.029 |
| R.S.D. | 0.423 | 0.660 | 1.034 | 0.193 | 0.326 | 1.936 | 0.473 | 0.417 |

| | Tl (ppb) |
|---|---|
| an | 1064.915 |
| D. | 67.816 |
| R.S.D. | 6.368 |

---

rected Counts Statistics 11:29 AM January 23, 1992
sk name : ALL_SIM
ple Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.005 | 0.002 | |
| 2 | -0.002 | 0.004 | |
| 3 | -0.045 | 0.030 | |
| 5 | 0.002 | 0.012 | |
| 6 | 1.554 | 0.009 | |
| 7 | -0.023 | 0.016 | |
| 8 | 0.154 | 0.063 | |
| 9 | 0.428 | 0.011 | |
| 10 | -0.031 | 0.021 | |
| 11 | 0.038 | 0.007 | |
| 12 | 0.053 | 0.004 | |
| 14 | -0.025 | 0.003 | |
| 15 | -0.016 | 0.019 | |
| 16 | -0.061 | 0.001 | |
| 17 | -0.005 | 0.000 | |
| 18 | -0.104 | 0.004 | |
| 19 | 0.003 | 0.007 | |
| 20 | 0.095 | 0.000 | |

| | | |
|---|---|---|
| 21 | -0.008 | 0.006 |
| 22 | 0.070 | 0.054 |
| 24 | 0.027 | 0.008 |
| 25 | -0.030 | 0.004 |
| 26 | -0.011 | 0.004 |
| 27 | 0.012 | 0.005 |
| 28 | 0.022 | 0.007 |
| 29 | 0.003 | 0.001 |
| 30 | -0.009 | 0.009 |
| 31 | 0.048 | 0.006 |
| 32 | 0.002 | 0.009 |
| 33 | -0.050 | 0.006 |
| 34 | -0.110 | 0.008 |
| 35 | -0.002 | 0.008 |
| 36 | -0.109 | 0.006 |
| 37 | -0.064 | 0.033 |
| 38 | 0.041 | 0.033 |
| 39 | -0.051 | 0.006 |
| 40 | 0.002 | 0.004 |
| 42 | -0.023 | 0.005 |
| 43 | 0.021 | 0.003 |
| 44 | -0.008 | 0.002 |
| 45 | -0.058 | 0.004 |

dentity 1: ICB Identity 2: ICB 11:29 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -17.851 | -1.060 | -25.135 | -8.716 | 1239.130 | -3.541 | 21.779 | -27.001 |
| .D. | 1.058 | 0.168 | 31.789 | 7.873 | 584.536 | 3.882 | 41.722 | 4.557 |
| R.S.D. | 5.924 | 15.810 | 126.473 | 90.322 | 47.173 | 109.612 | 191.565 | 16.876 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -65.006 | -42.993 | -3.403 | -3.632 | -1.416 | -0.872 | -5.433 | -3.013 |
| .D. | 29.328 | 0.646 | 0.938 | 0.269 | 4.559 | 0.238 | 0.000 | 0.263 |
| R.S.D. | 45.116 | 1.502 | 27.564 | 7.418 | 321.906 | 27.350 | 0.000 | 8.722 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -5.774 | -33.699 | -6.836 | -67.171 | -102.542 | -144.831 | -2.643 | 11.573 |
| .D. | 2.144 | 0.004 | 2.305 | 24.181 | 21.222 | 11.275 | 0.220 | 32.777 |
| R.S.D. | 37.121 | 0.013 | 33.721 | 35.999 | 20.696 | 7.785 | 8.321 | 283.215 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 1.832 | -4.602 | -24.942 | -49.267 | -1.266 | 20.859 | -4.117 | 4.829 |
| .D. | 7.688 | 0.127 | 11.706 | 3.779 | 2.854 | 16.497 | 2.548 | 15.080 |
| R.S.D. | 419.555 | 2.749 | 46.931 | 7.670 | 225.466 | 79.091 | 61.899 | 312.282 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -4.788 | 0.280 | 10.010 | -107.897 | -0.445 | -165.478 | 2.318 | -0.124 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| .D. | 0.746 | 1.400 | 6.463 | 36.917 | 0.418 | 25.478 | 1.749 | 0.285 |
| R.S.D. | 15.587 | 499.540 | 64.572 | 34.215 | 93.995 | 15.396 | 75.423 | 229.169 |

| | Tl (ppb) |
|---|---|
| ean | 14.768 |
| .D. | 24.696 |
| R.S.D. | 167.231 |

---

rrected Counts Statistics 11:31 AM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.021 | 0.002 | |
| 2 | 0.110 | 0.002 | |
| 3 | -0.135 | 0.008 | |
| 5 | -0.040 | 0.008 | |
| 6 | 2.016 | 0.022 | |
| 7 | 6.016 | 0.039 | |
| 8 | 0.546 | 0.004 | |
| 9 | 607.534 | 0.414 | |
| 10 | 0.044 | 0.017 | |
| 11 | 0.263 | 0.013 | |
| 12 | 0.060 | 0.003 | |
| 14 | -0.025 | 0.008 | |
| 15 | -0.013 | 0.016 | |
| 16 | -0.056 | 0.012 | |
| 17 | -0.042 | 0.000 | |
| 18 | 0.055 | 0.004 | |
| 19 | 304.617 | 0.932 | |
| 20 | 1134.050 | 3.449 | |
| 21 | 0.016 | 0.013 | |
| 22 | 3.623 | 0.076 | |
| 24 | 0.015 | 0.006 | |
| 25 | -8.518 | 0.004 | |
| 26 | 0.030 | 0.005 | |
| 27 | 0.018 | 0.001 | |
| 28 | 2.215 | 0.028 | |
| 29 | 936.602 | 3.533 | |
| 30 | 0.100 | 0.004 | |
| 31 | 0.077 | 0.011 | |
| 32 | 0.007 | 0.005 | |
| 33 | -0.061 | 0.012 | |
| 34 | -0.116 | 0.001 | |
| 35 | -0.101 | 0.002 | |
| 36 | -0.074 | 0.006 | |
| 37 | 0.341 | 0.020 | |
| 38 | -0.446 | 0.023 | |
| 39 | -0.046 | 0.009 | |
| 40 | 1.696 | 0.009 | |
| 42 | -0.007 | 0.010 | |
| 43 | 0.027 | 0.003 | |

| | | | |
|---|---|---|---|
| | 44 | -0.002 | 0.001 |
| | 45 | -0.075 | 0.009 |

ICSA-1 Identity 2: ICSA 11:31 AM January 23, 1992
ask n . ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -10.372 | 3.448 | -119.740 | -35.507 | 31347.826 | 1422.055 | 280.051 | 252164.997 |
| .D. | 9.916 | 0.084 | 7.907 | 5.195 | 1412.374 | 9.261 | 2.748 | 172.036 |
| R.S.D. | 8.830 | 2.430 | 6.603 | 14.631 | 4.505 | 0.651 | 0.981 | 0.068 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 41.460 | -22.905 | -1.933 | -3.598 | -0.708 | 0.400 | -156.211 | 7.348 |
| .D. | 23.805 | 1.116 | 0.709 | 0.771 | 3.865 | 2.874 | 0.000 | 0.234 |
| R.S.D. | 57.417 | 4.874 | 36.682 | 21.430 | 545.754 | 718.856 | 0.000 | 3.191 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 99567.437 | 191878.127 | 3.069 | 135.168 | -137.414 | -25421.158 | -0.142 | 48.564 |
| .D. | 304.564 | 583.665 | 5.441 | 30.940 | 17.199 | 11.275 | 0.280 | 8.009 |
| R.S.D. | 0.306 | 0.304 | 177.262 | 22.890 | 12.516 | 0.044 | 196.426 | 16.491 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| | 850.820 | 205243.473 | 116.099 | -31.743 | 0.316 | -15.299 | -6.129 | -174.468 |
| | 26.859 | 774.275 | 5.162 | 6.497 | 1.561 | 35.451 | 0.318 | 4.183 |
| R.S.D. | 3.157 | 0.377 | 4.446 | 20.466 | 493.253 | 231.714 | 5.184 | 2.397 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -0.045 | 17.297 | -86.773 | -77.687 | 34.000 | -80.898 | 6.024 | 0.995 |
| .D. | 0.817 | 0.819 | 4.587 | 52.093 | 0.801 | 55.253 | 1.749 | 0.215 |
| R.S.D. | 1808.314 | 4.737 | 5.286 | 67.054 | 2.356 | 68.299 | 29.027 | 21.650 |

| | Tl (ppb) |
|---|---|
| ean | -100.092 |
| .D. | 59.808 |
| R.S.D. | 59.753 |

orrected Counts Statistics 11:33 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| | 1 | 0.020 | 0.006 | |
| | 2 | 0.115 | 0.006 | |

| | | |
|---|---|---|
| 3 | -0.148 | 0.017 |
| 5 | -0.041 | 0.013 |
| 6 | 2.029 | 0.013 |
| 7 | 6.049 | 0.064 |
| 8 | 0.551 | 0.017 |
| 9 | 608.603 | 4.348 |
| 10 | 0.036 | 0.026 |
| 11 | 11.631 | 0.083 |
| 12 | 2.197 | 0.016 |
| 14 | -0.011 | 0.012 |
| 15 | 2.099 | 0.019 |
| 16 | 4.088 | 0.012 |
| 17 | -0.041 | 0.002 |
| 18 | 0.058 | 0.007 |
| 19 | 306.086 | 2.360 |
| 20 | 1140.154 | 5.671 |
| 21 | 1.275 | 0.027 |
| 22 | 3.572 | 0.079 |
| 24 | 0.017 | 0.011 |
| 25 | -8.567 | 0.009 |
| 26 | 8.390 | 0.057 |
| 27 | 0.018 | 0.003 |
| 28 | 2.251 | 0.021 |
| 29 | 938.508 | 4.562 |
| 30 | 0.131 | 0.002 |
| 31 | 0.107 | 0.026 |
| 32 | 0.010 | 0.003 |
| 33 | -0.004 | 0.009 |
| 34 | 3.227 | 0.023 |
| 35 | 0.441 | 0.018 |
| 36 | -0.076 | 0.011 |
| 37 | 24.319 | 0.140 |
| 38 | -0.470 | 0.020 |
| 39 | -0.060 | 0.007 |
| 40 | 6.748 | 0.045 |
| 42 | -0.012 | 0.009 |
| 43 | 0.763 | 0.006 |
| 44 | 2.737 | 0.023 |
| 45 | -0.063 | 0.006 |

---

Identity 1: ICSAB-I  Identity 2: ICSAB  11:34 AM January 23, 1992
Task name : ALL_SIM
Sample Weight : 1.0000  Solution Volume : 1.00
On-Peak Integrations : 3  Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -10.982 | 3.650 | -133.703 | -35.932 | 32217.391 | 1429.845 | 283.571 | 252608.921 |
| S.D. | 2.944 | 0.222 | 17.283 | 8.292 | 868.478 | 15.159 | 11.450 | 1806.295 |
| R.S.D. | 26.808 | 6.075 | 12.926 | 23.078 | 2.696 | 1.060 | 4.038 | 0.715 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 27.502 | 991.997 | 494.146 | -2.240 | 497.791 | 988.291 | -153.494 | 7.565 |
| S.D. | 37.393 | 7.427 | 3.618 | 1.189 | 4.506 | 2.864 | 8.483 | 0.470 |
| R.S.D. | 135.966 | 0.749 | 0.732 | 53.074 | 0.905 | 0.290 | 5.527 | 6.219 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sr (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 100047.738 | 192910.188 | 529.862 | 104.745 | -132.701 | -25568.078 | 509.750 | 53.187 |
| | 771.590 | 959.799 | 11.495 | 28.940 | 31.145 | 25.445 | 3.491 | 17.454 |
| | 0.771 | 0.498 | 2.169 | 27.629 | 23.470 | 0.100 | 0.685 | 32.817 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 883.719 | 205661.158 | 155.857 | -12.776 | 1.266 | 32.940 | 1056.051 | 807.139 |
| .D. | 17.988 | 999.812 | 2.977 | 15.821 | 0.914 | 27.935 | 7.196 | 32.212 |
| R.S.D. | 2.036 | 0.486 | 1.910 | 123.829 | 72.168 | 84.806 | 0.681 | 3.991 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -0.361 | 1024.743 | -91.546 | -162.276 | 540.936 | -104.801 | 517.655 | 512.092 |
| .D. | 1.509 | 5.868 | 3.992 | 44.537 | 3.919 | 46.914 | 4.339 | 4.312 |
| R.S.D. | 417.582 | 0.573 | 4.361 | 27.445 | 0.724 | 44.765 | 0.838 | 0.842 |

| | Tl (ppb) |
|---|---|
| ean | -20.393 |
| .D. | 41.205 |
| R.S.D. | 202.052 |

---

orrected Counts Statistics 11:35 AM January 23, 1992
ask name : ALL_SIM
ht : 1.0000 Solution Volume : 1.00
ntegrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.017 | 0.004 | |
| r | 2 | 0.004 | 0.005 | |
| i | 3 | -0.038 | 0.040 | |
| a | 5 | -0.005 | 0.012 | |
| a | 6 | 1.550 | 0.012 | |
| n | 7 | 0.005 | 0.003 | |
| i | 8 | 0.111 | 0.002 | |
| l | 9 | 0.462 | 0.011 | |
| | 10 | 0.017 | 0.024 | |
| n | 11 | 0.051 | 0.006 | |
| y | 12 | 0.053 | 0.004 | |
| i | 14 | -0.009 | 0.003 | |
| o | 15 | 0.005 | 0.006 | |
| i | 16 | -0.071 | 0.011 | |
| a | 17 | -0.003 | 0.001 | |
| n | 18 | -0.080 | 0.006 | |
| e | 19 | 0.023 | 0.009 | |
| a | 20 | 0.168 | 0.029 | |
| r | 21 | -0.003 | 0.008 | |
| d | 22 | 0.108 | 0.065 | |
| e | 24 | 0.035 | 0.007 | |
| | 25 | -0.013 | 0.007 | |
| | 26 | 0.010 | 0.008 | |

| | | |
|---|---|---|
| 27 | 0.012 | 0.001 |
| 28 | 0.015 | 0.002 |
| 29 | 0.061 | 0.024 |
| 30 | 0.000 | 0.008 |
| 31 | 0.058 | 0.008 |
| 32 | 0.006 | 0.009 |
| 33 | -0.045 | 0.021 |
| 34 | -0.105 | 0.002 |
| 35 | 0.003 | 0.011 |
| 36 | -0.093 | 0.005 |
| 37 | -0.142 | 0.018 |
| 38 | 0.037 | 0.020 |
| 39 | -0.067 | 0.005 |
| 40 | 0.002 | 0.005 |
| 42 | 0.003 | 0.007 |
| 43 | 0.015 | 0.002 |
| 44 | -0.011 | 0.001 |
| 45 | -0.078 | 0.004 |

---

entity 1: XXX Identity 2: Rinse 11:36 AM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -12.356 | -0.845 | -18.153 | -12.969 | 956.522 | 2.990 | -6.600 | -13.016 |
| D. | 1.608 | 0.199 | 42.360 | 7.838 | 768.902 | 0.625 | 1.374 | 4.681 |
| R.S. | 13.015 | 23.490 | 233.351 | 60.439 | 80.385 | 20.888 | 20.817 | 35.966 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 2.853 | -41.862 | -3.558 | -2.003 | 3.620 | -3.256 | 4.076 | -1.452 |
| D. | 34.458 | 0.497 | 0.938 | 0.353 | 1.518 | 2.523 | 2.353 | 0.392 |
| R.S.D. | 1207.749 | 1.187 | 26.366 | 17.614 | 41.928 | 77.495 | 57.728 | 26.989 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 0.872 | -21.347 | -5.022 | -50.480 | -81.807 | -92.217 | -1.362 | 9.261 |
| D. | 2.780 | 4.920 | 3.357 | 29.011 | 19.860 | 21.129 | 0.499 | 6.936 |
| R.S.D. | 318.740 | 23.047 | 66.842 | 57.469 | 24.276 | 22.912 | 36.651 | 74.890 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -5.588 | 8.181 | -12.902 | -43.288 | -0.211 | 34.023 | -2.528 | 13.281 |
| D. | 2.436 | 5.181 | 10.558 | 4.669 | 2.728 | 59.532 | 0.734 | 20.410 |
| R.S.D. | 43.599 | 63.330 | 81.832 | 10.787 | 1293.370 | 174.975 | 29.021 | 153.680 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -2.710 | -3.011 | 9.214 | -204.570 | -0.387 | -23.899 | -2.314 | -0.560 |
| D. | 0.895 | 0.764 | 4.004 | 31.005 | 0.502 | 36.171 | 1.061 | 0.108 |
| R.S.D. | 25.658 | 25.387 | 43.452 | 15.156 | 129.860 | 151.354 | 45.872 | 19.246 |

| | Tl (ppb) |
|---|---|

| | |
|---|---|
| an | -121.189 |
| D. | 26.624 |
| R.S.D. | 21.969 |

---

rrected Counts Statistics 11:38 AM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.000 | 0.007 | |
| 2 | -0.015 | 0.007 | |
| 3 | -0.076 | 0.018 | |
| 5 | -0.016 | 0.014 | |
| 6 | 1.540 | 0.011 | |
| 7 | -0.015 | 0.006 | |
| 8 | 0.092 | 0.002 | |
| 9 | 0.264 | 0.027 | |
| 10 | -0.019 | 0.029 | |
| 11 | 0.504 | 0.011 | |
| 12 | 0.247 | 0.005 | |
| 14 | -0.023 | 0.008 | |
| 15 | 0.400 | 0.008 | |
| 16 | 0.282 | 0.012 | |
| 17 | -0.005 | 0.002 | |
| 18 | -0.095 | 0.009 | |
| 19 | 0.014 | 0.005 | |
| 20 | 0.192 | 0.002 | |
| 21 | 0.036 | 0.007 | |
| 22 | -0.070 | 0.078 | |
| 24 | -0.005 | 0.013 | |
| 25 | -0.041 | 0.011 | |
| 26 | -0.025 | 0.006 | |
| 27 | 0.015 | 0.002 | |
| 28 | 0.000 | 0.007 | |
| 29 | 0.011 | 0.002 | |
| 30 | 0.012 | 0.011 | |
| 31 | 0.029 | 0.013 | |
| 32 | 0.011 | 0.002 | |
| 33 | -0.034 | 0.008 | |
| 34 | -0.061 | 0.005 | |
| 35 | -0.005 | 0.004 | |
| 36 | -0.127 | 0.004 | |
| 37 | 0.155 | 0.041 | |
| 38 | 0.007 | 0.011 | |
| 39 | -0.066 | 0.009 | |
| 40 | 0.296 | 0.000 | |
| 42 | 0.011 | 0.011 | |
| 43 | 0.168 | 0.007 | |
| 44 | 0.045 | 0.002 | |
| 45 | -0.044 | 0.006 | |

---

Identity 1: CRI-I Identity 2: CRI 11:38 AM January 23, 1992
Task name : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -19.836 | -1.610 | -57.601 | -20.198 | 282.609 | -1.731 | -19.579 | -95.127 |
| S.D. | 3.216 | 0.274 | 18.744 | 8.938 | 697.348 | 1.436 | 1.374 | 11.280 |
| R.S.D. | 16.215 | 17.017 | 32.542 | 44.251 | 246.754 | 82.947 | 7.017 | 11.858 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -48.132 | -1.448 | 41.547 | -3.462 | 96.788 | 80.909 | -5.433 | -2.406 |
| S.D. | 41.524 | 0.963 | 1.206 | 0.791 | 1.844 | 2.759 | 7.058 | 0.556 |
| R.S.D. | 86.271 | 66.501 | 2.903 | 22.845 | 1.905 | 3.398 | 129.916 | 23.092 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -2.070 | -17.317 | 11.580 | -130.215 | -193.021 | -177.590 | -3.477 | 32.380 |
| S.D. | 1.677 | 0.292 | 2.969 | 34.977 | 36.466 | 33.208 | 0.392 | 10.594 |
| R.S.D. | 81.046 | 1.688 | 25.643 | 26.861 | 18.892 | 18.699 | 11.279 | 32.719 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -22.943 | -2.776 | 2.584 | -61.431 | 1.582 | 62.279 | 11.346 | -1.812 |
| S.D. | 7.862 | 0.438 | 13.591 | 7.953 | 0.731 | 22.129 | 1.456 | 7.319 |
| R.S.D. | 34.267 | 15.790 | 525.908 | 12.946 | 46.187 | 35.531 | 12.833 | 404.033 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -7.227 | 9.462 | 3.248 | -198.528 | 29.118 | 18.391 | 103.996 | 9.887 |
| S.D. | 0.513 | 1.719 | 2.089 | 51.387 | 0.000 | 58.982 | 4.930 | 0.285 |
| R.S.D. | 7.099 | 18.132 | 64.310 | 25.884 | 0.001 | 320.703 | 4.740 | 2.882 |

| | Tl (ppb) |
|---|---|
| Mean | 113.219 |
| S.D. | 42.388 |
| R.S.D. | 37.439 |

Corrected Counts Statistics 11:40 AM January 23, 1992
Task name : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

| Analyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.014 | 0.005 | |
| 2 | 0.007 | 0.006 | |
| 3 | -0.168 | 0.018 | |
| 5 | 0.017 | 0.011 | |
| 6 | 1.544 | 0.005 | |
| 7 | -0.008 | 0.014 | |
| 8 | 0.711 | 0.012 | |

| | | |
|---|---|---|
| 9 | 1.492 | 0.004 |
| 10 | 0.025 | 0.028 |
| 11 | 5.643 | 0.030 |
| 12 | 2.158 | 0.005 |
| 14 | -0.012 | 0.003 |
| 15 | 2.092 | 0.027 |
| 16 | 1.987 | 0.036 |
| 17 | -0.002 | 0.001 |
| 18 | -0.079 | 0.006 |
| 19 | 1.498 | 0.021 |
| 20 | 2.978 | 0.022 |
| 21 | 1.205 | 0.005 |
| 22 | 0.149 | 0.042 |
| 24 | 0.033 | 0.008 |
| 25 | -0.035 | 0.005 |
| 26 | 8.081 | 0.051 |
| 27 | 0.016 | 0.002 |
| 28 | 0.029 | 0.004 |
| 29 | 2.298 | 0.017 |
| 30 | 0.381 | 0.012 |
| 31 | 0.850 | 0.016 |
| 32 | 1.512 | 0.022 |
| 33 | 0.137 | 0.013 |
| 34 | 1.517 | 0.009 |
| 35 | 0.268 | 0.014 |
| 36 | 3.526 | 0.031 |
| 37 | 11.575 | 0.020 |
| 38 | 2.345 | 0.027 |
| 39 | 0.786 | 0.006 |
| 40 | 4.895 | 0.026 |
| 42 | 0.087 | 0.010 |
| 43 | 0.721 | 0.004 |
| 44 | 2.545 | 0.015 |
| 45 | -0.019 | 0.007 |

---

entity 1: CCV-1 Identity 2: CCV 11:40 AM January 23, 1992
sk Name : ALL_SIM
ple Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Mg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -13.730 | -0.725 | -153.951 | 1.064 | 565.217 | -0.000 | 389.388 | 414.985 |
| .D. | 2.350 | 0.243 | 18.744 | 6.751 | 298.864 | 3.341 | 7.649 | 1.573 |
| R.S.D. | 17.115 | 33.487 | 12.175 | 634.295 | 52.876 | 88086292.569 | 1.964 | 0.379 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 12.567 | 457.360 | 485.017 | -2.342 | 496.296 | 487.511 | 6.792 | -1.366 |
| .D. | 39.796 | 2.649 | 1.191 | 0.327 | 6.274 | 8.618 | 4.075 | 0.406 |
| R.S.D. | 316.663 | 0.579 | 0.246 | 13.976 | 1.264 | 1.768 | 59.995 | 29.737 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| | 483.026 | 453.217 | 500.565 | -35.501 | -87.462 | -157.736 | 490.924 | 34.692 |
| | 6.875 | 3.717 | 2.148 | 18.912 | 23.713 | 14.990 | 3.089 | 14.438 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R.S.D. | 1.423 | 0.820 | 0.429 | 53.273 | 27.112 | 9.503 | 0.629 | 41.617 |

| | S (ppb) | Mg (ppb) | As (ppb) | Ma (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 5.644 | 498.475 | 478.769 | 446.348 | 476.577 | 449.599 | 512.622 | 493.822 |
| .D. | 4.085 | 3.616 | 14.876 | 10.169 | 6.834 | 36.271 | 2.702 | 24.722 |
| R.S.D. | 72.376 | 0.725 | 3.107 | 2.278 | 1.434 | 8.067 | 0.527 | 5.006 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 487.715 | 487.312 | 468.269 | 4951.307 | 490.934 | 441.290 | 488.472 | 476.149 |
| .D. | 4.172 | 0.857 | 5.273 | 37.733 | 2.620 | 55.801 | 2.505 | 2.868 |
| R.S.D. | 0.855 | 0.175 | 1.126 | 0.762 | 0.534 | 12.645 | 0.513 | 0.602 |

| | Tl (ppb) |
|---|---|
| ean | 293.713 |
| .D. | 46.823 |
| R.S.D. | 15.942 |

---

orrected Counts Statistics 11:42 AM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.013 | 0.007 | |
| 2 | 0.002 | 0.005 | |
| 3 | -0.061 | 0.018 | |
| 5 | 0.007 | 0.014 | |
| 6 | 1.554 | 0.010 | |
| 7 | -0.056 | 0.017 | |
| 8 | 0.120 | 0.006 | |
| 9 | 0.328 | 0.017 | |
| 10 | -0.006 | 0.007 | |
| 11 | 0.029 | 0.004 | |
| 12 | 0.044 | 0.004 | |
| 14 | -0.013 | 0.009 | |
| 15 | 0.002 | 0.009 | |
| 16 | -0.035 | 0.013 | |
| 17 | -0.002 | 0.002 | |
| 18 | -0.088 | 0.003 | |
| 19 | 0.004 | 0.014 | |
| 20 | 0.100 | 0.001 | |
| 21 | -0.016 | 0.003 | |
| 22 | 0.042 | 0.017 | |
| 24 | 0.027 | 0.007 | |
| 25 | -0.023 | 0.012 | |
| 26 | -0.002 | 0.009 | |
| 27 | 0.018 | 0.002 | |
| 28 | 0.014 | 0.018 | |
| 29 | 0.006 | 0.001 | |
| 30 | -0.020 | 0.004 | |
| 31 | 0.050 | 0.018 | |

| | | |
|---|---|---|
| 32 | 0.001 | 0.009 |
| 33 | -0.061 | 0.007 |
| 34 | -0.119 | 0.003 |
| 35 | -0.003 | 0.006 |
| 36 | -0.117 | 0.006 |
| 37 | -0.081 | 0.030 |
| 38 | 0.017 | 0.012 |
| 39 | -0.059 | 0.004 |
| 40 | 0.010 | 0.008 |
| 42 | 0.008 | 0.014 |
| 43 | 0.021 | 0.004 |
| 44 | -0.006 | 0.001 |
| 45 | -0.066 | 0.003 |

---

entity 1: CCB-1 Identity 2: CCB 11:43 AM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -14.035 | -0.912 | -41.891 | -5.314 | 1217.391 | -11.489 | -1.100 | -68.680 |
| D. | 3.302 | 0.184 | 19.320 | 9.043 | 680.890 | 3.981 | 3.867 | 6.914 |
| R.S.D. | 23.528 | 20.217 | 46.120 | 170.166 | 55.930 | 34.648 | 351.568 | 10.067 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -29.169 | -43.796 | -5.647 | -2.444 | 2.712 | 5.248 | 6.792 | -1.973 |
| | 9.272 | 0.314 | 0.815 | 0.924 | 2.063 | 3.175 | 7.058 | 0.164 |
| | 31.787 | 0.716 | 14.435 | 37.807 | 70.838 | 60.502 | 103.915 | 8.296 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -5.556 | -32.902 | -10.324 | -79.761 | -103.484 | -123.984 | -2.114 | 48.564 |
| D. | 4.729 | 0.097 | 1.107 | 7.472 | 18.541 | 35.280 | 0.553 | 16.017 |
| R.S.D. | 85.116 | 0.295 | 10.726 | 9.367 | 17.917 | 28.455 | 26.175 | 32.982 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -7.027 | -3.798 | -39.133 | -48.236 | -1.688 | -11.317 | -7.189 | 3.018 |
| D. | 20.295 | 0.127 | 5.214 | 11.354 | 2.813 | 19.087 | 0.971 | 10.612 |
| R.S.D. | 288.835 | 3.331 | 13.323 | 23.538 | 166.656 | 168.654 | 13.503 | 351.626 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -5.872 | -0.462 | 5.237 | -154.219 | 0.358 | 3.682 | 2.087 | 0.249 |
| D. | 0.817 | 1.259 | 2.288 | 24.168 | 0.780 | 75.833 | 2.779 | 0.215 |
| R.S.D. | 13.910 | 272.417 | 43.685 | 15.671 | 217.857 | 2059.875 | 133.185 | 86.595 |

| | Tl (ppb) |
|---|---|
| an | -36.802 |
| D. | 22.805 |
| R.S.D | 61.425 |

---

orrected Counts Statistics 11:44 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Pe egrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|---|
| | 1 | 4.509 | 0.036 | |
| | 2 | 48.671 | 0.413 | |
| | 3 | 0.586 | 0.010 | |
| | 5 | 1.172 | 0.027 | |
| | 6 | 6.273 | 0.077 | |
| | 7 | 4.276 | 0.074 | |
| | 8 | 1.871 | 0.013 | |
| | 9 | 3.286 | 0.022 | |
| | 10 | 5.915 | 0.049 | |
| | 11 | 22.416 | 0.139 | |
| | 12 | 4.204 | 0.033 | |
| | 14 | 18.975 | 0.213 | |
| | 15 | 8.289 | 0.089 | |
| | 16 | 4.091 | 0.047 | |
| | 17 | 0.245 | 0.002 | |
| | 18 | 15.377 | 0.139 | |
| | 19 | 3.187 | 0.048 | |
| | 20 | 12.413 | 0.111 | |
| | 21 | 2.430 | 0.027 | |
| | 22 | 2.393 | 0.118 | |
| | 24 | 0.398 | 0.012 | |
| | 25 | 0.263 | 0.015 | |
| | 26 | 32.086 | 0.276 | |
| | 27 | 0.311 | 0.008 | |
| | 28 | 0.966 | 0.007 | |
| | 29 | 4.715 | 0.035 | |
| | 30 | 0.800 | 0.013 | |
| | 31 | 4.938 | 0.034 | |
| | 32 | 6.295 | 0.029 | |
| | 33 | 0.343 | 0.006 | |
| | 34 | 1.073 | 0.260 | |
| | 35 | 0.362 | 0.007 | |
| | 36 | 7.077 | 0.057 | |
| | 37 | 45.646 | 0.292 | |
| | 38 | 7.170 | 0.057 | |
| | 39 | 0.120 | 0.007 | |
| | 40 | 9.754 | 0.084 | |
| | 42 | 0.159 | 0.006 | |
| | 43 | 2.844 | 0.016 | |
| | 44 | 10.407 | 0.082 | |
| | 45 | 0.086 | 0.011 | |

dentity 1: R939 Dig. STD 10-50 Identity 2: 1B48AA,2R48AR,3B48AR 11:46 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Pe egrations : 3 Off-Peak Integrations : 1

orrected Counts Statistics 11:44 AM January 23, 1992
ask name : ALL_SIM
eight : 1.0000 Solution Volume : 1.00
egrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 4.509 | 0.036 | |
| 2 | 48.671 | 0.413 | |
| 3 | 0.586 | 0.010 | |
| 5 | 1.172 | 0.027 | |
| 6 | 6.273 | 0.077 | |
| 7 | 4.276 | 0.074 | |
| 8 | 1.871 | 0.013 | |
| 9 | 3.286 | 0.022 | |
| 10 | 5.915 | 0.049 | |
| 11 | 22.416 | 0.139 | |
| 12 | 4.204 | 0.033 | |
| 14 | 18.975 | 0.213 | |
| 15 | 8.289 | 0.089 | |
| 16 | 4.091 | 0.047 | |
| 17 | 0.245 | 0.002 | |
| 18 | 15.377 | 0.139 | |
| 19 | 3.187 | 0.048 | |
| 20 | 12.413 | 0.111 | |
| 21 | 2.430 | 0.027 | |
| 22 | 2.393 | 0.118 | |
| 24 | 0.398 | 0.012 | |
| 25 | 0.263 | 0.015 | |
| 26 | 32.086 | 0.276 | |
| 27 | 0.311 | 0.008 | |
| 28 | 0.966 | 0.007 | |
| 29 | 4.715 | 0.035 | |
| 30 | 0.800 | 0.013 | |
| 31 | 4.938 | 0.034 | |
| 32 | 6.295 | 0.029 | |
| 33 | 0.343 | 0.006 | |
| 34 | 1.073 | 0.260 | |
| 35 | 0.562 | 0.007 | |
| 36 | 7.077 | 0.057 | |
| 37 | 45.646 | 0.292 | |
| 38 | 7.170 | 0.057 | |
| 39 | 0.120 | 0.007 | |
| 40 | 9.754 | 0.084 | |
| 42 | 0.159 | 0.006 | |
| 43 | 2.844 | 0.016 | |
| 44 | 10.407 | 0.082 | |
| 45 | 0.086 | 0.011 | |

dentity 1: R939 Dig. STD 10-50 Identity 2: 1B48AA,2B48AB,3B48AB 11:46 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
egrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 2044.698 | 1758.164 | 835.353 | 737.584 | 308978.251 | 1011.201 | 1154.523 | 1159.936 |
| .D. | 16.392 | 16.611 | 10.100 | 17.072 | 5042.026 | 17.567 | 8.409 | 9.189 |
| R.S.D. | 0.802 | 0.848 | 1.590 | 2.315 | 1.632 | 1.737 | 0.728 | 0.792 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 8337.551 | 1954.909 | 959.897 | 1931.122 | 1959.059 | 989.007 | 1014.697 | 1003.758 |
| .D. | 69.040 | 12.440 | 7.689 | 21.639 | 20.904 | 11.136 | 8.483 | 9.058 |
| R.S.D. | 0.828 | 0.636 | 0.801 | 1.121 | 1.067 | 1.126 | 0.836 | 0.902 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 1035.132 | 2049.103 | 1013.407 | 961.502 | 944.566 | 728.752 | 1955.035 | 2085.352 |
| .D. | 15.766 | 18.750 | 11.393 | 53.132 | 33.135 | 45.848 | 16.815 | 53.873 |
| R.S.D. | 1.523 | 0.915 | 1.124 | 5.526 | 3.508 | 6.291 | 0.860 | 2.583 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 1073.504 | 1028.067 | 1019.462 | 2974.931 | 1990.168 | 933.342 | 371.655 | 1026.281 |
| .D. | 7.948 | 7.679 | 16.474 | 21.029 | 9.271 | 20.539 | 82.557 | 12.059 |
| R.S.D. | 0.740 | 0.747 | 1.616 | 0.707 | 0.466 | 2.201 | 22.213 | 1.175 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 968.880 | 1920.832 | 1427.876 | 929.320 | 977.978 | 838.447 | 1963.839 | 1942.839 |
| .D. | 7.764 | 12.251 | 11.236 | 42.866 | 8.428 | 35.463 | 10.994 | 15.307 |
| R.S.D. | 0.801 | 0.638 | 0.787 | 4.613 | 0.862 | 4.230 | 0.560 | 0.788 |

| | Tl (ppb) |
|---|---|
| ean | 1032.098 |
| .D. | 77.461 |
| R.S.D. | 7.505 |

---

orrected Counts Statistics 11:51 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.016 | 0.001 | |
| r | 2 | 0.017 | 0.002 | |
| i | 3 | -0.034 | 0.016 | |
| a | 5 | -0.026 | 0.016 | |
| a | 6 | 1.558 | 0.009 | |
| n | 7 | -0.032 | 0.006 | |
| i | 8 | 0.946 | 0.018 | |
| l | 9 | 0.733 | 0.024 | |
| | 10 | -0.012 | 0.018 | |
| n | 11 | 0.211 | 0.006 | |
| u | 12 | 0.229 | 0.007 | |
| i | 14 | -0.012 | 0.003 | |

| | | | |
|---|---|---|---|
| | 15 | -0.003 | 0.002 |
| | 16 | -0.067 | 0.018 |
| | 17 | -0.005 | 0.000 |
| | 18 | -0.092 | 0.007 |
| | 19 | 0.156 | 0.004 |
| | 20 | 1.203 | 0.172 |
| | 21 | 0.000 | 0.007 |
| | 22 | 0.044 | 0.010 |
| | 24 | 0.029 | 0.003 |
| | 25 | -0.034 | 0.002 |
| | 26 | -0.000 | 0.005 |
| | 27 | 0.015 | 0.003 |
| | 28 | 0.051 | 0.007 |
| | 29 | 0.093 | 0.002 |
| | 30 | -0.019 | 0.007 |
| | 31 | 1.944 | 0.022 |
| | 32 | -0.000 | 0.006 |
| | 33 | -0.047 | 0.007 |
| | 34 | -0.110 | 0.006 |
| | 35 | -0.002 | 0.009 |
| | 36 | -0.091 | 0.008 |
| | 37 | -0.117 | 0.020 |
| | 38 | 3.338 | 0.030 |
| | 39 | -0.064 | 0.006 |
| | 40 | 0.009 | 0.005 |
| | 42 | 0.008 | 0.014 |
| | 43 | 0.026 | 0.002 |
| | 44 | -0.006 | 0.001 |
| | 45 | -0.056 | 0.002 |

~~940~~ 1940 8-28-92

dentity 1: ~~1946~~ Dig Blank Identity 2: Direct 11:51 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -12.814 | -0.295 | -13.964 | -26.364 | 1456.522 | -5.823 | 544.263 | 99.696 |
| .D. | 0.264 | 0.061 | 17.145 | 9.902 | 554.667 | 1.423 | 12.098 | 9.842 |
| R.S.D. | 2.063 | 20.830 | 122.780 | 37.560 | 38.082 | 24.437 | 2.223 | 9.872 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Mi (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -37.216 | -27.607 | 37.292 | -2.342 | 1.731 | -2.223 | -5.433 | -2.211 |
| .D. | 25.918 | 0.492 | 1.580 | 0.256 | 0.491 | 4.200 | 0.000 | 0.455 |
| R.S.D. | 69.642 | 1.781 | 4.237 | 10.942 | 28.385 | 188.956 | 0.000 | 20.588 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 44.239 | 153.871 | -3.488 | -80.220 | -98.772 | -154.758 | -1.992 | 30.068 |
| .D. | 1.425 | 29.159 | 3.085 | 4.188 | 8.162 | 6.199 | 0.275 | 18.350 |
| R.S.D. | 3.221 | 18.950 | 88.458 | 5.221 | 8.264 | 4.006 | 13.804 | 61.028 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| | 34.440 | 15.121 | -37.410 | 1123.179 | -2.110 | 26.892 | -4.329 | 4.225 |

| | | |
|---|---|---|
| 15 | -0.003 | 0.002 |
| 16 | -0.067 | 0.018 |
| 17 | -0.005 | 0.000 |
| 18 | -0.092 | 0.007 |
| 19 | 0.156 | 0.004 |
| 20 | 1.203 | 0.172 |
| 21 | 0.000 | 0.007 |
| 22 | 0.044 | 0.010 |
| 24 | 0.029 | 0.003 |
| 25 | -0.034 | 0.002 |
| 26 | -0.000 | 0.005 |
| 27 | 0.015 | 0.003 |
| 28 | 0.051 | 0.007 |
| 29 | 0.093 | 0.002 |
| 30 | -0.019 | 0.007 |
| 31 | 1.944 | 0.022 |
| 32 | -0.000 | 0.006 |
| 33 | -0.047 | 0.007 |
| 34 | -0.110 | 0.006 |
| 35 | -0.002 | 0.009 |
| 36 | -0.091 | 0.008 |
| 37 | -0.117 | 0.020 |
| 38 | 3.338 | 0.030 |
| 39 | -0.064 | 0.006 |
| 40 | 0.009 | 0.005 |
| 42 | 0.008 | 0.014 |
| 43 | 0.026 | 0.002 |
| 44 | -0.006 | 0.001 |
| 45 | -0.056 | 0.002 |

940 8-28-92

dentity 1: ~~0946~~ Dio Blank Identity 2: Direct 11:51 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -12.814 | -0.295 | -13.964 | -26.364 | 1456.522 | -5.823 | 544.263 | 99.696 |
| .D. | 0.264 | 0.061 | 17.145 | 9.902 | 554.667 | 1.423 | 12.098 | 9.842 |
| R.S.D. | 2.063 | 20.830 | 122.780 | 37.560 | 38.082 | 24.437 | 2.223 | 9.872 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -37.216 | -27.607 | 37.292 | -2.342 | 1.731 | -2.223 | -5.433 | -2.211 |
| .D. | 25.918 | 0.492 | 1.580 | 0.256 | 0.491 | 4.200 | 0.000 | 0.455 |
| R.S.D. | 69.642 | 1.781 | 4.237 | 10.942 | 28.385 | 188.956 | 0.000 | 20.588 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 44.239 | 153.871 | -3.488 | -80.220 | -98.772 | -154.758 | -1.992 | 30.068 |
| .D. | 1.425 | 29.159 | 3.085 | 4.188 | 8.162 | 6.199 | 0.275 | 18.350 |
| R.S.D. | 3.221 | 18.950 | 88.458 | 5.221 | 8.264 | 4.006 | 13.804 | 61.028 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 34.440 | 15.121 | -37.410 | 1123.179 | -2.110 | 26.892 | -4.329 | 4.225 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| D. | 7.855 | 0.456 | 9.031 | 13.607 | 1.907 | 19.790 | 1.862 | 16.599 |
| R.S.D. | 22.398 | 3.017 | 24.139 | 1.211 | 90.417 | 73.592 | 43.007 | 392.839 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| | -2.349 | -1.975 | 665.812 | -186.444 | 0.193 | 1.843 | 5.561 | 0.249 |
| .D. | 1.035 | 0.829 | 6.040 | 34.884 | 0.459 | 76.499 | 1.390 | 0.215 |
| R.S.D. | 44.063 | 41.985 | 0.907 | 18.710 | 238.366 | 4150.516 | 24.990 | 86.595 |

| | Tl (ppb) |
|---|---|
| ean | 33.520 |
| .D. | 10.742 |
| R.S.D. | 32.046 |

---

orrected Counts Statistics 11:57 AM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| | 1 | 0.047 | 0.013 | |
| | 2 | 0.046 | 0.017 | |
| | 3 | -0.037 | 0.012 | |
| | 5 | 0.004 | 0.029 | |
| | 6 | 1.573 | 0.009 | |
| | 7 | 0.064 | 0.001 | |
| | 8 | 5.027 | 0.039 | |
| | 9 | 125.736 | 1.402 | |
| | 10 | 0.326 | 0.039 | |
| | 11 | 0.612 | 0.008 | |
| | 12 | 0.535 | 0.003 | |
| | 14 | 0.222 | 0.016 | |
| | 15 | 0.047 | 0.004 | |
| | 16 | 0.140 | 0.010 | |
| | 17 | -0.003 | 0.002 | |
| | 18 | -0.053 | 0.013 | |
| | 19 | 0.948 | 0.027 | |
| | 20 | 1.600 | 0.022 | |
| | 21 | 2.434 | 0.023 | |
| | 22 | 0.166 | 0.048 | |
| | 24 | 0.063 | 0.018 | |
| | 25 | 0.013 | 0.024 | |
| | 26 | 0.053 | 0.020 | |
| | 27 | 1.447 | 0.035 | |
| | 28 | 27.371 | 0.340 | |
| | 29 | 0.197 | 0.003 | |
| | 30 | 0.002 | 0.012 | |
| | 31 | -20.807 | 0.000 | |
| | 32 | 0.267 | 0.008 | |
| | 33 | 0.042 | 0.012 | |
| | 34 | -0.094 | 0.011 | |
| | 35 | -0.015 | 0.003 | |
| | 36 | -0.075 | 0.014 | |

| | | | |
|---|---|---|---|
| 3 | 37 | 0.532 | 0.064 |
| | 38 | 3.655 | 0.034 |
| | 39 | 30.384 | 0.442 |
| n | 40 | 0.051 | 0.006 |
| b | 42 | 0.013 | 0.019 |
| | 43 | 0.033 | 0.004 |
| e | 44 | -0.003 | 0.001 |
| l | 45 | -0.058 | 0.009 |

---

dentity 1: R941 Sam #3AP891-6 Identity 2: 10ml-50ml 11:58 AM January 23, 1992
ask name : ALL_SIM
aaple Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 1.382 | 0.872 | -17.106 | -7.441 | 2434.783 | 16.998 | 3237.416 | 52025.976 |
| .D. | 6.098 | 0.664 | 12.078 | 18.622 | 562.283 | 0.136 | 25.598 | 582.580 |
| R.S.D. | 441.300 | 76.165 | 70.608 | 250.279 | 23.094 | 0.802 | 0.791 | 1.120 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 434.633 | 8.194 | 108.315 | 21.486 | 13.456 | 47.052 | 4.076 | 0.303 |
| .D. | 55.124 | 0.670 | 0.746 | 1.579 | 0.944 | 2.478 | 6.225 | 0.849 |
| R.S.D. | 12.683 | 8.178 | 0.689 | 7.347 | 7.018 | 5.266 | 152.733 | 279.696 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 303.131 | 219.095 | 1014.941 | -26.009 | -0.753 | -15.779 | 1.261 | 9964.324 |
| .D. | 8.796 | 3.735 | 9.602 | 21.584 | 52.162 | 72.277 | 1.233 | 242.486 |
| R.S.D. | 2.902 | 1.705 | 0.946 | 82.986 | 6931.144 | 458.064 | 97.855 | 2.434 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 31577.026 | 37.912 | -9.935 | -12948.031 | 82.594 | 57.603 | 0.967 | -19.319 |
| .D. | 392.557 | 0.633 | 15.855 | 0.000 | 2.375 | 34.598 | 3.368 | 5.433 |
| R.S.D. | 1.243 | 1.669 | 159.589 | 0.000 | 2.876 | 60.064 | 348.390 | 28.124 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -0.181 | 25.322 | 728.721 | 183783.710 | 4.333 | 29.423 | 10.656 | 0.808 |
| .D. | 1.845 | 2.677 | 6.774 | 2670.228 | 0.558 | 103.540 | 2.631 | 0.108 |
| R.S.D. | 1021.029 | 10.573 | 0.930 | 1.453 | 12.873 | 351.895 | 24.686 | 13.323 |

| | Tl (ppb) |
|---|---|
| ean | 19.456 |
| .D. | 63.809 |
| R.S.D. | 327.965 |

---

orrected Counts Statistics 12:05 PM January 23, 1992
ask : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00

| | | |
|---|---|---|
| 31 | 0.831 | 0.007 |
| 32 | 1.501 | 0.018 |
| 33 | 0.156 | 0.009 |
| 34 | 1.188 | 0.007 |
| 35 | 0.259 | 0.007 |
| 36 | 3.488 | 0.042 |
| 37 | 11.291 | 0.091 |
| 38 | 2.261 | 0.032 |
| 39 | 0.768 | 0.014 |
| 40 | 4.800 | 0.052 |
| 42 | 0.085 | 0.012 |
| 43 | 0.715 | 0.006 |
| 44 | 2.490 | 0.027 |
| 45 | 0.011 | 0.002 |

---

Identity 1: CCV-2 Identity 2: CCV 12:56 PM January 23, 1992
Task name : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -18.004 | -1.033 | -276.483 | -30.191 | -1195.652 | -9.207 | 364.968 | 426.478 |
| S.D. | 2.065 | 0.081 | 3.200 | 3.551 | 2208.743 | 2.008 | 3.387 | 5.036 |
| R.S.D. | 11.469 | 7.792 | 1.157 | 11.763 | 184.731 | 21.807 | 0.928 | 1.181 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 13.998 | 446.587 | 478.363 | -3.191 | 482.997 | 476.781 | 6.792 | -2.536 |
| S.D. | 19.585 | 3.445 | 3.371 | 0.655 | 4.878 | 4.818 | 4.075 | 0.516 |
| R.S.D. | 139.910 | 0.771 | 0.705 | 20.518 | 1.010 | 1.011 | 59.995 | 20.352 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 470.495 | 446.905 | 497.217 | -75.308 | -136.471 | -214.320 | 486.776 | -48.536 |
| S.D. | 1.308 | 4.053 | 6.297 | 5.592 | 23.713 | 24.976 | 3.570 | 32.777 |
| R.S.D. | 0.278 | 0.907 | 1.266 | 7.426 | 17.376 | 11.654 | 0.733 | 67.531 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -7.001 | 490.220 | 458.128 | 435.009 | 472.885 | 505.609 | 503.620 | 476.918 |
| S.D. | 2.884 | 3.848 | 18.606 | 4.559 | 5.575 | 23.939 | 2.067 | 16.599 |
| R.S.D. | 41.193 | 0.785 | 4.061 | 1.048 | 1.179 | 4.735 | 0.410 | 3.480 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 482.611 | 476.931 | 451.564 | 4840.536 | 481.393 | 426.580 | 484.534 | 466.013 |
| S.D. | 5.693 | 3.829 | 6.453 | 82.476 | 5.238 | 68.527 | 4.012 | 4.993 |
| R.S.D. | 1.180 | 0.803 | 1.429 | 1.704 | 1.088 | 16.064 | 0.828 | 1.071 |

| | Tl (ppb) |
|---|---|
| Mean | 502.336 |
| S.D. | 14.064 |
| R.S.D. | 2.800 |

orrected Counts Statistics 12:58 PM January 23, 1992
ask name : ALL_SIM
aapl ht : 1.0000 Solution Volume : 1.00
n-Pe. .tegrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.008 | 0.001 | |
| r | 2 | -0.008 | 0.003 | |
| i | 3 | -0.055 | 0.031 | |
| a | 5 | 0.007 | 0.007 | |
| q | 6 | 1.514 | 0.007 | |
| n | 7 | 0.015 | 0.006 | |
| i | 8 | 0.086 | 0.005 | |
| l | 9 | 0.312 | 0.013 | |
| | 10 | -0.019 | 0.045 | |
| n | 11 | 0.050 | 0.004 | |
| u | 12 | 0.047 | 0.009 | |
| i | 14 | -0.015 | 0.008 | |
| o | 15 | -0.005 | 0.017 | |
| i | 16 | -0.106 | 0.006 | |
| a | 17 | -0.003 | 0.001 | |
| u | 18 | -0.091 | 0.003 | |
| e | 19 | -0.009 | 0.007 | |
| a | 20 | 0.203 | 0.001 | |
| r | 21 | -0.019 | 0.001 | |
| d | 22 | -0.010 | 0.076 | |
| e | 24 | 0.015 | 0.005 | |
| m | 25 | -0.031 | 0.005 | |
| a | 26 | -0.017 | 0.005 | |
| | 27 | 0.020 | 0.002 | |
| | 28 | 0.024 | 0.009 | |
| g | 29 | 0.007 | 0.000 | |
| s | 30 | -0.013 | 0.009 | |
| a | 31 | 0.052 | 0.010 | |
| o | 32 | 0.006 | 0.005 | |
| e | 33 | -0.050 | 0.010 | |
| y | 34 | -0.122 | 0.004 | |
| b | 35 | -0.005 | 0.006 | |
| i | 36 | -0.114 | 0.003 | |
| d | 37 | -0.084 | 0.010 | |
| | 38 | 0.006 | 0.003 | |
| | 39 | -0.071 | 0.004 | |
| n | 40 | -0.004 | 0.004 | |
| b | 42 | 0.019 | 0.009 | |
| | 43 | 0.022 | 0.003 | |
| e | 44 | -0.008 | 0.001 | |
| i | 45 | -0.058 | 0.004 | |

dentity 1: CCB-2 Identity 2: CCV 12:59 PM January 23, 1992
ask name : ALL_SIM
aapl ht : 1.0000 Solution Volume : 1.00
n-Peak .ntegrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppb) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -16.478 | -1.302 | -36.306 | -5.527 | -1413.043 | 5.272 | -23.099 | -75.187 |
| | 0.529 | 0.123 | 32.183 | 4.614 | 443.926 | 1.300 | 3.322 | 5.260 |
| | 3.209 | 9.449 | 88.644 | 83.489 | 31.416 | 24.661 | 14.381 | 6.996 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -47.072 | -41.751 | -4.873 | -2.614 | 1.180 | -11.522 | 4.076 | -2.168 |
| .D. | 63.110 | 0.322 | 1.983 | 0.769 | 3.943 | 1.514 | 4.706 | 0.209 |
| R.S.D. | 134.070 | 0.767 | 40.695 | 29.415 | 334.043 | 13.143 | 115.455 | 9.644 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -9.806 | -15.468 | -11.719 | -103.260 | -138.356 | -147.809 | -2.989 | 64.747 |
| .D. | 2.225 | 0.097 | 0.483 | 34.223 | 12.750 | 14.990 | 0.275 | 13.871 |
| R.S.D. | 22.691 | 0.629 | 4.124 | 33.142 | 9.215 | 10.141 | 9.203 | 21.424 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 1.751 | -3.652 | -29.244 | -46.999 | 0.000 | 20.018 | -8.142 | -1.812 |
| .D. | 10.477 | 0.000 | 10.971 | 6.277 | 1.624 | 28.756 | 1.323 | 9.975 |
| R.S.D. | 229.501 | 0.000 | 37.515 | 13.355 | 7215889.785 | 143.649 | 16.247 | 550.604 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -5.510 | -0.560 | 3.116 | -224.710 | -1.027 | 66.197 | 3.013 | -0.062 |
| .D. | 0.359 | 0.437 | 0.526 | 21.219 | 0.438 | 49.747 | 1.749 | 0.187 |
| R.S.D. | 6.506 | 78.085 | 16.888 | 9.443 | 42.635 | 75.149 | 58.031 | 300.105 |

| | Tl (ppb) |
|---|---|
| ean | 17.112 |
| .D. | 28.129 |
| R.S.D. | 164.382 |

orrected Counts Statistics 1:00 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| | 1 | -0.033 | 0.007 | |
| | 2 | 241.212 | 1.521 | |
| | 3 | -0.083 | 0.013 | |
| | 5 | 0.005 | 0.005 | |
| | 6 | 1.526 | 0.010 | |
| | 7 | 20.574 | 0.172 | |
| | 8 | 0.074 | 0.003 | |
| | 9 | 0.141 | 0.011 | |
| | 10 | 0.613 | 0.023 | |
| | 11 | 108.143 | 0.620 | |
| | 12 | 20.565 | 0.124 | |

| | | |
|---|---|---|
| 14 | 95.776 | 0.482 |
| 15 | 40.264 | 0.230 |
| 16 | 19.847 | 0.128 |
| 17 | -0.006 | 0.001 |
| 18 | -0.072 | 0.004 |
| 19 | 14.597 | 0.130 |
| 20 | 55.633 | 0.346 |
| 21 | 11.802 | 0.068 |
| 22 | 0.273 | 0.018 |
| 24 | 0.069 | 0.004 |
| 25 | -0.345 | 0.003 |
| 26 | 160.126 | 1.065 |
| 27 | 0.171 | 0.007 |
| 28 | 0.122 | 0.008 |
| 29 | 22.309 | 0.137 |
| 30 | -0.093 | 0.008 |
| 31 | 15.889 | 0.058 |
| 32 | -0.009 | 0.006 |
| 33 | 0.409 | 0.012 |
| 34 | 1.063 | 0.005 |
| 35 | 0.014 | 0.006 |
| 36 | -0.116 | 0.005 |
| 37 | 220.579 | 1.079 |
| 38 | 23.718 | 0.124 |
| 39 | 0.792 | 0.005 |
| 40 | 47.099 | 0.253 |
| 42 | 0.856 | 0.006 |
| 43 | 0.023 | 0.003 |
| 44 | -0.008 | 0.000 |
| 45 | -0.065 | 0.002 |

dentity 1: SST1 STD 1848AC Identity 2: Direct 1:01 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -35.100 | 9708.517 | -64.932 | -6.590 | -630.435 | 4858.878 | -31.459 | -146.359 |
| .D. | 3.302 | 61.220 | 13.343 | 3.375 | 653.260 | 40.495 | 2.016 | 4.396 |
| R.S.D. | 9.408 | 0.631 | 20.550 | 51.217 | 103.621 | 0.833 | 6.409 | 3.004 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 821.203 | 9808.592 | 4757.472 | 9772.276 | 9507.369 | 4745.855 | -10.866 | -0.889 |
| .D. | 32.749 | 55.320 | 28.677 | 49.053 | 54.278 | 30.554 | 2.353 | 0.246 |
| R.S.D. | 3.988 | 0.576 | 0.603 | 0.502 | 0.571 | 0.644 | 21.652 | 27.701 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 4764.765 | 9356.357 | 4935.892 | -44.466 | 16.212 | -1081.947 | 9764.398 | 1112.040 |
| .D. | 42.465 | 58.534 | 28.439 | 8.005 | 10.705 | 10.317 | 64.984 | 48.550 |
| R.S.D. | 0.891 | 0.626 | 0.576 | 18.003 | 66.028 | 0.954 | 0.666 | 4.366 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ean | 34.942 | 4883.575 | -15.328 | 9748.194 | -4.958 | 243.894 | 368.372 | 33.203 |
| .D. | 9.107 | 30.107 | 9.683 | 35.585 | 1.743 | 39.800 | 1.433 | 11.016 |
| R.S.D. | 25.062 | 0.616 | 63.172 | 0.365 | 35.155 | 16.319 | 0.389 | 33.179 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -5.736 | 9270.923 | 4718.687 | 4989.574 | 4725.362 | 4683.146 | 3.245 | -0.062 |
| .D. | 0.626 | 45.319 | 24.701 | 31.005 | 25.337 | 35.032 | 1.749 | 0.000 |
| R.S.D. | 10.911 | 0.489 | 0.523 | 0.621 | 0.536 | 0.748 | 53.889 | 0.000 |

| | Tl (ppb) |
|---|---|
| ean | -34.459 |
| .D. | 14.639 |
| R.S.D. | 42.483 |

---

rrected Counts Statistics 1:03 PM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte | Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|---|
| | 1 | -0.132 | 0.006 | |
| | 2 | 0.024 | 0.014 | |
| | 3 | 4.739 | 0.043 | |
| | 5 | -0.019 | 0.003 | |
| | 6 | 1.539 | 0.017 | |
| | 7 | -0.049 | 0.023 | |
| | 8 | 0.014 | 0.004 | |
| | 9 | 1.160 | 0.022 | |
| | 10 | -0.032 | 0.019 | |
| | 11 | 0.227 | 0.006 | |
| | 12 | 0.103 | 0.003 | |
| | 14 | -0.001 | 0.018 | |
| | 15 | -0.010 | 0.005 | |
| | 16 | -0.070 | 0.011 | |
| | 17 | 1.243 | 0.002 | |
| | 18 | 76.403 | 0.183 | |
| | 19 | 0.020 | 0.006 | |
| | 20 | 0.535 | 0.001 | |
| | 21 | -0.007 | 0.010 | |
| | 22 | 11.620 | 0.061 | |
| | 24 | 1.814 | 0.007 | |
| | 25 | 1.751 | 0.010 | |
| | 26 | -0.406 | 0.011 | |
| | 27 | 0.023 | 0.003 | |
| | 28 | 0.013 | 0.009 | |
| | 29 | 0.012 | 0.001 | |
| | 30 | 0.079 | 0.002 | |
| | 31 | 0.081 | 0.006 | |
| | 32 | 0.009 | 0.004 | |
| | 33 | -0.053 | 0.005 | |
| | 34 | 15.903 | 0.068 | |
| | 35 | 2.600 | 0.028 | |

| | | |
|---|---|---|
| 36 | -0.134 | 0.002 |
| 37 | -0.087 | 0.028 |
| 38 | -0.003 | 0.011 |
| 39 | -0.049 | 0.009 |
| 40 | -0.007 | 0.002 |
| 42 | -0.003 | 0.006 |
| 43 | 0.058 | 0.001 |
| 44 | -0.008 | 0.001 |
| 45 | -0.047 | 0.004 |

---

dentity 1: SST2 SID 2B48AD Identity 2: Direct 1:04 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Ni (ppb) | Ta (ppb) | Mg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -80.589 | -0.027 | 4984.378 | -21.899 | 217.391 | -9.837 | -70.838 | 277.072 |
| .D. | 2.604 | 0.545 | 45.122 | 1.914 | 1109.335 | 5.452 | 2.877 | 9.142 |
| R.S.D. | 3.231 | 2029.459 | 0.905 | 8.738 | 510.294 | 55.426 | 4.061 | 3.299 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Mi (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -65.950 | -26.179 | 8.202 | -1.222 | -0.079 | -2.938 | 5078.915 | 4972.271 |
| .D. | 26.177 | 0.523 | 0.746 | 1.848 | 1.165 | 2.504 | 8.483 | 11.910 |
| R.S.D. | 39.692 | 1.998 | 9.097 | 151.230 | 1481.415 | 85.239 | 0.167 | 0.240 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -0.108 | 40.767 | -6.557 | 5123.614 | 4949.211 | 5161.193 | -26.735 | 83.242 |
| .D. | 1.800 | 0.174 | 3.993 | 27.453 | 18.541 | 29.831 | 0.679 | 22.295 |
| R.S.D. | 1660.344 | 0.426 | 60.891 | 0.536 | 0.375 | 0.578 | 2.540 | 26.784 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -3.827 | -2.484 | 88.576 | -29.269 | 0.844 | 10.132 | 5083.525 | 4717.270 |
| .D. | 9.866 | 0.127 | 2.980 | 3.517 | 1.141 | 12.818 | 21.569 | 51.364 |
| R.S.D. | 111.772 | 5.094 | 3.365 | 12.016 | 135.295 | 126.506 | 0.424 | 1.089 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -8.266 | -0.686 | 1.392 | -91.785 | -1.402 | -58.834 | 27.796 | -0.124 |
| .D. | 0.282 | 1.163 | 2.182 | 54.824 | 0.153 | 31.847 | 0.695 | 0.108 |
| R.S.D. | 3.413 | 169.526 | 156.710 | 59.731 | 10.942 | 54.131 | 2.500 | 86.618 |

| | Tl (ppb) |
|---|---|
| ean | 94.467 |
| .D. | 30.653 |
| R.S.D. | 32.448 |

---

orre ounts Statistics 1:05 PM January 23, 1992
ask name : ALL_SIM

-Peak Integrations : 3  Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | 3R.S.D. Kpulses |
|---|---|---|---|
| 1 | 22.899 | 0.145 | |
| 2 | 0.010 | 0.001 | |
| 3 | -1.822 | 0.020 | |
| 5 | 15.716 | 0.055 | |
| 6 | 26.689 | 0.097 | |
| 7 | 0.070 | 0.046 | |
| 8 | 12.556 | 0.077 | |
| 9 | 12.037 | 0.051 | |
| 10 | 31.069 | 0.171 | |
| 11 | 0.177 | 0.015 | |
| 12 | 0.056 | 0.005 | |
| 14 | -0.020 | 0.006 | |
| 15 | -0.061 | 0.017 | |
| 16 | 0.287 | 0.021 | |
| 17 | -0.009 | 0.001 | |
| 18 | -0.158 | 0.004 | |
| 19 | 0.015 | 0.011 | |
| 20 | 0.152 | 0.003 | |
| 21 | 0.015 | 0.003 | |
| 22 | -0.127 | 0.080 | |
| 24 | 0.031 | 0.004 | |
| 25 | -0.096 | 0.004 | |
| 26 | -0.006 | 0.004 | |
| 27 | 1.497 | 0.008 | |
| 28 | 4.601 | 0.053 | |
| 29 | 0.012 | 0.000 | |
| 30 | 3.958 | 0.014 | |
| 31 | 0.128 | 0.014 | |
| 32 | 31.597 | 0.100 | |
| 33 | 1.491 | 0.014 | |
| 34 | -0.081 | 0.022 | |
| 35 | -0.075 | 0.005 | |
| 36 | 36.461 | 0.178 | |
| 37 | -0.230 | 0.069 | |
| 38 | 0.030 | 0.013 | |
| 39 | -0.058 | 0.012 | |
| 40 | 0.010 | 0.005 | |
| 42 | 0.008 | 0.011 | |
| 43 | 14.204 | 0.086 | |
| 44 | 53.137 | 0.301 | |
| 45 | 0.654 | 0.004 | |

entity 1: SS73 STD 3B48AD Identity 2: Direct 1:06 PM January 23, 1992
sk name : ALL_SIM
aple Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppb) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|
| 10466.317 | -0.604 | -1886.509 | 10014.671 | 1640434.783 | 18.414 | 8206.837 | 4795.381 |
| 66.292 | 0.023 | 21.258 | 35.385 | 6354.709 | 10.845 | 50.648 | 21.011 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R.S.D. | 0.633 | 3.849 | 1.127 | 0.353 | 0.387 | 58.895 | 0.617 | 0.438 |

| | Y (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 43708.553 | -30.642 | -2.861 | -3.157 | -12.118 | 82.102 | -20.375 | -6.503 |
| .D. | 242.200 | 1.337 | 1.097 | 0.579 | 4.064 | 4.979 | 4.706 | 0.269 |
| R.S.D. | 0.552 | 4.364 | 38.332 | 18.343 | 33.535 | 6.064 | 23.095 | 4.000 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Na (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -1.961 | -24.013 | 2.651 | -156.085 | -92.174 | -341.387 | -2.338 | 10306.486 |
| .D. | 3.645 | 0.471 | 1.256 | 36.954 | 10.195 | 10.459 | 0.220 | 52.056 |
| R.S.D. | 185.892 | 2.043 | 47.365 | 23.099 | 11.060 | 3.064 | 9.406 | 0.505 |

| | S (ppb) | Mg (ppb) | As (ppb) | Ma (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 5288.639 | -2.557 | 5092.807 | 0.006 | 9996.833 | 4500.392 | 4.991 | -128.587 |
| .D. | 61.746 | 0.000 | 18.059 | 8.592 | 31.639 | 41.978 | 6.837 | 8.559 |
| R.S.D. | 1.168 | 0.000 | 0.355 | 150984.585 | 0.316 | 0.933 | 136.976 | 6.656 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 4950.452 | -6.694 | 7.955 | -148.177 | 0.385 | 5.521 | 9856.937 | 9914.370 |
| .D. | 24.118 | 2.703 | 2.502 | 73.256 | 0.460 | 60.509 | 59.841 | 56.231 |
| R.S.D. | 0.487 | 43.367 | 31.458 | 49.438 | 119.400 | 1096.084 | 0.607 | 0.567 |

| | Tl (ppb) |
|---|---|
| ean | 5024.063 |
| .D. | 30.653 |
| R.S | 0.610 |

---

orrected Counts Statistics 1:10 PM January 23, 1992
ag Name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.009 | 0.006 | |
| r | 2 | 0.010 | 0.002 | |
| i | 3 | -0.248 | 0.012 | |
| a | 5 | -0.001 | 0.008 | |
| a | 6 | 1.526 | 0.016 | |
| n | 7 | 0.006 | 0.015 | |
| i | 8 | 0.719 | 0.002 | |
| l | 9 | 1.551 | 0.011 | |
| | 10 | 0.074 | 0.022 | |
| n | 11 | 5.751 | 0.035 | |
| u | 12 | 2.218 | 0.015 | |
| i | 14 | -0.002 | 0.008 | |
| o | 15 | 2.154 | 0.020 | |

| | | |
|---|---|---|
| 16 | 2.022 | 0.009 |
| 17 | -0.005 | 0.001 |
| 18 | -0.085 | 0.007 |
| 19 | 1.563 | 0.003 |
| 20 | 3.076 | 0.019 |
| 21 | 1.242 | 0.006 |
| 22 | 0.023 | 0.031 |
| 24 | 0.026 | 0.002 |
| 25 | -0.038 | 0.003 |
| 26 | 8.349 | 0.051 |
| 27 | 0.011 | 0.003 |
| 28 | 0.012 | 0.018 |
| 29 | 2.370 | 0.016 |
| 30 | 0.401 | 0.007 |
| 31 | 0.880 | 0.029 |
| 32 | 1.560 | 0.007 |
| 33 | 0.155 | 0.005 |
| 34 | 1.556 | 0.004 |
| 35 | 0.255 | 0.006 |
| 36 | 3.653 | 0.025 |
| 37 | 11.993 | 0.167 |
| 38 | 2.394 | 0.021 |
| 39 | 0.794 | 0.009 |
| 40 | 5.030 | 0.040 |
| 42 | 0.085 | 0.004 |
| 43 | 0.749 | 0.004 |
| 44 | 2.630 | 0.023 |
| 45 | 0.010 | 0.003 |

CCV-3 Identity 2: CCV 1:10 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -15.714 | -0.577 | -238.083 | -10.205 | -630.435 | 3.148 | 394.447 | 439.355 |
| .D. | 2.604 | 0.061 | 12.741 | 5.311 | 1044.157 | 3.504 | 1.143 | 4.569 |
| R.S.D. | 16.570 | 10.657 | 5.351 | 52.048 | 165.625 | 111.327 | 0.290 | 1.040 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 81.770 | 467.032 | 499.020 | -1.290 | 510.775 | 495.856 | -5.433 | -1.756 |
| .D. | 31.287 | 3.127 | 3.419 | 0.808 | 4.770 | 2.137 | 4.075 | 0.455 |
| R.S.D. | 38.262 | 0.670 | 0.685 | 62.663 | 0.934 | 0.431 | 75.007 | 25.925 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 504.273 | 469.829 | 516.330 | -91.955 | -106.312 | -166.670 | 507.270 | 4.637 |
| .D. | 0.823 | 3.219 | 2.691 | 14.125 | 4.897 | 8.597 | 3.083 | 20.022 |
| R.S.D. | 0.163 | 0.685 | 0.521 | 15.360 | 4.607 | 5.158 | 0.608 | 431.741 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| e | -14.129 | 514.180 | 505.005 | 464.902 | 491.661 | 498.402 | 525.120 | 469.070 |
| . | 20.827 | 3.416 | 8.780 | 17.779 | 2.215 | 13.845 | 1.146 | 11.644 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R.S.D. | 147.403 | 0.864 | 1.739 | 3.824 | 0.451 | 2.778 | 0.218 | 2.482 |

| | Ti (ppb) | Cd (ppb) | P (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 504.968 | 506.847 | 477.947 | 5001.658 | 504.420 | 428.419 | 508.159 | 492.006 |
| .D. | 3.445 | 7.035 | 4.216 | 51.387 | 4.062 | 19.338 | 2.808 | 4.312 |
| R.S.. | 0.682 | 1.388 | 0.882 | 1.027 | 0.805 | 4.642 | 0.553 | 0.876 |

| | Tl (ppb) |
|---|---|
| ean | 495.304 |
| .D. | 18.606 |
| R.S.D. | 3.758 |

---

rrected Counts Statistics 1:12 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| | 1 | -0.001 | 0.003 | |
| | 2 | -0.008 | 0.001 | |
| | 3 | -0.071 | 0.022 | |
| | 5 | -0.004 | 0.012 | |
| | 6 | 1.526 | 0.023 | |
| | 7 | -0.028 | 0.038 | |
| | 8 | 0.098 | 0.003 | |
| | 9 | 0.412 | 0.015 | |
| | 10 | -0.061 | 0.006 | |
| | 11 | 0.041 | 0.005 | |
| | 12 | 0.052 | 0.005 | |
| | 14 | -0.015 | 0.006 | |
| | 15 | -0.017 | 0.015 | |
| | 16 | -0.087 | 0.010 | |
| | 17 | -0.006 | 0.001 | |
| | 18 | -0.085 | 0.004 | |
| | 19 | -0.007 | 0.003 | |
| | 20 | 0.038 | 0.001 | |
| | 21 | -0.005 | 0.002 | |
| | 22 | 0.125 | 0.055 | |
| | 24 | 0.021 | 0.008 | |
| | 25 | -0.032 | 0.003 | |
| | 26 | -0.015 | 0.007 | |
| | 27 | 0.016 | 0.002 | |
| | 28 | 0.005 | 0.005 | |
| | 29 | 0.001 | 0.001 | |
| | 30 | -0.007 | 0.005 | |
| | 31 | 0.040 | 0.022 | |
| | 32 | 0.014 | 0.004 | |
| | 33 | -0.049 | 0.007 | |
| | 34 | -0.110 | 0.003 | |
| | 35 | -0.011 | 0.006 | |
| | 36 | -0.110 | 0.004 | |
| | 37 | -0.066 | 0.039 | |

| | | |
|---|---|---|
| 38 | -0.009 | 0.020 |
| 39 | -0.070 | 0.006 |
| 40 | -0.007 | 0.007 |
| 42 | -0.008 | 0.010 |
| 43 | 0.025 | 0.002 |
| 44 | -0.007 | 0.001 |
| 45 | -0.054 | 0.004 |

---

dentity 1: CCB-3 Identity 2: CCB 1:12 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Mg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -20.599 | -1.315 | -53.062 | -12.331 | -630.435 | -4.879 | -15.180 | -33.924 |
| .D. | 1.399 | 0.040 | 22.761 | 7.734 | 1467.512 | 8.947 | 1.905 | 6.249 |
| R.S.D. | 6.792 | 3.061 | 42.895 | 62.718 | 232.778 | 183.382 | 12.551 | 18.422 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -106.488 | -42.785 | -3.635 | -2.580 | -1.731 | -7.150 | -8.150 | -1.734 |
| .D. | 7.790 | 0.412 | 1.145 | 0.622 | 3.456 | 2.412 | 2.353 | 0.246 |
| R.S.D. | 7.315 | 0.964 | 31.496 | 24.119 | 199.848 | 33.732 | 28.869 | 14.197 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| | -8.934 | -43.291 | -5.580 | -42.530 | -121.391 | -149.794 | -2.907 | 39.316 |
| | 0.823 | 0.097 | 0.871 | 24.523 | 22.679 | 10.317 | 0.406 | 16.017 |
| R.S. | 9.208 | 0.223 | 15.613 | 57.661 | 18.682 | 6.887 | 13.969 | 40.740 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -17.327 | -5.040 | -21.502 | -54.215 | 2.321 | 22.515 | -4.223 | -12.678 |
| .D. | 5.290 | 0.127 | 6.364 | 13.611 | 1.198 | 20.868 | 0.953 | 9.975 |
| R.S.D. | 30.533 | 2.510 | 29.596 | 25.106 | 51.626 | 92.685 | 22.571 | 78.676 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -4.923 | 0.168 | 0.066 | -220.682 | -1.309 | -86.414 | 5.098 | 0.062 |
| .D. | 0.513 | 1.642 | 4.019 | 33.641 | 0.703 | 54.420 | 1.061 | 0.108 |
| R.S.D. | 10.420 | 975.779 | 6062.381 | 15.244 | 53.733 | 62.976 | 20.820 | 173.145 |

| | Tl (ppb) |
|---|---|
| ean | 47.585 |
| .D. | 28.420 |
| R.S.D. | 59.726 |

---

orrected Counts Statistics 1:14 PM January 23, 1992
: ALL_SIM
: t : 1.0000 Solution Volume : 1.00
n-Peak integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.018 | 0.003 | |
| 2 | 0.012 | 0.003 | |
| 3 | -0.107 | 0.013 | |
| 5 | -0.033 | 0.007 | |
| 6 | 1.618 | 0.006 | |
| 7 | 0.097 | 0.053 | |
| 8 | 2.682 | 0.003 | |
| 9 | 270.799 | 1.331 | |
| 10 | 0.546 | 0.026 | |
| 11 | 1.213 | 0.004 | |
| 12 | 0.210 | 0.001 | |
| 14 | 0.032 | 0.005 | |
| 15 | -0.005 | 0.013 | |
| 16 | 0.156 | 0.009 | |
| 17 | -0.003 | 0.001 | |
| 18 | -0.097 | 0.003 | |
| 19 | 1.654 | 0.010 | |
| 20 | 2.032 | 0.003 | |
| 21 | 3.155 | 0.018 | |
| 22 | 0.082 | 0.022 | |
| 24 | 0.003 | 0.004 | |
| 25 | -0.050 | 0.005 | |
| 26 | 0.019 | 0.003 | |
| 27 | 1.508 | 0.026 | |
| 28 | 12.374 | 0.075 | |
| 29 | 0.204 | 0.001 | |
| 30 | -0.010 | 0.008 | |
| 31 | -31.466 | 0.000 | |
| 32 | 0.471 | 0.003 | |
| 33 | 0.060 | 0.006 | |
| 34 | -0.116 | 0.001 | |
| 35 | -0.030 | 0.005 | |
| 36 | -0.056 | 0.087 | |
| 37 | 0.800 | 0.035 | |
| 38 | 3.790 | 0.041 | |
| 39 | 63.284 | 0.094 | |
| 40 | 0.076 | 0.002 | |
| 42 | 0.001 | 0.003 | |
| 43 | 0.030 | 0.004 | |
| 44 | 0.001 | 0.001 | |
| 45 | -0.063 | 0.003 | |

:entity 1: R942 Sam #3AP891-7 Identity 2: 10ml-50ml 1:15 PM January 23, 1992
:sk name : ALL_SIM
:ample Weight : 1.0000 Solution Volume : 1.00
:-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Mg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -11.593 | -0.510 | -90.765 | -30.829 | 5413.043 | 24.788 | 1689.986 | 112284.909 |
| .D. | 1.472 | 0.106 | 18.773 | 4.600 | 370.842 | 12.548 | 1.980 | 552.811 |
| R.S | 12.698 | 20.888 | 20.684 | 14.920 | 6.851 | 50.623 | 0.117 | 0.492 |

| | | | |
|---|---|---|---|
| Be | 44 | -0.009 | 0.001 |
| Tl | 45 | -0.067 | 0.010 |

1: R943 San #3AP891-8 Identity 2: 10ml-50ml 1:30 PM January 23, 1992
Task : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppb) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -0.908 | 0.631 | -18.851 | -12.331 | -239.130 | 22.191 | 1365.716 | 20780.122 |
| S.D. | 4.446 | 0.480 | 14.970 | 8.438 | 1713.534 | 6.892 | 2.976 | 125.150 |
| % R.S.D. | 489.937 | 76.151 | 79.414 | 68.431 | 716.569 | 31.058 | 0.218 | 0.602 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 169.889 | -10.644 | 81.005 | 31.907 | 1.574 | 16.136 | -2.716 | -0.412 |
| S.D. | 19.789 | 0.830 | 1.012 | 0.734 | 3.967 | 6.332 | 4.706 | 0.974 |
| % R.S.D. | 11.648 | 7.794 | 1.249 | 2.301 | 252.028 | 39.242 | 173.238 | 236.474 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 125.851 | 233.944 | 707.180 | -38.552 | -59.187 | -82.290 | 1.118 | 7479.026 |
| S.D. | 4.341 | 2.041 | 4.591 | 39.852 | 48.343 | 43.600 | 1.052 | 38.616 |
| % R.S.D. | 3.449 | 0.872 | 0.649 | 103.373 | 81.679 | 52.983 | 94.053 | 0.516 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| | 30384.968 | 38.496 | 8.008 | 740627.898 | 45.464 | 8.563 | -2.211 | 27.769 |
| | 169.463 | 0.253 | 4.651 | 4654.138 | 3.423 | 25.104 | 2.646 | 11.876 |
| % R.S.D. | 0.558 | 0.657 | 58.075 | 0.628 | 7.529 | 293.159 | 119.674 | 42.767 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 0.497 | 16.247 | 745.359 | 73556.697 | 1.543 | -31.253 | 1.855 | -0.311 |
| S.D. | 1.222 | 1.299 | 7.970 | 258.140 | 0.323 | 24.873 | 1.605 | 0.108 |
| % R.S.D. | 245.959 | 7.998 | 1.069 | 0.351 | 20.933 | 79.586 | 86.495 | 34.643 |

| | Tl (ppb) |
|---|---|
| Mean | -43.834 |
| S.D. | 70.790 |
| % R.S.D. | 161.494 |

Corrected Counts Statistics 1:35 PM January 23, 1992
Task name : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

| Analyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.024 | 0.009 | |
| 2 | 0.036 | 0.006 | |

| | | | |
|---|---|---|---|
| 1 | 3 | -0.067 | 0.016 |
| a | 5 | -0.005 | 0.002 |
| q | 6 | 1.551 | 0.005 |
| n | 7 | 0.067 | 0.018 |
| i | 8 | 4.572 | 0.033 |
| l | 9 | 83.195 | 0.586 |
| | 10 | 0.207 | 0.026 |
| n | 11 | 0.536 | 0.007 |
| u | 12 | 0.505 | 0.002 |
| i | 14 | 0.273 | 0.002 |
| o | 15 | 0.010 | 0.003 |
| i | 16 | 0.937 | 0.015 |
| a | 17 | -0.003 | 0.001 |
| n | 18 | -0.072 | 0.011 |
| e | 19 | 0.143 | 0.009 |
| a | 20 | 3.680 | 0.132 |
| r | 21 | 1.993 | 0.014 |
| d | 22 | 0.066 | 0.023 |
| e | 24 | 0.033 | 0.012 |
| m | 25 | -0.029 | 0.011 |
| a | 26 | 0.039 | 0.011 |
| | 27 | 1.349 | 0.027 |
| | 28 | 31.230 | 0.015 |
| g | 29 | 0.197 | 0.003 |
| s | 30 | -0.011 | 0.003 |
| a | 31 | 1576.525 | 10.185 |
| o | 32 | 0.201 | 0.007 |
| e | 33 | 0.033 | 0.009 |
| g | 34 | -0.107 | 0.008 |
| b | 35 | -0.008 | 0.002 |
| i | 36 | -0.082 | 0.005 |
| d | 37 | 0.390 | 0.021 |
| | 38 | 4.691 | 0.035 |
| | 39 | 20.576 | 0.101 |
| n | 40 | 0.012 | 0.002 |
| b | 42 | -0.008 | 0.011 |
| | 43 | 0.022 | 0.005 |
| e | 44 | -0.005 | 0.001 |
| l | 45 | -0.059 | 0.008 |

---

dentity 1: R944 San #3AP891-9 Identity 2: 10ml-50ml 1:38 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -9.151 | 0.470 | -48.873 | -12.969 | 1043.478 | 17.706 | 2937.126 | 34354.156 |
| .D. | 3.948 | 0.246 | 16.570 | 1.105 | 321.710 | 4.159 | 21.932 | 243.251 |
| R.S.D. | 43.146 | 52.372 | 33.904 | 8.519 | 30.831 | 23.488 | 0.747 | 0.708 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Mi (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 268.245 | 1.409 | 101.430 | 26.680 | 4.800 | 22.415 | 1.359 | -0.910 |
| .D. | 36.793 | 0.627 | 0.402 | 0.212 | 0.759 | 3.642 | 2.353 | 0.688 |
| R.S. | 13.716 | 44.508 | 0.396 | 0.795 | 15.809 | 16.248 | 173.139 | 75.590 |

| | | |
|---|---|---|
| 9 | 3.393 | 0.070 |
| 10 | 6.241 | 0.077 |
| 11 | 22.023 | 0.184 |
| 12 | 4.404 | 0.019 |
| 14 | 20.521 | 0.129 |
| 15 | 8.190 | 0.098 |
| 16 | 4.075 | 0.061 |
| 17 | 0.257 | 0.001 |
| 18 | 15.788 | 0.054 |
| 19 | 3.184 | 0.034 |
| 20 | 12.384 | 0.040 |
| 21 | 2.423 | 0.025 |
| 22 | 2.634 | 0.089 |
| 24 | 0.498 | 0.025 |
| 25 | 0.346 | 0.024 |
| 26 | 33.483 | 0.109 |
| 27 | 0.301 | 0.003 |
| 28 | 0.976 | 0.029 |
| 29 | 4.631 | 0.031 |
| 30 | 0.803 | 0.009 |
| 31 | 5.945 | 0.022 |
| 32 | 6.266 | 0.052 |
| 33 | 0.330 | 0.015 |
| 34 | 3.451 | 0.032 |
| 35 | 0.525 | 0.021 |
| 36 | 7.297 | 0.045 |
| 37 | 44.315 | 0.350 |
| 38 | 8.848 | 0.051 |
| 39 | 0.196 | 0.019 |
| 40 | 9.628 | 0.047 |
| 42 | 0.192 | 0.014 |
| 43 | 2.832 | 0.024 |
| 44 | 10.644 | 0.056 |
| 45 | 0.038 | 0.020 |

---

dentity 1: R946 Dig. STD 10-50 Identity 2: 1B48AA,2B48AB,3B48AB 1:58 PM January 23, 1992
esk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Mg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 2101.177 | 2028.741 | 718.437 | 1871.918 | 310260.870 | 969.887 | 3852.077 | 1331.358 |
| .D. | 13.554 | 7.089 | 24.095 | 31.759 | 4005.608 | 29.682 | 27.443 | 29.008 |
| R.S.D. | 0.645 | 0.349 | 3.354 | 1.697 | 1.291 | 3.060 | 0.712 | 2.179 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 8798.506 | 1919.822 | 1006.472 | 2088.553 | 1935.767 | 985.271 | 1063.598 | 1030.442 |
| .D. | 109.271 | 14.610 | 4.442 | 13.169 | 23.105 | 14.432 | 4.706 | 3.541 |
| R.S.D. | 1.242 | 0.761 | 0.441 | 0.631 | 1.194 | 1.465 | 0.442 | 0.344 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| e | 1034.042 | 2044.257 | 1010.337 | 1070.158 | 1227.313 | 974.944 | 2040.200 | 2015.995 |
| . | 11.186 | 6.799 | 10.399 | 39.795 | 71.605 | 71.867 | 6.632 | 22.295 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R.S.D. | 1.082 | 0.333 | 1.029 | 3.719 | 5.834 | 7.371 | 0.325 | 1.106 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 1085.863 | 1009.586 | 1022.900 | 3597.541 | 1980.886 | 895.255 | 1127.117 | 959.270 |
| .D. | 32.929 | 6.840 | 11.634 | 13.793 | 16.507 | 40.458 | 10.029 | 37.219 |
| R.S | 3.033 | 0.678 | 1.137 | 0.383 | 0.833 | 4.519 | 0.890 | 3.880 |

| | Ti (ppb) | Cd (ppb) | P (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 998.690 | 1864.721 | 1761.578 | 1388.516 | 965.388 | 1018.638 | 1955.037 | 1987.177 |
| .D. | 6.122 | 14.702 | 10.196 | 111.791 | 4.746 | 78.204 | 16.825 | 10.354 |
| R.S.D. | 0.613 | 0.788 | 0.574 | 8.051 | 0.492 | 7.677 | 0.861 | 0.521 |

| | Tl (ppb) |
|---|---|
| ean | 835.195 |
| .D. | 141.579 |
| R.S.D. | 16.952 |

---

orrected Counts Statistics 2:02 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.002 | 0.009 | |
| r | 2 | 0.000 | 0.002 | |
| i | 3 | -0.227 | 0.022 | |
| a | 5 | -0.040 | 0.012 | |
| g | 6 | 1.510 | 0.013 | |
| n | 7 | -0.031 | 0.020 | |
| i | 8 | 0.692 | 0.005 | |
| l | 9 | 1.500 | 0.024 | |
| | 10 | 0.007 | 0.037 | |
| n | 11 | 5.542 | 0.023 | |
| u | 12 | 2.148 | 0.011 | |
| i | 14 | -0.021 | 0.001 | |
| o | 15 | 2.048 | 0.006 | |
| i | 16 | 1.957 | 0.022 | |
| s | 17 | -0.006 | 0.001 | |
| u | 18 | -0.088 | 0.003 | |
| e | 19 | 1.490 | 0.026 | |
| a | 20 | 2.969 | 0.021 | |
| r | 21 | 1.183 | 0.006 | |
| d | 22 | 0.054 | 0.051 | |
| e | 24 | 0.020 | 0.008 | |
| e | 25 | -0.046 | 0.002 | |
| a | 26 | 8.084 | 0.044 | |
| | 27 | 0.014 | 0.005 | |
| | 28 | 0.031 | 0.007 | |
| g | 29 | 2.272 | 0.014 | |
| s | 30 | 0.388 | 0.004 | |
| a | 31 | 0.998 | 0.011 | |

| | | | |
|---|---|---|---|
| o | 32 | 1.513 | 0.016 |
| e | 33 | 0.143 | 0.001 |
| a | 34 | 1.507 | 0.007 |
| h | 35 | 0.247 | 0.010 |
| | 36 | 3.510 | 0.025 |
| | 37 | 11.188 | 0.085 |
| | 38 | 2.311 | 0.030 |
| | 39 | 0.790 | 0.001 |
| n | 40 | 4.821 | 0.029 |
| b | 42 | 0.068 | 0.004 |
| | 43 | 0.714 | 0.006 |
| e | 44 | 2.498 | 0.013 |
| l | 45 | -0.001 | 0.004 |

---

dentity 1: CCV-4 Identity 2: CCV 2:03 PM January 23, 1992
ask name : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppb) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -19.073 | -0.979 | -216.090 | -35.507 | -1673.913 | -5.430 | 376.408 | 418.170 |
| S.D. | 4.070 | 0.084 | 22.680 | 7.338 | 820.634 | 4.604 | 2.976 | 9.821 |
| R.S.D. | 21.341 | 8.555 | 10.496 | 20.666 | 49.025 | 84.792 | 0.791 | 2.349 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -12.837 | 448.373 | 482.850 | -3.225 | 485.752 | 480.358 | -9.508 | -1.951 |
| | 52.330 | 2.012 | 2.482 | 0.102 | 1.342 | 5.127 | 4.075 | 0.225 |
| | 407.642 | 0.449 | 0.514 | 3.158 | 0.276 | 1.067 | 42.859 | 11.547 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 480.193 | 451.711 | 491.357 | -78.039 | -124.219 | -190.495 | 491.107 | 23.133 |
| S.D. | 8.413 | 3.475 | 2.691 | 22.918 | 22.854 | 4.549 | 2.663 | 31.783 |
| R.S.D. | 1.752 | 0.769 | 0.548 | 29.368 | 18.398 | 2.388 | 0.542 | 137.396 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 7.967 | 492.631 | 488.225 | 537.884 | 476.683 | 468.150 | 509.551 | 454.582 |
| S.D. | 8.499 | 3.071 | 5.370 | 6.671 | 4.926 | 2.762 | 2.824 | 18.231 |
| R.S.D. | 106.683 | 0.623 | 1.100 | 1.240 | 1.033 | 0.590 | 0.554 | 4.011 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Ba (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | 485.592 | 473.037 | 461.508 | 4973.461 | 483.500 | 334.646 | 483.376 | 467.381 |
| S.D. | 3.348 | 3.566 | 5.889 | 3.488 | 2.870 | 24.044 | 4.071 | 2.435 |
| R.S.D. | 0.689 | 0.754 | 1.276 | 0.070 | 0.594 | 7.185 | 0.842 | 0.521 |

| | Tl (ppb) |
|---|---|
| Mean | 420.293 |
| S.D. | 28.420 |
| R.S.D. | 6.762 |

---

| | | | |
|---|---|---|---|
| o | 32 | 1.513 | 0.016 |
| e | 33 | 0.143 | 0.001 |
| a | 34 | 1.507 | 0.009 |
| b | 35 | 0.247 | 0.010 |
| i | 36 | 3.510 | 0.025 |
| d | 37 | 11.188 | 0.085 |
| | 38 | 2.311 | 0.030 |
| | 39 | 0.790 | 0.001 |
| n | 40 | 4.821 | 0.029 |
| b | 42 | 0.068 | 0.004 |
| | 43 | 0.714 | 0.006 |
| e | 44 | 2.498 | 0.013 |
| l | 45 | -0.001 | 0.004 |

---

dentity 1: CCV-4 Identity 2: CCV 2:03 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -19.073 | -0.979 | -216.090 | -35.507 | -1673.913 | -5.430 | 376.408 | 418.170 |
| .D. | 4.070 | 0.084 | 22.680 | 7.338 | 820.634 | 4.604 | 2.976 | 9.821 |
| R.S.D. | 21.341 | 8.555 | 10.496 | 20.666 | 49.025 | 84.792 | 0.791 | 2.349 |

| | V (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -12.837 | 448.373 | 482.850 | -3.225 | 485.752 | 480.358 | -9.508 | -1.951 |
| .D. | 52.330 | 2.012 | 2.482 | 0.102 | 1.342 | 5.127 | 4.075 | 0.225 |
| R.S. | 407.642 | 0.449 | 0.514 | 3.158 | 0.276 | 1.067 | 42.859 | 11.547 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 480.193 | 451.711 | 491.357 | -78.039 | -124.219 | -190.495 | 491.107 | 23.133 |
| .D. | 8.413 | 3.475 | 2.691 | 22.918 | 22.854 | 4.549 | 2.663 | 31.783 |
| R.S.D. | 1.752 | 0.769 | 0.548 | 29.368 | 18.398 | 2.388 | 0.542 | 137.396 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 7.767 | 492.631 | 488.225 | 537.884 | 476.683 | 468.150 | 509.551 | 454.582 |
| .D. | 8.499 | 3.071 | 5.370 | 6.671 | 4.926 | 2.762 | 2.824 | 18.231 |
| R.S.D. | 106.683 | 0.623 | 1.100 | 1.240 | 1.033 | 0.590 | 0.554 | 4.011 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Ba (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 485.592 | 473.037 | 461.508 | 4973.461 | 483.500 | 334.646 | 483.376 | 467.381 |
| .D. | 3.348 | 3.566 | 5.889 | 3.488 | 2.870 | 24.044 | 4.071 | 2.435 |
| R.S.D. | 0.689 | 0.754 | 1.276 | 0.070 | 0.594 | 7.185 | 0.842 | 0.521 |

| | Tl (ppb) |
|---|---|
| ean | 420.293 |
| .D. | 28.420 |
| R.S | 6.762 |

---

orrected Counts Statistics 2:04 PM January 23, 1992
ask name : ALL_SIM
eight : 1.0000 Solution Volume : 1.00
egrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.010 | 0.002 | |
| r | 2 | -0.003 | 0.004 | |
| 1 | 3 | -0.039 | 0.021 | |
| a | 5 | 0.019 | 0.013 | |
| g | 6 | 1.517 | 0.010 | |
| n | 7 | -0.045 | 0.022 | |
| 1 | 8 | 0.097 | 0.007 | |
| l | 9 | 0.393 | 0.012 | |
| | 10 | -0.037 | 0.014 | |
| n | 11 | 0.053 | 0.007 | |
| u | 12 | 0.051 | 0.004 | |
| i | 14 | -0.011 | 0.007 | |
| o | 15 | -0.001 | 0.012 | |
| li | 16 | -0.069 | 0.005 | |
| a | 17 | -0.005 | 0.002 | |
| u | 18 | -0.088 | 0.001 | |
| e | 19 | 0.008 | 0.016 | |
| k | 20 | 0.208 | 0.001 | |
| r | 21 | -0.017 | 0.007 | |
| d | 22 | 0.086 | 0.051 | |
| e | 24 | 0.019 | 0.007 | |
| u | 25 | -0.024 | 0.005 | |
| a | 26 | -0.009 | 0.007 | |
| | 27 | 0.010 | 0.003 | |
| | 28 | 0.027 | 0.006 | |
| g | 29 | 0.007 | 0.001 | |
| s | 30 | -0.024 | 0.003 | |
| a | 31 | 0.205 | 0.009 | |
| o | 32 | 0.004 | 0.014 | |
| e | 33 | -0.055 | 0.009 | |
| a | 34 | -0.117 | 0.004 | |
| b | 35 | -0.006 | 0.015 | |
| i | 36 | -0.100 | 0.002 | |
| d | 37 | -0.115 | 0.024 | |
| | 38 | 0.011 | 0.015 | |
| | 39 | -0.047 | 0.004 | |
| n | 40 | 0.004 | 0.003 | |
| b | 42 | 0.001 | 0.005 | |
| | 43 | 0.018 | 0.002 | |
| e | 44 | -0.007 | 0.002 | |
| l | 45 | -0.062 | 0.005 | |

dentity 1: CCB-4 Identity 2: CCB 2:05 PM January 23, 1992
ask name : ALL_SIM
a ight : 1.0000 Solution Volume : 1.00
n egrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Mg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -15.562 | -1.100 | -19.200 | 2.340 | -1173.913 | -8.314 | -15.339 | -41.530 |
| D. | 0.700 | 0.152 | 21.793 | 8.144 | 643.420 | 5.123 | 4.682 | 4.815 |
| R.S.D. | 4.495 | 13.851 | 113.502 | 348.024 | 54.810 | 58.132 | 29.561 | 11.590 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -73.471 | -41.683 | -3.945 | -2.172 | 2.046 | -2.779 | -4.075 | -1.951 |
| .D. | 19.084 | 0.585 | 0.837 | 0.722 | 2.716 | 1.262 | 9.411 | 0.065 |
| R.S.D. | 25.975 | 1.405 | 21.215 | 33.256 | 132.729 | 45.396 | 230.969 | 3.333 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -4.249 | -14.511 | -10.603 | -60.268 | -126.104 | -125.969 | -2.541 | -4.610 |
| .D. | 5.375 | 0.190 | 2.940 | 22.736 | 19.792 | 14.891 | 0.433 | 18.350 |
| R.S.D. | 126.491 | 1.313 | 27.726 | 37.724 | 15.695 | 11.821 | 17.027 | 398.036 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 8.207 | -3.652 | -43.863 | 47.629 | -0.844 | 5.226 | -6.447 | -3.019 |
| .D. | 6.359 | 0.219 | 3.414 | 5.497 | 4.389 | 24.346 | 1.271 | 27.347 |
| R.S.D. | 77.484 | 6.000 | 7.783 | 11.542 | 520.080 | 465.869 | 19.713 | 905.829 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -3.613 | -1.863 | 4.044 | -79.701 | -0.224 | -33.092 | 0.234 | 0.124 |
| .D. | 0.271 | 1.009 | 3.044 | 25.155 | 0.348 | 27.210 | 1.446 | 0.323 |
| R.S.D. | 7.500 | 54.156 | 75.285 | 31.562 | 155.294 | 82.226 | 618.322 | 259.762 |

| | Tl (ppb) |
|---|---|
| ean | -13.361 |
| .D. | 34.689 |
| R.S.D. | 259.629 |

---

orrected Counts Statistics 2:07 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|---|
| - | 1 | 0.026 | 0.008 | |
| r | 2 | 0.119 | 0.006 | |
| i | 3 | -0.120 | 0.008 | |
| a | 5 | -0.034 | 0.021 | |
| a | 6 | 1.954 | 0.019 | |
| n | 7 | 5.829 | 0.088 | |
| i | 8 | 0.540 | 0.009 | |
| l | 9 | 605.033 | 3.257 | |
| | 10 | -0.023 | 0.024 | |
| n | 11 | 0.262 | 0.004 | |
| g | 12 | 0.059 | 0.005 | |
| i | 14 | -0.016 | 0.005 | |

| | | | |
|---|---|---|---|
| o | 15 | 0.014 | 0.004 |
| i | 16 | -0.076 | 0.008 |
| a | 17 | -0.045 | 0.002 |
| - | 18 | 0.071 | 0.007 |
| | 19 | 298.879 | 2.382 |
| k | 20 | 1124.306 | 5.103 |
| r | 21 | 0.006 | 0.004 |
| d | 22 | 3.524 | 0.089 |
| e | 24 | 0.025 | 0.010 |
| a | 25 | -8.614 | 0.004 |
| a | 26 | 0.044 | 0.006 |
| | 27 | 0.021 | 0.001 |
| | 28 | 2.191 | 0.033 |
| g | 29 | 918.004 | 5.280 |
| s | 30 | 0.113 | 0.004 |
| a | 31 | 0.257 | 0.008 |
| o | 32 | -0.011 | 0.012 |
| e | 33 | -0.062 | 0.009 |
| g | 34 | -0.114 | 0.002 |
| b | 35 | -0.100 | 0.009 |
| i | 36 | -0.067 | 0.009 |
| d | 37 | 0.329 | 0.025 |
| | 38 | -0.478 | 0.005 |
| | 39 | -0.032 | 0.004 |
| n | 40 | 1.673 | 0.012 |
| b | 42 | -0.004 | 0.004 |
| | 43 | 0.022 | 0.004 |
| e | 44 | -0.000 | 0.002 |
| l | 45 | -0.079 | 0.008 |

dentity 1: ICSA-F Identity 2: ICSA 2:07 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -8.082 | 3.811 | -104.030 | -31.254 | 27282.609 | 1377.987 | 276.531 | 251126.081 |
| .D. | 3.457 | 0.236 | 8.378 | 13.446 | 1220.687 | 20.789 | 5.988 | 1353.020 |
| R.S.D. | 42.778 | 6.190 | 8.054 | 43.020 | 4.474 | 1.509 | 2.166 | 0.539 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -52.782 | -23.054 | -2.165 | -2.715 | 5.587 | -4.369 | -169.795 | 8.411 |
| .D. | 34.406 | 0.361 | 1.047 | 0.539 | 0.829 | 1.790 | 6.225 | 0.423 |
| R.S.D. | 65.185 | 1.565 | 48.338 | 19.843 | 14.839 | 40.963 | 3.666 | 5.031 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Se (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 97691.997 | 190229.105 | -0.976 | 102.354 | -109.139 | -25707.058 | 0.691 | 71.683 |
| .D. | 778.656 | 863.635 | 1.691 | 35.196 | 27.267 | 12.036 | 0.347 | 6.936 |
| R.S.D. | 0.797 | 0.454 | 173.237 | 34.386 | 24.984 | 0.047 | 50.171 | 9.676 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 837.571 | 201167.801 | 133.297 | 79.997 | -5.485 | -17.298 | -5.494 | -172.657 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| .D. | 30.502 | 1157.117 | 4.530 | 4.683 | 3.650 | 27.166 | 0.635 | 16.433 |
| R.S.D. | 3.842 | 0.575 | 3.378 | 5.854 | 66.534 | -157.048 | 11.567 | 9.518 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | Y (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 0.858 | 16.793 | -93.137 | 10.930 | 32.822 | -69.672 | 3.013 | 1.368 |
| .D. | 1.242 | 1.046 | 0.911 | 21.219 | 0.695 | 20.883 | 2.893 | 0.285 |
| R.S.D. | 144.713 | 6.232 | 0.978 | 194.140 | 2.117 | 34.420 | 96.003 | 20.830 |

| | Tl (ppb) |
|---|---|
| ean | -128.221 |
| .D. | 54.623 |
| R.S.D. | 42.600 |

---

orrected Counts Statistics 2:09 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.013 | 0.009 | |
| r | 2 | 0.109 | 0.096 | |
| i | 3 | -0.158 | 0.010 | |
| a | 5 | -0.020 | 0.009 | |
| o | 6 | 1.966 | 0.008 | |
| n | 7 | 6.085 | 0.036 | |
| i | 8 | 0.530 | 0.012 | |
| il | 9 | 613.133 | 2.044 | |
| | 10 | 0.036 | 0.017 | |
| n | 11 | 11.517 | 0.037 | |
| u | 12 | 2.213 | 0.011 | |
| i | 14 | -0.032 | 0.008 | |
| o | 15 | 2.084 | 0.015 | |
| li | 16 | 3.978 | 0.023 | |
| a | 17 | -0.046 | 0.001 | |
| u | 18 | 0.051 | 0.004 | |
| e | 19 | 303.954 | 1.124 | |
| a | 20 | 1135.921 | 3.144 | |
| r | 21 | 1.260 | 0.009 | |
| d | 22 | 3.504 | 0.077 | |
| e | 24 | 0.014 | 0.012 | |
| m | 25 | -8.598 | 0.016 | |
| e | 26 | 8.492 | 0.020 | |
| | 27 | 0.023 | 0.002 | |
| | 28 | 2.203 | 0.023 | |
| g | 29 | 930.484 | 2.171 | |
| s | 30 | 0.104 | 0.017 | |
| a | 31 | 0.192 | 0.035 | |
| o | 32 | 0.006 | 0.009 | |
| e | 33 | -0.004 | 0.007 | |
| g | 34 | 3.240 | 0.006 | |
| b | 35 | 0.455 | 0.013 | |
| i | 36 | -0.061 | 0.022 | |

| | | | |
|---|---|---|---|
| | 37 | 23.749 | 0.034 |
| | 38 | -0.478 | 0.013 |
| | 39 | -0.047 | 0.011 |
| | 40 | 6.661 | 0.018 |
| | 42 | -0.023 | 0.007 |
| | 43 | 0.750 | 0.004 |
| | 44 | 2.699 | 0.006 |
| | 45 | -0.054 | 0.005 |

---

dentity 1: ICSAB-F Identity 2: ICSAB 2:10 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -14.035 | 3.381 | -144.176 | -22.749 | 28065.217 | 1438.423 | 269.931 | 254490.546 |
| .D. | 4.070 | 0.246 | 10.900 | 5.753 | 531.165 | 8.581 | 7.984 | 849.088 |
| R.S.D. | 29.000 | 7.274 | 7.561 | 25.287 | 1.893 | 0.597 | 2.958 | 0.334 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 28.003 | 981.849 | 497.937 | -4.345 | 494.329 | 962.144 | -171.153 | 7.067 |
| .D. | 24.177 | 3.276 | 2.567 | 0.834 | 3.494 | 5.499 | 2.353 | 0.271 |
| R.S.D. | 86.337 | 0.334 | 0.516 | 19.184 | 0.707 | 0.572 | 1.375 | 3.831 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| | 99350.931 | 192193.801 | 523.863 | 79.088 | -139.299 | -25661.393 | 515.992 | 87.866 |
| | 367.421 | 532.009 | 3.560 | 33.539 | 32.526 | 46.169 | 1.196 | 10.594 |
| R.S.D. | 0.370 | 0.277 | 0.679 | 42.408 | 23.350 | 0.180 | 0.232 | 12.058 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 834.966 | 203902.691 | 121.456 | 39.383 | 0.000 | 34.290 | 1060.182 | 831.287 |
| .D. | 21.756 | 475.762 | 21.702 | 21.659 | 2.836 | 20.138 | 1.984 | 23.287 |
| R.S.D. | 2.606 | 0.233 | 17.868 | 54.996 | 12603531.134 | 58.729 | 0.187 | 2.801 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 1.716 | 1000.808 | -93.137 | -81.715 | 532.668 | -148.929 | 508.853 | 504.941 |
| .D. | 3.031 | 1.421 | 2.631 | 68.624 | 1.544 | 39.134 | 2.893 | 1.165 |
| R.S.D. | 176.591 | 0.142 | 2.825 | 83.980 | 0.290 | 26.277 | 0.568 | 0.231 |

| | Tl (ppb) |
|---|---|
| ean | 45.241 |
| .D. | 36.541 |
| R.S.D. | 80.769 |

---

Counts Statistics 2:11 PM January 23, 1992
ALL_SIM
ample weight : 1.0000 Solution Volume : 1.00

-Peak Integrations : 3 Off-Peak Integrations : 1

| alyte Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|
| 1 | 0.025 | 0.003 | |
| 2 | 0.012 | 0.003 | |
| 3 | -0.042 | 0.041 | |
| 5 | -0.030 | 0.014 | |
| 6 | 1.498 | 0.006 | |
| 7 | 0.004 | 0.038 | |
| 8 | 0.109 | 0.002 | |
| 9 | 0.467 | 0.016 | |
| 10 | -0.008 | 0.016 | |
| 11 | 0.057 | 0.008 | |
| 12 | 0.055 | 0.003 | |
| 14 | -0.015 | 0.007 | |
| 15 | -0.006 | 0.008 | |
| 16 | -0.088 | 0.014 | |
| 17 | -0.005 | 0.001 | |
| 18 | -0.069 | 0.006 | |
| 19 | 0.016 | 0.006 | |
| 20 | 0.260 | 0.015 | |
| 21 | -0.002 | 0.001 | |
| 22 | 0.161 | 0.033 | |
| 24 | 0.041 | 0.002 | |
| 25 | -0.008 | 0.004 | |
| 26 | 0.005 | 0.000 | |
| 27 | 0.013 | 0.004 | |
| 28 | 0.024 | 0.010 | |
| 29 | 0.042 | 0.012 | |
| 30 | -0.002 | 0.007 | |
| 31 | 0.146 | 0.009 | |
| 32 | -0.003 | 0.007 | |
| 33 | -0.039 | 0.007 | |
| 34 | -0.106 | 0.003 | |
| 35 | -0.015 | 0.009 | |
| 36 | -0.092 | 0.003 | |
| 37 | -0.058 | 0.017 | |
| 38 | 0.013 | 0.019 | |
| 39 | -0.049 | 0.003 | |
| 40 | 0.010 | 0.002 | |
| 42 | -0.010 | 0.007 | |
| 43 | 0.024 | 0.002 | |
| 44 | -0.006 | 0.001 | |
| 45 | -0.052 | 0.003 | |

dentity 1: xxx Identity 2: Rinse 2:12 PM January 23, 1992
esk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppb) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -8.540 | -0.496 | -22.691 | -29.128 | -2434.783 | 2.676 | -8.360 | -10.800 |
| .D. | 1.212 | 0.116 | 43.045 | 9.207 | 407.282 | 9.074 | 1.324 | 6.677 |
| R.S.D. | 14.187 | 23.406 | 189.699 | 31.608 | 16.728 | 339.142 | 18.232 | 61.818 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -32.025 | -41.326 | -3.016 | -2.614 | 1.023 | -7.230 | -6.791 | -0.694 |
| | 23.277 | 0.674 | 0.804 | 0.668 | 1.834 | 3.307 | 2.353 | 0.381 |
| | 72.683 | 1.631 | 26.657 | 25.548 | 179.234 | 45.736 | 34.644 | 54.930 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -1.525 | -5.722 | -4.604 | -26.772 | -62.957 | -77.327 | -1.667 | 18.509 |
| .D. | 2.041 | 2.478 | 0.242 | 14.827 | 5.886 | 12.399 | 0.000 | 28.030 |
| R.S.D. | 133.868 | 43.312 | 5.249 | 55.383 | 9.349 | 16.034 | 0.000 | 151.443 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 4.666 | 4.018 | -15.051 | 10.932 | -2.954 | 52.348 | -2.846 | -18.715 |
| .D. | 11.083 | 2.657 | 9.060 | 5.747 | 2.282 | 19.404 | 0.917 | 16.433 |
| R.S.D. | 237.541 | 66.133 | 60.196 | 52.566 | 77.262 | 37.068 | 32.226 | 87.808 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -2.575 | 0.532 | 4.508 | -91.785 | 0.406 | -97.446 | 4.403 | 0.373 |
| .D. | 0.341 | 0.708 | 3.715 | 18.459 | 0.152 | 37.547 | 1.061 | 0.108 |
| R.S.D. | 13.245 | 133.083 | 82.419 | 20.111 | 37.375 | 38.531 | 24.106 | 28.866 |

| | Tl (ppb) |
|---|---|
| ean | 56.761 |
| .D. | 22.605 |
| R.S.D. | 39.686 |

---

orrected Counts Statistics 2:14 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.012 | 0.006 | |
| r | 2 | 0.001 | 0.001 | |
| i | 3 | -0.044 | 0.014 | |
| a | 5 | -0.008 | 0.010 | |
| a | 6 | 1.505 | 0.001 | |
| n | 7 | -0.029 | 0.021 | |
| i | 8 | 0.113 | 0.005 | |
| l | 9 | 0.353 | 0.011 | |
| | 10 | -0.027 | 0.027 | |
| n | 11 | 0.499 | 0.009 | |
| u | 12 | 0.258 | 0.001 | |
| i | 14 | -0.028 | 0.007 | |
| o | 15 | 0.407 | 0.006 | |
| i | 16 | 0.249 | 0.020 | |
| a | 17 | -0.004 | 0.001 | |
| u | 18 | -0.092 | 0.005 | |
| e | 19 | 0.006 | 0.003 | |

| | | |
|---|---|---|
| 20 | 0.208 | 0.001 |
| 21 | 0.046 | 0.002 |
| 22 | 0.025 | 0.020 |
| 24 | 0.025 | 0.007 |
| 25 | -0.024 | 0.005 |
| 26 | -0.007 | 0.001 |
| 27 | 0.011 | 0.002 |
| 28 | 0.005 | 0.005 |
| 29 | 0.009 | 0.001 |
| 30 | -0.005 | 0.012 |
| 31 | 0.107 | 0.020 |
| 32 | -0.000 | 0.005 |
| 33 | -0.046 | 0.013 |
| 34 | -0.052 | 0.004 |
| 35 | -0.002 | 0.008 |
| 36 | -0.099 | 0.004 |
| 37 | 0.114 | 0.029 |
| 38 | -0.006 | 0.008 |
| 39 | -0.047 | 0.003 |
| 40 | 0.306 | 0.003 |
| 42 | 0.033 | 0.008 |
| 43 | 0.163 | 0.003 |
| 44 | 0.046 | 0.001 |
| 45 | -0.064 | 0.005 |

entity 1: CRI-F Identity 2: CRI 2:14 PM January 23, 1992
sk name : ALL_SIM
mple Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -14.341 | -0.966 | -24.088 | -14.882 | -2000.000 | -5.036 | -5.720 | -58.156 |
| .D. | 2.522 | 0.023 | 15.044 | 6.379 | 37.653 | 4.878 | 2.976 | 4.557 |
| R.S.D. | 17.587 | 2.406 | 62.454 | 42.860 | 1.883 | 96.862 | 52.030 | 7.835 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -59.463 | -1.835 | 44.178 | -3.971 | 98.441 | 73.121 | -1.358 | -2.189 |
| .D. | 38.260 | 0.770 | 0.134 | 0.737 | 1.416 | 4.818 | 4.075 | 0.334 |
| R.S.D. | 64.342 | 41.950 | 0.303 | 18.549 | 1.439 | 6.589 | 300.114 | 15.242 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -4.794 | -14.673 | 15.625 | -87.685 | -110.082 | -126.962 | -2.379 | 4.637 |
| .D. | 1.132 | 0.098 | 0.837 | 8.842 | 20.842 | 13.755 | 0.070 | 14.438 |
| R.S.D. | 23.621 | 0.666 | 5.357 | 10.084 | 18.933 | 10.834 | 2.961 | 311.333 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -17.963 | -3.287 | -19.344 | -12.776 | -2.004 | 25.500 | 14.100 | 3.622 |
| .D. | 5.457 | 0.253 | 14.876 | 12.125 | 1.675 | 38.908 | 1.116 | 14.068 |
| R.S.D. | 30.381 | 7.698 | 76.906 | 94.902 | 83.551 | 152.577 | 7.914 | 388.427 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ean | -3.523 | 7.745 | 0.663 | -83.729 | 30.155 | 139.745 | 100.753 | 9.950 |
| .D. | 0.513 | 1.198 | 1.897 | 18.459 | 0.253 | 41.767 | 1.838 | 0.108 |
| R.S.D. | 14.561 | 15.468 | 242.488 | 22.046 | 0.839 | 29.898 | 1.825 | 1.083 |

| | Tl (ppb) |
|---|---|
| ean | -25.081 |
| .D. | 32.226 |
| R.S.D. | 128.484 |

---

orrected Counts Statistics 2:16 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 0.016 | 0.004 | |
| r | 2 | 0.012 | 0.004 | |
| i | 3 | -0.181 | 0.020 | |
| a | 5 | 0.016 | 0.011 | |
| g | 6 | 1.504 | 0.028 | |
| n | 7 | 0.025 | 0.026 | |
| i | 8 | 0.707 | 0.005 | |
| l | 9 | 1.548 | 0.022 | |
| | 10 | 0.017 | 0.022 | |
| n | 11 | 5.642 | 0.025 | |
| | 12 | 2.192 | 0.010 | |
| | 14 | -0.005 | 0.003 | |
| o | 15 | 2.095 | 0.008 | |
| li | 16 | 1.961 | 0.020 | |
| a | 17 | -0.005 | 0.001 | |
| u | 18 | -0.086 | 0.002 | |
| e | 19 | 1.522 | 0.005 | |
| a | 20 | 3.025 | 0.012 | |
| r | 21 | 1.200 | 0.003 | |
| d | 22 | 0.029 | 0.057 | |
| e | 24 | 0.021 | 0.007 | |
| a | 25 | -0.036 | 0.014 | |
| a | 26 | 8.230 | 0.025 | |
| | 27 | 0.021 | 0.002 | |
| | 28 | 0.014 | 0.008 | |
| g | 29 | 2.312 | 0.008 | |
| s | 30 | 0.388 | 0.014 | |
| a | 31 | 0.942 | 0.013 | |
| o | 32 | 1.533 | 0.009 | |
| e | 33 | 0.178 | 0.013 | |
| g | 34 | 1.536 | 0.004 | |
| b | 35 | 0.264 | 0.006 | |
| i | 36 | 3.581 | 0.003 | |
| d | 37 | 11.508 | 0.047 | |
| | 38 | 2.326 | 0.020 | |
| r | 39 | 0.805 | 0.005 | |
| | 40 | 4.907 | 0.022 | |
| | 42 | 0.095 | 0.003 | |

| | | |
|---|---|---|
| 43 | 0.727 | 0.001 |
| 44 | 2.556 | 0.016 |
| 45 | 0.011 | 0.004 |

entity 1: CCV-4 Identity 2: CCV 2:16 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -12.662 | -0.496 | -167.915 | 0.426 | -2021.739 | 7.791 | 386.528 | 438.109 |
| .D. | 1.832 | 0.168 | 20.919 | 7.245 | 1845.011 | 6.071 | 3.024 | 9.139 |
| R.S.D. | 14.467 | 33.757 | 12.458 | 1699.084 | 91.259 | 77.929 | 0.782 | 2.086 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 0.323 | 457.301 | 492.986 | -1.595 | 497.004 | 481.232 | -6.791 | -1.821 |
| .D. | 31.789 | 2.192 | 2.238 | 0.269 | 1.772 | 4.690 | 2.353 | 0.130 |
| R.S.D. | 9842.729 | 0.479 | 0.454 | 16.888 | 0.357 | 0.975 | 34.644 | 7.143 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 490.871 | 461.231 | 498.612 | -89.495 | -119.506 | -161.707 | 499.971 | 69.371 |
| .D. | 1.645 | 2.079 | 1.256 | 25.737 | 19.860 | 40.942 | 1.499 | 10.594 |
| R.S.D. | 0.335 | 0.451 | 0.252 | 28.758 | 16.618 | 25.319 | 0.300 | 15.272 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -11.745 | 501.396 | 487.798 | 503.455 | 483.117 | 570.247 | 518.871 | 485.974 |
| .D. | 9.278 | 1.838 | 18.604 | 7.896 | 2.848 | 37.352 | 1.284 | 11.310 |
| R.S.D. | 78.998 | 0.367 | 3.814 | 1.568 | 0.590 | 6.550 | 0.247 | 2.327 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 495.122 | 486.468 | 464.424 | 5066.106 | 492.067 | 483.580 | 492.409 | 478.263 |
| .D. | 0.414 | 1.966 | 4.004 | 31.395 | 2.210 | 14.594 | 0.802 | 2.932 |
| R.S.D. | 0.084 | 0.404 | 0.862 | 0.620 | 0.449 | 3.018 | 0.163 | 0.613 |

| | Tl (ppb) |
|---|---|
| ean | 499.992 |
| .D. | 26.624 |
| R.S.D. | 5.325 |

orrected Counts Statistics 2:18 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | 2R.S.D. Kpulses |
|---|---|---|---|---|
| Zr | 1 | 0.012 | 0.006 | |

| | | |
|---|---|---|
| 2 | -0.001 | 0.004 |
| 3 | -0.062 | 0.012 |
| 5 | -0.021 | 0.004 |
| 6 | 1.503 | 0.025 |
| 7 | -0.009 | 0.017 |
| 8 | 0.085 | 0.003 |
| 9 | 0.342 | 0.014 |
| 10 | 0.024 | 0.011 |
| 11 | 0.033 | 0.007 |
| 12 | 0.042 | 0.002 |
| 14 | -0.031 | 0.011 |
| 15 | -0.017 | 0.011 |
| 16 | -0.059 | 0.011 |
| 17 | -0.002 | 0.002 |
| 18 | -0.079 | 0.004 |
| 19 | -0.005 | 0.010 |
| 20 | 0.037 | 0.001 |
| 21 | -0.010 | 0.003 |
| 22 | 0.099 | 0.055 |
| 24 | 0.022 | 0.008 |
| 25 | -0.023 | 0.004 |
| 26 | -0.003 | 0.002 |
| 27 | 0.012 | 0.003 |
| 28 | 0.013 | 0.005 |
| 29 | 0.002 | 0.001 |
| 30 | -0.007 | 0.003 |
| 31 | 0.119 | 0.012 |
| 32 | -0.013 | 0.007 |
| 33 | -0.058 | 0.008 |
| 34 | -0.127 | 0.004 |
| 35 | -0.020 | 0.009 |
| 36 | -0.108 | 0.004 |
| 37 | -0.138 | 0.020 |
| 38 | -0.019 | 0.014 |
| 39 | -0.058 | 0.005 |
| 40 | 0.006 | 0.001 |
| 42 | -0.007 | 0.011 |
| 43 | 0.022 | 0.002 |
| 44 | -0.006 | 0.001 |
| 45 | -0.060 | 0.008 |

---

Identity 1: CCR-4 Identity 2: CCR 2:18 PM January 23, 1992
Task name : ALL_SIM
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| Mean | -14.341 | -1.020 | -43.637 | -23.387 | -2130.435 | -0.236 | -23.979 | -63.002 |
| S.D. | 2.944 | 0.163 | 12.273 | 2.240 | 1609.870 | 3.981 | 2.286 | 5.670 |
| % R.S.D. | 20.530 | 15.953 | 28.125 | 9.578 | 75.565 | 1686.192 | 9.534 | 9.000 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| M | 12.765 | -43.499 | -6.034 | -4.277 | -1.652 | -0.315 | 6.792 | -1.344 |
| S... | 14.856 | 0.594 | 0.402 | 1.117 | 2.660 | 2.712 | 8.150 | 0.271 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R.S.D. | 116.384 | 1.367 | 6.663 | 26.118 | 161.000 | 859.617 | 119.991 | 20.145 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -8.498 | -43.456 | -7.812 | -54.365 | -116.679 | -122.991 | -2.155 | 11.573 |
| .D. | 3.274 | 0.096 | 1.107 | 24.767 | 21.222 | 11.912 | 0.106 | 20.022 |
| R.S.D. | 38.528 | 0.222 | 14.174 | 45.557 | 18.188 | 9.686 | 4.902 | 173.001 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -8.473 | -4.675 | -22.362 | -5.355 | -5.118 | -4.127 | -9.519 | -28.374 |
| .D. | 5.925 | 0.253 | 4.147 | 7.558 | 2.075 | 21.792 | 1.203 | 16.599 |
| R.S.D. | 69.921 | 5.413 | 18.545 | 141.152 | 33.918 | 528.079 | 12.638 | 58.500 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -4.743 | -2.829 | -1.790 | -150.191 | 0.031 | -77.221 | 3.013 | 0.249 |
| .D. | 0.548 | 0.819 | 2.787 | 31.005 | 0.058 | 60.760 | 1.605 | 0.108 |
| R.S.D. | 11.547 | 28.965 | 155.688 | 20.644 | 188.738 | 78.684 | 53.253 | 43.297 |

| | Tl (ppb) |
|---|---|
| ean | 0.703 |
| .D. | 56.404 |
| R.S.D. | 8018.914 |

---

orrected Counts Statistics 2:20 PM January 23, 1992
ask : ALL_SIM
amp. ght : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | -0.037 | 0.006 | |
| r | 2 | 246.646 | 0.335 | |
| i | 3 | -0.089 | 0.027 | |
| a | 5 | -0.034 | 0.011 | |
| o | 6 | 1.538 | 0.008 | |
| n | 7 | 20.974 | 0.130 | |
| i | 8 | 0.077 | 0.008 | |
| l | 9 | 0.078 | 0.016 | |
| | 10 | 0.612 | 0.060 | |
| n | 11 | 110.026 | 0.070 | |
| u | 12 | 21.043 | 0.032 | |
| i | 14 | 98.497 | 0.455 | |
| o | 15 | 40.920 | 0.037 | |
| i | 16 | 20.251 | 0.026 | |
| a | 17 | -0.004 | 0.000 | |
| u | 18 | -0.067 | 0.006 | |
| e | 19 | 14.917 | 0.064 | |
| a | 20 | 56.872 | 0.081 | |
| r | 21 | 12.006 | 0.024 | |
| d | 22 | 0.324 | 0.033 | |
| e | 24 | 0.069 | 0.005 | |
| m | 25 | -0.357 | 0.006 | |

| | | | |
|---|---|---|---|
| | 26 | 163.749 | 0.269 |
| | 27 | 0.175 | 0.007 |
| | 28 | 0.128 | 0.006 |
| | 29 | 22.722 | 0.012 |
| | 30 | -0.002 | 0.013 |
| | 31 | 16.313 | 0.052 |
| | 32 | 0.006 | 0.004 |
| | 33 | 0.421 | 0.008 |
| | 34 | 1.079 | 0.003 |
| | 35 | -0.009 | 0.009 |
| | 36 | -0.112 | 0.003 |
| | 37 | 224.303 | 0.408 |
| | 38 | 24.378 | 0.087 |
| | 39 | 0.843 | 0.001 |
| | 40 | 48.026 | 0.018 |
| | 42 | 0.896 | 0.010 |
| | 43 | 0.017 | 0.002 |
| | 44 | -0.008 | 0.000 |
| | 45 | -0.063 | 0.005 |

---

dentity 1: SST1 STD 1048Ac Identity 2: Direct 2:20 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Mo (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -36.780 | 9927.279 | -71.914 | -31.679 | 195.652 | 4953.309 | -29.479 | -172.530 |
| | 2.522 | 13.472 | 28.341 | 7.254 | 523.096 | 30.687 | 5.335 | 6.594 |
| | 6.857 | 0.136 | 39.410 | 22.898 | 267.360 | 0.620 | 18.096 | 3.822 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 819.361 | 9776.646 | 4868.281 | 10028.924 | 9662.387 | 4842.021 | -1.358 | -0.585 |
| .D. | 84.977 | 6.245 | 7.508 | 46.381 | 8.617 | 6.127 | 0.000 | 0.396 |
| R.S.D. | 10.371 | 0.064 | 0.154 | 0.462 | 0.089 | 0.127 | 0.000 | 67.583 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 4869.259 | 9565.887 | 5021.133 | -22.766 | 16.212 | -1118.677 | 9997.570 | 1142.095 |
| .D. | 20.770 | 13.676 | 9.925 | 14.911 | 13.069 | 16.934 | 16.415 | 50.174 |
| R.S.D. | 0.427 | 0.143 | 0.198 | 65.495 | 80.553 | 1.514 | 0.164 | 4.393 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 49.417 | 4974.154 | -13.576 | 10010.020 | 0.000 | 257.680 | 373.667 | -9.056 |
| .D. | 7.237 | 2.657 | 16.473 | 31.913 | 1.317 | 22.493 | 1.021 | 15.403 |
| R.S.D. | 17.905 | 0.053 | 121.338 | 0.319 | 5854315.791 | 8.729 | 0.273 | 170.089 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -5.285 | 9427.393 | 4850.007 | 5293.690 | 4818.293 | 4903.789 | -0.461 | -0.062 |
| .D. | 0.414 | 17.156 | 17.399 | 3.488 | 1.794 | 54.420 | 1.446 | 0.000 |
| R.S.D | 7.833 | 0.182 | 0.359 | 0.066 | 0.037 | 1.110 | 313.818 | 0.000 |

Tl

| | (ppb) |
|---|---|
| ean | -20.393 |
| .D. | 32.490 |
| R.S.D. | 159.270 |

rrected Counts Statistics 2:23 PM January 23, 1992
sk name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | -0.144 | 0.004 | |
| r | 2 | -0.011 | 0.005 | |
| i | 3 | 4.886 | 0.041 | |
| e | 5 | -0.024 | 0.012 | |
| u | 6 | 1.541 | 0.014 | |
| n | 7 | -0.083 | 0.035 | |
| i | 8 | 0.024 | 0.009 | |
| l | 9 | 1.194 | 0.041 | |
| | 10 | -0.012 | 0.016 | |
| n | 11 | 0.229 | 0.011 | |
| u | 12 | 0.094 | 0.004 | |
| l | 14 | -0.019 | 0.002 | |
| o | 15 | -0.026 | 0.003 | |
| i | 16 | -0.071 | 0.008 | |
| e | 17 | 1.278 | 0.004 | |
| d | 18 | 78.579 | 0.227 | |
| e | 19 | 0.036 | 0.007 | |
| a | 20 | 0.407 | 0.004 | |
| r | 21 | -0.013 | 0.009 | |
| d | 22 | 11.847 | 0.049 | |
| e | 24 | 1.865 | 0.006 | |
| s | 25 | 1.802 | 0.004 | |
| e | 26 | -0.438 | 0.006 | |
| | 27 | 0.021 | 0.004 | |
| | 28 | 0.016 | 0.008 | |
| q | 29 | 0.009 | 0.001 | |
| s | 30 | 0.085 | 0.006 | |
| a | 31 | 0.237 | 0.024 | |
| o | 32 | 0.012 | 0.003 | |
| e | 33 | -0.044 | 0.017 | |
| q | 34 | 16.431 | 0.052 | |
| b | 35 | 2.675 | 0.045 | |
| l | 36 | -0.135 | 0.010 | |
| d | 37 | -0.160 | 0.025 | |
| | 38 | -0.007 | 0.020 | |
| | 39 | -0.047 | 0.008 | |
| n | 40 | -0.013 | 0.002 | |
| b | 42 | -0.021 | 0.004 | |
| | 43 | 0.060 | 0.004 | |
| e | 44 | -0.008 | 0.002 | |
| l | 45 | -0.036 | 0.004 | |

entity 1: SS72 SF3 2348A2 Identity 2: Direct 2:24 PM January 23, 1992
sk name : ALL_SIM
mple Weight : 1.0000 Solution Volume : 1.00
Integrations : 3 Off-Peak Integrations : 1

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Mo (ppm) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -86.084 | -1.436 | 5138.329 | -25.088 | 369.565 | -17.706 | -64.458 | 291.196 |
| D. | 1.851 | 0.209 | 42.738 | 7.967 | 920.005 | 8.213 | 5.915 | 17.179 |
| R.S.D. | 2.150 | 14.569 | 0.832 | 31.756 | 248.942 | 46.386 | 9.177 | 5.900 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -37.188 | -26.000 | 6.113 | -3.021 | -3.777 | -3.336 | 5222.901 | 5113.733 |
| D. | 22.563 | 0.955 | 0.815 | 0.204 | 0.818 | 1.805 | 14.693 | 14.739 |
| R.S.D. | 60.673 | 3.672 | 13.334 | 6.742 | 21.651 | 54.125 | 0.281 | 0.288 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | 5.122 | 19.165 | -9.068 | 5225.630 | 5092.469 | 5313.077 | -28.707 | 69.371 |
| D. | 2.176 | 0.600 | 3.720 | 22.020 | 17.043 | 10.459 | 0.336 | 28.030 |
| R.S.D. | 42.496 | 3.130 | 41.023 | 0.421 | 0.335 | 0.197 | 1.170 | 40.407 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -5.559 | -3.214 | 96.314 | 67.421 | 1.688 | 37.841 | 5251.394 | 4853.101 |
| D. | 9.330 | 0.219 | 7.447 | 14.998 | 0.796 | 49.632 | 16.659 | 81.122 |
| R.S.D. | 167.843 | 6.818 | 7.732 | 22.245 | 47.186 | 131.159 | 0.317 | 1.672 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| an | -8.356 | -3.767 | 0.597 | -81.715 | -1.956 | -156.284 | 28.954 | -0.062 |
| D. | 1.293 | 1.032 | 3.929 | 48.336 | 0.174 | 24.044 | 2.631 | 0.323 |
| R.S.D. | 15.469 | 27.387 | 658.564 | 59.152 | 8.915 | 15.385 | 9.086 | 519.797 |

| | Tl (ppb) |
|---|---|
| an | 174.165 |
| D. | 24.696 |
| R.S.D. | 14.180 |

orrected Counts Statistics 2:25 PM January 23, 1992
ask name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

| nalyte | Channel | Mean Kpulses | S.D. Kpulses | %R.S.D. Kpulses |
|---|---|---|---|---|
| r | 1 | 23.354 | 0.039 | |
| r | 2 | 0.008 | 0.008 | |
| i | 3 | -1.845 | 0.030 | |
| - | 5 | 15.857 | 0.063 | |
| | 6 | 26.881 | 0.054 | |
| n | 7 | 0.068 | 0.042 | |

| | | |
|---|---|---|
| 8 | 12.673 | 0.028 |
| 9 | 12.183 | 0.024 |
| 10 | 31.781 | 0.062 |
| 11 | 0.143 | 0.003 |
| 12 | 0.056 | 0.005 |
| 14 | -0.025 | 0.009 |
| 15 | -0.080 | 0.019 |
| 16 | 0.301 | 0.023 |
| 17 | -0.006 | 0.001 |
| 18 | -0.155 | 0.007 |
| 19 | 0.002 | 0.009 |
| 20 | 0.137 | 0.001 |
| 21 | 0.019 | 0.001 |
| 22 | -0.099 | 0.051 |
| 24 | 0.021 | 0.013 |
| 25 | -0.100 | 0.007 |
| 26 | -0.016 | 0.008 |
| 27 | 1.476 | 0.014 |
| 28 | 4.572 | 0.027 |
| 29 | 0.011 | 0.001 |
| 30 | 3.973 | 0.015 |
| 31 | 0.190 | 0.003 |
| 32 | 32.008 | 0.017 |
| 33 | 1.493 | 0.015 |
| 34 | -0.120 | 0.011 |
| 35 | -0.067 | 0.007 |
| 36 | 37.068 | 0.072 |
| 37 | -0.277 | 0.025 |
| 38 | 0.018 | 0.013 |
| 39 | -0.053 | 0.005 |
| 40 | 0.017 | 0.002 |
| 42 | 0.020 | 0.003 |
| 43 | 14.488 | 0.023 |
| 44 | 54.202 | 0.093 |
| 45 | 0.656 | 0.004 |

---

dentity 1: SST3 STD 3R48AD Identity 2: Direct 2:26 PM January 23, 1992
ask-name : ALL_SIM
ample Weight : 1.0000 Solution Volume : 1.00
n-Peak Integrations : 3 Off-Peak Integrations : 1

---

| | Zr (ppb) | Sr (ppb) | Bi (ppb) | Ta (ppb) | Hg (ppb) | Sn (ppb) | Si (ppb) | Al (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 10674.526 | -0.671 | -1910.248 | 10104.822 | 1652978.261 | 17.863 | 8283.835 | 4855.891 |
| .D. | 17.655 | 0.314 | 31.073 | 40.246 | 3512.669 | 10.024 | 18.585 | 9.821 |
| R.S.D. | 0.165 | 46.862 | 1.627 | 0.398 | 0.213 | 56.117 | 0.224 | 0.202 |

| | W (ppb) | Zn (ppb) | Cu (ppb) | Li (ppb) | Co (ppb) | Ni (ppb) | La (ppb) | Eu (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 44915.732 | -33.618 | -2.707 | -3.632 | -16.603 | 85.369 | -10.866 | -6.330 |
| .D. | 87.528 | 0.273 | 1.097 | 0.808 | 4.506 | 5.511 | 2.353 | 0.479 |
| R.S.D. | 0.195 | 0.811 | 40.524 | 22.254 | 27.139 | 6.457 | 21.652 | 7.573 |

| | Fe (ppb) | Ca (ppb) | Cr (ppb) | Nd (ppb) | Ce (ppb) | Sm (ppb) | Ba (ppb) | P (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | -5.992 | -26.555 | 4.325 | -143.332 | -121.391 | -351.314 | -2.928 | 10165.469 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| R.S.D. | 48.893 | 0.368 | 9.677 | 16.023 | 30.310 | 5.954 | 16.710 | 0.926 |

| | S (ppb) | Mg (ppb) | As (ppb) | Na (ppb) | Mo (ppb) | Se (ppb) | Ag (ppb) | Pb (ppb) |
|---|---|---|---|---|---|---|---|---|
| | 5255.563 | -2.849 | 5111.728 | 38.352 | 10126.895 | 4505.832 | -7.294 | -112.891 |
| | 30.814 | 0.127 | 19.364 | 2.143 | 5.308 | 44.624 | 3.397 | 12.328 |
| R.S.D. | 0.583 | 4.441 | 0.379 | 5.586 | 0.052 | 0.990 | 46.575 | 10.929 |

| | Ti (ppb) | Cd (ppb) | B (ppb) | K (ppb) | Mn (ppb) | Sb (ppb) | V (ppb) | Be (ppb) |
|---|---|---|---|---|---|---|---|---|
| ean | 5032.746 | -8.683 | 5.436 | -119.981 | 1.124 | 69.875 | 10054.502 | 10113.112 |
| .D. | 9.688 | 1.055 | 2.648 | 31.005 | 0.154 | 16.548 | 16.107 | 17.437 |
| R.S.D. | 0.193 | 12.155 | 48.719 | 25.842 | 13.656 | 23.683 | 0.160 | 0.172 |

| | Tl (ppb) |
|---|---|
| ean | 5038.127 |
| .D. | 30.653 |
| R.S.D. | 0.608 |

R935-R946
1/23/92

THIS PAGE INTENTIONALLY
LEFT BLANK