

PLANT RECORDS RECEIPT NO.
35545

1651 K/TL-62-  
Part 2F

This document consists of 25 pages  
No. 37 of 53 copies, Series A.

K-25 TECHNICAL SERVICES DIVISION  
ACTIVITIES REPORT FOR NOVEMBER 1976

TECHNICAL SERVICES FOR BARRIER  
DEVELOPMENT AND PRODUCTION (U)

Compiled by  
J. D. Joyner and G. L. Marshall  
Classification and Technical Information Department

R. W. Levin  
Division Director

KTL 625 PT2F 37 A  
\*KTL 625 PT2F 37 A\*

~~SECRET~~  
~~Classification Change to CRD~~  
~~ADD [Signature]~~  
The information is based on [Signature] AD [Signature] review as authorized by DOE Office of Documentation Memo of 9/18/94.

December 20, 1976



prepared for the U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION  
under U.S. GOVERNMENT Contract W-7405 eng 26

1651

~~RESTRICTED DATA~~  
This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Its dissemination or disclosure to any unauthorized person is prohibited.

**K25RC**  
NOT TO BE LOANED FROM  
PLANT RECORDS

Classified by ~~[Signature]~~  
Supervisor Classification  
Technical Information Department...

Air Pollution Sampling and Analysis - R. L. Clark and C. L. Buskirk

Existing procedures were adapted and implemented for sampling gaseous effluents from various exhaust stacks in the plant area. These samples were subsequently analyzed for such air pollutants as fluorides, uranium, oxides of nitrogen, sulfur dioxide and total particulate matter. Analytical results are sent to the operation groups and to the Waste Management and Pollution Control Department to help assess the plant's environmental pollution problems.

New Water Pollution Analysis - B. K. Salmon, J. F. Simmons and C. L. Buskirk

Weekly composite samples from several liquid effluent points in the plant have been analyzed for the past several months to gather a basis for control of environmental pollution. Several analyses recently added to this program necessitated the implementation of new procedures, including the measurement of Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and total solids content. About 60 parameters are now measured in water effluents.

Converter Decontamination: Control Analysis Group - C. L. Buskirk

This group provided analytical coverage for the clean-up operation conducted in the furnace stands in K-1401, following the recent incident in the plant purge cascade. The decontamination operation required frequent monitoring of the clean-up gas for fluorine and  $UF_6$ . The entire operation covered a three-week period and required shift coverage around the clock. The urgency of this work was reduced as the purge cascade became operable.

Increased Urine Analysis - J. A. Lampley

The number of urine samples analyzed for uranium and associated alpha activity during the month increased over the normal level. Samples from the routine industrial hygiene urine program were supplemented by submissions from personnel involved in the clean-up from the recent plant inleakage.

Explosivity Testing of Fine Nickel Powder - S. B. Woodfin

High surface area nickel powder produced by thermal decomposition of nickel formate has been tested for explosivity at the request of the Barrier Development Department. The powder feed rate was varied up to 6.16 g/m and the airflow was varied from 2.54 down to 0.25 ft<sup>3</sup>/min. No explosion occurred.

Testing Filter Paper Handsheets - F. N. Wiggins and G. S. Petit

The Herty Foundation at Savannah, Ga. is developing a "fluoride-resistant" high efficiency particulate absolute (HEPA) filter paper for the AEC. Current papers consist of fiber blends of asbestos and a special glass



[REDACTED]

15

Spectrochemical Analyses of Poplar Creek Bed-Core Samples -  
D. C. Randolph

[Keywords: Spectrochemical Analysis, Poplar Creek]

The Spectrochemical Laboratory recently received bed-core samples from Poplar Creek for the analysis of certain metallic elements. The analyses were needed by the ORGDP Environmental Protection Group to provide a base for future environmental studies. The core samples were taken at eight points on Poplar Creek between Blair Bridge and the Clinch River. Iron, copper, nickel, and zinc were determined in the samples by atomic absorption spectrophotometry after dissolution of the materials.

A special new spectrographic technique\* was adapted for making the requested mercury, lead, and cadmium determinations. The technique consisted of mixing the dried, pulverized sample with a graphite-calcium fluoride buffer which contained bismuth as an internal standard. The buffer additive suppresses the interfering iron spectrum from these samples. Portions of the mixtures were transferred to graphite electrodes which were fitted with boiler caps and the electrodes were excited on the spectrograph with a dc arc. Standards were prepared using a synthetic matrix and were analyzed along with the samples. Limits of sensitivity of 0.1 ppm for mercury and cadmium and 1 ppm for lead were obtained using the technique.

Precision Studies for the Determination of Chloride  
O. B. Young

[Keywords: Chlorides--Analysis,

Precision studies have been conducted for the analysis of chloride in using the Parr Bomb ignition technique. Three separate were each analyzed ten times using the Parr Bomb ignition technique for sample preparation followed by a chloride determination using the Aminco-Cotlove coulometric titrator. A statistical analysis of the results showed the precision of a single analysis at the 95% confidence level is  $\pm 23\%$  of the value in the 70 to 90 ppm range. Work is continuing to improve the technique by eliminating a problem of possible iron interference originating from the materials of the Parr Bomb.

Hydrolysis and Analysis of Rhenium Hexafluoride - M. P. Jones and  
J. K. Lowery

[Keywords: Rhenium Hexafluoride, X-Ray Analysis]

Samples of rhenium hexafluoride ( $\text{ReF}_6$ ) were recently received from the Materials and Systems Development Department for the determination of the  $\text{ReF}_6$  content. The purity of the  $\text{ReF}_6$  was needed to permit accurate

---

\*Cowgill, U. M., "A New Method for Homogenizing Powder Mixtures and One Solution to the Problem of Variable Matrices Commonly Found in Lake Muds," *Applied Spectroscopy*, 28, No. 5, 455-457 (September/October 1974).

~~SECRET~~

1651

K-TL-430, Part 8

This document consists of 60 pages  
No. 36 of 49 copies, Series A.

LABORATORY DIVISION  
MONTHLY ACTIVITIES REPORT (U)

FEBRUARY 1975

PLANT RECORDS RECEIPT NO.
U68387

\*KTL 430 PTR 36 A\*  
KTL 430 PTR 36 A

Compiled by  
J. D. Joyner  
and  
G. L. Marshall  
Technical Information Department

J. C. Barton  
Division Superintendent

~~SRD classification changed to OAS~~  
~~ADD signature~~ ~~Date~~  
 This downgrading based on a final ADD review conducted by DOE Office of Decommissioning on 3/16/94.  
 March 14, 1975

**K25RC**  
NOT TO BE LOANED FROM  
PLANT RECORDS



prepared for the U.S. ATOMIC ENERGY COMMISSION  
under U.S. GOVERNMENT Contract W-7405 eng 26

~~RESTRICTED DATA~~

This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Its dissemination or disclosure to any unauthorized person is prohibited.

~~INTERNAL~~

This document contains preliminary information which was prepared primarily for internal use. Since it is subject to revision and does not represent a final report, it should not be disseminated beyond the organizations indicated by the distribution list without prior approval of the ORGDP Laboratory Division Superintendent.

~~G. W. Cagle~~  
Classifying Official  
~~Technical Information~~  
Department Head  
Title of Position

~~SECRET~~

CHEMICAL ANALYSIS DEPARTMENT  
C. W. Weber

CONTROL ANALYSIS SECTION - T. Kwasnoski

Facility II Stack Sampling - C. L. Buskirk, et al

[Keywords: Selas Evaporator, Stack Samples]

A sampling program, designed to characterize the gaseous effluent from the Facility II Selas evaporator, has been completed.

Twelve gas samples, each of 2-hr sampling duration, were collected from the stack of the evaporator during a 48-hr period of continuous operation.

The concentration of sulfur dioxide in all samples was very low. A routine sampling program on the stack will be implemented when the facility resumes normal operation.

Facility II Analytical Support Laboratory - H. H. Sullivan, et al

[Keywords: Chemical Analyses]

Analysis of Heat Treatment Fluids - S. B. Harris and J. S. McCall

[Keywords: Heat Treatment Fluids, Water Content, Infrared Analysis]

Samples of a heat treatment fluid used in a cooling loop in the Separation Systems Division were analyzed in an attempt to determine the cause of an operational problem. Analyses for water content and flash point, as well as an infrared scan, were obtained on the used materials and on a sample of new material. There were no significant differences in the flash points between the new and used samples and the comparative infrared scans showed very little evidence of degradation with use. The water content of the new material was below the vendor's specification maximum of 0.2 wt %, but that in the used samples ranged from 0.5 to 1.3 wt %. Subsequent examination of the cooling system revealed a water leak. Routine analysis of incoming fluid materials will be initiated along with periodic checking of the fluid in the system.

1651

K-TL-430, Part 8

This document consists of 60 pages  
No. 36 of 49 copies, Series A.

LABORATORY DIVISION  
MONTHLY ACTIVITIES REPORT (U)

FEBRUARY 1975

PLANT RECORDS RECEIPT NO.
<u>U68387</u>

KTL 430 PT8 36 A  
\*KTL 430 PT8 36 A\*

Compiled by  
J. D. Joyner  
and  
G. L. Marshall  
Technical Information Department

J. C. Barton  
Division Superintendent

~~RESTRICTED DATA~~  
~~ADD SIGNATURE~~  
~~THIS DOCUMENT IS BASED ON FINAL REVIEW AS AUTHORIZED BY DOE OFFICE OF SECURITY ON 3/16/94~~  
March 14, 1975

**K25RC**  
NOT TO BE LOANED FROM  
PLANT RECORDS



**UNION  
CARBIDE**

**OAK RIDGE GASEOUS DIFFUSION PLANT**  
OAK RIDGE, TENNESSEE

prepared for the U.S. ATOMIC ENERGY COMMISSION  
under U.S. GOVERNMENT Contract W-7405 eng 26

~~RESTRICTED DATA~~  
This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Dissemination or disclosure to any unauthorized person is prohibited.

~~INTERNAL~~  
This document contains preliminary information, which is prepared primarily for internal use. Since it is subject to revision and does not represent a final report, it should not be disseminated outside the organizations created by and for the Laboratory without prior approval of the Laboratory Division Superintendent.

G. W. Cagle  
Classifying Official  
  
Technical Information  
Department Head  
Title of Position

and sulfate before the trucks are unloaded. The analyses are completed within 30 min.

The iron and magnesium are determined by atomic absorption spectrophotometry, after dissolution of the lime sample in hydrochloric acid. Sulfate is measured turbidimetrically as barium sulfate after precipitation from hydrochloric acid solution with barium chloride. Glycol is employed to maintain the precipitate in suspension. The procedures provide adequate sensitivity for measuring the specification limits of 0.05% iron, 1% magnesium, and 0.1% sulfate.

EXHAUST STACK SAMPLING (U) - [J. S. McCall and R. L. Clark, Chemical Analysis Department]

[Keywords: Stack Exhausts; Fluorine; Nickel]

At the request of the Plant Methods and Environmental Management Group, samples were collected from a K-1004-L exhaust stack used for exhausting fluorine from both the CPP and the Physical Measurements Laboratory. The sampling was conducted in such a manner that the contribution of each area to the total emission could be measured. After all data are evaluated, recommendations will be made for limiting the emission from the stack.

A sampling program is under way for Barrier Manufacturing personnel to evaluate the amount of nickel dust being exhausted through two stacks which service the K-1037 Blend Tower. Samples from each stack are being collected at a rate of 3 to 4 per week, over a 4- to 6-week period. A periodic sample is being collected concurrently on the inlet stream to the exhaust bag filter to determine the efficiency of the filter. The data from this study will be used to implement changes in the bag filter design and/or in blend tower operation to reduce emissions.

PLANT RECORDS RECEIPT NO.
U 68092

1651

K-TL-430, Part 4

This document consists of 52 pages  
No 35 of 48 copies, Series A.

LABORATORY DIVISION  
MONTHLY ACTIVITIES REPORT (U)

OCTOBER 1974

KTL 430 PT4 35 A



\*KTL 430 PT4 35 A\*

Compiled by

J. D. Joyner

~~CONFIDENTIAL~~  
~~ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED~~  
~~DATE 11/15/83 BY SP-8 JCS/STC~~

This document is based on information furnished by the Office of the Laboratory Division Superintendent.

J. C. Barton  
Division Superintendent

**K25RC**  
NOT TO BE LOANED FROM  
PLANT RECORDS

November 8, 1974

UNION  
CARBIDE

**OAK RIDGE GASEOUS DIFFUSION PLANT**

OAK RIDGE, TENNESSEE

prepared for the U.S. ATOMIC ENERGY COMMISSION  
under U.S. GOVERNMENT Contract W-7405 eng 26

~~RESTRICTED DATA~~  
This document contains restricted data as defined in the Atomic Energy Act of 1954. Its transmission or disclosure to any unauthorized person is prohibited.

~~INTERNAL~~  
This document contains preliminary information which is prepared primarily for internal use since it is subject to revision and does not represent a final report. It should not be disseminated beyond the organizations indicated by the distribution list without prior approval of the RGDPLaboratory Division Superintendent.

G. W. Cagle  
Classifying Official  
  
Technical Information  
Department Head  
Title of Position

~~SECRET~~

17

Analytical Support Work

[Keywords: Chemical Analysis]

The Elemental and Spectrochemical Laboratories, in addition to the routine types of samples, have received a variety of nonroutine samples in support of various plant programs. Nonroutine analytical work recently performed by the Spectrochemical Group included: filter papers used in environmental monitoring of air for a variety of elements in dust, submitted by

~~SECRET~~

the Plant Industrial Hygiene Group; special urine samples for the determination of nickel from the Plant Industrial Hygiene Group; silt samples from the 802-H cooling tower basin for metallic constituents from the Environmental Protection Group; determination of metallic constituents from the Analytical Development Group; discolored oil for the determination of metallic constituents from Separation Systems; solutions from osmosis studies being conducted by the Materials and Systems Development Department for the determination of sodium and calcium; metals and alloys from Materials Evaluation Services for the determination of the alloying constituents; stainless steel welds from Materials Evaluation Services for the determination of alloying elements; and special samples from INCO's Huntington Plant for nickel

The following nonroutine samples were analyzed by the Elemental Analysis Laboratory: phosphorus in oil samples from the Laboratory Troubleshooting Group:

halogens, ammonia, chromium and pH in special water samples from the Analytical Development Group;  $U^{+4}$  and  $U^{+6}$  in test loop residues from the Materials and Systems Development Department; special samples from Separation Systems Division; uranium in special samples from INCO's Huntington, W. Va. plant; fluoride and chloride in effluent samples, and chloride in detergents, solutions from the Materials and Systems Development Department; and uranium in leaching solutions from the Laboratory Troubleshooting Group.

ANALYTICAL DEVELOPMENT AND MICROANALYSIS SECTION - J. H. Stewart, Jr.

X-Ray Diffraction and Microscopy Services - T. W. Bartlett,  
F. N. Bensey, Jr., W. D. Ghormley, Jr., and D. R. Johnson

The microscopy laboratory received a total of 90 samples during the month,

the identification of sodium nickel (II) sulfate hydrate [ $Na_2Ni(SO_4)_2 \cdot 4H_2O$ ] as the residue remaining on a *cleaned* bellows, from an ORGDP cleaning procedure under development in K-1420 by the Materials and Systems Development Department; and the rapid (less than 1 hr) identification of nickel as the dark material found in a medical nasal swab sample received from the Industrial Hygiene Group.

1651

Date of Issue: October 19, 1971

Report Number: K-TL-201, Part 1

LABORATORY DIVISION  
MONTHLY ACTIVITIES REPORT(U)

SEPTEMBER 1971

R 82324



KTL 201 PTJ 40 A

to

Wm. J. Wilcox, Jr.  
Technical Director  
Production Plants

NOT TO BE RELEASED FROM  
PLANT PREMISES

J. C. Barton  
Division Superintendent

~~SECRET~~  
~~CONFIDENTIAL~~  
OCT 20 1971  
ADD TO [redacted]  
This document is based on a review of [redacted]  
conducted by the Office of [redacted] on 10/16/94

UNION CARBIDE CORPORATION  
NUCLEAR DIVISION  
Oak Ridge Gaseous Diffusion Plant  
Oak Ridge, Tennessee

RESTRICTED  
This document contains information which is exempt from automatic declassification under Executive Order 11652, as amended, and is not to be released outside the [redacted] without the express written approval of the [redacted].  
GPO: 1971 O - 348-100  
declassification [redacted]

CHEMICAL ANALYSIS DEPARTMENT  
C. W. Weber

CONTROL ANALYSIS SECTION - T. Kwasnoski

Color Measurement

C. C. Wright

[Keywords: Specification Analysis, Color Measurement]

A method (ASTM D 1209-69) has been implemented for the visual measurement of the color of essentially water-white liquids.

In the procedure, the color of the sample is compared visually in Nessler tubes to that of standards containing known amounts of a reference cobalt-platinum solution. The result is reported as a color number on a platinum-cobalt scale. The color number corresponds to a fixed dilution of the reference solution.

Exhaust Stack Sampling - J. S. McCall, R. L. Clark, and E. Armes

[Keywords: Exhaust Stack, Particulate Emissions]

Air samples were recently taken at seven exhaust stacks in the K-1037 facility to establish particulate emission levels for an environmental impact statement.

Infrared Analytical Services - J. S. McCall

[Keywords: Infrared Analysis; Residues]

Infrared analyses have been performed for the purpose of qualitative identification of residues remaining on surfaces treated with cleaners, brighteners, or rust preventatives following evaporation. Samples of rust preventatives, Rust Veto and Cosmoline, were evaporated at room temperature; by infrared scans, the residues from both materials proved to be long chain saturated hydrocarbons. That from the Rust Veto also contained a significant level of carbonyl compound.

A metal brightener, ARP 28, and an alkali cleaner for aluminum, Isoprep 35, were also examined by infrared for identification of residues. The solids remaining after room-temperature evaporation of the aqueous phase from the ARP 28 showed the presence of nitrate and ammonium ions with no trace of organics. The residue left after evaporation of Isoprep 35 indicated the presence of hydroxyl groups and inorganic carbonate, with only a slight trace of hydrocarbons.