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MOUND LABORATORY

OPERATED BY

MONSANTO CHEMICAL COMPANY

MIAMISBURG, OHIO

PROGRESS MEMORANDUM

February 16 - March 15, 1952

Released through the
MOUND LSDR PROJECT
(funded through DOE's OPENNESS INITIATIVE)
Record Copy held at Mound Facility

CONTROL SECTION

Abstract

Group 20

Ninety-eight purity determinations were made, three determinations required resampling.

A compact six channel stirring unit was designed which can be used in the four channel plating hoods.

The sensitivity curve of the macro-purity balance was compared with a similar balance located in the "R" Building. It appeared that our balance was out of adjustment. A letter was sent to the balance manufacturer requesting information to aid in re-establishing our optimum sensitivity.

The insulator type weighing cylinder was received and is being tested.

MOUND DECLASSIFICATION REVIEW
1ST REVIEW-DATE: 9/11/97
AUTHORITY: AOC ADC ADD
NAME: H. ANDERSON
2ND REVIEW-DATE: 1/21/98
AUTHORITY: ADD
NAME: [illegible]
DETERMINATION (CIRCLE NUMBER(S))
1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO:
3. CONTAINS NO DOE CLASSIFIED INFO
4. COORDINATE WITH:
5. CLASSIFICATION CANCELLED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY):

Group 22

The annual A.E.C. audit of the precious metals stock was conducted during this period. Coincidentally the precious metals stock may be reduced by approximately $12,000.00 in compliance with an A.E.C. request to reduce all stock inventories, if possible, without affecting operating practices.

Group 24

An abnormal increase was noted in the number of guns, particularly XY's, with high neutron counts. A reworking of these substandard items is indicated.

GROUP 1
Excluded from automatic downgrading and declassification

This document [illegible] defined in the [illegible] transmittal or the disclosure of its contents in any manner to an unauthorized person is prohibited.

Group 33

The bookkeeping survey and the efficiency study were continued in the Y Section.

Several pairs of gloves were fabricated on the site from Unichrome, a vinyl type plastic. The gloves are being tested in P and E line #3.

DETAILED REPORT

Group 20 - Electrolytic Purity Assay

Operations

Purities were determined on 98 products during this period. Three products required resampling. To date, 248 products have been run this year; 5 or 2.02 percent required resampling.

Fifty-nine bismuth determinations were made variously for H. F. Anson, H. L. Rawlings, and R. W. Endebrock.

Thirty-nine chloride determinations were made for H. F. Anson.

Personnel

A letter of resignation was received from Mrs. Jean Herman on February 26, 1952 effective June 1, 1952. Copies were forwarded to the proper people.

Carl Eads returned to this group March 1, until sufficient work is available to utilize his full time on the 208 program.

EQUIPMENT AND MAINTENANCE

One foil was dropped and recovered from Logac Mike.

Nine foil holders were serviced this period. All were cleaned and in addition two tips required straightening.

No service, except cleaning, was required by the Micro Balances this period.

The Friden Calculator has been repaired and returned.

The Koroseal tile in front of the production line was removed, cleaned, and will be relaid March 14. If this proves satisfactory, all the Koroseal tile in the lab will be relaid. This is a test for the entire "T" area where Koroseal tile is used.

The lab cabinet that will house the distillation and control equipment for this process has been received and installed in the appropriate place. Assembly and installation of the apparatus has started. It was necessary to move the fire blanket to the North-east corner of room 260.

DEVELOPMENT

Design of Six-Unit Stirrer R. Morgan

A six unit stirrer, with the individual units on five inch centers, only one inch longer overall than the present four unit stirrers has been designed. While designed primarily for hood #10, it is usable in any of our plating hoods. No major alteration of the present hoods is required. Minor alterations to accommodate six loading blocks and the electrical service would be required. The work can be done from the front of the hood, however, the hoods would first have to be decontaminated.

William Mead asserts an adequate 6 unit plating controller can be built that will fit into the space presently occupied by our four unit controllers.

Macro-Assay Development
(Measurement of Buoyancy of a Thermally-Hot Sample) A. Elmlinger

All the weights, pan and rider type, of our semi-micro balance were calibrated on the micro-balance in the Research Building against a set of weights certified by the National Bureau of Standards.

By comparison the sensitivity of our semi-micro balance differs widely from the same type balance used in the Research Building. Wm. Ainsworth & Sons' Catalog AW 12 shows the Research Building balance to be the properly adjusted balance. Our balance was readjusted to bring the full load sensitivity within the specified range. However, the requirement that no load sensitivity be within 20 percent of full load sensitivity has not been approached. The best adjustment, thus far, has the no load sensitivity 40 percent of that at full load. A letter was sent to the manufacturer inquiring about the feasibility of re-establishing the specified performance.

A new thermal control cylinder, utilizing Santocel as the

insulating medium, was fabricated by the machine shop. This cylinder will reduce the load on the balance during hot weighings from about 100 grams to about 60 grams.

A weight loss curve, with a new 25 curie gauze in the new thermal control cylinder, was run on the Research Building semi-micro balance. A comparison weight loss curve will be run on our balance using the new heat source and each of the types of thermal control cylinders available. When this work is completed, hot weighings will be resumed.

Group 22 - Inventory and Sampling

During the month, the yearly audit of the precious metals stock was completed by M. A. Lee of the A.E.C. staff from Oak Ridge. Only minor discrepancies were uncovered with one exception; the Inventory Group was aware that approximately 30 grams of 0.002" Tantalum Foil was classified as Platinum foil through some error made during the year and the opportunity was taken during the audit to adjust this matter. Also, foil of thicknesses of 0.0001" and less was placed on a square inch accountability basis rather than a weight basis due to the difficulty of weighing such material without destroying it. The physical inventory following the audit was then reconciled with the records of the Accounting Department and an Inventory Adjustment Report issued to coordinate both sets of records. This year's audit also included an examination of the records kept on bismuth slugs as received from Hanford and the stock of bismuth pigs used in processing operations; spot checks were made of several batches of "hot" slugs and the pig stock was checked completely. No discrepancies were uncovered in this category.

During the progress of the audit mentioned above, it was noted that issuance of stock over the past several years had resulted in many small remainders of foil of irregular size and shape. Much of this is of such an irregular shape as to make it unlikely that it could ever be used to fill a requisition. Accordingly, a ruling was sought and secured from Mr. S. H. Cunningham for permission to transfer such material to scrap; this work is now in progress and will tend to reduce the dollar value of the inventory.

Upon request of the A.E.C., the precious metals stock has been re-examined in the light of reducing the inventory stock to more realistic levels. It has been determined that a reduction of approximately $12,000 can be made without seriously impeding the work of the project. A memorandum has been circulated to the supervisory staff involved outlining the reduction in detail, and the material declared excess will be removed from stock after March 15.

During an investigation in 1949 and 1950 which was concerned with calibration of the Logac-8 instruments, the Inventory Group came upon the phenomenon that small samples of fairly high Po concentration (2.0 ml and 0.5 curies per ml.) did not decay according to the accepted 138.4 day half-life tables. The behavior was investigated to some extent and results were secured indicating a half-life of considerably more than 138 days. Results were somewhat erratic for the first 20 to 30 days and then tended to stabilize. The behavior aroused considerable interest, but the Inventory Group was not equipped to pursue the matter beyond this stage; as a corollary of the work, it was of course apparent that such samples had to be assayed immediately in order to be sure of dependable results and that such solutions could not be successfully reassayed - this fact was of the utmost importance in calibration work. At the time of the discovery, some interest was indicated by the Research Division and this interest has been recently revived. At the request of Mrs. Mary Lou Curtis, the Inventory Group has turned over to her all data collected in the investigation and she is going to pursue the matter further in an effort to determine the underlying cause.

On March 7, Mr. Fowles of Brush Beryllium called the Inventory Group requesting the return of Beryllium rod Y-4512 received in a shipment from them on February 26. He stated that recent examination of their processing data on this rod indicated that it was too high in Manganese and Aluminum to meet our specifications. He agreed to replace it with a good bar if we would return it to them in Cleveland. The matter is being attended to.

The solution of the spent AUM items continues somewhat slowly due to the fact that the Concentration Group is handling these in batches of approximately twelve. Following efforts by the Health Physics Section to decontaminate those items suspected of contamination with 239, it was decided that the Inventory Group could best destroy these completely without decontamination. Steps have been taken to do this work in Room 247 and the necessary apparatus has already been secured. Once successful destruction has been achieved, the resulting solutions will be delivered to the R Building for disposal in the evaporator.

On March 7, word was received from Los Alamos that the Beryllium stock from Brush Beryllium Company which was being used for "Cell" parts was not satisfactory for the purpose. Mr. Roy suggested that a small supply of stock on hand at Mound Laboratory which had been furnished by Los Alamos from material fabricated by M.I.T. be used for the purpose; he also requested that all uncoated parts already fabricated plus samples of the rod stock from Brush Beryllium be forwarded to him for X-ray examination. The work of packaging this material is now in progress and the material should leave Mound Laboratory on March 15. Some aspects of security during shipment of the fabricated parts remain unsettled at the time of writing.

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Group 24

Production

The routine assaying of products progressed according to schedule during this period, the work load being about average. Some equipment repairs were made and a few changes in equipment were effected, but no significant operating difficulties were encountered.

The stockpile of finished guns and gauzes on hand at the end of the period is quantitatively adequate to meet commitments for approximately one month ahead. From the quality standpoint the activity in the stockpile meets specifications, except for the number of guns, especially XY's, giving high neutron counts. Some reworking will be required in the near future to clear the stockpile of these substandard production items.

A number of changes were made in calorimetry equipment. Calorimeter #8 (Calorimetry Research Type #40) was received from the Calorimetry Research Group, the repairs mentioned in last month's report having been completed. The instrument has been installed in the constant-temperature bath and preliminary checks indicate that it is in satisfactory operating condition. Another calorimeter, #6 (Calorimetry Research Type #46), developed bridge circuit difficulties and had to be sent to Calorimetry Research for repair. A new calorimeter has been received and installed in position #5 in the Assay Laboratory. This instrument is Calorimetry Research's #54 which was originally constructed for high-activity samples and later modified to take slugs. It is believed to be suitable for the routine assaying of all types of production items. A number of structural improvements have been incorporated in this latter instrument.

In addition to the regular production work the following assay were made for other groups during this period:

No. Assays	Type Sample	For Group
8	Production Gun	Neutron Source
2	Neutron Source	Neutron Source
2	Alpha Source	Y Section
2	Slug Section	Calorimetry Research

Group 33

The search was continued for a more substantial glove material. Several pairs of Unichrome gloves were made in the lab on molds loaned us by the Surety Rubber Company. Several pairs of these gloves are being tested in line #3 of P. and E. To date it appears that the

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Unichrome, in glove thickness, is more subject to abrasion damage than is the rubber. They are also attacked by Acetone. This would limit their effectiveness in Electrolysis and Micro Assay.

Replies were received from several companies on the matter of glove materials.

A conference between Mr. Harris, Mr. Capocefalo and Mr. Lowry indicated that the work on the Contamination Control Program could be terminated very soon with a summary report of all findings.

P. J. Lowry

mg

P. J. Lowry

Copy 1 - Mr. E. C. McCarthy
2 - Mr. P. J. Lowry
3 - Central Files
4 - Central Files