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MLM-363

[illegible]

MOUND LABORATORY

Operated by

MONSANTO CHEMICAL COMPANY

MIAMISBURG, OHIO

APR 15 [illegible]

OSTI

M. L. Ewing
Laboratory Director

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[illegible] PROGRESS REPORT

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OPERATIONS RESEARCH GROUP

Group 33

B. G. Blanko, G. D. Nelson, J. H. Payne, Jr., J. E. Rogers, and W. S. Stringham, Jr.

PERSONNEL DISTRIBUTION

Type of Problem

General	Specific	No. of Man-Months
Process Design and Construction	I. Bismuth-II Process, Design and Construction	1
Research on Process Chemistry	II. Potential of the Stannous-Stannic Ion Couple in Hydrochloric Acid	1
Special Analyses and Analytical Research	Routine Analyses	1
Miscellaneous	III. Decontamination of Platinum	1
Group Leader	Administrative	1
	Total	5

ABSTRACT AND DETAILED REPORT

I. Bismuth-II Process, Design and Construction - W. S. Stringham, Jr

The work on the installation of the process line has been stopped almost completely because the necessary equipment has not been received from the Machine Shop. Plans have been made to have a large part of this work done on the outside in order to speed up the completion of the process line.

During this time working drawings have been reorganized and a number of smaller details completed.

II. Potential of the Stannous-Stannic Ion Couple in Hydrochloric Acid - G. D. Nelson

The potential of the stannous-stannic ion couple in hydrochloric acid

is of considerable importance in the Bismuth-II Process because stannous chloride is used as a reducing agent for the reduction of polonium. The potential of the couple was previously investigated by Huey and Tartar,[1] but their investigations covered only the low hydrochloric acid concentration. Previous measurements of the potential of the couple[2] were considered unreliable at high chloride ion concentration because of the high liquid junction potentials involved. The results which have been obtained indicate that the stannous-stannic ion couple is a less powerful reducing agent than bismuth when the hydrochloric acid concentration is greater than two molal. The results further confirm the previous work,[3] which shows that a sharp separation of bismuth and polonium should be obtained in the Bismuth-II Process.

III. Decontamination of Platinum - B. C. Blanke

Experiments have been run to determine the material balance on the proposed decontamination procedure for platinum which was described in the last progress report.[4] It has been found that, following the precipitation of the aluminum hydroxide floc, 83 per cent of the original platinum may be removed by decantation of the supernatant solution. An addition 6.5 per cent is removed from the precipitate by filtration. The remaining platinum may be recovered by dissolving the aluminum hydroxide precipitate in hydrochloric acid, adding stannous chloride solution, and extracting the platinous complex with ethyl acetate.

REFERENCES

1. Huey, C. S. and Tartar, H. V., J. Am. Chem. Soc. 56, 2585 (1934).

2. Payne, J. H., Jr., Production Research Progress Report, Section II (April 1-15, 1947).

3. Payne, J. H., Jr., Production Research Progress Report, Section V (October 16-31, 1947); Section III (November 1-15, 1947).

4. Payne, J. H., Jr., Operation Research Progress Report, MLM-332, Section IV (April 1-30, 1949).

JHP/rce