

PROJECT 9536

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File

72202

- Date 9-24-45

Subject Production Test No. SE-224-T-PA-7

To W. O. Simon

From E. R. Gilbert

Copy No. 4-1-1 ~~copy~~  
L. Squires

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SEPTEMBER 24, 1945

PRODUCTION TEST No. SE-224-T-P4-7

POTASSIUM HYDROXIDE REMOVAL OF LANTHANUM FLUORIDE PRODUCT CAKE  
FROM THE CENTRIFUGE

Objective

To improve the completeness of removal of the lanthanum fluoride product cake from the 40 inch Bird centrifuge (E-2).

Background

Both the T and E Areas have experienced difficulty in obtaining complete removal of the LaF<sub>3</sub> product cake from the 40 inch Bird centrifuge (E-2). Various modifications of the cake removal procedure have been tested with varying success but no procedure has been found which will give consistently good results. Partial retention from each of several runs have resulted in as much as 50% of a normal run being held up in the E-2 centrifuge bowl following a typical cake removal procedure. One such hold up as this was removed completely by the use of a 50% KOH slurry treatment used as part of a clean out procedure. It is proposed in this test that the KOH normally added directly to the F Cell precipitator (F-1) during metathesis be added via the E-2 centrifuge as part of a regular LaF<sub>3</sub> product cake removal procedure.

The proposed change in procedure does not conflict with the operating standards.

Procedure

It is proposed that a series of test runs be carried out in the West Area, beginning with Run F-6-08-F-15 in which slurring with 50% KOH is substituted for the present two water slurrying. This KOH will go with the cake into the Cell F precipitator and provide the alkali for a normal metathesis. Attached is a copy of the procedure proposed as the basis for the first run. Minor changes in this procedure may be desirable based on close observation of the E-2 Beckman meter during cake removal.

No harmful effect on the following run in Cell E should result as ample water is provided for flushing the KOH from the Cell F system. Replacing part of this water by an acid flush might prove an aid in dissolving any metathesized cake left behind.

The metathesis conditions in Cell F remain the same except for the method of KOH addition and therefore no difficulties are anticipated.

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The Cell E time cycle should be essentially unaffected with a slight reduction resulting in the Cell F time cycle.

The fact that the F-1-PS sample will be taken after the KOH addition necessitates a change in the routine analytical procedure but such samples have been analysed successfully in the past.

Data

The Technical Department Plant Assistance Group IX will assist operations in monitoring both Cell E and Cell F operations during the test series.

Equipment and Materials

This test will necessitate putting back into service the E-A Pump as the E-2-C scale tank is not equipped with an agitator for making up the 50% KOH.

Responsibility

Technical Department Plant Assistance: E.H. Benton, E.R. Gilbert, P.H. Lehman.  
All Operations will be carried out under the usual S Department supervision.

Estimated Completion

These preliminary tests should be completed within one week after the start.

Approval

M. Kay  
S Department

Date 9/26/45

M. F. Cohen  
Technical Department

Date 9/26/45

B. J. Mackay  
Assistant Manager

Date 9/27

ERC:jld

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## FLUORIDE PRODUCT - 224 BUILDING

VIII - PRODUCT CAKE REMOVAL

Date \_\_\_\_\_

Run No. \_\_\_\_\_

1. With supervisor's approval, plug E-2 to stop and read Wt. Ptr.
2. Bring E-2 to 10 RPM, start E-2 to F-1 jet and add 700 lbs. of water from E-2D through bowl sprays at not less than 70 psi. (If manometer exceeds 3.0, stop sprays temporarily until bowl is empty) Stop jet at end.
3. Plug E-2 to stop.
4. Backman on E-2 at 30 RPM
5. Make up 722 lbs. of 50% Potassium Hydroxide in E-A.  
Note: Make up just prior to use so that it will be hot.
  - a. Add 297 lbs. of water when used
  - b. Start agitator
  - c. Add 425 lbs. of Potassium Hydroxide
  - d. Continue agitation until solid is dissolved.
  - e. Take sample to lab for approval
6. Transfer 50% Potassium Hydroxide from E-A to E-2C using the E-A pump
7. With E-2 stopped add 361 lbs. of hot (approx. 85°C) 50% Potassium Hydroxide to E-2 from E-2-C
8. Bring E-2 to 110 RPM and hold 2 min. Plug to stop. Repeat three times.
9. Bring E-2 to 110 RPM and hold 2 min. Start E-2 to F-1 jet. Plug to stop.
10. Stop E-2 jet when E-2 is empty.
11. Backman on E-2 at 30 RPM
12. With E-2 stopped add 361 lbs. of hot (approx. 85°C) 50% Potassium Hydroxide to E-2 from E-2C

Time OK to proceed \_\_\_\_\_  
 Time E-2 stopped \_\_\_\_\_  
 E-2 Wt. Ptr. \_\_\_\_\_ lbs.

E-2 at 10 RPM  
 Time start jet \_\_\_\_\_  
 Time stop jet \_\_\_\_\_  
 Pump pressure \_\_\_\_\_  
 Lbs. water added \_\_\_\_\_

E-2 stopped \_\_\_\_\_

E-2 Meter \_\_\_\_\_ Factor \_\_\_\_\_

Lbs. water add \_\_\_\_\_ Time \_\_\_\_\_  
 Time agitator on \_\_\_\_\_  
 Lbs. Potassium Hydroxide add \_\_\_\_\_  
 Lbs. total \_\_\_\_\_ Time \_\_\_\_\_  
 Time dissolved \_\_\_\_\_

Sampled by \_\_\_\_\_  
 Time OK'd by lab \_\_\_\_\_

Time transferred \_\_\_\_\_

Potassium Hydroxide lbs. add \_\_\_\_\_ Time \_\_\_\_\_  
 Potassium Hydroxide Temp. \_\_\_\_\_

Time first slurring \_\_\_\_\_ Time 2nd \_\_\_\_\_  
 Time 2nd \_\_\_\_\_ Time 3rd \_\_\_\_\_

Time jet on \_\_\_\_\_  
 E-2 stopped \_\_\_\_\_

Time stopped \_\_\_\_\_

Meter \_\_\_\_\_ Factor \_\_\_\_\_

Potassium Hydroxide lbs. add \_\_\_\_\_ Time \_\_\_\_\_  
 Potassium Hydroxide Temp. \_\_\_\_\_

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## FLUORIDE PRODUCT - 224 BUILDING

## VIII - PRODUCT CAKE REMOVAL (Cont'd)

13. Bring E-2 to 110 RPM and hold 2 min. Plug to stop. Repeat three times.
14. Bring E-2 to 110 RPM and hold 2 min. Start E-2 to F-1 jet. Plug to stop.
15. Stop E-2 jet when E-2 is empty.
16. Beckman on E-2 at 30 RPM.
17. Flush E-2-C to E-2 with 200 lbs. of water.
18. Bring E-2 to 110 RPM and hold 2 min. Start E-2 to F-1 jet. Plug to stop.
19. Stop E-2 jet when E-2 is empty.
20. With E-2 at 10 RPM and with the F-2 to F-1 jet on add sufficient water from E-2-D through the bowl sprays to E-2 to F-1 to bring the total weight in F-1 to 2400 lbs. (approx. 800 lbs.) When jet gasses stop jet.
21. Beckman on E-2 at 30 RPM
22. Obtain supervisor's approval that E-2 Beckman reading is satisfactory.

Date \_\_\_\_\_

Run No. \_\_\_\_\_

Time first slurring \_\_\_\_\_ Time 2nd \_\_\_\_\_  
Time 3rd \_\_\_\_\_ Time 4th \_\_\_\_\_Time jet on \_\_\_\_\_  
E-2 stopped \_\_\_\_\_

Time stopped \_\_\_\_\_

Meter \_\_\_\_\_ Faster \_\_\_\_\_

Lbs. water add \_\_\_\_\_ Time \_\_\_\_\_

Time jet on \_\_\_\_\_  
E-2 stopped \_\_\_\_\_

Time stopped \_\_\_\_\_

Lbs. water add \_\_\_\_\_

Pump pressure \_\_\_\_\_

Time jet off \_\_\_\_\_

Meter \_\_\_\_\_ Faster \_\_\_\_\_

E-2 Beckman Limit \_\_\_\_\_ 20x10-14

Approved by \_\_\_\_\_ Time \_\_\_\_\_  
Supervisor \_\_\_\_\_

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2400 LBS

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2400 LBS

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