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FINAL REPORT

PRODUCTION TEST 221-T-14

USE OF AMMONIUM SILICO FLUORIDE CONTAINING INSOLUBLE MATERIAL IN EXCESS OF THAT ALLOWABLE UNDER HW SPECIFICATIONS

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FINAL REPORT ON PRODUCTION TEST 221-T-14

USE OF AMMONIUM SILICO FLUORIDE CONTAINING INSOLUBLE MATERIAL IN EXCESS OF THAT ALLOWABLE UNDER HW SPECIFICATIONS

Objective:

To determine if a lot of ammonium silico fluoride containing insoluble material in excess of that allowable under HW specifications could be used in routine process operations.

Background:

The specifications on the ammonium silico fluoride used in the first and second decontamination cycles are as follows:

$(NH_4)_2SiF_6$	98.0% min.
Insoluble Material	0.3% max.

Analyses made on individual samples taken from a 34,400 lbs. lot of this material, received during a shortage period from Davidson Chemical under Order No. HW 27614, were as follows:

Sample No.	1	2	3	4	5	Av.
% $(NH_4)_2SiF_6$	96.9	98.6	98.2	98.3	98.1	98.0
% Insol.	0 15	1.8	1.9	1.0	1.1	1.2

Five additional samples were taken and analyzed at the request of Davidson Chemical. These results were as follows:

Sample No.	1	2	3	4	5	Av.
% $(NH_4)_2SiF_6$	98.6	99.0	99.7	97.4	97.7	98.5
% Insol.	0.29	0.62	0.38	0.69	0.70	0.74

It was proposed to test this material in production runs to determine if the material was to be returned to the vendor or accepted under a waiver of specifications.

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Proposed Procedure:

It was proposed to prepare ammonium silico fluoride solution from the test material sufficient to process one run through the first and second decontamination cycles. This solution was to be clarified by settling over a period of fifteen hours prior to use. Contingent upon the results of this run, a test series of runs was to be made.

Test Results:

The off-standard ammonium silico fluoride was used in the product precipitations of Run T-8-11-F-11 at T Plant. The first cycle product cake solution contained difficultly soluble material which may have been beta bismuth phosphate since the precipitate had been held for several hours prior to centrifugation. The resultant second cycle by-product precipitation loss was 0.64%, approximately 0.4% higher than average. The product precipitation losses were unaffected.

Further testing of the off-standard ammonium silico fluoride was conducted at B Plant. Thirty test runs revealed no objections to the use of this material. The data are tabulated in Tables I and II.

TABLE I - Use of Off-Standard $(NH_4)_2SiF_6$

Product Solution	Type $(NH_4)_2SiF_6$	Number of runs	Per Cent of Runs with Turbity of grams/liter				
			0.0	0.1	0.2	0.3	greater than 0.3
14-4P	Standard	Previous 20(1)	30	40	15	5	10
14-4P	Test	30(2)	33	50	17	0	0
17-4P	Standard	Previous 20(1)	40	30	20	5	5
17-4P	Test	30(3)	57	33	10	0	0

TABLE II - Loss Data

Type $(NH_4)_2SiF_6$	Waste Losses--% of Basis			
	14-3WS	16-4BP	17-3WS	A-4BP
Standard(1)	0.15	0.26	0.16	0.14
Test	0.19(2)	0.28(2)	0.15(3)	0.14(3)

(1) Runs B-8-11-D-10 through B-8-12-F-5
(2) Runs B-8-12-F-8 through T-9-01-D-5
(3) Runs B-8-12-F-6 through T-9-01-D-3

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Conclusions and Recommendations:

It was concluded from these data that use of the off-standard ammonium silico fluoride presented no operating difficulties when clarified by decantation after settling for a period of fifteen hours. It was recommended, therefore, that the material be accepted under a waiver of specifications.

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