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from C.B.D.

Subject - Arsenic Suppression

Abstract - to use a constant amount of FeCl_3 with varying amounts of NH_4Cl on combined samples of thickeners #6, #11, #13 to evaluate the use of NH_4Cl as an arsenic suppressant and a substitute for NH_4OH .

Procedure - Samples were taken from thickeners #6, #11, #13 and combined for testing. The tested sample volumes of the combined thickeners was 2500 ml. with 3 grams of FeCl_3 added. These samples were agitated and then varying amounts of NH_4Cl were added to the samples and agitated again. After this final agitation the samples were analyzed for pH, Cu, Fe & As.

Data -

thickener	pH	Cu ppm	Fe ppm	As ppm
#6 thickener	6.2	ND	25	25
#11 thickener	3.5	128	126	107
#13 thickener	6.4	ND	16	520
Combination	6.1	ND	35	119
Combination (three)	?	.1	52	127
Combination + FeCl_3	5.1	1.38	29	27

NB. - Combination ratios: #6 = $\frac{70}{125}$ #11 = $\frac{35}{125}$ #13 = $\frac{20}{125}$

- below all samples 2500ml with 3 grams FeCl_3 (or 248 ppm Fe)

Amount NH_4Cl (g)	pH	Cu ppm	Fe ppm	As ppm
5	5.3	1.38	17.2	22.4
7	5.2	1.92	26.4	21.0
10	5.3	1.42	15.6	23.0
15	5.3	1.95	15.6	21.5
20	5.2	2.40	25.6	20.2 20.2

Conclusions:

- comparing the combination to the theoretical combination a decrease in iron and arsenic is noted. Comparing this to previous tests (Dec 22/75 and Sept 5/75) a reverse was noted in the arsenic level, ~~to~~ to an increase of approximately 50 ppm As.
- Comparing the theoretical combination to the combination with FeCl_3 added, there shows a considerable drop in the iron and arsenic levels. This same type of decrease was also noted on a previous report (page 5, Feb 16/76). Also with the ~~addition of FeCl_3~~ there shows leaching of copper from the solids after the addition of FeCl_3 .
- as for the NH_4Cl as an arsenic suppressant, it's not functional, but this test shows us that the suppression of arsenic is pH dependant.