

# MEMORANDUM

To H. E. PAWSON, R. J. TUCKER  
From C.O.O.  
Subject ARSENIC SUPPRESSION

Date MARCH 11, 1976  
Ref.

ABSTRACT: to use a constant amount of  $\text{FeCl}_3$  with varying amounts of  $(\text{NH}_4)_2\text{CO}_3$  on combined samples of thickeners #6, #11 and #13 to evaluate the use of  $(\text{NH}_4)_2\text{CO}_3$  as an arsenic suppressant and as a substitution for  $\text{NH}_4\text{OH}$ .

PROCEDURE: Samples were taken from the thickeners #6, #11, #13 and combined for testing. The tested sample volume of the combined thickeners was 2000 ml with 2.5 grams of  $\text{FeCl}_3$  added. These samples were agitated and varying amounts of  $(\text{NH}_4)_2\text{CO}_3$  were added to the samples and agitated again. After this final agitation the samples were analyzed for pH, Cu, Fe, As. They were held for a 24 hr period and analyzed again.

(A) DATA	pH	ppm Cu	ppm Fe	ppm As
#6	6.3	ND	30	25
#11	5.0	ND	128	150
#13	6.0	ND	226	1060
Combination	5.9	.17	45	200
Combination (the?)		ND	57	226
Combination + $\text{FeCl}_3$	3.5	16.8	92	164

NB - combination Ratio's #6 - 70/125, #11 - 35/125, #13 = 20/135  
- below all samples 2000 mil with 2.5 grams  $\text{FeCl}_3$  (or 238 ppm Fe)

## Amount

(NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub> (g)		ppm	ppm	ppm
	pH	Cu	Fe	As
3	6.5	.14	2.35	71
5	6.9	.25	2.75	94
10	7.2	.80	1.3	103
20	7.3	1.00	2.40	110

## 24 HOUR SAMPLES

(B)

		ppm	ppm	ppm
	pH	Cu	Fe	As
#6 thickener	6.4	ND	25	36
#11 thickener	3.3	ND	122	113
#13 thickener	6.2	ND	9.1	1110
Combination	3.7	.14	24	160
Combination + FeCl <sub>3</sub>	4.1	14.6	97	154

## Amount

(NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub> (g)		ppm	ppm	ppm
	pH	Cu	Fe	As
3	6.9	.06	.15	63.5
5	7.2	.10	.10	90
10	7.0	.48	.10	95
20	7.4	.65	.15	102

## CONCLUSIONS

From an overall view of the above findings, it would seem that the use of (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> as an arsenic suppressant and a substitute for NH<sub>4</sub>OH it fails miserably, but then so do the samples (i.e. #6 and combination pH's) Also noticed in the samples containing (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub>; the more of an increase in (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> the higher the level of arsenic, so a reasonable assumption would be, the CARBONATE ION has an affect on the arsenic, therefore making it more soluble.

Therefore (NH<sub>4</sub>)<sub>2</sub>CO<sub>3</sub> tests have been finalized.