

HEP
RTT
CQO

Arsenic Suppression ~~Effect~~

ABSTRACT: to use a constant amount of FeCl_3 with varying amounts of $(\text{NH}_4)_2\text{CO}_3$ on combined samples of thickeners #6, #11, #13 and #13. To evaluate the use of $(\text{NH}_4)_2\text{CO}_3$ as an arsenic suppressant and as a substitute for NH_4OH .

PROCEDURE: samples were taken from thickeners #6, #11, #13 and combined for testing. The tested sample volume of the combined thickeners was 2000ml with 2.5 grams of 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. ~~at 24 hr. post~~ They were held for a 24 hr period and analyzed again.

Data: A)

Thicker	pH	ppm Cu	ppm Fe	ppm As
#6	6.3	ND	30	25
#11	5.0	ND	128	150
#13	6.0	ND	26	1060
Combination	5.9	.17	45	200
Combination (thea)	?	ND	57	226
Combination FeCl_3	3.5	16.8	92	164

NB - Combination Ratios #6 = $\frac{70}{125}$, #11 = $\frac{35}{125}$, #13 = $\frac{20}{135}$

- below all samples 2000ml with 2.5 grams FeCl_3 (or 238 ppm Fe)

Amount $(\text{NH}_4)_2\text{CO}_3$ (g)	pH	ppm Cu	ppm Fe	ppm 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

B) 24 hr. samples

	pH	ppm Cu	ppm Fe	ppm 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_3	4.1	14.6	97	154

Amount. (NH_4) ₂ CO ₃ (g)	pH	ppm Cu	ppm Fe	ppm As
3	6.9	.06	.15	63.5
5	7.2	.10	.10	90.9
10	7.0	.48	.10	95
20	7.4	1.65	.15	102

Conclusions.

- from an overall view of the above findings, it would seem that the use of (NH_4)₂CO₃ as ~~an~~ arsenic suppressant and a substitute for NH_4OH it fails miserably, but then so do the samples (i.e. #6 & combination pH's)
- also noticed in the samples containing (NH_4)₂CO₃; the more of an increase in (NH_4)₂CO₃ ~~the more increase~~ ~~the more~~ the higher the level of arsenic, so a reasonable assumption would be, the carbonate ion has an affect on the arsenic, ~~in making~~ therefore making it more soluble.
- therefore (NH_4)₂CO₃ tests have been finalized