

MEMORANDUM

To H.E. Pawson; R.J. Tucker;

Date Nov 19, 1975

From C.O. Olesen

Ref.

Subject The use of copper chloride as an arsenic suppressant in thickeners 6 & 11.

Procedure:

To take a 500 ml sample and subject it to CuCl_2 & NH_4OH , with different amounts of CuCl_2 .

Part I:

#6 thickener pH = 6.8 ppmAs = 33 ppmCu = 0.18 ppmFe = 11.2

Amt CuCl_2 (g)	NH_4OH Drops	pH	pH24	ppmAs	ppmAs24	ppmCu	ppmCu24
.065	0	6.5	9.6	22.5	13.0	26	10.3
.110	0	6.3	9.7	22.5	10.0	44	12.2
.150	0	6.2	9.7	22.5	7.0	77	18.0
0.0	7	10.2	9.9	22.5	22.0	.3	.20

ppmFe	ppmFe24
.7	1.4
.3	ND
.5	ND
.7	.08

Note: within the 24 hr wait period the samples were subjected to 7 drops of NH_4OH within the CuCl_2 samples.

Part II:

#11 thickener pH = 5.7 ppmAs = 143 ppmCu = ND ppmFe = 250

CuCl_2 (g)	NH_4OH Drops	pH	pH24	ppmAs	ppmAs24	ppmCu	ppmCu24
2.04	0	3.1	5.1	143	25	1320	970
2.54	0	3.1	5.1	143	25	1580	1030
3.00	0	3.0	4.9	143	32	2100	1480
0	7	9.6	9.3	45	40	.1	ND

ppmFe	ppmFe24
120	.6
140	.5
140	.5
2.0	1.0

Note: amount of copper chloride is 10 times the theoretical amount needed.

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Part III:

#11 thickener

- 20 drops of NH_4OH was added to a 500 ml sample which gave the following results

pH	-	9.9	ppmCu	-	ND
ppmAs	-	44	ppmFe	-	.4

Conclusions:

- pH still has a high influence upon whether or not the different metal salts will suppress the arsenic
- it is also reasonable to note that a significant reduction in iron is noticed; and that the arsenic might be going to the iron as an iron-arsenic complex
- also shown is the use of CuCl_2 to CuSO_4 , that CuSO_4 is the better of the two as an arsenic suppressant
- in comparing Part II to Part III in the amount of NH_4OH used an equilibrium is shown through the suppression of arsenic.