

Giant
YELLOWKNIFE MINES LIMITED

MEMO TO: D. Cooper
CC: J.S. McAlpine, S.E. El-Alfy
FROM: D. Bartlett
DATE: October 27, 1988
SUBJECT: Free Cyanide Titration - TRP Tailings

During the week of Sept. 25 - Oct. 1, 1988, the measured free cyanide concentration of TRP tailings was in the 3.0 lb/ton range versus the usual 0.3 lb/ton. The cyanide addition had been doubled during this test period from 1.0 to 2.0 lb/ton of feed, but this gross effect on the tailings cyanide measurement was impossible unless some other ions were reacting with the AgNO_3 titrant.

It was subsequently determined that an inappropriate strength AgNO_3 solution was the reason for the discrepancy. However, in the meantime, investigative work by Dan Kivari (1) and others have resulted in some noteworthy technical points concerning the TRP titration.

Using AgNO_3 titrant and rhodamine indicator, viz:

1. Rhodamine indicator is subject to far less interferences compared to the alternative KI indicator.
2. Sulphide (S^{2-}) ion is a potential interference, however, its presence will be noted by a brown precipitate (Ag_2S) which will mask the normal indicator colour and change from yellow to salmon pink.


In this instance, a fresh solution sample should be obtained and the sulphide ion first removed by precipitation with PbNO_3 . The PbS precipitate should be filtered off, rhodamine indicator added and titration with AgNO_3 conducted in the usual manner.

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(1) Memo: Dan Kivari to Sadek El-Alfy, "TRP Review and Recommendations", October 3, 1988

With the low reactivity of GYML tailings sulphides (reducing powers <100), titration interference with sulphide is not expected. However, should solution discolouring occur, a simple test to identify S^{2-} is to use lead acetate paper. A positive result will be immediate appearance of a dark black colour.

3. The only other common interference is dissolved copper. Titration with $AgNO_3$ will reduce $Cu(CN)_4^{2-}$ to $Cu(CN)_2$. This is not anticipated to be a problem with GYML tailings (current levels <10 ppm Cu), however, correction factors can be readily developed should the need arise.


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