THE DEVELOPMENT AND IMPLEMENTATION OF NEW TTC FLOTATION CHEMICALS

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ABSTRACT

Batch floats were done on Merensky ore from Section 10 at Impala Platinum. The ultimate objective of this project was a pilot plant trial and certain questions had to be answered before the trial could be conducted. To circumvent decomposition of trithiocarbonates (TTC's) in water, tablets, solvents and emulsions were prepared and tested as carriers of TTC's in the flotation system. The emulsion gave the best result.

The decomposition rate of short chain ionic and covalent collectors in water were measured. In water iC_3-TTC was less stable and decomposed faster than the corresponding xanthates.

Long and short chain ionic TTC's, covalent TTC and long chain mercaptans were evaluated and compared to the standard collector. iC_3-TTC dosed in an emulsion showed significant improvement on the standard at Impala Platinum. Combinations of the collectors also showed good results. Mineral potential data for the TTC's differed from xanthates. The TTC dosed as a powder or in emulsion showed a two step drop in potential. At this stage the only conclusion from this is that xanthates and TTC have a different mechanism of adsorption.

Three collectors were chosen for testing on a continuous 60 liter cell at Impala Platinum. iC_3-TTC dosed in water and the emulsion were compared to the standard collector. A 2.8% and 5% improvement on PGM and nickel recovery was observed with the emulsion.

UITTREKSEL

Flotasie-eksperimente is gedoen met Merensky erts van Seksie 10 van Impala Platinum Die hoofdoelwit van die projek was 'n aanlegproefloop en sekere vrae moes beantwoord word. Trithiokarbonate (TTC's) is as tablette, oplosmiddels en emulsies voorberei en die ontbinding van TTC's in water is met die verskillende draers getoets. Die emulsiesisteem het die beste resultate gelewer.

Die ontbindingstempo van kortketting ioniese en kovalente kollekteerders in water is gemeet. In water was iC_3-TTC minder stabiel en het vinniger opgebreek as die ooreenstemmende xantate.

Lang- en kortketting ioniese TTC's, kovalente TTC en langketting merkaptane is getoets en vergelyk met die standaard kollekteerder. iC_3-TTC gedoseer as 'n emulsie toon aansienlike verbetering op die standaard by Impala Platinum. Kombinasies van die kollekteerders het ook goeie resultate gelewer. Mineraalpotensiaaldata vir die TTC's verskil van xantate. Die TTC gedoseer as poeier of emulsie toon 'n dubbele daling in potensiaal. Die enigste gevolgtrekking op hierdie stadium is dat xantate en TTC verskillende adsorpsiemeganismes toon.

Drie kollekteerders is gekies om verdere toetse met 'n kontinue 60 liter flotasiesel by Impala Platinum te doen. iC_3-TTC is gedoseer in water en as emulsie en vergelyk met die standaard kollekteerder. Verbeterings van onderskeidelik 2.8% en 5% op PGM en nikkelherwinning is verkry met die emulsie.

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