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Flotation Recovery of Gold-Loaded Fine Activated Carbon Using Emulsified Diesel and Kerosene as Collectors

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Abstract : The recovery of fine activated carbon with adsorbed gold in the cyanidation tailings of a small-scale gold plant was investigated due to the high amount of gold present. In the study, collectors that were used are kerosene and diesel. Emulsification of the oils was done to improve its collecting property, thus also the recovery. It was found out that the best hydrophile lypophile balance (HLB) of emulsified diesel and kerosene oil is 13 and 12 respectively. The amount of surfactants (SPAN 20 and TWEEN 20) for the best stability of the emulsified oils was found to be 10% in both kerosene and diesel. Optical microscopy showed that the oil dispersion in the water forms spherical droplets like features. The higher the stability, the smaller the droplets and their number were increasing. The smaller droplets indicate better dispersion of oil in the water. Consequently, it will have a greater chance of oil and activated carbon particle interaction during flotation. Due to the interaction of dispersed oil phase with carbon, the hydrophobicity of the carbon will be improved and will be attached to the bubble. Thus, flotation recovery will be increased. Results showed that the recovery of the fine activated carbon using emulsified diesel or kerosene is three times more effective than using pure diesel or kerosene.

Keywords : emulsified oils, flotation, hydrophile lyophile balance, non-ionic surfactants
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