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Gold Recovery from its Flotation Concentrate using Acidic Thiourea Leaching and Organosilicon Polymer

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The method for the recovery of gold from its flotation concentrate using acidic thiourea leaching followed by adsorption on an organosilicon polymer (PSTM-3C) was discussed in the present study. The study had allowed identification of the effect of thiourea, oxidizer and acid concentration, leaching time, temperature and pulp density on gold dissolution in thiourea solution. The results showed that the vast majority of gold (93.6%) from the gold concentrate was dissolved in nitric acid solution with thiourea under the optimum conditions. Whereas some accompanying elements like Se, Te, V, Cr and Ni in the concentrate were insoluble in the acidic thiourea solution. Gold was recovered from the leach liquor by adsorption on the organosilicon polymer PSTM-3C. The influence of acid concentration, adsorption time and temperature was studied for gold recovery using the polymer. The result showed that about 94.4% of gold was adsorbed on the polymer from the liquor after the optimization of the experimental conditions. The FT-IR anaylsis revealed that when the polymer adsorbed Au from the liquors, a new IR band appeared at 1703 cm^{-1} while the IR band at 1554.5 cm^{-1} which observed in the IR spectrum of the pure polymer was disappeared.

Key Words : Gold leaching, Flotation concentrate, Thiourea, Organosilicon polymer