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Exploring the Influences on Entrainment of Serpentines by Grinding and Reagents

Authors : M. Tang, S. M. Wen, D. W. Liu

Abstract : This paper presents the influences on the entrainment of serpentines by grinding and reagents during copper–nickel sulfide flotation. The previous bench flotation tests were performed to extract the metallic values from the ore in Yunnan Mine, China and the relatively satisfied results with recoveries of 86.92% Cu, 54.92% Ni, and 74.73% Pt+Pd in the concentrate were harvested at their grades of 4.02%, 3.24% and 76.61 g/t, respectively. However, the content of MgO in the concentrate was still more than 19%. Micro-flotation tests were conducted with the objective of figuring out the influences on the entrainment of serpentines into the concentrate by particle size, flocculants or depressants and collectors, as well as visual observations in suspension by OLYMPUS camera. All the tests results pointed to the presences of both “entrapped-in” serpentines and its coating on the hydrophobic flocs resulted from strong collectors (combination of butyl xanthate, butyl ammonium dithophosphate, even after adding carboxymethyl cellulose as effective depressant. And fine grinding may escalate the entrainment of serpentines in the concentrate.

Keywords : serpentine, copper and nickel sulfides, flotation, entrainment
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