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عنوان مقاله:

A comparative study of two-stage flotation of Zn and Pb oxide minerals using anionic, cationic, and mixed (cationic/anionic) collectors

محل انتشار:

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خلاصه مقاله:

A lead-zinc carbonate ore sample containing 2.5% Pb and 9.39% Zn was used in this research work. The sample was prepared from the Darreh-Zanjir mine located in the Yazd province (Iran). Influences of the influential factors on flotation of smithsonite and cerussite were investigated. Among the different parameters involved, dosages of the dispersant, depressants, sulfidizing agent, and collectors de-sliming prior to lead or zinc flotation were essential for the effective recovery and grade of the Zn and Pb flotation concentrates. In addition, the anionic, cationic, and mixed (cationic/anionic) collectors were employed for flotation of smithsonite. The results of reverse and cumulative flotation of both Zn and Pb were relatively low in comparison with the direct process without depressant. Flotation of smithsonite using mixed collectors (Armac C+KAX) showed promising results. Also dosages of chemicals in the cleaning stage for the Zn and Pb concentrates were optimized, and finally, after the cleaner stage for both lead and zinc, a cerussite concentrate with Pb grade and recovery of 49.82% and 60.06%, respectively, and smithsonite concentrate with Zn grade and recovery of 35.47% and 68.56%, respectively, were obtained under the optimal conditions. Furthermore, kinetics of Zn and Pb oxide mineral flotations in the rougher and cleaner stages were studied, which showed that some kinetics models, especially the classical first-order model, could predict the flotation behaviour of the Zn and Pb oxide minerals.

کلمات کلیدی:

Flotation, Anionic and Cationic Collectors, Zinc and Lead Oxide Minerals

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