عنوان مقاله:

Mixed moderate thermophilic bioleaching of Cu, Mo and Re from molybdenite concentrate: effects of silver ion, medium and energy sources

محل انتشار:

مجله بین المللی معدن و مهندسی زمین, دوره 51, شماره 2 (سال: 1396)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Hadi Abdollahi - *School of Mining, College of Engineering, University of Tehran, Tehran ۱۴۳۹۹۵۷۱۳۱ Iran*

Sied Ziaeddin Shafaei - *School of Mining, College of Engineering, University of Tehran, Tehran ۱۴۳۹۹۵۷۱۳۱ Iran*

Mohammad Noaparast - *School of Mining, College of Engineering, University of Tehran, Tehran ۱۴۳۹۹۵۷۱۳۱ Iran*

Zahra Manafi - *Sarcheshmeh Copper Complex, Research and Development Centre, Rafsanjan ۷۷۳۱۶۴۳۱۸۱ Iran*

خلاصه مقاله:

This study evaluates the effects of different additives such as silver ion, medium and energy sources on the efficiency of mixed moderate thermophilic bioleaching approach to extract Cu, Mo and Re from molybdenite concentrate containing 0.98% Cu, 1.56% Fe, 53.84% Mo, and 0.055% Re. Molybdenite was the major phase of Mo-bearing mineral and chalcopyrite, covellite and pyrite were distinguished as minor phases. The higher copper extraction was obtained in tests with silver additives in all types and quantities rather than tests without silver ion. Kinetic of copper dissolution varied in these experiments and depended on the types and amounts of silver, and other supplemented additives such as ferric ion. There was no clear difference in the copper extraction by various culture media and 100% of Cu was dissolved after 30 days of treatment, using 50 mg/L of silver nitrate as additives. In the best condition and without silver additives, maximum 60% of copper was extracted even in the presence of energy sources such as sulfur, ferrous and ferric ions. In the most effective test with initial pH 1.57, 50 mg/L silver nitrate, and 50 g/L ferric sulfate, 100% of copper was dissolved in less than a week with highest kinetics rate. Molybdenum and rhenium extraction had the same tends with redox potential graph. By increasing the redox potential to the 550-600mV, molybdenite started to dissolve and finally, molybdenum and rhenium were extracted 2% and 9.53% in the best .condition; respectively

کلمات کلیدی:

Bioleaching, chalcopyrite bioleaching, Mo and Re extraction, molybdenite concentrate, silver catalysis