

عنوان مقاله:

Solvent Extraction of Zinc from a Bioleaching Solution by Modification of D₂EHPA: Optimization and Thermodynamic Studies

محل انتشار:

مجله معدن و محیط زیست، دوره 12، شماره 1 (سال: 1400)

تعداد صفحات اصل مقاله: 17

نویسندگان:

P. Tahmasebizadeh - Mining engineering department, Faculty of Engineering, University of Birjand, Birjand, Iran

S. Javanshir - Mining engineering department, Faculty of Engineering, University of Birjand, Birjand, Iran

خلاصه مقاله:

In this work, zinc extraction from an industrial leach solution was investigated by saponified di(2-ethylhexyl)phosphoric acid (D₂EHPA). The solution obtained was from a bioleaching process of a low-grade lead-zinc sulfide ore that contained 50 g/L of zinc and 6.3 g/L of iron. The selective and high Zn(II) extraction yield were obtained by modification of D₂EHPA in a proposed two-step process. Firstly, a significant amount of iron (87%) was removed as sodium-jarosite via precipitation from the pregnant leaching solution (PLS) prior to zinc extraction, and secondly, the effective parameters involved in zinc extraction including the contact time, saponification degree, type of saponifier, stirring speed, pH, temperature, D₂EHPA concentration, and phase ratio (A:O) were investigated. The results obtained showed that 98.4% of zinc could be extracted under the optimum conditions, i.e. 20% D₂EHPA, 15% saponification degree, 650 rpm, pH 2, and an A:O ratio of 1:1 at the ambient temperature (25 ± 2 °C) during 90 s; it was 25% higher than using non-saponified D₂EHPA under the same conditions. Moreover, while one theoretical step was required for the complete extraction of zinc by saponified D₂EHPA, the required number of steps using D₂EHPA was about three. Therefore, the advantages of the process would be two-fold: reducing the number of extraction stages and no need for neutralizing the raffinate in every extraction stage.

کلمات کلیدی:

Zinc extraction, D₂EHPA, Saponification, Thermodynamic

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1200442>

