عنوان مقاله:

Dissolution behavior of antimony, lead, and silver from lead anode slime in chloride medium

محل انتشار:

نهمین کنفرانس و نمایشگاه بین المللی مهندسی مواد و متالورژی ایران و چهاردهمین همایش ملی مشترک انجمن مهندسی متالورژی و مواد ایران و انجمن ریخته گری ایران (سال: 1399)

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خلاصه مقاله:

Lead anode slime generated during electrorefining of lead is a byproduct consists of valuable and hazardous elements, such as Ag, Sb, Pb. Recovering these elements from the lead anode slime is attractive for a sustainable future of resource development. In this research, dissolution behavior of silver, antimony, and lead from lead anode slime was studied thermodynamically and experimentally. The thermodynamic results showed that in a HCl media, while Sb dissolves, insoluble PbCl2 generates. Increasing chloride concentration results in a higher Pb dissolution. A considerable amount of Ag will be dissolved in a concentrated HCl solution and then will precipitate by lowering the concentration of HCl. By the addition of water, hydrolysis of Sb can happen and Sb precipitates as Sb4O5Cl2. The obtained results were verified experimentally. First, Sb and Pb were separated by leaching in a HCl solution. Complete dissolution of Sb was attained by leaching the slime in the two-molar solution of HCl, for one hour, at room temperature and with the pulp density of 1 to 20 (gr to ml). More than 90% of the lead, in the form of PbCl2, remained in the leaching residue. By hydrolysis and addition of water to triple the volume of the leach solution, about 70% of the antimony in the solution was precipitated as an oxychloride composition with the purity of over 90%.

کلمات کلیدی:

Antimony, Lead, Silver, Lead Anode Slime, Hydrochloric Acid, Leaching