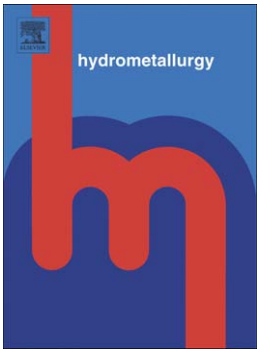

Metal values separation from residue generated in alkali fusion-leaching of copper anode slime

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Metal values separation from residue generated in alkali fusion-leaching of copper anode slime

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Abstract: Most Cu, Te, Sb and precious metals in copper anode slime were enriched in residue using an alkali fusion-leaching process. In this paper, Cu and Te were extracted from the residue by acid leaching and Sb was separated by sulphide leaching. It was found that 96.2% Cu and 83.5% Te were extracted into leaching solution under the optimum conditions: 1mol/L of H_2SO_4 concentration, 6% of NaCl addition, 20^oC of leaching temperature and 20min of leaching time. 86.8% Sb was extracted when Na_2S concentration, leaching temperature and leaching time were determined at 90 g/L, 80 ^oC and 40min, respectively. Chemical analysis indicated that Ag, Pb and Au were enriched in the sulphide leaching residue, which could be processed to recover precious metals.

Keywords: copper anode slime; Cu & Te extraction; Sb extraction; optimization

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1. Introduction

Copper anode slime, a by-product collected from the bottom of the electrolytic cells during the refining of copper, is abundant in valuable metals like Cu, Pb, Sb, Sn Se, Te, Au, Ag and PGMs (Kilic et al., 2013). Numerous viable approaches have been developed to treat anode slimes including sulfation roasting-leaching, acid pressure oxidative leaching, oxidation roasting-leaching, chlorination leaching, soda roasting leaching and caustic pressure leaching (Cooper, 1990; Amer, 2003; Fan et al., 2013; Khaleghi et al., 2014). Among these approaches, sulfation roasting-leaching (Hait et