

Experimental Study on Processing of Zinc Oxide Ore by Sulfurization Roasting-Flotation Method

WANG Cong-bing¹, ZHENG Yong-xing^{2*}, CHEN Lu-zheng¹, LAI Zhen-ning¹

(1. *Faculty of Land Resources Engineering, Kunming University of Science & Technology, Kunming 650093, China;*

2. *State Key Laboratory of Complex Nonferrous Metal Resources Clean Utilization, Kunming 650093, China*)

Abstract: A sulfurization roasting-flotation method has been proposed and investigated in this paper to solve problems of difficult separation and low ore dressing indexes of the normal flotation for processing zinc oxide ore. In this method, the zinc oxide was roasted by the vulcanizing agent of sulfur and converted to zinc sulfide which was then to have been treated by the conventional flotation method for recovering zinc concentrate. The ore sample used in this investigation contains 5.13% Zn at an oxide rate of 86.55%, with main gangue minerals of quartz and calcite. Based on a series of experiments, the optimum condition for the roasting process has been established with the sulfur addition rate of 3%, roasting temperature of 650°C, roasting time of 60 minutes, and grinding fineness of less than 74 μm, respectively, as 86.33% of the roasted product can be recovered by the closed-circuit flotation method with the zinc concentrate containing 38.96% Zn.

Keywords: zinc oxide ore; sulfurization roasting; flotation