High efficient flotation processing technology for the low-grade refractory graphite ore

DONG Yan-hong, ZENG Hui-ming*, YANG Jian-wen, CHEN Dai-xiong

(*Hunan Provincial Key Laboratory of Complex Copper Lead Zinc Associated Metal Resources Comprehensive Utilization, Hunan Research Institute of Non-ferrous Metals, Changsha* 410100, *China*)

Abstract: The low grade refractory graphite ore has been selected to carry out a study of process mineralogy in this paper. It is found out that main factors affecting the beneficiation indexes include the low grade of raw ore, the micron size of the disseminated grains, high content of lamelleted mica which is easily to be floated, and the existence of pyrite which has good floatability. On this basis of the above study, the benefication tests including a great amount of conditional comparative tests and the reagent system optimization have been conducted. The results show that a combination of the mixed collecting agent of diesel oil and dodecyl dimethyl betaine (the dosage ratio is 4:1) and the foaming agent of fusel alcohols (which was called MA in the text) has effectively improved the grade and recovery of the concentrate and reduced dosages of reagents. Pyrite can be efficiently separated from graphite by using lime as an inhibitor. The concentrate, obtained through the closed-circuit test, contains 90.82% of carbon with the recovery rate of 91.18%. This test has effectively improved the comprehensive utilization value of the ore.

Keywords: graphite; mixed diesel-oil; MA; flotation