



Performance of a full-scale continuous centrifugal concentrator in reconcentrating fine hematite from tailings

Luzheng Chen, Siqing Liu and Shuming Wen

Associate professors and professor, respectively, Faculty of Land Resource Engineering, Kunming University of Science and Technology, Kunming, Yunnan Province, China

Abstract

The study aimed to evaluate the separation performance of a full-scale continuous centrifugal concentrator in the reconcentration of fine hematite from high-gradient magnetic separation (HGMS) concentrate in a tailings recovery plant, and to investigate the usefulness of the technology in industrial applications. The effect of changing the operating variables on concentrate grade and recovery was studied. The results indicate that among the variables considered in the study (water spray pressure, centrifugal acceleration, feed volume flow rate, feed percent solids and the reciprocation and spacing of water sprays), the change in centrifugal acceleration affects the recovery the most and continuous concentration can be achieved only when the water spray has a sufficient pressure. In addition, the reciprocation and spacing of the water sprays have a significant influence on the concentrate grade. Although performance of the full-scale concentrator is slightly inferior to pilot-scale trials, due to limitations in the scale-up design and the fluctuations of feed material characteristics, this concentrator provides a potential way to achieve continuous concentration and obtain a high-grade concentrate from tailings.

Key words: Gravity separation, Hematite, Tailings, Iron/ iron ores