Environmental Engineering and Management Journal *July/August 2009, Vol.8, No. 4, 981-984*
http://omicron.ch.tuiasi.ro/EEMJ/

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MAGNETIC DENSITY SEPARATION OF DIAMONDS FROM GANGUE

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Abstract

In view of the predicted diamond shortage in 2010, a number of innovative processes have been proposed recovering <2 mm diamonds which are currently lost in tailings. One of these innovations is based on the ferrohydrostatic separation (FHS) as developed by De Beers. This new method, known as magnetic density separation, creates an apparent density range inside a ferromagnetic fluid in order to create multiple density fractions in a single process. Results of lab-scale experiments separating a mixture of orthoclase, calcite, olivine and ilmenite are presented. In this mixture olivine represents the diamond fraction. Orthoclase and calcite simulate the lighter density minerals while ilmenite represents the heavy density fraction.

Key words: diamond, magnetic density separation, minerals processing, sink-float

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