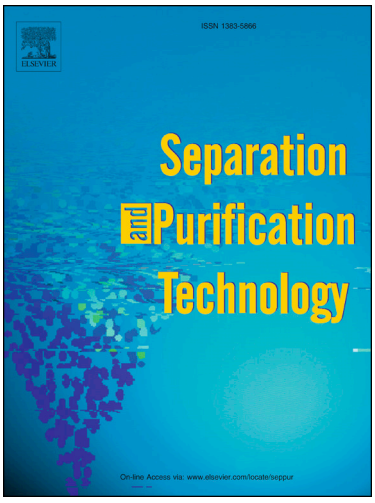

A new method for gravity separation: Vibrating table gravity concentrator

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PII: S1383-5866(18)31324-8
DOI: https://doi.org/10.1016/j.seppur.2018.09.074
Reference: SEPPUR 14972

To appear in: *Separation and Purification Technology*

Received Date: 18 April 2018
Revised Date: 11 September 2018
Accepted Date: 25 September 2018

Please cite this article as: O. Yıldırım GÜLSOY, E. GÜLCAN, A new method for gravity separation: Vibrating table gravity concentrator, *Separation and Purification Technology* (2018), doi: https://doi.org/10.1016/j.seppur.2018.09.074

A new method for gravity separation: Vibrating table gravity concentrator

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Abstract

This paper discusses recently developed gravity concentration equipment, namely ***vibrating table***, and reports detailed descriptions of the equipment in terms of principles of design and their effects on operational parameters. Vibrating table originally combines the known physical phenomena of a teetered bed, resistance to water flow, vibration, and density differences. The resulting effect of these combined forces can also be manipulated by integrated settings of feed rate, solid %, plate inclination, and water rate. Following the detailed description of the equipment, mineral separation tests with two different chromite ores obtained from industrial applications were performed in order to investigate the performance of the laboratory scale vibrating table. While former chromite ore had low grade with complex mineralogy and inadequate liberation, the latter had high grade consisting of liberated lumpy chromite particles. Experimental studies were focused on investigating the effect of plate inclination, removal of slimes, ore type, size classification, and particle size on separation performance. Within the tests performed with -600 µm, -800 µm, and -1000 µm high grade chromite ores under certain conditions, it was observed that increase in particle size results in a dramatic increase in recovery, while % grade decreases slightly. In another test with high grade chromite ore, sustainable product qualities were achieved up to a recovery of 93.22% in comparison with the 66.08% achieved with a conventional shaking