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The efficiency of the flotation technique for the removal of nickel ions from aqueous solution

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ABSTRACT

A simple and cost-effective treatment procedure was proposed to remove nickel(II) from aqueous solution under the optimized conditions. It is based on the sorption of Ni^{2+} ions from aqueous solutions onto limestone (LS) fines, which is an inexpensive and widespread over the globe, followed by flotation with oleic acid (HOL) surfactant. The different parameters (namely: solution pH, sorbent, surfactant and nickel concentrations, shaking times, ionic strength, temperature and the presence of foreign ions) influencing the sorptive-flotation process were examined. Nearly 99% of Ni^{2+} ions were removed from aqueous solutions at pH 7 after shaking for 5 min and at room temperature (~25°C). The procedure was successfully applied to recover nickel(II) spiked to some natural water samples. Moreover, a sorption and flotation mechanism is suggested.

Keywords: Nickel; Flotation; Limestone; Surfactant; Sorbent

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