

CEST02_076

Separation of Lead Ions from Industrial Wastewater by Ion Flotation Using Sodium Dodecyl Sulfate

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ABSTRACT

The rapid development of industries led to use a large amounts of water in industrial processes, which produce large amounts of wastewater effluents. Industrial wastewaters loaded with various pollutants such as heavy metals (arsenic, lead, mercury, cadmium, zinc, copper etc.). Presence of heavy display high-term toxicity. Lead is one of the most toxic heavy metals to the health and aquatic organisms. Ion flotation technique was used for separation of lead ions from synthetic industrial wastewater by adding chemical reagent (sodium dodecyl sulfate, SDS) as a collector and alcohol as frother in the presence of dispersed air bubbles. The synthetic wastewater was prepared in the laboratory scale to conduct the experiments. Batch flotation studies were conducted to investigate the optimum conditions for lead. Effect of various parameters like solution pH, an initial lead ions concentration, SDS dosage, and air flow rate were also determined. The optimum conditions were solution pH = 8.0, an initial lead ions concentration of 50 (mg/L), SDS dosage (50 mg/50 ml), and air flow rate = 1000 (ml/min). In optimal conditions, recovery of lead ions were more than 90.0% after 30 min. This study showed that the use of ion flotation is effective method for lead ions separation.

Keywords. ion flotation, heavy metals, SDS, wastewater.