



Evaluation of lead and COD removal from lead octoate drier effluent by chemical precipitation, coagulation–flocculation, and potassium persulfate oxidation processes

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ABSTRACT

A range of treatment processes for the removal of mineral and organic pollutants from industrial wastewater have been investigated. This study was aimed to remove lead, turbidity, and chemical oxygen demand (COD) from lead octoate drier wastewater via potassium persulfate oxidation in the presence of UV and heat, chemical precipitation by sulfuric acid, and coagulation–flocculation processes. $\text{Al}_2(\text{SO}_4)_3$, poly-aluminum chloride (PAC), and FeCl_3 were employed as coagulants. Lime, bentonite, and cationic and anionic polymers were also utilized as coagulant aids. All of the applied methods were successful in lead and turbidity removal. Precipitation by sulfuric acid followed by filtration eliminated 99.0% of lead and 90.0% of turbidity. The most removal efficiency involving coagulation–flocculation processes was 99.7% for lead (by PAC/lime) and 98.3% for turbidity (by PAC). However, COD removal was only achieved by potassium persulfate oxidation. The results indicated that oxidation process by potassium persulfate in exposure to heat was the most promising treatment method, resulting in the removal of COD, lead, and turbidity at the rates of 94.9, 99.9, and 96.6%, respectively.

Keywords: Lead octoate; COD; Lead removal; Potassium persulfate; Oxidation; Coagulation

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