

Sustainable and Cost-effective Approach for Treatment of Plating Industrial Wastewater Effluents

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ABSTRACT

The wastewater resulting from the plating industry contains high contents of toxic metals, such as chromium, which is a serious threat to the environment due to its cumulative effects and non-degradability. Several methods have been actively investigated to remove heavy metal ions from aqueous matrices. This research aimed to study the effects of coagulation and filtration on the degree of removal of main toxic metals from the plating industry wastewater. It has been shown that the rate of toxic pollutants removal was significantly influenced by different types of coagulants used in the pre-treatment. The degree of selected metals reduction strongly depended on the pH. However, the removals did not change linearly with the coagulant dosage. The most efficient method was chosen for process conditions in which more than 80% metal reduction was achieved and the final concentrations of copper, chromium, and nickel in the treated wastewater were within the required limits. The use of combined technological solutions made it possible to remove heavy metal ions from wastewater in a sustainable way, allowing to take further work related to metals recovery.

KEYWORDS: heavy metals removal, real wastewater, plating industry

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