



Could the optimization of electrocoagulation simply be based on the maximization of flocs yield?

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ABSTRACT

Electrocoagulation (EC) is a promising and moderately environmentally-friendly electrochemical wastewater treatment method. Since a wide range of pollutants are present in wastewater, it has become tedious to optimize the operation parameters of EC for every single kind of pollutant. In this work, we tried to prove that the optimization of EC could be simply based on the maximization of flocs yield that determines the hydroxide flocs' adsorption effect. The influence of some crucial operation parameters on flocs yield was investigated. It was found that flocs yield reaches its maximum at no aeration condition and flocs yield steadily decreased with the increment of extra time after electrolysis. Weak acid and neutral initial pH lead to a higher flocs yield. The impacts of flocs yield on EC efficiency were investigated. Three typical pollutants (anions (F⁻), organics (MO), and heavy metal ions (Ni²⁺)) were chosen as the target pollutant. It was found that higher flocs yield resulted in higher removal efficiency of anions and organics apart from heavy metal ions. Hence, the optimization of operation parameters of the EC process could be simply based on the maximization of flocs yield.

Keywords: Electrocoagulation; Hydroxide flocs; Flocs yield; Electrochemical wastewater treatment; Adsorption

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