Statistical modeling on COD removal from metal-working fluids through electrocoagulation process

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ABSTRACT

The present investigation envisages with the percentage chemical oxygen demand (COD) removal from metal-working fluids through batch electrocoagulation reactor using mild steel anode and stainless steel cathode. Box–Behnken experimental design was used to optimize individual variables and interactions of variables on percentage COD removal. The operating variables are the current density (2.0–2.4 Adm^{-2}), the electrolyte pH (6–8), and the electrolysis time (90–110 min). The responses have been critically analyzed with Pareto analysis of variance, response surface methodology, and quadratic model for percentage COD removal. Analysis showed a high coefficient of determination value R^2 (0.9527) for the percentage COD removal and satisfactory prediction for second-order regression model.

Keywords: Electrocoagulation; Box–Behnken method; COD removal; Response surface methodology; Current density

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