



## Electrocoagulation process to remove contaminants of coking wastewater using aluminum electrode

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### ABSTRACT

The removal of phenol, cyanide, ammonia–N and chemical oxygen demand (COD) from coking wastewater was carried out by electrocoagulation process (ECP) in batch mode using an aluminum electrode. Various operating parameters such as pH, current density (CD), electrolyte concentration and electrode gap (EG) that potentially affect the removal efficiency of pollutants were investigated. The optimum pH, CD, electrolyte concentration and EG were found to be 10.5, 37.2 A/m<sup>2</sup>, 100 mg/dm<sup>3</sup> and 17.5 mm, respectively. Cyanide, ammonia–N, COD and phenol removal at optimum condition were found to be 82.7%, 52.1%, 91% and 36%, respectively, which indicates that ECP is a promising technology for the removal of these species. Statistical analysis using analysis of variance showed a high coefficient of determination values for COD removal ( $R^2 = 0.9967$ ) between the experimental values and predicted values by a second-order regression model.

*Keywords:* Chemical oxygen demand; Electrochemical treatment; Aluminum electrode; Coking wastewater; Phenol; Cyanide; Ammonia–N

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