

Modeling of Coagulation Process for the Removal of Carbofuran in Aqueous Solution

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Abstract : A coagulation/flocculation process was adopted for the reduction of carbamate insecticide (carbofuran) from aqueous solution. Ferric chloride (FeCl_3) was used as a coagulant to treat the carbofuran. To exploit the reduction efficiency of pesticide concentration and COD, the jar-test experiments were carried out and process was optimized through response surface methodology (RSM). The effects of two independent factors; i.e., FeCl_3 dosage and pH on the reduction efficiency were estimated by using central composite design (CCD). The initial COD of the 30 mg/L concentrated solution was found to be 510 mg/L. Results exposed that the maximum reduction occurred at an optimal condition of $\text{FeCl}_3 = 80$ mg/L, and pH = 5.0, from which the reduction of concentration and COD 75.13% and 65.34%, respectively. The present study also predicted that the obtained regression equations could be helpful as the theoretical basis for the coagulation process of pesticide wastewater.

Keywords : carbofuran, coagulation, optimization, response surface methodology

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