

## Removal of heavy metal ions from electroplating wastewater

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### ABSTRACT

Polyacrylic acid diallyl dimethyl ammonium chloride (AAC-Dadmac) hydrogel was used as adsorbent for the removal of heavy metals (Cu(II), Ni(II), Zn(II) and total Cr) from electroplating wastewater. The effects of hydrogel dosage, contact time and shaking speed on heavy metal removal from electroplating wastewater were studied in a batch system. The equilibrium adsorption isotherm of heavy metals on the AAC-Dadmac hydrogel was studied using Langmuir and Freundlich isotherm models. The adsorption equilibrium data fitted well to the Langmuir isotherm model. The maximum adsorption capacities,  $q_m$  (mg/g), of the AAC-Dadmac hydrogel for Cu(II), Ni(II), Zn(II) and total Cr were 2.336, 0.960, 5.319, and 4.608 mg/g, respectively. Kinetics of adsorption was found to follow the pseudo-second-order rate equation. The results showed that the AAC-Dadmac hydrogel can be used as an alternative adsorbent for the removal of heavy metal ions from electroplating wastewater.

*Keywords:* Adsorption; Diallyl dimethyl ammonium chloride; Electroplating wastewater; Heavy metal; Hydrogel; Wastewater treatment

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