



Activated carbon derived from date stone as natural adsorbent for phenol removal from aqueous solution

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Received 19 May 2016; Accepted 6 March 2017

ABSTRACT

The aim of present study was to investigate the phenol adsorption onto a date stone activated carbon (DSAC) in a batch system with considering initial pH, initial phenol concentration, DSAC dosage, and contact time. Four two-parameter isotherm models (Langmuir, Freundlich, Temkin and Dubinin–Radushkevich) and four three-parameter isotherm models (Sips, Redlich–Peterson, Toth and Khan) were used to fit the experimental data. To determine the best-fit isotherm, a statistical method of Goodness of fit (GooF) was applied. An optimization method, according to standard normalized error (SNE), was used to determine the best set of parameters for each isotherm model. GooF analysis indicated that the best isotherm model to describe the phenol adsorption on surface of DSAC was Freundlich with a maximum adsorption capacity of 33.53 mg/g among the two-parameter models and Sips with a maximum adsorption capacity of 11.68 mg/g among the three-parameter isotherms. The results indicated that the DSAC is effective adsorbent for phenol removal from the aqueous solutions in terms of low cost, high availability, and easy production process.

Keywords: Phenol; Activated carbon; Date stone; Adsorption

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