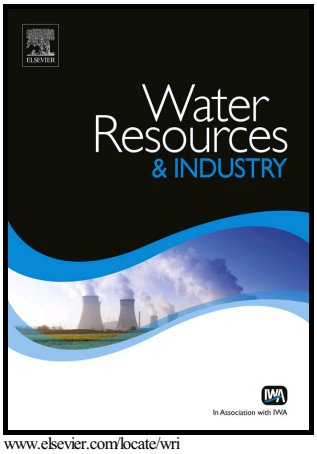

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Removal of chlorinated phenol from aqueous media by guava seed (*Psidium Guajava)* tailored activated carbon

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Abstract

In this study, the activated carbons (ACs) were prepared from guava seeds via two stages activation. The dried guava seeds were semi-carbonized at 300 ^{o}C for 1 h, and then the carbonized samples were impregnated with zinc chloride ($ZnCl_2$). The $ZnCl_2$: sample impregnation ratios (w/w) were altered from 1:1 to 5:1. The ACs were characterized by the yield percentage, ash content, moisture content, pH value, adsorption quality of 2,4-dichlorophenol (2,4-DCP) and surface functional groups. The surface area of the best produced AC3 was found to be 919.40 m^2 g^{-1}. It was found that AC3 had highest 2,4-DCP adsorption capacity, which was 20.9 mg g^{-1}. The 2,4-DCP adsorption kinetic of prepared AC3 was pseudo-second order with correlation value of 0.995. In addition, the 2,4-DCP adsorption capacity of AC3 was fitted to the Langmuir model with correlation coefficient value of 0.977, indicating that chemisorption was a major contributor to the adsorption process.

Keywords

Activated carbon; Two stage self-generated atmosphere; 2,4-dichlorophenol; Guava seeds; Kinetics

1. Introduction