

Removal of 2-chlorophenol using pomelo (*Citrus Maxima*) albedo as a new low cost adsorbent

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ABSTRACT

Activated carbon is an effective material which acts as an adsorbent for treatment of contaminated wastewater, but the production process is costly. This work prepares a low-cost adsorbent from waste pomelo albedo for the adsorptive removal of 2-chlorophenol from aqueous solutions. The adsorbent was prepared via a simple conventional method which involves acid treatment before drying and grinding. The pore size and surface area of the pomelo albedo adsorbent were 89.4 Å and 78.3 m²/g, respectively. Removal of 2-chlorophenol was conducted via batch adsorption at various conditions including adsorbent dosage (0.2–0.8 g), contact times (0–3 h), initial 2-chlorophenol concentration (20–80 mg/L), temperature (28–52 °C), and pH (2–8). The optimum chlorophenol sorption recovery was ~ 92% achieved at 50 °C, pH 2, 50 mg/L 2-chlorophenol concentration with 0.2 g of pomelo albedo adsorbent. This was due to the optimum amount of cation exchanged between the 2-chlorophenol molecules and surface of adsorbent at ideal surface interaction parameters. This result suggested that pomelo albedo had great potential as an adsorbent to be used for treatment of industrial wastewater containing 2-chlorophenol.

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KEYWORDS: Adsorption, Pomelo albedo, *Citrus grandis*, Agricultural waste, Wastewater treatment

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