

عنوان مقاله:

Recycling of used tires as an adsorbent for the removal of Parachlorophenol from aqueous solutions:
Characterization, adsorption and equilibrium studies

محل انتشار:

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خلاصه مقاله:

Parachlorophenol has an extended usage in refineries, petrochemical industries, insecticide and herbicide manufacturing industries. The purpose of this study is determination of optimum adsorption parameter of 4-chlorophenol by carbon adsorbent. Activated carbon was made in laboratory conditions by using pyrolysis furnace in 750°C for 2.5 hours. Scanning Electron Microscope (SEM) was used for determining structural characteristics of the activated carbon produced from recycled used tires and BET isotherm was used to find out its special surface. The structure of produced activated carbon in this study has a special surface of 111.702 m²/g. The internal diameter of holes was 1.54 nm and the total volume of them was 0.124 cc/g. The removal efficiency was reduced from 88.59% to 69.25% by changing the pH from 3 to 9. In addition, the efficiency was reduced from 88.59% to 75.95% when the primary concentration of Parachlorophenol increased from 10 mg/L to 60 mg/L. On the other hand, changing the temperature from 10 to 30°C increased it from 65.86% to 74.53%. Moreover contact time had direct impacts on the removal efficiency. The results conform Freundlich isotherm (R² = 0.9958). The efficiency of Parachlorophenol removal would be decreased by increasing pH and concentration of the pollutant, and would be increased by adding temperature and contact time. As a conclusion, because of the cheapness of recycled tiers, the produced activated carbon from them can be used as an effective and low-cost method for Parachlorophenol removal from aqueous solutions.

کلمات کلیدی:

Adsorption; Activated carbon; Isotherm; Parachlorophenol; Used tiers; Recycling

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