عنوان مقاله:

Removal of parachlorophenol from the aquatic environment by recycled used tires as an adsorbent: 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. Tire a solid waste, which is disposed in large amounts each year, a large number of them in landfills can cause irreparable environmental impacts. Consequently lots of efforts were done to produce activated carbon from used tires. Activated carbon was made in laboratory conditions by using pyrolysis furnace. Scanning electron microscopy was used for determining structural characteristics of the activated carbon produced from recycled used tires and Brunauer, Emmett, and Teller 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 ml/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 to 60 mg/L. On the other hand, changing the temperature from 10°C 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, since the recycled tires are cheap, the produced activated carbon from them can be used as an effective and low-cost method for parachlorophenol removal from aqueous solutions.

کلمات کلیدی:

Activated Carbon, Isotherm, Parachlorophenol, Recycling, Used Tires