

Preparation and characterization of activated carbon derived from waste rubber tire via chemical activation with ZnCl₂: surface area and morphological studies

Abstract

Turning waste to wealth is an important aspect in promoting green technology. In this study, activated carbon from waste rubber tire was prepared using chemical activation (ZnCl₂) by way of two-stage activation in self-generated atmosphere method. The preparation parameters examined and compared in this study were activation time, activation temperature, and impregnation ratio. The adsorption of the target pollutant, 2,4-dichlorophenol (DCP), was used to evaluate the efficiency of adsorption capacity of the prepared activated carbon. Results from the experimental work showed that the activated carbon prepared satisfied the Freundlich isotherm and complied with the pseudo-second-order kinetics (not presented here). Other parameters studied, such as the percentage yield of activated carbon, ash, and moisture content and the morphology structure, are presented in this chapter. This study showed that waste rubber tire dehydrated with ZnCl₂ with an impregnation ratio of 1:1 and activated at a temperature of 500 °C for 120 min gave the best result (AC5).