

Evaluation of the use of activated carbon derived from coconut shells to treat car wash wastewaters

Abstract

Car wash services generate wastewater that consists of many contaminants. The discharge of raw car wash wastewater would bring adverse impacts to the environment. Therefore, this study aims to evaluate the use of activated carbon derived from coconut shells to treat car wash wastewater. In this study, activated carbon (AC) prepared from coconut shells shows a good microporosity structure with functional groups on the surface. The performance of activated carbon prepared is evaluated by determining the removal efficiency of the parameter including COD, BOD, and heavy metals concentration (zinc and iron) from car wash wastewater. The operating parameters are dosage (0.2 - 1.0 g/100 mL), contact time of 30 min-150 min and pH adjustment (pH 3 - pH 9). Throughout the research, the highest removal efficiencies of COD, BOD, zinc, and iron from automatic car wash wastewater are 91.03 %, 88.51 %, 68.25 %, and 86.09 % respectively achieved by 0.8 g of carbon dosage under 90 rpm agitation speed for 60 min. Under the same operational condition, CSAC removed 84.43 % COD, 81.80 % BOD, 59.78 % zinc, and 78.58 % iron from manual car wash wastewater. Therefore, the removal of pollutants from car wash water by using activated carbon derived from coconut shells has been proven to be an effective method.

Keywords

Activated carbon; Wastewater; Water quality