

CHARACTERIZATION AND KINETIC ADSORPTION OF THE DIFFERENT SOURCES ACTIVATED CARBON FOR LIQUID-PHASE ADSORPTION

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ABSTRACT

The activated carbon from oil-palm stones of agricultural by-products from palm-oil mills in several tropical countries, a coconut shells and a solid waste exploring coals mining (ex-coal mining) were studied in this paper. The activated and characterized carbon are carried out both chemical and adsorptive properties. The different chemical activators such as H_3PO_4 , KOH, H_2SO_4 in the different ratio and also different temperature from 550° to $850^\circ C$ was done. The adsorptive properties are including the textural properties of the activated carbons are investigated. It was found that the temperature and hold time had significantly influences on the surface area and pore size in the distribution of the activated carbon. The optimum conditions for preparing these activated carbons from chars. paralyzed at $600^\circ C$ to derive the highest specific surface areas were found to be an activation temperature of $750^\circ C$ for phenol adsorption of KOH for carbon from coconut shells, H_3PO_4 for oil palm stone and ex-coal mining activator in $850^\circ C$. For chemical characterization, AAS and a Fourier transform infrared (FTIR) spectroscopy were used to identify the inorganic components and surface organic functional groups of the activated carbons, respectively. For the determination of the adsorptive capacity of the activated carbons, adsorption of phenol was carried out using spectrophotometric analyses. Experimental results showed that phenol and iodine could be adsorbed effectively by the three different activated carbons. The adsorptive capacity of these activated carbons was comparable with those of some commercial activated carbons by using Juan, R-S *et al's model*^[1].

Keywords: *activated carbon, oil palm stone, coconout shell, ex-coal maining, phenol reduction, kinetic adsorption, adsorptive capacity*

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