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4000008806

HADIAH



REMOVAL OF METHYLENE BLUE IN AQUEOUS SOLUTION USING
ACTIVATED CARBON DERIVED FROM COCONUT-SHELL

TEE LE KEAU

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ABSTRACT

The preparation of activated carbon from agricultural waste could increase economic return. Thus, coconut shells were used as a raw material for the preparation of activated carbon in this research with an aim to remove methylene blue from aqueous solution. Dried, pieces of coconut shells were treated by two-stage activation process namely semi-carbonization stage followed by activation stage at temperature 400-600°C to get activated carbon using phosphoric acid as the activating agent. Experiments are carried out in a lab scale muffle furnace under static conditions such as different concentration of phosphoric acid, carbonization time and temperature. Analysis such as adsorption methylene blue, pH, SEM and FT-IR were done. Yield, moisture and ash content also have been determined. From the results, sample activated using the highest concentration of acid (5.0 Molar) showed the highest methylene blue adsorptive capacity which was 2.433mgg⁻¹. For the kinetic studies, pseudo-second order was the best applicable model to describe the adsorption of methylene blue. Sample activated at 600 °C also showed the clearest pore size distribution in SEM. Infrared spectra indicated it present of methyl, aromatic, alkenes functional groups.

