

SYNTHESIS AND CHARACTERIZATION OF COMPOSITES Fe₃O₄ ACTIVATED CARBON FROM THE SHELL OF COCONUT USING HYDROTHERMAL METHOD FOR ANILINE ADSORPTION

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Abstract

Synthesis and characterization of activated carbon modified Fe₃O₄ has been carried out by the hydrothermal method. This composite is made from coconut shell activated carbon and a mixture of FeCl₃·6H₂O with FeSO₄·7H₂O. The work process starts from the activated carbon activation stage using HNO₃. Then proceed with the synthesis step in a hydrothermal reactor that contains a mixture of activated carbon, FeCl₃·6H₂O, FeSO₄·7H₂O, distilled water, and a little ethanol. The reactor is heated at 250 °C for 5 hours. At the aniline adsorption tested, it used several parameters such as pH, concentration, contact time, and weight.

The results of the characterization with FTIR showed the interaction of Fe-O bonds on the wave number band 521.46 cm⁻¹. The results of SEM-EDX show a spherical surface morphology with a rough surface, XRD provides information that this composite micro particle has a simple cubic structure.

This composite has succeeded in reducing the level of aniline in a dilute solution. The trial results showed the optimum adsorption conditions at pH 5, 250 ppm concentration, 75 minutes contact time, and 0.5 gram composite weight.

Keywords: Composites, Fe₃O₄, Hydrothermal Method, Adsorption, Aniline.

