PEMANFAATAN KOMPOSIT Ag_2O-CuO/KARBON AKTIF UNTUK ADSORPSI PARASETAMOL DALAM PERAIRAN

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INTISARI

Telah dilakukan penelitian tentang sintesis Komposit Ag_2O-CuO/Karbon Aktif dengan bahan dasar karbon aktif yang berasal dari tandan kosong kelapa sawit. Sintesis komposit Ag_2O-CuO/Karbon Aktif dilakukan dengan metode hidrotermal pada suhu 300 ℃. Hasil sintesis kemudian dilakukan karakterisasi dengan XRD, FTIR, SEM, GSA, dan Spektrofotometer UV-Vis. Hasil karakterisasi XRD, FTIR, SEM, dan GSA menunjukkan bahwa karbon aktif dan komposit Ag_2O-CuO/Karbon Aktif memiliki struktur *Simple Cubic* (SC). Ukuran kristal karbon aktif adalah 35,371 nm. Ukuran kristal yang dimiliki komposit Ag_2O-CuO/Karbon Aktif adalah 37,991; 32,522; 24,959; 23,407; 21,692 nm. Dari hasil karakterisasi menunjukkan bahwa komposit memiliki ikatan logam oksida Ag-O dan Cu-O yang menandakan bahwa Ag_2O dan CuO berhasil diembankan pada karbon aktif sehingga menghasilkan komposit Ag_2O-CuO/Karbon Aktif. Presentase unsur karbon (C) pada karbon aktif sebesar 34,24%, dan pada komposit Ag_2O-CuO/Karbon Aktif memiliki presentase unsur perak (Ag) sebesar 14,80% serta unsur tembaga (Cu) sebesar 23,80%. Karbon aktif yang dihasilkan memiliki luas permukaan 37,044 m^2/g. Komposit Ag_2O-CuO/Karbon Aktif memiliki luas permukaan 138,167 m^2/g. Jenis pori pada karbon aktif adalah mesopori, sedangkan pada komposit Ag_2O-CuO/Karbon Aktif adalah mikropori. Adsorpsi parasetamol berhasil dilakukan dengan menggunakan adsorben komposit Ag_2O-CuO/Karbon Aktif pada pH 6, konsentrasi parasetamol 700 ppm, massa adsorben 0,3 gram, waktu kontak adsorpsi 150 menit dengan presentase adsorpsi 91,429%. Isoterm adsorpsi parasetamol oleh komposit Ag_2O-CuO/Karbon Aktif mengikuti model isoterm Langmuir dan pseudo orde 2.

Kata Kunci : Tandan Kosong Kelapa Sawit, Karbon Aktif, Komposit Ag_2O-CuO/Karbon Aktif, Parasetamol, Adsorbsi

UTILIZATION OF Ag_2O-CuO/ACTIVATED CARBON COMPOSITES FOR PARACETAMOL ADSORPTION IN WATER

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ABSTRACT

This research has been carried out on the synthesis of Ag_2O-CuO/Activated Carbon composites with activated carbon as the base material from oil palm empty fruit bunches. Ag_2O-CuO/Activated Carbon composite was synthesized by hydrothermal method at 300 ℃ temperature. The results have been characterized by XRD, FTIR, SEM, GSA, and UV-Vis Spectrophotometer. The results of XRD, FTIR, SEM, and GSA characterization showed that activated carbon and Ag_2O-CuO/Activated Carbon composites had a *Simple Cubic* (SC) structure. The crystal size of activated carbon was 35,371 nm. The crystal size of the Ag_2O-CuO/Activated Carbon composite is 37.991; 32.522; 24,959; 23,407; 21,692 nm. The characterization results show that the composite has Ag-O and Cu-O metal oxide bond which indicate that Ag_2O and CuO have been successfully implanted on activated carbon to produce Ag_2O-CuO/Activated Carbon composites. The percentage of carbon elements (C) in activated carbon was 34.24%, and the Ag_2O-CuO/Activated Carbon composite has a percentage of silver (Ag) of 14.80% and copper (Cu) of 23.80%. The activated carbon produced has a surface area of 37,044 m^2/g. Ag_2O-CuO/Activated Carbon composite has a surface area of 138,167 m^2/g. The type of pores in activated carbon is mesoporous, while in Ag_2O-CuO/Activated Carbon composites are micropores. Paracetamol adsorption was succesfully carried out using Ag_2O-CuO/Activated Carbon composite adsorbent at pH 6, paracetamol concentration of 700 ppm, adsorbent mass of 0.3 grams, adsorption contact time of 150 minutes with an adsorption percentage of 91.429%. Paracetamol adsorption isotherm by Ag_2O-CuO/Activated Carbon composite followed the Langmuir isotherm model and pseudo order 2.

Keywords : Oil Palm Empty Fruit Bunches, Activated Carbon, Ag_2O-CuO Composite/Activated Carbon, Paracetamol, Adsorption