

SINTESIS KOMPOSIT ASAM HUMAT/KITIN/MAGNETIT DAN APLIKASINYA SEBAGAI ADSORBEN ZAT WARNA *MALACHITE GREEN*

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INTISARI

Telah dilakukan sintesis komposit Asam Humat/Kitin/Magnetit dan aplikasinya sebagai adsorben zat warna malachite green. Asam humat diekstraksi dari tanah gambut menggunakan metode *International Humic Substances Society* (IHHS). Sintesis adsorben komposit Asam Humat/Kitin/Magnetit dilakukan dengan metode kopresipitasi dan memanfaatkan NH_4OH sebagai agen pengendap hingga pH mencapai 11. Material dikarakterisasi menggunakan *Fourier Transform Infra-Red Spectroscopy* (FTIR), *X-Ray Diffraction* (XRD), dan *Vibrating Sample Magnetometer* (VSM). Kajian adsorpsi zat warna *malachite green* meliputi variasi pH, kinetika adsorpsi, dan isoterm adsorpsi. Konsentrasi zat warna *malachite green* dianalisis menggunakan spektrofotometer UV-Vis.

Hasil karakterisasi menunjukkan bahwa komposit Asam Humat/Kitin/Magnetit telah berhasil disintesis. Adsorpsi zat warna *malachite green* menggunakan komposit optimum pada pH 7 dan mengikuti kinetika orde kedua semu model Ho-McKay dengan konstanta laju adsorpsi sebesar $19 \text{ g mg}^{-1} \text{ menit}^{-1}$. Isoterm adsorpsi zat warna *malachite green* mengikuti model Langmuir dan didapatkan nilai K_L sebesar $173,4 \text{ L mg}^{-1}$.

Kata kunci: adsorpsi, komposit AH/Kitin/Magnetit, malachite green

SYNTHESIS OF HUMIC ACID/CHITIN/MAGNETITE COMPOSITE AND ITS APPLICATION AS *MALACHITE GREEN* DYE ADSORBENT

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ABSTRACT

The synthesis of Humic Acid/Citin/Magnetite composite and its application as adsorbent for malachite green dye was carried out. Humic acid was extracted from peat soil using the *International Humic Substances Society* (IHHS) method. The synthesis of Humic Acid/Citin/Magnetite composite adsorbent was carried out by coprecipitation method and utilized NH_4OH as precipitating agent until the pH reached 11. The material was characterized using *Fourier Transform Infra-Red Spectroscopy* (FTIR), *X-Ray Diffraction* (XRD), and *Vibrating Sample Magnetometer* (VSM). Adsorption studies of malachite green dye included pH variation, adsorption kinetics, and adsorption isotherms. The concentration of *malachite green* dye was analyzed using a UV-Vis spectrophotometer.

The characterization results showed that the Humic Acid/Citin/Magnetite composite had been successfully synthesized. Adsorption of malachite green dye using the composite was optimum at pH 7 and followed the Ho-McKay model pseudo second-order kinetics with an adsorption rate constant of $19 \text{ g mg}^{-1} \text{ min}^{-1}$. The adsorption isotherm of *malachite green* dye followed the Langmuir model and obtained a K_L value of 173.4 L mg^{-1} .

Keywords: adsorption, humic acid/chitin/magnetite composites, malachite green