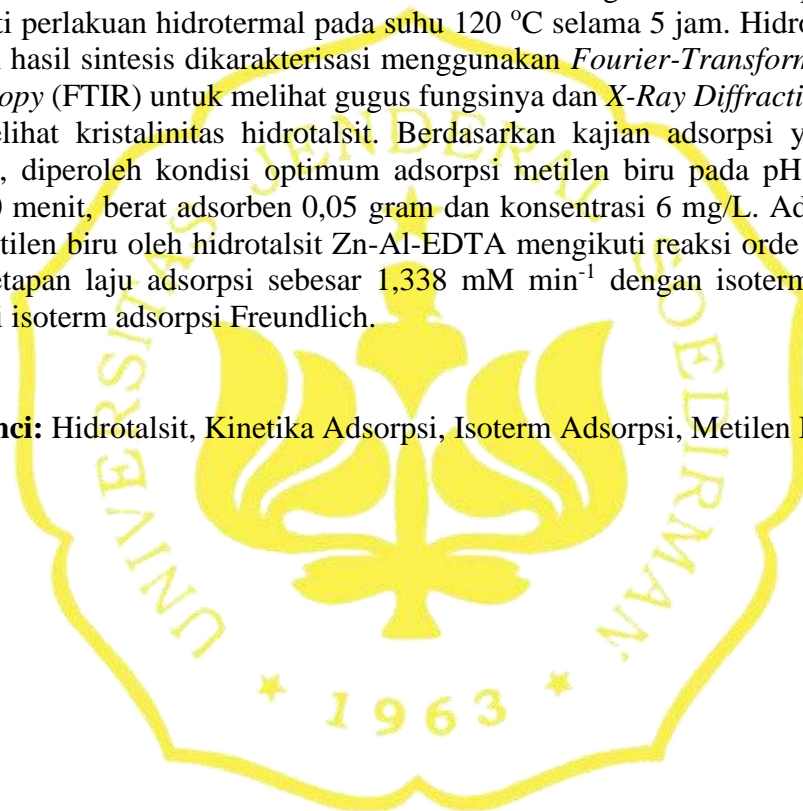


ABSTRAK

Metilen biru merupakan pewarna kationik yang paling sering digunakan dalam pewarna tekstil dan makanan. Metilen biru dapat menyebabkan mutasi genetik, iritasi saluran pencernaan dan reproduksi jika tertelan, sianosis jika terhirup, iritasi pada kulit. Penelitian ini dilakukan adsorpsi metilen biru menggunakan hidrotalsit Zn-Al-EDTA. Tujuan penelitian ini adalah untuk mempelajari sintesis, karakterisasi dan kajian adsorpsi pada hidrotalsit Zn-Al-EDTA. Sintesis hidrotalsit Zn-Al-EDTA dilakukan dengan metode kopresipitasi dan diikuti perlakuan hidrotermal pada suhu 120 °C selama 5 jam. Hidrotalsit Zn-Al-EDTA hasil sintesis dikarakterisasi menggunakan *Fourier-Transform Infrared Spectroscopy* (FTIR) untuk melihat gugus fungsinya dan *X-Ray Diffraction* (XRD) untuk melihat kristalinitas hidrotalsit. Berdasarkan kajian adsorpsi yang telah dilakukan, diperoleh kondisi optimum adsorpsi metilen biru pada pH 7, waktu kontak 30 menit, berat adsorben 0,05 gram dan konsentrasi 6 mg/L. Adsorpsi zat warna metilen biru oleh hidrotalsit Zn-Al-EDTA mengikuti reaksi orde dua semu dengan tetapan laju adsorpsi sebesar 1,338 mM min⁻¹ dengan isoterm adsorpsi mengikuti isoterm adsorpsi Freundlich.

Kata Kunci: Hidrotalsit, Kinetika Adsorpsi, Isoterm Adsorpsi, Metilen Biru



ABSTRACT

Methylene blue is the cationic dye most commonly used in textile and food dyes. Methylene blue can cause genetic mutations, irritation of the gastrointestinal tract and reproduction if ingested, cyanosis if inhaled, irritation of the skin and. In this study, methylene blue adsorption was carried out using Zn-Al-EDTA hydrotalcite. The purpose of this study was to study the synthesis, characterization and adsorption studies in Zn-Al-EDTA hydrotalcites. The synthesis of Zn-Al-EDTA hydrotalcite was carried out by the coprecipitation method and followed by hydrothermal treatment at a temperature of 120 °C for 5 hours. The synthetic Zn-Al-EDTA hydrotalcites were characterized using Fourier-Transform Infrared Spectroscopy (FTIR) to see their functional groups and X-Ray Diffraction (XRD) to see the crystallinity of hydrotalcite. Based on the adsorption studies that have been carried out, the optimum condition of methylene blue adsorption at pH 7, contact time 30 minutes, adsorbent weight 0.05 grams and concentration 6 mg/L. Adsorption of methylene blue dye by Zn-Al-EDTA hydrotalcites following a pseudo second order reaction with an adsorption rate constant of 1.33855 mM min⁻¹ with adsorption isotherms following Freundlich's adsorption isotherm.

Keywords: *Hydrotalcite, Adsorption Kinetics, Adsorption Isotherm, Methylene Blue*

