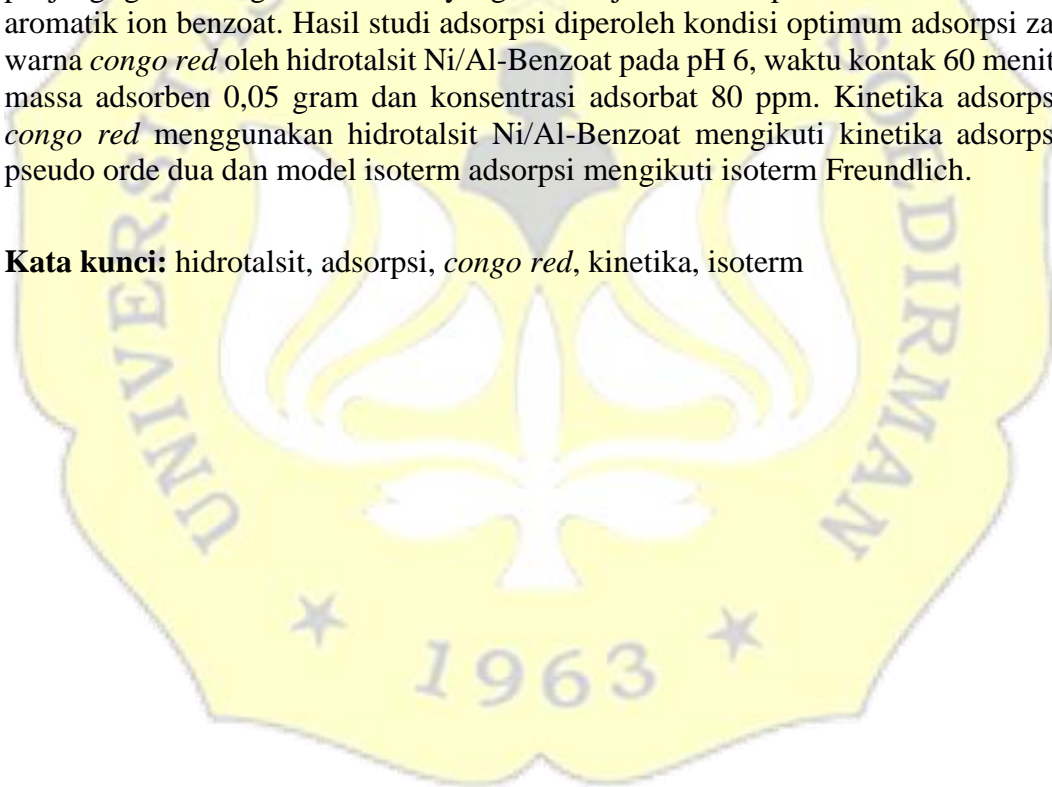


ABSTRAK

Telah dilakukan penelitian mengenai adsorpsi zat warna *congo red* menggunakan hidrotalsit Ni/Al-Benzoat. Tujuan penelitian ini yaitu untuk mengetahui kemampuan hidrotalsit Ni/Al-Benzoat sebagai adsorben dalam mengadsorpsi zat warna *congo red*. Hidrotalsit Ni/Al-Benzoat disintesis menggunakan metode kopresipitasi dengan perbandingan mol $\text{Ni}^{2+}:\text{Al}^{3+}$ yaitu 3:1. Hidrotalsit Ni/Al-Benzoat hasil sintesis dikarakterisasi menggunakan instrumen FTIR dan XRD. Kajian adsorpsi hidrotalsit Ni/Al-Benzoat terhadap *congo red* dilakukan dengan beberapa parameter, yaitu pH, waktu kontak, massa adsorben, dan konsentrasi adsorbat. Hasil analisis XRD menunjukkan hidrotalsit Ni/Al- NO_3 teridentifikasi pada sudut $11,15^\circ$. Hidrotalsit Ni/Al- NO_3 terinterkalasi dengan anion benzoat membentuk hidrotalsit Ni/Al-Benzoat terlihat dari pergeseran sudut ke $5,91^\circ$. Hasil analisis FTIR hidrotalsit Ni/Al-Benzoat muncul pita serapan pada panjang gelombang 1597 cm^{-1} yang menunjukkan serapan C=C dari cincin aromatik ion benzoat. Hasil studi adsorpsi diperoleh kondisi optimum adsorpsi zat warna *congo red* oleh hidrotalsit Ni/Al-Benzoat pada pH 6, waktu kontak 60 menit, massa adsorben 0,05 gram dan konsentrasi adsorbat 80 ppm. Kinetika adsorpsi *congo red* menggunakan hidrotalsit Ni/Al-Benzoat mengikuti kinetika adsorpsi pseudo orde dua dan model isoterm adsorpsi mengikuti isoterm Freundlich.

Kata kunci: hidrotalsit, adsorpsi, *congo red*, kinetika, isoterm



ABSTRACT

Research has been carried out on the adsorption of congo red dye using Ni/Al-Benzoate LDH. The purpose of this study was to determine the ability of Ni/Al-Benzoate LDH as an adsorbent in adsorption of congo red dye. Ni/Al-Benzoate LDH was synthesized using the coprecipitation method with a mole ratio of $\text{Ni}^{2+}:\text{Al}^{3+}$ is 3:1. The synthesized Ni/Al-Benzoate LDH was characterized using FTIR and XRD instruments. Adsorption study of Ni/Al-Benzoate LDH on congo red was carried out with several parameters, among them are pH, contact time, adsorbent mass, and adsorbate concentration. The results of the XRD analysis showed that Ni/Al- NO_3 LDH was identified at an angle of 11.15° . Ni/Al- NO_3 LDH intercalates with benzoate anion to form Ni/Al-Benzoate LDH as seen from the angle shift to 5.91° . The results of the FTIR analysis of Ni/Al-Benzoate LDH show an absorption band at a wavelength 1597 cm^{-1} which indicates C=C absorption from the aromatic ring of the benzoate ion. The results of the adsorption study obtained optimum conditions for the adsorption of congo red dye by Ni/Al-Benzoate LDH at pH 6, contact time of 60 minutes, adsorbent mass of 0.05 gram and adsorbate concentration of 80 ppm. The adsorption kinetics of congo red using Ni/Al-Benzoate LDH follow the second order pseudo adsorption kinetics and the adsorption isotherm model follows the Freundlich isotherm.

Keywords: LDH, adsorption, congo red, kinetics, isotherm

