ABSTRAK

Telah dilakukan penelitian tentang studi adsorpsi rhodamin B menggunakan adsorben hidrotalsit Ni/Al-Oksalat. Penelitian ini bertujuan untuk menghasilkan rendemen hidrotalsit Ni/Al-Oksalat, mengetahui kondisi optimum hidrotalsit Ni/Al-Oksalat dalam mengadsorpsi rhodamin B serta mengetahui model kinetika adsorpsi dan isoterm adsorpsi. Hidrotalsit Ni/Al-Oksalat berhasil disintesis menggunakan metode kopresipitasi dengan dilanjutkan metode hidrotermal pada suhu 120 ^{0}C selama 16 jam. Hidrotalsit Ni/Al-Oksalat hasil sintesis dikarakterisasi dengan FTIR dan XRD. Berdasarkan hasil penelitian menunjukkan bahwa kinetika adsorpsi rhodamin B menggunakan hidrotalsit Ni/Al-Oksalat mengikuti model kinetika pseudo orde dua dengan nilai R^2 sebesar 0,9995. Isoterm adsorpsi yang lebih sesuai adalah isoterm Freundlich dengan nilai K_F sebesar 0,335 dan 1/n sebesar 1,136. Hal ini menggambarkan bahwa adsorpsi terjadi pada sistem heterogen dan lapisan adsorpsi yang terbentuk bersifat *multilayer*. Hidrotalsit Ni/Al-Oksalat memiliki kemampuan adsorpsi terhadap rhodamin B sebesar 4,815 mg/g pada kondisi adsorpsi terbaik yaitu pH 7, waktu kontak 60 menit, massa adsorben sebesar 0,07 gram, dan konsentrasi adsorbat sebesar 30 mg/L.

Kata Kunci: Hidrotalsit, adsorpsi, rhodamin B, kinetika adsorpsi, isoterm adsorpsi

ABSTRACT

Research on the adsorption study of rhodamine B using hydrotalcite Ni/Al-Oxalate adsorbents has been carried out. This study aims to produce hydrotalcite Ni/Al-Oxalate, to determine the optimum conditions for hydrotalcite Ni/Al-Oxalate to adsorb rhodamine B and to determine the adsorption kinetics model and adsorption isotherm. Hydrotalcite Ni/Al-Oxalate was successfully synthesized using the coprecipitation method followed by the hydrothermal method at 120 ^{0}C for 16 hours. The synthesized Ni/Al-Oxalate hydrotalcite was characterized by FTIR and XRD. The results showed that the adsorption kinetics of rhodamine B using hydrotalcite Ni/Al-Oxalate followed a pseudo second order kinetics model with an R^2 value of 0.9995. A more suitable adsorption isotherm is the Freundlich isotherm with a KF value of 0.335 and 1/n of 1.136. This illustrates that adsorption occurs in heterogeneous systems and the adsorption layer formed is multilayer. Hydrotalcite Ni/Al-Oxalate has an adsorption capacity of rhodamine B of 4.815 mg/g under the best adsorption conditions, namely pH 7, contact time of 60 minutes, adsorbent mass of 0.07 gram, and adsorbate concentration of 30 mg/L.

Keywords: *Hydrotalcite, adsorption, rhodamine B, adsorption kinetics, adsorption isotherm*