PEMBUATAN MEMBRAN KITOSAN–NATRIUM HUMAT SEBAGAI ADSORBEN BIRU METILEN

Yosy Purnamasari

12/331171/PA/14475

INTISARI

Telah dilakukan penelitian pembuatan membran kitosan–natrium humat sebagai adsorben biru metilen. Membran disintesis dengan melarutkan natrium humat dalam natrium hidroksida dan diikuti penambahan kitosan dan asam asetat, kemudian diuapkan pada suhu 70 ºC. Selanjutnya membran dikarakterisasi dengan FTIR dan SEM. Pengaruh waktu, pH, konsentrasi, kinetika adsorpsi dan desorpsi, pola isoterm adsorpsi, kapasitas adsorpsi, dan energi adsorpsi dipelajari juga.

Spektra FTIR membran kitosan–natrium humat menunjukkan adanya serapan yang cukup tajam pada daerah 1574 cm^{-1} yang merupakan karakteristik dari membran kitosan–natrium humat. Kondisi optimum terjadi pada waktu kontak 60 menit, pH 8, dan pada konsentrasi biru metilen 250 mg L^{-1}. Hasil penelitian menunjukkan adsorpsi mengikuti kinetika reaksi pseudo orde dua dengan pola isoterm Langmuir. Nilai kapasitas adsorpsi maksimum oleh membran kitosan–natrium humat 46,95 mg g^{-1} dan energi adsorpsi 23,3 kJ mol^{-1}. Hasil desorpsi terbaik dengan menggunakan NaCl 1 M dengan mengikuti kinetika pseudo orde dua dengan konstanta laju desorpsi sebesar $7{,}2\times10^{-2}$ g mol^{-1} $menit^{-1}$.

Kata kunci: Membran, kitosan, natrium humat, biru metilen, kinetika adsorpsi desorpsi

SYNTHESIS OF CHITOSAN–SODIUM HUMATE MEMBRANE AS ADSORBENT FOR METHYLENE BLUE

Yosy Purnamasari
12/331171/PA/14475

ABSTRACT

A research on the synthesis of chitosan–sodium humate membrane as adsorbent for methylene blue has been carried out. The membrane was obtained by dissolving sodium humate in natrium hydroxide and adding chitosan and acetic acid, then evaporating at 70 ºC. The membran was characterized by FTIR and SEM. The influence of time, pH, concentration, desorption and adsorption kinetics, adsorption isotherms pattern, adsorption capacity and adsorption energy were also studied.

The results of FTIR characterization of chitosan–sodium humate membrane showed an absorption at 1574 cm^{-1} that was characteristic of chitosan–natrium humate. The optimum conditions are observed for contact time of60 minutes, at pH 8, and methylene blue concentration of 250 mg L^{-1}. The results showed that the adsorption followed the pseudo second order reaction kinetics with the Langmuir isotherm pattern. The maximum adsorption capacity value by chitosan–sodium humate membrane was 46.95 mg g^{-1} and the adsorption energy was 23.3 kJ mol^{-1}. Maximum desorption of chitosan–sodium humate membran was in 1 M NaCl which follows pseudo second–order kinetic with desorption and desorption rate constant of 7.2×10^{-2}g mol^{-1} min^{-1}.

Key words: membrane, chitosan, sodium humate, methylene blue, desorption adsorption kinetics