INTISARI

PEMBUATAN FILM KOMPLEKS POLIELEKTROLIT KITOSAN/KARAGINAN DAN PEMANFAATANNYA SEBAGAI ADSORBEN ASAM HUMAT

Oleh

Dihliz Zunaim
14/369026/PA/16342

Telah dilakukan pembuatan film kitosan/karaginan dan digunakan untuk adsorpsi desorpsi asam humat. Karakterisasi film kitosan/karaginan dilakukan dengan uji spektroskopi FTIR, SEM, uji *swelling*, dan uji kestabilan pH. Uji kemampuan adsorpsi dilakukan pada berbagai variasi komposisi, waktu kontak dan konsentrasi. Uji kemampuan desorpsi dilakukan dengan memvariasikan konsentrasi NaOH. Semua hasil perlakuan pada uji adsorpsi dan desorpsi dianalisis menggunakan spektrofotometer UV-Visible.

Hasil karakterisai FTIR menunjukkan film berhasil disintesis dan karakterisasi menggunakan SEM menunjukkan adanya perubahan morfologi film sebelum dan sesudah adsorpsi serta setelah desorpsi. Uji penyerapan air diperoleh hasil rasio film 30:70 mempunyai persen *swelling* tertinggi dan uji kestabilan film menunjukkan bahwa film dapat bertahan pada pH larutan 4-10. Adsorpsi mencapai titik optimum pada film dengan perbandingan komposisi 70:30. Adsorpsi asam humat menggunakan massa film 0,03 g mencapai optimum pada pH 5, waktu kontak 600 menit dan konsentrasi 450 mg L^{-1} dengan kapasitas adsorpsi sebesar 50,4 mg g^{-1}. Model kinetika adsorpsi asam humat mengikuti model kinetika orde kedua semu. Model isoterm adsorpsi mengikuti model isoterm Langmuir dengan kapasitas maksimum (q_m) 61,4 mg g^{-1}. Uji desorpsi menunjukkan desorpsi dengan NaOH 1 M menghasilkan persen desorpsi tertinggi sebesar 85,4%.

Kata kunci: asam humat, kitosan, karaginan, adsorpsi

ABSTRACT

PREPARATION OF CHITOSAN/CARRAGEENAN POLYELECTROLYTE COMPLEX AND ITS UTILIZATION AS ADSORBENT FOR HUMIC ACID

By

Dihliz Zunaim
14/369026/PA/16342

A research on the preparation of chitosan/carrageenan film and the study of the adsorption and desorption of humic acid have been conducted. The characterizations of chitosan/carrageenan were observed by FTIR spectroscopy, SEM, swelling analysis, and pH stabilization. Adsorption capability test was performed by varying the chitosan and carrageenan composition ratios, contact times, pH, and the concentration of humic acid. Desorption capability test was performed by varying the concentration of NaOH. All treatments results in adsorption and desorption study were analyzed by using a UV-Visible spectrophotometer.

The preparation film succeeded as shown in FTIR, the surface morphology of the film was changed before and after adsorption also after desorption as shown in SEM result. Swelling test results showed that film with the ratio at 70:30 had the highest swelling percent and film stability test results showed that film was stable at pH 4-10. Adsorption reached the optimum ratio at 70:30. Adsorption of humic acid using 0.03 g film mass reached the optimum at pH 5, 600 min of contact time and 450 mg L^{-1} of concentration with 50.4 mg g^{-1} adsorption capacity. Kinetics adsorption model followed the pseudo-second-order models. Isotherm model of humic acid adsorption followed Langmuir model with maximum adsorption capacity (q_m) value of 61.4 mg g^{-1}. Desorption study showed that desorption with 1 M NaOH has the highest desorption percent at 85.4%.

Keywords: humic acid, chitosan, carrageenan, adsorption