

## **BAB V**

### **KESIMPULAN DAN SARAN**

#### **V.1 Kesimpulan**

Berdasarkan hasil penelitian dan pembahasan yang telah dilakukan, maka dapat disimpulkan bahwa :

1. Sintesis film kitosan-CMC dan kitosan-CMC tertaut silang EDTA dengan berbagai variasi komposisi telah dilakukan. Keberhasilan sintesis ditunjukkan dengan karakterisasi IR yaitu pergeseran puncak pada bilangan gelombang  $1597\text{ cm}^{-1}$  pada kitosan menjadi  $1589\text{ cm}^{-1}$  pada kitosan-CMC menunjukkan terjadinya interaksi elektrostatik antara gugus  $-\text{NH}_3^+$  dari kitosan dengan  $-\text{COO}^-$  pada CMC. Pembentukan interaksi hidrogen antara gugus  $-\text{NH}_3^+$  dengan  $-\text{COO}^-$  pada EDTA ditandai dengan melebarnya puncak pada bilangan gelombang  $1589\text{ cm}^{-1}$ .
2. Komposisi optimum dari film kitosan-CMC adalah komposisi dengan perbandingan kitosan:CMC 3:7 sedangkan komposisi optimum dalam sintesis film kitosan-CMC tertaut silang adalah film dengan komposisi kitosan:EDTA 4:1. Penambahan CMC pada material terbukti mampu menaikkan kapasitas penyerapan air dan kapasitas adsorpsinya pada ion logam Cu(II). Penambahan EDTA malah menurunkan kapasitas penyerapan air, namun pada komposisi optimumnya dapat menaikkan kapasitas adsorpsi dan menambah kestabilan film pada media asam.
3. Kapasitas adsorpsi maksimum diperoleh pada waktu kontak 90 menit pada pH 5 dan konsentrasi awal logam sebesar  $100\text{ mg L}^{-1}$ . Pada keadaan optimum, film kitosan-CMC tertaut silang EDTA memiliki kapasitas adsorpsi sebesar  $73,95\text{ mg g}^{-1}$ . Adsorpsi logam Cu(II) pada film mengikuti model kinetika orde dua semu dan model isoterm adsorpsi Freundlich.
4. Telah dilakukan studi desorpsi dengan variasi pelarut yaitu larutan  $\text{Na}_2\text{EDTA}$  0,1 M, HCl 0,001 M, NaCl 0,1 M, dan akuabides. Kapasitas desorpsi terbesar ditunjukkan oleh larutan  $\text{Na}_2\text{EDTA}$  sebesar 98%

menunjukkan bahwa interaksi logam Cu(II) dengan situs aktif film didominasi oleh ikatan kovalen koordinasi.

## **V.2 Saran**

1. Perlu adanya penentuan densitas taut silang antara kitosan dengan EDTA sehingga dapat diketahui seberapa rapat taut silang yang terjadi pada material film.
2. Perlu dilakukan kajian selektivitas adsorpsi oleh film terhadap logam Cu(II).
3. Perlu dilakukan kajian regenerasi bagi material film.

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