BAB V
KESIMPULAN DAN SARAN

V.1. Kesimpulan

Berdasarkan penelitian yang telah dilakukan, diperoleh MCC berbasis sabut kelapa yang memiliki dimensi panjang 1-3 µm dan memiliki bentuk batang (*rod-like*) dengan besar kristalinitas MCC yang didapat sebesar 89,5%. Sintesis SLT yang menggunakan MCC sebagai *template* berbentuk mesopori dan memiliki distribusi pori 8-13 nm dengan luas area spesifik yang dapat dibuat sebesar 12,969 m^2/g. Berdasarkan hasil EDX didapatkan bahwa SLT yang telah berhasil disintesis memiliki komposisi karbon 1,34% massa, oksigen 50,75% massa dan silika 47,91% massa. SLT yang berhasil disintesis memiliki struktur amorf dari silika pada peak 23,3°. Kapasitas maksimum MB yang dapat di adsorpsi oleh SLT sebesar 262,07 mg/g pada kondisi suhu 50°C, pH 11, dan selama 24 jam. Persamaan model kinetika adsorpsi yang sesuai menggunakan *pseudo-second order*, menandakan bahwa adsorpsi MB pada SLT dikontrol oleh adsorpsi kimia melalui ikatan hidrogen dan interaksi elektrostatik. Persamaan model adsorpsi isoterm yang paling mendekati adalah persamaan BET dan jumlah lapisan yang didapatkan adalah 90678 lapisan (30°C); 15,71 lapisan (40°C); 14,78 lapisan (50°C). Analisa persamaan Freundlich menunjukkan permukaan struktur SLT tidak heterogen. Sementara itu, analisa Temkin menunjukkan bahwa proses adsorpsi yang terjadi bersifat endotermis dan mekanisme adsorpsi yang terjadi adalah *physiosorption/ion exchange*. Analisa persamaan Dubinin-Radushkevinch didapatkan bahwa tipe adsorpsi

yang terjadi berjenis *physiosorption/ ion exchange*. SLT bekas dapat digunakan kembali untuk proses adsorpsi MB hingga 5 kali. Hal ini menunjukkan bahwa SLT berbasis sabut kelapa sebagai *template* merupakan adsorben yang menjanjikan untuk adsorpsi MB.

V.2. Saran

Pada proses pretreatment sabut kelapa, setelah proses delignifikasi diperlukan pencucian menggunakan akuades hingga mencapai pH netral sebelum dilakukan proses pemutihan. Proses pemanasan pada delignifikasi, pemutihan, dan sintesa SLT, suhu reaksi harus dijaga tetap stabil karena proses delignifikasi, pemutihan, dan sintesa SLT merupakan proses yang peka terhadap suhu sehingga akan berdampak pada hasil yang dihasilkan. Adsorben SLT harus disimpan dalam tempat tertutup untuk menjaga ketersediaan situs aktif pada SLT. Sebelum SLT digunakan untuk adsorpsi, SLT perlu diaktivasi terlebih dahulu untuk menguapkan sisa air yang ada dalam pori SLT.

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