Contents of supplementary data

Fig. 1S: (a,b) Nitrogen adsorption- desorption isotherms, (c,d) average pore diameter Note:(a,c for cellulose) &(b,d for MC)

Fig. 2S: Effect of adsorbent dosage on of the dyes adsorption on MC studied dyes (100 mg L^{-1}), sorbent (1g/L), pH =6 for BG, MG and pH= 10 for CV, MB, at 308 K

Fig. 3S: Adsorption isotherms at different MC dosages ((25-600) mg/L) initial concentrations, studied dyes (100 mg L^{-1}), sorbent (1g/L), pH =6 for BG, MG and pH= 10 for CV, MB, at 308 K

Fig.4S: adsorption isotherms models by MC the nonlinear curve fittings a) MC-MB b)MC-CV   c) MC-BG   d) MC-MG

Fig. 5S: Effect of contact time on the removal efficiency of the studied dyes by MC: studied dyes (100 mg L^{-1}), sorbent (1g/L), pH =6 for BG, MG and pH= 10 for CV, MB, at 308 K.

Fig. 6S: Kinetic models fittings for the studied dyes adsorption on MC.

Fig. 7S: Plot of ln K$_C$ vs 1/T absolute temperature.

Fig 8S: A) Various eluents were used to desorb CV, MB, BG, and MG from the MC adsorbent. B) Ethanol and HCl in a 1:1 ratio served as an eluent for five cycles of adsorption and desorption of CV, MB, BG, and MG..

Table 1S: Elemental analysis of the prepared materials.

Table 2 S: Adsorption kinetics and isotherms nonlinear models

Table 3S: Thermodynamic parameters of the studied adsorption processes.

Table 4S: Effect ionic strength on the removal percentages of the studied dyes .