



Removal of reactive dyes (Yellow 145, Red 195 and Blue 222) by chitosan extracted from *Esanthelphusaspp. Sayamiaspp.* and activated carbon prepared from *Mimosa pigra L.* coated with chitosan

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Dyes in wastewater can be removed through various methods including chemical treatment, filtration, electrochemical method and adsorption. Low cost and effective adsorbents are interestingly required to be studied for this purpose. The properties of chitosan extracted from *Esanthelphusaspp. Sayamiaspp.* and activated carbon prepared from *Mimosa pigra L.* (ACM) coated with chitosan were studied using SEM, FTIR and BET Surface area analyzer. The adsorption capacity of extracted chitosan and ACM coated with chitosan for three aqueous reactive dye solutions have been investigated at room temperature by batch reactors using UV-VIS spectrophotometry. The effect of pH, contact time, dye concentrations and adsorption isotherms for each dyes have been calculated. The results indicated that the maximum adsorption capacity for extracted chitosan was found at pH 3, 3 and 5 for reactive yellow 145, red 195 and blue 222, respectively. The maximum adsorption capacity for ACM coated with chitosan was indicated at pH 8, 3 and 3 for reactive yellow 145, red 195 and blue 222, respectively. For reactive yellow 145, red 195 and blue 222, the maximum of adsorption onto extracted chitosan was at a contact time of 4, 6 and 6 hrs, respectively, while that of the ACM coated with chitosan was at 4, 5, and 6 hrs, respectively. The adsorption capacity of both adsorbents increased with increasing in dye concentrations. For the extracted chitosan, it was observed that Langmuir adsorption isotherm was fitted for the adsorption data of reactive yellow 145 and red 195, but Freundlich adsorption isotherm was fitted for the adsorption data of reactive blue 222. In addition, the Langmuir model was well fitted for the ACM coated with chitosan for all types of reactive dyes.

Keywords: Reactive dyes; Adsorption; Activated carbon coated with chitosan