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Optimization of column studies on the adsorption of congo red dye using phosphoric acid-treated eichhornia crassipes

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Abstract : The present paper examines the use of phosphoric acid-modified eichhornia crassipes for the continuous adsorption of congo red (CR) dye in columns. The adsorbent was characterized using Fourier transform infrared spectroscopy and X ray diffraction study. A fixed bed column analysis was carried out to evaluate the parameters that affecting the adsorption of CR dye onto phosphoric acid-modified eichhornia crassipes, such as initial CR concentration (80–140 mg/L), column bed height (5–20 cm), and feed flow rate (5–15 mL/min). Maximum bed capacity of 15.21 mg/g was achieved at 100 mg/L inlet CR dye concentration with 10 cm bed height and 5 mL/min of feed flow rate. Thomas and model was in good agreement with the experimental results. Desorption and use of spent carbon as admixture in concrete datas has been obtained.

Key words : Adsorption, Eichhornia Crassipes, Congo red, Fixed bed column, Admixture.

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