



Biosorption of toxic acidic dye–Acid Blue 25, by aquatic plants

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ABSTRACT

The adsorption of Acid Blue 25 (AB25) ions by aquatic plants, *Potamogeton pusillus* and *Ceratophyllum demersum* from aqueous solutions was studied. The adsorption was studied as a function of solution pH (2–11), contact time (0–60 min), biomasses dosage (0.1–2.5 g/L), initial dye concentration (30–100 mg AB25 /L), biosorbents particle size (53–500 µm), addition of neutral salts (20–100 mg KNO₃/L and 20–100 mg KH₂PO₄/L), and salinity (0.5–40 g NaCl/L). The results of equilibrium adsorption were successfully described through Freundlich and Temkin isotherm for both of the biosorbents. Maximum adsorption capacity of 183.46 and 129.68 mg/g were observed for *P. pusillus* and *C. demersum*, respectively. Different kinetic models including pseudo-first order, pseudo-second order, and intra-particle diffusion were examined, and the pseudo-second order was shown to be the best model to fit the adsorption kinetics data. Thermodynamic parameters demonstrated that adsorption of AB25 ions was spontaneous and endothermic at a temperature range of 10–40°C. FTIR analysis confirmed the responsibility of several functional groups on the surface of the biosorbents for the adsorption of AB25 in this process.

Keywords: Biosorption; Aquatic plants; Acid Blue 25 dye; *Potamogeton pusillus*; *Ceratophyllum demersum*

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