



Biosorption of Methylene blue from aqueous solutions by using blue green algae *Oscillatoria sp.*: Kinetic and equilibrium studies

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ABSTRACT

*This study is aimed at investigating the sorption of Methylene blue (MB) dye from aqueous solutions using a blue green alga *Oscillatoria sp.* as an adsorbent. The impact of several influential parameters such as pH, contact time, temperature, initial dye concentration, biosorbent particle size and its dose on the adsorption capacity of *Oscillatoria sp.* was evaluated. The maximum adsorption capacity of this biomass was found to be 129.58 mg/g at an initial dye concentration of 100 mg L⁻¹, pH 7, biosorbent size 100 μm and dosage 5 g L⁻¹ at a contact time 60min respectively. Results were analyzed by Langmuir and Freundlich models of adsorption. Dye adsorption equilibrium data fitted well in Langmuir isotherm than the Freundlich isotherm which showed monolayer adsorption. The rate of adsorption followed the second order kinetic model and the thermodynamic studies showed that the adsorption of methylene blue dye was favorable, spontaneous and endothermic in nature. The FT-IR analysis showed the involvement of different functional groups. This study indicates that this algal biomass could be used as an effective and efficient biosorbent for the removal of Methylene blue dye.*

Keywords: Biosorption, Methylene blue, *Oscillatoria sp.*, Kinetics.
