



Adsorption Studies of Methyl Violet Dye using Biosorbents

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Abstract:The batch adsorption experiments were carried out to remove methyl violet from aqueous solution using copper pod flower. In the present study, the use of low cost, abundantly available, highly efficient and eco-friendly biosorbent copper pod flower has been reported as an alternative to the current expensive methods of removing of methyl violet dye from aqueous solution. The objective of this study was to investigate the removal of methyl violet from synthetic wastewater by the biosorption on biosorbents. Effect of process parameters initial dye concentrations, adsorbent dosage, temperature (30, 40, 45, 50, 55 and 60°C), contact time and pH (2-12) were studied. Experimental tests were conducted in a batch process. The equilibrium data were analyzed using Freundlich, Langmuir isotherm, Tempkin and Dubinin – Radushkevich isotherm models. The equilibrium data were best represented by Freundlich isotherm model better than the Langmuir isotherm model. The dimensionless separation factor, R_L indicated that the biosorptions of the malachite green dye onto biosorbents were favourable. The pseudo-first order, pseudo-second order kinetic model, Elovich model and intraparticle diffusion model were used to examine the experimental data of different initial concentrations. From experimental data it was found that adsorption of methyl violet onto copper pod flower followed the pseudo-second order kinetic model. The adsorption process was found to be exothermic in nature. Surface morphology was also examined using Scanning Electron Microscopy. The characterization of biosorbent was investigated by scanning electron microscope and X-Ray diffraction data.

Keywords:Copper pod, Dye, Adsorption, Isotherm, Kinetic.

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