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# Methylene Blue Adsorption Isotherm on *Spirulina* sp. Microalgae Biomass The coated Silica-Magnetite

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## Abstract

In this study, it has been performed modification of *Spirulina* sp. algae biomass with silica (HAS) coated with magnetite particles (HASM) and its adsorption test on a solution of methylene blue dye (MB) in solution. The identification of HASM adsorbent functional groups was studied using infra-red (IR) spectrophotometer, the degree of crystallinity of the material was determined by X-ray diffraction (XRD), while the morphology and HASM constituent elements were analyzed by Scanning Electron Microscopy-Energy-Dispersive-X-Ray (SEM-EDX). The HASM adsorption isotherm of MB solution was studied by applying adsorption experiments using the batch method. The concentrations of MB dye in the adsorption process were analyzed by a UV-Vis spectrometer. Adsorption of 100 mg L<sup>-1</sup> MB dye solution by HASM adsorbent at pH of 6 with a contact time of 60 minutes resulted in an adsorbed MB amount of 90.90 mg g<sup>-1</sup>. The adsorption isotherm model of the MB dye solution in the HASM adsorbent tends to follow the model of Freundlich adsorption isotherm. The adsorbent HASM is an effective adsorbent that absorbs MB dye in solution.

**Keywords:** *Spirulina* sp., adsorption, silica-coated magnetite.