

ABSTRACT

ADSORPTION STUDY OF Pb (II) AND Cu (II) IONS ON *Chaetoceros* sp ALGAE BIOMASS WITH COATING OF SILICA-MAGNETITE

By

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In this study, it had been performed the synthesis of silica algae hybrid (HAS) and HAS-magnetite analyzed with using an infrared spectrophotometer (IR), a scanning electron microscope (SEM) and an atomic absorption spectrophotometer (AAS). HAS and HAS-magnetite functional group identification were performed using infrared spectrophotometer (IR). Spectra data of infrared spectrophotometer showed that the addition of a new absorption with wave number of 2924.09 cm^{-1} , which derived from C-H stretching vibrations of aliphatic ($-\text{CH}_2$). Thus, hybridization of silica with *Chaetoceros* sp algae biomass had been performed successfully on HAS and HAS-magnetite. Surface morphology analysis on the adsorbent was applied using scanning electron microscope (SEM). Micrograph of magnetite is crystalline and micrographs of silica-magnetite tend to be amorphous. While micrograph of HAS are amorphous and HAS-magnetite is crystalline. Adsorption kinetics data of Pb (II) and Cu (II) ion on algae, HAS and HAS-magnetite tend to follow second order pseudo kinetics model with values of k_2 respectively, 0.018, 0.285 and $0.428\text{ mmol g}^{-1}\text{ min}^{-1}$ for Pb (II) ion and for Cu(II) ion 0.159, 0.344 and $0.681\text{ mmol g}^{-1}\text{ min}^{-1}$. Adsorption isotherms of Pb (II) and Cu (II) ion on algae, HAS and HAS-magnetite tend to follow Freundlich isotherm models with values of K_f respectively 1.028, 1.116, and 1.140 mol L^{-1} for the Pb (II) ion, whereas for the Cu (II) ions are 1.253, 1.135, and 1.218 mol L^{-1} .

Keywords: adsorption, *chaetoceros* sp algae, isotherm.