

Cadmium Adsorption by Modified Magnetic Biochar

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Abstract : Heavy metal contamination in an environment is an important problem in Thailand that needs to be addressed urgently, particularly contaminated with water. It can spread to other environments faster. This research aims to study the adsorption of cadmium ion by unmodified biochar and sodium dodecyl sulfate modified magnetic biochar derived from *Eichhornia Crassipes*. The determination of the adsorbent characteristics was by Scanning Electron Microscope, Fourier Transform Infrared Spectrometer, X-ray Diffractometer, and the pH drift method. This study also included the comparison of adsorption efficiency of both types of biochar, adsorption isotherms, and kinetics. The pH value at the point of zero charges of the unmodified biochar and modified magnetic biochar was 7.40 and 3.00, respectively. The maximum value of adsorption reached when using pH 8. The equilibrium adsorption time was 5 hours and 1 hour for unmodified biochar and modified magnetic biochar, respectively. The cadmium adsorption by both adsorbents followed Freundlich, Temkin, and Dubinin - Radushkevich isotherm model and the pseudo-second-order kinetic. The adsorption process was spontaneous at high temperatures and non-spontaneous at low temperatures. It was an endothermic process, physisorption in nature, and can occur naturally.

Keywords : *Eichhornia crassipes*, magnetic biochar, sodium dodecyl sulfate, water treatment

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