

## ABSTRACT

### THE ADSORPTION STUDY OF DIVALENT METALS ION $\text{Ca}^{2+}$ , $\text{Cu}^{2+}$ , AND $\text{Cd}^{2+}$ IN SOLUTIONS USING ALGAE BIOMASS *Dunaliella* sp

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In this research, it has been performed adsorption process of  $\text{Ca}^{2+}$ ,  $\text{Cu}^{2+}$ , and  $\text{Cd}^{2+}$  ions by the use of algae biomass *Dunaliella* sp. Several variables were evaluated, these include dosages of algae biomass as adsorbent, pHs, interaction times, and the initial concentration of ions which was interacted with adsorbent and the adsorption process used in this research was batch process. Algae biomass of *Dunaliella* sp was characterized by spectrophotometer infrared (IR) and concentration of ions was analyzed using absorption atomic spectrophotometer (AAS). Optimum condition from adsorption process of  $\text{Ca}^{2+}$ ,  $\text{Cu}^{2+}$ , and  $\text{Cd}^{2+}$  ions using algae biomass *Dunaliella* sp was obtained at pH 4. Adsorption data of experiments were used to determine the adsorption kinetics and adsorption isotherm. Adsorption kinetics for  $\text{Ca}^{2+}$ ,  $\text{Cu}^{2+}$ , and  $\text{Cd}^{2+}$  ions follows pseudo order 2 with rate constants ( $\text{g mg}^{-1} \text{min}^{-1}$ ) of 0.28, 1.25 and 2.10 for  $\text{Ca}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Cd}^{2+}$ , respectively. Adsorption isotherm of  $\text{Ca}^{2+}$ ,  $\text{Cu}^{2+}$ , and  $\text{Cd}^{2+}$  ions using *Dunaliella* sp obeys Langmuir adsorption isotherm with adsorption capacity ( $\text{mg g}^{-1}$ ) of 8.35, 16.76 and 43.23 for  $\text{Ca}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Cd}^{2+}$ , respectively.

Keywords : *Dunaliella* sp, adsorption kinetics, adsorption isotherm