

ABSTRACT**Biosorption Process of Lead (Pb^{2+}), Cadmium (Cd^{2+}), and Copper (Cu^{2+}) Use Lorjuk Shell Powder (*Solen vagina*)**

Water pollution from heavy metal in the wastewater is one of the most serious concerns of the world. It can be harmful to the environment and humans, so this problem needs to be overcome. In the present study, we examine about biosorption process, isotherm, and kinetic model for the removal of Lead (Pb), Cadmium (Cd), and Copper (Cu) by lorjuk shell powder (*Solen vagina*). Lorjuk is one of the leading marine commodities in East Java, which generally only consumes meat, while shells have the potential to become waste. The characteristics of the lorjuk shell powder (*Solen vagina*) used in the study were gray color with a size of 100 mesh that contains water content, protein, minerals, and chitin. Most of the minerals are calcium and its functional groups contain C = O which is important in metal binding. The greater the initial levels of Pb^{2+} , Cd^{2+} , and Cu^{2+} cause an increasing adsorption capacity, while the increasing biosorbent mass causes the adsorption capacity to decrease. Based on the percentage of efficiency, the optimum condition of parameters in this study were 100 mg/L (initial metal concentration); 1.5 grams of Pb^{2+} and Cd^{2+} ; 2 grams for Cu^{2+} (biosorbent mass); 20 minutes for Pb^{2+} , 60 minutes for Cd^{2+} , and 120 minutes for Cu^{2+} (contact time) with a percentage more than 90%. This is due to the inverse relationship between the adsorption capacity and the biosorbent mass of the equation. Multivariate ANOVA and Kruskal Wallis statistical analysis were showed a significant difference in the biosorption process between parameters (initial metal concentration, biosorbent mass, and contact time) for Pb^{2+} , Cd^{2+} , and Cu^{2+} metals respectively.

Keyword: Lorjuk shell powder, Biosorption, Lead (Pb), Cadmium (Cd), Copper (Cu)