EFFECT OF THE ADSORBENT MASS OF SIMPLICIA JAVANESE WOOD CORTEX (Lannea coromandelica) POLYMERIZED ON THE ADSORPTION CAPACITY OF Cd(II) IONS

Insani*, Widwiastuti

Study Program of D3 Pharmaceutical and Food Analysis, Health Polytechnic Ministry of Health Malang

*Email: keikeninsani33@gmail.com

ABSTRACT

Background: *Cadmium (Cd) is a hazardous heavy metal that is still found contaminating water above safe limits, necessitating effective control measures. One natural material with potential to address this pollution is the simplicia of Lannea coromandelica bark, which contains tannins capable of binding metal ions. However, because tannins are easily soluble in water, polymerization with formaldehyde is carried out to enhance adsorption capacity.* ***Purpose:*** *This study aims to investigate the effect of varying the mass of polymerized Lannea coromandelica cortex simplicia adsorbent on the adsorption capacity of Cd(II) ions and to determine the optimum adsorbent mass.* ***Methods:*** *The adsorbent was prepared from Java wood bark simplicia sized > 200 mesh and polymerized using 37% formaldehyde. Adsorption was conducted by contacting varying masses of adsorbent (0.05; 0.10; 0.15; 0.20; 0.25; 0.30; 0.40; and 0.50 grams) with 5 ppm Cd(II) solution, stirred at 100 rpm for 60 minutes. The final Cd(II) concentration was analyzed using the dithizone method with a UV-Vis spectrophotometer at 518 nm wavelength. Adsorption capacity (mg/g) was calculated from the difference between initial and final Cd(II) concentrations divided by the adsorbent mass.* ***Results:*** *The results showed that the adsorption capacity of Cd(II) ions increased with adsorbent mass up to 0.20 grams, reaching a maximum capacity of 0.404 mg/g and an adsorption percentage of 36.292%. A decline in adsorption capacity was observed with further increases in adsorbent mass from 0.25 to 0.50 grams.* ***Conclussion****: The adsorption capacity of Cd(II) ions increased with increasing mass of polymerized adsorbent but decreased after reaching the optimum mass. The polymerized Lannea coromandelica cortex simplicia using 37% formaldehyde demonstrated a Cd(II) adsorption efficiency of 36.292% at the optimum mass of 0.20 grams.*

Keywords: *Adsorption, Cadmium, Javanese Wood (Lannea coromandelica), Polymerization, Dithizon, UV-Vis Spectrophotometry*