

ABSTRACT

Hexavalent chromium (Cr(VI)) is a heavy metal found in aquatic wastewater. It is toxic, carcinogenic, and difficult to degrade, so that can endanger the environment and the health of living things. One method to address this waste is adsorption. Natural zeolite is known as a material with good surface area and ion exchange capacity, but it is less effective in adsorbing anionic metals such as Cr(VI). Therefore, zeolite modification with chitosan was carried out to improve its adsorption capacity, because chitosan has a positively charged amine group that can interact with Cr(VI) ions. This study aimed to obtain a zeolite-chitosan composite by varying the mass ratio of zeolite and chitosan, determine the characterization of the zeolite-chitosan composite, and determine the effect of zeolite modification with chitosan on the adsorption capacity of Cr(VI). The stages in the research include activation of natural zeolite with HCl, synthesis of activated zeolite composite with chitosan, characterization using FTIR, PSA, GSA, and SEM-EDX, as well as Cr(VI) adsorption test at various concentrations of 5; 10; 15; 20; 30; 40; and 50 ppm using UV-Vis spectrophotometry with 1,5-diphenylcarbazide (DPC) reagent. The results showed that the zeolite-chitosan composite had a higher adsorption capacity than the activated zeolite. This indicates that the addition of chitosan can increase the ability of zeolite in adsorbing Cr(VI) metal.

Keywords: *Natural zeolite, chitosan, adsorption, Cr(VI), Uv-Vis spectrophotometer*