

Effect of Variable Interaction on Ammonium Adsorption Process Using Bioadsorbent from Pineapple Crown Waste

Arika Dewi Puspita^{1,*}, Muhammad Alif¹, Munira Munira¹, Takdir Syarif¹

¹*Department of Chemical Engineering, Faculty of Industrial Technology, Universitas Muslim Indonesia, Makassar 90231, Indonesia*

^{*}*Presenter's email: arikadewipuspita@gmail.com*

Abstract. Industrial wastewater, which contains many organic molecules, is one source that can pollute the environment. When high concentrations of organics and other nutrients are present in water, especially nitrogen in the form of ammonia (NH_3), the growth of aquatic plants will accelerate. As a result, this condition will eventually cause the death of aquatic biota. Liquid waste in the form of ammonia can also cause various diseases to humans. One way to treat ammonia waste is by adsorption process with activated charcoal adsorbent. Activated carbon is a porous solid consisting of 85% to 95% carbon that can be made from carbon containing materials by heating them at elevated temperatures. Agricultural waste is a renewable resource that can be used for biotechnology because it has non-toxic characteristics, can be regenerated, and has a low price. Until now, pineapple crowns are still rarely processed and utilized so that they become a source of waste that can pollute the environment. Pineapple crown waste can be processed into bioadsorbent by carbonization and activation process using 2% of NaOH. This study was conducted with the aim of determining the optimum ratio between NH_4^+ concentration, contact time, and adsorbent concentration on ammonium adsorption ability using the Response Surface Methodology (RSM) method where all variables were varied simultaneously to obtain more diverse results.

Keywords: Activation, Bioadsorbent, Carbonization, Pineapple crown waste