SEPARATION OF B3 WASTE IN THE ENVIRONMENT WITH ADSORBEN ACTIVATED CHARCHOAL OF Sea Pandanus LEAVES FROM KULONPROGO

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ABSTRACT

It has been synthesized activated charcoal from sea *pandanus* leaves with 5% HNO_3, 1% NaOH and 5% $ZnCl_2$. The aim of this research is to know the character of activated charcoal, the power and the adsorption efficiency, and the type of activated charcoal adsorption isotherm on heavy metal ions Cd, Cu, Zn, Fe and Pb.

The subject of this study was activated charcoal which was synthesized from sea *pandanus* leaves obtained from the beach of TrisikKulonprogo Yogyakarta. The stages of making charcoal are drying, carbonation, chemical activation with 5% HNO_3 solution, and physical activation at 700^oC with CO_2 gasification. Activated charcoal contact process and waste water with a batch system. Qualitative and quantitative analysis using the Atomic Absorption Spectrophotometer (AAS) instrument. Characterization of activated charcoal adsorbent is in accordance with SNI 06-3730-1995 and analysis of charcoal surface area with surface area analyzer (SAA) instrument. The same procedure was repeated for activation with 1% NaOH solution and 5% $ZnCl_2$ solution.

Characterization results of activated charcoal by 5% HNO_3, 1% NaOH and 5% $ZnCl_2$ showed better quality than charcoal before activation. Water content, ash content, and adsorption power of I_2 have fulfilled the standards, while the volatile substances and bound carbon content have not fulfilled SNI 06-3730-1995. The SAA test results showed that activated charcoal of 5% activated HNO_3 was micropore with a surface area of ??337.9532 m^2/g and mesopore category for charcoal activated by 1% NaOH and 5% $ZnCl_2$ with a surface area of ??19.667 m^2/g and 68.543 m^2/g which was originally only 3.7719 m^2/g, resulting in an increase. The optimum adsorption capacity of 5% HNO_3 activated charcoal was Cu 0.6858 mg/g and the optimum adsorption efficiency was Zn 97.9811%. The optimum adsorption of charcoal activated by 1% NaOH is Cu 0.99616 mg/g and optimum adsorption efficiency is Cu 99.616%. The optimum adsorption power of activated charcoal by5% $ZnCl_2$ was Cu 2.9505 mg/g and optimum adsorption efficiency was Cd 99.9288%. For Pb, Cd and Zn metal ions in adsorption with 1% NaOH activated charcoal it is still possible to have adsorption power greater than that value. The types of Cu, Zn, and Fe adsorption isotherms are likely to follow the Freundlich adsorption isotherm pattern which means that the adsorption process occurs at heterogeneous surface pores with multilayer surface layers.

Kata Kunci: *activeated charcoal, sea pandanus, adsorption isotherm, adsorption power, adsorption efficiency*