

Title : Feasibility Study of Granular Activated Carbon Regeneration Improvement by Chemical Method

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ABSTRACT

This research aims to determine the optimal conditions for the chemical regeneration of granular activated carbon, focusing on reducing carbon dioxide emissions from Ajitide I Plus G production, which is generated in the heat treatment regeneration process. The research focuses on varying the concentration of sodium hydroxide under two conditions: Condition 1 (6%, 8%, 10%) and Condition 2 (15%, 20%, 25%) all at a constant temperature of 80°C. The regeneration efficiency was evaluated using %Regeneration efficiency and iodine value for adsorption capacity examination. The results showed that in Condition 1, a sodium hydroxide concentration of 10% at 80°C provided a %Regeneration efficiency of 70% and an iodine value of 892 mg/g, which were the highest values and achieved the target. In Condition 2, concentrations of 15%, 20%, and 25% at 80°C showed a decrease in %Regeneration efficiency and failing to meet the setup target. Therefore, a sodium hydroxide concentration of 10% at 80°C is recommended as the most suitable condition for the chemical regeneration of granular activated carbon, offering the potential to reduce carbon dioxide emissions by 738 tons per year. However, increasing chemical concentration further may impact the wastewater treatment process, which requires further investigation.