AIP Conference Proceedings Volume 2703 9 June 2023 Article number 050001 1st International Conference of Chemical Science, Engineering, and Technology, ICO-CSET 2021 Virtual, Online 6 September 2021 through 7 September 2021 Code 189317

Process Optimization of Microwave Assisted KOH-Activated Carbon Derived From Sugarcane Bagasse Using Central Composite Design

Abstract

In this work, the process optimization for the synthesis of activated carbon (AC) derived from sugarcane bagasse via microwave assisted potassium hydroxide (KOH) activation for methylene blue (MB) dye adsorption was employed using Central Composite Design. Characterization of AC using Brunauer Emmett and Teller (BET) revealed specific surface area of 307.2 m2/g. Three variables namely power, time and char/KOH ratio were chosen for the process optimization and MB removal percentage as the investigated response. The optimum preparation conditions were found occurred at power of 200 W, time of 2 min and char/KOH ratio of 0.5, resulting in the removal of 94.30% MB. The sugarcane bagasse-based AC produced shows the great potential to be utilized as a raw material for the production of AC with good adsorption properties.