



## Preparation and characterization of activated carbon from melon (*Citrullus vulgaris*) seed hull by microwave-induced NaOH activation

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### ABSTRACT

In the present work, melon seed hull (MS), an industrial effluent abundantly available from the melon seed oil processing plants was utilized as a feedstock for preparation of activated carbon (MSAC) by microwave assisted NaOH chemical activation. MSAC was characterized by Fourier transform infrared spectroscopy, scanning electron microscopy, elemental analysis, and nitrogen adsorption–desorption study. The adsorptive properties of MSAC were quantified using methylene blue (MB), cationic dye, and acid blue 15 (AB); anionic dye as model adsorbates. The surface chemistry was examined by zeta potential measurement and evaluation of surface acidity/basicity. Result showed that the monolayer adsorption capacities of MSAC for MB and AB were 333.50 and 341.96 mg/g, respectively. The BET surface area, Langmuir surface area, and total pore volume of MSAC were identified to be 1,187 m<sup>2</sup>/g, 1,804 m<sup>2</sup>/g, and 0.68 cm<sup>3</sup>/g, respectively. The findings revealed the potential use of MS derived activated carbon for cationic and anionic dyes removal.

*Keywords:* Activated carbon; Adsorption; Dye; Isotherm; Melon seed hull; Microwave

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