

## ACTIVATED CARBON FROM LONGAN SEED BY CARBON DIOXIDE ACTIVATION

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### Abstract

This work studied the feasibility of activated carbon preparation from longan seed. Longan seed is a solid waste produced from the fruit cannery. This waste was used as a starting precursor to produce activated carbon by first carbonizing it under a constant flow of nitrogen at a set condition of 650 °C and 120 minutes, followed by activating the resultant char with carbon dioxide. The effects of temperature and holding time during activation step were investigated. Activation conditions were varied with activation temperatures of 800-900 °C and holding times of 30-180 minutes. The burn-offs achieved were in the range of 14-90 %. Porous properties of these activated carbons were characterized using nitrogen gas adsorption data at 77 K. The derived activated carbons were dominated with micropore structure, with the percentage of micropore volume being higher than 70 % of total pore volume. The increasing of activation temperature or activation time resulted in an increase in BET surface area and pore volume. However, at the high temperature of 900 °C and activation time varying from 60 to 120 minutes, these properties tended to decrease. The optimum activation condition that gave the maximum in surface area and total pore volume occurred at 850 °C and holding time of 180 minutes, with BET surface area and total pore volume being 1278 m<sup>2</sup> g<sup>-1</sup> and 0.81 cc g<sup>-1</sup>, respectively. In addition, there was a direct relationship between the activated carbon porous properties and the extent of gasification burn-off, giving a maximum of these properties at 70 % of char burn-off.

**Keywords:** Longan Seed, Activated Carbon, Physical activation, Porosity.