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Conversion of waste corn cobs to activated carbons for natural gas (methane) adsorption

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Adsorbed Natural Gas (ANG) is an alternative energy source technology that uses micropores in adsorbent materials to store natural gas. Activated carbons, which are useful adsorbents with a highly porous form of carbon are promising adsorbent materials that can be used to store methane. In this study, dried crushed corn cobs were used to produce activated carbons, using a chemical activation method. A set of experiments was performed under various conditions to determine the optimum conditions for preparing the activated carbons. The activation process varies depending on the concentration of the activating agent (phosphoric acid), the impregnation temperature, the carbonization temperature, and the heating rate. The resultant activated carbon is further immobilized into monolithic form, to increase the density. The micro porosity of the activated carbons produced from corn cobs can have a methane uptake capacity of 150v/v or greater, and a BET surface area of 800m²/g-1600m²/g.