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The Synthesis Of Micro-Porous Activated Carbon From Rice Husk By Chemical Activation And Optimizaton Of Experimental Paramaters

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To produce low-cost highly porous carbon has great significance for the development of industrial processes. The most direct route for producing carbon is to employ agricultural wastes and residues. As an agricultural waste, rice husk is abundantly present in the world. However, the utilization of rice husk is limited to forage and fodder in Turkey. In this study, activated carbons based on agricultural waste i.e. rice husk were produced by wet chemical method using an activating agent HNO₃ at different temperatures and acid/raw material ratios. The morphological, chemical and structural properties of 12 different activated carbons produced were thoroughly characterized by Brunauer-Emmett-Teller (BET) Surface Analysis, Fourier Transform Infrared Spectroscopy (FTIR), Elemental (CHNO) Analysis, Scanning Electron Microscopy (SEM) and X-Ray Diffraction (XRD). The results indicated that the production of highly porous carbons from rice husk is dependent highly on experimental parameters.

Keywords: Porous activated carbon, Agricultural waste, Characterization

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Hierarachial Pore Structure Of Activated Carbon From Bovine Bone By Microwave Irradiation

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According to the EU Commission Decision 94/381/EC, the feed of livestock with meat and bone has been forbidden. Therefore, a high amount of bovine bone has to be disposed of or transformed into valuable by-products. For this purpose, in this study highly porous biochars were manufactured from bovine bones through microwave-assisted activation. The obtained biochars were characterized by nitrogen adsorption-desorption, scanning electron microscopy, and Fourier Transform Infrared spectroscopy. Also, the effects of the experimental variables, such as microwave irradiation power, impregnation time and temperature, on the morphological and structural properties of the biochars were optimized by Response Surface Methodology (RSM). Variance analysis (ANOVA) of the produced biochars shows that all the experimental variables used in the production of micro-meso porous carbons had a considerable effect on pore surface area and volume. This effect was correlated successfully by nonlinear interacted quadratic model.

Keywords: Bovine, Porous powder, RSM optimization