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Determination of the Micropore Structures of Activated Carbons by Adsorption of Various Dyestuffs from Aqueous Solution

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Abstract: In this study, some activated carbons prepared from sour cherry pits under various conditions were investigated. For comparison purposes, the commercial activated carbons Merck-2514 and Merck-2184 were used. The nitrogen adsorption isotherms at 77 K were used as reference for comparison, while p-nitrophenol, methylene blue, orange-II and victoria blue adsorptions were determined from aqueous solution at 298 K. It was clear from the specific surface area values obtained that the best activated carbon was obtained by activation for 4 hours following the chemical activation. Its adsorption properties are closer to the levels of the Merck commercial carbons. It was concluded that the characterization of microporous structure, and the testing of the removal of organic impurities from aqueous solution for active carbons having high adsorption ability from the gas phase, can generally be carried out by adsorption of organic solutes whose molecular sizes are smaller than the micropore size (1.5 nm) of the adsorbent.

Key Words: Activated carbon, analysis of pore structure, dyestuff adsorption, N₂ adsorption.

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