

Adsorption Dynamics of Water Vapor on Acid treated Activated Carbon

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Activated carbon has been mainly used for the removal of pollutant vapors from air because of their high adsorption capacity, fast adsorption kinetics and ease of regeneration. The competitive adsorption of water and trichloroethylene vapors on acid treated activated carbons was investigated by equilibrium and fixed bed experiment to correlate with the structure and functionality of activated carbons. Thus, the primary goal of our study was to investigate the adsorption and desorption kinetics as well as column dynamics in terms of temperature and relative humidity to understand the effect of changes in atmospheric conditions on the performance of activated carbon bed in real situations. In addition, the other objective is to analysis the competitive adsorption between water vapor and organic compounds on activated carbon quantitatively. This result comes from the different adsorption mechanism according to the relative humidity. Pure and binary adsorption breakthrough curves of water vapor and trichloroethylene according to the relative humidity were measured.