

Power activated carbon adsorption of odourants of alcohols, aldehydes, ketones and esters in drinking water

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Abstract

Alcohols, aldehydes, ketones, and esters are common odourants in drinking water; especially they are closely related with algae. This thesis mainly conducted research used by activated carbon (F400) of 17 kinds of alcohols, aldehydes, ketones and esters reported. The sorption was analyzed using pseudo-first-order and pseudo-second-order kinetic models. Equilibrium data were well fitted to the Freundlich and Langmuir isotherm equations. And the relationship of chemical and physical properties and adsorption characteristics was discussed. Finally, the adsorption parameters obtained with the physic-chemical parameters and molecular connectivity index established adsorption model respectively. The main conclusions of the study are as follows:

- (1) The dynamic tests indicate equilibrium adsorption finished for all of the material in 6 h. The sorption was analyzed using pseudo-first-order and pseudo-second-order kinetic models, and they both represented the kinetic data well.
- (2) Equilibrium data of the 17 kinds of substances were well fitted to the Freundlich and Langmuir isotherm equations and the equilibrium data were found to be well represented by the Langmuir isotherm equation. LogKoc, logD, polarizability, and molecular volume all showed a positive correlation with adsorption, but contrary to solubility.
- (3) Adsorption models are established by physic-chemical parameters and molecular connectivity index. And one of molecular connectivity index fitting data better.

Key words: odourants; activated carbon; adsorption; model