Evaluations of the physicochemical characterizations of activated carbons

張怡怡

Chiang YC;Chiang PC and Chang EE

摘要.

Abstract

The objectives of this research were to identify the surface physicochemical characteristics of activated carbons, as well as examine the specific relationship of those properties by using a statistical analysis. Eight commercial activated carbons with different raw materials, including peat, bituminous and coconut shell, were considered. The ash content, pH value, oxygenated functional groups, true density and apparent density were measured with recommended standard methods. The adsorption isotherms of nitrogen, argon and mercury were reported by using automatic adsorption apparatus. The results indicated that non-polar vapor adsorption on activated carbon was primarily determined by the amounts of specific surface area and pore volume of activated carbon. It has been realized that surface pH value was primarily influenced by the chemical properties of activated carbon exhibited in macropores. The shapes of hysteresis loops on adsorption isotherms of nitrogen suggested that the pores were probably sjit-shaped or resulted from the plate-like particles. In addition, it was demonstrated that the proportion of three kinds of pores was responsible for the shape of hysteresis loop. The loop area was related to the mesopore volume.