

Adsorption of phenol from aqueous solution on activated carbons according to oxidation stabilization condition

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Abstract

Activated carbon is a representative material that can meet both economy and elimination performance through adsorption process in water purification. Activated carbon for water treatment was prepared through oxidative stabilization process using cheap petroleum pitch. Especially, the effect of oxidative stabilization process on mesopore formation of activated carbon was investigated. IR analysis of the oxidation-stabilized infusibilization pitch revealed that the peak of the 1710-1760 cm⁻¹ region, which appeared through the oxidative stabilization, was produced strongly. It can be seen that most of the injected oxygen binds to the carboxyl structure and strongly binds the aromatic elements. This proves that stabilization has resulted in the combination of volatile matter. The experimental results showed that the meso ratio of activated carbon prepared by oxidation - stabilized infusibilization pitch at 330 °C was 52%, which could be meshed more than 3 times of commercial activated carbon for water purification. The activated carbon showed a high phenol removal rate of 92%. That is, the oxidative stabilization of the pitch is advantageous for forming a high specific surface area and a mesopore, thereby providing a method of producing activated carbon which is very useful in the field of water purification.