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# Ultrasonic Regeneration of Activated Carbon Exhausted by Isopropyl Alcohol

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## Abstract:

The adsorption of isopropyl alcohol (IPA) onto activated carbon in aqueous solution and the regeneration of IPA-exhausted activated carbon by ultrasound were investigated. The durability of the activated carbon in the ultrasonic field is studied, and the effects of parameters such as ultrasonic intensity, solution temperature and the addition of ethanol are discussed.Adsorption of IPA onto activated carbon in aqueous solution is considered to be mainly resulted from the hydrogen bonding between the IPA molecules and activated carbon surface. Modeling of adsorption kinetics illustrates that the adsorption of IPA would be controlled by combined chemisorption and intra-particle diffusion. In ultrasonic regeneration of exhausted activated carbon studies, the optimal parameters for ultrasonic intensity, solution temperature and addition of ethanol were 24.5 w/cm2 , 45°C and 10% v/v, the regeneration efficiency reached 83%. The regeneration efficiency was decreased to 64% after four adsorption-desorption cycles. Modeling of desorption kinetics shows that the pseudo-second-order kinetics was adequate for the ultrasonic regeneration of exhausted activated carbon. The ultrasonic desorption appears to be diffusion-limited initially, but with time proceeds, there is a shift to the reaction-controlled regime.

Biography: My name is Hui-Ting Wu. I am cuttently persuing master degree in chemical engineering at National Taiwan University of Science and Technology (NTUST). I am working in Environmental Laboratory of Professor Young Ku, which mainly focusing on advanced oxidation process.

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