



Research on absorption of ammonia by Nitric acid-modified Bamboo Charcoal at low temperature

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ABSTRACT

To solve the problem of low concentration of ammonia (NH_3 and/or NH_4^+) in China North winter Waterworks, Bamboo Charcoal was modified by nitric acid to enhance its absorption capacity. A few important factors such as absorbent dosage, contact time, temperature and initial ammonia concentration were investigated. Scanning electron microscope and infrared radiation were used for characterizing. The equilibrium data were analyzed using the Langmuir and Freundlich isotherm models. The equilibrium adsorption data fitted well into Langmuir adsorption isotherm and showed a maximum ammonia adsorption capacity of 0.65 mg/g. The best efficiency of Modified Bamboo Charcoal dosage, initial ammonia concentration, contact time and temperature were 1.5 g, 5 mg/L, 2 h and 5 °C, respectively. Compared with Raw Bamboo Charcoal, Nitric acid-modified Bamboo Charcoal displays a better ammonia removal capacity (from 10 to 40%), which implies a potential application for removing ammonia pollutants from drinking water at low temperature.

Keywords: Nitric acid-modified Bamboo Charcoal; Ammonium; Drinking water; Low temperature; Adsorption

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