

Chittraporn Chantasorn 2012: Adsorption of Chromium (III) and Phenol by Activated Bamboo Charcoal (*Thyrsostachys siamensis* Gamble) Activated with Nitric Acid. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Associate Professor Apisit Songsasen, Ph.D. 112 pages.

Bamboo wood (*Thyrsostachys siamensis* Gamble) was carbonized at 450 °C. The carbonized charcoals were then ground and sieve to less than 150 µm and activate with 70 % HNO₃ for 3 hours. The bamboo charcoal (BC) and bamboo activated charcoal (BAC) obtained were characterized by Fourier transform Infrared Spectrometry (FT-IR) and Scanning electron microscope (SEM). The present of broad peak in the range of 3,450 – 3,350 cm⁻¹ was defined as O-H stretching vibration of hydroxyl group. The C-C stretching vibration of aromatic group can be observed in the range of 1,580 – 1,540 cm⁻¹ and the band at 1,200-1,000 cm⁻¹ was difficult to assigned because of the overlapping band. The weak absorption band can be observed at 880 – 650 cm⁻¹ was attributed to C-H bending of aromatics or cyclic group.

The maximum Cr(III) removal efficiency of BC and BAC at optimum pH 4.0 (for both BC and BAC), were 92.61 ± 0.94% and 92.68 ± 0.87% and the maximum adsorption capacity were 1.01 mg/g and 1.98 mg/g respectively. The phenol values of BC and BAC for adsorption ability of phenol were 28.09±1.37 g/L and 19.35 ± 0.08 g/L, and the adsorption capacity were 0.19 mg/g and 0.26 mg/g respectively. The obtained specific surface area of BC and BAC were in the range of 5-53 m²/g. Phenol value of BAC had significant difference from BC (p ≤ 0.05; paired t-test) and the adsorption mechanism of phenol should be fitted with Freundlich isotherm model as considered from the correlation coefficient (R²).

Student's signature

Thesis Advisor's signature