

Pitsanu Khorboot 2009: Preparation and Characterization of Activated Carbon from *Bambusa arundinacea* (Retz.) Wild, *Bambusa oldhamii* and *Gigantochloa verticiliata*. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Associate Professor Apisit Songsasen, Ph.D. 197 pages.

Activated carbons were prepared from *Bambusa arundinacea* (Retz.) Wild (BAW), *Bambusa oldhamii* (GO) and *Gigantochloa verticiliata* (GV), from Kanchanaburi province by chemical activation with phosphoric acid (H_3PO_4) and potassium hydroxide (KOH). The results showed that physical properties and adsorption capacities of the prepared activated carbon depended on types of chemical agents and activation conditions such as chemical concentrations and time of activation. For the adsorption of iodine, methylene blue and Cd (II) of all samples, the activated carbon which was prepared from 1-year-GV charcoal activated by 20% w/v KOH had the highest adsorption capacity in each adsorbate species (1,202 mg/g for iodine, 15.50 mg/g for methylene blue and 0.48 mg/g for Cd (II)). In case of the adsorption of phenol, the bamboo charcoal prepared from 1-year BAW provided the highest adsorption capacity, 4.90 mg/L, while commercial activated carbon was 2.59 mg/L.

The adsorption isotherms of iodine, phenol, methylene blue and Cd (II) were studied. Adsorption isotherm data of iodine, phenol and Cd (II) were fitted to both Langmuir and Freundlich models as considered from the correlation coefficient (R^2). On the other hand, adsorption isotherm data of methylene blue was well fitted with Langmuir isotherm more than Freundlich isotherm. In addition, the concentration of organic acids found in wood vinegar was subject to types and ages of bamboo. Acetic acid was found with the highest concentration in organic acids.

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Thesis Advisor's signature

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