Narumon Sombun 2012: An Investigation of Activated Carbon Synthesized from Jatropha Seed Coat. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Associate Professor Penjit Srinophakun, Ph.D. 77 pages.

This research studiedon the characteristics of activated carbon prepared from jatropha seed coat. Three activation processes by physical activation in the presence of $CO_2$, chemical activation with KOH and physico-chemical activation were compared. The effects of activation temperature (600, 700, 800 and 900 °C) and holding time (1, 2 and 3 h) on the pore structure were studied. It was found that activated carbon obtained from the chemical and physico-chemical activations provided good iodine adsorption, high specific surface area and micropore pore volume, while the physical activation gave poor iodine adsorption. The results also showed that increasing the activation temperature from 600 to 900 °C developedthe iodine adsorption (from 501.56 to 1304.31 mg/g for chemical activation and from 385.42 to 1469.40 mg/g from physico-chemical activation) and the BET surface area (from 533.05 to 1400.23 $m^2$/g for chemical activation and 422.24 to 1397.11 $m^2$/g for physico-chemical activation).The highest iodine adsorption (1510.80 mg/g) and BET surface area (1497.06 $m^2$/g) were obtained when the activation temperature reached to 2 h. Activated carbon synthesized from jatropha seed coat by physico-chemical activation at the final temperature of 900 °C for 2 h was then used to examine the adsorption equilibrium and kinetics of methylene blue dye at 30 °C. Equilibrium data gave good fits with Langmuir adsorption isotherm with maximum monolayer adsorption capacity 909.09 mg/g. The rate of adsorption could be best described by the pseudo-second-order equation.

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