

Veeravut Praepanichakul 2006: Lead Removal from Synthetic Wastewater by Adsorption Process Using Activated Carbon from Coconut Shell and Corncob. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Miss Narumol Vongthanasunthorn, D.Eng. 83 pages.
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Production of activated carbon from agricultural residues helps reducing the cost of production and increasing value of such materials. The objectives of this research are to determine an optimum condition for chemical manufacturing of activated carbon from coconut shell and corncob, to determine optimum factors of lead removal in synthesis wastewater and to compare efficiency of lead removal and cost of production with commercial activated carbon. Activation process in this study is chemical activation in which carbonization and activation are combined. Edible salt was used as a reagent in the activation. The optimum production condition of the activated carbon from coconut shell was found to be at 700 C with the duration of 60 min using weight of raw material-to-salt of 1:3 whereas the optimum condition for producing the activated carbon from corncob was found to be at 400 C with the duration of 180 min using weight of raw material-to-salt of 1:1. Iodine number of the activated carbon from coconut shell and corncob are 532.23 and 229.29 mg/g, respectively, which are lower than the industrial standard of commercial activated carbon of 600 mg/g. Iodine number of the commercial activated carbon (ord No 143/04) is 830.33 mg/g. The optimum factors of lead removal in synthetic wastewater of the activated carbon from coconut shell and corncob and the activated carbon ord No 143/04 were found to be at pH of 4 with contact time of 5 min. From the comparison of Frundrich Isotherm, the lead removal efficiency of the activated carbon from coconut shell ($K_f = 21.097$ mg/g and $1/n = 0.5122$) and the activated carbon from corncob ($K_f = 15.921$ mg/g and $1/n = 0.8007$) is lower than the activated carbon ord No 143/04 ($K_f = 49.704$ mg/g and $1/n = 0.568$). Production costs of the activated carbon from coconut shell (34.1 Baht/kg) and the activated carbon from corncob (45.85 Baht/kg) are cheaper than the cost of the activated carbon ord No 143/04, which is 60 Baht/kg.

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