Chapter 5

Conclusion and Recommendation

5.1 Conclusion

1. The specific surface area of carbon adsorbents varies directly with activating temperature.

2. Surface characteristics of carbons adsorbents depends strongly on activating reagent and activating condition. Subsequently, the adsorption equilibrium constant for a given adsorbate varies broadly from the value of several tens on activated with sulfuric acid up to several ten thousands on the corncob activated with zinc chloride or phosphoric acid.

3. All carbon adsorbents provide a large fraction of non-polar surface, thus, they prefer adsorbing non-polar molecules, such as benzene, to adsorbing polar ones, such as o-xylene.

4. A small fraction of remaining activating reagents, can affect adsorption of certain types of adsorbates.

5. The rate of adsorption is controlled by the pore diffusion and also depends on the shape of adsorbate molecules, i.e.benzene tends to be adsorbed more rapidly than toluene and o-xylene, respectively.

6. Carbon adsorbents from corncob activated with sulfuric acid has low heat of adsorption. While those from corncob activated with phosphoric acid and/or zinc chloride have high heat of adsorption.

7. Heat of adsorption, in the range of 40-160 kJ/mol, is higher than heat of condensation 2-3 times

5.2 Recommendation

Further studies of adsorption on carbon adsorbents may be carried on

1. Adsorption of other polar molecules, such as alcohols and ketones, in order to verify the polarity of the adsorbent surface.

2. Activating corncobs with various reagents at the same temperature to verify activity of each reagent.

3. Effects of the moisture content in the prepared corncobs on the specific surface area and the adsorption equilibrium constant.

4. Activating corncobs with hydrochloric acid for study effect of chlorine in carbon adsorbents.