

Chapter VI



CONCLUSION

For fluidized bed adsorption, there are a lot of interesting works to be studied. Only few people have worked in this field, especially in liquid phase and mixed adsorption. Then this work was selected to study the phenomena of adsorption in fluidized bed to increase the knowledge about mixed adsorption and characteristics of each adsorbate to surface of activated carbon.

An initial approach has been made toward characterization of rates of uptake of persistent pollutants from aqueous solution by granular activated carbon in fluidizing bed. This work has been directed toward studying effects of systemic variables of the operating on rates of transfer of solutes from solution phase to adsorbed phase in both pure and mixed solutions. An elementary but useful model for mass transfer had been utilized for quantifying the relative effects of these variables in terms of mass transfer rates and coefficients. The results could be summarized as following.

- 1) Mass transfer coefficients for different influent dilute concentration have been found to be equivalent over the range of concentrations of solute studied. Therefore mass transfer rate, for the same size of particle, seems to increase with the increasing of concentration of solute.

2) Mass transfer rates for different four sizes of activated carbon evaluated, for the same concentration and feed rate, have been found to correlate well, increase with the increasing of surface area per unit mass of adsorbent.

3) Correlation between mass transfer rate and influent flow rate has been explained on the basis of increasing of the pressure on the solid interface with increasing superficial velocity.

4) It was also observed that film diffusion controls the mass transfer rate of solute to the surface of activated carbon during initial stages of operations.

5) For a two-solute competitive study with mixture of compounds of sodium hydroxide and sodium carbonate, the amounts adsorbed, at the same concentration, are lower than the adsorption in single-solute solution.

6) Mass transfer coefficients increase with the increasing of surface area of adsorbent.

There are a lot of works to be studied in the field of fluidized bed adsorption. This work is only a part of them. The results taken for single-solute system correspond to those done by Sagetong (41). And for mixed-solute system, the result corresponded to those of Kirichenko (31). However the author suggested that more experiments should be taken to support the result taken. The other interesting steps that should continue studying are

- 1) The effect of variables on adsorption of various types of adsorbate.
- 2) Adsorption for mixed-solute should be studied more for application purpose .
- 3) Regeneration should be studied for reducing cost.