Chapter 6

CONCLUSION AND RECOMMENDATION

Conclusion

1. Although both pumice and perlite are composed of the same chemical composition, the former contains certain fraction of crystalline solid, while the latter is just a mixture of metal oxides. Consequently, the former provides higher specific surface area than the latter.

2. The specific surface area of pumice is independent of particle size, whereas that of perlite varies inversely with the particle sizes.

3. Pores of perlite are formed by thermal expansion of volatile substance, such as water, while ones of pumice occur within the crystalline solid.

4. Both pumice and perlite prefer adsorbing polar molecules to adsorbing non-polar ones. Besides the specific surface area, pumice may contain higher fraction of polar surface area than perlite, thus the adsorption equilibrium constant of a given adsorbate on the former is greater than that on the latter.

5. Heat of adsorption for acetone varies with types of adsorbents, i.e. 17-20 kJ/mol for perlite and 27-30 kJ/mol for pumice. While the heat of adsorption for toluene varies with sizes of adsorbents, i.e. 16 kJ/mol, 26kJ/mol and 38 kJ/mol for 40-60 mesh, 60-80 mesh, and 80-100 mesh respectively.

6. Because of the molecular shape of adsorbates, the overall mass transfer coefficient for toluene on a given adsorbent is greater than that for acetone.

7. Because of the large pore size of perlite in comparison with pumice, the overall mass transfer coefficients for a given adsorbate on perlite are greater than that on pumice.

Recommendation

Further adsorption studies may be carried on

1. The effects of temperature for expanding raw perlites.

2. Other derivations of perlites and pumice.