ChL 751 Major 4-5-09. (275)

1. Why is it important to decompose any mass transfer (10) coefficient into a zero flux mass transfer coefficient and a correction factor?
2. Why is it important to have an estimate of N_t (10+15) in solving mass transfer problems? List three situations where N_t is known with certainity.
3. Derive the diffusion equation for multicomponent (50) diffusion in solids. (Consider substitutional diffusion only).
4. Derive Fick's second law for multicomponent (30) diffusion. List and discuss all the assumptions.
5. Derive the diffusion equation for multicomponent diffusion in liquids. What is the expected temperature and pressure variation of diffusivities.
(60) Start from a binary system at infinite dilution, derive the equation for it and then derive it for multicomponent system and any conc^n.
6. Discuss the various options available to evaluate effective diffusivity in mass transfer problems (30+30) for multicomponent systems. Why should fluxes be given much more importance than diffusivities.
7. Is it possible to know the state of matter from temperature variation of diffusivity (10+20) for ~~multicomponent~~ any binary systems? Is it possible for multicomponent systems? Explain.
(10) 8. List two terms which define mass Xfer coeff.

Best of Luck