DEPARTMENT OF CHEMICAL ENGINEERING

Major Examination. CHL 766. Interfacial Engineering

Max. Time: 2 hrs Max. Marks: ~~40~~ 50

Q. 1. a. What are the factors governing stability of colloids? (2 marks)

b. Illustrate the role of Brownian motion in stability of colloidal dispersions with numerical calculations. (3 marks)

c. How would you render glass hydrophobic in such a manner that it would not contaminate the surrounding aqueous medium. (3 marks)

d. How do activation energies differ in surface and bulk-phase reactions? (2 marks)

Q. 2. a. Describe any two methods of measuring surface tensions in detail? (8 marks)

b. How would you measure the interfacial tension between carbon tetrachloride and water by the ring method? (2 marks)

Q. 3. a. Explain how a monolayer would reduce the rate of momentum transfer from wind to a water body? (5 marks)

b. How are wave-damping at a clean interface and that by surface-active agents described quantitatively? (5 marks)

Q.4. Derive Wenzel's relationship? How is it made use of in tensiometry? (10 marks)

Q. 5. It is proposed to manufacture protein fibers by a continuous interfacial process. Propose the central idea behind such a process and proceed to describe your plan in detail for it with the help of a complete process flow sheet. (10 marks)