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### Associate Professor

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| B.S. | ChE, National Taiwan University | 1976 |
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| Ph.D. | ChE, Pennsylvania State University | 1985 |

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- **Diffusion in Polymeric Systems**
    - **Solvent Diffusion in Polymers**

      Sorption and Diffusion of solvent molecules in various polymeric systems including crosslinked polymers, ternary (solvent-solvent-polymer) systems, and glassy polymers have been studied.

      

    - **Drug Delivery Systems**

      Polystyrene microcapsules were prepared by two-step emulsification procedure followed by solvent evaporation method. Mechanisms of drug released from the microcapsules were studied.

    - **Pervaporation**

      Chemically modified chitosan membranes have been prepared for pervaporation processes in ethanol/water and methanol/water systems. The influence of crosslinking agents as well as the moiety of modified chitosan of the membranes on separation factors and permeation rates in pervaporation was investigated.
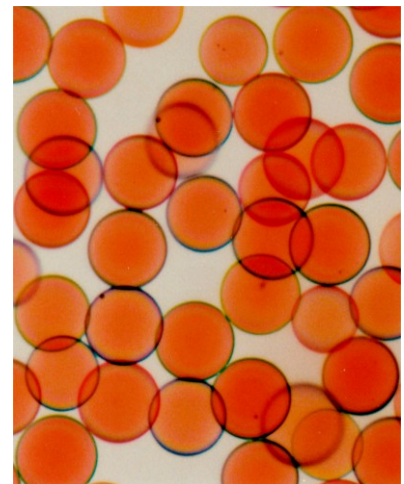
- **Quartz Crystal Sensors**
    - **Weight Measurement**

      It is well known that the resonance frequency of quartz crystals depends on the mass of the coated materials. Consequently, change in mass as small as nano grams of the coated material can be detected by measuring the resonance frequency of the crystal.

    - **Dissolution Behavior of Photoresist**

Experiments based on the above principle have been designed in this lab. For example, diffusion coefficients and equilibrium weight uptakes of solvents in various conditions can be determined by measuring the frequency change of crystals coated with polymers. In addition, dissolution behaviors of photoresist in various solvents have been studied by monitoring the weight change of the coated crystal immersed in solvents.

- **Detection the Compositions of Multi-Component Absorbate by Single Quartz Crystal Sensor:**
  A method to monitor and to determine the compositions of pollutants by a single quartz crystal sensor in conjunction with the method of artificial neural network (ANN) computing has been proposed in this lab. The strategy of calculating compositions of multi-component systems by ANN was verified experimentally. Experiments were carried out for water/acetone/PVAc systems. The calculated compositions were consistent with the experimental data.
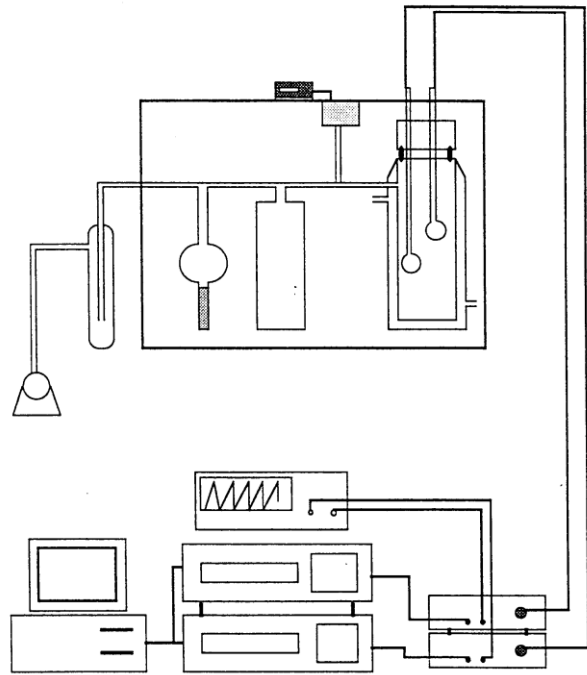
- **Engineering Computations**
  - **Radial Basis Functions**
    MQ RBFs method (Multiquardics Radial Basis Functions Method) is a meshless algorithm. This method has been shown to be effective in solving complicated physical problems with irregular domains. A mechanism to allocate the node points in irregular domains is investigated in this lab. The 'randomness' of the randomly-distributed node points can be adjusted by a factor. It is found that accuracy of solutions increases with decreasing 'randomness' of the distributed node points. In addition, method of overlapping domain decomposition incorporated in MQ RBFs was also investigated.
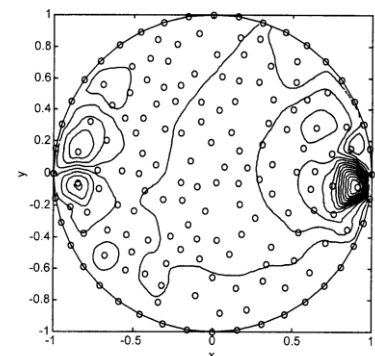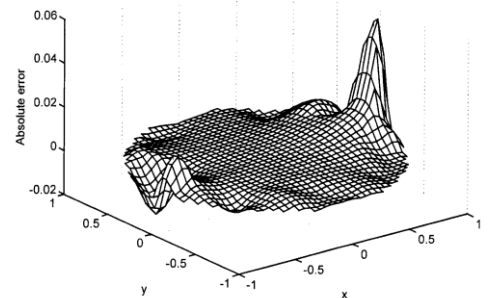
- **Friction Behaviors between Artificial Leathers**
  Friction behaviors between artificial leathers were investigated in this lab. Methods to reduce friction coefficients and frictional noises are still under study.