WORCESTER POLYTECHNIC INSTITUTE

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addition to the Department faculty, Bob Thompson, who is an expert wine maker and bread baker.

The Department had its beginnings in 1922 when the late B. F. Dodge, then a recent PhD from Harvard, was invited to be lecturer in Industrial Chemistry and Chemical Engineering for the senior chemistry students. In 1925 T. K. Sherwood was appointed to the faculty to broaden the ChE curriculum within the chemistry department. In 1940 Ernest Wilson, a chemical engineer, became the chairman of the combined chemistry and ChE department, and until his death in 1958, he built a faculty, laboratory facilities and a strong undergraduate program. Beginning in 1958, Wil Kranich presided over a growing graduate and research program, a new building, and the redirection of the undergraduate program under the WPI Plan. When Kranich became Dean of Graduate Studies, the chairmanship passed in 1975 to Imre Zwiebel. With a strong department faculty and a healthy level of outside support, challenges and opportunities still remain for growth, excellence and unknown new horizons. □

WPI

CHEMICAL ENGINEERING FACULTY

Kohler, J. T.: Assistant Professor
Biomedical and enzyme engineering, biotransport phenomena

Kranich, W. L.: George C. Gordon Professor and Dean of Graduate Studies
Catalysis, process development

Ma, Y. H.: Associate Professor (Professor as of July 1, 1976)
Applied mathematics, simulation, diffusion in porous solids

Meader, J. W.: Assistant Professor
Rheology, heat transfer

Sand, L. B.: Professor
Materials synthesis, molecular sieve catalysts, sorbents, geochemistry

Thompson, R. W.: Assistant Professor
Adsorption phenomena, applied kinetics and chemical reactor behavior, emulsion polymerization kinetics

Wagner, R. E.: Professor
Nuclear technology, transport phenomena, thermodynamics

Weinrich, S. D.: Leonard P. Kinnicutt Assistant Professor
Systems analysis, optimization, process control

Weiss, A. H.: Professor
Complex reaction kinetics, catalysis, resource recovery

Zwiebel, I.: Professor and Department Head
Adsorption, applied mathematics, reactor design, process design, mass transfer

VISITING RESEARCH FACULTY

1975-76

Aharoni, C.: Technion—Israel Institute of Technology, Haifa, Israel
Catalysis, adsorption

Aiello, R.: University of Naples, Naples, Italy
Molecular sieves

Antoshin, G.: USSR Academy of Science, Moscow, USSR
Catalysis

Guczi, L.: Institute of Isotopes of the Hungarian Academy of Science, Budapest, Hungary
Catalysis

ChE book reviews

PARTICLE SIZE MEASUREMENT

by Terry Allen
Halsted Press, 1975. 454 pages, $25.95.

Reviewed by Clyde Orr, Georgia Institute of Technology

The author, a Lecturer at the University of Bradford in England, has expanded and partially updated his earlier edition of the same title. Coverage is broader than the title would suggest, encompassing, in addition to the stated subject, treatment of sampling, surface area evaluation, and pore determinations in porous materials. An effort is made to develop the theoretical background of each subject, but much of the treatment consists of technique and procedural reviews. This makes the book valuable for the novice. Others more knowledgable will recognize the author's bias occasionally creeping into the presentation.

The work consists of 18 chapters the first three of which cover bulk powder sampling from gas streams, and atmospheric sampling. Separate chapters pertain to the treatment of size distributions, to the interaction between particles and fluids in a gravitational field, and to powder dispersion. Remaining chapters are devoted more

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NOMENCLATURE

- a Local interfacial area per unit volume of column, ft^2.
- a_o Packing surface area per unit volume, ft^{-1}.
- D Diffusivity, ft^2/sec.
- D_p Equivalent spherical particle diameter, $D_p = 6(1-\epsilon)/a_o$, ft.
- E Energy dissipation per unit volume, lb_f-ft/ft^3-sec.
- G Gas flow rate per column cross-sectional area, lb/hr-ft^2.
- g_c Conversion constant, 32.2 lb_m-ft/lb_f-sec^2.
- H Henry's Law constant, pressure units.
- H_{OL} Overall height of a mass transfer unit based on the liquid phase, ft. or in.
- K Overall mass transfer coefficient, lb/hr-ft^2.
- k Mass transfer coefficient based on film driving force, lb/hr-ft^2.
- L Liquid flow rate per column cross-sectional area, lb/hr-ft^2.
- N Rate of transport of gas into liquid phase per unit area of contact, lb/hr-ft^2.
- N_{OL} Overall number of mass transfer units based on the liquid phase.
- P Pressure, pressure units.
- Re Reynolds number, $D_p V\rho/\mu(1-\epsilon)$.
- S Column cross-sectional area, ft^2.
- V Superficial velocity, ft/sec.
- x Liquid-phase mole fraction, moles solute/moles liquid.
- y Gas-phase mole fraction, moles solute/moles gas.
- Z Packed column height, ft. or in.
- α Ergun constant used by Reiss (1967).
- β Ergun constant used by Reiss (1967).
- δ Frictional pressure gradient, p.s.i./ft.
- ϵ Packing void fraction used by Reiss (1967).
- μ Fluid viscosity, lb/hr-ft.
- ρ Fluid density, lb/ft^3.

SUBSCRIPTS

- e Based on equilibrium.
- G Based on the gas phase.
- g Based on the gas phase.
- i Based on interfacial contact.
- L Based on the liquid phase.
- l Based on the liquid phase.
- lg Based on the gas-liquid phases combined.
- x Based on the liquid phase.
- y Based on the gas phase.
- 1 Entrance to the packing.
- 2 Exit from the packing.

SUPERSCRIPT

- * Based on the liquid phase in equilibrium with the bulk gas phase.

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BOOKS: **Continued from page 93.**

specifically to measurement methods such as those involving sieving, sedimentation (both gravitational and centrifugal), radiation scattering, electrical sensing, permeametry, adsorption, and the like.

The book suffers the common failing of many today because of delay between preparation and publication; few references are latter than 1972. Nevertheless, it alone is nearly current in the field; earlier works are severely outdated. □

Applied Optimal Control—Optimization, Estimation, and Control. (Revised Printing)

A. E. Bryson, Jr. and Yu-Chi Ho. Revised printing. The Halsted Press, John Wiley & Sons. New York, 1975. 481 pages.

This widely acclaimed and used textbook in optimal control is now available in a revised printing from the Halsted Press.

Tables on the Thermophysical Properties of Liquids and Gases in Normal and Dissociated States, 2nd Ed.

N. B. Vargaftik

Halsted Press, New York, 1975. 758 pages.

This extensive work presents thermodynamic and transport properties of a wide range of materials in the liquid, gaseous, dissociated and ionized states over a wide range of temperatures and pressures. The listed properties of pure substances in Part 1 include hydrogen and hydrogen compounds; metals; carbon compounds; hydrocarbons and organic compounds; nitrogen and ammonia; oxygen; sulfur dioxide; halogens; monoatonic gases. Part 2 presents properties of mixtures and includes air; diffusion in gases; thermodiffusion in gases; thermophysical properties of gas mixtures and solutions; liquid fuels; high temperature heat transfer agents; and oils.