NOTATION

C = solute concentrations in external solution, (wt.%)
C_o = input solute concentration
D_p = particle diameter, (cm.)
K_d = equilibrium distribution coefficient, (dimensionless)
k = mass transfer coefficient, (min.$^{-1}$)
L = solution flow rate, ml./(min.)(sq. cm.)
N_{Re} = particle Reynolds number, $\frac{D_p L \bar{\rho}}{\bar{\mu}}$
q = solute concentration in internal solution, (wt.%)
t = time, (min.)
$\bar{\rho}$ = average fluid density, (g./ml.)
$\bar{\mu}$ = average fluid viscosity, g./(cm.)(min.)

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BOOKS

Absorption, Distillation and Cooling Towers, W. S. Norman, John Wiley and Sons, Incorporated, New York (1961). 477 pages. $11.50.

This book is devoted to the chemical engineering treatment of mass transport phenomena and, more particularly, to the mass transfer unit operations involving gas and liquid phases. Its principal value is as a knowledgebale, up-to-date, and extensive review of engineering research work in these areas.

The first three chapters deal with molecular transport properties and the development of the mass transfer coefficient. The fourth chapter treats the fundamental procedures for the analysis of performance of absorption and distillation towers, and the fifth chapter contains information on equilibrium relations and special distillation processes. The sixth through the thirteenth chapters must be considered the heart of the book. Found here are rather complete discussions on

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INFORMATION RETRIEVAL

Key Words: Polymers-1, Plastics-1, Elastomers-1, Space-4, Vacuum-4, Radiation-4, Light-4, Meteoroids-4, Sun-4, Damage-2, Decomposition-2, Stability-8.

Abstract: Effects of space environments upon various polymeric materials are evaluated. Most polymers are stable in vacuum at temperatures as high as in air; exceptions are listed. Vacuum stability is sensitive to formulation and curing procedure. The radiation belts will damage exposed polymer surfaces; solar flare emissions will probably affect exposed surfaces of the more sensitive materials. Sunlight may increase optical absorption and reduce elastomer flexibility. Meteoric erosion will produce on exposed surfaces a few pits. When structural laminates are hit by larger meteoroids, spalling of pieces off the inside will occur through greater thicknesses than will perforation.

Reference: Jaffe, L. D., Chem. Eng. Progr. Symposium Ser. No. 40, 59, p. 81 (1963).

Key Words: Evaporation-7, Vacuum-5, Compatibility-7, Aerospace-8, Stability-6, Methods-8, Volatility-6, Vaporization-7, Outgassing-7, Knudsen Cell-10, Space-5, Grease-1, Testing-8, Microbalance-10, Plastics-1, Oil-1.

Abstract: Continuous weight measurement during vacuum exposure evaporation studies is recommended, especially for engineering materials in which vaporization rates vary because of the heterogeneity of the materials.

A test method giving more refined information than is now available is proposed as a standard for correlation of results between laboratories. Use of the Knudsen cell concept is a further improvement.

Experimental work giving better than 1% reproducibility on pure and engineering materials is reported for vapor pressures down to 10^{-5} mm. Hg. The bulk of the studies concern plastics and eighteen oils and greases.

Reference: Riehl, W. A., Chem. Eng. Progr. Symposium Ser. No. 40, 59, p. 103 (1963).

the state of knowledge of such subjects as performance criteria for packed towers used for absorption and distillation operations, design of packed towers, performance and design of column plates used for gas-liquid contacting. Brief discussions of the phenomena involved in simultaneous heat and mass transfer and absorption accompanied by chemical reaction are also included. A chapter on spray towers and related subjects is included. The fourteenth and last chapter relates a summary of the book with the economic factors inherent in the design of a unit.

The style of writing is such that the work is easily read and understood. To be particularly noted are the excellent descriptions of individual investigations.

The space allotted to fundamentals in the first part of the book is not enough to allow for a complete exposition of these principles. This section is useful only as a basis for the discussions which follow.

This work, then, is not to be considered as a textbook but rather as a reference for research workers in this area as well as engineers engaged in design work. Dr. Norman says in the introduction "... it is hoped that the contents of this book will assist the technologist to a fuller realization of the contributions made by research and that the research worker may gain a better understanding of the ends to which his work is directed."

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