INFORMATION RETRIEVAL*

Prediction of the first normal stress difference in polymer solutions, Meister, Bernard J., and R. Dale Biggs, **AIChE Journal, 15,** No. 5, p. 643 (September, 1969).

Key Words: A. Shear Stress-8, Stresses-8, Rheology-8, Polymers-9, Solutions-9, Molecular Model-10, Viscoelastic-0, Liquids-9.

Abstract: Shear stress and first normal stress difference data are presented for several polymer solutions undergoing steady shear rates from 1.0 to 100,000 sec.$^{-1}$. The steady shear response is divided into three regions as a function of increasing shear rate. These are diffusion controlled linear regioning, a moderate shear rate regioning where shear controls the entanglement-disentanglement process and a high shear rate region where aggregation of polymer molecules occurs. A molecular model is derived for the shear controlled region that allows prediction of the first normal stress difference from the viscosity function and one additional constant that depends only on the molecular species.

Effect of liquid-packing surface interaction on gas absorption and flooding in a packed column, Coughlin, Robert W., **AIChE Journal, 15,** No. 5, p. 654 (September, 1969).

Key Words: A. Gas Absorption-8, Packing Material-6, 8, Contact Angle-6, 8, Oxygen-9, 5, Mass Transfer-2, 7, 9, Liquid Loading-7, 9, Packed Column-10, Liquid Rate-6, Gas Rate-6, Sodium Sulfite Solution-1, 5, Air-1, Loading Behavior-2.

Abstract: Gas absorption, pressure drop, liquid holdup and loading behavior in a packed column have been investigated using packing materials almost geometrically identical but fabricated from three different materials (ceramics, Saran, and polyethylene). For the absorption of oxygen into sodium sulfite solution, observed values of the liquid-side, composite, overall mass transfer coefficient, K_La, were about 25% larger for ceramic packing than for the polymeric packings. It was also observed that liquid loading occurs more readily in the case of the polymeric packing materials and it appears that the usual type of correlation is inadequate for predicting loading when polymeric packings are employed. In the case of liquid operating holdup no differences were observed from packing to packing. These observations are discussed in terms of the nature of the interaction between liquid and packing surface and it is pointed out how these phenomena may be fundamentally different from those of previous investigations which relied upon surface-active agents added to the liquid.

Model simulation of adiabatic continuous-flow-stirred-tank reactors, Keairns, D. L., and F. S. Manning, **AIChE Journal, 15,** No. 5, p. 660 (September, 1969).

Key Word: A. Yields-7, 8, 9, Stirred Tank Reactors-9, Prediction-8, Model Simulation-10, Residence Time-6, Impeller Size-9, Impeller Shape-9, Temperature-7, Outlet Stream-9, Mixing-8, Comparison-8, Experimental-0, Theoretical-0, Water-5, Hydrogen Peroxide-5, Sodium Thiosulphate-5, Rate-6.

Abstract: Manning, Wolf, and Keairns' model for continuous-flow-stirred-tank reactors has been extended to include adiabatic as well as isothermal operation. The adiabatic, steady state yield of a continuous-flow-stirred-tank reactor was measured experimentally using the second-order, homogeneous, exothermic reaction between sodium thiosulfate and hydrogen peroxide. Model predictions of overall tank yield agreed closely with the data thus verifying the applicability of this model to explain the effects of operating variables such as impeller size, impeller type, agitator speed, feed location, feed concentration, and flow rates.

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student's first exposure to material and energy balances and thermodynamics should emphasize calculational techniques, then one must be willing to accept a rapid introduction to principles and leave for some other course a deeper understanding of thermodynamics.

The difficulty in adapting multi-purpose books to individual curricula is one reason why so many such introductory books are becoming available. Although the authors suggest how their book may be used in conventional one-term courses, it is not likely that **Material and Energy Balance Computations** will find much use of that type. For really satisfactory use of this book the adopting school should be prepared to make a major modification of the traditional curriculum.

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How to Manage Your Information, Bart E. Holm, Reinhold, New York (1968). 292 pages.

How to Manage Your Information by Bart E. Holm is not an easy book to read. It is not a subject for the casual reader but rather will receive attention from those who *must* know. The subject is not a popular one since the reader cannot take a passive part, he must do it himself. Although the preface claims, "simple—steps for the individual—to help manage his information," the approach is so broad as to discourage the neophyte. Much of the subject matter is an outgrowth of contributions of the Du Pont Company to the engineering professions, and this aspect of the book deserves especially favorable comment.

The information crisis is dealt with only briefly and one can obtain a feeling of despair that we are heading towards an impenetrable morass, and indeed we may be. The author has offered simplified term lists for a number of sciences. Coincidence or concept coordination by any of several mechanical means suggested by the author can provide the individual with a powerful method of retrieving relevant material and rejecting extraneous information for his pre-existing file. Mr. Holm does not emphasize strongly enough, however, that no system is better than its input—it cannot retrieve information not stored. The diligent individual will benefit by these ideas.

Considerable space is devoted to the mechanized or computerized systems of the future. No engineer can afford

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* For details on the use of these Key Words and the AIChE Information Retrieval Program, see **Chem. Eng. Progr.,** Vol. 60, No. 8, p. 88 (August, 1964). A free copy of this article may be obtained by sending a post card, with the words "Key Word Article" and your name and address (please print) to Publications Department, AIChE, 345 East 47 St., N. Y., N. Y., 10017. Price quotations for volume quantities on request.

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to be ignorant to this field, since whether he wills or not, the past is rapidly becoming bygone and the methods of the computer age are with us.

Perhaps the most useful part of the book is the quite complete list of information sources, data centers, and specialized libraries. This information generally includes addresses. A useful coverage of the abstract sources is also helpful.

It is clear that modern information management is a far cry from the past role of the librarian as a caretaker.

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Radiative Transfer, H. C. Hottel and A. F. Sarofim, McGraw-Hill Book Company, New York, 1967. 520 pages.

For many years in the past, engineers in the U.S. have obtained their knowledge on radiative heat transfer from Hottel's chapter in the consecutive editions of the book, *Heat Transmission,* by W. H. McAdams. It is the opinion of this reviewer that the new book by Hottel and Sarofim will play the same role for many years to come. It is the most comprehensive text available today and fulfills remarkably the stated aim to supply the student, practicing engineer, or scientist with a background adequate for attacking a radiative problem of almost any degree of complexity.

It is interesting to note that all engineering textbooks on radiative transfer, which are presently available, start the treatment with special and relatively simple situations and gradually add complexities as the discussion proceeds. This obviously stems from the feeling that a general statement of the process is too involved for absorption by a student or reader.

The present book which uses the same approach begins with a discussion of the basic definitions and geometric concepts used in radiative transfer and of the laws of black body radiation. In Chapter 2, it introduces the concept of the view factor and the exchange area and discusses the various methods by which these parameters can be calculated. With this preparation, the reader is now able to follow in Chapter 3 the method by which the radiative interchange among gray Lambertian surfaces with a nonabsorbing intervening medium can be analyzed. The radiative properties of real surfaces, however, deviate from the ones assumed

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Foaming and frothing related to system physical properties in a small perforated plate distillation column, Lowry, R. P., and Matthew Van Winkle, **AIChE Journal, 15,** No. 5, p. 665 (September, 1969).

Key Words: A. Frothing-7, 8, Foaming-7, 8, Height-8, Froth-9, Physical Properties-6, Distillation Columns-9, Perforated Plates-10, Laboratory Scale-0, Surface Tension-6, Heat Transfer-6, Density-6, Viscosity-6, Binary Systems-0.

Abstract: Experimental froth heights occurring on a perforated distillation tray were correlated with the determining system physical properties under distillation conditions. A photographic technique was used to measure accurately the foam and froth heights. Several data points were obtained over a range of composition for each of five binary systems which were selected to cover a reasonably broad range of system physical properties.

An experimental study of *steady state multiplicity* in a *loop reactor*, *Root, R. B.,* and R. A. Schmitz, **AIChE Journal, 15,** No. 5, p. 670 (September, 1969).

Key Words: A. Multiplicity-8, Steady State-0, Loop Reactor-9, Adiabatic-0, Sodium Thiosulfate-1, Hydrogen Peroxide-1, Water-5, Disturbances-6, Stability-7.

Abstract: Steady state multiplicity in an adiabatic loop reactor was studied in experiments employing the reaction between sodium thiosulfate and hydrogen peroxide in aqueous solution. The steady state characteristics of the loop reactor were predicted by a method which utilized batch reactor data of temperature vs. time directly. Experimental results verify the existence of multiple steady states on ranges of feed flow rates and recycle ratios and demonstrate the capability of the simple model for predicting the qualitative and quantitative features of the reactor steady state.

Thermally induced solid state polycondensation of nylon 66, nylon 6-10, and polyethylene terephthalate, Chen, F. C., Richard G. Griskey, and G. H. Beyer, **AIChE Journal, 15,** No. 5, p. 680 (September, 1969).

Key Words: A. Polycondensation-8, Nylon 66-1, Nylon 6-10-1, Polyethylene Terephthalate-1, Molecular Weight-6, Rate Functions-7, Reaction Rate-6, Diffusion-6, 8, Temperature-6, Polymerization-7, 8, Solid State-0.

Abstract: The mechanism of solid state polycondensation has been subjected to a fundamental analysis. Equations were formulated for combined diffusion and chemical reaction for two separate situations. One was for solid state polycondensation in polymer flakes or chips. The other dealt with polymer powders. The resultant solutions related molecular weight changes to rate functions. A technique for deriving the rate functions from experimental data is described. Solid state polycondensations were then studied for nylon 66, nylon 6-10, and polyethylene terephthalate.

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