well-advised to use it after they have studied some of the other books.

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Rheometry, Industrial Applications

K. Walters, ed.
418 pp. Wiley, New York, 1980. $75.00

This first volume of the new series "Material Science Research Studies" discusses the uses of rheometry as an industrial tool. Restricting itself to fluid materials, many with yield values, the book is mainly directed to the materials-oriented section of the rheological community, but also provides information useful in the industrial testing laboratory and to the production manager.

There are chapters on fundamental concepts, detergents, lubricants, foods, molten polymers, paints and printing inks, industrial aqueous suspensions (including clays, paper, pharmaceuticals). An extensive source of information for anyone engaged in the design, operation and quality control of industrial processes, this volume also elucidates the intricate relation between measured rheological properties and the real flow that occurs during production and performance.

Shortcomings are unavoidable when seven authors write on seven huge and divergent subjects. Not only do style and level of sophistication differ widely from chapter to chapter, not only is there avoidable overlap, but also there are inconsistencies and even contradictions. True capillary viscosimeters, dies, melt flow indexers, consistency cups—even when entrance and exit conditions and length/diameter ratios are introduced—are treated as "capillary" instruments without regard to which steady-state conditions exist. Thixotropy, shear thinning or thickening, storage hardening, Bingham and other plasticities, viscoelasticity and elasticoviscosity are defined or described in ways that conflict with each other and with standard texts. Efforts to define industrial designations such as structure, hardness, toughness or stringiness, in physical terms are at best tentative, as evident by their absence in the index. No glossaries of terms or of symbols exist.

Some of the authors point out that data that can be reproduced and interpreted can only be gathered under viscosimetric flow conditions, which obtain in well-designed test instruments

and for homogeneous materials, but hardly ever occur in the field. Most chapters contain some excellent descriptions of efforts to establish the actual rheological processes that take place during critical stages of operations and to connect micro- and macroscopic events. The book is best when it points out where rheometric data serve in the classification and ranking of materials, in quality control and as signals for internal changes due to time, temperature, working and so on, and when it discusses where correlations between rheometric data and events in practice must remain empirical. There are many valuable discussions but no general guidance on how the unlimited variety of nonhomogeneous materials might be characterized rheometrically.

Thus, the book is an extensive source of practical information, a starting point for theoretical understanding and an excellent review for inquisitive rheologists. However, it points to the need of a book that would give a sense of coherence and direction to a field of immense practical and scientific importance. Until such a book becomes available, *Rheometry, Industrial Applications* will be found useful and serviceable.

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new books

Particles, Nuclei and High-Energy Physics

Polarization Phenomena in Nuclear Physics—1980. Fifth International Symposium, Santa Fe. G. Ohlsen, R. Brown, N. Jarmie, W. McNaughton, G. Hale eds. 768 pp. AIP, New York, 1981. $84.00

Physica Scripta: Proceedings from International Conference on Experimentation at LEP, Uppsala 1980, Vol. 2. G. Flügge, ed. 161 pp. Royal Swedish Academy of Sciences, Stockholm, 1981. no price stated

Physica Scripta: Topical Questions in QCD. Copenhagen, 1980. K. Hansen, P. Hoyer, P. Olesen, J. L. Petersen, eds. 168 pp. Royal Swedish Academy of Sciences, Stockholm, 1981. no price stated

Physica Scripta: Nuclei at Very High Spin. Sven Gosta Nilsson in Memoriam. Proceedings of Nobel Symposium 50, Orenas, Sweden, 1980. G. Leander, J. Ryde, eds. 291 pp. Royal Swedish Academy of Sciences, Stockholm, 1981. no price stated

Current Topics in Elementary Particle Physics. Contributions to International Summer Institute, Bad Honnef, 1980. K. Mütter, K. Schilling, eds. 343 pp. Plenum, New York, 1981. $45.00

Physica Scripta: Proceedings from the International Conference on Experimentation on LEP. Uppsala, 1980, Vol. 1. T. Ekelöf, ed. 280 pp. Royal Swedish Academy of Sciences, Stockholm, 1981. no price stated