Molecular weight determination

Molar Mass Measurements in Polymer Science. By N. C. Billingham. Pp.254. (Kogan Page: London, 1977.) £13.50.

DISCUSSION of the theories underlying molecular weight determinations is almost an incidental part of most textbooks of polymer science. In contrast, practical aspects of the various techniques are most commonly discussed in the instruction manuals issued by appropriate manufacturers. The author of this book has made a highly successful attempt to combine the two sources of information into a most useful and reasonably concise reference text.

As the title indicates, the book is written with a fairly rigid adherence to the SI system of units; molar mass, a fundamental unit with dimensions, being preferred to the more generally used, dimensionless quantity, molecular weight.

In the early part of the book the various molar mass averages, and their relationships, are discussed as a preliminary to a most enlightening survey of the nature and behaviour of polymer molecules in solution. Membrane

osmometry, vapour pressure, light scattering, ultracentrifuge, viscosity, and gel permeation chromatography techniques are fully described in later chapters and, for each, there is a discussion of both underlying theory and practical laboratory procedures. Different types of instruments supplied by various manufacturers are individually described and compared, and full details of equipment suppliers and a list of suitable solvents for most common polymers are included as appendices. There is also a very short discussion of chemical methods for assay of endgroups in polymers.

In total, the contents of this book are rather similar to those of two edited volumes (*Polymer Molecular Weights*, ed. P. E. Slade, Jr, recently published) and indicate the requirement for a convenient reference text of this kind. The present single volume, however, has the advantages of both lower price and a more coordinated treatment of the subject. It will be valuable to anyone interested in polymer characterisation and especially to research workers who may be abruptly faced with the problems of molecular weight determination.

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Liquid-state chemistry

Introduction to Liquid State Chemistry. By Y. Marcus. Pp. viii+357. (Wiley-Interscience: London and New York, 1977.) £12.50; \$24.00.

LIQUID-STATE PHYSICS is a flourishing branch of science which has been reviewed recently in several good books. The liquids discussed were those whose structure is the most easily determined, and whose properties provide the most direct test of physical theories; argon is the archetype. Professor Marcus has a different aim—to give an account of the equilibrium properties and structure of those liquids that are of more concern to the chemist. "Crude petroleum, sea water, aqueous acetone and molten cryolite" are his examples.

Before tackling his main subject, he rightly supposes that his reader will need first to know something of the physics of simple liquids and their mixtures, and so the first half of his book is essentially liquid-state physics. Unfortunately, 160 pages is too small a space for this to be anything but a string of theories, models, approximations, and references. Those familiar with the field might wish that he had been more critical in his choice of material; those who are not, will probably gain little but a list of references and useful tables, since the text is not only too condensed but abounds with errors and examples of misplaced emphasis.

The second half of the book covers his main interest; there are chapters on mixtures of molecular liquids, solutions of electrolytes, molten salt mixtures, and mixtures of liquid metals. Here, the level of rigour of the physics is necessarily lower than in the earlier chapters; often a well chosen correlation of physical properties is more valuable than a neat trick with the grand partition function. Chemists who work with liquids will welcome the last four chapters, with their extensive tables and full references.

The units of the book are said to SI, but this system implies not only the use of metres, kilogrammes, seconds, and so on, but also the use of the rationalised electromagnetic system. Unfortunately, the author has married the sizes of the units of the SI with equations of the unrationalised electrostatic system, so that we have, for example, a polarisability in $\text{m}^3 \text{mol}^{-1}$. This combination will probably confuse students reared on the *Système International*, and not only on its units.

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Advances in Invertebrate Reproduction

Volume I

Edited by K. G. Adiyodi & Rita G. Adiyodi
1977; xii+514pp.; art paper; hard bound; £23/\$40
(inclusive of postage)

Proceedings of the First Symposium of the International Society for Invertebrate Reproduction, Calicut, September 10-12, 1975. Updated and revised. The 39 original contributions and overviews by leading authorities in the field cover several fascinating aspects of sexuality, reproduction and behaviour of a wide range of invertebrates. Some of the comparative data given on vertebrates add to the usefulness of this volume. Profusely illustrated and complete with author, subject and species indexes.

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