introduction to the basic science and technology of the copolyester fibres, which is reinforced by a later chapter giving details of the spinning behaviour of these types of polymer. These two chapters, the first by a group at Hoechst–Celanese closely involved in the invention and development of the copolyesters, and the second by W. R. Krigbaum of Duke University, provide a very good overall account for the reader.

The fourth chapter in this book is a very well presented account of polydiacetylene single crystal fibres. The structure and morphology of these materials has been illuminated by some remarkable electron micrographs, and the understanding of mechanical behaviour greatly advanced by studies of the Raman spectrum under stress. Both of these developments are due to R. J. Young, the author of this chapter.

Two further chapters deal with the specialized areas of polystyrene-based functional fibres (Toray Industries) and bioabsorbable fibres for medical use (Y. Ikada). The polystyrene-based fibres are of especial interest as ion exchange resins and solid acid-base catalysts. A wide range of practical applications for the bioabsorbable fibres are discussed.

Finally, this handbook contains two chapters on inorganic fibres. The preparation and applications of lead fibres are considered by Kikuchi and Shoji (Toray Industries). Aluminium oxide fibres are discussed by Romine (Du Pont) who presents a comprehensive account of their processing, structure, properties and applications.

In summary, this handbook offers authoritative discussion of a very wide range of new fibres. The presentations are of a uniformly high standard and in most cases provide the reader with valuable information on the applications of these new materials, as well as a comprehensive account of their preparation, structure and properties.

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Polymer Characterization

D. Campbell and J. R. White
Chapman and Hall, UK, 1989,
viii + 362 pages, £19.95
ISBN 0-412-27170-2

This book has 78 pages on electron microscopy and 30 pages on other optical techniques that provide a good account of these methods and their applications to polymers. The 25 pages on molecular weight determination and 34 pages on electron spin resonance are of doubtful value. Other sections cover vibrational spectroscopy, ultraviolet, nuclear magnetic resonance, X-ray diffraction and thermal analysis. These sections give the impression of having been compiled by authors with little depth of research or teaching experience in these fields. In vibrational spectroscopy, for example, no indication is given of the tremendous advantages that the Fourier Transform infra-red spectrometers have brought to polymer studies. This reviewer must declare an interest having first obtained *FT*i.r. spectra of polymers in 1965 but the volume of recent publications on applications of *FT*i.r. to polymers should clearly indicate the importance of this technique.

Density measurements, neutron diffraction and e.s.c.a. are covered under 'Other Techniques'. No other technique of surface analysis is mentioned; chromatographic techniques are ignored apart from molecular weight applications.

It is difficult to envisage anyone who would benefit from the book as it stands. Much of the book contains descriptions of techniques that are readily available elsewhere (e.g. in textbooks of physical chemistry) and which are too detailed for the average polymer technologist, but insufficient for the specialist polymer chemist. The section on microscopy alone would have made an excellent monograph but the present volume is a disappointment.

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An Introduction to Rheology

H. A. Barnes, J. F. Hutton and K. Walters
Elsevier, Amsterdam, 1989, ix + 199 pages, US$92.00
ISBN 0-444-87140-3

Although this is a relatively small book, it gives a good introduction to rheology. It introduces the reader to the many aspects of this difficult topic, with chapters on viscosity, linear viscoelasticity, normal stresses, extensional viscosity, rheology of polymeric solutions and of suspensions and theoretical rheology. It also gives a comprehensive bibliography for more detailed rheological reading and an extensive glossary of rheological terms.

The book is well written and illustrated and the text is logically laid out and easy to follow. However, it does lean towards the pure scientist's point of view. There are a large number of illustrations, although some of these could have been made larger for easier interpretation. The four photographic illustrations concentrate on the more dramatic, but nevertheless important, effects of rheological behaviour of viscoelastic fluids.

The content of the book concentrates on viscoelastic behaviour of 'fluids'. This was initially confusing for an introductory text, until the authors' philosophy was clearly spelt out in Chapter 3, namely that all fluids are viscoelastic in theory, and that deviations from this behaviour are only due to the application of a narrow range of practical operating conditions. This lead to a focusing on rheology of polymer solutions and melts, and a virtual total lack of reference to food and fermentation 'fluids'. This concentration is in itself of no major concern, but when coupled with other minor points, gave the impression that this is an introductory text for rheologists rather than one for scientists and engineers in general.

The mathematical treatment of rheological behaviour is deliberately kept to a minimum. For both viscoelastic and the brief mention of non-viscoelastic fluids, a general approach is made to mathematically describe the rheological behaviour. From this the traditional rheological equations for fluids, like pseudoplastic, Bingham, Kelvin and Maxwell, are obtained as special situations. This unifying of mathematical models is thought useful to the non-specialist, even if a larger operating range of shear rate than normal in practical situations is needed to see the difference between the modern and general model and the traditional models for pseudoplastic and Bingham fluids. For the more mathematically oriented reader, theoretical rheology is introduced briefly in the last chapter of the book.

The overall impression is of a text which competently and concisely introduces the new reader to the general theoretical aspects, but which lacks the more practical aspects of rheology.

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