book reviews

Olefin metathesis and ring-opening polymerization of cyclo-olefins

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2nd Revised Edition, Editura Academici and John Wiley and Sons, Ltd, 1985, £34.50, ISBN 0-471-90267-5

The first edition of this book was published under the title 'Metateza olefinelor si polimerizarea prin deschidere de inel a cicloolefinelor' in 1981 and at that time was the first and only book devoted to this interesting and important field of chemistry. Unfortunately, from the point of view of both the authors and the potential readership, it was only available in a Roumanian edition at that stage. This second revised edition is in English and represents a considerable expansion in the coverage of the subject matter; the number of references and printed pages have almost doubled and it is claimed that the literature through 1982 has been exhaustively reviewed. The major additions to the original text appear to be: a tabular survey of olefin metatheses and metathesis ring-opening polymerizations, which occupies 116 pages; and substantial expansion and revision of the chapters dealing with reaction conditions, kinetics and mechanism, stereochemistry, and applications. In the meantime another book covering essentially the same field has been published (K. J. Ivin, 'Olefin Metathesis', Academic Press, 1983); comparisons are almost inevitable.

The book under consideration here is a translation and, while there are a few unusual constructions and usages, there do not appear to be any serious problems for the reader arising from the translator's work. On the other hand, there are some assertions that may be difficult to accept: for example, 'Polypentylene is a valuable competitor of natural rubber and has considerable economic importance' (page 12); this does not appear to reflect the present situation in Western Europe and North America, although some other speciality materials (including elastomers) produced via metathesis do find a market. The editorial work on the book does not seem to have been sufficiently critical at times; for example, Figure 7.14 (page 340) is meaningless as drawn and seems unlikely to represent the authors' intentions. However, the frequency of these relatively minor quibbles is low and they do not greatly detract from what is a welcome and useful addition to the literature of the field. The organization of data and the approach to the subject matter in this and in Ivin's book are different, and Ivin's text also tends to be written in a rather more succinct manner. The styles and organization are complimentary and workers in the field and those contemplating entering the field would be well advised to have access to copies of both books. However, librarians and individuals with limited means may well be forced to make a choice, in which case I would recommend Ivin's text as the current 'best buy' on this topic.

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Failure of Plastics

W. Brostow and R. D. Corneliussen (Eds.)

Hanser Publishers, Munich, 1986, xxii + 486 pages, £86.45, ISBN 3-446-14199-5

Although at first sight this text might appear to be the work of Professor Brostow and Professor Corneliussen, it is in fact an edited volume that contains twenty-four quite distinct and separate chapters; the Editors providing two of these, one of which is an introduction to the volume. Some of the chapters are the work of more than one author, although the majority have been produced by an individual. In total there are thirty-two contributors; the greater part of these are from the United States of America, with a significant fraction from main-land Europe, in particular Sweden and West Germany.

The main emphasis of the book is on the *mechanical* failure of organic polymers, and indeed the adoption of the qualifying adjective 'mechanical' would not have led to a significant loss of accuracy in the description of the contents. Other failure modes, such as thermal degradation, irradiation damage and certain types of environmentally induced failures are referenced, but mainly in the context of their effects on mechanical properties. The odd paper may not fit entirely into this description; which is the case for the chapter on dielectric and dynamic mechanical properties of rubbers. So, the book naturally has a strong coverage of such topics as yield, relaxation, creep, fracture, fatigue and crazing, and the way these processes are influenced by the environment, temperature, rate of deformation and sample history. A few chapters deal with specific systems such as fibres, injection-moulded components and oriented polymers. Three chapters deal exclusively with the failure of fibrous composites, and there is also one on friction and wear.

All of the contributions are in the form of reviews, some of which are impressive in terms of their quality and coverage. Across the chapters there is a blend of microscopic, and continuum approaches to the subject matter. The whole collection has a strong and authoritative feel, and I believe that a number of the chapters will become long-standing, widely referenced and definitive reviews. Whether the whole text will be appreciated by a wide audience is more difficult to judge. It will have some value in certain undergraduate courses and in commercial development groups. The nature of the intended audience is not easy to define, but it is likely to be mainly within the academically oriented scientific research community.

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