

The language used is understandable, although some of the occasional awkward constructions which interrupt the flow of the manuscript should have been eliminated at the editorial stage. The book is well produced, apart from the minor reservation noted above, and there are very few typographical errors.

It can reasonably be expected that this review will be well received and will stimulate much further work and discussion.

W. J. Feast

**ADVANCES IN POLYMER SCIENCE, Volume 38
Polymerization Processes
Springer-Verlag, New York,
Heidelberg, 1981, 170 pages,
\$46.10. ISBN 0-387-10217-5.**

Volume 38 of this series contains five articles written by separate authors. The articles vary in both their purpose and subject matter.

The first article, by N. Yamazaki and F. Higashi, deals with new condensation polymerisations which are promoted by phosphorus compounds. This is concerned largely with work which has been carried out by the authors during the last 10 years. The review sets out the reaction types in a systematic manner. It covers the formation of polyamides, polypeptides and polyesters. The discussion is concise and reasonably clear (34 references).

The second article by G. Silvestri, S. Gambino and G. Filardo discusses the electrochemical production of initiators for polymerisation processes. This deals with the synthesis of complex catalysts and the direct electrocatalysis of polymerization. The discussion is detailed and reviews the publication of many workers (133 references).

In the third article, M. Kamashi deals with the influence of solvents on the free-radical polymerisation of vinyl compounds. This is not merely a factual account but an historical review of the development of basic ideas. The reasons why rate coefficients depend on solvent type are discussed in a quantitative manner. The article is well-researched and presented clearly (146 references).

The fourth article, by A. A. Berlin, S. A. Volfson and N. S. Enikolpian is entitled 'Kinetics of Polymerization Processes'. Primarily, it is a review of work carried out in the Soviet Union during the last five years. Both ionic and free-radical polymerisation are covered. The variation of chain termination rate coefficients with radical size is treated in some detail and the possibilities of 'living' radical polymerizations are discussed. The article includes thermodynamic effects in the kinetics of ionic heterogeneous polymerization. In conclusion, there is a substantial quantitative discussion of models which may be used to describe polymerization processes. This is a useful review and the authors have been successful in relating recent Soviet work with work which has been carried out elsewhere (145 references).

The last article, by J. P. Kennedy and J. M. Delvaux, deals with the synthesis, characterisation and morphology of polybutadiene-polystyrene graft copolymers. Unlike the other sections of the book, this is an original account of new experimental research.

A study has been made in which polystyrene cations are grafted on to polybutadiene. Model reactions have been used as an aid to understanding the process. The effect of reaction conditions on the efficiency of graft formation is evaluated (40 references).

Obviously, this is a book for those who are familiar with polymerization processes already. The standard of work is high and generally the presentation is clear. In all cases, the references include recent publications; the papers were received by the editors between July 1979 and June 1980. Few readers will be concerned equally with all of the articles but those workers who specialise in one of the fields which is covered will find the consultation of the book worthwhile.

B. W. Brooks

**'Semiconducting Polymers'
Marian Kryszewski
PWN-Polish Scientific
Publishers, Warsaw, 1980**

The contribution of Professor Kryszewski and his coworkers at the Polish Academy of Sciences in Lodz will be well known to those interested in semiconducting polymers. His many personal contacts both in the East and West are reflected in the authoritative way in which he is able to discuss the literature from a large number of research workers. The original Polish version of the book appeared in 1968. The English translation was prepared during the period 1970-74 and was rewritten and extended to include the literature which appeared during this period. Literature published in the period 1974-78 has been collected into a final chapter which is entitled 'Recent Trends'. This complements the first eight chapters and extends the discussion to cover more recent advances in selected topics. Professor Kryszewski has made a valiant effort to produce a comprehensive review of the literature for which he must be heartily congratulated. However, one feels that because of the volume of literature covered certain of the sections lack a directness required to maintain the reader's interest. As with any translation, the occasional lapse of syntax is to be expected. These are rare and the style of writing is in general good. For a book for its size 594 pages — the number of typographical errors are small, a few minor slips, such as Linschitz for Linschutz, occur but these will not distract the reader from an appreciation of the breadth and thoroughness of the coverage of the literature. The first three chapters are concerned with fundamentals and describe the general character of semiconducting polymers, their preparation and physical/chemical properties. These chapters are well organised and indexed allowing the reader to easily find the particular topic of interest. Chapters 4-8 deal with magnetic, catalytic activity, photoconductivity, biological semiconductors and methods of measurement of electrical and photoconductivity. Unlike the first three chapters the text is not as well divided into subsections and it is somewhat more difficult to access topics of particular interest. Chapter 9 complements the preceding chapters and reviews the literature from 1973 to 1978. It is divided into sub-sections similar to those used for the previous eight chapters and as such

reflects the general organisation of the book indicated above. A minor irritation was the use of italics for the references in this section. Instead of following on with the numerical order of references used in the previous chapters, a separated bibliography is used for this chapter and the references are distinguished by being in italics. This point is made in the preface. However, the reader may find himself a little confused since chapter 9 also contains references from the main body of the text, and differentiating between italic and normal numerals is not always easy. An additional point which would have eased reference to the data would have been the greater use of subheadings in this chapter. For instance, it is not directly obvious that the discussion of $(SN)_x$ starts on page 442 and extends to 446, likewise polyacetylene pp. 446-454 and polydiacetylene pp. 454-455. Despite these minor criticisms, the reader should find this a very authoritative work in which the author has added his skill and experience to the discussion of many of the mechanistic points concerned with the interpretation of charge migration in these systems. I would anticipate that this text will be eagerly consulted by all interested in semiconducting polymers and should find a place in all University libraries. Unfortunately, any book on such an actively researched field is of necessity bound to be out of date before it is published. The growth of activity indicated by Professor Kryszewski into polyacetylenes, in fact, occurred and has attracted considerable interest with the appearance of the polymeric battery. For the reader interested in this particular area, a review by MacDiarmid¹ is strongly recommended. In conclusion, *Semiconducting Polymers* is a book well worth a read, and for the worker in this field may be considered to be the most recent authoritative reference on the subject, and as such an essential addition to their library.

¹ A. G. MacDiarmid and A. J. Heeger 'Organic metals and semiconductors: The Chemistry of Polyacetylene (CH_x) and its derivatives', *Synthetic Metals*, 101-108 (1979:80)

Richard A. Pethrick

**MOLECULAR ELECTRO-OPTICS Electro-optic Properties of Macromolecules and colloids in solution
Edited by Sonja Krause
Plenum Press (Volume B64
NATO Advanced Study
Institute Series) New York,
1981 — \$59.50.**

Electro-optic investigations of polymers and colloids are not used on a routine basis to characterize their structure, but as this volume shows the techniques grouped under electro-optics are capable of supplying a variety of fundamental information intimately associated with structure. Kerr effect, electric linear dichroism and electrically induced fluorescence are related to molecular