

# Book Reviews

**Interfacial Synthesis.**  
**Volume 1 – Fundamentals**  
*Edited by F. Millich and*  
*C. E. Carraher, Jr*  
Marcel Dekker, New York, 1977,  
pp. xi + 298, SFr 113

The editors have planned a two volume book to deal with various aspects of interfacial synthesis. This, the first volume, has ten chapters written by separate authors. The primary purpose of the book is to provide an introduction for chemistry students. This somewhat narrow outlook is emphasized in the first chapter which is written by one of the editors.

Chapters 2 and 3 (by J. H. Rushton) deals with the effects of stirring on heterogeneous reactions. Much of the discussion is at an elementary level and a number of trivial statements appear. Relatively few equations are employed. Unfortunately, these equations are liable to confuse the reader because some of the symbols are defined incorrectly. The author uses a mixture of metric and 'British Standard' units but does not use the SI system. There is a great deal of repetition both within and between the chapters. The English is poor and some sentences are incomplete.

Chapter 4 (by D. J. Goldsmith) discusses two phase synthesis in organic chemistry. A number of two phase reactions are described, although reaction at a phase interface is not a definite feature of all these reactions. With the exception of 'phase-transfer' catalysis, there is little explanation given for some heterogeneous reactions.

Chapter 5 (by J. H. Bradbury and P. J. Crawford) has the title 'Kinetics and Mechanisms'. It is largely concerned with polycondensation reactions and is, in part, an extension of the discussions in Morgan's earlier book. A brief account of mass transfer is given. This is confined to the stagnant-film theory and some of the discussion is duplicated in later chapters.

Chapter 6 (by F. MacRitchie) presents a good account of interface effects on chemical reaction rates. The discussion is laid out in an orderly fashion and the important phenomena are described clearly. Where possible, the treatment is quantitative and examples of experimental procedures for rate measurements are given.

In Chapter 7, L. B. Sokolov discusses the essential features of liquid-vapour interfacial polycondensation. This is followed by a chapter from L. B. Sokolov and V. Z. Nikonov on the macroscopic kinetics of copolycondensation. This is a well written systematic account in which various hydrodynamic conditions are considered. The various cases of mass transfer accompanied by chemical reaction are identified and standard theories are modified to allow for the copolymerization reaction.

A review of relevant aspects of emulsion polymerization (by J. L. Gardon) is given in Chapter 9. This chapter is laid out clearly and various theoretical topics are discussed. A strong emphasis is placed on the author's previous publications and much of the discussion is similar to that found in these publications.

In the final chapter, D. A. Cadenhead and R. E. Baier give an introduction to biological membranes and biological polymers at interfaces. This is a qualitative account which is well-written and contains a number of illustrations. The authors should succeed in their aim of encouraging readers to find out more about these biological systems.

The standard of the book obviously varies from chapter to chapter. It does contain some useful reviews but few students will be inclined to read all of it. Many potential readers will be interested in a few of the topics only and will probably feel that the high cost of the book makes its purchase unjustified.

*B. W. Brooks*

**Advances in Polymer Science:**  
**No. 23 Reactivities**  
Springer-Verlag, Berlin-  
Heidelberg-New York, 1977,  
pp. 136, \$25.60

This particular volume contains four review articles all of which deal with highly topical subjects in polymer chemistry and together reflect the growing maturity of this science. Each deals critically though not exhaustively with the literature up to 1975, and the text provides a very readable and reasonably up to date distillation of published information.

Chapter 1, dealing with polymeric reagents is written by Dr Walter Heitz a pioneer in this field. In contrast to a number of recent reviews on this subject the author has concentrated on the role of the polymer support in these systems, reflecting his parallel interest in gel chromatographic phenomena. As a result the work is perhaps a little lacking in detail concerning some applications, but is extremely valuable in highlighting the advantages and limitations of the support, often overlooked by eager practitioners in synthesis.

Chapter 2 is written by an author associated with the active group at the University of Mainz. It deals with polymers which possess intrinsic pharmacological properties, and polymers as carriers for recognized drug preparations. In the latter case emphasis is placed on the covalent attachment of drugs

to a macromolecular backbone, with only a brief mention of the work on implants containing drug molecules physically encapsulated.

Naturally with relatively little mechanistic information available on the action of low molecular weight drugs, an analogous description of their polymeric counterparts, must of necessity also be rather scant. However, the author has gone to some trouble to provide such details when these are available. Furthermore he has succeeded in minimizing the amount of medical and pharmacological terminology employed, making the review amenable to digestion by organic and polymer chemists. Even a casual reading provides valuable information not normally conveniently available to the latter groups, and represents a very useful insight into this important and expanding field.

Chapter 3 appears somewhat as a surprise since a very similar subject area was covered recently in Volume 20 of this Series. However, a second surprise occurs with the author's success in reviewing this area from a novel point of view. A considerable body of literature now exists on cooperative action in esterolyses catalysed by linear synthetic polymers, and earlier reviews tend to be either somewhat chronological, or to deal systematically with the various linear polymers which have been investigated. The present Chapter, however, gathers the literature together critically under the various cooperative phenomena that have been identified, and as a result provides a more convenient and somewhat less confusing analysis for readers new to the field.

Chapter 4 is again written by an author who is a leading contributor in the field. Cyclic oligomer formation is a particularly complex area not conveniently amenable to mechanistic investigation, and since the presence of low molecular weight species in polymeric materials can have a dramatic influence on their physical properties, an understanding of how they arise is vitally important. Situations where high yields of particular cyclic oligomers e.g. dimers, are obtained are potentially of considerable synthetic importance and the author has drawn attention to these cases. He has also gathered together a large amount of information on a wide variety of oxygen, sulphur and nitrogen containing heterocyclic monomers, and has succeeded in his discussion in distilling some general observations from the many apparently independent systems described in the literature.

The whole Volume maintains the high standard characteristic of the Series and should be an automatic selection for libraries. Many polymer scientists, particularly those interested in the organic/synthetic area may also find a personal copy extremely useful. Potential buyers should not be deterred by a rather strange title.

*D. C. Sherrington*