that is offered is in terms of the excellent electrical and thermal resistances offered by these materials, coupled with their adhesive properties, their ease of preparation, purification and processability, but difficulties that ensue from giving individual materials both separate and inclusive discussion are evident within these chapters. The particular scenes have to be set through repetition of some of the foregoing material. The same treatment is then meted out for epoxy resins prior to a switch to thermoplastic materials and polymers for increased circuit density in interconnection technology. Even though these chapters are free standing, restatements of methods described earlier are still to be found.

The shift away from the classical structure–property considerations associated with the polymers that meet the requirements of conventional electronic applications comes in the later chapters, the first of which is concerned with the behaviour of piezoelectric and pyroelectric polymers. Apart from selected fluoropolymers there are few others that display these properties and this chapter is devoted to the underlying physics. Likewise, the theory behind non-linear optical materials is developed in some detail before any discussion of the known polymer structures that exhibit these effects. The third-order non-linear effects are then singled out for special attention and repetition is again evident as the underlying theory unfolds. Here, there is so little specific mention of polymers that one is left with the distinct impression that a chapter written jointly with the author of the previous paper would have made a single, more satisfactory contribution.

If integration of the molecular science and the technology was a hallmark of all the earlier papers, the one concerned with polymers for optical waveguides is predominantly concerned with circuit structures and design implementation. Given that the technology is still in its youth, this is not surprising, but the chapter does not place polymers, their properties and their processing at the central position suggested by the book's title. This is not a comment that can be applied to the last two chapters which are, respectively, concerned with the Langmuir–Blodgett manipulation of electrically responsive polymers, and the basic concepts of the mechanical behaviour of polymers. However, it is difficult to understand why the last chapter has been placed where it is or, indeed, why it has even been included, unless it has been directed at readers with a background in electronic engineering. It has no direct relevance to the rest of the subject matter, and since the readers of the remainder of the book would have to be well versed in either polymer chemistry, polymer physics or materials science, they should already have a good measure of the understanding it conveys. Regrettably, this last chapter sticks out like a sore thumb and the author does little to put it into context.

The book is securely bound and will withstand years of handling. Published only in hardback, and selling in the United Kingdom at £73.50, it will be purchased by libraries but not individuals. It would nonetheless be a useful reference to have to hand within any university, industrial or government research centres that are concerned with such applications of polymers. It is not going to feed the requirement of day-by-day research, but with its well produced figures and diagrams it will fulfil a useful introductory purpose, and properly place the research in a wider technological context.

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Polymer Chemistry: An Introduction (3rd Edn)

Raymond B. Seymour and Charles E. Carraher (Eds)
Marcel Dekker Inc., New York, 1992, 664 pages, $55.00
ISBN 0-8247-8719-6

This textbook provides an easily readable introduction and essential guidance to the field of macromolecular chemistry for graduate or final year undergraduate students; it also presents the practitioner and technologist with a general review of the subject. There is sufficient material relating to polymer characterization, structure–property relationships, and polymer processing to give a broad overview of the field. This edition covers new topics such as superconductors, enzymes, comparative/synthetic macromolecular structures, geotextiles, solid waste, room temperature vulcanizing agents, polymer degradation and kinetics of biopolymer catalysis.

After a brief note on nomenclature, this book contains 17 chapters, covering a very wide range of topics in polymer chemistry. The text starts with an introduction to polymer science in order to give a general idea about the subject. Chapter 2 covers polymer structure (morphology), including the stereochemistry of polymers and molecular introductions. Both of these subjects have been described very clearly and some problems, useful for students, are also mentioned. The third chapter describes the rheology and solubility of polymers and how the interaction between rheology and thermodynamics is crucial for a complete understanding of the properties of blended polymers. Chapters 4 and 5 are concerned with molecular weight determinations and the areas of physical testing and characterization of polymers with the aid of spectroscopy and thermal analysis techniques. Chapter 6 covers an understanding of natural polymers which is the most rapidly growing area of macromolecules, i.e. DNA, RNA, proteins and polycarbohydrates. Chapters 7–10 deal with the mechanisms and chemical aspects of polymerization reactions, i.e. ionic and complex coordinative polymerization, free-radical chain polymerization and copolymerization. These chapters are well supported by up-to-date and useful examples. Chapters 11 and 12 are concerned with the chemistry and the sources of inorganic polymers containing organic portions which are called inorganic–organic polymers and inorganic polymers such as alkaline silicate glass. Chapters 13 and 14 are brief introductions to the areas of fillers and reinforcements of polymers and also plasticizers, stabilizers, flame retardants and other additives.

This book also contains two useful chapters, Chapters 15 and 16, dealing with chemical reactions of polymers and the synthesis of reactants and intermediates. Again the authors have provided good coverage and clear descriptions of the chemical reactions involved. The final chapter, Chapter 17, gives a brief description of the techniques in polymer technology. In this chapter the reader finds a list of many American companies divided according to their function which are active in the general area of synthetic polymers.

This book also contains useful appendices with the trade names of polymers, structures of common polymers and mathematical values and units. There are numerous useful exercises in most of the chapters with solutions at the end of the book. Overall, this book contains much of value and I recommend it to students seeking knowledge of the basic principles of polymer chemistry and I think it should be in the library of any research group interested in macromolecular science.

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Thermotropic Liquid Crystal Polymer Blends

F. P. La Mantia (Ed.)
Technomic Publishing Co., Basel, 1993, 187 pages, $65.00
ISBN 0-87762-960-9

I was encouraged by the title of this book: blends of liquid crystalline polymers may still prove to be commercially viable despite the downturn in activity amongst many companies, yet I was not aware of