Thermotropic Liquid Crystals, Fundamentals. By *G. Vertogen* und *V. A. de Jeu*. Springer-Verlag, Berlin 1988. xi, 324 pp., hard cover, DM 134.00.—ISBN 3-540-17946-1

The chemistry and physics of liquid crystals is certainly one of the most fruitful areas of modern materials science. However, despite the enormously growing literature there are only a few books available treating this subject. The classical treatise by *de Gennes* ("The Physics of Liquid Crystals", Oxford 1974) is no longer up-to-date, despite the clarity of presentation. The book by *Vertogen* and *de Jeu* aims to fill this gap. It is the clear intention of the authors to focus solely on fundamental aspects of thermotropic liquid crystals.

The book is organized in four sections. Part I is devoted to an introduction of the subject, and gives a very clear descriptive account of the various liquid crystalline phases. Here the reader finds an overview of some more recent developments, such as smectics with bond orientational order. However, other topics of interest such as discotic or polymeric liquid crystals are dealt with in a very brief manner. Part II deals with continuum theory, introduced entirely in tensor notation. Experiments relating to the orientational behavior of liquid crystals are described from a theoretical point of view in Part III. The final part outlines the present state of the theories of liquid crystalline order.

In all chapters the material is treated in a rigorous mathematical way. This makes the book rather tedious reading for the beginner, but is very useful for those who are more advanced in this field. A very thorough introduction of the Landau theory, and the treatment of molecular statistical theories starting from the theory of simple liquids, is certainly of particular interest, since it may not be found in other books. However, the choice of experimental examples has been restricted to only a few selected samples. Consequently the book is not a guide to current experimental work in this field. One wonders if a treatise on thermotropic liquid crystals can virtually omit areas such as polymer liquid crystals or discotics without being regarded as incomplete. Nevertheless, the consistent and vigorous presentation of the selected topics makes this treatise a highly useful and indispensable book for everyone working seriously in the field of liquid crystals.

Matthias Ballauff
Max-Planck-Institut für Polymerforschung
Mainz (FRG)

Synthesis and Separations Using Functional Polymers. By *D. C. Sherrington* and *P. Hodge*. Wiley, Chichester 1988. x, 454 pp., bound, £ 52.50.—ISBN 0-471-91848-2

Coming into prominence some 25 years ago as supports for solid phase peptide synthesis, synthetic functional polymers have emerged as a class of novel materials with a multitude of applications, such as supports for biotechnology, solid phase organic synthesis, and separation techniques, as well as for several other purposes. The obvious advantages of these heterogeneous systems (ease of separation, recycling etc.) have stimulated a great deal of research interest in this area, which is evident from the many research papers and review articles on these topics. During the development of the field it became evident that the technique is far more complex than was initially thought; this warrants careful consideration of the chemical and physical properties of the polymeric supports used, and of optimizing the specific reaction conditions necessary with these systems. To apply them correctly requires a thorough understanding from the standpoints of organic chemistry (or biochemistry) and polymer chemistry.

In bringing out this volume to provide researchers with an in-depth and up-dated overview covering all these aspects, *D. C. Sherrington* and *P. Hodge* have done a commendable job with the help of a group of well-known scientists. By summarizing the published work of many leading practitioners of polymer supported chemistry, this book provides a critical review of some of the most important aspects. The present volume is a sequel to the first book on this topic ("Polymer-supported Reactions in Organic Synthesis") by the same editors, published nearly a decade ago. While some of the chapters of the earlier book have merely been updated since 1979, others are new additions.

The book is divided into eleven chapters dealing with several interesting aspects of the applications of functional polymers in chemical operations (syntheses and separations). It appears that the chapter authors were persuaded to cover the entire story instead of highlighting their own scientific accomplishments. Thus, with the exception of one chapter, a wide and balanced coverage of the specific topics has been achieved.

The book begins with a chapter by *Guyot*, which gives an authoritative and comprehensive account of the design and structural characterization of polymeric supports. Support design appears to be critically important for success in this field. The second chapter by *Hodge* provides a detailed review of the applications of functional polymers in synthetic organic chemistry. Further interesting aspects of the applications of functional polymers covered in this book include: "Polymeric Phase Transfer Catalysts" (*Tomoi* and *Ford*); "Polymeric Models of Reactive Biological Systems" (*Challa* and *van den Berg*); "Polymers in Affinity Chromatography" (*Jervis*); "Polymeric Ligands in Hydrometallurgy" (*Warshawsky*); "Polymer Bound Transition Metal Complex Catalysts" (*Garrou* and *Gates*) and "Use of Chiral Polymers for the Separation of Enantiomers" (*Pirkle* and *Mohler*), which provide valuable information on the state of the art in these research topics. Somewhat more specialized applications are dealt with in the chapters on "Design and Industrial Applications of Polymeric Acid Catalysts" (*Widdecke*), and "Properties of Polymeric Rose Bengals—Polymers as Photochemical Reagents" (*Neckers*). The last chapter of the book, "A Wider Perspective of Polymeric Supports and Reactive Polymers"