

# book reviews

## **Polymer Science in the Next Decade. Trends, Opportunities and Promises**

*O. Vogl and E. H. Immergut (Eds.)*

John Wiley and Sons Inc.,  
New York, 1988, x+284  
pages, £90.00  
ISBN 0-471-63239-2

This book contains the proceedings of a symposium which was held at the Plaza Hotel in New York City 6-7 May, 1985 and honours the 90th birthday of one of the most distinguished founding fathers of polymer science in the world today namely, Professor Herman Mark. Some 500 people attended this symposium and lectures were presented by a number of eminent polymer scientists around the world to honour this event.

Although the contents are diverse, as might be expected for an occasion like this, the book presents an overall theme for the past and future development of polymer science. Numerous dedications are contained in some of the chapters such as Linus Pauling and the US Ambassador of Austria. With regard to the latter the president of Austria awarded Professor Mark with the 'Knight Commander's Great Golden Cross First Class'; a well deserved honour from his country of origin.

The book contains some 24 papers and spans the whole field of polymer science. Flory discusses chain molecules at interfaces, and Perutz engineering new proteins, while chemically active polymers are discussed by Katchalski-Katzir. Polymer supports and modern stereochemistry are discussed by Merrifield and Schlogl, and Wilke covers new catalysts for polymer synthesis. Polymer photochemistry, photoinitiated reactions and stereoregular polymers are covered by Smets, Ranby and Pino while lanthanides for polymerization, conductive polymers and polymeric materials for the future are covered by Baogong, Ogata and Bikales. In the last session of the symposium, papers were presented on radiation effects (Pearce), membrane biology (Ringsdorf), macromolecules and evolution (Eirich), polymers with fluorescent labels (Morewetz), and hydrophilic polymers (Overberger) and drug design (Goodman). Many of the papers discuss novel advances in the field with a view to future developments.

Overall the book of well-produced with clear diagrams, structures and equations and a pleasure to read. Apart from its sentimental value the book provides a useful insight into major developments in

polymer science coupled with a number of interesting perspectives on future trends. Unfortunately at £90 a copy it is very expensive for personal use but nevertheless would form a valuable addition to many journal collections. I look forward to the next 10 years and would similarly like to pass on my congratulations to Herman Mark and hopefully have the opportunity to celebrate his 100th birthday.

*N. S. Allen*  
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## **Polymer Motion in Dense Systems: Springer Proceedings in Physics 29**

*D. Richter and T. Springer (Eds.)*

Springer-Verlag, Berlin, FRG,  
1988, x+307 pages, DM 98  
ISBN 3-540-19167-4

This book consists of the papers presented at a workshop jointly organised by the Institut Laue-Langevin (ILL, Grenoble) and the Institut für Festkörperforschung (IFF, Jülich), which took place at Grenoble in September 1987. The subject of polymer motion in dense systems was considered by the organisers to embrace all types of molecular motion in bulk polymers and polymer melts, but restricted to molecular modelling of this motion very largely in phenomenological terms. The approach is based in many instances on the comparatively recent ideas of de Gennes, and Doi and Edwards, or on earlier ideas of Rouse, Ferry and others. Accepting the limitation that there is little or no discussion of the effects of real structure or morphology, the series of papers collected into this book represents a totally comprehensive view of the present state of the art. Although the papers are essentially written for experts in the field, this reviewer found the review articles which introduce each section of particular value in presenting an up-to-date summary of the appropriate theoretical developments and explaining new experimental techniques. Of especial note, were an exposition of local motion in bulk polymers by Monnerie and co-workers, introducing the application of the techniques of fluorescence anisotropy and  $^{13}\text{C}$  NMR, a review of the use of small angle neutron scattering for studying dynamic properties of polymers by Rennie, an account of the application of photon correlation spectroscopy and Rayleigh-Brillouin spectroscopy to the

study of thermal density fluctuations near the glass transition (Meier and Fischer), neutron spin echo studies of polymer relaxation in melts and the motion of cross-links in rubber networks (Richter, Ewen and Oeser), and the application of light scattering and small angle X-ray scattering to phase separation in polymer blends (Strobe).

This is a book written by experts for experts, but will also be of general value as a library reference. It has been prepared from camera-ready manuscripts, so that the reader must be prepared for the inevitable differences in style and presentation. The reviewer noted comparatively few errors and agreed with the editors in considering that these are acceptable in view of the comparatively rapid publication and the not unreasonable cost of the book.

This book summarises the work of 86 contributors, mostly from France, Germany and England, to the latest developments in a specialised area of polymer science, that dealing with the molecular physics of polymer motion in melts and bulk solids including the dynamics of phase separation in polymer blends. It is valuable to have a permanent record available for general use of what must have been a most rewarding experience for the participants and in spite of the anticipated problems presented by a series of very detailed and in some cases rather idiosyncratic expositions, some of the intellectual excitement of the occasion was transmitted to the reviewer.

*I. M. Ward*  
(University of Leeds)

## **Biological and Synthetic Polymer Networks**

*O. Kramer (Ed.)*

Elsevier Applied Science, Barking, UK, 1988, xii+548 pages,  
£80.00  
ISBN 1-85166-166-2

This volume is made up of 36 papers selected from the 8th Polymer Networks Group meeting held in 1986, and covers a wide range of topical work of three-dimensional crosslinked structures of both biological and synthetic origin. The tone of the book is set admirably by an introductory paper from Burchard's group in which the main features of permanent networks are compared with reversibly gelling systems, drawing together as it does examples from biology

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and the synthetic polymer field. The rest of the book is then divided into five sections, only one of which is on 'Biological Networks'. The remaining four concentrate predominantly on synthetic systems and are grouped under 'Network formation' (which is the largest with 14 papers), 'Characterization', 'Swelling', and a brief three-paper coverage of some recent work on 'Rubber Elasticity'.

The book provides a useful commentary on the interrelation of properties in biological and synthetic polymers and the

common techniques which can be used to study both types of macromolecules. It does suggest that the polymer community should pay more attention to some biological material research and this tends to be supported by the fact that only eight of the papers deal specifically with the natural macromolecules. The editor has, however, been able to strike a better balance between the theoretical papers and those purely devoted to experimental observations. There is also sufficient to catch the interest of the general reader

who, for example, may have been unaware that a spider spins the radial and guy line fibres of its web from one type of silk and the spiral lines from another.

For the specialists working in the area this book provides much information of considerable interest both specific and general, and can be recommended as a welcome addition to the library shelves but I doubt few will feel able to find £80 to acquire a personal copy.

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