

only one chapter of a different nature, viz. a review of ^{13}C relaxation studies of bulk polymers (mainly by the author) which demonstrates both the potential of this kind of study and the difficulties of interpretation involved.

The chapters of vibrational spectroscopy are in general of the nature of reviews except for a short one on studies of γ -aminopropyltriethoxysilane adsorbed on bulk iron. They cover the applications of Raman spectroscopy to biopolymers, of Fourier transform (FT) i.r. spectroscopy both to optically dense materials such as coal, and to synthetic polymers which are usually optically less dense materials. In these latter studies it is really the computer (necessarily attached to a FT instrument, rather than the FT technique itself, which is shown to be a useful tool for manipulating spectra). As admitted by the authors, most of the manipulations could be done using a conventional spectrophotometer and a separate computer, though perhaps less conveniently. One chapter is devoted to dynamic infrared studies of synthetic polymers. The mass spectroscopic studies described are concerned with thermal and mechanical degradation and combustion of polymers and the characterization of the products.

The book is well produced and contains much interesting and stimulating material on a wide variety of experimental techniques applied to a very wide range of types of polymer system.

D. I. Bower

Developments in Chromatography - 1

Edited by C. E. H. Knapman
Applied Science Publishers Ltd.,
1978, pp 245

Chromatographic techniques have been studied actively in recent years, and a review of the significant developments is most welcome. There are now so many forms of chromatography which are used widely as analytical and preparative techniques in all branches of chemistry that only a limited number of the more important developments can be selected for critical review in a volume of just over 200 pages. The range of chromatographic techniques is well illustrated by the chapter on 'Chromatography in Forensic Science' by R. N. Smith who describes many procedures and applications. This chapter does degenerate into a catalogue of references in places and the reader can only refer to the original papers for details.

In view of the breadth of chromatography today, this reviewer with interests in the chemistry of synthetic polymers was pleasantly surprised to find two chapters directly relevant to polymer characterization. The chapter on 'Polymer Molecular Weight Distribution by Gel Permeation Chromatography' by Hatt is a more general review than the title suggests. The author reviews the theories of the g.p.c. mechanism, calibration, resolution, and practical aspects in detail, but the problem of chromatographic inter-

pretation is described briefly. The comprehensive table on column packings is particularly useful. The chapter on 'Developments in Continuous Chromatographic Refining' by Barker indicates how preparative polymer fractionation may be performed by alternative methods to the direct scale-up of analytical procedures. Continuous processes utilize more of the column, and countercurrent, crosscurrent and cocurrent flow processes are reviewed from a chemical engineering viewpoint. Results for several separations of polymers by a g.p.c. mechanism are described.

The remaining three chapters are more appropriate to chemists characterizing low molecular weight additives in polymers by gas chromatography. The chapter by Vernon covers the thermodynamic aspects of solute-solvent interactions for liquid stationary phases. This chapter is restricted to low molecular weight liquids or low polymers as stationary phases, and a discussion of high polymer stationary phases is omitted. The procedures for the separation of isomers described by Sharples will be of interest to those involved with identifying chemically similar additives in polymers. Finally, the experimental operation and scope of a range of detectors are covered in a chapter by Grant.

In summary, this volume, which contains many references to papers published in 1977, should be acquired by a library serving a laboratory interested in chromatographic separations.

J. V. Dawkins

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