

however, in a subsequent article 'Styrene' (M. H. GEORGE), in which mechanisms of initiation, primary radical termination, retardation and inhibition, and stereoregularity are discussed in rather more detail.

Specific aspects of free-radical polymerization mechanisms are treated in detail in those chapters where they have particular relevance. Transfer processes and emulsion polymerization occupy a large portion of the article on vinyl acetate polymerization (M. K. LINDEMANN) which contains many references to the Japanese literature (this article has almost 600 references). The chapter on vinyl and vinylidene chlorides (G. TALAMINI and E. PEGGION) is largely devoted to a consideration of the effects of polymer precipitation on the kinetics of the bulk polymerization of vinyl chloride. This topic is also covered briefly in an article on occlusion phenomena in general (A. D. JENKINS), which concentrates on the polymerization of acrylonitrile, but also discusses polymerization in the presence of precipitants. Two articles are concerned with monomers having more than one polymerizable group, namely cyclopolymerization of non-conjugated diolefins (W. G. GIBBS and J. M. BARTON) and acrolein (R. C. SCHULZ). Finally, the book contains an extensive account of heats of polymerization (R. M. JOSHI and B. J. ZWOLINSKI) which includes discussions of bond-energy schemes, experimental methods and the implications of the results.

On the basis of one half of the vinyl polymerization section it is difficult to judge how comprehensive the whole series will be, but at least there is a considerable amount of useful information and references on particular aspects. The series will undoubtedly be a useful addition to the library shelves but the price may preclude private purchase.

G. C. EASTMOND

Water-Soluble Resins, 2nd Edition

Edited by ROBERT L. DAVIDSON and MARSHALL SITTIG. Reinhold: London, 1968.

6 in. × 9 in. 234 pp. 140s

THE second edition of this book is an enlarged, up to date and compact review of water-soluble polymers which find increasingly wide application in many diverse industries as product improvers and essential processing aids.

The introduction clearly defines the types and functions of these various compounds which may be classified as natural, modified natural or synthetic in origin, and it goes on to mention briefly some properties related to electrochemical and rheological behaviour. In view of the practical importance of these characteristics a more detailed treatment would not have been out of place even though these aspects as they relate to certain specific polymers, are given more prominence in some of the later chapters.

Each of the following chapters covers a different class of water-soluble polymer and is self-contained, often presenting much new information. The authors would always appear to be associated with particular manufacturing companies which, in a work of this type, can have obvious advantages. The text which stresses practical applications, is presented objectively and without competitive commercial bias.

Starch is unfortunately the only representative in the book of the natural gums. The important basic properties of native starches are described in some detail and chemically modified starches are dealt with clearly but more briefly. This chapter includes a large number of useful references for those interested in further reading.

The growing importance of water-soluble cellulose ethers is reflected in the increased space allotted to this subject and now covered by three chapters describing methyl (including hydroxy propyl methyl) cellulose, hydroxyethyl cellulose and carboxymethyl cellulose. These represent the principal commercially available varieties and for each there is some description of the preparation, properties and uses. Much useful data are given on rheological behaviour such as the viscosity/shear relationships to be found in high viscosity non-Newtonian solutions. In dealing with the various applications an attempt has been made to detail the different properties which make the cellulose ethers particularly suitable. This pattern is maintained to a large degree in the remaining chapters which cover the true synthetic water-soluble resins. These are polyvinyl alcohol, polyvinyl pyrrolidone polyacrylic acid and its homologues, polyacrylamide, ethylene oxide polymer and polyethylene imine.

Polyethylene oxide and polyvinyl alcohol in common with the cellulose ethers give strong flexible water-soluble films and some information is disclosed on the preparation and possible uses of the films. The data relative to polyethylene oxide are quite detailed in this respect.

The chapters on polyacrylic acid derivatives including polyacrylamide cover a broad spread of information and deal very effectively with different methods of polymerization and the physical and chemical properties of the types available. The somewhat unusual polyvinyl pyrrolidone, a fall-out from the high pressure acetylene chemistry of REPPÉ is also well described.

The final chapter is entirely new to this second edition and describes some different ethylene imine polymers. These materials which are cationic and react in some ways similarly to simple amines have only recently become available commercially. A number of application areas including adhesives, ion exchange resins, photography and textiles are specified.

This volume makes no pretence of being a theoretical treatise and its practical approach should be of value to anyone concerned with the everyday problems of thickening, binding or emulsifying aqueous systems.

H. BATES

Applied Spectroscopy Reviews, Volume I

Edited by E. G. BRAME Jr. Marcel Dekker: New York, 1968. 6 in. × 9 in. 456 pp. \$16.50

THIS is the first volume of a continuing series covering '... the entire field of spectroscopy ... applied to the various fields of science ...'. The reviewer can see no point in publishing a series having such wide terms of reference, especially as duplication of effort has already resulted from the proliferation of much more specialized series dealing with recent advances. The articles in volume one are of a high standard and spectroscopists will regret that personal copies will be a luxury on account of the low fraction of material that will be of direct interest to them. Chapter 1 is entitled 'Atomic fluorescence spectrometry' and is a short comprehensive account of this new development in flame photometry. Basic theory is presented and useful comparisons are made with cognate methods. The next chapter, 'Integrated intensities of adsorption bands in infra-red spectroscopy' points out the difficulties encountered in measuring absolute intensities and gives a useful compilation of data (including a correlation chart) for a wide variety of structural units. Chapter 3 is an interesting account of 'Internal reflection spectroscopy': this is an aid useful to infra-red spectroscopists working with solid or liquid samples. The following chapter 'Methods and applications in the examination of small samples by high-resolution n.m.r.' is an excellent exposition of the optimum conditions required by microcells, spectrometer settings and signal enhancement techniques in the pursuit of high sensitivity. Chapter 5 covers developments in 1965 and 1966 in 'Chemical far infra-red spectroscopy' in the areas of instrumentation and techniques but it deals mainly with applications to organic and inorganic compounds in this 300 to 10 cm^{-1} region. Chapter 6 will be of the most interest to readers of *Polymer*, namely, 'The examination of polymers by high-resolution nuclear magnetic resonance'. This is a useful collection of experimental methods and of configurational data obtained for a wide variety of polymers. The following chapter, 'Infra-red spectra of adsorbed molecules' is a review of techniques and vibration spectra observed for molecules adsorbed on metals and on metal oxide surfaces. The final chapter on 'Instrumentation, special characteristics and applications of soft X-ray spectroscopy' describes methods of X-ray excitation, dispersion and detection and also includes data on inorganic materials.

L. H. SUTCLIFFE

Treatise on Coatings, Volume I. Film-Forming Compositions, Part 2

Edited by R. R. MYERS and J. S. LONG. Marcel Dekker: New York, 1968. 6 in. × 9 in. xl+434 pp. \$28.75

THIS book is the second out of three comprising Volume II of what is going to be a monumental, comprehensive, but very expensive reference work on Paint Technology. The work