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Book reviews

Sourcebook of Advanced Organic Laboratory Preparations. Edited by Stanley R. Sandler and Wolf Karo, Academic Press Inc., 1992. 332 pp. Price £44.00. ISBN 0-12-618506-9.

Along with the expanding utilisation of polysaccharides, there is a growing demand for synthetic methods which facilitate selective structural modifications in order to affect, or ideally tailor, product properties such as viscosity, hydrophilicity/hydrophobicity, polyelectrolyte characteristics, gelation and metal chelating capacity.

One of the most important applications is the synthesis of analogues of natural polysaccharides, such as dextran, heparin or xanthan gum. In the biomedical context, selective chemical procedures are of interest in areas such as structure, activity elucidation or activity modification of biologically active polysaccharides, and for the preparation of conjugates of polysaccharides and biological substances. Selective modification is also of interest in polysaccharide application involving the preparation of selective permeable membranes, matrices for drug delivery, and controlled release formulation, and are also of considerable value for the synthesis of branched polysaccharides.

'Sourcebook of Advanced Organic Laboratory Preparations' is designed as a concise reference text, looking at the manipulative technique and apparatus involved in organic synthesis. Emphasis is placed not only in simple organic compounds but also on polymers. Each chapter describes the synthesis of a given class of compound and is preceded by a general discussion outlining the salient features of the investigation. Each experiment illustrates an important reaction ensuring that all the practical skills required of an organic chemist are developed along the way, and the importance of safety in the laboratory is stressed throughout the book.

This book will undoubtedly prove useful to all students and industrial chemists as a convenient source of synthetic procedures or as a guide to choose the synthetic routes. In addition, appendices provide useful information about documentation of product and process research and development, and provide some guidance in record keeping, instructions for laboratory records, and electronic record keeping for patent purposes. However, as it provides only outline information it can only be used as a starting point to the reader interested in this field.

The improvements that we suggest be taken into account during forward planning for the next editions of the book are that the apparatus, instruments and chemicals required for each experiment should be listed at the beginning of each procedure, and estimations should be given for the amount of time necessary to complete each experiment.

Zilda M.B. Figueiredo
John F. Kennedy

Thermoreversible Gelation of Polymers and Biopolymers. By J. Guenet, Academic Press, London, 1992. xi + 280 pp. Price £40.00. ISBN 0-12-305380-3.

Thermoreversible gelation is a rapidly growing and important area of polymeric and biopolymeric science, and encompasses a variety of different systems. It can be regarded as a relatively new science, with the majority of research occuring in the last 25 years. Put simply, thermoreversible gelation is generally concerned with the storage of a liquid in a 'solid' way by using a gel. A gel is capable of incorporating and retaining a proportion of liquid which far outweighs its own basic components. In some cases gels can contain upto 99% solvent. To date, no single work has aimed to bring all of the varied and abundant literature concerning thermoreversible gelation together. This, however, is the aim of 'Thermoreversible Gelation of Polymers and Biopolymers'. It achieves this by relying mainly on experimental results (few theories for gels have been expounded) from electron and optical microscopy, light scattering and diffraction techniques.

The volume consists of three main chapters dealing with gel formation, gel morphology and molecular structure, and mechanical properties and rheology. Each chapter is divided into two main sections. The first of these deals with synthetic polymers, the second with biopolymers. This arbitrary division is an excellent idea because it allows the biopolymer scientist to access directly the information which is of interest without wading through reams of synthetic polymer date (and vice versa). Other good points include an excellent index

and table of contents, a clear writing style and a multidisciplinary approach. This makes for an excellent volume which should be of use to polymeric and biopolymeric scientists in a variety of different fields. The biopolymeric aspects of the volume will be great interest to the readership of this journal.

John F. Kennedy
David W. Taylor

Immunoassay — A Survey of Patents, Patent Applications and Other Literature 1980–1991. Edited by Judith Sigmond, Bernard Salomons and Marten Terpstra, Elsevier Applied Science, London, 1992. viii + 292 pp. Price US$220.00. ISBN 1-85166-866-7.

Immunologists employ a number of techniques which are common to other biological sciences. For example, the gene structure of immunologically important molecules has been elucidated by molecular biological techniques, while the methods used to isolate antigens and antibodies are those of biochemistry and protein fractionation. However, immunology has developed a great number of its own techniques, particularly those based on the specificity of the antigen–antibody interaction. These are finding increasing use in many of the biological sciences, e.g. in the quantification of low concentrations of antigenic molecules and in the identification of particular antigens. Currently, investigation of the antigenicity of oligosaccharides is of significant interest, especially in the biochemical and medical fields.

'Immunoassay' provides a literature review (patents, patent applications and other literature, such as journal articles) of the many immunological methods now available. The first of the three main chapters brings together non-antigen specific methods, apparatus and kits for immunoassay. It includes enzymatic, fluorescence, luminescent, optical and colorimetric immunoassay methods, radioimmunoassay, other methods and reagents. The second chapter covers immunospecific methods, such as immunological tests for tumours, veneral diseases, hepatitis, diabetes, rheuma, allergies, heart diseases, pregnancy, urine, thyroid, interferon, bacteria, fungi and testing cattle. The third chapter focusses on devices, i.e. apparatus, strips, tubes and miscellaneous. This is then followed by a list of patentees.

The information in this book serves as a valuable guide for those active in the field, especially immunologists, chemists, pharmacologists and bioengineers. However, it will probably be accessed by reference and borrowing rather than personal purchase because of its high price.

Marion Paterson
John F. Kennedy

Industrial Gums — Polysaccharides and Their Derivatives — Third Edition. Edited by Roy L. Whistler and James N. BeMiller, Academic Press, Inc., San Diego, 1993. xi + 642 pp. Price £105.00. ISBN 0-12-746253-8.

Polysaccharides or gums are found in nearly all plant and animal tissues. In many instances, the exact role in nature of these polysaccharides is not known. However, it appears that several function either as energy resources or as structural components.

The commercial usefulness of most gums is based on their ability to alter the basic properties of water. The major uses of gums are as thickening agents, suspending agents, film-forming agents, water-retaining agents, coagulants, colloids, and lubricants. Gums are used extensively in laundry products, textiles, adhesives, paper, paint, and foods. Nearly all gums have a combination of food and industrial application.

The third edition of 'Industrial Gums' provides an up-to-date coverage of gums and their uses. It also includes the recent progress in the understanding of the physical and biochemical behaviour of polysaccharides, and the molecular basis for their various properties.

The opening chapter, by R.L. Whistler, outlines briefly the factors which affect raw gum costs; the industrially valuable properties of gums; chemical modifications of gums, as well as the sensory perception and nutritional characteristics of gums.

The first ten chapters bring together detailed information on conformational origins of polysaccharide solution and gel properties; chemical modification of gums; biosynthesis of extracellular polysaccharides; agar; algin; carrageenan; guar, locust bean, tara and fenugreek gums; aloe, chia, flaxseed, okra, psyllium seed, quince seed and tamarind gums; and pectin. The other chapters discuss hemicelluloses; exudate gums; xanthan, gellan, welan and rhamsan; dextran; curdlan; pullalan; scleroglucan; cellulose derivatives; starch-based gums; chitin; and analysis of gums in foods.

Each chapter provides an interesting reference work of direct relevance to those involved in the research, development and teaching of the subject.

Marion Paterson
John F. Kennedy