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Book reviews

Infrakrasnye Spektry Pektinovyh Veschestv (*Infrared Spectra of Pectic Substances*), by M. P. FILLIPPOV, edited by G. V. LAZUR'EVSKY, approved by the Institute of Chemistry of the Academy of Science of the Moldavian SSR, "Shtiinza" Publishers, Kishinev, USSR, 1978, 75 pages, 14 × 21.5 cm, paperback, 780 copies published, Rubles 0.70 (~$1.00).

This little book is a personalized approach to the application of infrared (i.r.) spectroscopy to the structural study of natural pectins, *i.e.*, galacturonoglycans, and related acidic polysaccharides found in plants. The book, primarily designed for carbohydrate chemists working in the field of polysaccharides, is a monograph consisting of six chapters. In the Introduction (Chapter 1; 2 pages, 45 references), the author surveys the natural sources of acidic polysaccharides, and includes some references to the biological and physiological importance of pectins. The survey also cites literature on the chemical modification of pectins, and their identification by i.r. spectroscopy, as compared with published data [R. S. Tipson, *Infrared Spectroscopy of Carbohydrates*, NBS Monograph 111 (1968)].

The author next (in Chapter 2; 9 pages, 1 Table, 5 Figures, and 24 references) deals with methods of preparation of samples for i.r. measurements: KBr pellets, mulls, and films, and derivatization and deuteration on films. Good homogeneity of pectin samples by use of lyophilization was achieved on films; the technique included direct evaporation of an aqueous solution on AgCl, CaF_2, polyethylene, paraffins (in the case of starches), or Plexiglass (agar), or direct pressure for water-insoluble polysaccharides (cellulose). The interfering water in the KBr pellet (bands at 3400 and 1630 cm^{-1}) can be considerably lessened by treating the pellet *in vacuo* during 1 h at 60–80°.

The following segment (Chapter 3; 26 pages, 9 Tables, 14 Figures, and 29 references) analyzes in detail the absorption bands in the i.r. spectra of pectins and such derivatives as acetates, amides, and salts; the i.r. spectra of pectins from various plants and from different types of grape are also discussed. The i.r. spectra of pectates of mono- and di-valent metals generally show a similar pattern, except for bands due to the carboxyl groups. For example, Li^+ pectate shows ν_{sym} (CO_2^-) at 1423 cm^{-1} and ν_{asym} (CO_2^-) at 1617 cm^{-1}, in contrast to Pb^{2+} pectate, showing ν_{sym} (CO_2^-) at 1408 cm^{-1} and ν_{asym} (CO_2^-) at 1580 cm^{-1}.

The next chapter (Chapter 4; 14 pages, 5 Tables, 2 Figures, and 17 references) describes the i.r. techniques used in the determination of functional groups in numerous pectins; these include selection of a standard and conditions for measurement and determination of (*a*) the orientation of carboxyl groups, (*b*) the extent of methylation of carboxyl groups, (*c*) the replacement of hydrogen atoms in carboxyl groups by metal ions, (*d*) starch and pectin in a mixture, and (*e*) protein in pectin.

The action of various reagents on pectins is also of concern to the author (Chapter 5; 14 pages, 2 Tables, 7 Figures, and 25 references); for example, interaction with metallic cations, and the effect of mineral acids and alkali. The chapter also describes methods for the isolation of pectins from plants.

In conclusion, in Chapter 6 (1 page), the author advocates the usefulness of i.r. spectroscopy in determination of the structure of polysaccharides; he considers that it can differentiate between secondary and tertiary pectin structures, depending on whether their carboxyl groups are present as methyl esters, or are free, or combined with metal ions. The book ends with a Table of Contents, but Subject and Author Indexes are not provided. In general, the monograph is scientifically sound, and is written by a specialist who is actively involved in the field, as evidenced by 25 references to his own work.

This monograph may now be supplemented by i.r. spectra of disaccharides in the region 1000–40 cm^{-1} [V. M. Tul'chinsky, S. E. Zurabyan, K. A. Asankozhoev, G. A. Kogan, and A. Ya. Khorlin, *Carbohydr. Res.*, 51 (1976) 1–8] and cello-oligosaccharides and cellulose over a wide range of temperature [H. Hatakeyama, C. Nagasaki, and T. Yurugi, *ibid.*, 48 (1976) 149–158]. The author has promised to include new information in a supplementary edition.

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Radiation Biology and Chemistry: Research Developments, Studies in Physical and Theoretical Chemistry: Volume 6, edited by HAYDN E. EDWARDS, SUPPIAH NAVARATNAM, BARRY J. PARSONS, AND GLYN O. PHILLIPS, Elsevier Scientific Publishing Company, Amsterdam, Oxford, and New York, 1979, xiv + 505 pages + Author and Subject Indexes, List of Participants, Dfl. 160.00, U.S. $78.00.

This book provides a record of the Proceedings of the Association for Radiation Research Winter Meeting, January 3–5, 1979, held at Cartrefle College of The North East Wales Institute of Higher Education, Clwyd, Wales, United Kingdom. The meeting was dedicated to honor Alma Howard and Michael Ebert, a husband and wife team, long associated with the Paterson Laboratories of the Christie Hospital and Holt Radium Institute, who are retiring from full-time research.

The Weiss Medal was awarded to John P. Keene for achievements in pulse radiolysis. Keene is also associated with the Paterson Laboratories. His medalist lecture was "Fast Reaction Techniques".

The forty-six papers survey research developments during the 1960s and 1970s in radiation chemistry and biology, with special emphasis given to the interfaces between the disciplines of chemistry, biochemistry, and biology. Pulse radiolysis was