Publications

Book reviews

Coordination Polymerization, edited by Charles C. Price and Edwin J. Vanderberg (Polymer Science and Technology, Vol. 19, Plenum Press, Plenum Publishing Corp., 233 Spring St., New York, NY 10013, 1983, 329 pp., $42.50).

This volume contains 15 papers reporting on recent advances in selectivity in vinyl and ring-opening addition polymerizations at a symposium to celebrate the ACS award in Polymer Chemistry presented to Edwin J. Vanderberg in 1981. It is perhaps the most up-to-date selection of reports on the subject. It offers a good deal of information and is a fine contribution to the series.

The first chapter by C. C. Price is an introductory one entitled "Selectivity in Addition Polymerization." The second by E. J. Vanderberg details his involvement in this polymerization method from its inception. He also discusses the first synthesis of isotactic poly(R-glycidol) and isotactic poly(R,S-glycidol).

Other chapters report on the polymerization and copolymerization of monomers such as epoxides, oxiranes, methyl ω-epoxy-alkanoates, *cis* and *trans* thiiranes, alkyl vinyl ethers and a variety of olefins by novel and complex coordination catalysts having high productivity and, in some cases, stereospecificity. The mechanistic aspects of coordination polymerization are covered in a separate chapter, although most attempt some elucidation of the reactions. This one by Russian Academy workers will be interesting to the donor-acceptor school. In some cases, recipes and detailed conditions are given but the important ones already have been covered in patents. The index appears to be quite adequate.

"Coordination Polymerization" is recommended reading for all those involved in polymer science. Each of its chapters is pertinent to the subject and well prepared by experts with worldwide reputations.

Thermodynamics of Polymer Solutions, by Michio Kurata (MMI Press Polymer Monograph Series, Vol. 1, Harwood Academic Publishers, PO Box 786, Cooper Station, New York, NY 10276, 1982, 294 pp., $94).

This textbook is an English translation of three of the four chapters of Professor Kurata's book in Japanese concerning more recent developments in the theory of the equilibrium properties of polymer solutions. The translator, Hiroshi Fujita, points out that the content of this volume is fully consistent with the title. It provides a very clear and concise theoretical treatment of the thermodynamics of polymer solutions containing chapters on sedimentation equilibrium, light scattering and introducing the thermodynamics of polymer solutions after the chapter on thermodynamics of solutions. Throughout the chapters, each topic is given thorough mathematical treatment with some derivations. In the chapter on light scattering, Professor Kurata explains the Bernoulli, Gaussian, Poisson and most probable distributions for polymers, then moves into fluctuations of molecular number density, distribution functions, Tyndall-Rayleigh scattering and polarizability. The mathematical treatments of light scattered from polymer solutions and from copolymer solutions are considered separately and thoroughly.

Polymer fractionation according to molecular weight by cooling liquid phase solutions is discussed as well as precipitation and extraction. A limited explanation of molecular weight distribution and average molecular weight is presented, but nowhere in the book is found the term "dalton."

The emphasis is on the theoretical. There are no practical examples in detail. The index consists of four pages but this may be adequate. It is a small book with less than 300 pages. An appendix explains partial derivatives, homogeneous functions, vectors, dyadics, orthogonal transformations and the electric field of scattered light.

In summary, because of the high cost and in spite of the excellent printing, one can find a better buy in some other books on this subject. For example, "The Principles of Polymer Chemistry" by P. J. Flory and "Physical Chemistry of Macromolecules" by C. Tanford, although not recent books, present much of the same material.

I recommend this book to polymer science students as supplemental reading in the library.

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