

Book review

Inorganic and Organometallic Polymers; edited by M. Zeldin, (Indiana-Purdue University Indianapolis), K.J. Wynne (Office of Naval Research, Washington), and H.A. Allcock (Pennsylvania State University) ACS Symposium Series 360, American Chemical Society, Washington DC, 1988, xii + 512 pages, ISBN 0-8412-1442-5

This book, compiled from presentations at an American Chemical Society meeting in April 1987, has as subtitle "Macromolecules containing Silicon, Phosphorus, and Other Inorganic Elements". (I know what inorganic chemistry is, but what is an inorganic element? Any except C? Or any except C, H, O?) There are seven main sections: on Polysilanes and Polycarbosilanes, Polysilazanes and Polysilazoxanes, Polysiloxanes, Polyphosphazenes, Organoelement-Oxo Polymers derived from Sol-Gel Processes, Boron-containing Polymers, and Other Metal- and Metalloid-containing Polymers, together with an introduction by one of the editors and much better indexes than are normally found in volumes of symposium proceedings. Within each section there are authoritative reviews of current knowledge by leading researchers and summaries of recent work from university and industrial laboratories. The amount of detailed information given in the book is impressive and the references extensive, so the articles here should provide an excellent introduction for anyone embarking on research and stimulate those already involved in it.

Interest in inorganic polymers by funding agencies and industry has been cyclical. There was a surge in the 1950's and 1960's, very little in the 1970's, and a new boom over the last few years. If the contents of the present book are compared with those of a similar volume published in 1961, we see how the emphases have changed. The most studied inorganic polymers are still those with chains of rings of alternating main group elements (e.g. Si–O, B–N, P–N) with pendant organic groups, but the approach is much more interdisciplinary than it was. Thermal stability is not the only important physical property: chemists work with physicists and materials scientists on electrical, magnetic, and photochemical measurements, and with process engineers to ensure that the complex chemical reactions during fabrication of components are properly understood. Inorganic polymers are also seen as precursors to ceramics, both those such as SiC or BN that are already known, and new materials containing combinations of several different elements such as Si–C–N–O or Si–N–Al–O.

This thought-provoking and useful book provides a clear assessment of the present state of research on inorganic polymers and indicates some of the directions in which the subject is growing. It should assist in the development of much new work.