

Book review

New Monomers and Polymers; by Bill M. Culbertson and Charles U. Pittman, Jr., Plenum Press, New York and London, 1984, xi + 494 pages, US\$59.50. ISBN 0-306-41477-5.

The main applications of organometallic polymers are as catalysts, absorbers of ultra-violet radiation, semi-conductors and as reagents to prevent fouling of surfaces. Obviously, they can be prepared by polymerizing corresponding organometallic monomers but an alternative route consists of adding organometallic moieties to existing organic polymers. Organometallic monomers and polymers are featured at several points in this book, although they are by no means its sole concern, and attention is drawn here to the relevant chapters.

Polymers containing platinum or palladium are easily synthesised by mixing aqueous solutions of a suitable difunctional transition metal compound and a complementary difunctional organic substance, from which mixture the desired polymer precipitates. Such reactions, together with structural characterization of the products, are discussed in two chapters (pp. 133–162); apart from the interest inherent in molecules of this unusual type, polymers afford a possible method for minimizing the undesirable, even lethal, side-effects of Pt and Pd compounds that are effective in the treatment of tumours.

The other organometallic items in this volume are not medically oriented. Thus, organometallic polymers may contain the metal moiety close to or far removed from the locus of polymerization, and they exist in many different structural forms, some of which are well-known. The chapter beginning on p. 243 reports the synthesis of a number of new examples of the η^5 -vinylcyclopentadienyl type.

On p. 269 we find a short chapter devoted to the preparation of polymers for application in connection with inertial fusion, the process by which nuclear fusion of deuterium and tritium produces helium plus a neutron which is absorbed by lithium with concomitant release of energy. Targets for such a process require a rather complicated layer structure, and the pre-heat shields must be generally composed of atoms of low atomic number containing up to 4% of atoms with atomic number 70 to 85. This article is concerned with the preparation of polymers appropriate for pre-heat shields and which contain lead, ruthenium, osmium or tungsten.

The chapter beginning on p. 329 reviews the use of alkyllithiums as initiators for the polymerization of myrcene, 3,7-dimethyl-2,6-octadiene. (N.B. The text of pages vi and vii should be interchanged.)