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Book Review

***Metathesis Polymerization of Olefins and Polymerization of Alkynes*, edited by Y. Imamoglu, NATO ASI Series C 506, Kluwer Academic Publishers, Dordrecht, 1998, xv + 443 pp., ISBN 0-7923-4941-5; US\$214.00**

This book collects the results of the NATO Advanced Study Meeting held in Akcay, Turkey, in September 1995, devoted to ring-opening metathesis polymerization (ROMP), acyclic diene metathesis (ADMET) and alkyne polymerization. It includes the main and short lectures presented at the workshop, a total of 26 contributions written by some of the major authorities in the field. It is divided into three sections: (I) Metathesis polymerization of olefins, ROMP and ADMET (356 pages, 21 chapters); (II) Alkyne polymerization (34 pages, 2 chapters); and (III) Molecular modelling and alkene polymerization (50 pages, 3 chapters). A previous volume in this NATO series is dedicated to olefin metathesis and polymerization.

Schrock gives a fine account of the use of molybdenum imido alkylidene complexes in the ROMP of olefins. The use of well-defined catalysts has allowed the initial olefin attack and the influence of the forming isomers (rotamers) in the polymer structure to be studied. The effects of temperature, as well as other factors, are also discussed. Living polymerization of alkynes by the same type of complexes is also considered and well discussed by the same author in Section II. Basset and coworkers present the utilization of aryloxide tungsten complexes in olefin metathesis. In another chapter, they provide a good overview of some industrial applications of this reaction. Wagener gives a thorough description of the ADMET polymerization and its use in producing a wide variety of hydrocarbon and functionalized polymers. He also reports an interesting approach to metathesis depolymerization and its application as a medium for polymer recycling. The current importance of such an argument makes this contribution quite attractive. Noels and Demonceau describe the use of new ruthenium-based catalysts in olefin metathesis and the dichotomy of cyclopropanation versus metathesis of olefins using late transition-metal complexes. Makovetsky and coworkers outline

the utilization of non-traditional catalysts in the ROMP of cycloolefins and in the addition polymerization of norbornene. Additionally, they present the synthesis of permeable and permselective polymers, membrane materials, by ROMP of norbornenes. The ROMP of cycloolefins is discussed by Dragutan and coworkers in two chapters. The first provides a systematic study of the correlation between the nature of the catalyst and polymer selectivity in WCl_6 -based systems. The metathesis of unsaturated organosilicon compounds is reviewed by Finkelshtein, whereas recent developments in the synthesis of graft copolymers and fluorinated homopolymers and block copolymers through living ROMP are examined by Khosravi. Two contributions consider the preparation of optically active polymers by ROMP of enantiomerically pure monomers and the synthesis of soluble conjugated polymers with optical properties. Additional subjects considered in Section I are: the study of the initiation, propagation and termination reactions in olefin metathesis; the metathesis ring-chain equilibrium in cyclobutene and related systems; the quantitative determination of the microstructure and composition of crosslinked rubber blends; and the preparation of liquid crystalline polymers via ROMP.

Finally, the following topics are surveyed in Sections II and III: catalytic reactions of alkenes and alkynes in the presence of Group 6 metal carbonyls, ethylene polymerization, the substitution effect in chromocene derivatives, and polymer formation from α,β -unsaturated carbonyl compounds. The final chapter deals with a detailed molecular modelling study of tungsta-carbenes in olefins metathesis (the complete parameter set is available from the authors).

The volume assembles a number of useful contributions covering a broad spectrum of subjects and important aspects of olefin metathesis and alkyne polymerization. In spite of the heterogeneity of such edited books, which sometimes are a collection of unconnected contributions, the present volume has a high level of comparable and coordinated sections. Although it is aimed at specialists, some chapters are written in a didactic style and, in general, the book can be recom-

mended as a useful tool for introducing a new researcher to the area of olefin and alkyne polymerization. Given the great activity in this field, a shorter publication process would have been desirable in order to avoid rapid outdateding of the contents and some overlap with other reviews or recent books.

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