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A Review of "Design and Synthesis of Conjugated Polymers"

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Book Review

Design and Synthesis of Conjugated Polymers, edited by M. Leclerc and J.-F. Morin, Wiley-VCH Verlag GmbH & Co., Weinheim, 2010, ISBN 978-3-527-32474-3, xv +363 pp, $215.00. This volume is also available as an E-book.

Conjugated Polymer Synthesis: Methods and Reactions, edited by Y. Chujo, Wiley-VCH Verlag GmbH & Co., Weinheim, 2010, ISBN 978-3-527-32267-1, xv +313 pp, $215.00. This volume is also available as an E-book.

The considerable current interest in electrical and optical properties of conjugated polymers such as electroluminescence, photovoltaic effects, and related sensor activities has been powered by a considerable amount of synthetic chemistry, much of it innovative. This chemistry is the subject of these two books.

From their titles, it might appear that these two books would have a lot in common. What they have in common is that both books have a heavy emphasis on the synthetic methodology and relatively little detail on the physical properties of the conjugated polymers. The two books have one set of authors in common: I. Osaka and R.D. McCullough wrote articles dealing with synthetic approaches to regioregular poly-3-alkylthiophenes. While the two chapters cover similar topics they are of different lengths; 31 pages in the Chujo book and 54 pages in the Leclerc and Morin book.

The Leclerc–Morin book has nine chapters. The editors state that the aim of the book is to review advances in the controlled and well-designed synthesis of important classes of conjugated polymers. Their subjects are substituted polyacetylenes, polyarylene synthesis via Suzuki polycondensation, regioregular polythiophenes, poly (phenylenevinylenes), poly (aryleneethynylenes), poly (2,7-carbazoles), phenylene-based ladder polymers, polysiloles, and polyfluorenes. Each chapter is written by active researchers in the field and in several cases, the authors are the pioneers of the work under discussion.

The Chujo book has 11 chapters, three authored or co-authored by Chujo. The editor states that the book aims to summarize the major developments in the topics of synthesis of new conjugated polymers, novel methodologies for the preparation of conjugated polymers, and inorganic elements containing main-chain-type conjugated polymers. The topics are organometallic polycondensation, catalyst-transfer condensation polymerization, regioregular and regiosymmetric polythiophenes, functional hyperbranched polymers, through-space conjugated polymers, nano-sized macrocycles, organoboron polymers, macromolecules with phosphorus in the main chain, organoarsenic, phosphorus, and antimony polymers, synthetic strategies to main-chain metallopolymers, and helical polyacetylene prepared in liquid crystal field. The first three chapters listed above are those of most interest with respect to current research topics. While the chemistry associated with introduction of boron and Group V elements is interesting, these materials and their properties are not at the forefront of current discussion.

On the whole, both books meet the objectives stated by the editors. They will be found useful by both students seeking an introduction to the subject as well as practicing professionals.

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