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Book reviews

Römpp encyclopedia of natural products

W. Steglich, B. Fugmann and S. Lang-Fugmann (eds)
Georg Thieme Verlag, Stuttgart, 2000
x + 748 pages. DM 498
ISBN 3-13-117711-X

Natural products have provided targets for synthetic chemists for many years. The diversity of their structures and the range of their biological activities have provided the stimulus for many studies. The development of organometallic chemistry has brought many more of these compounds within the ambit of the synthetic chemist. Since the majority of natural products are chiral, there is the opportunity to use these compounds both as chiral starting materials and as components of chiral reagents or catalysts. This *Römpp Encyclopedia of Natural Products* provides a valuable source of information for this work.

This English language edition of the encyclopedia is a translation and major revision, including an update of the German edition, which was published in 1997. The objective of the encyclopedia is to provide a source of information on the major natural products. Although the choice of entries is inevitably selective and restricted to secondary metabolites, nevertheless a very wide and useful range of natural products is included. The literature in this revision has been covered up to the end of 1999. Each entry contains sources, structural information, formulae, physical constants, details of biological activity and uses, together with leading references. There are also entries for a number of terms that are used in natural product chemistry and for collective names for groups of natural products. The entries are concise, informative and clear, providing a useful summary of the pertinent material. They are very well cross-referenced. Useful synthetic derivatives are additionally included. There is a formula index and an index of Latin names for species. The entries have been contributed by a panel of 39 authors who have covered the major groups of natural products, including antibiotics, terpenoids, steroids, fatty acids, alkaloids, flavonoids and sugars.

This book contains a wealth of information and is a very useful addition to the reference library. It provides, in one volume, a valuable source of information on the major natural products and it can be recommended to those departments whose research is likely to bring synthetic and organometallic chemists into contact with natural products.

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Silicon-containing polymers

R. G. Jones, W. Ando and J. Chojnowski (eds)
Kluwer Academic Publishers, Dordrecht, 2000
xx + 768 pages. £196
ISBN 0-412-83110-4

This book on silicon-containing polymers has the subtitle *The Science and Technology of their Synthesis and Applications*, which gives a fair indication of its scope, although there is not a great deal on the technology in the sense of processing details. It consists of 28 articles by well-qualified practitioners in the various fields, and is presented in the following four sections.

Section 1, Polysiloxanes (editor J. Chojnowski): synthesis of linear polysiloxanes (41 pages); organosiloxane block and graft copolymers (36 pages); side-group modified polysiloxanes (33 pages); silicone copolymer networks and interpenetrating polymer networks (22 pages); preparation and properties of silicone elastomers (16 pages); polysilsesquioxanes (27 pages); thermal properties of polysiloxanes (27 pages); surface properties and applications (19 pages); and polysiloxanes—direction of applications and perspectives (10 pages). (I found this last essay, which speculates on possible future developments, especially interesting, but I would have welcomed some elaboration of the statement that the vacant *d*-orbitals of silicon represent a key factor in the chemistry of polysiloxanes, or at least some supporting references.)

Section 2, Polycarbosilanes and Polysilazanes (editor R. G. Jones): polycarbosilanes (77 pages); and polysilazanes (26 pages).

Section 3, Polysilanes and Related Polymers (editor R. G. Jones): synthesis of polysilanes by the Wurtz reductive-coupling reaction (21 pages); synthesis of polysilanes by new procedures: part 1, ring-opening polymerisations and the polymerisation of masked disilanes (25 pages); part 2, catalytic dehydropolymerisation of hydrosilanes (18 pages); modification and functionalisation of polysilanes (19 pages); hydrosilylation and silylation in organopolymer synthesis (21 pages); σ- and π-conjugated organosilicon polymers (51 pages); electronic structure and spectroscopy of polysilanes (31 pages); electronic and optical properties in device applications of polysilanes (22 pages); and

thermal properties and phase behaviour of polysilanes (21 pages).

Section 4, Special Topics (editor W. Ando): silicon-containing vinyl monomers and polymers (16 pages); liquid crystalline silicon-containing polymers (20 pages); organosilicon dendrimers, molecules with many possibilities (27 pages); optically active silicon-containing polymers (22 pages); organosilicate oligomers and nanostructured materials (29 pages); preceramic polymer-derived silicon oxycarbides (30 pages); plasma processing of silicon-containing monomers (16 pages); and microlithographic applications of organosilicon polymers (18 pages).

The book reveals very effectively the remarkably wide range of silicon-containing polymers and the large number of research groups working on them. The editors have made an excellent choice of contributors, so that all of the contributions appear authoritative. (The editors also provide, in a brief but effective preface, a concise outline of the background to and scope of the content of the book.) There is inevitably some overlap in the content of the separate essays, but where this is the case it is generally helpful to the reader rather than annoying; there are minor differences in interpretation; for example, in at least two essays the strength of the Si—O bond and other properties of silicon compounds are attributed in part to $p(\mathrm{O}) \rightarrow d(\mathrm{Si})_{\Pi}$ interaction, but in the second page of the very good first essay, by J. Chojnowksi and M. Cypryk, it is correctly stated that the relevant interactions are now usually regarded as of the $p(\mathrm{O}) \rightarrow \sigma^*(\mathrm{Si—X})_{\Pi}$ type (negative hyperconjugation).

In view of the remarkably large number of scientists evidently engaged in development of these new types of polymer it is disappointing to find that, although they have revealed many potential applications for the various types of polymer discussed, as yet there are very few actual commercial applications of products other than the well-established polysiloxanes. (In my 1960 book, *Organosilicon Compounds*, I was sceptical about the possibility that polysilazanes would have significant commercial applications, and it seems that I have not yet been shown to be wrong, although the polymers do have interesting properties and can serve as ceramic precursors. A little surprisingly, there is no survey of applications of silicon nitride.) The new types of polymer most likely to meet commercial success seem likely to be high-cost materials made on a relatively small scale but of very high value. Thus, the liquid-crystalline species described seem to me to be among the best candidates.

This book is a first-class example of its type, even though, as is usual nowadays, the subject index is rather poor. It presents a massive amount of information in a very well organized way and will certainly stimulate yet more studies in its already intensively worked field. At today's prices it represents good value, and can be warmly recommended.

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