

considerable effort in accumulating the basics. However, these would have to be supplemented by additional more recent, up-to-date data. As an up-to-date reference, it has serious limitations as outlined above.

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Organosilicon Chemistry III — from Molecules to Materials

Norbert Auner and Johann Weis (eds)

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This hard-back volume contains a summary of lectures and poster contributions to the *III. Munchner Silicontage* in April 1996. The volume is attractively produced with all papers in the same standard format, with good-quality graphics, clear well-produced reaction schemes and useful tables of physical and spectroscopic data. Literature citations are included at the end of each paper.

The contributions are organized in two sections: Part I, 'Fascinating organosilicon compounds' (466 pages) and a shorter Part II, 'Silicon based materials' (270 pages); full titles of all contributions are listed in the Contents section. The details from 76 contributions are described in Part I prefaced by a beautifully written brief account (16 pages) introducing the main current research areas of molecular organosilicon chemistry, including some key literature sources listed under appropriate headings for each of these areas. Germany has a reputation for excellent research in this area and most of the German household names of main-group chemistry, along with several from other countries, are to be found here pushing back the frontiers of silicon chemistry. Some of the topics covered in these contributions are as follows. Silylene species feature in many of the contributions, either as reactive intermediates or stable entities, and an extensive range of addition reactions are described, including the fascinating reaction chemistry from decamethylsilicocene and heterocumulenes. The chemistry of compounds with multiple bonds between two silicon centres or silicon and other elements is tackled by several groups and synthetic routes to iminosilanes and metastable silylidene-phosphanes and -arsanes are elaborated, along with addition and cycloaddition products of reactions with organic and inorganic reagents including elemental phosphorus, sulphur and tellurium. A considerable degree of interest is directed towards

compounds with silicon-to-metal single bonds, including examples where the steric properties of the bulky hypersilyl group, $(\text{Me}_3\text{Si})_3\text{Si}$, and supersilyl groups, $(\text{Me}_3\text{C})_3\text{Si}$, are exploited for the stabilization of unusual oxidation states or low coordination at metal centres.

Several papers deal with metal oligosilane complexes, including reactions leading to corresponding chlorosilane and silanol derivatives. Several groups report on the chemistry of silanols and associated metallasiloxanes. Novel aspects of the chemistry of oligosilanes and polysilanes are described, including catalytic routes to polychloro-oligosilanes and stepwise synthesis of dendritic polysilanes. Hypervalent silicon compounds continue to fascinate and some particularly interesting reaction chemistry of the pentacoordinated silicon compound $(2-\text{Me}_2\text{NCH}_2\text{C}_6\text{H}_4)(\text{CH}_2=\text{CH})\text{Si}(\text{H})_2$ is described, including formation of carbosilane and siloxane polymers and the replacement of the $\text{Si}(\text{H})_2$ fragment with $\text{Si}=\text{S}$ or $\text{Si}=\text{Cr}(\text{CO})_5$.

The introduction to Part II of the volume gives a brief survey of the technologies based on organosilicon and inorganic silicon chemistry and concludes with the observation that much more effort is required on the materials science and technology front, particularly related to the growth area of silicon-based sol-gel materials. An interesting discussion on environmental issues relating to silicon products is included here. The 28 other papers in this section of the volume touch on a broad range of the topics of current interest in silicon-based materials chemistry. A substantial article on the chemistry and applications of liquid-crystalline cyclic siloxanes is included. Studies of photoconductivity in polysilylenes, fluorescence and luminescence behaviour of modified siloxanes as well as electrical and electronic applications of silicone elastomers are presented. The syntheses of novel preceramic polymers, poly(diorganosilylene-co-ethynylene)s, polycarbosilanes and polyorganoborosilazanes are featured. Several papers deal with applications of alkylalkoxysilanes as reagents for surface modification, as consolidants for natural stone or as precursors for the synthesis of novel organic-inorganic hybrid materials by sol-gel processing. There are several other contributions dealing variously with cationic reagents as photoinitiators and photocrosslinking agents, the role of some structure-directing agents in the synthesis of zeotype materials, aspects of chemical modification of silica surfaces and the synthesis and properties of nitrido silicates.

This volume provides an excellent and valuable summary of much recent work in organosilicon and inorganic silicon chemistry. It is very good value at £70.

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