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Silicon and silicon compounds have contributed decisively to the technical progress. Technical applications range from mass commodities to highly sophisticated special materials, from ceramics to polymers, from medicine to microelectronics. To keep pace with scientific and technical developments Germany and Austria have established national priority programs, strongly linked to each other as well as to some Swiss groups. At mid-term of the German program and the end of the first funding period of the Austrian program the results are summarized in this special edition of the journal Monatshefte für Chemie/Chemical Monthly, giving an excellent overview of the current chemical (and partly physical) acitivites in the joint Austrian/German/Swiss program. The contributions cover topical and interdisciplinary developments in the following areas: • new phenomena in compounds with Si-Si bonds: transitions between molecular compounds and solids, cyclosilanes, polysilanes, silicides, amorphous hydrogenated silicon, • novel silicon-oxygen systems: functionalized sol-gel compounds, spherosiloxanes, siloxene, • compounds with low- and high-coordinated silicon, • new spectroscopic and analytical techniques for the characterization of molecular and polymeric silicon compounds.

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Editorial Review

Review
"The editors have succeeded in putting together a wide-ranging monograph on developments in many of the most important, although clearly not all, areas of silicon chemistry during the last few years."

Gerald Linti, Anorganisch-Chemisches Institut, Universität Heidelberg
Angewandte Chemie + IE 2004 - 116/23

From the Back Cover
The combined results from an international research project involving 40 interdisciplinary groups, providing the latest knowledge from the past few years. Adopting an application-oriented approach, this handy reference is a must-have for every silicon chemist, whether working inorganic, organic, physical or polymer chemistry, materials science or physics.

From the Contents:

Investigations on the Reactivity of Atomic Silicon Reactions with Matrix Isolates SiO Molecules *In situ*-Diagnostics of Amorphous Silicon Thin Film Deposition the Gas Phase Oxidation of Silyl Radicals by Molecular Oxygen Oxidation of matrix-Isolated Silylenes Short-Lived Intermediates with Double Bonds to Silicon Kinetic Stabilization of Disilenes and Disilynes A Tetrasilabuta-I,3-diene and related Compounds with Conjugated Multiple Bonds Chemistry of Metalated Oligosilanes Oligosilyl Substituted Heptaphosphanes Polysilanes: Formation, bonding and Structure Phase Behavior of n-Alkylsubstituted Polysilanes Structural and Electronic Systematic in Zintl Phases of the Tetrels Zintl Phases MSi_2 (M=Ca, Eu, Sr, Ba) at Very High Pressure Silicon-and Germanium-Based Sheet Polymers and Zintl Phases Kautsky-Siloxene Analogous Monomers and Oligomers Silicon-Based Nanotubes Structure and Reactivity of Solid SiO Si Nanocrystallites in SiO_x Films by Vapour Deposition and Thermal Processing Theoretical Treatment of Silicon Clusters Isomers of Neutral Silicon clusters Investigation of the Influence of Oxidation and HF Attack on the Photoluminescence of Silicon Nanoparticles Localization Phenomena and Photoluminescence from Nano-structured Silicon, Silicon/Silicon Dioxide Nanocomposites, Silsesquioxanes and Branched Polysilanes Higher-Coordinate Silicon Compounds with SiO_5 and SiO_6 Skeletons Functionalized Silanols and Silanolates Transition Metal Fragment Substituted Silanols of Iron and Tungsten-Synthesis, Structure and Condensation Reactions Rational Synthesis of Cyclosiloxanes and Molecular Alumo- and Gallosiloxanes Synthesis Structure and reactivity of Novel oligomeric Titanasiloxanes Metallasilsesquioxanes g Spin-Spin Interaction in Silsesquioxanes and Transition Metal Substitution Characterization of Si-Polymers by Coupling of HPLC-Separation Methods with MALDI-TOF-MS the Stepwise3 Formation of Si-O-Networks Mechanism of Ring and Cage Formation in Siloxanes Structurally Well-Defined Amphiphilic Polysiloxane Copolymers Synthesis and Functionalization of Mesostructured Silica-Based Films Modification of ordered Mesostructured Materials during Synthesis Biosilicification; Structure, Regulation of Structure and Model Studies

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