

Organosilicon Chemistry

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Comprehensive and focused, this book provides a broad overview of silicon chemistry—with an emphasis on both the preparation and reactivity of silicon compounds—helping scientists utilize organosilicon chemistry from inside and outside their subdisciplines.

The book examines the entire area of organosilicon chemistry, featuring organic, inorganic/organometallic and polymer aspects. It opens by introducing the mechanistic patterns in silicon chemistry, then presents the chemistry of silicon-bonds not involving carbon (inorganic, polymer and organic examples); and it closes with a look at the organic chemistry of silicon, exploring the properties of organic molecules containing silicon, including their bioactivity, and ways in which these reactivities have been exploited.

Written to be equally useful to organic, organometallic/inorganic, and polymer chemists, readers of this work will find topical examples from all areas of silicon chemistry, including examples of particular interest to materials scientists. These examples, in combination with the established mechanistic foundation, facilitate an understanding of silicon chemistry to solve synthetic problems of today and offer viable suggestions for the challenges of tomorrow.

Organosilicon Chemistry provides, in a succinct way, an extensive overview of silicon chemistry that will immediately resonate with synthetic and non-synthetic specialists alike who want to discover the realm of possibilities in the world of silicon chemistry. This practical reference encourages the intermingling of concepts and ideas

between the organic, polymer, organometallic/inorganic chemical communities, and material scientists, making it an indispensable working resource for students, academic and industrial chemists in varied arenas. For more information, see: www.wiley.com/brooksilicon.

Abbreviated Table of Contents:

Part I: The Fundamentals of Silicon Reactivity: Reactive Intermediates and Reaction Mechanisms:

Organosilanes: Where to Find Them, What to Call Them, How to Detect Them. Atomic and Molecular Properties of Silicon. Silicon-Based Reactive Intermediates. Extracoordination at Silicon. Reaction Mechanisms for Nucleophilic Substitution at Silicon.

Part II: The Formation and Cleavage of Non-Carbon Bonds to Silicon: Applications in Organic and Polymer Chemistry:

Silicon and Transition Metal Chemistry. Hydrosilanes as Reducing Agents. Replacing H with Si: Silicon-Based Reagents. Silicones. Siloxanes Based on T and Q Units. Other Silicon-Containing Polymers.

Part III: The Formation and Cleavage of Silicon-Carbon Bonds: Applications in Organic Synthesis:

Formation of Si-C Bonds: The Synthesis of Functional Organosilanes. Silicon in a Biological Environment. Silicon in the Organic World: Electronic Effects of Silyl Groups. Rearrangements. Cleavage of Si-C Bonds.

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