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Editorial

Recent advances in organosilicon chemistry directed towards organic synthesis[☆]

Foreword

Since the 1970s organosilicon chemistry plays an increasingly important role in organic synthesis. Silicon-containing organic molecules, such as silyl enol ethers, silyl ketene acetals, vinyl- and allylsilanes, have been widely used in Lewis acid-mediated condensation reactions with electrophiles. It has been shown a long time ago that such transformations allow to solve several problems associated with related base-mediated reactions (such as the occurrence of elimination rather than the desired substitution reactions, problems related to the regioselectivity, etc.). Therefore, organosilicon chemistry represents today an important part of the practical and theoretical education of undergraduate and graduate students in the field of organic chemistry.

The aim of the present *Tetrahedron Symposium-in-Print* is to highlight some recent advances in the field of organosilicon chemistry directed towards organic synthesis. In recent years, much synthetic effort has been directed towards the development of new silicon-containing building blocks and their synthetic application. Our Symposium-in-Print includes silyl enol ether-type molecules, such as silyl enol ethers, silyl ketene acetals, 1,1-bis(silyl)ketene acetals, 1,2-bis(silyloxy)cyclobutenes, and 1,3-bis(silyloxy)-1,3-butadienes, silylated azolium salts and silicon-tethered α-hydroxyaldehydes (which have been used in silatropic ene cyclizations). Organosilanes also represent an integral part of the present Symposium. This includes, for example, acylsilanes, allylsilanes, silacyclic allylsilanes, bis(allylsilanes), cyclic 1,1-bis(silyl)alkenes, silylketenes and silyl-containing carbanions. Synthetic applications of all these building blocks include, for example, one-pot cyclizations (for the synthesis of complex molecules from simple starting materials), stereoselective coupling reactions, new practical procedures, diversity-oriented syntheses and natural product syntheses. The natural products (±)-cameroonanol, prelactone B and (−)-nomadone were successfully prepared.

Catalytic transformations of organosilicon compounds play an increasingly important role. The present Symposium-in-Print includes, for example, indium-catalyzed reactions of silyl enol ethers, palladium-catalyzed cross coupling reactions of allylsilane–vinylcopper species, organocatalytic asymmetric aldol reactions, rhodium(I)-catalyzed enantioselective 1,4-additions of nucleophilic silicon, and NaOH-catalyzed crossed Claisen condensations of silyl ketene acetals.

Last but not the least, computational chemistry plays an increasingly important role in organosilicon chemistry. The present Symposium-in-Print includes two computational studies. One is related to the structure of silenolates (i.e., silicon analogues of enolates) and the other deals with the reductive dimerization of bis(allylsilanes).

In conclusion, organosilicon chemistry, in its combination with organic synthesis, covers various aspects of research. This includes, for example, building block chemistry, development of new reactions and synthetic strategies, catalysis, stereoselective synthesis, medicinal chemistry, natural product synthesis and computational chemistry. New ideas and concepts will not cease so soon.

Finally, I am very grateful to all authors for their great enthusiasm and support of this venture, and for their very interesting contributions.

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[☆] The term ‘organosilicon chemistry’ is herein defined as the chemistry of silicon-containing organic molecules. It is not defined exclusively as the chemistry of compounds containing a carbon–silicon bond.

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