



Organometallic Compounds of Low- Coordinate Si, Ge, Sn and Pb

The wait for the first comprehensive monograph on the chemistry of low-coordinate group 14 elements is finally over. With enthusiasm I thus welcomed the opportunity to review the book by Vladimir Ya. Lee and Akira Sekiguchi entitled *Organometallic Compounds of Low-Coordinate Si, Ge, Sn and Pb* and this enthusiasm was further fostered by the enjoyable read of the well-written oeuvre. The subtitle *From Phantom Species to Stable Compounds* could almost be applied to the book itself as the very fact of its publication indicates that this subfield of group 14 chemistry has reached early stages of maturity.

The book is organized in six chapters covering the following low-coordinate compound classes: cations, anions, radicals, carbene and alkene analogues, and aromatic compounds. The detailed table of contents and the substantial index enables the reader to readily locate individual topics, which should not keep anyone from reading the entire book from first to last page. The book kept my undivided attention during a two weeks' worth of commuting; on more than one occasion I came dangerously close to missing my stop.

Representatives of the compound classes that define the six chapters occur as transient intermediates of several important technological processes (e.g. the Direct Process, the Siemens Process, plasma-enhanced chemical vapor deposition, etc.) and their discussion in advanced undergraduate lecture courses is thus indispensable. While the primary audience of the book are certainly researchers and teachers in higher education, this fact renders the book a useful supplement to any advanced undergraduate course on main group chemistry. The sensible use of deliberate repetition clearly demonstrates the qualities of Sekiguchi and Lee as teachers: important milestones and concepts are explained two or three times over in an eloquent way so that the interest of the reader is captured early on.

In addition, each chapter is preceded by a concise introduction including a brief historical account, which provides sufficient context for the more recent results. Past or present scientific disputes, an innate characteristic of any thriving research subject, are adequately described. In particular the captivating story of the silylenium ion is convincingly summarized. References to leading reviews of each chapter's topic are systematically provided and allow more in-depth literature searches without much hassle where needed. In order to locate the primary research paper, however, no additional source has to be consulted:

the combined list of citations of the book contains close to 1100 entries overall, which may well equate to more than 5000 individual citations.

In case of cations, anions, and radicals, generic synthetic methods are then briefly summarized followed by the discussion of a wealth of specific examples of the synthesis of stable and persistent derivatives. The factually accurate description of primary literature beyond the superficial accumulation of data is visibly aided by the unique competence of the authors in group 14 chemistry. They manage to put individual contributions into the greater scheme and nicely explain interdependencies, e.g. the role of substituents for the electronic and steric stabilization of the reactive species.

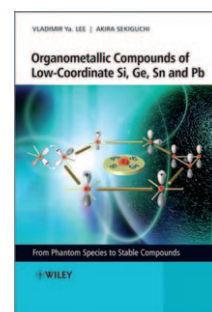
Naturally, the own contributions by the authors that are of central importance to the field are a recurring theme of the book. Their first-hand experiences and enthusiasm become readily apparent on numerous occasions thus adding a welcome personal touch to the treatise. For instance, the discussion of the stable acyclic and cyclic cations, radicals and anions that are interconvertible by reversible redox processes is particularly well done using multiple cross-referencing to point out any interdependencies. Another example of the authors' passion for this chemistry is the fascinating cyclopentadienide analogue with two silicon atoms and one germanium atom in the ring that is discussed in enlightening clarity and detail.

The only critique concerns the subchapter on antiaromatic compounds: the large variety of compounds subject to computational studies featuring various combinations of group 14 elements is indiscriminately referred to with the same number and the actual composition then detailed in brackets. For instance, all heavier cyclobutadienes are labeled as **63**. This unconventional practice (usually one would specify the different compounds, e.g. **63a** for tetrasilacyclobutadiene) makes this subchapter unnecessarily difficult to digest. In a future version this issue should be easy to rectify.

This minor aspect should, however, by no means distract from the overall outstanding quality of *Organometallic Compounds of Low-Coordinate Si, Ge, Sn and Pb*. The book will quickly become indispensable for the researcher or teacher in the organometallic chemistry of low-valent silicon and extremely useful to postgraduate students and postdocs interested in the stabilization of highly reactive compounds. It will definitely be the most perused book on my shelf, a reference work for years to come.

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DOI: 10.1002/anie.201007349



Organometallic Compounds of Low-Coordinate Si, Ge, Sn and Pb
From Phantom Species to Stable Compounds. Edited by Vladimir Ya. Lee and Akira Sekiguchi. John Wiley & Sons, Hoboken 2010. 448 pp., hardcover, € 149.00.—ISBN 978-0470725436