Chemistry of Heterocyclic Compounds, Vol.35, No. 8, 1999

ORGANOMETALLIC COMPOUNDS IN HETEROCYCLIC CHEMISTRY

The 20th century is characterized by the rapid development of organometallic chemistry. It opened possibilities for the synthesis and investigation of new heterocyclic systems. The usual heterocyclic compounds contain only one of the three heteroatoms – oxygen, sulfur, or nitrogen, or their combinations. Insertion of the other heteroatoms into the ring permits one to prepare an enormous amount of new heterocycles including metallacycles. There exist several ways to construct a new heterocycle by introducing a new heteroatom (more than 90) into the ring. The first is the introduction of only one heteroatom (as, for example, in siloles, stannacyclanes, phospholes). The second is the introduction of more similar (as in the carborane family) or different heteroatoms (silastannacyclane) untill the full replacement of all ring carbons (silatetrahedrane, germacubane). The third involves the insertion of the second heteroatom into the ring of the known heterocycle (stannoxetane, phosphazetidine, zirconaoxacyclanes) or the construction of an inorganic ring (borazene, cyclosiloxanes, cyclosilazanes, phosphazenes). The heterocycles containing one of these heteroatoms can be converted into another heterocycle (boratranes to silatranes and germatranes, zirconacycles to stannacycles).

The replacement of the hydrogen atom in the oxygen-, sulfur- or nitrogen-containing heterocycle for the organometallic substituent gives a lot of possibilities to prepare organofunctional heterocycles (e.g., from organolithium, -magnesium or -zinc derivatives, nucleosides and β-lactam antibiotics by the silyl and stannyl methods).

In commemoration of the centenary of Academician A. N. Nesmeyanov, the founder of the Russian organometallic chemistry school, we decided to publish a special issue of the journal "Chemistry of Heterocyclic Compounds" devoted to organometallic compounds in heterocyclic chemistry. Articles on metallacycles as well as on heterocyclic compounds bearing an organometallic substituent are also included.

In fact, we have received more articles than it is possible to publish in one issue of the Journal. Therefore, we decided to publish articles on organometallic chemistry also in the next issue of the journal. This issue contains articles on the application of borane-nitrogen heterocycle complexes for the synthesis of alkaloids; articles on the molecular structure and conformation analysis of boron heterocycles; articles on phase transfer catalysis in trimethylsilylcyanation of heterocyclic ketones; synthesis and properties of disilapiperazines and metallasiloxanes; articles on the synthesis and properties of four-membered rings containing tin-oxygen and tin-phosphorus bonds and on the properties of bicyclic phosphacycles; papers on the synthesis and transformation of cyclic iodonium salts with an asymmetric carbon atom; articles on the synthesis and molecular structure of new heterocycles containing platinum, palladium or gold.

In the ninth issue the articles on other bora-, sila-, germa- and stannaheterocycles will be published.

The Editorial board thanks all the contributors for the manuscripts on organometallic heterocycles submitted for these special issues of the Journal. We look forward to further fruitful cooperation.

Editor-in-Chief E. Lukevics

0009-3122/99/3508-0885$22.00