

Успехи химии

Том 93
Номер 11
2024

Содержание

	N статьи	
Т.И.Горбунова, Д.О.Егорова, В.И.Салоутин, О.Н.Чупахин	RCR5138	Аэробная бактериальная деструкция полихлорбифенилов и их гидроксид- и метоксипроизводных
М.Ю.Москалик, Б.А.Шаинян	RCR5140	Непредельные органосиланы: синтез, превращения и применение
Ю.Ю.Титова, А.В.Иванов	RCR5149	Неклассические эффективные методы восстановления гетероароматических соединений
Л.А.Васильева, Г.А.Гайнанова, Э.А.Романова, К.А.Петров, С.Feng, Л.Я.Захарова, О.Г.Синяшин	RCR5150	Супрамолекулярный подход к разработке наноносителей для противодиабетических препаратов: пациент-ориентированная таргетная терапия

Contents

Aerobic bacterial degradation of polychlorinated biphenyls and their hydroxy and methoxy derivatives

RCR5138

T.I.Gorbunova,^a D.O.Egorova,^b V.I.Saloutin,^a O.N.Chupakhin^a

^a *I.Ya.Postovsky Institute of Organic Synthesis, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia*

^b *Institute of Ecology and Genetics of Microorganisms, Ural Branch of the Russian Academy of Sciences, Perm, Russia*

Polychlorinated biphenyls are persistent organic pollutants hazardous to humans and to the environment. The products of biotransformation of these compounds can exist in natural objects as hydroxy and methoxy derivatives. This review summarizes the biodegradation pathways of polychlorinated biphenyls under the action of aerobic bacterial strains. The possibility of complete biodegradation of polychlorinated biphenyls and their derivatives under laboratory conditions is demonstrated. This information is valuable for researchers specializing in the biotransformations and toxicity of polychloroarene derivatives and would be useful for the development of remediation processes of natural objects contaminated with polychlorinated biphenyls.

Bibliography — 253 references.

Unsaturated organosilanes: synthesis, transformations and applications

RCR5140

M.Yu.Moskalik, B.A.Shainyan

A.E.Favorsky Irkutsk Institute of Chemistry, Siberian Branch of the Russian Academy of Sciences, Russia

The urgency of improving the efficiency of known methods and developing new ones for the synthesis of unsaturated silanes is caused by the need to obtain useful compounds, including biologically active ones, on their basis. This review considers methods for the preparation of unsaturated silanes, their transformations and prospects for their use as precursors in organic and organoelement synthesis. A large number of substituted organosilicon products are given, including those capable of further functionalization and the formation of heterocycles, including silaheterocycles.

Bibliography — 205 references.

Non-classical effective methods for reduction of heteroaromatic compounds

RCR5149

Yu.Yu.Titova, A.V.Ivanov

A.E.Favorsky Irkutsk Institute of Chemistry, Siberian Branch of the Russian Academy of Sciences, Russia

The review summarizes the known data on various methods for saturation and dearomatization of heterocyclic moieties, forming diverse aromatic compounds. Since the classical hydrogenation of substrates with molecular hydrogen has a number of fundamental drawbacks that hinder both its use at the laboratory level and its widespread implementation in industrial production, the main attention is paid to non-classical methods described in the literature over the last 20–25 years. The methods of ammonia-free Birch reduction, transfer hydrogenation, reduction by Hantzsch esters and some other reactions involving heterocyclic compounds are summarized and systematized. It is shown that such methods of reduction or dearomatization of heterocycles can in some cases be more efficient than classical procedures.

Bibliography — 173 references.

**Supramolecular approach to the design of nanocarriers for antidiabetic drugs:
targeted patient-friendly therapy**

RCR5150

L.A.Vasileva,^a G.A.Gaynanova,^a E.A.Romanova,^a K.A.Petrov,^a C.Feng,^b L.Ya.Zakharova,^a
O.G.Sinyashin^a

^a *Arbuzov Institute of Organic and Physical Chemistry, FRC Kazan Scientific Center, Russian Academy of Sciences, Russia*

^b *Shanghai Jiao Tong University, Shanghai, China*

Diabetes and complications derived are among serious global health concerns that critically deteriorate the quality of patient life and in some cases result in lethal outcome. Herein, general information on the pathogenesis, factors aggravating the course of the disease and drugs used for the treatment of two types of diabetes are briefly discussed. The aim of the review is to introduce supramolecular strategies that are currently being developed for the treatment of diabetes mellitus and are very effective alternative to chemical synthesis, which allows for fabrication of nanocontainers with switchable characteristics answering green chemistry criteria. Particular attention is paid to organic (amphiphilic and polymeric) formulations, including naturally driven compositions due to their biocompatibility, low toxicity, and bioavailability. Advantages and limitations of different nanosystems are discussed, with their adaptivity to noninvasive administration routes emphasized. Bibliography — 378 references.