

Успехи химии

Том 92
Номер 10
2023

Содержание

№ статьи

Е.А.Пермяков,
В.М.Коган

RCR5094

Каталитическая конверсия изоэлектронных молекул CO и N₂ в присутствии водорода

Т.Н.Паширова,
А.В.Немтарев,
Е.В.Souto,
В.Ф.Миронов

RCR5095

Триарилфосфониевые соединения — эффективные векторы для митохондриально-направленных систем доставки: стратегии декорирования и перспективы клинического применения

Д.В.Спектор,
А.А.Бублей,
Е.К.Белоглазкина,
О.О.Красновская

RCR5096

Пролекарства на основе Pt(IV) как альтернатива препаратам Pt(II): синтез и биологическое действие

М.В.Ерпалов,
А.П.Тарутин,
Н.А.Данилов,
Д.А.Осинкин,
Д.А.Медведев

RCR5097

Химия и электрохимия промежуточных слоев на основе CeO₂: увеличение срока службы твердооксидных топливных элементов и электролизеров

Russian Chemical Reviews

Volume 92 Number 10 2023

Contents

Catalytic conversion of isoelectronic CO and N₂ molecules in the presence of hydrogen

RCR5094

E.A.Permakov, V.M.Kogan

N.D.Zelinsky Institute of Organic Chemistry of the Russian Academy of Sciences, Russia

The review is devoted to the comparative consideration of the mechanisms of transformations of isoelectronic molecules of carbon(II) oxide and molecular nitrogen in reductive conversion processes. The similarities and differences in the activation of these molecules are demonstrated. Fundamentally and commercially relevant catalytic systems are described and parallels in their operation are also shown. Promising trends in the search for new catalytic systems and processes are noted. Related molecules with similar reductive conversion processes are indicated.

Bibliography — 337 references.

Triarylphosphonium compounds as effective vectors for mitochondria-targeted delivery systems: decoration strategies and prospects for clinical application

RCR5095

T.N.Pashirova,^a A.V.Nemtarev,^a E.B.Souto,^{b,c} V.F.Mironov^a

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

^b *UCIBIO – Applied Molecular Biosciences Unit, MEDTECH, Laboratory of Pharmaceutical Technology, Department of Drug Sciences, Faculty of Pharmacy, University of Porto, Portugal*

^c *Associate Laboratory i4HB - Institute for Health and Bioeconomy, Faculty of Pharmacy, University of Porto, Portugal*

Mitochondrial dysfunctions lead to the emergence and development of a large number of diseases. The present review gives the first systematic survey of various aspects of studies of mitochondria-targeted nanosystems containing triphenylphosphonium vector groups providing targeted delivery of drug substances to these organelles. Approaches to the design of both the initial triphenylphosphonium components and various nanoparticles bearing these groups are summarized and analyzed. The relationship between the key parameters of triphenylphosphonium nanoparticles (chemical composition, size, shape, ζ -potential, drug loading, drug encapsulation efficiency, *etc.*) and the biological action is discussed; in some cases, the mechanism of mitochondria targeting is presented. The design principles and preparation methods for mitochondria-targeted triphenylphosphonium delivery nanosystems are of interest to researchers specializing in the field of nanomaterials, nanotechnology, molecular biology, biotechnology and pharmaceutical chemistry.

Bibliography — 243 references.

Platinum(IV)-based prodrugs as an alternative to Pt(II)-based drugs: synthesis and biological action

RCR5096

D.V.Spector, A.A.Bubley, E.K.Beloglazkina, O.O.Krasnovskaya

Faculty of Chemistry, Lomonosov Moscow State University, Russia

The chemotherapy with cisplatin and its analogues, widely used in medical practice, is associated with undesirable side effects caused by non-selective ligand exchange and binding of the complexes to various biomolecules in the body. An alternative to classical platinum(II)-based drugs are platinum(IV) prodrugs, that is, platinum(II) complexes additionally modified with diverse biologically active axial ligands, including known pharmaceutical products. In recent years, quite a few studies devoted to the design of effective Pt(IV) prodrugs have been published, with some