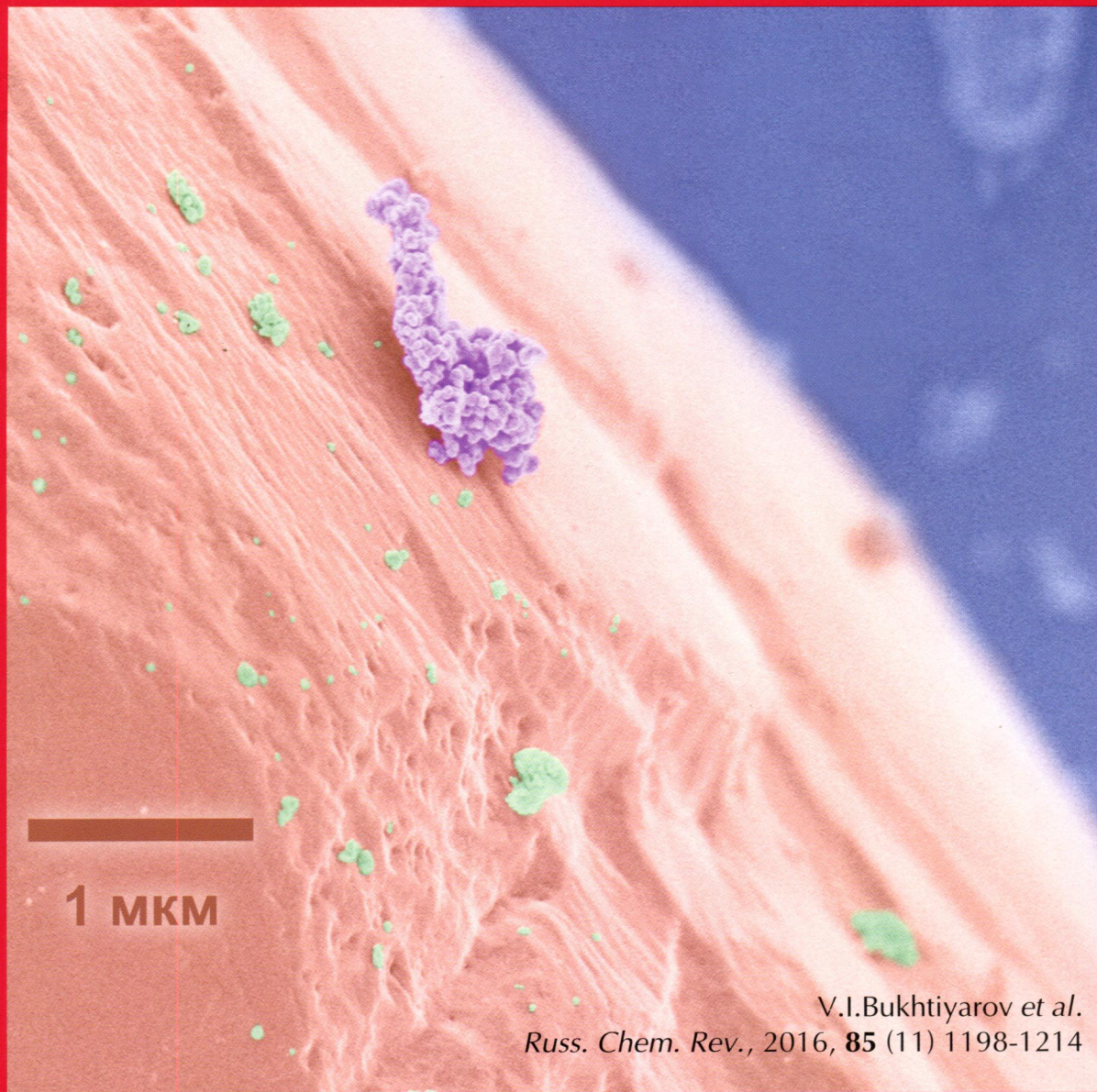


Успехи ХИМИИ



Российская
академия наук



Обзорный журнал по химии

Том 85

Номер 11 2016

стр. 1185–1276

Успехи химии

Том 85

Номер 11

2016

Содержание

- | | | |
|---|-------------|--|
| С.М.Алдошин,
Н.А.Санина | 1185 | Фотохромные магнитные материалы на основе оксалатных комплексов переходных металлов |
| В.И.Бухтияров,
В.И.Зайковский,
А.С.Кашин,
В.П.Анаников | 1198 | Современная электронная микроскопия в изучении химических систем на стыке органического синтеза и катализа |
| Д.В.Конарев,
Р.Н.Любовская | 1215 | Новые подходы к синтезу координационных соединений фуллеренов C_{60} и C_{70} с переходными металлами |
| А.А.Друзина,
В.И.Брегадзе,
А.Ф.Мионов,
А.А.Семиошкин | 1229 | Синтез конъюгатов полиэдрических гидридов бора с нуклеозидами |
| А.Б.Ярославцев | 1255 | Основные направления разработки и исследования твердых электролитов |

Contents

Photochromic magnetic materials based on transition metal oxalate complexes 1185

S.M.Aldoshin, N.A.Sanina

Institute of Problems of Chemical Physics, Russian Academy of Sciences, Chernogolovka, Moscow Region, Russia

The review presents a discussion of theoretical and experimental approaches to the design of compounds that combine both photochemically active groups and magnetic species in the same crystal lattice and can serve as the basis for the development of novel materials with specified properties and functions, including high-purity composites and nanomaterials. Data on the synthesis, structure and investigation of magnetic properties of para- and ferromagnetic anionic (tris)oxalate complexes of 3d metals with various organic photochromic cations are presented. The assembly of the complexes to ordered nanostructures and polymer composites is considered.

Bibliography — 62 references.

Modern electron microscopy in the study of chemical systems at the intersection of organic synthesis and catalysis 1198

V.I.Bukhtiyarov,^{a, b} V.I.Zaikovskii,^{a, b} A.S.Kashin,^c V.P.Ananikov^{c, d}

^a *Borshchov Institute of Catalysis, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia*

^b *Novosibirsk State University, Russia*

^c *Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow, Russia*

^d *Saint Petersburg State University, Russia*

Electron microscopy, which has proved useful in materials science, heterogeneous catalysis, metallurgy and some other areas, is currently attracting increasing attention of specialists working in fine organic synthesis. The state-of-the-art possibilities of direct visualization of micro- and nanoobjects suitable for investigation of highly electron beam-sensitive organic molecular and hybrid systems extend the scope of applicability of electron microscopy in chemistry. The representative examples of electron microscopic investigations at the intersection of organic synthesis and catalysis are given.

Bibliography — 114 references.

New approaches to the synthesis of coordination compounds of fullerenes C₆₀ and C₇₀ with transition metals

1215

D.V.Konarev, R.N.Lyubovskaya

Institute of Problems of Chemical Physics, Russian Academy of Sciences, Chernogolovka, Moscow Region, Russia

The most important trends of the coordination chemistry of fullerenes, including synthesis and investigation of η^2 -complexes, polynuclear complexes and coordination dimers are considered. The authors' results of the last several years are presented, in particular, dealing with the preparation of fullerene coordination compounds with transition metals by reduction reactions and reactions of transition metals with radical anion salts of fullerenes. The properties of coordination compounds with monomeric, dimeric and polymeric fullerenes and with fullerene anions are discussed.

Bibliography — 103 references.

Synthesis of conjugates of polyhedral boron hydrides with nucleosides

1229

A.A.Druzina,^a V.I.Bregadze,^a A.F.Mironov,^b A.A.Semioshkin^a

^a *Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences, Moscow, Russia*

^b *Moscow Technological University, Institute of Fine Chemical Technology, Russia*

Data on the methods of synthesis of conjugates of polyhedral boron hydrides with natural and non-natural nucleosides are overviewed. These conjugates arouse interest regarding the possible medical application as therapeutic agents. Main approaches towards nucleoside-based 12-vertex *closo*-carboranes (C₂B₁₀H₁₂), 11-vertex *nido*-carboranes ([C₂B₉H₁₁]⁻), metallacarboranes [cobalt and iron bis(1,2-dicarbollides)] and *closo*-dodecaborate anion ([B₁₂H₁₂]²⁻) are presented. Methods of nucleoside modification both at the heterocyclic base and at the carbohydrate units are considered.

Bibliography — 98 references.

Major trends in the development and investigation of solid electrolytes

1255

A.B.Yaroslavtsev

Kurnakov Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Moscow, Russia

The general regularities of ion transport in solid electrolytes are briefly considered and the defect formation mechanisms and the ion transport as such are discussed. Various approaches used to obtain solid electrolytes are described, related to the formation of defective solid solutions, nanodisperse and composite materials, liquid phase-containing materials as well as amorphous inorganic and polymeric materials. Highly lithium, oxygen and hydrogen ion conductive electrolytes, which have the greatest prospects for practical application, are described in detail. Characteristic features of ion transport in these systems, the shortcomings that restrict their application and the possibility of modification of the systems are analyzed.

Bibliography — 500 references.