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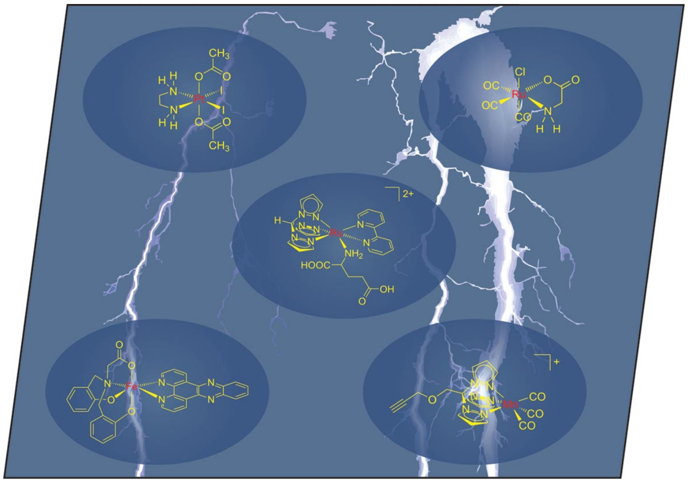
COVER PICTURE

The cover picture shows examples of metal complexes with photoactivated biological activity, as symbolized by the lightning in the background. This includes liberation of small-molecule messengers, such as carbon monoxide, nitric oxide, and neuroactive amines from the metal coordination sphere, as well as light-triggered oxidative or covalent modification of DNA. More examples are presented in the Microreview by U. Schatzschneider on p. 1451ff.



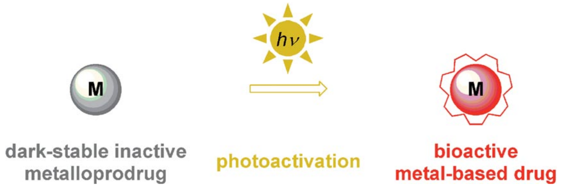
MICROREVIEW

Photoactivable Metal Complexes

U. Schatzschneider* 1451–1467

Photoactivated Biological Activity of Transition-Metal Complexes

Keywords: Photochemistry / CO releasing molecules / NO releasing molecules / Biological activity / Prodrugs / DNA cleavage



Precise control of the biological activity of transition-metal complexes can be achieved by photoactivation of compounds otherwise stable under physiological conditions in the absence of light. Potential applications include fundamental studies on the behavior of biological systems, as well as novel photochemotherapeutic approaches.

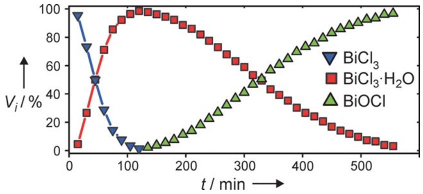
SHORT COMMUNICATION

Topochemistry

A. Wosylus,* S. Hoffmann, M. Schmidt, M. Ruck* 1469–1471

In-situ Study of the Solid-Gas Reaction of $BiCl_3$ to BiOCl via the Intermediate Hydrate $BiCl_3{\cdot}H_2O$

Keywords: Bismuth / Hydrates / Kinetics / Reactive intermediates / Solid-state reactions / Topochemistry



$BiCl_{3(s)} + H_2O_{(g)}$ = ? This question has more answers than the trivial one. Temperature and humidity decide on reaction paths!

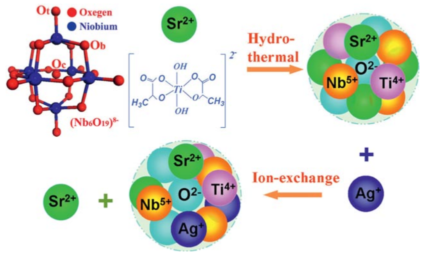
FULL PAPERS

Nanocrystalline Niobates

H. Tong, J. Ye* 1473–1480

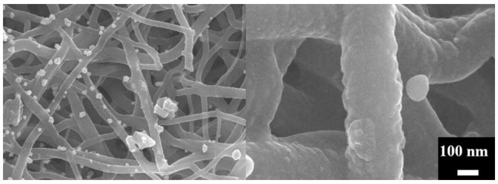
Building Niobate Nanoparticles with Hexaniobate Lindqvist Ions

Keywords: Niobium / Nanoparticles / Lindqvist ions / Synthetic methods



A general method to synthesize nanocrystalline niobates by using hexaniobate Lindqvist ions as niobium source is presented. Both the compositions and elements of as-prepared nanocrystalline niobates are adjustable to produce strong influences on their crystal phase, energy band structure, and photocatalytic performance.

Silver Nanofibres



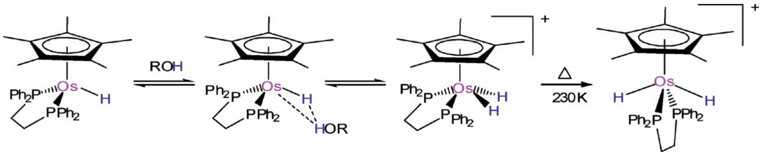
Electrospinning of a colloidal silver acetate solution rather than the conventional sol–gel process was introduced as a novel strategy to produce silver nanofibres. Electrophoretic light scattering and dynamic light scattering analyses have affirmed that the electrospun solution is a colloid. Calcination of the electrospun mats produced smooth and unbroken pure silver nanofibres. The advantageous physical features of the fibres suggest utilising the prepared nanofibres in various fields.

N. A. M. Barakat,* T. E. Farrag, M. A. Kanjwal, S. J. Park, F. A. Sheikh, H. Yong Kim* 1481–1488

Silver Nanofibres by a Novel Electrospinning Process: Nanofibres with Plasmon Resonance in the IR Region and Thermal Hysteresis Electrical Conductivity Features

Keywords: Silver / Nanostructures / Electrospinning of colloidal solutions / Surface plasmon resonance / Electrochemistry

Metal Hydride Protonation



Large metal atom participation in "dihydrogen bonding" to Cp*OsH(dppe) makes the direct proton transfer to a metal a favored process in the presence of a hydride ligand, yielding *cis*-[Cp*(dppe)Os-$(H)_2]^+$ at low temperatures. Similarly to lighter nonclassical congeners, it transforms into the thermodynamically more stable *trans*-[Cp*(dppe)M$(H)_2]^+$ upon warming.

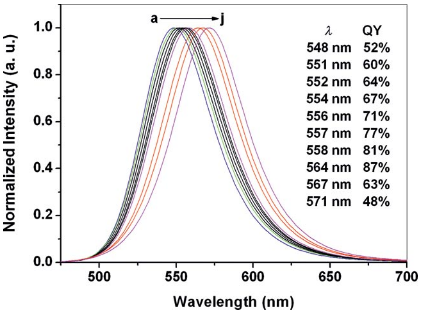
P. A. Dub, O. A. Fillipov, G. A. Silantyev, N. V. Belkova,* J.-C. Daran, L. M. Epstein, R. Poli,* E. S. Shubina* 1489–1500

Protonation of Cp*M(dppe)H Hydrides: Peculiarities of the Osmium Congener

Keywords: Osmium / Hydrido ligand / Proton transfer / Hydrogen bonds / Density functional calculations

More Biocompatible Quantum Dots

The photoluminescence spectra of CdTe (a) and size-dependent dihydrolipoic acid (DHLA)-capped CdTe/CdS core–shell quantum dots (b–j) with high quantum yields.



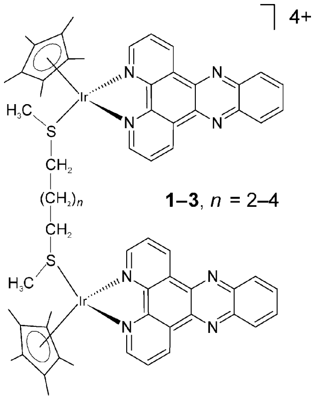
Y.-F. Liu,* B. Xie, Z.-G. Yin, S.-M. Fang,* J.-B. Zhao 1501–1506

Synthesis of Highly Stable CdTe/CdS Quantum Dots with Biocompatibility

Keywords: Cadmium / Dihydrolipoic acid / Luminescence / Quantum dots / Biocompatibility / Semiconductors

Organoiridium DNA Intercalators

Dinuclear organoiridium(III) complexes containing two $\{(\eta^5\text{-}C_5Me_5)Ir(dppz)\}^{2+}$ fragments connected by flexible dithiaalkane ligands exhibit rapid and strong bis-intercalation into DNA. An NOESY study established sequence-selective binding of complex **3** (n = 4) into the double-strand decanucleotide d(5′-GCGCATCGGC-3′).



1–3, n = 2–4

M. Kokoschka, J.-A. Bangert, R. Stoll, W. S. Sheldrick* 1507–1515

Sequence-Selective Organoiridium DNA Bis-Intercalators with Flexible Dithiaalkane Linker Chains

Keywords: DNA / DNA recognition / Iridium / Intercalation / Polypyridyl ligands

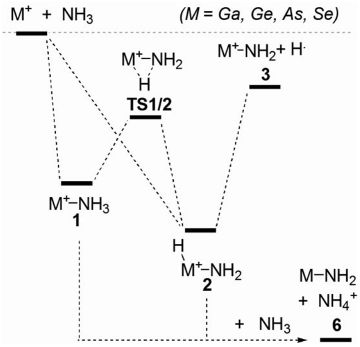
CONTENTS

Cation Activation of Ammonia

G. K. Koyanagi, V. Kapishon, D. K. Bohme,* X. Zhang, H. Schwarz* 1516–1521

Reactivity Pattern in the Room-Temperature Activation of NH_3 by the Main-Group Atomic Ions Ga^+, Ge^+, As^+ and Se^+

Keywords: Main-group elements / Ammonia / N–H bond activation / Reactivity pattern / Gas-phase ion chemistry



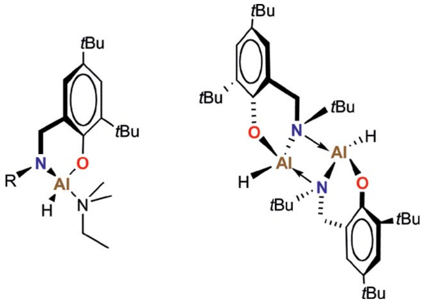
Ammonia activation by main-group M^+: Room-temperature reactions of ammonia with the main-group atomic cations, Ga^+, Ge^+, As^+ and Se^+ have been studied with ICP/SIFT tandem mass spectrometry and DFT computations. The observed pattern in the primary chemistry includes ammonia addition (**1**), H-atom elimination (**3**) and a cation-assisted proton transfer to yield NH_4^+. (**6**). Other possible pathways are calculated to be inhibited by kinetic barriers.

An Unusual N-Bridged Ligand

G. Martínez, J. Chirinos, M. E. G. Mosquera,* T. Cuenca,* E. Gómez 1522–1529

An Unusual N-Bridged (Amido)(hydrido)(phenoxido)aluminium Dinuclear Compound – The Role of Nitrogen Substituents in Determining Nuclearity: A Combined Experimental and Theoretical Study

Keywords: Aluminum / N ligands / Density functional calculations / Bridging ligands / Ligand effects



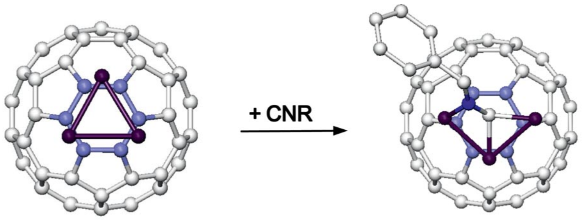
The mononuclear (amido)(hydrido)(phenoxido)aluminium complexes [AlH{3,5-tBu$_2$-2-(O)$C_6H_2CH_2$-NR}·NEtMe$_2$] (R = 2,6-Me$_2$C$_6$H$_3$, C_6F_5) and the dinuclear hydride [AlH{μ-3,5-tBu$_2$-2-(O)$C_6H_2CH_2$-NtBu}]$_2$, which has an unusual N-bridged phenoxido–amido ligand, were prepared by treatment of AlH_3·NEtMe$_2$ with iminophenol or aminophenol compounds. Theoretical calculations were used to clarify and rationalize the structures.

Metal–Fullerene Bonding

Y.-K. Han,* K. H. Kim, J. C. Kim, B. K. Park, J. T. Park* 1530–1535

[60]Fullerene–Metal Cluster Complexes: Understanding Novel η^1 and $\eta^{2[6:5]}$ Bonding Modes of Metallofullerenes

Keywords: Fullerenes / Transition metals / Bonding modes / Cluster compounds / Density functional calculations



$Os_3(CO)_8(CNR)(\mu_3\text{-}\eta^{2[6,6]}, \eta^{2[6,6]}, \eta^{2[6,6]}\text{-}C_{60})$ $Os_3(CO)_8(CNR)(\mu_3\text{-}CNR)(\mu_3\text{-}\eta^1,\eta^{2[6,5]},\eta^1\text{-}C_{60})$

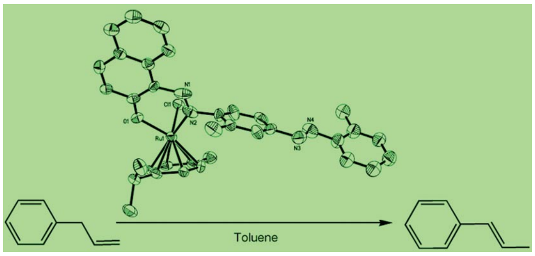
The reaction of $[Os_3(CO)_8(CNR)(\mu_3\text{-}\eta^{2[6:6]},\eta^{2[6:6]},\eta^{2[6:6]}\text{-}C_{60})]$ (R = CH_2Ph) with CNR (4e donor) produces $[Os_3(CO)_8(CNR)(\mu_3\text{-}CNR)(\mu_3\text{-}\eta^1,\eta^{2[6:5]},\eta^1\text{-}C_{60})]$. DFT calculations clearly show that the η^1 and $\eta^{2[6:5]}$ modes are preferable to $\eta^{2[6:6]}$ for electron-rich environments. Electron additions were found to significantly decrease π-type interactions, whereas they had little effect on σ-type interactions.

Olefin Isomerization Catalysts

F. Ding, Y. Sun, F. Verpoort* ... 1536–1543

O,N-Bidentate Ruthenium Azo Complexes as Catalysts for Olefin Isomerization Reactions

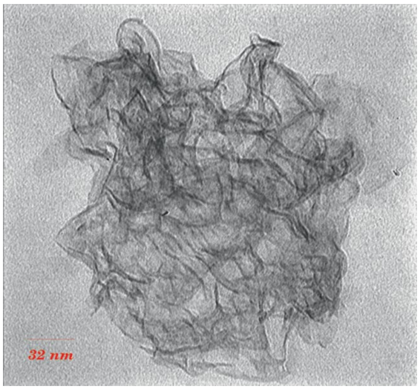
Keywords: Isomerization / Olefins / Ruthenium



A series of ruthenium complexes [(η^6-p-cymene)RuCl(L)] [L incorporate an azo group (**1**–**5**) or an imino group (**6**–**7**)] have been synthesized and studied as olefin isomerization catalyst. The obtained results suggest that the catalytic activity strongly depends on the steric and electronic environment of the ligand.

Mesostructured Nano-Alumina

Two series of aluminium-containing nanorods, gamma-alumina and boehmite, with excellent textural properties were synthesized. In addition to characterization by TEM analysis, their fractal dimensions were measured in order to determine the subtle changes in morphology of materials.



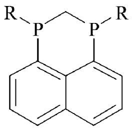
F. Rashidi,* A. N. Kharat,* A. M. Rashidi, E. Lima, V. Lara, J. S. Valente **1544–1551**

Fractal Geometry Approach to Describe Mesostructured Boehmite and Gamma-Alumina Nanorods

Keywords: Boehmite / Alumina / Nanostructures / Fractals / Sol-gel processes / Mesoporous materials / Aluminum

Synthesis of 1,3-Diphosphaphenalene

The reaction of 1,8-dilithionaphthalene with methylene-bis(dialkylamino-chloro)phosphanes gave a new heterocyclic system 1,3-diphospha-2,3-dihydro-1*H*-phenalene.



R = Alk$_2$N, Cl

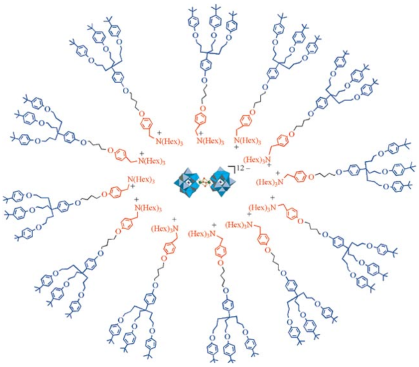
A. Tarasevych, I. Shevchenko,* A. B. Rozhenko, G.-V. Röschenthaler* **1552–1558**

Synthesis of 1,3-Diphospha-2,3-dihydro-1*H*-phenalenes

Keywords: Phosphanes / Diphosphinines / Heterocycles / Naphthalene derivatives / DFT calculations

Dendritic Zirconium-POMs

A series of dendritic zirconium-peroxotungstosilicate hybrids was synthesized and used as recoverable catalysts in the oxidation of sulfides with H_2O_2. These hybrids represent the first examples of DENDRI-POMs based on a zirconium-containing polytungstate. The synthetic approach used is promising and elegant with respect to catalytic activity, selectivity (also enantioselectivity), and catalyst recovery.



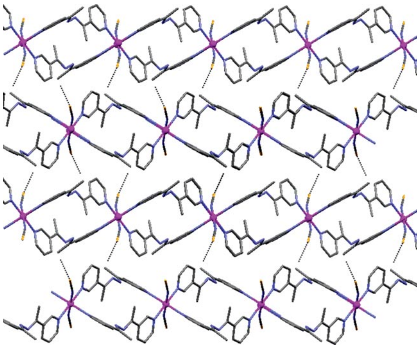
C. Jahier, S. S. Mal, U. Kortz,* S. Nlate* **1559–1566**

Dendritic Zirconium-Peroxotungstosilicate Hybrids: Synthesis, Characterization, and Use as Recoverable and Reusable Sulfide Oxidation Catalysts

Keywords: Dendrimers / Polyoxometalates / Homogeneous catalysis / Oxidation / Catalyst recovery / Zirconium

Solid-State Reactions

Solid-state reversible anion exchange and irreversible anion replacement were studied in five new zinc(II) coordination polymers. In the crystal lattice of these compounds, the coordination number of Zn^{II} does not change upon removal of four water molecules and new types of Zn–N$_{bpdh}$ and Zn–N$_{NCS/N_3}$ or Zn···O$_{NO_2}$ bonds are formed.



M. Khanpour, A. Morsali* **1567–1571**

Solid-State Reversible Anion Exchange and Irreversible Anion Replacement in 1D Zinc(II) Coordination Polymers: Precursors for the Preparation of Zinc(II) Nanostructures

Keywords: Zinc / Polymers / Nanostructures / Solid-state reactions

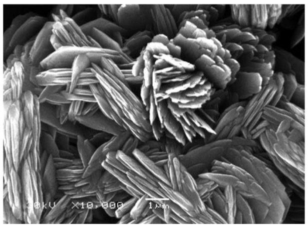
CONTENTS

Layer-by-Layer Chemical Deposition

S. M. S. Haggag* 1572–1580

Surface Layer-by-Layer Chemical Deposition Reaction for Nanosized Thin-Film Formation of Metal Complexes of 2-Mercaptonicotinic Acid

Keywords: Layer-by-layer deposition / Thin films / Nanostructures / Thermochemistry / Electron microscopy



A layer-by-layer chemical deposition technique is implemented for thin-film formation of nanosized metal complexes of 2-mercaptonicotinic acid [H_2mna]. The synthesized homogeneous thin films were found to have a detected particle size in the range ≥20−130 nm and were characterized by various methods including SEM, EI-MS, FTIR TGA, DTG, and UV/Vis spectroscopy.

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* Author to whom correspondence should be addressed.

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