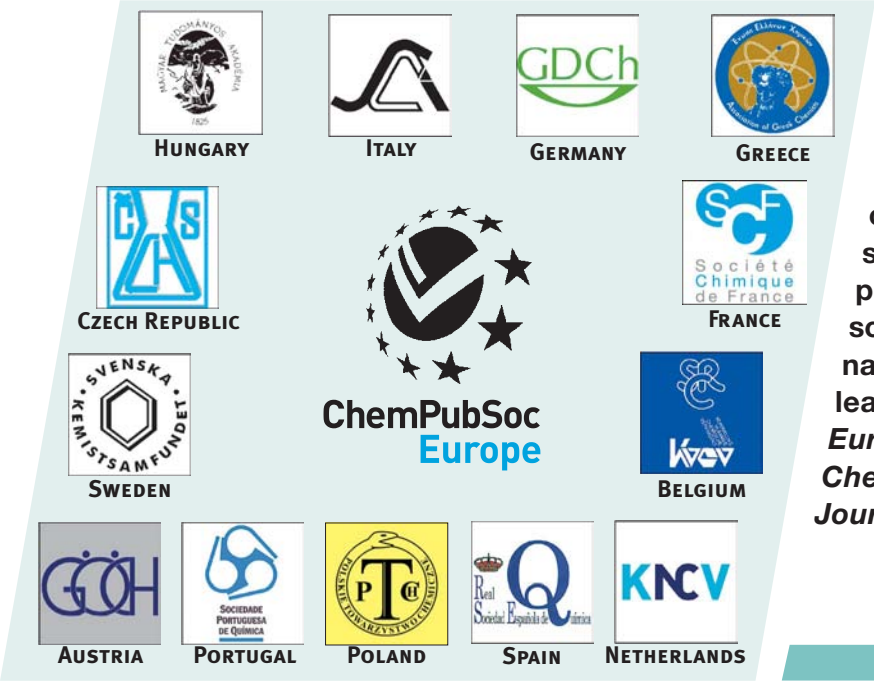
EurJIC
European Journal of Inorganic Chemistry



EurJIC is a journal of ChemPubSoc Europe, a union of 16 European chemical societies formed for the purpose of publishing high-quality science. All owners merged their national journals to form two leading chemistry journals, the *European Journal of Inorganic Chemistry* and the *European Journal of Organic Chemistry*.

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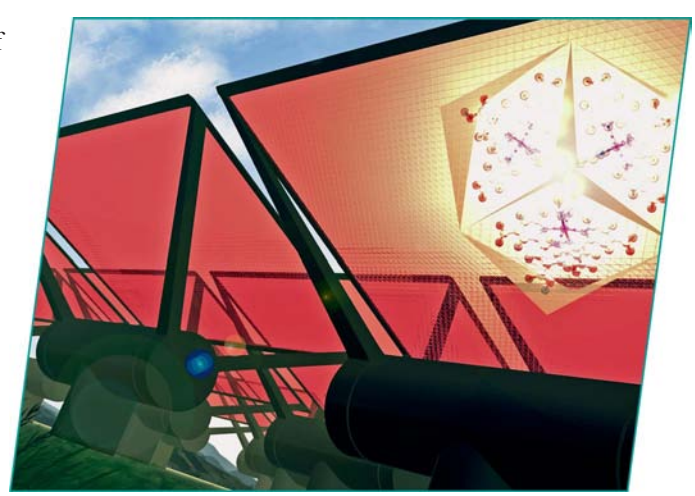
COVER PICTURE

The cover picture shows the molecular structure of three ruthenium polypyridyl complexes, namely the tris(isothiocyanato)bis(2,2′-bipyridyl-4,4′-dicarboxylato)ruthenium(II)−2,2′:6′,2′′-terpyridine-4,4′,4′′-tricarboxylic acid tris(tetrabutylammonium) salt (commonly known as Black Dye). The background of the picture corresponds to the drawing of a series of dye-sensitised solar cells, which use ruthenium complexes as photosensitisers. This is the topic of the Microreview by A. Reynal and E. Palomares on p. 4509ff, in which the properties, synthetic routes and main applications of the most relevant ruthenium−polypyridyl complexes are presented in further detail.



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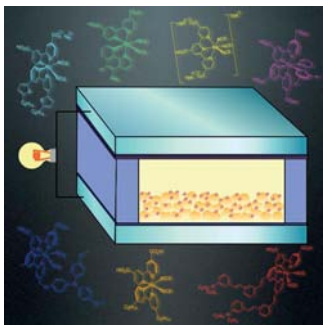
MICROREVIEW

Dye Solar Cells

Keywords: Dye-sensitized solar cells / Ruthenium / Charge transfer / Sensitizers

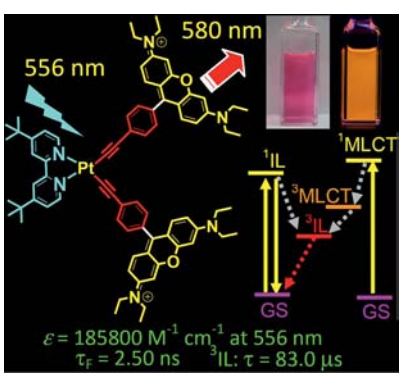


The review describes dye solar cells and the use of ruthenium complexes as sensitisers in this molecular device.

FULL PAPERS

Photochemistry

Keywords: Photochemistry / Rhodamine / Platinum / Triplet–triplet annihilation / Upconversion / Chromophores



An *N*^*N* Pt^{II} bis(acetylide) complex containing rhodamine was prepared (Pt–Rho), which shows intense UV/Vis absorption at 556 nm (ε = 185800 $M^{-1}cm^{-1}$), fluorescence of the ligand, and prolonged triplet excited state lifetime (τ_T = 83.0 μs, rhodamine-localised ^{3}IL state). Pt–Rho was used as sensitiser for triplet–triplet annihilation upconversion, and an upconversion quantum yield of 11.2% was observed.

Bimetallic Nanoparticles

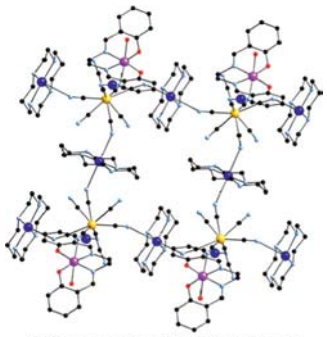
Keywords: Nanoparticles / Colloids / Silver / Gold / Dyes / Metal–Dye interactions

The one-pot synthesis of a range of silver-gold core-shell colloids is presented. These core-shell particles were characterised by several methods and shown to consist primarily of silver cores and gold exteriors that were slightly oxidised at the surface by the surfactant. The effect of methylene blue dye absorption onto these colloids was monitored. An increase in the extinction coefficient of the dye was observed. The different levels of increase in the extinction coefficient for the silver-gold colloids versus the pure metal colloids were explained.

Heterotrimetallic Complexes

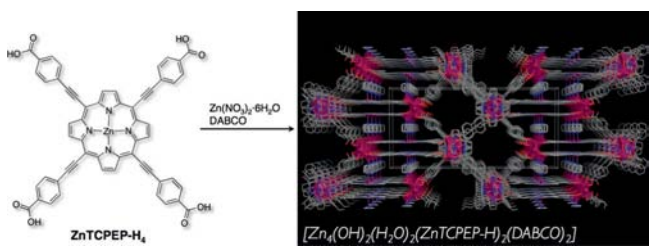
Keywords: Cyanides / Copper / Manganese / Molybdenum / Magnetic properties / Supramolecular chemistry

By using the stepwise "polynuclear complex as ligand" synthetic approach, we succeeded in obtaining an original cyano-based heterotrimetallic bidimensional network: $[Mo(CN)_8\{Cu(cyclam)\}_2Mn(salen)(H_2O)](ClO_4)$ [cyclam = 1,4,8,11-tetraazacyclotetradecane, H_2salen = 1,2-bis(salicylideneamino)ethane] based on molybdenum(IV), copper(II), and manganese(III). We report its synthesis, X-ray structure, and magnetic properties.



Porphyrin-Based Porous MOFs

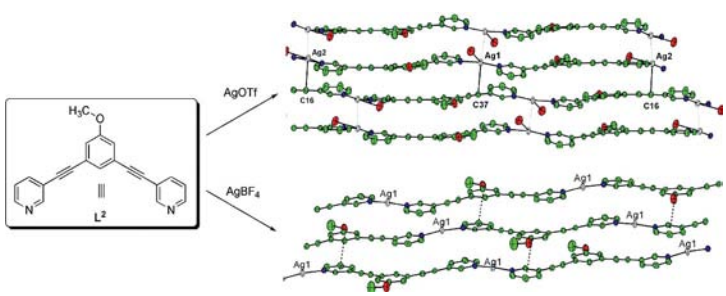
Keywords: Microporous materials / Zinc / Metal–organic frameworks / Porphyrinoids / Carboxylate ligands



We have designed a new tetracarboxylporphyrin building block, ZnTCPEP-H_4, and used it in the construction of a novel porphyrin-based metal carboxylate framework, Zn_4·ZnTCPEP·DABCO, which has a 3D network topology. Zn_4·ZnTCPEP·DABCO has a BET surface area of 461 m^2/g, a Langmuir surface area of 581 m^2/g, and a hydrogen adsorption capacity of 0.86 wt.-% at 77 K and 0.1 MPa.

Silver(I) Coordination Polymers

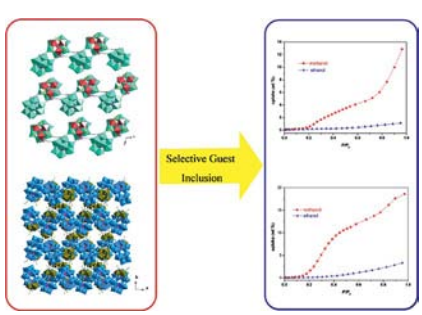
Keywords: Coordination chemistry / Coordination polymers / Silver / Ligand design / Self-assembly



A family of silver(I) coordination polymers $[AgL^2X]_n$ (**1**) has been prepared and characterized from silver salts AgX (X = CF_3SO_3, BF_4, NO_3, PF_6) and 5-methoxy-1,3-bis(pyridin-3-ylethynyl)benzene (L^2) acting as a bidentate ligand. $[AgL^2CF_3SO_3]_n$ (**1a**) and $[\{AgL^2\}\{BF_4\}]_n$ (**1b**) were structurally characterized. The influence of the anions and intermolecular aromatic interactions on the packing are reported.

Nanoporous Ionic Crystals

Keywords: Polyoxometalates / Adsorption / Microporous materials / Ionic crystals / Channel structures

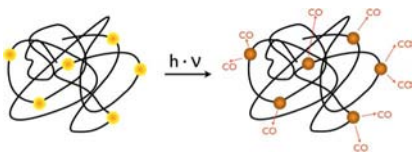


Based on polyoxometalate anions and macrocations, $KH_2[Cr_3O(OOCCH_3)_6(H_2O)_3][\alpha\text{-}GeMo_{12}O_{40}]\cdot 10H_2O$ (**1**), $K_{1.5}H_{1.5}[Cr_3O(OOCCH_3)_6(H_2O)_3][\alpha\text{-}GeW_{12}O_{40}]\cdot 9.5H_2O$ (**2**), $NaH_2[Cr_3O(OOCCH_3)_6(H_2O)_3]_3[\alpha\text{-}P_2W_{18}O_{62}]\cdot 32H_2O$ (**3**), and $Na_3[Cr_3O(OOCCH_3)_6(H_2O)_3]_3[\alpha\text{-}As_2W_{18}O_{62}]\cdot 34H_2O$ (**4**) have been prepared and characterized.

CONTENTS

CO-Releasing Molecules

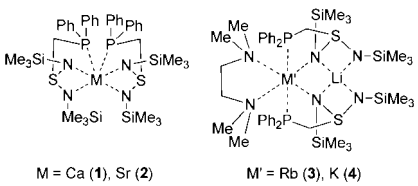
Keywords: Carbon monoxide / Carbonyl ligands / Polymer conjugates / Manganese / EPR effect / Cytotoxicity



Functionalised copolymers of 2-hydroxypropyl methacrylate and acrylamide (HPMA) were designed as polymeric carrier systems to deliver organometallic drugs, for example, $Mn(CO)_3$ photoCORMs, to tumour tissue and centres of inflammation.

Ligand Design

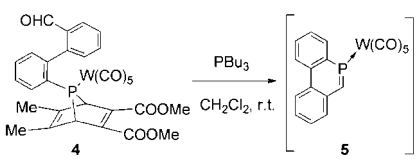
Keywords: Sulfur / Ligand design / N,P,S ligands / s-Block metals / Solid-state structures



[(tmeda)Li{$Ph_2PCH_2S(NSiMe_3)_2$}] contains a *N*-chelated lithium cation that is easy to replace with other s-block metals. The phosphanyl side arm of the ligand provides a coordination site that is softer than the N atoms and allows for the synthesis of heterobimetallic complexes; while the P atom contributes to the tripodal facial coordination with Ca (**1**) and Sr (**2**) and binds with the secondary metals Rb (**3**) and K (**4**). In complexes **3** and **4** lithium is the structural anchor.

Phosphinines

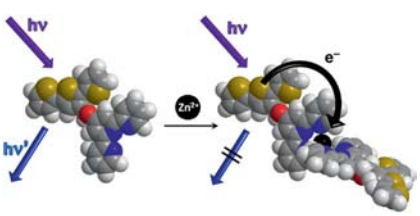
Keywords: Cycloaddition / Phosphorus heterocycles / Phospha-Wittig reaction



The reaction of **4** with tributylphosphane at room temperature gives phosphaphenanthrene complex **5**, which can be detected by ^{31}P NMR and trapped by addition, and [2+4] or [2+3] cycloaddition.

Terthiophene Systems

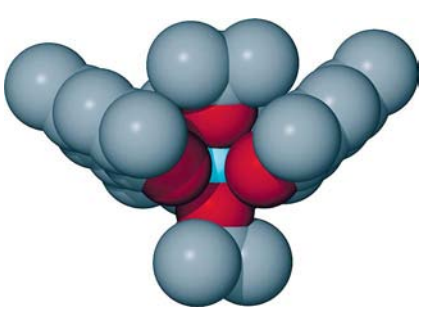
Keywords: Zinc(II) complexes / Luminescence / Oligothiophenes / Electrochemistry



Coupling of terthiophene and terpyridine units leads to luminescent and electroactive systems with potential applications as sensors of protons and metal ions.

Polymerisation

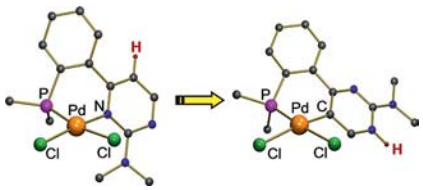
Keywords: Titanium / Zirconium / Hafnium / Ring-opening polymerization / Sustainable chemistry



New group 4 bis(phenolate) complexes have been prepared and characterised in the solid state. The complexes have been tested for the ring-opening polymerization (ROP) of *rac*-lactide both in the melt and solution with low polydispersity indices. In the solid state, the isopropoxide complexes adopt a *trans* configuration.

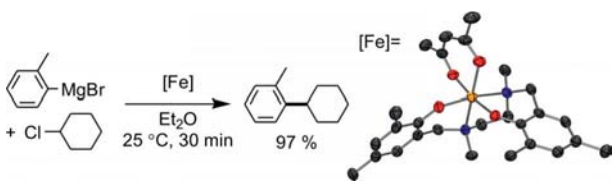
Pyrimidinylphosphanes

NH_2 versus NR_2: Subtle steric requirements determine the reactivity of palladium complexes bearing aminopyrimidinyl phosphane ligands and their performance as catalysts in Suzuki–Miyaura coupling reactions.



Keywords: P,N ligands / C–H activation / Palladium / Phosphanes

Iron(III) Phenolato Complexes

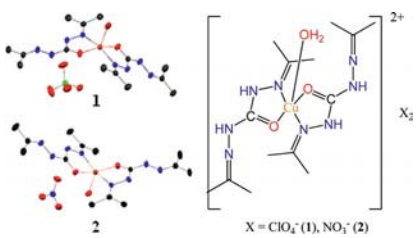


Iron(III)acac complexes supported by tetradentate N,O ligands have been prepared and structurally characterized. Their attempted use as single component, air-stable catalysts for C–C cross coupling of aryl Grignard reagents with secondary alkyl bromides and chlorides is presented.

Keywords: Transition metals / Iron / N,O ligands / Cross-coupling / Homogeneous catalysis

Organometallic Energetic Materials

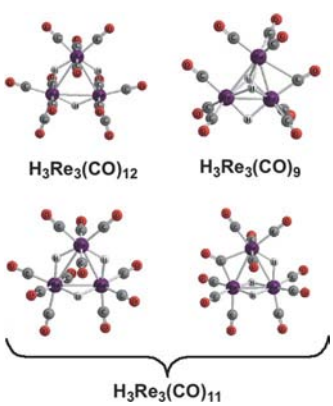
Crystal structures of copper(II) complexes with carbohydrazide derivatives prove the five-membered ring coordination mode of copper with carbohydrazide. Synthesized compounds exhibit properties of pyrotechnic flame colorants generating blue and green colors.



Keywords: Copper / Flame colorants / Calorimetry

Bridging Hydrogen Atoms

The lowest energy $H_3Re_3(CO)_{12}$ and $H_3Re_3(CO)_{11}$ structures have central Re_3 triangles with edge-bridging hydrogen atoms. The Re_3 triangles in the lowest energy $H_3Re_3(CO)_{10}$ and $H_3Re_3(CO)_9$ structures have one and two face-bridging hydrogen atoms, respectively, with the remaining hydrogen atoms in edge-bridging positions.



Keywords: Rhenium / Bridging ligands / Density functional calculations / Thermochemistry

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