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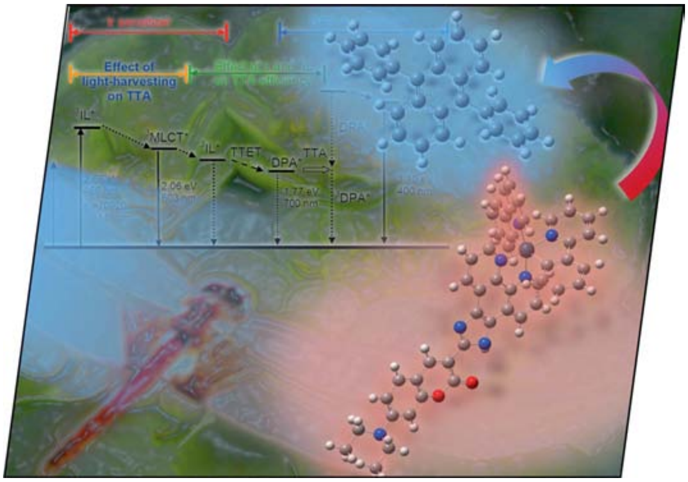
COVER PICTURE

The cover picture shows the triplet-triplet-annihilation (TTA) upconversion between a visible-light harvesting IrIII complex and 9,10-diphenylanthracene (DPA). In the upper left-hand corner is the qualitative Jablonski diagram describing the photophysical process involved in the TTA upconversion. Although the coumarin-containing Ir^{III} complexes are weakly phosphorescent, we proved that the long-lived ^3IL excited state was populated upon photoexcitation by using time-resolved transient absorption spectroscopy, emission spectroscopy at 77 K, and DFT calculations. The complexes were used as triplet sensitizers for TTA upconversion, and an upconversion quantum yield of up to 23.4% was observed. Thus, we propose that the T1 excited state of the triplet sensitizers does not necessarily have to be emissive. Details are discussed in the article by J. Zhao et al. on p. 3165ff. The cover art was produced by Dr. Xin Liu (Dalian University of Technology).



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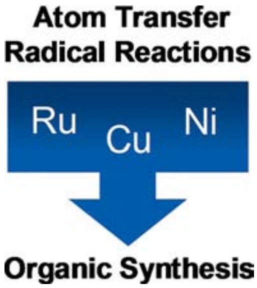
MICROREVIEW

Metal-Catalyzed ATRA Reactions

J. M. Muñoz-Molina, T. R. Belderrain,*
P. J. Pérez* **3155–3164**

Atom Transfer Radical Reactions as a Tool for Olefin Functionalization – On the Way to Practical Applications

Keywords: ATRA reactions / Homogeneous catalysis / Transition metals / Radicals / Olefins



Active metal-catalyzed atom transfer radical addition (ATRA) systems based on ruthenium, nickel, or copper have been developed in the last two decades. Many of those catalytic systems are quite stable in terms of handling, as well as inexpensive and easy to prepare. Their initial application to model olefins shows that the time for a wider application as a tool in organic synthesis has come.

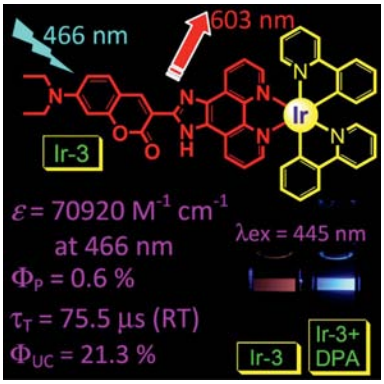
FULL PAPERS

Upconversion

J. Sun, W. Wu, H. Guo,
J. Zhao* **3165–3173**

Visible-Light Harvesting with Cyclometalated Iridium(III) Complexes Having Long-Lived ^{3}IL Excited States and Their Application in Triplet–Triplet-Annihilation Based Upconversion

Keywords: Photochemistry / Light harvesting / Luminescence / Upconversion / Iridium



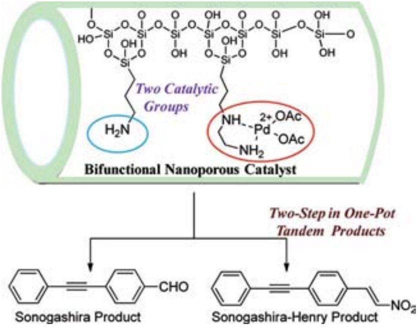
Cyclometalated iridium(III) complexes with intense absorption in the visible region were prepared. The complexes show long-lived intraligand triplet excited states, with lifetimes (τ_T) of up to 75.5 µs (Φ_P = 0.6%). The complexes were used as triplet sensitizers in triplet–triplet-annihilation (TTA) upconversion, and quantum yields (Φ_{UC}) of up to 21.3% were observed.

Bifunctional Nanocatalysts

K. K. Sharma, A. V. Biradar, S. Das,
T. Asefa* **3174–3182**

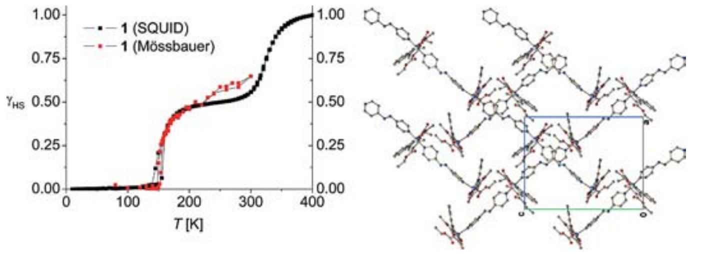
Bifunctional Mesoporous Silica Catalyst for C–C Bond Forming Tandem Reactions

Keywords: Heterogeneous catalysis / C–C coupling / Palladium / Mesoporous materials / Bifunctional catalysts



Hybrid organic–inorganic mesoporous bifunctional catalysts were synthesized and shown to catalyze the tandem Sonogashira and Henry reactions in a one-pot system. The synthesis of the catalysts was performed by sequential grafting of two different functionalized organosilanes on MCM-41 and SBA-15 mesoporous silica materials by using 2-propanol and toluene as solvents in subsequent steps.

Spin Crossover Complexes



An unusual wide plateau is observed for a 1D chain spin crossover compound with a perpendicular arrangement of the polymer chains.

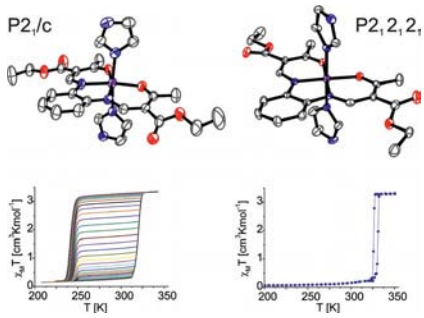
W. Bauer, T. Pfaffeneder, K. Achterhold, B. Weber* **3183–3192**

Complete Two-Step Spin-Transition in a 1D Chain Iron(II) Complex with a 110-K Wide Intermediate Plateau

Keywords: Spin crossover / Coordination polymers / Magnetic properties / Moessbauer spectroscopy / Iron

Spin Crossover

Two modifications of compound **1** show totally different spin-crossover behaviour. Detailed investigations including FORC measurements and isotopic labelling experiments revealed reasons for this behaviour. This finding is important for the development of new rules for the purposeful synthesis of spin-crossover complexes with wide thermal hysteresis loops around room temperature.



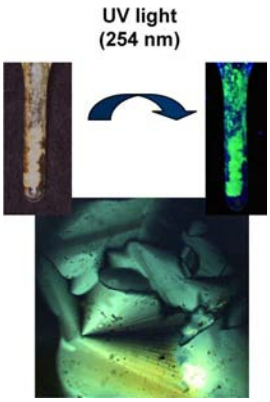
B. Weber,* W. Bauer, T. Pfaffeneder, M. M. Dîrtu, A. D. Naik, A. Rotaru, Y. Garcia* **3193–3206**

Influence of Hydrogen Bonding on the Hysteresis Width in Iron(II) Spin-Crossover Complexes

Keywords: Molecular bistability / Spin crossover / Memory effect / Hydrogen bonds / Crystal engineering

Switchable Luminescence

[C_{12}mpyr]Br doped with $TbBr_3$ and [C_{12}mpyr]$_3$[$TbBr_6$] are ionic liquid crystals that show strong green photoluminescence. For the analogous imidazolium compounds, the color of this emission can be switched between blue-white and green.



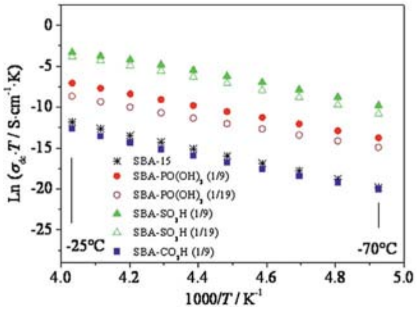
A. Getsis, A.-V. Mudring* **3207–3213**

Switchable Green and White Luminescence in Terbium-Based Ionic Liquid Crystals

Keywords: Ionic liquids / Ionic liquid crystals / Liquid crystals / Lanthanides / Luminescence

Hybrid Materials

The hydrated and functionalized SBA-15 samples, which contained two loadings of the different acid groups [CO_2H, $PO(OH)_2$ and SO_3H], were tested for their application as proton conductors. Some of them were found to be promising candidates for electrolyte solid applications in fuel cells. The conductivity values depended on the pK_a and the density of the functional groups that were attached to the mesopore surface.



N. Bibent, A. Mehdi, G. Silly, F. Henn, S. Devautour-Vinot* **3214–3225**

Proton Conductivity versus Acidic Strength of One-Pot Synthesized Acid-Functionalized SBA-15 Mesoporous Silica

Keywords: Self-assembly / Hybrid materials / Organic-inorganic hybrid composites / Mesoporous materials / Conducting materials

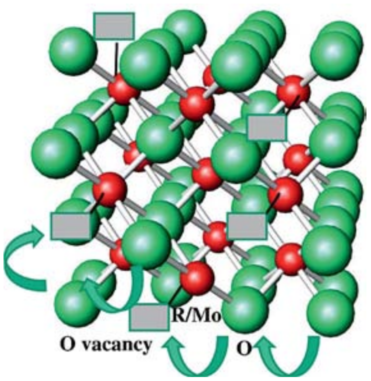
CONTENTS

Anodes for Solid Oxide Fuel Cells

**A. Aguadero,* M. J. Martínez-Lope,
V. Pomjakushin,
J. A. Alonso 3226–3231**

Oxygen-Deficient $R_2MoO_{6-\delta}$ (R = Tb, Dy, Y, Ho, Er, Tm, Yb) with Fluorite Structure as Potential Anodes in Solid Oxide Fuel Cells

Keywords: Fluorites / Lanthanides / Fuel cells / Molybdenum / Oxides



The highly oxygen-deficient members of the family of fluorites $R_2MoO_{6-\delta}$ with δ values of 0.8(1) (R = Y, Tm) and 1.2(1) (R = Tb, Dy, Ho, and Er) have been proposed as possible mixed ionic/electronic conductors useful as anodes for solid oxide fuel cells (SOFCs), with maximum conductivities of $1.1\,\mathrm{S\,cm^{-1}}$ and thermal expansion coefficients around $9\times10^{-6}\,\mathrm{K^{-1}}$.

Homogeneous Catalysis

**A. D. Chowdhury, S. M. Mobin,
S. Mukherjee, S. Bhaduri,*
G. K. Lahiri* 3232–3239**

$[Pd(L)Cl_2]$-Catalyzed Selective Hydroxylation of Arylboronic Acids to Phenols

Keywords: Palladium / Homogeneous catalysis / Phosphane ligands / Hydroxylation

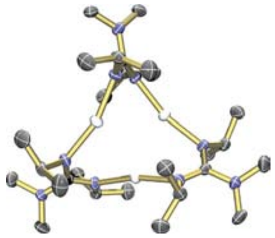
Complex **1** catalyzes the selective hydroxylation of arylboronic acid to phenol in presence of O_2 at 298 K in low-dielectric solvents; however, in high-dielectric solvents biaryl is formed along with phenol.

Potential Precusors for CVD

**T. J. J. Whitehorne, J. P. Coyle,
A. Mahmood, W. H. Monillas,
G. P. A. Yap, S. T. Barry* 3240–3247**

Group 11 Amidinates and Guanidinates: Potential Precursors for Vapour Deposition

Keywords: Thermal reaction mechanism / Gold / Silver / Copper / N ligands / Chemical vapor deposition



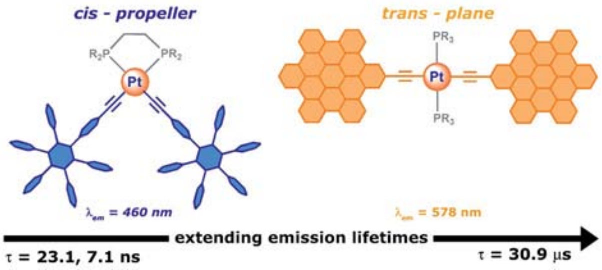
Several group 11 amidinates and guanidinates were synthesized and thermally characterised. In general, these were found to produce a metal upon heating. Thus, the thermal chemistry was investigated, and these compounds were assessed as potential precursors for chemical vapour deposition.

Propellers and Planes

**D. Nolan, B. Gil, F. A. Murphy,
S. M. Draper* 3248–3256**

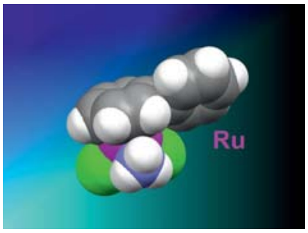
Propellers and Planes: Phosphorescent Pt^{II} σ-Acetylides from Polyaromatic Ligands

Keywords: Platinum / Isomers / Alkyne ligands / Graphene / Photophysics



σ-Acetylide hexa-*peri*-hexabenzocoronene (HBC) and polyphenylene Pt^{II} complexes were synthesised in *cis* and *trans* geometries. The photophysical and electrochemical data are consistent with an enhancement of π-conjugation in the *trans* isomer, which exhibits long-lived phosphorescence (τ = 30.9 μs) centred on the planar HBC chromophore ($^3\pi\pi^*$).

The synthesis and characterization of the novel dichlorido half-sandwich Ru^{II} complexes [(η^6-arene)Ru(NH$_3$)Cl$_2$] (arene = *p*-cymene or biphenyl) are described. Their hydrolysis, nucleobase binding and cancer cell cytotoxicity are investigated.



S. Betanzos-Lara,
A. Habtemariam, G. J. Clarkson,
P. J. Sadler* **3257–3264**

Organometallic *cis*-Dichlorido Ruthenium(II) Ammine Complexes

Keywords: Ruthenium / Sandwich complexes / Cytotoxicity / Antitumor agents / Arene ligands / N ligands

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* Author to whom correspondence should be addressed.

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