

# Dalton Transactions

An international journal of inorganic chemistry incorporating Acta Chemica Scandinavica  
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## IN THIS ISSUE

ISSN 1477-9226 CODEN DTARAF 44(40) 17417–17868 (2015)



### Cover

See Michael I. Webb and Charles J. Walsby,  
pp. 17482–17493.

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**44**, 17482.



### Inside cover

See Chris S. Hawes,  
Stuart R. Batten,  
David R. Turner et al.,  
pp. 17494–17507.

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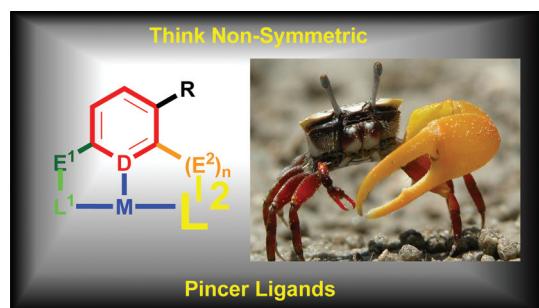
## PERSPECTIVE

17432

### Non-symmetric pincer ligands: complexes and applications in catalysis

Matthew Asay\* and David Morales-Morales\*

Non-symmetric pincer ligands and their complexes have become relevant in different areas of chemistry greatly increasing the pincer structural motifs known and hence their physical and chemical properties. The impact of these species in organometallic chemistry and catalysis is discussed in this perspective.



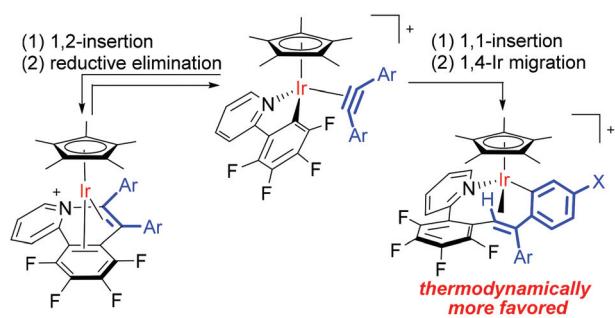
## COMMUNICATIONS

17448

### Competition between vinylidene rearrangement and 1,2-insertion of carbon-disubstituted internal alkynes at a Cp\*Ir(III) complex

Yousuke Ikeda, Shintaro Kodama, Noriko Tsuchida and Youichi Ishii\*

Competition between vinylidene rearrangement/1,1-insertion and 1,2-alkyne insertion into the Ir–Ar bond of  $[\text{Cp}^*\text{Ir}(\text{ppy}-\text{F}_4)]^+$  was observed on reaction with diarylacetylenes. The former process afforded the 9-membered iridacycle via the subsequent 1,4-Ir migration.



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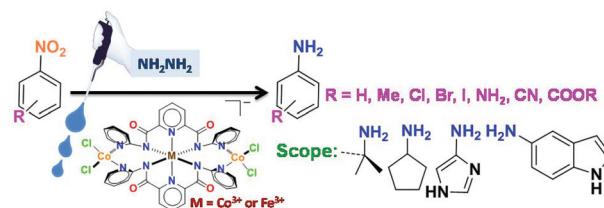
## COMMUNICATIONS

17453

**Trinuclear  $\{\text{Co}^{2+}-\text{M}^{3+}-\text{Co}^{2+}\}$  complexes catalyze reduction of nitro compounds**

Sumit Srivastava, Manvender S. Dagur, Afsar Ali and Rajeev Gupta\*

Trinuclear  $\{\text{Co}^{2+}-\text{Co}^{3+}-\text{Co}^{2+}\}$  and  $\{\text{Co}^{2+}-\text{Fe}^{3+}-\text{Co}^{2+}\}$  complexes function as reusable heterogeneous catalysts for the selective reduction of assorted nitro compounds to their corresponding amines. The mechanistic investigations suggest the involvement of a  $\text{Co}(\text{II})-\text{Co}(\text{I})$  cycle in the catalysis.

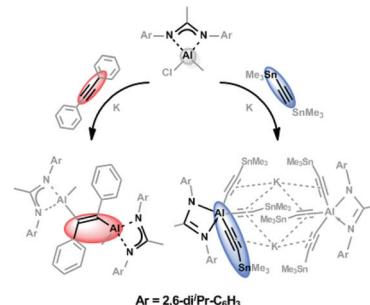


17462

**Addition of *in situ* reduced amidinato-methylaluminium chloride to acetylenes**

T. Chlupatý, J. Turek, F. De Proft, Z. Růžičková and A. Růžička\*

Addition of *in situ* reduced amidinato-methylaluminium chloride to acetylenes was observed. Whether the structure of the products contains an ethylene bridge or terminally bonded ethynyl groups, and the further reactivity of the products are closely related to the substituents on the  $\text{C}\equiv\text{C}$  group.

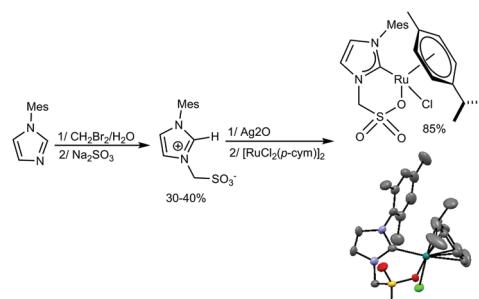


17467

**Ruthenium(II) and iridium(III) complexes featuring NHC–sulfonate chelate**

A. Rajaraman, A. R. Sahoo, F. Hild, C. Fischmeister,\* M. Achard\* and C. Bruneau

Three new complexes bearing a chelating ( $\kappa^2\text{C}, \text{O}$ ) NHC– $\text{SO}_3^-$  ligand have been prepared.

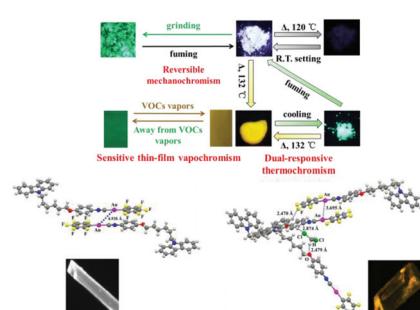


17473

**A novel carbazole-based gold(I) complex with interesting solid-state, multistimuli-responsive characteristics**

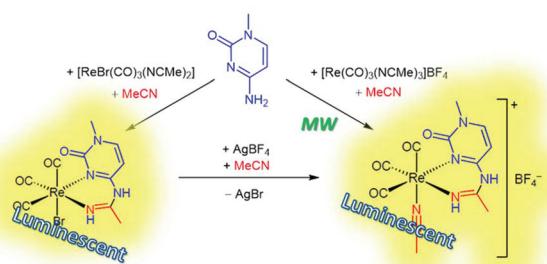
Zhao Chen, Jinhua Liang, Yuting Nie, Xuqingfeng Xu, Guang-Ao Yu, Jun Yin\* and Sheng Hua Liu\*

A novel carbazole-based gold(I) complex is reported. The luminogen exhibits significant solid-state reversible mechanochromism, dual-responsive thermochromism and sensitive thin-film vapochromism properties.



## COMMUNICATIONS

17478



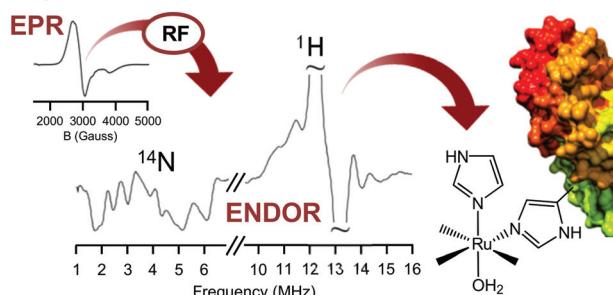
**Amidino ligands obtained from the coupling of 1-methylcytosine and nitrile: a new method to incorporate biomolecules into luminescent  $\text{Re}(\text{CO})_3$  complexes**

Patricia Gómez-Iglesias, Jose Miguel Martín-Alvarez, Daniel Miguel and Fernando Villafaña\*

Amidino chelating ligands obtained from the coupling of 1-methylcytosine with nitriles allow the incorporation of biologically relevant substrates into  $\text{Re}(\text{CO})_3$  complexes.

## PAPERS

17482

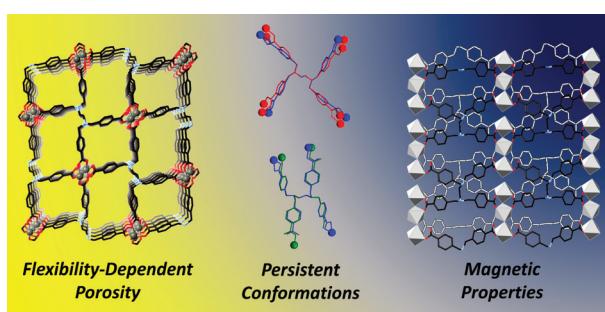


**Albumin binding and ligand-exchange processes of the  $\text{Ru}(\text{III})$  anticancer agent NAMI-A and its bis-DMSO analogue determined by ENDOR spectroscopy**

Michael I. Webb\* and Charles J. Walsby\*

Coordination of  $\text{Ru}(\text{III})$  anticancer candidates to albumin via histidine imidazoles has been demonstrated by electron nuclear double resonance (ENDOR) spectroscopy.

17494

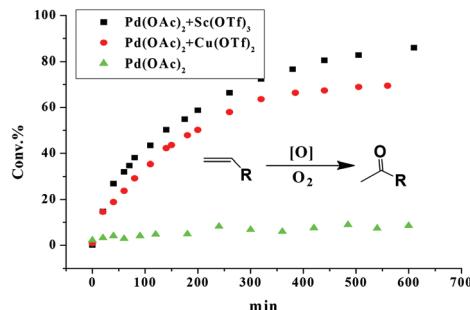


**Coordination polymers from a highly flexible alkyldiamine-derived ligand: structure, magnetism and gas adsorption studies**

Chris S. Hawes,\* Nicholas F. Chilton, Boujemaa Moubaraki, Gregory P. Knowles, Alan L. Chaffee, Keith S. Murray, Stuart R. Batten\* and David R. Turner\*

Studies into a series of coordination polymers from a new diamine polycarboxylate ligand reveal an interplay between flexibility and material properties.

17508



**Non-redox metal ions can promote Wacker-type oxidations even better than copper(II): a new opportunity in catalyst design**

Shuhao Qin, Lei Dong, Zhuqi Chen, Sicheng Zhang and Guochuan Yin\*

Non-redox metal ions can accelerate Pd(II)-catalyzed Wacker-type oxidations better than Cu(II), revealing a new role of Cu(II) in the Wacker-type mechanism.

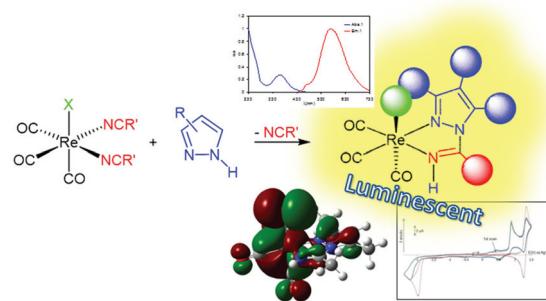
## PAPERS

17516

**Luminescent rhenium(I) tricarbonyl complexes with pyrazolylamidino ligands: photophysical, electrochemical, and computational studies**

Patricia Gómez-Iglesias, Fabrice Guyon, Abderrahim Khatyr, Gilles Ulrich, Michael Knorr, Jose Miguel Martín-Alvarez, Daniel Miguel and Fernando Villafañe\*

Neutral and cationic rhenium(I)tricarbonyl pyrazolylamidino phosphorescent complexes are obtained by a new strategy to design new targeted chelating N-donor ligands.

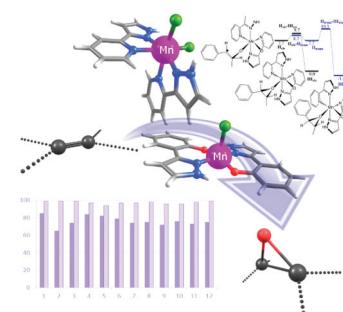


17529

**Reusable manganese compounds containing pyrazole-based ligands for olefin epoxidation reactions**

Ester Manrique, Albert Poater, Xavier Fontrodona, Miquel Solà, Montserrat Rodríguez\* and Isabel Romero\*

New robust and effective Mn-pyrazolyl catalysts for olefin epoxidation in [bmim]PF<sub>6</sub> : CH<sub>3</sub>CN, with good activity even after several reuses, are described. The *cis* → *trans* isomerization in the epoxidation of *cis*-β-methylstyrene is confirmed through computational calculations.

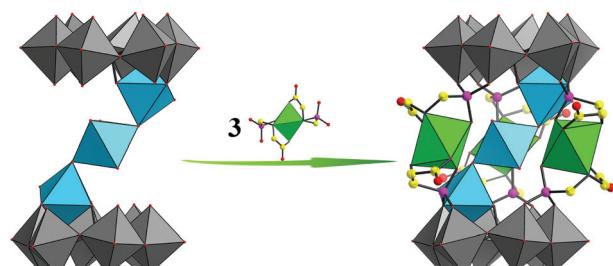


17544

**Grafting transition metal–organophosphonate fragments onto heteropolyoxomolybdate: activity in photocatalysis**

Xiaopeng Sun, Zhijie Liang, Pengtao Ma, Ran Ban, Mingshuang Jiang, Dongdi Zhang,\* Jingping Wang and Jingyang Niu\*

Polyanion **1a** can be seen as the structure decorated by three isolated {Ni(OOCCH<sub>2</sub>NHCH<sub>2</sub>PO<sub>3</sub>)<sub>2</sub>} based on the "Z-shaped" framework {Ni<sub>3</sub>O<sub>2</sub>(H<sub>2</sub>O)<sub>6</sub>(PMo<sub>6</sub>O<sub>24</sub>)<sub>2</sub>(μ<sub>3</sub>-O)<sub>2</sub>(μ<sub>2</sub>-O)<sub>6</sub>}.

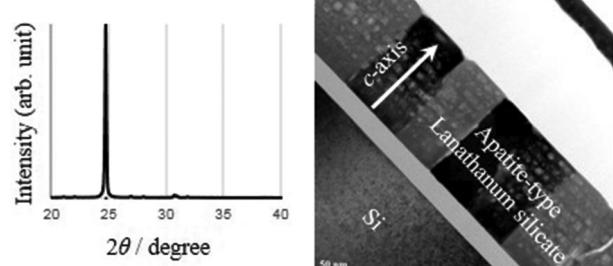


17551

**Chemical solution deposition of the highly *c*-axis oriented apatite type lanthanum silicate thin films**

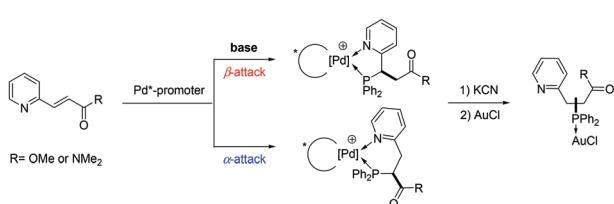
Shigeo Hori,\* Yasuhiro Takatani, Hiroaki Kadoura, Takeshi Uyama, Satoru Fujita and Toshihiko Tani

Highly *c*-axis oriented apatite-type lanthanum silicate thin films composed of columnar grains were fabricated by a simple solution coating method.



## PAPERS

17557

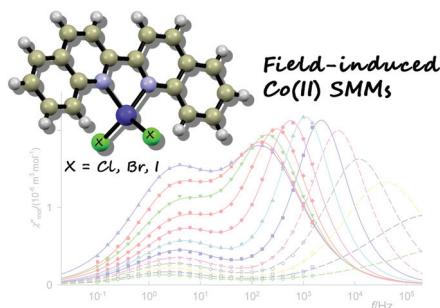


### Palladacycle promoted base controlled regio- and enantioselective hydrophosphination of 2-pyridylacrylate/amide and the cytotoxicity of their gold complexes

Yu-Xiang Jia, Renta Jonathan Chew, Bin-Bin Li, Pengcheng Zhu, Yongxin Li, Sumod A. Pullarkat, Nguan Soon Tan\* and Pak-Hing Leung\*

The regio- & stereoselective hydrophosphination of pyridine-functionalized alkenes is achieved. Gold–phosphine adducts were found to be potent anti-cancer agents.

17565

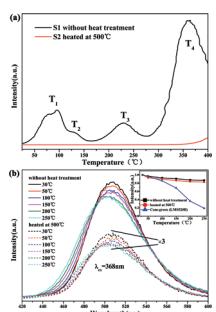


### Three tetracoordinate Co(II) complexes [Co(biq)X<sub>2</sub>] (X = Cl, Br, I) with easy-plane magnetic anisotropy as field-induced single-molecule magnets

L. Smolko, J. Černák, M. Dušek, J. Miklovic, J. Titiš\* and R. Boča

Three mononuclear complexes [Co<sup>II</sup>(biq)X<sub>2</sub>] (biq = 2,2'-biquinoline; X = Cl, Br, I) possess a sizable magnetic anisotropy, and they display a superparamagnetic behaviour in an applied external field that culminates between  $B_{DC} = 0.2\text{--}0.3$  T.

17572

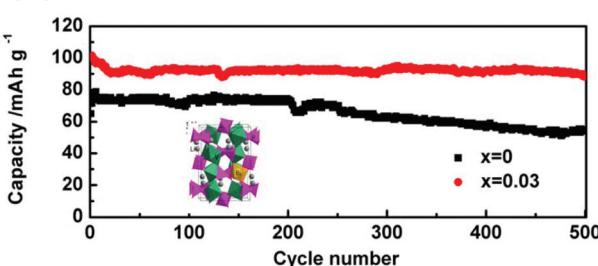


### Luminescence properties of a new green afterglow phosphor NaBaScSi<sub>2</sub>O<sub>7</sub>:Eu<sup>2+</sup>

Gen Li, Yuhua Wang,\* Wei Zeng, Wenbo Chen, Shaochun Han, Haijie Guo and Xicheng Wang

A novel green afterglow phosphor NaBaScSi<sub>2</sub>O<sub>7</sub>:Eu<sup>2+</sup> was prepared by a solid state reaction under a reductive atmosphere.

17579



### A Bi-doped Li<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>/C cathode material with an enhanced high-rate capacity and long cycle stability for lithium ion batteries

Yi Cheng, Kai Feng,\* Wei Zhou, Hongzhang Zhang, Xianfeng Li and Huamin Zhang\*

A promising cathode material Li<sub>3</sub>V<sub>1.97</sub>Bi<sub>0.03</sub>(PO<sub>4</sub>)<sub>3</sub>/C for high-power Li rechargeable batteries shows excellent electrochemical performance.

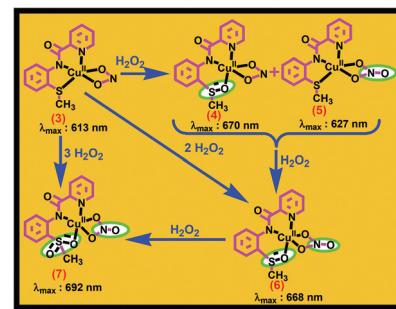
## PAPERS

17587

## Copper coordinated ligand thioether-S and $\text{NO}_2^-$ oxidation: relevance to the $\text{Cu}_M$ site of hydroxylases

Ram Chandra Maji, Anirban Bhandari, Ravindra Singh, Suprakash Roy, Sudip K. Chatterjee, Faye L. Bowles, Kamran B. Ghiassi, Milan Maji, Marilyn M. Olmstead and Apurba K. Patra\*

$\text{Cu}^{II}$  mediated systematic and stoichiometric oxidation of aryl thioether-S and  $\text{NO}_2^-$  using the oxidants  $\text{H}_2\text{O}_2$  and molecular  $\text{O}_2$ .

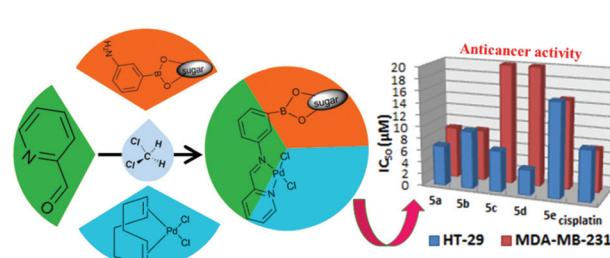


17600

## Sugar-boronate ester scaffold tethered pyridyl-imine palladium(II) complexes: synthesis and their *in vitro* anticancer evaluation

Eda Rami Reddy, Rajiv Trivedi,\* Akella Venkata Subrahmanyam Sarma, Balasubramanian Sridhar, Hasitha Shilpa Anantaraju, Dharmarajan Sriram, Perumal Yogeeshwari and Narayana Nagesh\*

The anticancer activity of sugar-boronate ester containing palladium(II) complexes is reported.

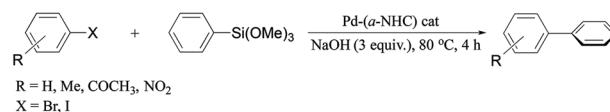
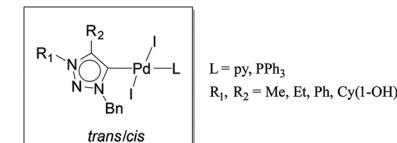


17617

## Fluoride-free Hiyama coupling by palladium abnormal N-heterocyclic carbene complexes

Sudipta Modak, Manoj Kumar Gangwar, Mitta Nageswar Rao, Mahesh Madasu, Alok Ch. Kalita, Vincent Dorcet, Mayuri Arun Shejale, Ray J. Butcher and Prasenjit Ghosh\*

A series of Pd complexes of the 1,2,3-triazole based abnormal NHC ligands of the type (*a*-NHC) $\text{PdI}_2(\text{L})$  [ $\text{L} = \text{NC}_5\text{H}_5$  and  $\text{PPPh}_3$ ] successfully catalyzed the fluoride-free Hiyama coupling in air.

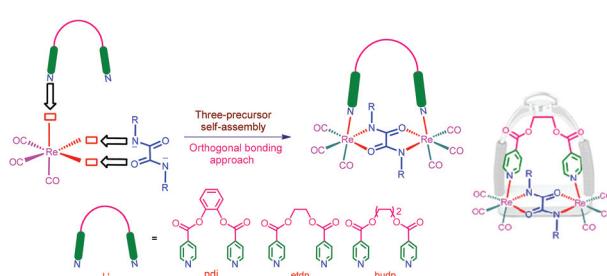


17629

## Self-assembly of oxamidato bridged ester functionalised dirhenium metallastirrups: synthesis, characterisation and cytotoxicity studies

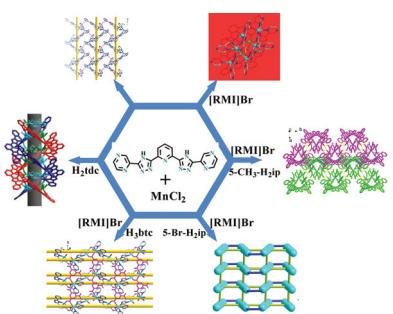
Buthanapalli Ramakrishna, R. Nagarajaprakash, V. Veena, N. Sakthivel\* and Bala. Manimaran\*

Hetero-topic self-assembly of  $\text{Re}_2(\text{CO})_{10}$  with oxamide ligands and ester-functionalised ditopic-tectons afforded dinuclear metallacycles resembling a stirrup. The metallastirrups showed promising cytotoxic activity against few cancer cell lines *in vitro*.



## PAPERS

17639

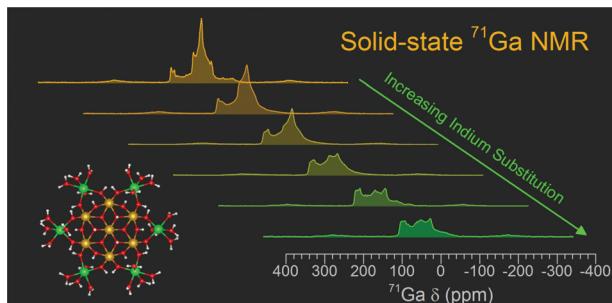


## Influence of ionic liquids on the syntheses and structures of Mn(II) coordination polymers based on multidentate N-heterocyclic aromatic ligands and bridging carboxylate ligands

Jian-Hua Qin, Hua-Rui Wang, Qi Pan, Shuang-Quan Zang, Hongwei Hou\* and Yaoting Fan

[RMI]Br probably serves as a template directing agent for the formation of a cluster helicate in **2**, while it serves as a mineralizing agent in **3–6**. Additionally, [RMI]Br could obviously improve the crystal yield of **7**.

17652

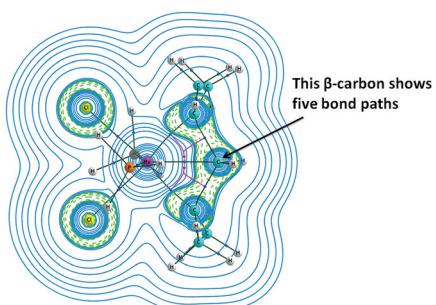


## Structural study by solid-state <sup>71</sup>Ga NMR of thin film transistor precursors

Blake A. Hammann, Zayd L. Ma, Katherine M. Wentz, Maisha K. Kamunde-Devonish, Darren W. Johnson and Sophia E. Hayes\*

<sup>71</sup>Ga NMR yields lineshapes that reflect the different coordination environments in tridecameric "**Ga**<sub>13-x</sub>**In**<sub>x</sub>" hydroxido-aquoclusters, [Ga<sub>13-x</sub>In<sub>x</sub>(μ<sub>3</sub>-OH)<sub>6</sub>(μ<sub>2</sub>-OH)<sub>18</sub>(H<sub>2</sub>O)<sub>24</sub>]. Indium substitution is found only in the peripheral "outer" metal sites (shown in green).

17660

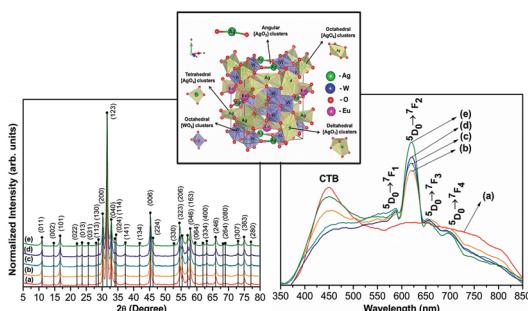


## Hypercoordinate β-carbon in Grubbs and Schrock olefin metathesis metallacycles

Premaja R. Remya and Cherumuttathu H. Suresh\*

From the analysis of structural, bond order, electron density and <sup>13</sup>C NMR data of a large variety of ruthenacyclobutanes and tungstenacyclobutanes, we show that the C<sub>β</sub> of the metallacycle is pentacoordinate.

17673



## Structural and photoluminescence properties of Eu<sup>3+</sup> doped α-Ag<sub>2</sub>WO<sub>4</sub> synthesized by the green coprecipitation methodology

Ivo M. Pinatti, Içamira C. Nogueira, Wyllamanney S. Pereira, Paula F. S. Pereira, Rosana F. Gonçalves, José A. Varela, Elson Longo and Ieda L. V. Rosa\*

Europium doped silver tungstates α-Ag<sub>2-3x</sub>Eu<sub>x</sub>WO<sub>4</sub> ( $x = 0, 0.0025, 0.005, 0.0075$  and  $0.01$  mol) were synthesized by the coprecipitation method at 90 °C for 30 minutes. PL spectra showed a broad band related to the [WO<sub>6</sub>] group and characteristic narrow peaks due to the f-f transitions of Eu<sup>3+</sup> as a result of efficient energy transfer from the matrix.

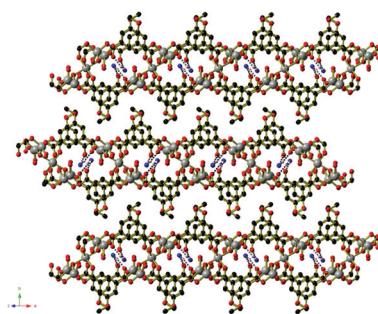
## PAPERS

17686

**Coordination polymers of Zn<sup>II</sup> and 5-methoxy isophthalate**

Laura J. McCormick, Samuel A. Morris, Simon J. Teat, Matthew J. McPherson, Alexandra M. Z. Slawin and Russell E. Morris\*

Four different coordination polymers were prepared by reaction of Zn(OAc)<sub>2</sub> and 5-methoxy isophthalic acid using various aqueous/aqueous alcohol solvent systems.

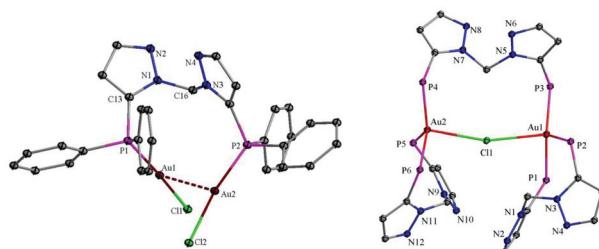


17696

**Gold(I) complexes of bisphosphines with bis(azol-1-yl)methane backbone: structure of a rare dinuclear gold(I) complex  $[(Au_2Cl)\{CH_2(1,2-C_3H_2N_2PPh_2)_2\}_3Cl]$** 

Sajad A. Bhat, Joel T. Mague and Maravanji S. Balakrishna\*

This paper describes the synthesis of gold(I) complexes of bisphosphines based on bis(azol-1-yl)methane viz. bis(imidazol-1-yl)methane, bis(pyrazol-1-yl)methane and bis(1,2,4-triazol-1-yl)methane.

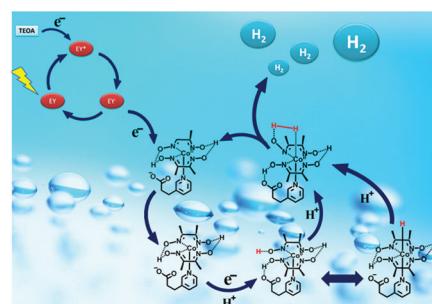


17704

**Enhanced photocatalytic hydrogen production by introducing the carboxylic acid group into cobaloxime catalysts**

Junfei Wang, Chao Li, Qianxiong Zhou, Weibo Wang, Yuanjun Hou,\* Baowen Zhang and Xuesong Wang\*

[Co(III)(dmgh)<sub>2</sub>(py-*m*-CH<sub>2</sub>CH<sub>2</sub>COOH)Cl] showed a much improved photocatalytic H<sub>2</sub> production activity compared to Co(III)(dmgh)<sub>2</sub>(py)Cl], and the COOH group may serve as a proton relay to account for its promising performance.

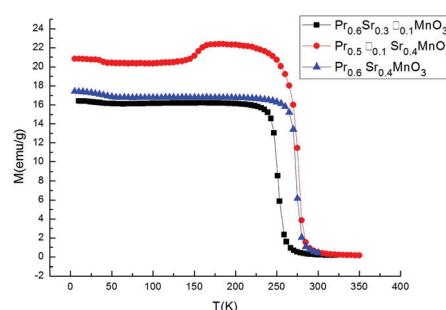


17712

**A-site-deficiency effect on critical behavior in the Pr<sub>0.6</sub>Sr<sub>0.4</sub>MnO<sub>3</sub> compound**

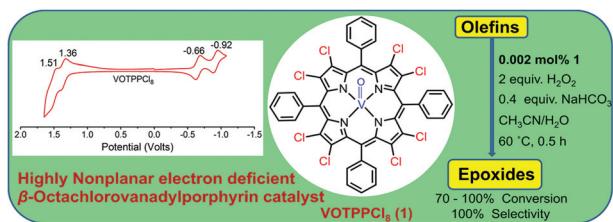
F. Elleuch, M. Bekri, M. Hussein, M. Triki, E. Dhahri,\* E. K. Hlil and L. Bessais

We present the effect of vacancy in Pr<sub>0.6</sub>Sr<sub>0.4</sub>MnO<sub>3</sub> via dc magnetisation measurements.

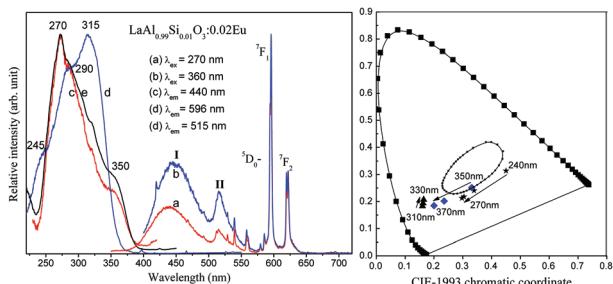


## PAPERS

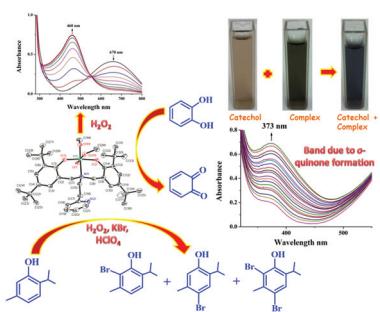
17720



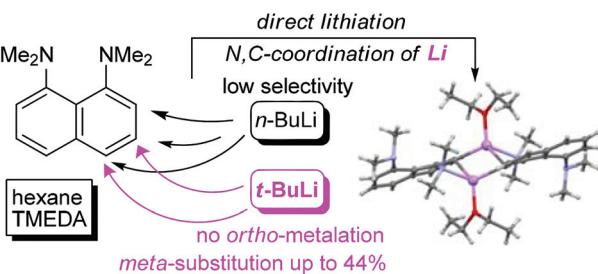
17730



17736



17756



## Electron deficient nonplanar

**β-octachlorovanadylporphyrin as a highly efficient and selective epoxidation catalyst for olefins**

Ravi Kumar, Nikita Chaudhary, Muniappan Sankar\* and Mannar R. Maurya\*

Highly electron deficient and nonplanar β-octachlorovanadylporphyrin (VOTPPCl<sub>8</sub>) was synthesized and utilized for selective epoxidation of olefins with very high TOF numbers (6566–9650 h<sup>-1</sup>).

**Eu<sup>2+</sup> and Eu<sup>3+</sup> co-activated LaAlO<sub>3</sub> phosphor: synthesis and tuned luminescence**

Wanping Chen

In phosphor LaAlO<sub>3</sub>:Eu<sup>3+</sup>, the incorporation of Si<sup>4+</sup> can effectively enhance the Eu<sup>2+</sup> emission and change the luminescence color of the phosphor.

**Vanadium(v) complexes of a tripodal ligand, their characterisation and biological implications**

Mannar R. Maurya,\* Bhawna Upadhyay, Fernando Avecilla, Pedro Adão and J. Costa Pessoa\*

Different vanadium(v) complexes with 6,6'-(2-(pyridin-2-yl)ethylazanediyl)bis(methylene)bis(2,4-di-*tert*-butylphenol) (H<sub>2</sub>L<sup>1</sup>) were isolated and characterized and one of them, [V<sup>V</sup>O(OMe)(MeOH)(L<sup>1</sup>)] was used as a functional mimic of catechol oxidase and as catalyst precursor for the oxidative bromination of thymol.

**Ring lithiation of 1,8-bis(dimethylamino)-naphthalene: another side of the 'proton sponge coin'**

Alexander S. Antonov, Alexander F. Pozharskii,\* Valery A. Ozeryanskii, Aleksander Filarowski, Kyrill Yu. Suponitsky, Peter M. Tolstoy and Mikhail A. Vovk

A set of X-ray, multinuclear NMR and DFT approaches was used to address a question of selectivity, relative stability and enhanced reactivity of ring lithiated 1,8-bis(dimethylamino)naphthalenes.

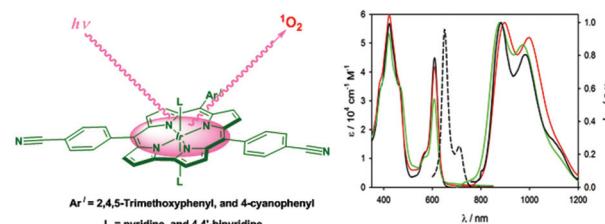
## PAPERS

17767

**NIR-emissive iridium(III) corrole complexes as efficient singlet oxygen sensitizers**

Woormileela Sinha, Luca Ravotto, Paola Ceroni\* and Sanjib Kar\*

The observed phosphorescence of the studied Ir(III) corroles at ambient temperature appears at much longer wavelengths than the previously reported Ir(III) porphyrin/corrole derivatives. Efficiencies of these compounds in the generation of singlet oxygen are also studied for the first time.

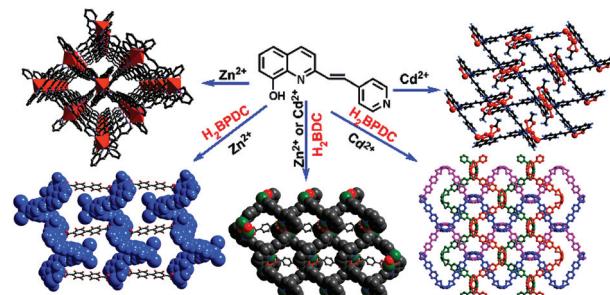


17774

**Structural and luminescence modulation in 8-hydroxyquinolinate-based coordination polymers by varying the dicarboxylic acid**

Guozan Yuan,\* Guoli Hu, Weilong Shan, Suo Jin, Qingyun Gu and Jing Chen

Using dicarboxylic acids as secondary auxiliary ligands, six coordination polymers are synthesized under solvothermal conditions. These polymers exhibited disparate fluorescence emission bands and lifetimes due to their different metal centers and supramolecular structures.

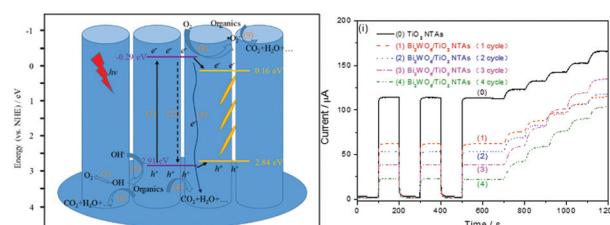


17784

**Photoelectrochemical properties and the detection mechanism of Bi₂WO₆ nanosheet modified TiO₂ nanotube arrays**

Yajun Pang, Guangqing Xu,\* Xu Zhang, Jun Lv, Kai Shi, Pengbo Zhai, Qianyun Xue, Xuedong Wang and Yucheng Wu\*

Bi₂WO₆ nanosheet modified TiO₂ NTAs are constructed for the enhancement of the photoelectrochemical determination of organic compounds.

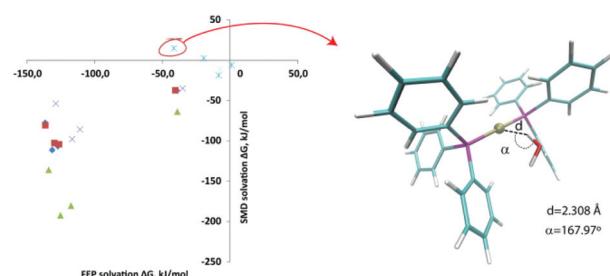


17795

**An explicit account of solvation is essential for modeling Suzuki–Miyaura coupling in protic solvents**

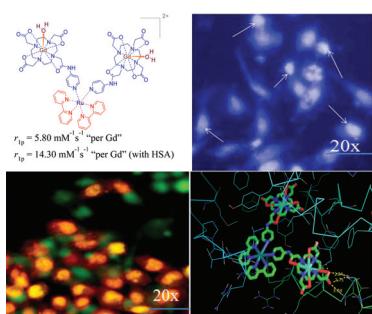
Alexey A. Zeifman,\* Fedor N. Novikov, Victor S. Stroylov, Oleg V. Stroganov, Igor V. Svitanko and Ghermes G. Chilov

We compared explicit and implicit solvation approaches in modeling the free energy profile of the final step of Suzuki–Miyaura coupling.



## PAPERS

17800

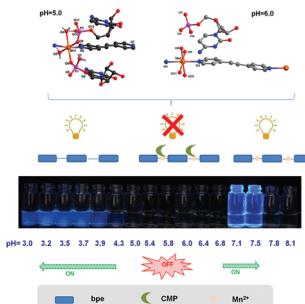


### Synthesis, relaxivity, and *in vitro* fluorescence imaging studies of a novel d-f heterometallic trinuclear complex as a potential bimodal imaging probe for MRI and optical imaging

A. Nithyakumar and V. Alexander\*

A novel heterometallic Ru<sup>II</sup>-Gd<sup>III</sup> complex which functions as a contrast agent for MRI and an optical probe for fluorescence imaging and *in vitro* fluorescence imaging studies with HeLa cell lines and molecular docking with DNA and HSA are reported.

17810

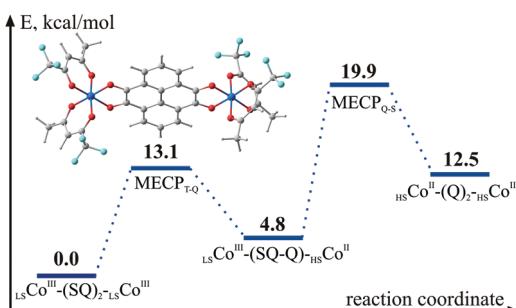


### Controllable synthesis of nucleotide complex based on pH control: a small-molecule fluorescent probe as an auxiliary ligand to indicate the pre-organization of the nucleotide complex in solution

Pei Zhou, Chong Wang, Qi-ming Qiu, Jian-feng Yao, Chuan-fang Sheng and Hui Li\*

Different crystalline complexes of CMP-bpe-M(II) are synthesized based on pH control and their pre-organization mode in aqueous solution under different pH was studied by fluorescence spectroscopy.

17819

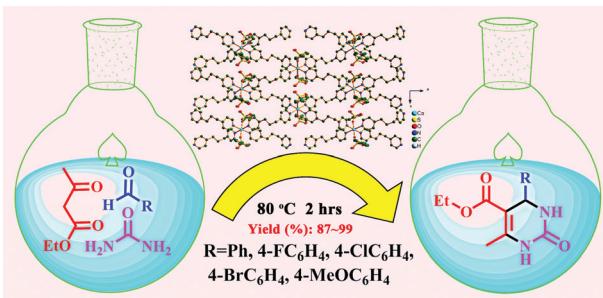


### Theoretical modeling of valence tautomeric dinuclear cobalt complexes. Adducts of Co<sup>II</sup> diketonates with cyclic redox-active tetraone ligands

V. I. Minkin,\* A. G. Starikov and A. A. Starikova

B3LYP\*/6-311++G(d,p) calculated two-step VT rearrangement of a Co(II) diketonate and a pyrene-4,5,9,10-tetraone 2 : 1 adduct occurs with the migration of paramagnetic centers.

17829



### A series of phenyl sulfonate metal coordination polymers as catalysts for one-pot Biginelli reactions under solvent-free conditions

Jin-Hua Wang, Gui-Mei Tang,\* Yong-Tao Wang,\* Yue-Zhi Cui, Jun-Jie Wang and Seik Weng Ng

A series of phenyl sulfonate metal coordination polymers have been obtained under hydrothermal conditions, which show high catalytic performances for one-pot Biginelli condensation reactions under solvent-free conditions.

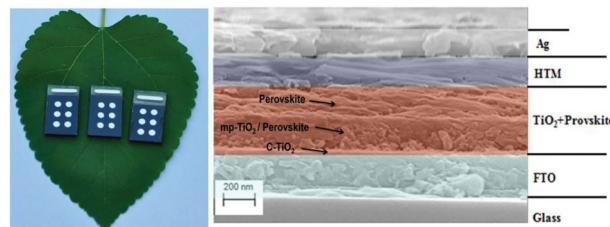
## PAPERS

17841

## Controlled reaction for improved $\text{CH}_3\text{NH}_3\text{PbI}_3$ transition in perovskite solar cells

J. J. Zhao,\* P. Wang, Z. H. Liu, L. Y. Wei, Z. Yang, H. R. Chen, X. Q. Fang, X. L. Liu and Y. H. Mai\*

It is found that the optimum PCE of the loading time in the  $\text{CH}_3\text{NH}_3\text{I}$  solution is possible only at a relatively short time. A suitable loading time dramatically improves the charge transport within the perovskite layer, explaining the outstanding performances of meso-superstructured solar cells based on this loading time.

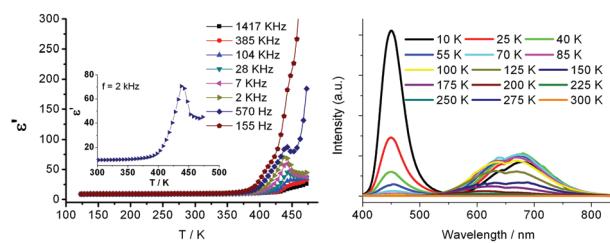


17850

## An amphidynamic inorganic–organic hybrid crystal of bromoplumbate with 1,5-bis(1-methyl-imidazolium)pentane exhibiting multi-functionality of a dielectric anomaly and temperature-dependent dual band emissions

Yuan-Bo Tong, Li-Te Ren, Hai-Bao Duan,\* Jian-Lan Liu and Xiao-Ming Ren\*

A hybrid crystal designed by the ‘multifunctional integrating strategy’, shows the bi-functionality of a dielectric anomaly and temperature-dependent dual band emissions.



17859

## The synergy between Ti species and $\text{g-C}_3\text{N}_4$ by doping and hybridization for the enhancement of photocatalytic $\text{H}_2$ evolution

Xiao-jing Wang, Xiao Tian, Fa-tang Li,\* Jun Zhao, Yu-pei Li, Rui-hong Liu and Ying-juan Hao

A Ti species modified  $\text{g-C}_3\text{N}_4$  photocatalyst was synthesized via an *in situ* hydrothermal route and the subsequent low-temperature calcination.

