

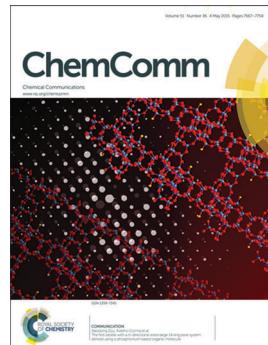
### IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS 51(36) 7567–7754 (2015)



#### Cover

See Fu-Ping Huang,  
He-Dong Bian *et al.*,  
pp. 7598–7601.  
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2015, **51**, 7598.



#### Inside cover

See Xiaodong Zou,  
Avelino Corma *et al.*,  
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*Chem. Commun.*,  
2015, **51**, 7602.

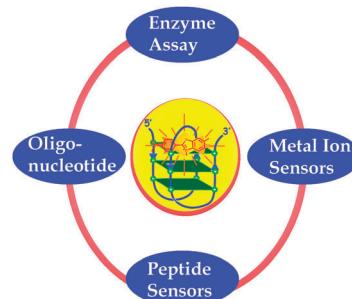
### FEATURE ARTICLE

7581

#### Targeting G-quadruplex structures with extrinsic fluorogenic dyes: promising fluorescence sensors

Achikanath C. Bhasikuttan\* and Jyotirmayee Mohanty\*

This article provides a brief account of the recent reports on the fluorescence properties of some of the fluorogenic dyes towards G-quadruplex DNAs, which have been turned into promising bio-analytical methods.



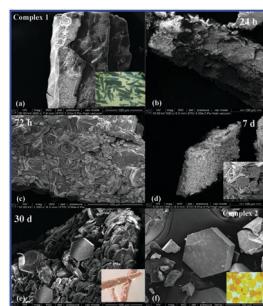
### COMMUNICATIONS

7598

#### An intuitionial hierarchical assembly of cluster–organic frameworks with a thickness of 1.97 nm from a discrete $\text{Co}_{14}$ cluster

Fu-Ping Huang,\* Peng-Fei Yao, Hai-Ye Li, Qing Yu,  
He-Dong Bian\* and Hong Liang

An intuitionial hierarchical assembly, metaphorically referred to as a "blossom and yield fruit" process, from a discrete cluster  $\{\text{Co}_{14}(\text{CH}_3\text{O})_4(\text{dpbt})_6\text{Cl}_{12}\} \cdot 14\text{CH}_3\text{OH}$ , (**1**) to 2D cluster organic frameworks  $\{\text{Co}_{14}(\text{CH}_3\text{O})_{10}(\text{dpbt})_6\text{Cl}_6\} \cdot 12\text{CH}_3\text{OH}$ , (**2**), has been established.



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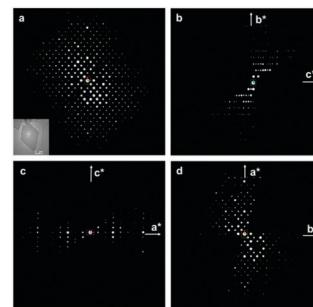
## COMMUNICATIONS

7602

**The first zeolite with a tri-directional extra-large 14-ring pore system derived using a phosphonium-based organic molecule**

Yifeng Yun, Manuel Hernández, Wei Wan,  
Xiaodong Zou,\* Jose L. Jordá, Angel Cantín,  
Fernando Rey and Avelino Corma\*

A new germanosilicate zeolite (denoted as ITQ-53) with extra-large pores has been synthesised using tri-tertbutylmethylphosphonium cation as the organic structure directing agent (OSDA).

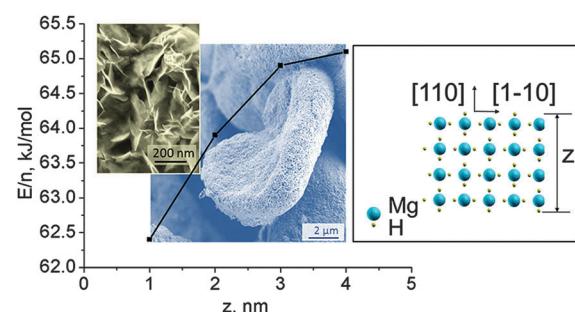


7606

**Sonogenerated metal-hydrogen sponges for reactive hard templating**

Olga Baidukova, Helmuth Möhwald, Aliaksei S. Mazheika,  
Dmitry V. Sviridov, Tatiana Palamarciuc, Birgit Weber,  
Pavel V. Cherepanov, Daria V. Andreeva and  
Ekaterina V. Skorb\*

Sonogenerated magnesium-hydrogen sponges with low dehydrogenation energy are used as prospective reactive hard templates for the synthesis of organized nanostructures.

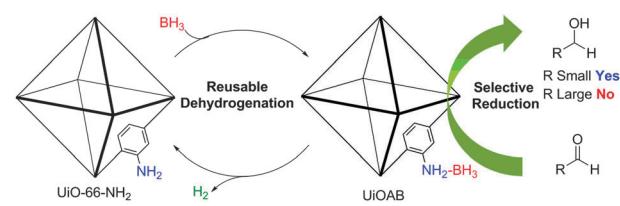


7610

**A rationally designed amino-borane complex in a metal organic framework: a novel reusable hydrogen storage and size-selective reduction material**

Xinbo Wang, Linhua Xie, Kuo-Wei Huang and  
Zhiping Lai\*

A novel microporous material UiOAB was synthesized, which can act as both a reusable hydrogen chemical storage material and a size-selective reducing agent.

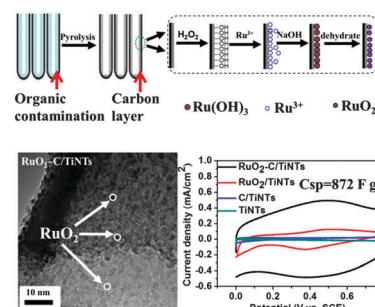


7614

**Carbon cladded TiO<sub>2</sub> nanotubes: fabrication and use in 3D-RuO<sub>2</sub> based supercapacitors**

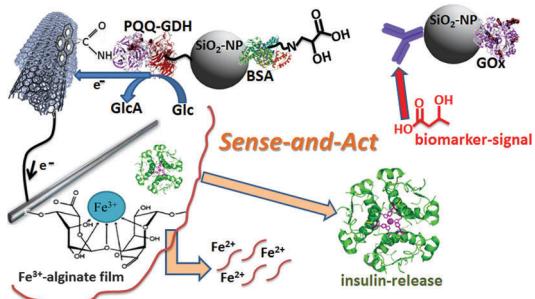
Zhi-Da Gao, Xu Zhu, Ya-Hang Li, Xuemei Zhou,  
Yan-Yan Song\* and Patrik Schmuki\*

We introduce a highly conformal coating of self-organized TiO<sub>2</sub> nanotubes with a graphite-like, thin carbon layer. Such modified nanotubes can serve as a highly conductive 3D structure or scaffold for defined modifications. Here we show highly defined RuO<sub>2</sub> modification and the use as a high yield, stable supercapacitor.



## COMMUNICATIONS

7618

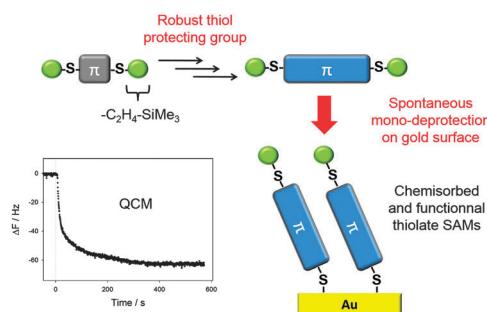


### A bioelectronic system for insulin release triggered by ketone body mimicking diabetic ketoacidosis *in vitro*

Maria Gamella, Natalia Guz, José M. Pingarrón, Roshanak Aslebagh, Costel C. Darie and Evgeny Katz\*

A bioelectronic system was activated with a biomarker of diabetic ketoacidosis to release insulin operating as a Sense-and-Act device.

7622

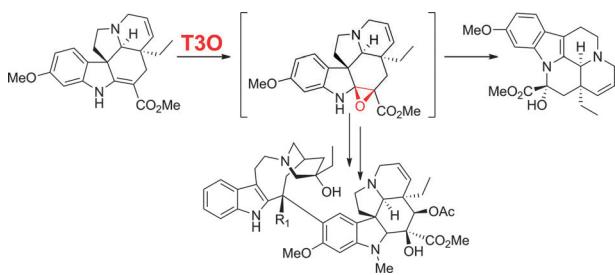


### Spontaneous assembly of silylthioethane-thiol derivatives on $\text{Au}(111)$ : a chemically robust thiol protecting group as the precursor for the direct formation of aromatic gold thiolate monolayers

Claude Niebel, François Calard, Thibaut Jarrosson, Jean-Pierre Lère-Porte, Tony Breton\* and Françoise Serein-Spirau\*

SAMs on gold were directly obtained from aromatic derivatives presenting robust silylthioethane-thiol groups as anchoring agents.

7626

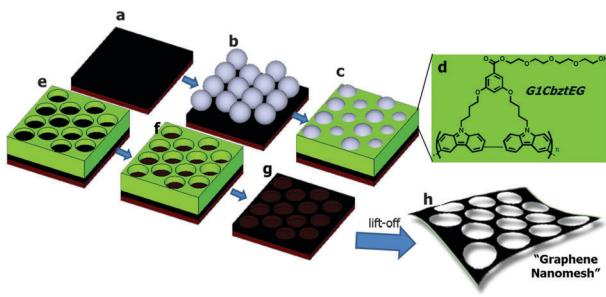


### Discovery of a P450-catalyzed step in vindoline biosynthesis: a link between the aspidosperma and eburnamine alkaloids

Franziska Kellner, Fernando Geu-Flores, Nathaniel H. Sherden, Stephanie Brown, Emilien Foureau, Vincent Courdavault and Sarah E. O'Connor\*

A cytochrome P450, 16T3O, that catalyzes a key step in vinblastine biosynthesis has been discovered.

7629



### Electrochemical fabrication of graphene nanomesh via colloidal templating

J. D. Mangadlao, A. C. C. de Leon, M. J. L. Felipe and R. C. Advincula\*

A simple fabrication of graphene nanomesh (GNM) was accomplished by arraying polystyrene (PS) spheres onto a CVD-deposited graphene, electro-deposition of carbazole units, removal of PS template and electrochemical oxidative etching. The GNM was characterized by scanning electron microscopy (SEM), atomic force microscopy (AFM) and Raman spectroscopy.

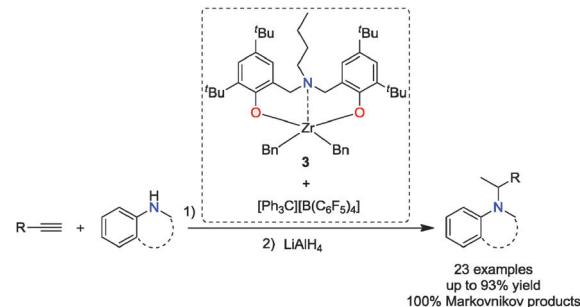
## COMMUNICATIONS

7633

**Zirconium catalysed intermolecular hydroamination reactions of secondary amines with alkynes**

Qiu Sun, Yaorong Wang, Dan Yuan,\* Yingming Yao\* and Qi Shen

The first example of group 4 metal catalysts capable of mediating intermolecular hydroamination reactions of secondary aromatic amines is reported.

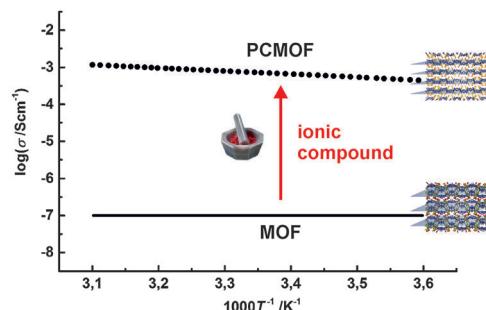


7637

**Ground to conduct: mechanochemical synthesis of a metal–organic framework with high proton conductivity**

Dariusz Matoga,\* Marcin Oszajca and Marcin Molenda

A high proton-conducting metal–organic framework (PCMOF) is prepared for the first time by economical and environmentally-friendly mechanochemistry.

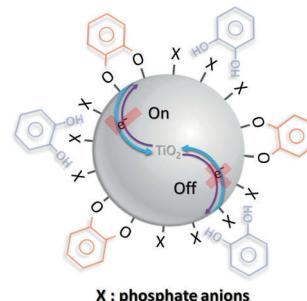


7641

**Semiconductor-enhanced Raman scattering for highly robust SERS sensing: the case of phosphate analysis**

Wei Ji,\* Wei Song, Ichiro Tanabe, Yue Wang, Bing Zhao and Yukihiro Ozaki\*

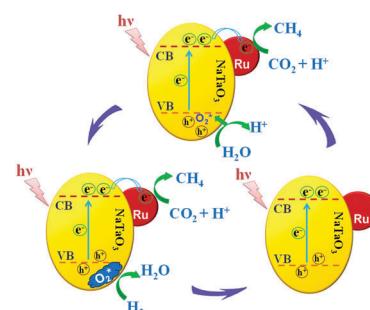
Quantitative analysis of phosphate anions was achieved by measurement of "turn-off" SERS based on the first-layer effect of a chemical mechanism.



7645

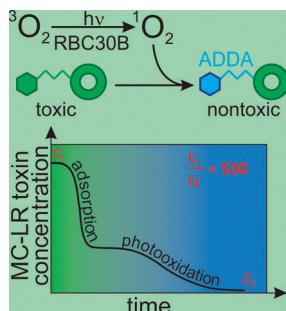
**Highly efficient and stable photocatalytic reduction of  $\text{CO}_2$  to  $\text{CH}_4$  over Ru loaded  $\text{NaTaO}_3$** 

Mu Li, Peng Li,\* Kun Chang, Tao Wang, Lequan Liu, Qing Kang, Shuxin Ouyang and Jinhua Ye\*

An efficient and stable photocatalytic activity was obtained over  $\text{NaTaO}_3$  by introducing electron donor ( $\text{H}_2$ ) into the  $\text{CO}_2$  reduction process with water and loaded Ru as cocatalysts. The main effect of the electron donor was found to release the peroxide intermediates of the half reaction for water oxidation.

## COMMUNICATIONS

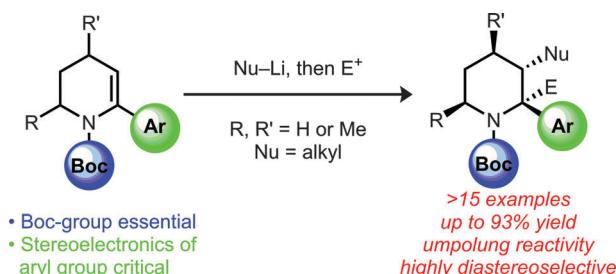
7649

**A hybrid adsorbent/visible light photocatalyst for the abatement of microcystin-LR in water**

M. Długosz, A. Kwiecień, P. Żmudzki, B. Bober, J. Krzek, J. Bialczyk, M. Nowakowska\* and K. Szczubińska\*

A hybrid adsorbent/photocatalyst was obtained and used for the removal of microcystin-LR, a potent toxin, from water via adsorption and photocatalyzed oxidation with singlet oxygen.

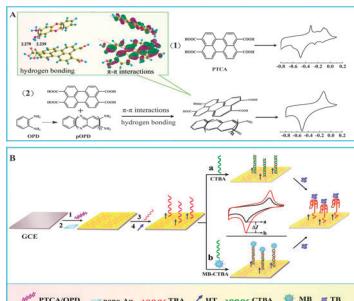
7653

**Stereocontrolled synthesis of vicinally functionalized piperidines by nucleophilic  $\beta$ -addition of alkylolithiums to  $\alpha$ -aryl substituted piperidine enecarbamates**

Timothy K. Beng, Hironori Takeuchi, Manuel Weber and Richmond Sarpong\*

Substituted piperidines are emerging as important medicinally-active structural motifs.

7657

**3,4,9,10-Perylenetetracarboxylic acid/o-phenylenediamine nanomaterials as novel redox probes for electrochemical aptasensor systems based on an Fe<sub>3</sub>O<sub>4</sub> magnetic bead as a nonenzymatic catalyst**

Yuanyuan Chang, Shunbi Xie, Yaqin Chai,\* Yali Yuan and Ruo Yuan\*

A novel redox probe 3,4,9,10-perylenetetracarboxylic acid/o-phenylenediamine was applied in an electrochemical aptasensor to detect thrombin based on an Fe<sub>3</sub>O<sub>4</sub> magnetic bead as a nonenzymatic catalyst.

7661

**Halochromic and hydrochromic squaric acid functionalized perylene bisimide**

Takeshi Maeda\* and Frank Würthner\*

A squaric acid functionalized perylene bisimide senses solvent polarity, pH and humidity through the intramolecular charge transfer initiated by protonation/deprotonation.

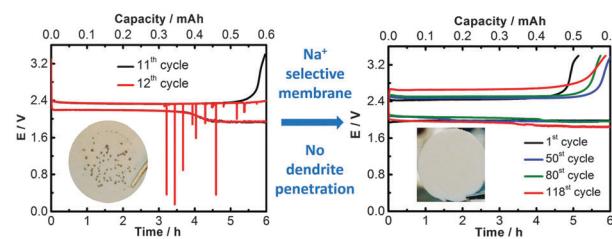
## COMMUNICATIONS

7665

**Investigating dendrites and side reactions in sodium–oxygen batteries for improved cycle lives**

Xuanxuan Bi, Xiaodi Ren, Zhongjie Huang, Mingzhe Yu, Eric Kreidler and Yiyang Wu\*

Sodium dendrites and side reactions were investigated in the sodium–oxygen batteries, the cyclability of which was greatly improved by a sodium ion selective polymer membrane.

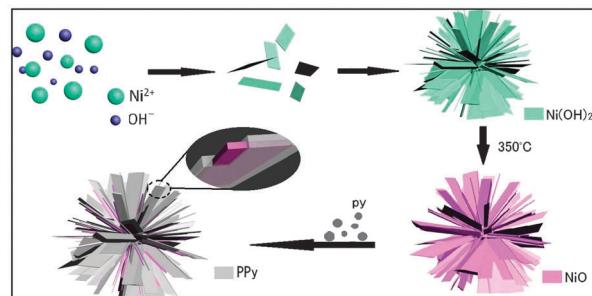


7669

**Polypyrrole encapsulation on flower-like porous NiO for advanced high-performance supercapacitors**

Wenjing Ji, Junyi Ji,\* Xinghong Cui, Jianjun Chen, Dajun Liu, Hua Deng and Qiang Fu\*

A 3D flower-like porous NiO@polypyrrole composite is prepared to investigate the role of PPy coating for high-performance supercapacitors.

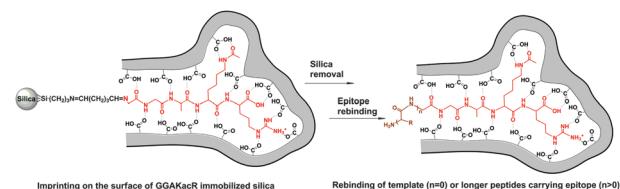


7673

**An artificial receptor synthesized by surface-confined imprinting for the recognition of acetylation on histone H4 K16**

Fangfang Yang, Shen Lin and Xiangchao Dong\*

Molecularly imprinted artificial receptor with high selectivity for the recognition of acetylation on histone H4 K16.

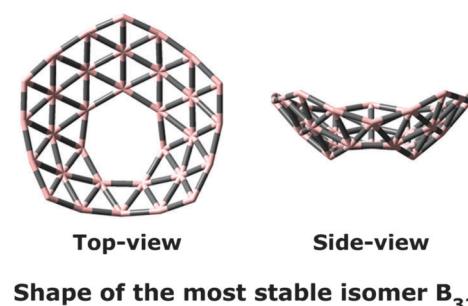


7677

**The B<sub>32</sub> cluster has the most stable bowl structure with a remarkable heptagonal hole**

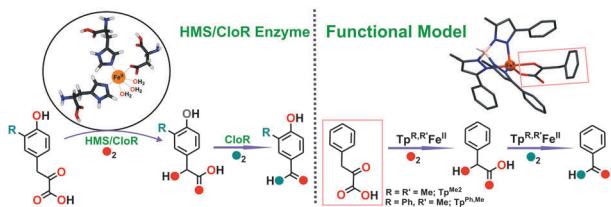
Truong Ba Tai\* and Minh Tho Nguyen\*

The cluster B<sub>32</sub><sup>0/-</sup> exhibits an aromatic bowl structure containing one heptagonal hole.



## COMMUNICATIONS

7681

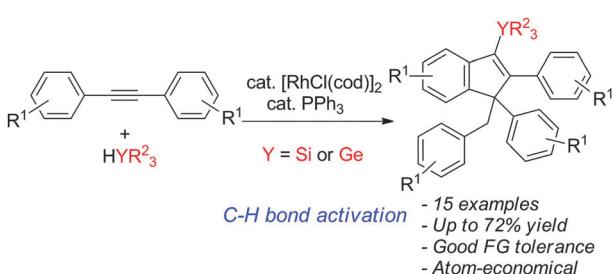


## Dioxygen activation and two consecutive oxidative decarboxylations of phenylpyruvate by nonheme iron(II) complexes: functional models of hydroxymandelate synthase (HMS) and CloR

Debobrata Sheet, Shrabanti Bhattacharya and Tapan Kanti Paine\*

Iron(II)-phenylpyruvate complexes of facial tridentate ligands react with dioxygen to undergo two consecutive oxidative decarboxylations to form benzoic acid via mandelic acid.

7685

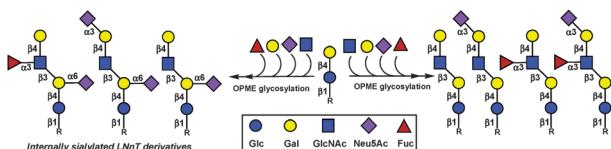


## Rhodium-catalysed synthesis of multi-substituted silylindenes from aryl alkynes and hydrosilanes via C-H bond activation

Shunsuke Sueki and Yoichiro Kuninobu\*

We successfully developed rhodium-catalysed synthesis of multi-substituted silylindenes from 2 equivalents of aryl alkynes and 1 equivalent of hydrosilanes in moderate to good yields via C-H bond activation for the first time.

7689

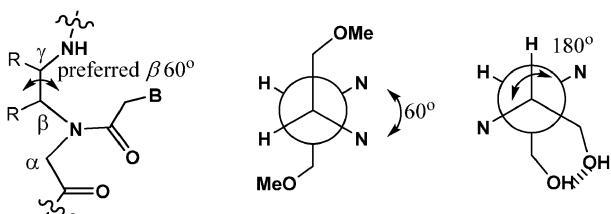


## Sequential one-pot multienzyme (OPME) synthesis of lacto-*N*-neotetraose and its sialyl and fucosyl derivatives

Congcong Chen, Yan Zhang, Mengyang Xue, Xian-wei Liu, Yanhong Li, Xi Chen,\* Peng George Wang,\* Fengshan Wang\* and Hongzhi Cao\*

A highly efficient sequential one-pot multienzyme (OPME) approach for the synthesis of lacto-*N*-neotetraose (LN<sub>n</sub>T) and its derivatives at preparative scale was reported.

7693



## $\beta, \gamma$ -Bis-substituted PNA with configurational and conformational switch: preferred binding to cDNA/cRNA and cell-uptake studies

Tanaya Bose, Anjan Banerjee, Smita Nahar, Souvik Maiti\* and Vaijayanti A. Kumar\*

$\beta, \gamma$ -Bis-methoxymethyl and  $\beta, \gamma$ -bis-hydroxymethyl PNA show highly differential binding properties while interacting with cDNA/cRNA and can access intracellular space.

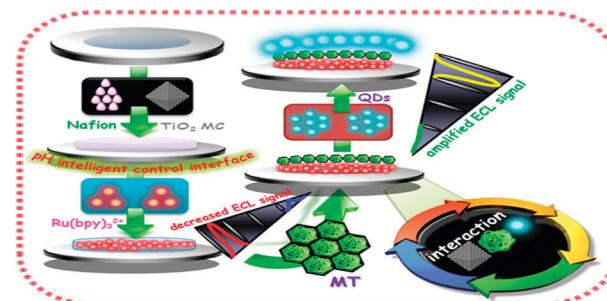
## COMMUNICATIONS

7697

**A ratiometric biosensor for metallothionein based on a dual heterogeneous electro-chemiluminescent response from a  $\text{TiO}_2$  mesocrystalline interface**

Hong Dai,\* Guifang Xu, Shupei Zhang,  
Zhenheng Hong\* and Yanyu Lin

An dual-responses ECL sensor for metallothionein was developed by the  $\text{TiO}_2$  mesocrystals-dependent metallothionein-regulated ECL emissions of  $\text{Ru}(\text{bpy})_3^{2+}$  and CdTe QDs.

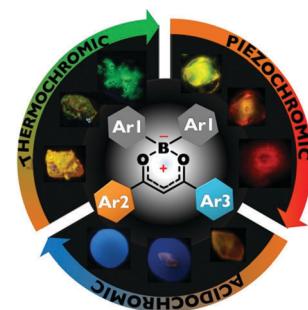


7701

**The facile realization of RGB luminescence based on one yellow emissive four-coordinate organoboron material**

Lu Wang, Kai Wang, Houyu Zhang, Chuanjun Jiao,  
Bo Zou,\* Kaiqi Ye, Hongyu Zhang\* and Yue Wang

The present study not only provides a model of the facile realization of **RGB** luminescence based on one compound by an external stimulating approach but also gives a design guidance towards smart luminescent organic materials.

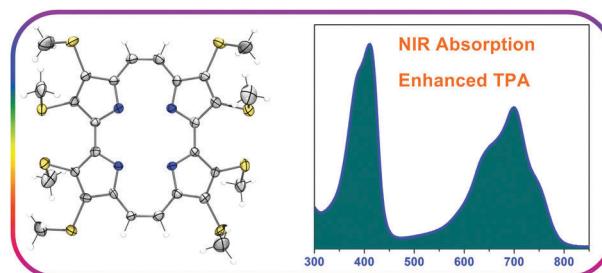


7705

**$\beta$ -Octakis(methylthio)porphycenes: synthesis, characterisation and third order nonlinear optical studies**

Anup Rana, Sangsu Lee, Dongho Kim\* and  
Pradeepa K. Panda\*

A novel electron deficient  $\beta$ -octakis(methylthio)porphycene, along with its  $\text{Zn}(\text{II})$  and  $\text{Ni}(\text{II})$  derivatives, was synthesized for the first time.



7709

**An intramolecular crossed-benzoin reaction based KCN fluorescent probe in aqueous and biological environments**

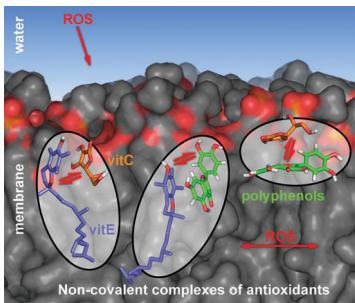
Jae Hong Lee, Joo Hee Jang, Nithya Velusamy,  
Hyo Sung Jung, Sankarprasad Bhuniya\* and  
Jong Seung Kim\*

A turn-on fluorescent probe **IND-1** was designed for selective cyanide anion sensing in aqueous and biological environments.



## COMMUNICATIONS

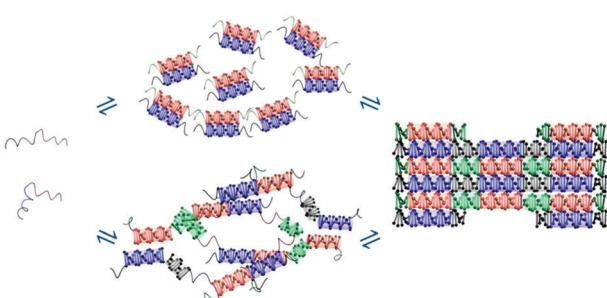
7713

**Synergism of antioxidant action of vitamins E, C and quercetin is related to formation of molecular associations in biomembranes**

Gabin Fabre, Imene Bayach, Karel Berka, Markéta Palonciová, Marcelina Starok, Claire Rossi, Jean-Luc Duroux, Michal Otyepka\* and Patrick Trouillas\*

Vitamins and polyphenols form non-covalent complexes in biomembranes enhancing the global antioxidant status through synergism.

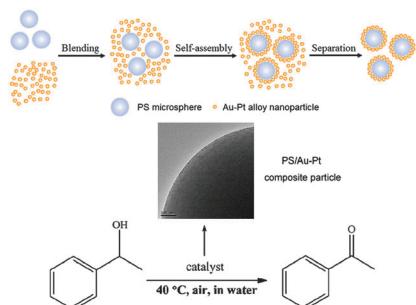
7717

**Mechanism of DNA assembly as revealed by energy barriers**

Lin Niu, Xuyan Yang, Jihan Zhou, Chengde Mao,\* Haojun Liang and Dehai Liang\*

DNA assembly is determined by the conformation adjustment rate of strands and the spreading rate of strands on the nuclei surface.

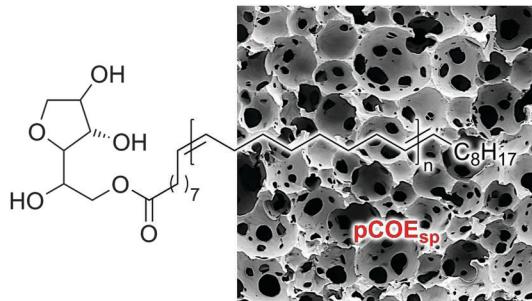
7721

**A facile and efficient synthesis of polystyrene/gold–platinum composite particles and their application for aerobic oxidation of alcohols in water**

Yunxing Li,\* Yan Gao and Cheng Yang

Herein a facile and effective synthesis of the polystyrene/gold–platinum composite particles with high catalytic activity and good recyclability for aerobic oxidation of 1-phenylethanol under mild conditions is reported.

7725

**Covalent incorporation of the surfactant into high internal phase emulsion templated polymeric foams**

Sebastijan Kovačič,\* Florian Preishuber-Pflügl, David Pahovnik, Ema Žagar and Christian Slugovc\*

This paper describes a “one pot” approach where intrinsically hydrophobic polymer foams are turned more hydrophilic by covalent incorporation of the surfactant.

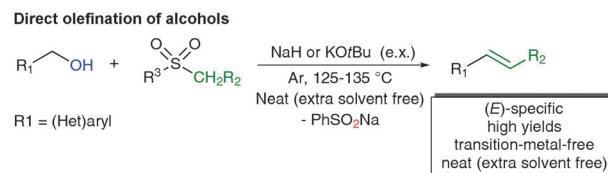
## COMMUNICATIONS

7729

**(E)-Specific direct Julia-olefination of aryl alcohols without extra reducing agents promoted by bases**

Chuan-Zhi Yao, Qiang-Qiang Li, Mei-Mei Wang, Xiao-Shan Ning and Yan-Biao Kang\*

(E)-Specific direct Julia-olefination of aryl alcohols promoted by bases: a strategy of self-hydride transferring redox process.

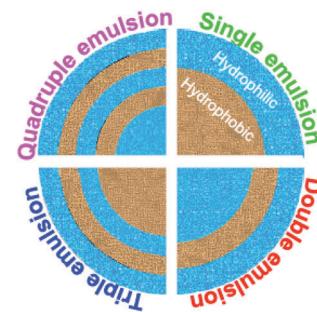


7733

**Multi-layered polymeric nanoparticles for pH-responsive and sequenced release of theranostic agents**

Hai Wang, Shuting Zhao, Pranay Agarwal, Jenna Dumbleton, Jianhua Yu, Xiongbin Lu and Xiaoming He\*

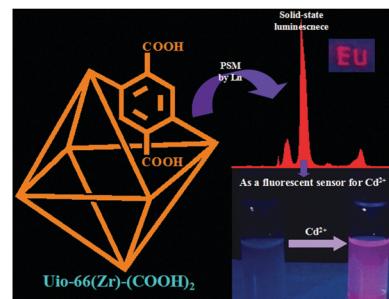
Multi-layered polymeric nanoparticles are prepared by 1–4 emulsifications to encapsulate hydrophilic and hydrophobic theranostic agents for pH-responsive and sequenced release.



7737

**A water-stable lanthanide-functionalized MOF as a highly selective and sensitive fluorescent probe for Cd<sup>2+</sup>**

Ji-Na Hao and Bing Yan\*

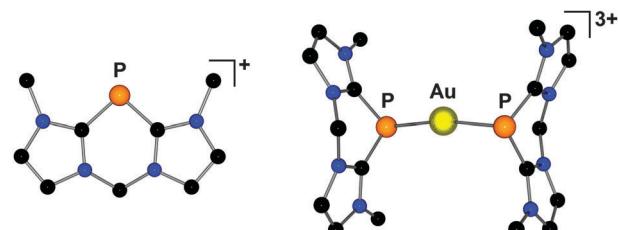
A highly selective and sensitive fluorescent sensor for Cd<sup>2+</sup> in aqueous solution based on a lanthanide post-functionalized metal–organic framework was developed.

7741

**Remarkably stable chelating bis-N-heterocyclic carbene adducts of phosphorus(i) cations**

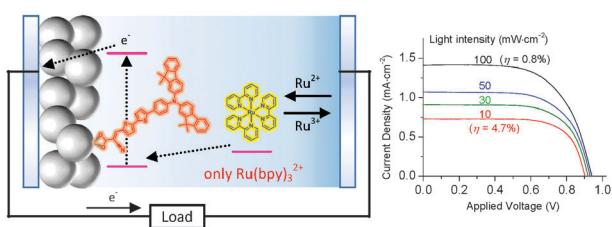
Justin F. Binder, Ala'aeddeen Swidan, Martin Tang, Jennifer H. Nguyen and Charles L. B. Macdonald\*

Treatment of triphosphonium precursors with bidentate bis-N-heterocyclic carbenes generates remarkably stable phosphamethine cyanine dyes with useful chemical and physical properties.



## COMMUNICATIONS

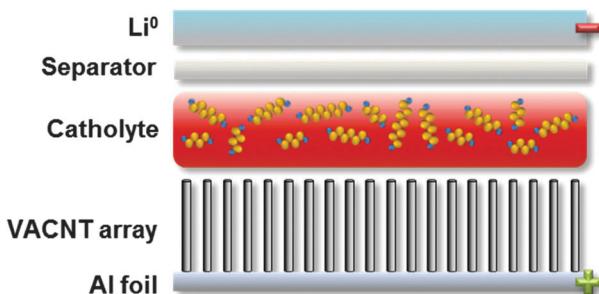
7745

**A ruthenium complex as a single-component redox shuttle for electrochemical photovoltaics**

Jeung Yoon Kim, Won Seok Yun, Ho-Jin Son,  
JaeDong Lee and Nak Cheon Jeong\*

A new conceptual “single-component redox shuttle” led to a large enhancement of  $V_{OC}$  ( $\sim 940$  mV) and also greatly boosted the energy conversion efficiency under low-power illumination level by a factor of ca. 5.6.

7749

**Vertically-aligned carbon nanotubes on aluminum as a light-weight positive electrode for lithium-polysulfide batteries**

S. Liatard, K. Benhamouda, A. Fournier, R. Ramos,  
C. Barchasz\* and J. Dijon

A light-weight, high specific surface current collector made of vertically-aligned carbon nanotubes grown on an aluminum substrate was fabricated and studied as a positive electrode in a semi-liquid lithium/polysulfide battery.