

# ChemComm

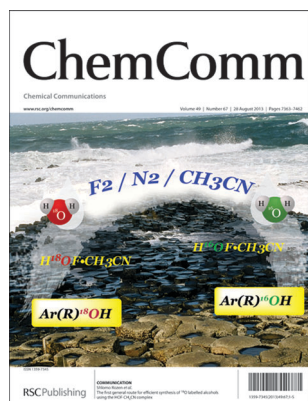
Chemical Communications

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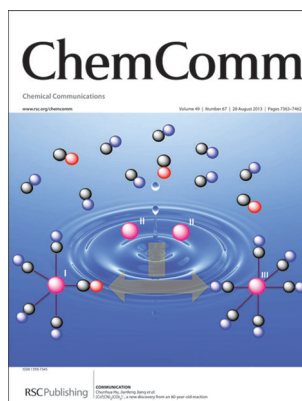
## IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS 49(67) 7363–7462 (2013)



### Cover

See Shlomo Rozen *et al.*, pp. 7379–7381.  
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### Inside cover

See Chunhua Hu, Jianfeng Jiang *et al.*, pp. 7382–7384.  
Image reproduced by permission of Jianfeng Jiang from *Chem. Commun.*, 2013, **49**, 7382.

## PROFILE

7374

### Interview with Shunichi Fukuzumi

“Rashomon stories”, artistic explosions, and hydrogen peroxide fuel cells. Shunichi Fukuzumi reflects on his academic career and Japanese culture.



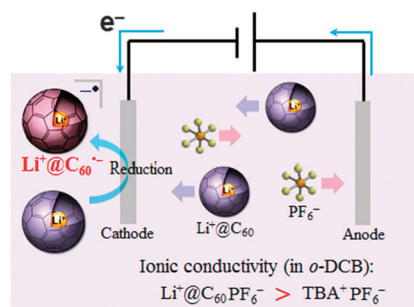
## COMMUNICATIONS

7376

### Ionic conductivity of $[\text{Li}^+\text{@C}_{60}](\text{PF}_6^-)$ in organic solvents and its electrochemical reduction to $\text{Li}^+\text{@C}_{60}^{\bullet-}$

Hiroshi Ueno, Ken Kokubo,\* Yuji Nakamura, Kei Ohkubo, Naohiko Ikuma, Hiroshi Moriyama, Shunichi Fukuzumi and Takumi Oshima

The ionic conductivity of  $[\text{Li}^+\text{@C}_{60}](\text{PF}_6^-)$  in *o*-dichlorobenzene was found to be higher than that of  $\text{TBA}^+\text{PF}_6^-$ , and its electrochemical reduction gave the monovalent radical anion  $\text{Li}^+\text{@C}_{60}^{\bullet-}$ .



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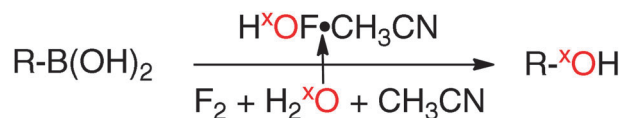
## COMMUNICATIONS

7379

### The first general route for efficient synthesis of $^{18}\text{O}$ labelled alcohols using the $\text{HOF} \cdot \text{CH}_3\text{CN}$ complex

Julia Gatenyo, Inna Vints and Shlomo Rozen\*

A mild and very efficient method for converting boronic acids to alcohols has been developed using the acetonitrile complex of hypofluorous acid  $\text{HOF} \cdot \text{CH}_3\text{CN}$ .



1

R = alkyl, aryl

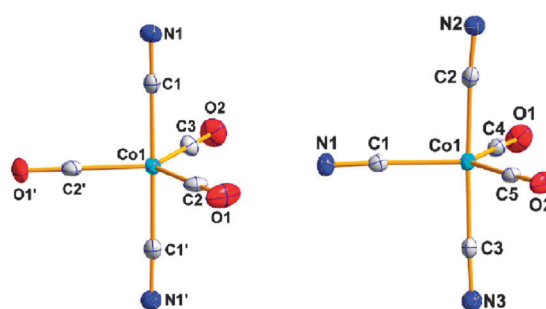
x = 16 or 18

7382

### $[\text{Co}^{\text{I}}(\text{CN})_2(\text{CO})_3]^-$ , a new discovery from an 80-year-old reaction

Wenfeng Lo, Chunhua Hu,\* Marck Lumeij, Richard Dronskowski, Michael Lovihayeem, Oren Ishai and Jianfeng Jiang\*

Mixed Co–CN–CO compounds were discovered from the cyanide catalyzed carbonylation of cobalt(II) in aqueous solution.

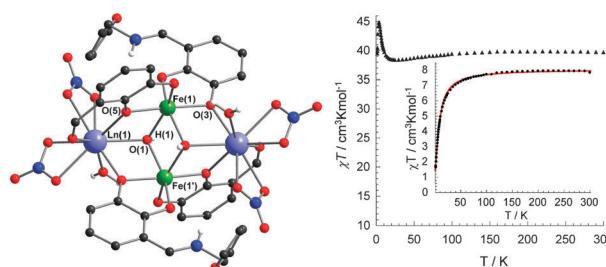


7385

### Direct observation of the role of lanthanides in stabilizing a ferromagnetic spin orientation in a weak $\text{Fe}^{\text{III}}\text{--Fe}^{\text{III}}$ antiferromagnet

Hua Xiang, Valeriu Mereacre,\* Yanhua Lan, Tong-Bu Lu,\* Christopher E. Anson and Annie K. Powell\*

Analysis of Mössbauer spectra and susceptibility of two  $\{\text{Fe}_2\text{Ln}_2\}$  compounds shows that the intramolecular magnetic field from the  $\text{Dy}^{\text{III}}$  ions can overcome the weak antiferromagnetic Fe–Fe coupling to give a ferromagnetic spin arrangement.

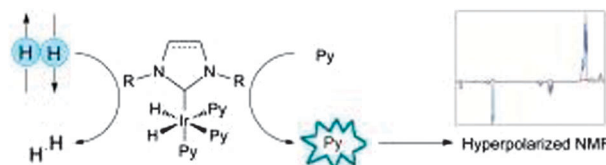


7388

### Ligand effects of NHC–iridium catalysts for signal amplification by reversible exchange (SABRE)

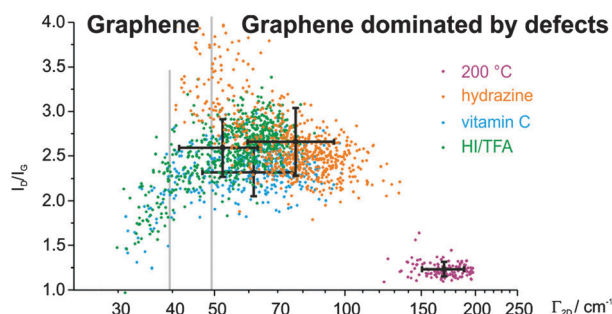
Bram J. A. van Weerdenburg, Stefan Glöggler, Nan Eshuis, A. H. J. (Ton) Engwerda, Jan M. M. Smits, René de Gelder, Stephan Appelt, Sybren S. Wymenga, Marco Tessari, Martin C. Feiters,\* Bernhard Blümich and Floris P. J. T. Rutjes

Iridium complexes with unsaturated N-heterocyclic carbenes bearing aromatic substituents are most efficient in polarization transfer between *para*-hydrogen and pyridine (SABRE).



## COMMUNICATIONS

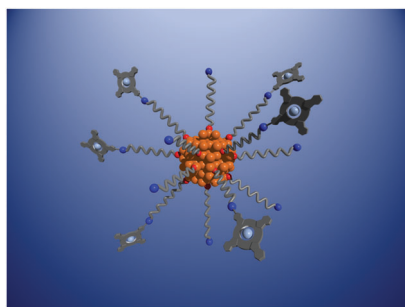
7391

**Graphene oxide: efficiency of reducing agents**

Siegfried Eigler,\* Stefan Grimm, Michael Enzelberger-Heim, Paul Müller and Andreas Hirsch

The quality of graphene from graphene oxide was probed by Raman spectroscopy allowing the efficiency of reducing agents to be determined.

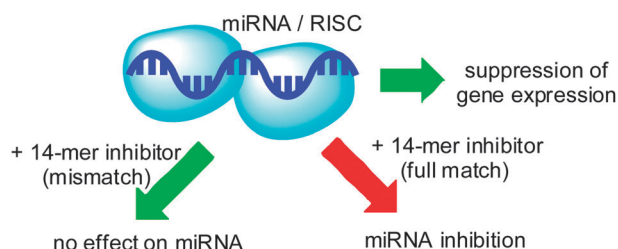
7394

**Magneto-optical nanomaterials: a SPIO–phthalocyanine scaffold built step-by-step towards bimodal imaging**

Julien Boudon, Jérémy Paris, Yann Bernhard, Elena Popova, Richard A. Decréau\* and Nadine Millot\*

A SPIO–phthalocyanine nanohybrid is developed as a bimodal contrast agent for Optical and Magnetic Resonance Imaging. The organic coating was covalently attached onto SPIO in a step-by-step approach. The SPIO–Pc nanohybrid is ca. 60 nm with a coverage of ca. 690 Pc/SPIO.

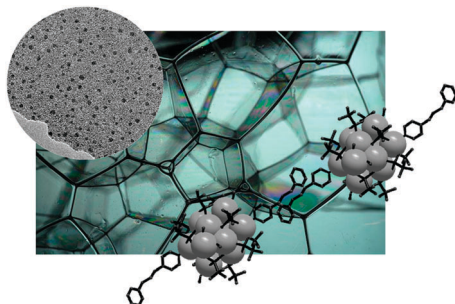
7397

**Short, terminally modified 2'-OMe RNAs as inhibitors of microRNA**

Jenny Blechinger, Hanna Pieper, Paul Marzenell, Larisa Kovbasyuk, Andrius Serva, Vytaute Starkuviene, Holger Erfle and Andriy Mokhir\*

Terminally modified 14-mer 2'-OMe RNA inhibitors of microRNAs with excellent sequence discriminating properties were developed.

7400

**A facile “bottom-up” approach to prepare free-standing nano-films based on manganese coordination clusters**

Lei Zhang, Camelia I. Onet, Rodolphe Clérac, Mathieu Rouzières, Bartosz Marzec, Markus Boese, Munuswamy Venkatesan and Wolfgang Schmitt\*

A novel method for preparing thin, homogeneous free-standing Dried Foam Films (DFFs) consisting of polynuclear manganese complexes is reported.

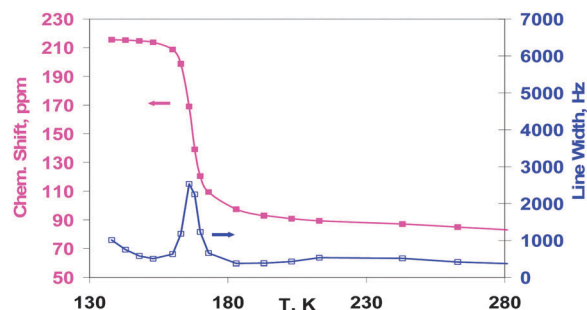
## COMMUNICATIONS

7403

**Flexibility of ZIF-8 materials studied using  $^{129}\text{Xe}$  NMR**

Marie-Anne Springuel-Huet,\* Andrei Nossov, Flavien Guenneau and Antoine Gédéon

Variable-temperature  $^{129}\text{Xe}$  NMR data show that xenon adsorption on ZIF-8 materials leads to a structural transition.

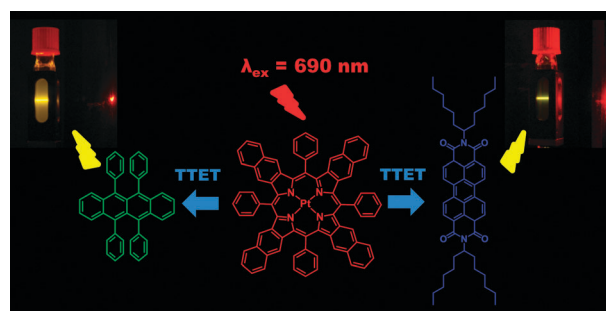


7406

**Near-IR phosphorescent metalloporphyrin as a photochemical upconversion sensitizer**

Fan Deng, Jonathan R. Sommer, Mykhaylo Myahkostupov, Kirk S. Schanze\* and Felix N. Castellano\*

PtTPTNP has been successfully utilized as a photochemical upconversion sensitizer in conjunction with rubrene and perylene diimide acceptors/annihilators.

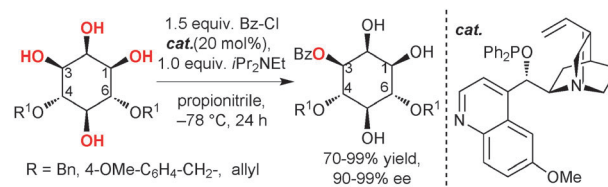


7409

**Desymmetrization of 4,6-protected *myo*-inositol**

Markus B. Lauber, Constantin-Gabriel Daniliuc and Jan Paradies\*

A phosphinit derived catalyst allows organocatalytic desymmetrization of *myo*-inositol derivatives in high yield (70–99%) and excellent enantioselectivity (90–99% ee).

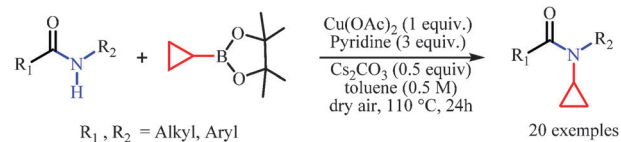


7412

**Direct *N*-cyclopropylation of secondary acyclic amides promoted by copper**

Emilie Racine, Florian Monnier,\* Jean-Pierre Vors and Marc Taillefer\*

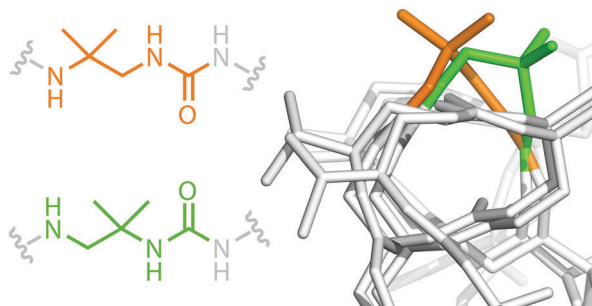
The *N*-cyclopropylation of aromatic and aliphatic secondary acyclic amides, known to be poor nucleophiles, has been accomplished using a simple and cheap copper system. The corresponding tertiary acyclic amides, which constitute a wide family of biologically active compounds, have been obtained in good to excellent yields.





## COMMUNICATIONS

7415

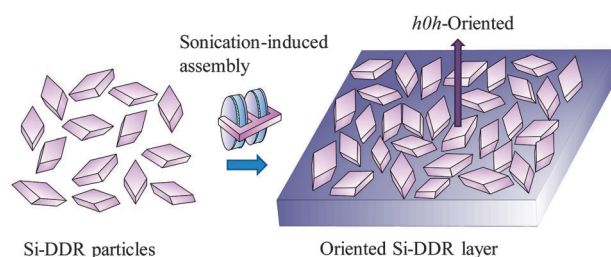


### Influence of achiral units with *gem*-dimethyl substituents on the helical character of aliphatic oligourea foldamers

Juliette Fremaux, Christel Dolain, Brice Kauffmann, Jonathan Clayden\* and Gilles Guichard\*

The structures of various urea oligomers incorporating one or two central achiral 1,2-diamino-1,1-dimethylethane (DADME) units have been investigated in solution and in the crystalline state.

7418

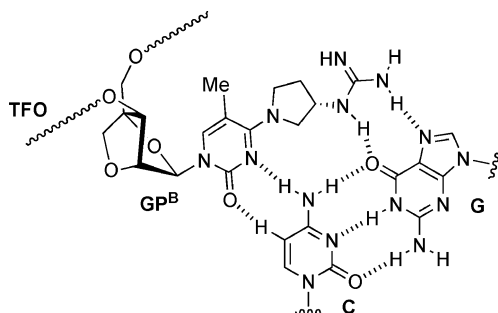


### Synthesis and sonication-induced assembly of Si-DDR particles for close-packed oriented layers

Eunjoo Kim, Wanxi Cai, Hionsuck Baik, Jaewook Nam\* and Jungkyu Choi\*

Here, we report a seeded growth protocol for synthesizing monodisperse Si-DDR particles of  $\sim 1.3\text{--}10\ \mu\text{m}$  by varying the seed amount. These Si-DDR particles were deposited onto porous  $\alpha\text{-Al}_2\text{O}_3$  discs *via* sonication-induced assembly, constituting close-packed *h0h*-oriented layers.

7421

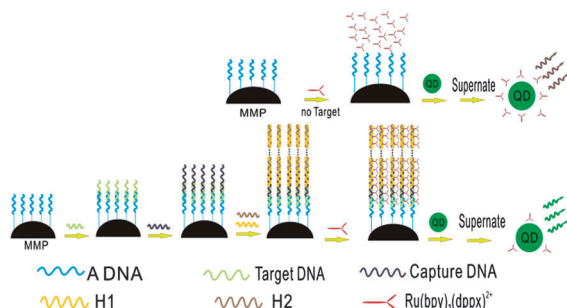


### 2',4'-BNA bearing a chiral guanidinopyrrolidine-containing nucleobase with potent ability to recognize the CG base pair in a parallel-motif DNA triplex

Yoshiyuki Hari,\* Masaaki Akabane and Satoshi Obika\*

In triplex formation, **GP<sup>B</sup>** (see picture) recognized a CG base pair within dsDNA with high sequence-selectivity and affinity.

7424



### An ultrasensitive biosensor for DNA detection based on hybridization chain reaction coupled with the efficient quenching of a ruthenium complex to CdTe quantum dots

Yufei Liu, Ming Luo, Ji Yan, Xia Xiang, Xinghu Ji,\* Guohua Zhou and Zhike He\*

A highly sensitive and selective DNA biosensor based on hybridization chain reaction is described, which combines quantum dots and a ruthenium complex.

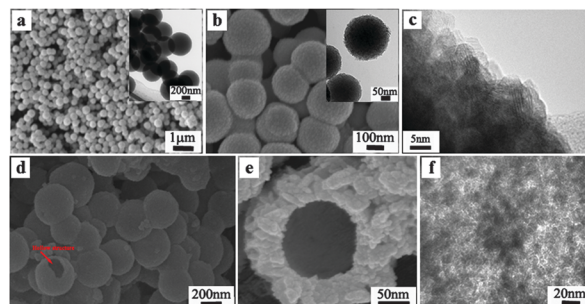
## COMMUNICATIONS

7427

**Hierarchically porous  $\text{Co}_3\text{O}_4$  hollow spheres with tunable pore structure and enhanced catalytic activity**

Chang-An Wang,\* Sa Li and Linan An\*

$\text{Co}_3\text{O}_4$  hollow spheres with two-level hierarchical pores and high surface area are synthesized, and the shell thickness and the mesoporous structure are well-tuned through pre-treatment of the carbon spheres with alkali/acid.

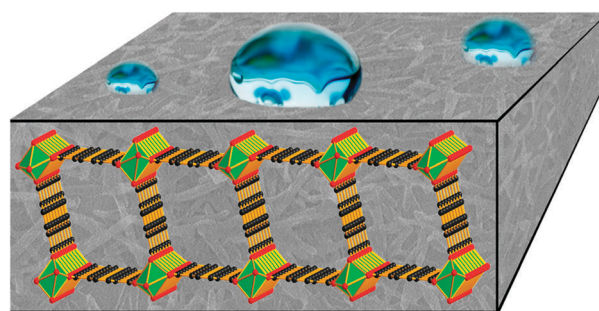


7430

**Environmentally friendly synthesis of highly hydrophobic and stable MIL-53 MOF nanomaterials**

Jia Liu, Feng Zhang, Xiaoqin Zou,\* Guangli Yu, Nian Zhao, Songjie Fan and Guangshan Zhu\*

Highly hydrophobic MIL-53 metal-organic framework nanomaterials have firstly been prepared *via* a facile ionothermal synthesis approach.

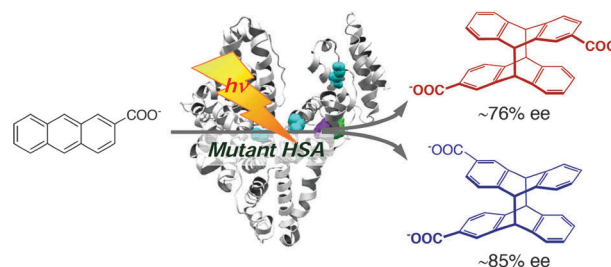


7433

**Photochirogenesis with mutant human serum albumins: enantiodifferentiating photocyclodimerization of 2-anthracenecarboxylate**

Masaki Nishijima, Hanako Kato, Gaku Fukuhara, Cheng Yang, Tadashi Mori, Toru Maruyama, Masaki Otagiri\* and Yoshihisa Inoue\*

Mutant HSAs with impaired sites 1 and/or 2 accelerated the photocyclodimerization of 2-anthracenecarboxylate to afford chiral cyclodimers in 75–85% ee.

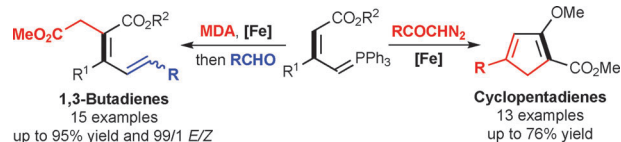


7436

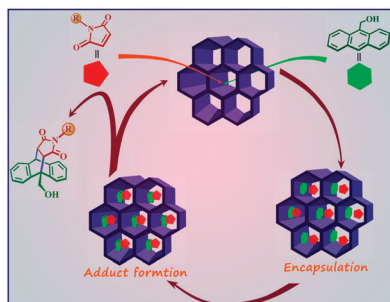
**Reaction of trisubstituted alkenes with iron porphyrin carbenes: facile synthesis of tetrasubstituted dienes and cyclopentadienes**

Peng Wang, Saihu Liao, Sunewang R. Wang, Run-Duo Gao and Yong Tang\*

The unprecedented reactivity of trisubstituted alkenes with iron porphyrin carbenes has been successfully realized by increasing the electron density of the double bond. Both 1,3-butadiene and cyclopentadiene products can be obtained with this method.



7439

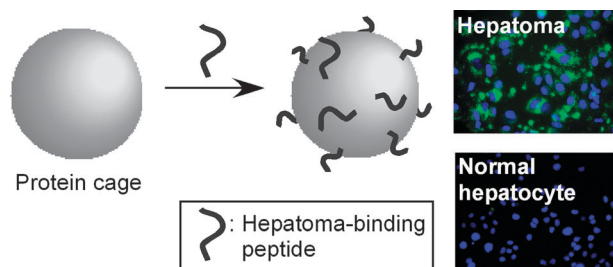


### An electron rich porous extended framework as a heterogeneous catalyst for Diels–Alder reactions

Bappaditya Gole, Arun Kumar Bar, Arijit Mallick, Rahul Banerjee and Partha Sarathi Mukherjee\*

A highly electron rich porous metal–organic framework (MOF) has been synthesized and successfully used as an effective heterogeneous catalyst for Diels–Alder reactions through encapsulation of the reactants in confined nano-channels of the framework.

7442

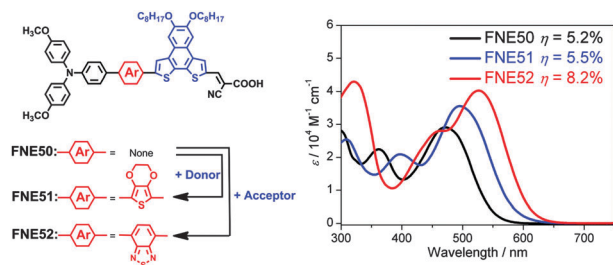


### A nanocarrier based on a genetically engineered protein cage to deliver doxorubicin to human hepatocellular carcinoma cells

Riki Toita, Masaharu Murata,\* Kana Abe, Sayoko Narahara, Jing Shu Piao, Jeong-Hun Kang and Makoto Hashizume

A genetically engineered protein cage with a hepatoma-binding peptide is taken up selectively by hepatoma cells, and will be a useful nanocarrier to deliver cytotoxic agents to hepatoma cells.

7445

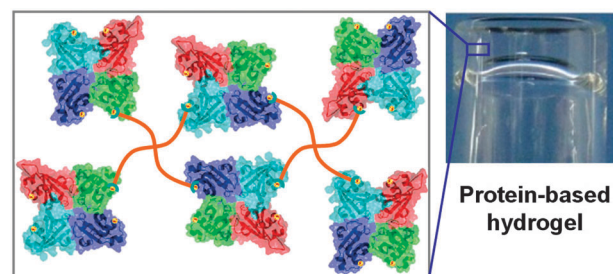


### Embedding an electron donor or acceptor into naphtho[2,1-*b*:3,4-*b'*]dithiophene based organic sensitizers for dye-sensitized solar cells

Quanyou Feng, Xiaowei Jia, Gang Zhou\* and Zhong-Sheng Wang\*

An electron donor and acceptor, respectively, is embedded into naphtho[2,1-*b*:3,4-*b'*]dithiophene based organic sensitizers to tune their optoelectronic properties.

7448



### Multifunctional biohybrid hydrogels for cell culture and controlled drug release

Huaimin Wang, Aitian Han, Yanbin Cai, Ying Xie, Hao Zhou,\* Jiafu Long\* and Zhimou Yang\*

A novel biohybrid hydrogel system is developed for cell culture and controlled drug release.



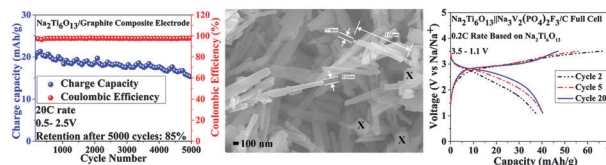
## COMMUNICATIONS

7451

**Na<sub>2</sub>Ti<sub>6</sub>O<sub>13</sub>: a potential anode for grid-storage sodium-ion batteries**

Ashish Rudola, Kuppan Saravanan, Sappani Devaraj, Hao Gong and Palani Balaya\*

Investigation of a kinetically facile and thermally stable anode material, Na<sub>2</sub>Ti<sub>6</sub>O<sub>13</sub>, demonstrating an ultra-long cycle life for application in sodium-ion batteries.

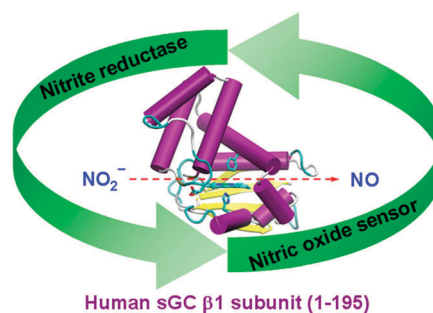


7454

**Human soluble guanylate cyclase as a nitric oxide sensor for NO-signalling reveals a novel function of nitrite reductase**

Jie Pan, Qiming Xu, Ying-Wu Lin, Fangfang Zhong and Xiangshi Tan\*

Human soluble guanylate cyclase which plays a critical role in the NO-sGC-cGMP signalling pathway reveals a novel nitrite reductase activity.



7457

**Translational repression using BIV Tat peptide–TAR RNA interaction in mammalian cells**

Chaitanya Sudrik, Manish Arha, Jicong Cao, David V. Schaffer\* and Ravi S. Kane\*

We developed a strategy to create novel genetically encoded switches based on translational repression using the interaction between a ligand and its binding site in the 5'-UTR.

