

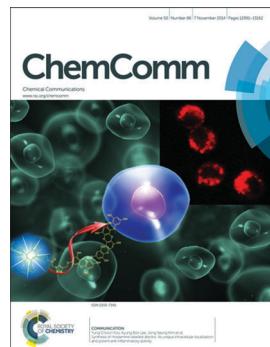
### IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS 50(86) 12991–13162 (2014)



#### Cover

See Lionel Salmon,  
Azzedine Bousseksou  
*et al.*, pp. 13015–13018.  
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#### Inside cover

See Yung Choon Yoo,  
Kyung Bok Lee,  
Jong Seung Kim *et al.*,  
pp. 13045–13048.  
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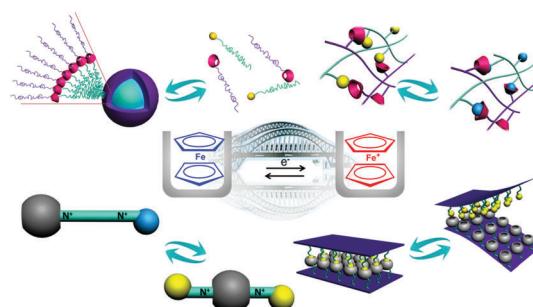
### FEATURE ARTICLE

13005

#### Ferrocene-based supramolecular structures and their applications in electrochemical responsive systems

Liao Peng, Anchao Feng, Meng Huo and Jinying Yuan\*

In the field of electrochemical stimuli, ferrocene and its derivatives were widely studied with different host molecules, mainly including cyclodextrin, cucurbituril, pillararene and calixarene. This article generally summarizes the recent work regarding the host-guest interactions between ferrocene derivatives and their host molecules, as well as various supramolecular systems based on these interactions.



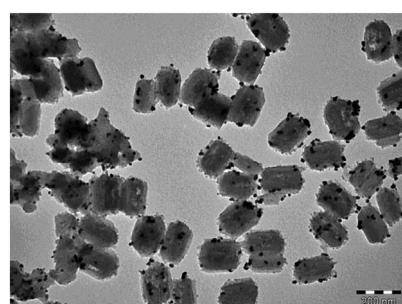
### COMMUNICATIONS

13015

#### The photo-thermal plasmonic effect in spin crossover@silica–gold nanocomposites

Iurii Suleimanov, José Sánchez Costa, Gábor Molnár, Lionel Salmon\* and Azzedine Bousseksou\*

Nanocomposite spin crossover materials with gold nanoparticles were synthesized and plasmon-enhanced photothermal spin state switching was evidenced using Raman spectroscopy.



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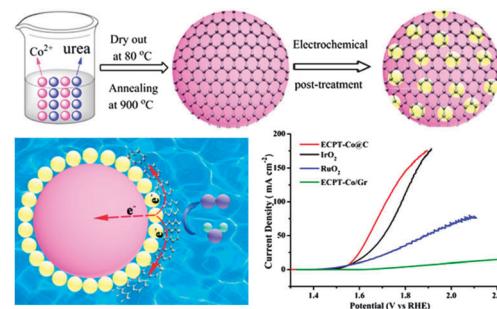
## COMMUNICATIONS

13019

**A high-performance electrocatalyst for oxygen evolution reactions based on electrochemical post-treatment of ultrathin carbon layer coated cobalt nanoparticles**

Qingqing Xiao, Yuxia Zhang, Xin Guo, Lin Jing, Zhiyu Yang, Yifei Xue, Yi-Ming Yan\* and Kening Sun

A simple electrochemical post-treatment of an ultrathin carbon layer coated metallic cobalt hybrid ( $\text{Co@C}$ ) generates an ECPT-Co@C hybrid as a novel OER electrocatalyst with excellent activity.

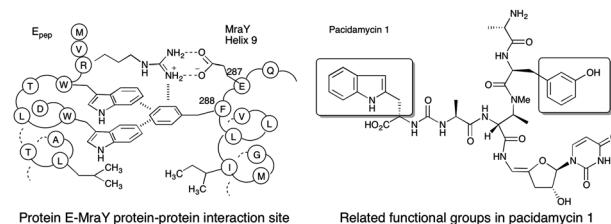


13023

**Mechanism of action of the uridyl peptide antibiotics: an unexpected link to a protein–protein interaction site in translocase MraY**

Maria T. Rodolis, Agnes Mihalyi, Christian Ducho, Kornelia Eitel, Bertolt Gust, Rebecca J. M. Goss and Timothy D. H. Bugg\*

The pacidamycin and muraymycin uridyl peptide antibiotics show some structural resemblance to an Arg-Trp-x-x-Trp sequence motif for protein–protein interaction between bacteriophage  $\phi$ X174 protein E and *E. coli* translocase MraY.

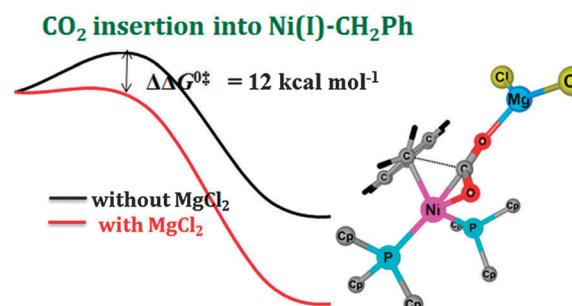


13026

**The crucial roles of  $\text{MgCl}_2$  as a non-innocent additive in the Ni-catalyzed carboxylation of benzyl halide with  $\text{CO}_2$**

Fareed Basha Sayyed and Shigeyoshi Sakaki\*

$\text{MgCl}_2$  accelerates the  $\text{CO}_2$  insertion as a non-innocent additive and the one-electron reduction process as one reagent in the Ni-catalyzed carboxylation of benzyl chloride with  $\text{CO}_2$ .

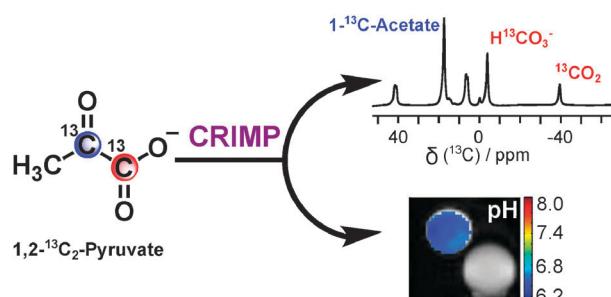


13030

**Chemical Reaction-Induced Multi-molecular Polarization (CRIMP)**

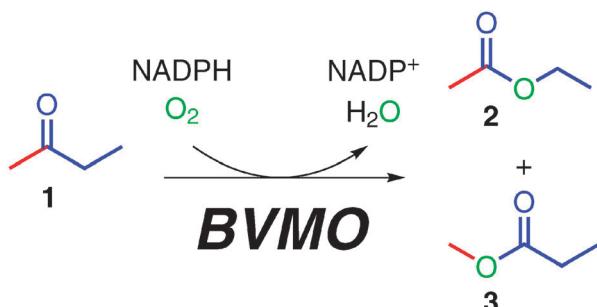
Y. Lee, N. M. Zacharias, D. Piwnica-Worms and P. K. Bhattacharya\*

Here we present a novel hyperpolarization method, Chemical Reaction-Induced Multi-molecular Polarization (CRIMP), which could be applied to the study of several *in vivo* processes simultaneously including glycolysis, TCA cycle, fatty acid synthesis and pH mapping.



## COMMUNICATIONS

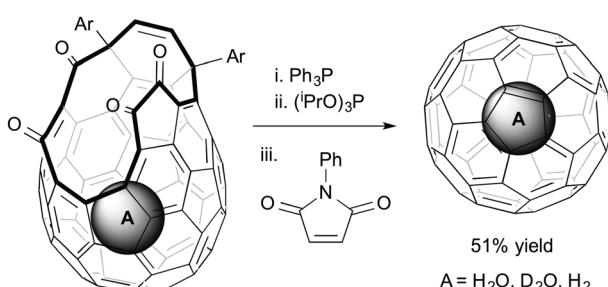
13034

**Synthesis of methyl propanoate by Baeyer–Villiger monooxygenases**

Hugo L. van Beek, Remko T. Winter, Graham R. Eastham and Marco W. Fraaije\*

The smallest asymmetric ketone 2-butanone (**1**) could be converted by several Baeyer–Villiger monooxygenases into the abnormal product methyl propanoate (**3**), as opposed to the normal product ethyl acetate (**2**) when a chemical Baeyer–Villiger oxidation is performed.

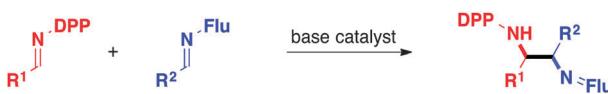
13037

**An optimised scalable synthesis of H<sub>2</sub>O@C<sub>60</sub> and a new synthesis of H<sub>2</sub>@C<sub>60</sub>**

Andrea Krachmalnicoff, Malcolm H. Levitt and Richard J. Whitby\*

New efficient and practical routes to H<sub>2</sub>O@C<sub>60</sub>, D<sub>2</sub>O@C<sub>60</sub> and H<sub>2</sub>@C<sub>60</sub> are described.

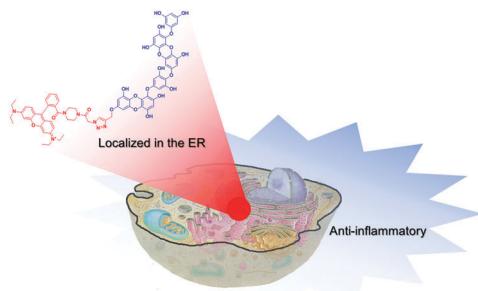
13041

**Catalytic imine–imine cross-coupling reactions**

Masatoshi Matsumoto, Masashi Harada, Yasuhiro Yamashita and Shū Kobayashi\*

Base-catalyzed efficient imine–imine cross-coupling reactions using an imine bearing 9-fluorenyl moiety have been developed.

13045

**Synthesis of rhodamine-labelled dieckol: its unique intracellular localization and potent anti-inflammatory activity**

Jong Hwan Kwak, Yanxia He, Byungkwon Yoon, Seyoung Koo, Zhigang Yang, Eun Ju Kang, Bong Ho Lee, Seung-Yun Han, Yung Choon Yoo,\* Kyung Bok Lee\* and Jong Seung Kim\*

Rhodamine-labelled dieckol localized in the ER of RAW cells. Anti-inflammatory activity of the compound was greater than that of dieckol.

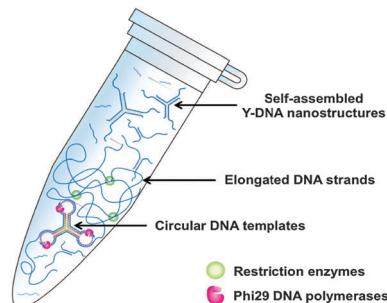
## COMMUNICATIONS

13049

**Self-assembled DNA nanostructures prepared by rolling circle amplification for the delivery of siRNA conjugates**

Cheol Am Hong, Bora Jang, Eun Hye Jeong, Hansaem Jeong and Hyukjin Lee\*

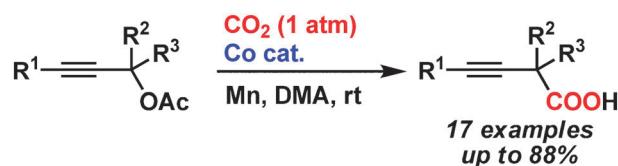
Large-scale preparation of DNA nanostructures for siRNA delivery has been achieved by an isothermal enzymatic amplification process.



13052

**Cobalt-catalyzed carboxylation of propargyl acetates with carbon dioxide**

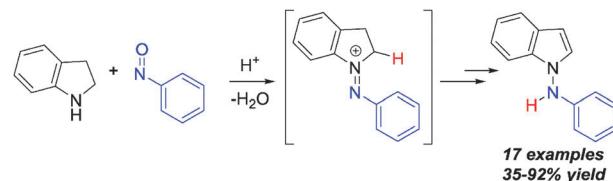
Keisuke Nogi, Tetsuaki Fujihara,\* Jun Terao and Yasushi Tsuji\*

The cobalt-catalyzed carboxylation of propargyl acetates proceeds with CO<sub>2</sub> (1 atm) at room temperature in the presence of Mn powder as a reductant.

13056

**Synthesis of *N*-aryl-1-aminoindoles via intermolecular redox amination**

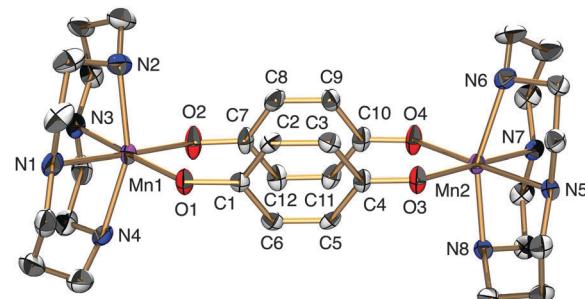
Kinthada Ramakumar and Jon A. Tunge\*

A redox amination strategy was developed for the synthesis of *N*-aryl-1-aminoindoles by N–N bond formation.

13059

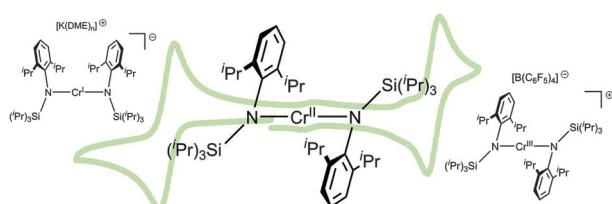
**Synthesis and crystal structure of a dinuclear, monomeric Mn<sup>II</sup> *p*-semiquinonato complex**

Harutaka Nakamori, Takahiro Matsumoto, Takeshi Yatabe, Ki-Seok Yoon, Hidetaka Nakai and Seiji Ogo\*

The first crystal structure of a monomeric *p*-semiquinonato d-block complex and its reactivity toward dioxygen are described.

## COMMUNICATIONS

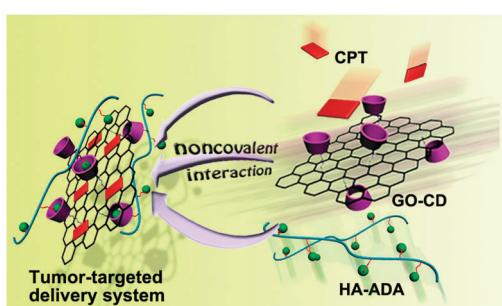
13062

**Two-Coordinate Chromium****Stable in Multiple Oxidation States****A bis(amido) ligand set that supports two-coordinate chromium in the +1, +2, and +3 oxidation states**

Irene C. Cai, Michael I. Lipschutz and T. Don Tilley\*

A bulky silylamido ligand has been used to support low-coordinate chromium complexes in various oxidation states.

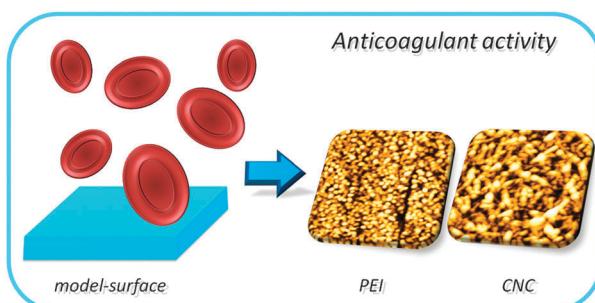
13066

**A small-sized graphene oxide supramolecular assembly for targeted delivery of camptothecin**

Ying-Ming Zhang, Yu Cao, Yang Yang, Jia-Tong Chen and Yu Liu\*

A conjugated delivery system consisting of  $\beta$ -cyclodextrin modified graphene oxide, hyaluronated adamantane, and camptothecin was constructed, displaying a satisfactory stability and a higher curative effect toward tumor cells.

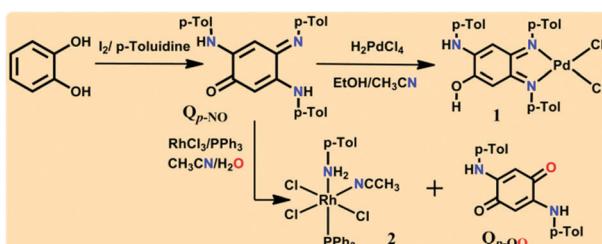
13070

**Design of anticoagulant surfaces based on cellulose nanocrystals**

Heike M. A. Ehmann,\* Tamilselvan Mohan, Maria Koshanskaya, Sylvia Scheicher, Doris Breitwieser, Volker Ribitsch, Karin Stana-Kleinschek and Stefan Spirk\*

The anticoagulant activity of surfaces decorated with cellulose nanocrystals (CNCs) prepared via sulfuric acid hydrolysis, is explored.

13073

**Metal ion promoted tautomerization and C–N bond cleavage: conversion of catechol to a *p*-benzoquinone derivative**

Pinaki Saha, Amit Saha Roy, Thomas Weyhermüller and Prasanta Ghosh\*

Metal ion promoted conversion of catechol to a *p*-quinone derivative is reported.

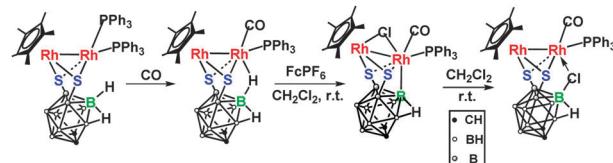
## COMMUNICATIONS

13077

**Metal–metal redox synergy in selective B–H activation of *ortho*-carborane-9,12-dithiolate**

Xiaolei Zhang, Zhiwen Zhou and Hong Yan\*

Metal–metal redox synergy is introduced, for the first time, for B–H functionalization of inert dicarba-dodecaboranes under mild conditions in high yields.

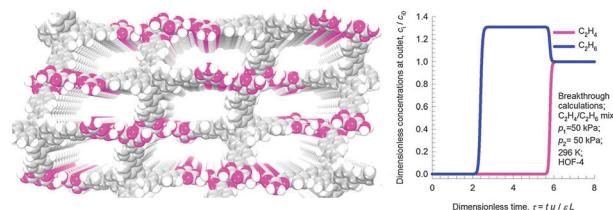


13081

**A microporous six-fold interpenetrated hydrogen-bonded organic framework for highly selective separation of C<sub>2</sub>H<sub>4</sub>/C<sub>2</sub>H<sub>6</sub>**

Peng Li, Yabing He, Hadi D. Arman, Rajamani Krishna, Hailong Wang, Linhong Weng and Banglin Chen\*

A unique six-fold interpenetrated hydrogen-bonded organic framework (HOF-4) has been constructed for highly selective separation of C<sub>2</sub>H<sub>4</sub>/C<sub>2</sub>H<sub>6</sub> at room temperature and normal pressure.

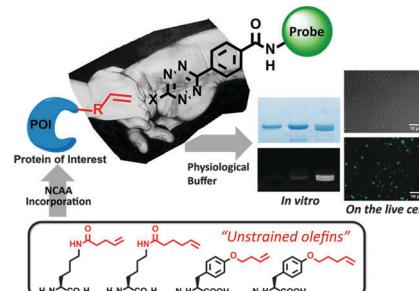


13085

**Genetically encoded unstrained olefins for live cell labeling with tetrazine dyes**

Yan-Jiun Lee, Yadagiri Kurra, Yanyan Yang, Jessica Torres-Kolbus, Alexander Deiters and Wenshe R. Liu\*

A number of non-canonical amino acids (NCAs) with unstrained olefins are genetically encoded using mutant pyrrolysyl-tRNA synthetase–tRNA<sub>CUA</sub><sup>Pyl</sup> pairs for catalyst-free labeling with tetrazine dyes.

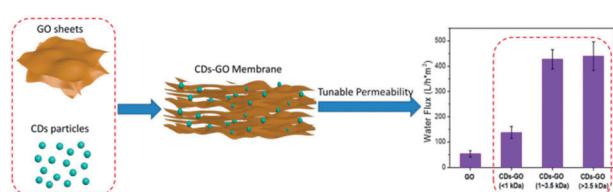


13089

**Graphene oxide membranes with tunable permeability due to embedded carbon dots**

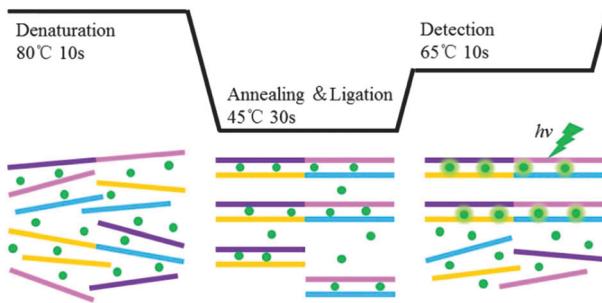
Wentai Wang, Ehsan Eftekhari, Guangshan Zhu, Xiwang Zhang,\* Zifeng Yan\* and Qin Li\*

CDs–GO membranes with tunable permeation were fabricated by embedding carbon dots (CDs) between graphene oxide (GO) nanosheets.



## COMMUNICATIONS

13093

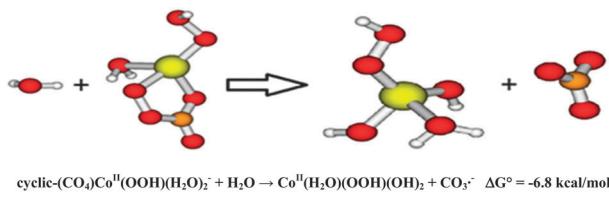


### Sensitive quantification of messenger RNA with a real-time ligase chain reaction by using a ribonucleotide-modified DNA probe

Yanlei Hu, Hongxia Jia, Yucong Wang, Yongqiang Cheng and Zhengping Li\*

A highly sensitive and specific mRNA assay is developed with a real-time fluorescence LCR by using a ribonucleotide-modified DNA probe.

13096

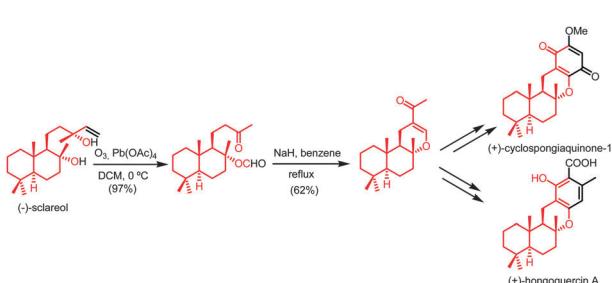


### The role of carbonate as a catalyst of Fenton-like reactions in AOP processes: $\text{CO}_3^{\cdot-}$ as the active intermediate

Ariela Burg,\* Dror Shamir, Inna Shusterman, Haya Kornweitz and Dan Meyerstein\*

The reaction  $\text{Co}(\text{H}_2\text{O})_6^{2+} + \text{H}_2\text{O}_2$  proceeds via a transient that decomposes into  $\text{Co}^{\text{II}}(\text{H}_2\text{O})(\text{OOH})(\text{OH})_2^+$  and  $\text{CO}_3^{\cdot-}$ . Plausible biological implications are pointed out.

13100

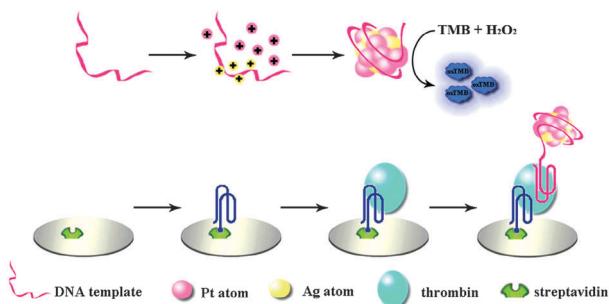


### A short synthetic route towards merosesquiterpenes with a benzoxanthene skeleton

Antonio Fernández, Esteban Alvarez, Ramón Alvarez-Manzaneda, Rachid Chahboun\* and Enrique Alvarez-Manzaneda\*

A short synthetic sequence for the preparation of merosesquiterpenes with a benzoxanthene skeleton starting from (–)-sclareol is reported. The D ring of the target compound is obtained through a Diels–Alder cycloaddition.

13103



### One-pot synthesized DNA-templated Ag/Pt bimetallic nanoclusters as peroxidase mimics for colorimetric detection of thrombin

Cheng Zheng, Ai-Xian Zheng, Bo Liu, Xiao-Long Zhang, Yu He,\* Juan Li, Huang-Hao Yang\* and Guonian Chen

One-pot synthesized DNA-templated Ag/Pt bimetallic nanoclusters possess highly-efficient peroxidase-like catalytic activity and are applied to design a colorimetric aptasensor for the protein detection with high sensitivity and selectivity.

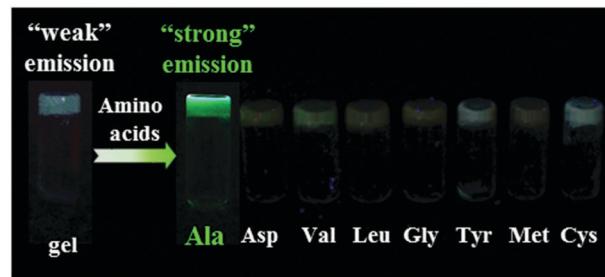
## COMMUNICATIONS

13107

**Tb<sup>3+</sup>-triggered luminescence in a supramolecular gel and its use as a fluorescent chemoprobe for proteins containing alanine**

Sung Ho Jung, Ka Young Kim, Dong Kyun Woo, Shim Sung Lee and Jong Hwa Jung\*

A tetracarboxylic acid-appended thiocalix[4]arene-based ligand with Tb<sup>3+</sup> formed a supramolecular gel which showed novel fluorogenic sensor capability for probing alanine and proteins containing alanine.

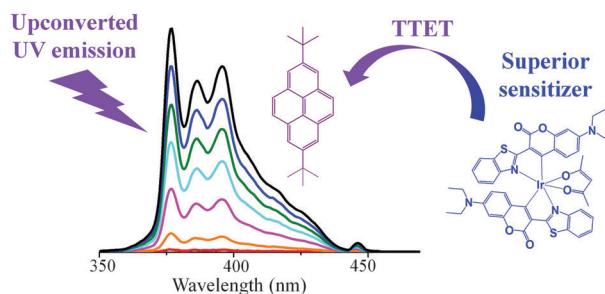


13111

**A bis-cyclometalated iridium complex as a benchmark sensitizer for efficient visible-to-UV photon upconversion**

Pengfei Duan, Nobuhiro Yanai\* and Nobuo Kimizuka\*

The biggest problem in visible-to-UV photon upconversion—the quenching of upconverted emission by sensitizers—was solved by employing a superior sensitizer with less UV absorption intensity.

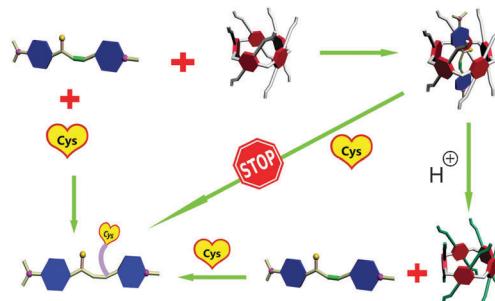


13114

**Acidic microenvironment triggered release of a Cys probe from the cavity of a water-soluble pillar[5]arene**

Pi Wang, Zhengtao Li and Xiaofan Ji\*

A Cys probe is prepared. It can be included into the cavity of a water-soluble pillar[5]arene. This **WP5** probe complex shows no response toward Cys under neutral conditions in water, while the release of the Cys probe can be realized in an acidic microenvironment.

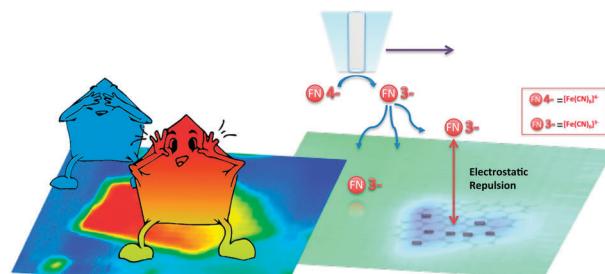


13117

**Playing peekaboo with graphene oxide: a scanning electrochemical microscopy investigation**

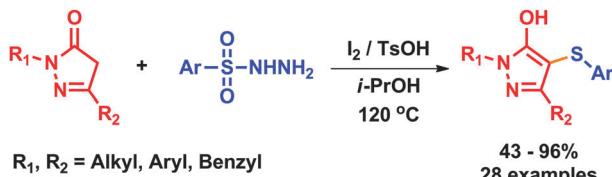
Stefania Rapino,\* Emanuele Treossi, Vincenzo Palermo,\* Massimo Marcaccio, Francesco Paolucci and Francesco Zerbetto

Electrostatic interactions with the molecular mediator control imaging of graphene oxide by scanning electrochemical microscopy.



## COMMUNICATIONS

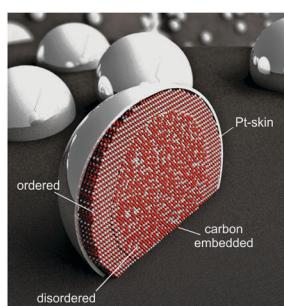
13121

***p*-Toluenesulphonic acid-promoted, I<sub>2</sub>-catalysed sulphenylation of pyrazolones with aryl sulphonyl hydrazides**

Xia Zhao,\* Lipeng Zhang, Tianjiao Li, Guiyan Liu, Haomeng Wang and Kui Lu\*

A *p*-toluenesulphonic acid promoted, iodine catalyzed direct sulphenylation reaction of pyrazolones with aryl sulphonyl hydrazides has been developed.

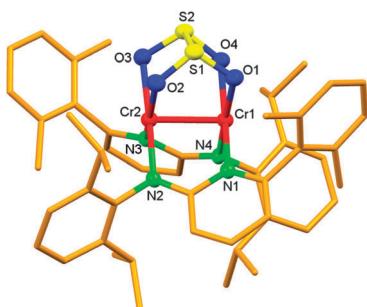
13124

**A highly active PtCu<sub>3</sub> intermetallic core–shell, multilayered Pt-skin, carbon embedded electrocatalyst produced by a scale-up sol–gel synthesis**

M. Bele, P. Jovanović, A. Pavlišić, B. Jozinović, M. Zorko, A. Rečnik, E. Chernyshova, S. Hočevar, N. Hodnik\* and M. Gaberšček\*

We present a novel, scaled-up sol–gel synthesis which enables one to produce 20 g batches of highly active and stable carbon supported PtCu<sub>3</sub> nanoparticles as cathode materials for low temperature fuel cell application.

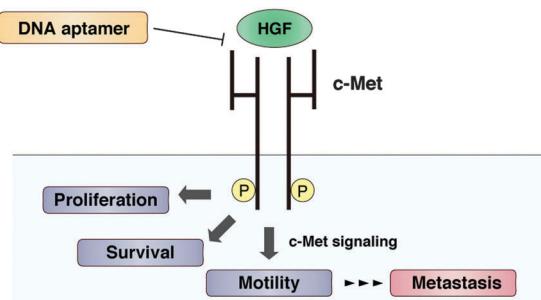
13127

**CO<sub>2</sub> and SO<sub>2</sub> activation by a Cr–Cr quintuple bond**

Awal Noor, Sadaf Qayyum, Tobias Bauer, Stefan Schwarz, Birgit Weber and Rhett Kempe\*

A quintuply bonded dichromium complex stabilized by aminopyridinato ligands activates CO<sub>2</sub> and SO<sub>2</sub> by reducing the (formal) bond order of the metal–metal bonds.

13131

**A DNA aptamer to c-Met inhibits cancer cell migration**

R. Ueki and S. Sando\*

CLN0003\_SL1, an optimized 50-mer DNA aptamer, suppressed the metastasis-related behaviour of cancer cells. This aptamer may be a promising molecular platform for preventing tumour development and metastasis.

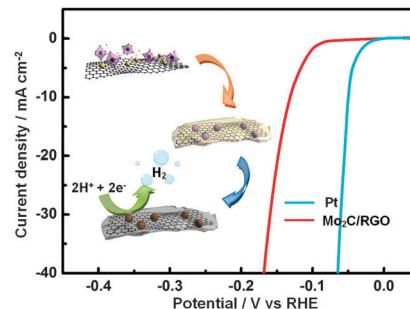
## COMMUNICATIONS

13135

**Molybdenum carbide stabilized on graphene with high electrocatalytic activity for hydrogen evolution reaction**

Lin Feng Pan, Yu Hang Li, Shuang Yang, Peng Fei Liu, Ming Quan Yu and Hua Gui Yang\*

Molybdenum carbide stabilized by a carbon layer on graphene exhibits excellent electrocatalytic activity for the hydrogen evolution reaction.

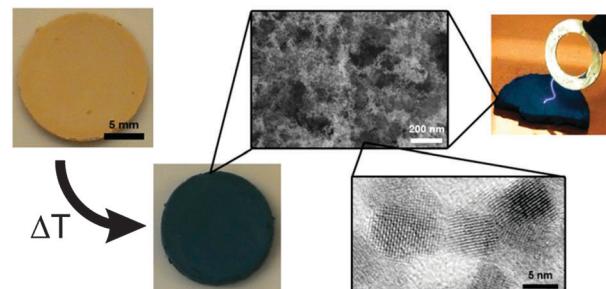


13138

**Assembly of antimony doped tin oxide nanocrystals into conducting macroscopic aerogel monoliths**

Felix Rechberger, Gabriele Ilari and Markus Niederberger\*

We present the 3-dimensional assembly of preformed antimony doped tin oxide nanocrystals into conducting centimeter-sized aerogel monoliths.

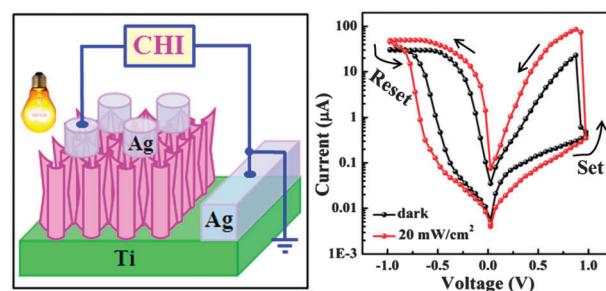


13142

**Enhanced resistive switching effect upon illumination in self-assembled NiWO<sub>4</sub> nano-nests**

Bai Sun, Wenxi Zhao, Lujun Wei, Hongwei Li and Peng Chen\*

The self-assembled NiWO<sub>4</sub> nanosheet array is synthesized by a hydrothermal process, and a white-light controlled resistive switching memory device is demonstrated.

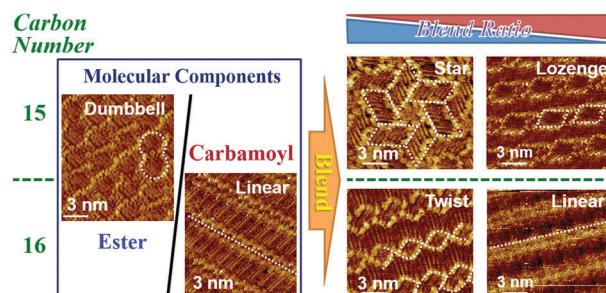


13146

**Bicomponent blend-directed amplification of the alkyl chain effect on the 2D structures**

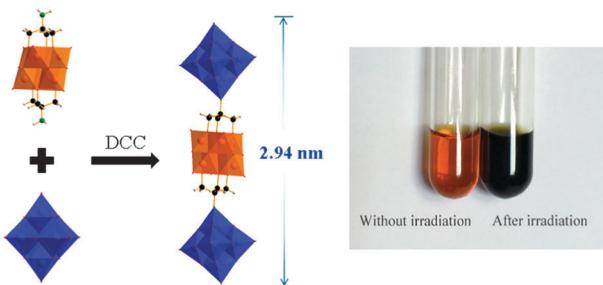
Yoshihiro Kikkawa,\* Manami Ishitsuka, Ayumi Kashiwada, Seiji Tsuzuki and Kazuhisa Hiratani

The 2D structures of bicomponent blends in isobutylene compounds were observed by using scanning tunneling microscopy at the solid/liquid interface. Amplification of the alkyl chain effect was found on the 2D structures.



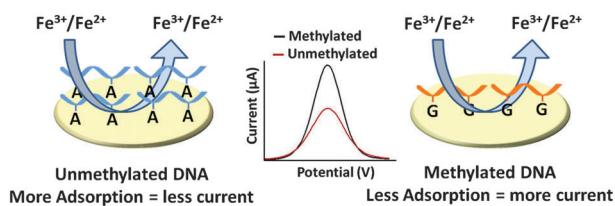
## COMMUNICATIONS

13150

**A redox active triad nanorod constructed from covalently interlinked organo-hexametalates**

Aruuhan Bayaguud, Jin Zhang,  
Rao Nauman Nasim Khan, Jian Hao and Yongge Wei\*  
A photoactive nanorod-like inorganic–organic hybrid compound based on polyoxometalate architectures and organic linkers has been successfully synthesized.

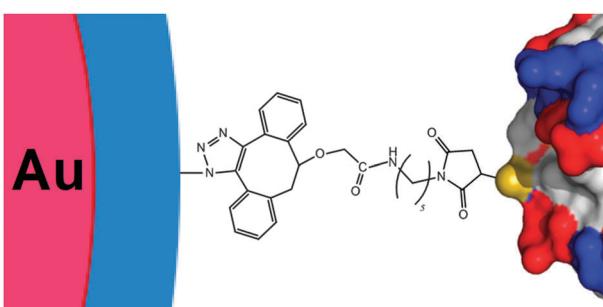
13153

**eMethylsorb: electrochemical quantification of DNA methylation at CpG resolution using DNA–gold affinity interactions**

Abu Ali Ibn Sina, Sidney Howell, Laura G. Carrascosa,\*  
Sakandar Rauf, Muhammad J. A. Shiddiky\* and  
Matt Trau\*

Base dependent affinity interaction of DNA with gold has been utilised to electrochemically quantify the methylation status of bisulphite treated DNA samples.

13157

**Monovalent maleimide functionalization of gold nanoparticles via copper-free click chemistry**

D. J. Nieves, N. S. Azmi, R. Xu, R. Lévy, E. A. Yates and  
D. G. Fernig\*

A single maleimide was installed onto the self-assembled monolayer of gold nanoparticles by copper-free click chemistry. Simple covalent biofunctionalisation is demonstrated by coupling fibroblast growth factor 2 and an oligosaccharide in a 1:1 stoichiometry by thiol-Michael addition.