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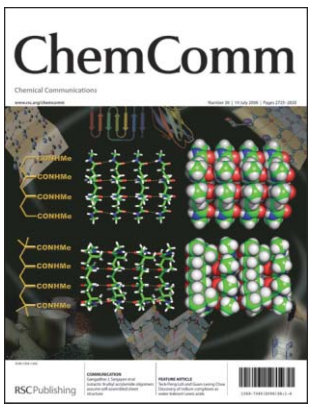
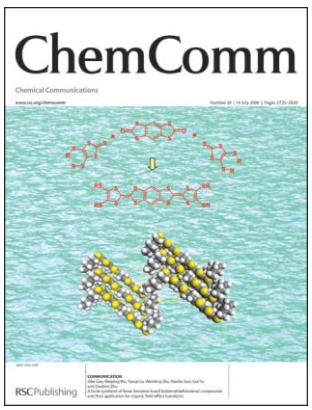


Cover
See Gangadhar J. Sanjayan *et al.*, page 2756.
The image shows the ability of isotactic *N*-acrylamide oligomers to assume self-assembled sheet structures, reminiscent of protein β-sheets. Image reproduced by permission of Amol Kendhale, Rajesh Gonnade, Pattuparampil R. Rajamohanan and Gangadhar J. Sanjayan from *Chem. Commun.*, 2006, 2756.



Inside cover
See Yunqi Liu *et al.*, page 2750.
High performance solution processed organic thin film field-effect transistors based on benzene-fused bis(tetrathiafulvalene) compounds.
Image reproduced by permission of Xike Gao, Weiping Wu, Yunqi Liu, Wenfeng Qiu, Xiaobo Sun, Gui Yu and Daoben Zhu from *Chem. Commun.*, 2006, 2750.

CHEMICAL TECHNOLOGY

T25

Chemical Technology highlights the latest applications and technological aspects of research across the chemical sciences.

Chemical Technology

July 2006/Volume 3/Issue 7

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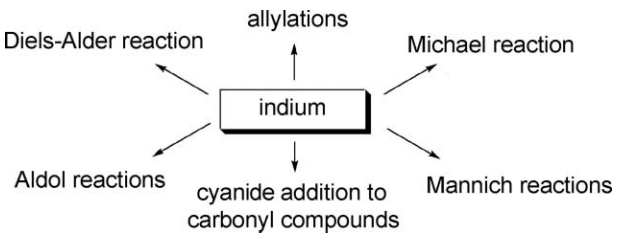
FEATURE ARTICLE

2739

Discovery of indium complexes as water-tolerant Lewis acids

Teck-Peng Loh* and Guan-Leong Chua

This article describes our work on the use of indium complexes as catalysts in various carbon–carbon bond forming reactions.



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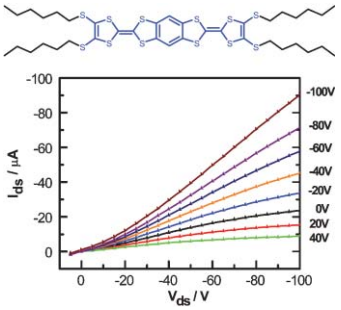

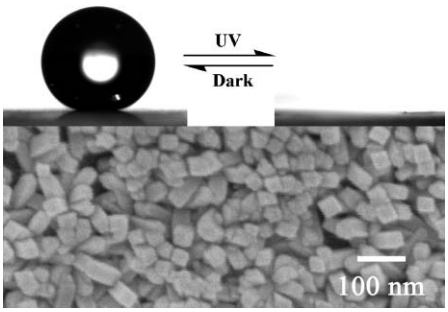

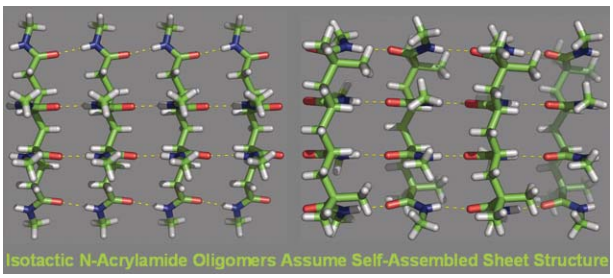

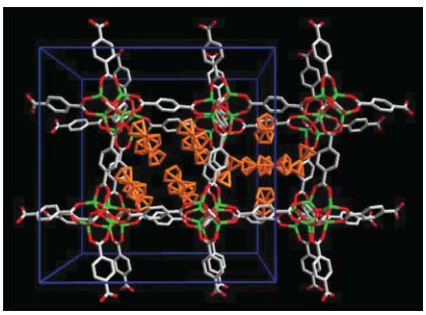

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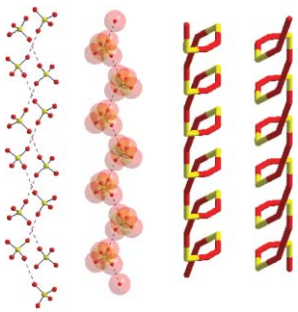
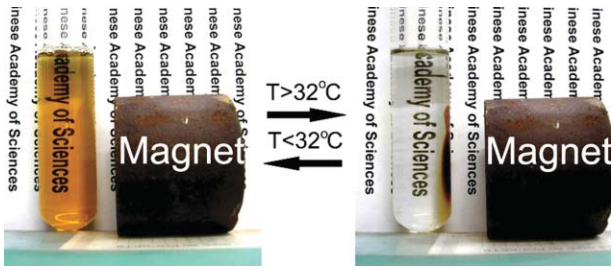


Sulfate anion helices formed by the assistance of a flip-flop water chain

Pallepogu Raghavaiah, Sabbani Supriya and Samar K. Das*

A flip-flop chainlike extended structure of water tetramers assists the supramolecular construction of sulfate anion helices that are formed *via* O···O non-covalent non-hydrogen bonded interaction in a simple inorganic–organic compound $[C_6H_{10}N_2]SO_4{\cdot}1.5H_2O$

2765

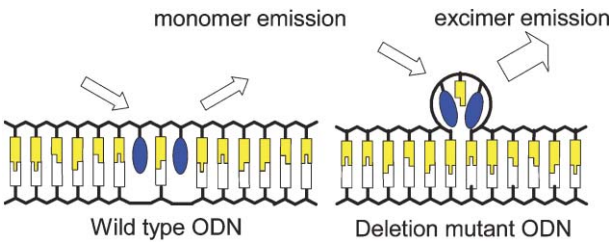


Magnetic separation of polymer hybrid iron oxide nanoparticles triggered by temperature

Yabin Sun, Xiaobin Ding,* Zhaohui Zheng, Xu Cheng, Xinhua Hu and Yuxing Peng*

The water dispersion of poly-*N*-isopropylacrylamide hybrid nanoparticles exhibited temperature-triggered magnetic separation behaviour. If the temperature switched between below and above 32 °C, the nanoparticles could be dispersed into water and reversibly separated by a magnetic field of 1.1 T.

2768

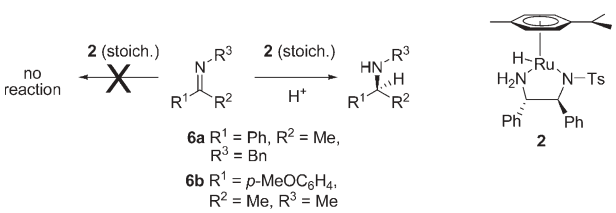


Insertion of two pyrene moieties into oligodeoxyribonucleotides for the efficient detection of deletion polymorphisms

Hiromu Kashida, Hiroyuki Asanuma* and Makoto Komiyama

For the detection of deletion polymorphisms, two pyrene moieties are tethered to an oligodeoxyribonucleotide (ODN). One- and two-base deletions can be selectively detected by the strength of the excimer emission.

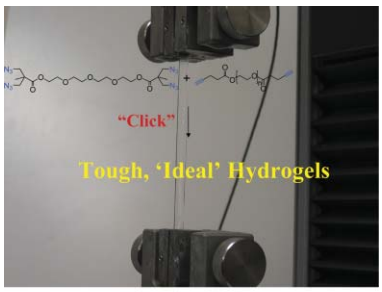
2771

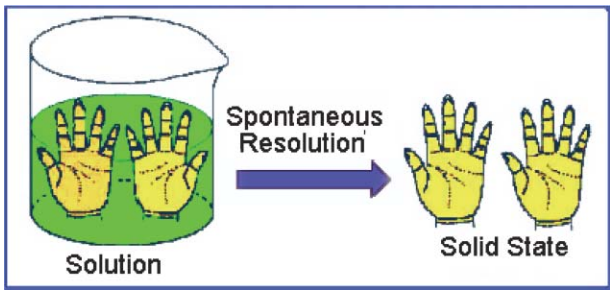


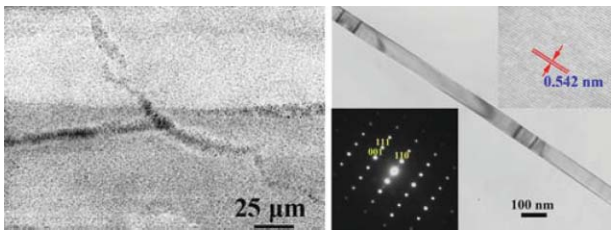
Mechanistic investigation on the hydrogenation of imines by $[p\text{-}(Me_2CH)C_6H_4Me]RuH(NH_2CHPhCHPhNSO_2\text{-}C_6H_4\text{-}p\text{-}CH_3)$. Experimental support for an ionic pathway

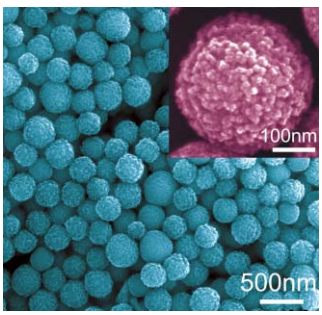
Jenny B. Åberg, Joseph S. M. Samec and Jan-E. Bäckvall*

The need for acidic activation in the stoichiometric hydrogenation of imines **6a** or **6b** by Noyori's catalyst $[p\text{-}(Me_2CH)C_6H_4Me]RuH(NH_2CHPhCHPhNSO_2C_6H_4\text{-}p\text{-}CH_3)$ (**2**) is inconsistent with the proposed concerted mechanism and supports an ionic mechanism.









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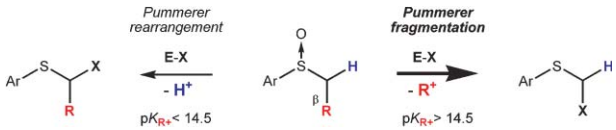
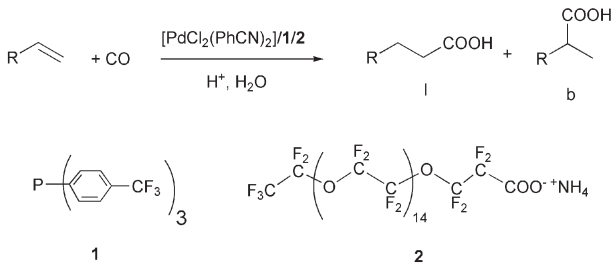


Pummerer fragmentation *vs.* Pummerer rearrangement: a mechanistic analysis

Benoît Laleu, Marco Santarem Machado and Jérôme Lacour*

Depending upon the nature of the substituent at the β-position of the sulfoxide moiety, a Pummerer reaction can be oriented "at will" towards C_α–H (rearrangement) or C_α–C_β (fragmentation) bond cleavage.

2789

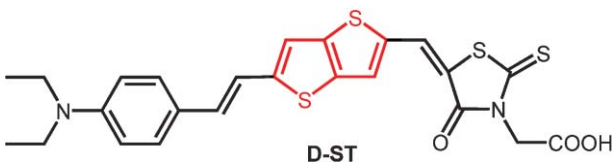


Hydrocarboxylation of terminal alkenes in supercritical carbon dioxide using perfluorinated surfactants

Clara Tortosa-Estorach, Núria Ruiz and Anna M. Masdeu-Bultó*

High selectivity in acids is obtained in the first example of hydrocarboxylation of 1-octene in supercritical carbon dioxide using a Pd/P(4-C_6H_4-CF_3)$_3$ catalyst system and a perfluorinated surfactant **2**.

2792

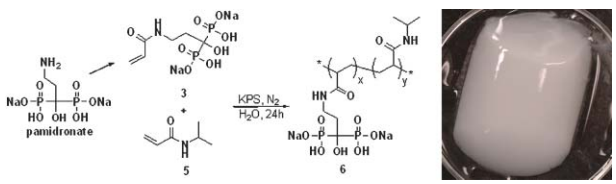


Novel organic dyes for efficient dye-sensitized solar cells

Shao-Lu Li, Ke-Jian Jiang,* Ke-Feng Shao and Lian-Ming Yang*

A novel organic dye containing thienothiophene segments was developed, and nano-crystalline TiO_2 dye-sensitized solar cells were fabricated with 6.23% of the overall conversion efficiency (η) under AM 1.5 irradiation: short-circuit current density (J_{sc}) 15.23 mA cm^{-2}; open-circuit photovoltage (V_{oc}) 0.56 V; and fill factor (*ff*) 0.73.

2795



The first pamidronate containing polymer and copolymer

Ling Wang, Min Zhang, Zhimou Yang and Bing Xu*

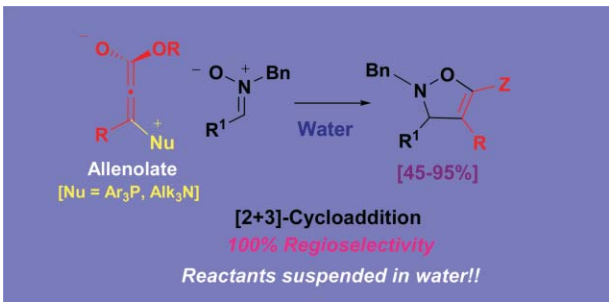
A new monomer, *N*-acryl pamidronate (**3**), has been synthesized, and its crosslinked copolymer (**6**) can form a hydrogel that serves as the substrate for direct biomineralization (*e.g.*, the formation of hydroxyapatites).

2798

Organocatalysis "on water". Regioselective [3 + 2]-cycloaddition of nitrones and allenolates

David González-Cruz, David Tejedor, Pedro de Armas,* Ezequiel Q. Morales and Fernando García-Tellado*

The first example of a regioselective and organocatalyzed 1,3-dipolar cycloaddition reaction between conjugated alkynoates and nitrones "on water" is described.

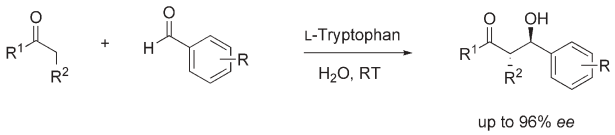


2801

Asymmetric aldol reactions catalyzed by tryptophan in water

Zhaoqin Jiang, Zhian Liang, Xiaoyu Wu and Yixin Lu*

Tryptophan was shown to be able to catalyze direct aldol reactions between various cyclic ketones and aromatic aldehydes in water with high enantioselectivity.

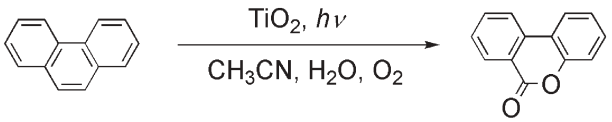


2804

Synthesis of a coumarin compound from phenanthrene by a TiO_2-photocatalyzed reaction

Suguru Higashida,* Aiko Harada, Rikako Kawakatsu, Noriko Fujiwara and Michio Matsumura*

Phenanthrene was converted into a coumarin compound by a TiO_2-photocatalyzed reaction in an acetonitrile solution containing 8 wt% water and molecular oxygen in 45% yield.

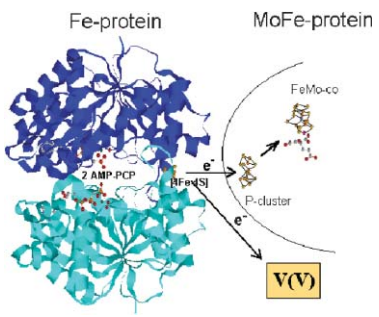


2807

Vanadium(V) is reduced by the 'as isolated' nitrogenase Fe-protein at neutral pH

Karl Fisher, David J. Lowe and Jan Petersen*

A redox-active protein, the nitrogenase Fe-protein, is presented that is able to reduce orthovanadate depending on the oxidation state of its [4Fe-4S] cluster in a manner that does not require a nucleotide-dependent conformational rearrangement.



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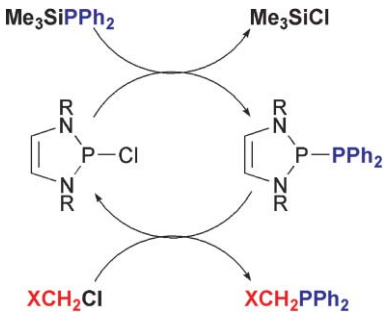
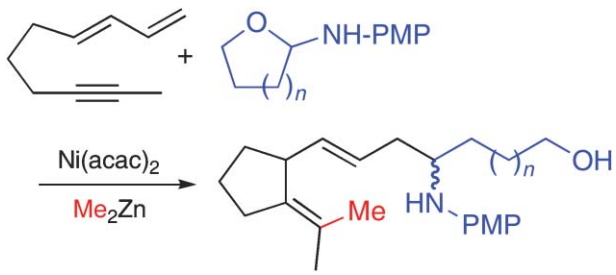


Phosphorus–carbon bond formation catalysed by electrophilic *N*-heterocyclic phosphines

Sebastian Burck, Daniela Förster and Dietrich Gudat*

A *P*-chloro-diazaphospholene catalyses the phosphorus–carbon bond formation reaction between diphenylsilylphosphine and various alkyl chlorides.

2813



Nickel catalyzed stereoselective conjugate addition of dimethylzinc upon aldimines across 1,3-dien-8-ynes and 1,3-dien-9-ynes

Masanari Kimura, Masahiko Mori, Nahoko Mukai, Keisuke Kojima and Yoshinao Tamaru*

Nickel(0) catalyzes multi-component connection of Me_2Zn, alkynes, dienes, aldehydes and anisidine, furnishing dienyl amines in good yields.

2816

Smart oligopeptide gels: *in situ* formation and stabilization of gold and silver nanoparticles within supramolecular organogel networks

Sudipta Ray, Apurba Kumar Das and Arindam Banerjee*

Tripeptide with redox active tyrosine based smart organogels have been used for *in situ* formation and stabilization of gold and silver nanoparticles within the supramolecular gel networks and the gold nanoparticles are aligned in arrays along the gel nanofibers of peptide **1**–toluene gels.

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Relaxometric and solution NMR structural studies on ditopic lanthanide(III) complexes of a phosphinate analogue of DOTA with a fast rate of water exchange

Jakub Rudovský, Mauro Botta, Petr Hermann, Avtandil Koridze and Silvio Aime

Model studies of the Cu$_B$ site of cytochrome *c* oxidase utilizing a Zn(II) complex containing an imidazole–phenol cross-linked ligand

Russell P. Pesavento, Derek A. Pratt, Jerry Jeffers and Wilfred A. van der Donk

Phosphinic derivative of DTPA conjugated to a G5 PAMAM dendrimer: an ^{17}O and ^{1}H relaxation study of its Gd(III) complex

Petra Lebdušková, Angélique Sour, Lothar Helm, Éva Tóth, Jan Kotek, Ivan Lukeš and André E. Merbach

A tris(2,2′-bipyridine)ruthenium(II) derivative tethered to a *cis*-PtCl$_2$(amine)$_2$ moiety: syntheses, spectroscopic properties, and visible-light-induced scission of DNA

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Breaking the N_2 triple bond: insights into the nitrogenase mechanism

Brett M. Barney, Hong-In Lee, Patricia C. Dos Santos, Brian M. Hoffman, Dennis R. Dean and Lance C. Seefeldt

A positively charged trinuclear 3N-chelated monofunctional platinum complex with high DNA affinity and potent cytotoxicity

Yongmei Zhao, Weijiang He, Pengfei Shi, Jianhui Zhu, Lin Qiu, Liping Lin and Zijian Guo

Reinforced molecular recognition as an alternative to rigid receptors

Sijbren Otto

Engineering emissive europium and terbium complexes for molecular imaging and sensing

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