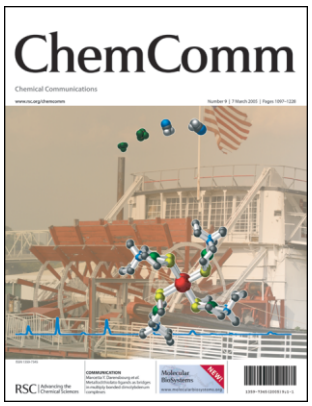
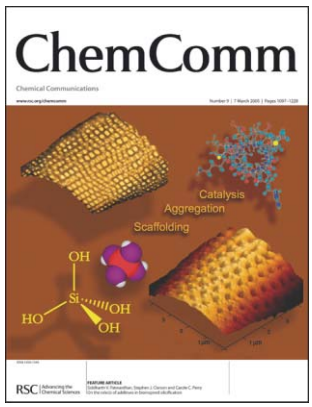
IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS (9) 1097–1228 (2005)



Cover
Full steam ahead with a hexametallic molecular paddlewheel. See p. 1122. Image reproduced by permission of Stephen P. Jeffery, Jonghyuk Lee and Marcetta Y. Darensbourg



Inside cover
Additives in bioinspired silicification regulate three key aspects - catalysis, aggregation and scaffolding. See p. 1113. Artwork kindly prepared by Jay Yocis, Photographic Services, University of Cincinnati. Image reproduced by permission of Siddharth V. Patwardhan, Stephen J. Clarson and Carole C. Perry

CHEMICAL SCIENCE

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant scientific advances.

Chemical Science

March 2005/Volume 2/Issue 3

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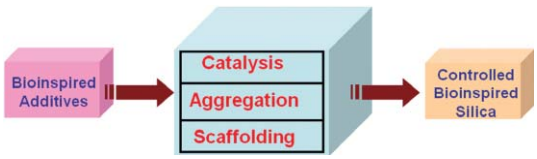
FEATURE ARTICLE

On the role(s) of additives in bioinspired silicification

Siddharth V. Patwardhan,* Stephen J. Clarson and Carole C. Perry

The results obtained from bioinspired silicification investigations are hypothesised to arise from specific modes of action of the organic additives—additives act as catalysts, aggregation promoting agents or structure-directing agents or typically, exhibit a combination of these behaviours.



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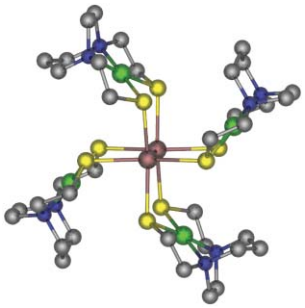
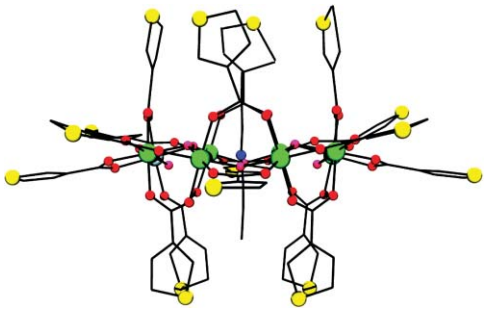
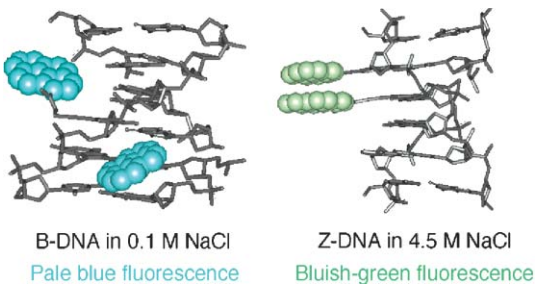
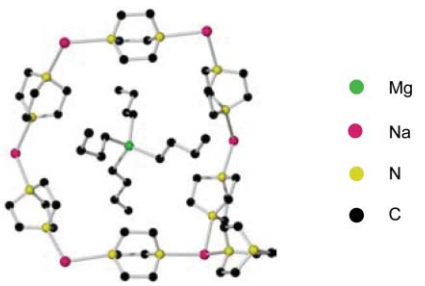
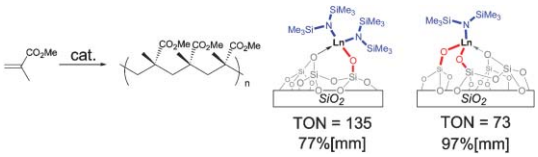
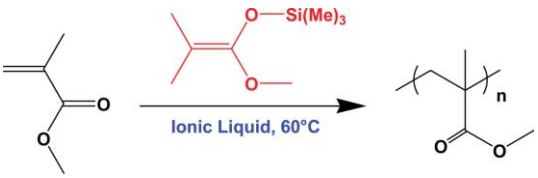


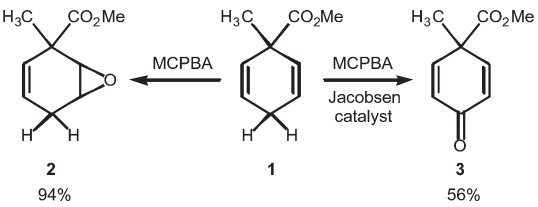


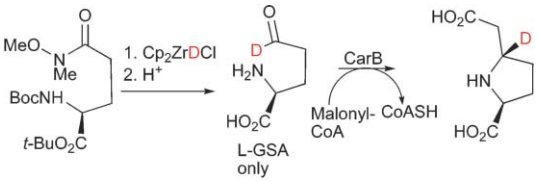












1170

Low-melting sugar–urea–salt mixtures as solvents for Diels–Alder reactions

Giovanni Imperato, Ernst Eibler, Julia Niedermaier and Burkhard König*

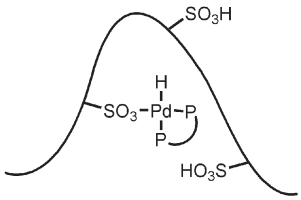
Using abundant bulk chemicals, such as sugar, urea and ammonium chloride, low-melting stable mixtures have been obtained, which are suitable as green solvents for organic reactions.

1173

Highly active and selective palladium catalyst for hydroesterification of styrene and vinyl acetate promoted by polymeric sulfonic acids

Hirohito Ooka,* Tsutomu Inoue, Shinichi Itsuno and Masato Tanaka*

1,2-Bis(di-*tert*-butylphosphinomethyl)benzene–palladium species used in conjunction with polymeric sulfonic acids of limited SO_3H loadings generate high performance catalyst systems in hydroesterification of styrene and vinyl acetate affording branched structured esters.

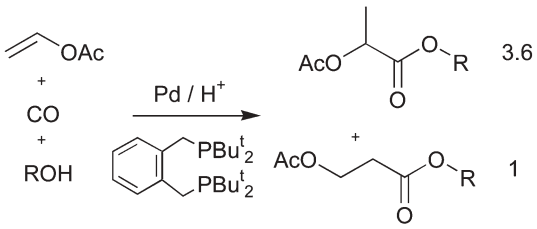


1176

Methoxycarbonylation of vinyl acetate catalysed by palladium complexes of bis(ditertiarybutylphosphinomethyl)benzene and related ligands

Adam J. Rucklidge, George E. Morris and David J. Cole-Hamilton*

Palladium complexes of bis(ditertiarybutylphosphinomethyl)-benzene are active catalysts for the methoxycarbonylation of vinylacetate to give acetyl protected lactate esters with 78% branched selectivity and minimal side product formation.

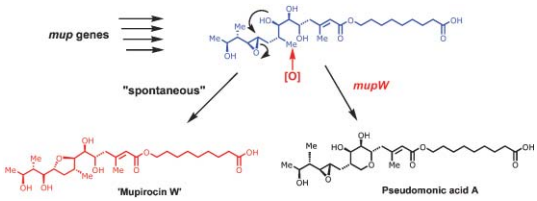


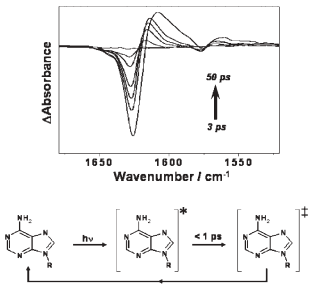
1179

Mupirocin W, a novel pseudomonic acid produced by targeted mutation of the mupirocin biosynthetic gene cluster

Sian M. Cooper, Russell J. Cox, John Crosby, Matthew P. Crump, Joanne Hothersall, Wanpen Laosripaiboon, Thomas J. Simpson* and Christopher M. Thomas

Mutation of the *mupW* gene in the mupirocin biosynthetic gene cluster in *Pseudomonas fluorescens* results in efficient production of a novel pseudomonic acid metabolite, mupirocin W, which lacks the characteristic tetrahydropyran ring, and reveals the role of the *mupW* gene in pseudomonic acid biosynthesis.

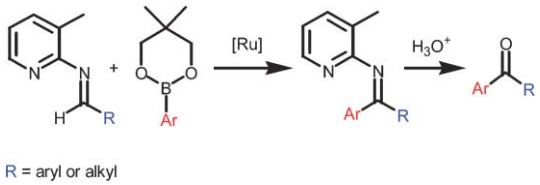




Monitoring the effect of ultrafast deactivation of the electronic excited states of DNA bases and polynucleotides following 267 nm laser excitation using picosecond time-resolved infrared spectroscopy

Marina K. Kuimova, Joanne Dyer, Michael W. George,* David C. Grills, John M. Kelly,* Pavel Matousek, Anthony W. Parker,* Xue Zhong Sun, Michael Towrie and Aine M. Whelan

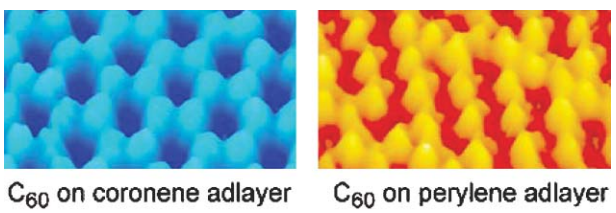
A picosecond infrared spectroscopic study of DNA bases has demonstrated that electronic excitation creates vibrationally excited ground state molecules within the first picosecond.



Ruthenium-catalyzed coupling of aldimines with arylboronates: new synthetic method for aromatic ketones

Young Jun Park, Eun-Ae Jo and Chul-Ho Jun*

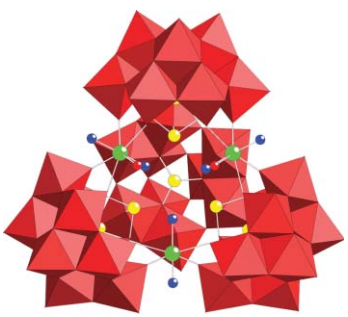
Using the chelation strategy, the reaction of aryl or alkyl aldimines bearing the 3-picolin-2-yl group with various arylboronates in the presence of ruthenium catalyst furnished the corresponding ketimines in high yields for a short reaction time. The resulting ketimines were readily converted to ketones by hydrolysis.



Effect of underlying coronene and perylene adlayers for [60]fullerene molecular assembly

Soichiro Yoshimoto, Eishi Tsutsumi, Oomi Fujii, Ryuji Narita and Kingo Itaya*

Supramolecularly assembled layers of C_{60} on coronene- and perylene-modified Au(111) surfaces were investigated and the structure of the C_{60} adlayer was found to be strongly influenced by the underlying organic layers.



Polyoxoanions functionalized by diorganotin groups: the tetrameric, chiral tungstoarsenate(III), $[\{Sn(CH_3)_2(H_2O)\}_2\{Sn(CH_3)_2\}As_3(\alpha\text{-}AsW_9O_{33})_4]^{21-}$

Firasat Hussain and Ulrich Kortz*

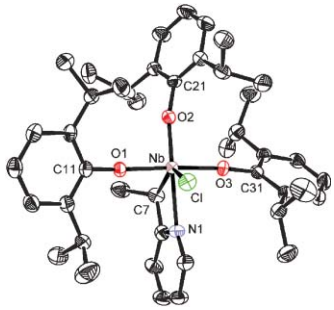
The tetrameric, hybrid organic–inorganic tungstoarsenate(III) $[\{Sn(CH_3)_2(H_2O)\}_2\{Sn(CH_3)_2\}As_3(\alpha\text{-}AsW_9O_{33})_4]^{21-}$ is composed of four (B-α-AsW_9O_{33}) fragments that are linked by three dimethyltin groups and three As(III) atoms resulting in an unprecedented, chiral polyoxoanion assembly with C_1 symmetry.

1194

Regioselective insertion of 2-vinylpyridine in niobium and tantalum aryloxide complexes: an alternate route to pyridylalkyl metallacycles

Rex A. Corbin,* Brandon E. Dusick, Khamphee Phomphrai, Phillip E. Fanwick and Ian P. Rothwell

A series of niobium and tantalum aryloxide compounds containing η^2 pyridylalkyl ligation have been synthesized *via* a regioselective insertion of 2-vinylpyridine into a metal–hydride bond. The latter originates from ^{n}BuSnH.

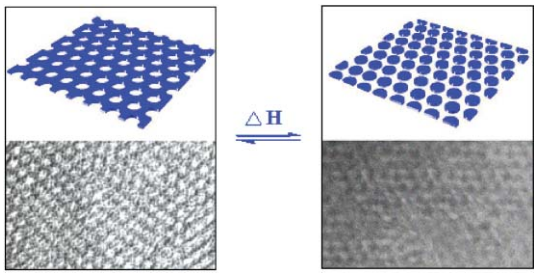


1197

Structural inversion in 3-D hexagonal organization of coil–rod–coil molecule

Long Yi Jin, Jinyoung Bae, Jong-Hyun Ahn and Myongsoo Lee*

We report an unusual example of supramolecular structural inversion in coil–rod–coil molecules, from organized coil perforations in a rod layer to organized discrete rod-bundles in a coil matrix, while maintaining a 3-D hexagonal superlattice.

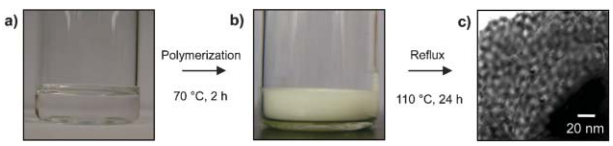


1200

Fabrication of mesoporous polymer using soft template method

Jyongsik Jang* and Joonwon Bae

Nanoporous polymer materials (see image c) with tunable pore sizes were fabricated from micelle/polymer precursors (see image b) which were prepared by the micelle template method in reverse microemulsion systems (see image a) and the pore size could be tuned by varying the type and concentration of surfactant.

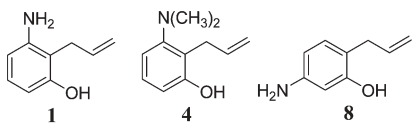


1203

Enhanced reactivity in OH/NH/π polyfunctional systems through coupled proton/electron transfer in the excited state: the photocyclisation of 2-allyl-3-aminophenol

Edgar A. Leo, Rosa Tormos and Miguel A. Miranda*

The photocyclisation rate of 2-allyl-3-(or 5-)aminophenols (**1**, **4** and **8**) is dramatically enhanced, when compared with reference compounds, as a consequence of a coupled proton/electron transfer process.



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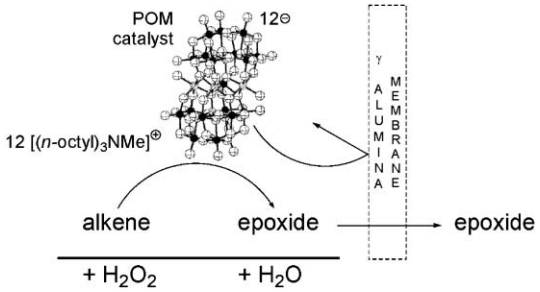
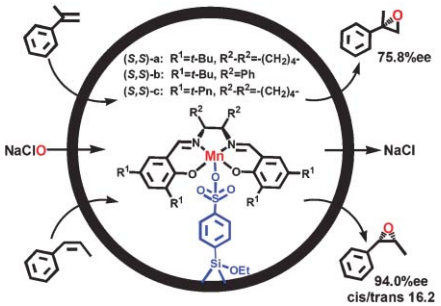


Highly efficient recycling of a "sandwich" type polyoxometalate oxidation catalyst using solvent resistant nanofiltration

Peter T. Witte, Sankhanilay Roy Chowdhury, Johan E. ten Elshof,* Dorit Sloboda-Rozner, Ronny Neumann and Paul L. Alsters*

A "sandwich" type polyoxometalate catalyst ($[MeN(n\text{-}C_8H_{17})_3]_{12}[WZn_3(ZnW_9O_{34})_2]$) was very efficiently recycled by nanofiltration with almost quantitative retention, using an α-alumina supported mesoporous γ-alumina membrane.

1209

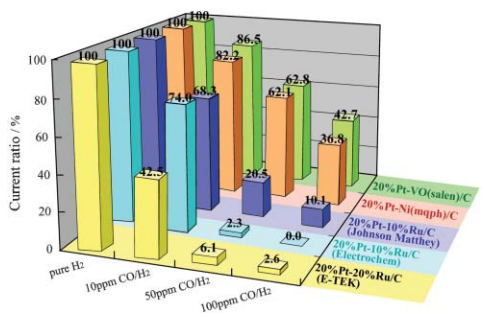


Enantioselective epoxidation of unfunctionalised olefins catalyzed by Mn(salen) complexes immobilized in porous materials *via* phenyl sulfonic group

Huidong Zhang, Song Xiang and Can Li*

New heterogeneous chiral Mn(salen) catalysts axially immobilized on mesoporous materials *via* phenyl sulfonic groups result in remarkably higher ee values (75.8 *vs.* 55.0% and 94.0 *vs.* 54.8%) and ratio of *cis*/*trans* (16.2 *vs.* 0.38) for asymmetric epoxidation of unfunctionalised olefins than their analogous homogeneous counterparts.

1212



New CO tolerant electro-catalysts exceeding Pt–Ru for the anode of fuel cells

Hiroshi Yano, Chisato Ono, Hidenobu Shiroishi and Tatsuhiro Okada*

Novel types of CO tolerant electro-catalysts have been developed from Pt and organic metal complexes that are far superior to Pt–Ru as anode catalysts in reformate gas fuel cells.

1215

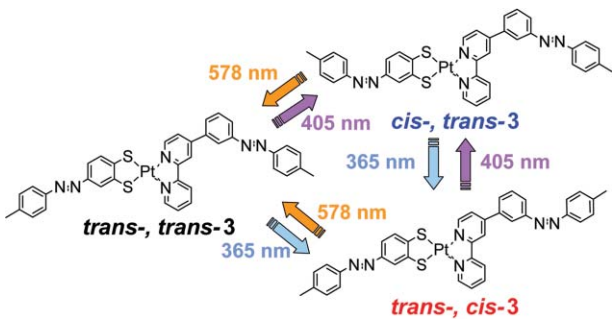
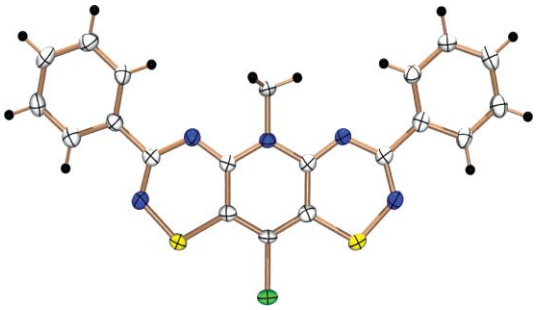


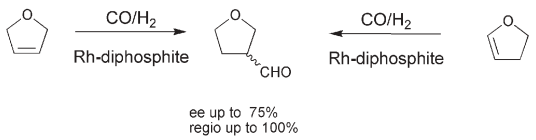
Photo-controllable tristability of a dithiolato-bipyridine-Pt(II) complex molecule containing two azobenzene moieties

Ryota Sakamoto, Masaki Murata, Shoko Kume, Hidekazu Sampei, Manabu Sugimoto* and Hiroshi Nishihara*

A new platinum complex with both an azo-bound dithiolato ligand and an azobenzene-bound bipyridine ligand exhibits tristability reversibly controllable using different energy lights.

COMMUNICATIONS





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* Indicates the author for correspondence: see article for details.

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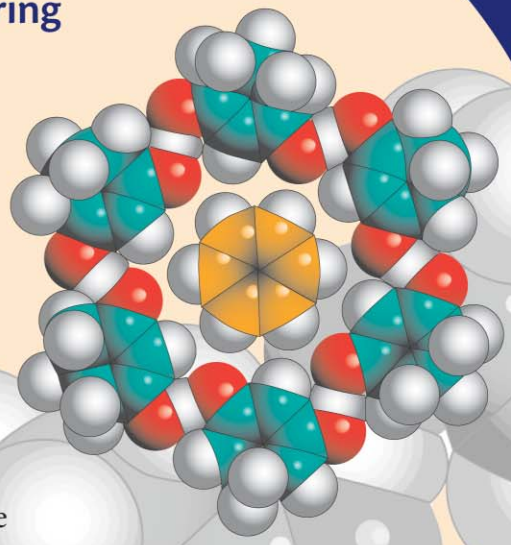

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