#### IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS (45) 5589-5704 (2005)



#### Cover

See Jordi Gómez-Segura, Olga Kazakova, Julia Davies, Patrick Josephs-Franks, Jaume Veciana and Daniel Ruiz-Molina, page 5615. Cooling evaporation of a CH<sub>2</sub>Cl<sub>2</sub> solution of Mn<sub>12</sub> clusters on HOPG has been used to induce their selforganization into magnetic rings. Image reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland, from Chem. Commun., 2005, 5615.



#### Inside cover

See Kun Jiao, Bin Zhang, Bin Yue, Yu Ren, Shixi Liu, Shirun Yan, Calum Dickinson, Wuzong Zhou and Heyong He, page 5618. Porous single crystals of Cr<sub>2</sub>O<sub>3</sub> were fabricated using mesoporous KIT-6 as a hard template. Image reproduced by permission of Wuzong Zhou et al., from Chem. Commun., 2005, 5618.

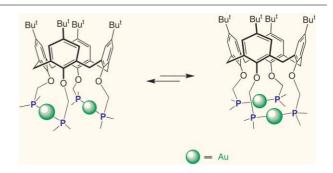
#### **FEATURE ARTICLE**

#### 5603

Playing with podands based on cone-shaped cavities. How can a cavity influence the properties of an appended metal centre?

Catherine Jeunesse, Dominique Armspach and Dominique Matt\*

The potential of molecules that combine the properties of a conical cavity with those of a covalently-linked transitionmetal centre is highlighted through the assessment of cyclodextrin- and calixarene-derived podands ("cavitand" ligands) in coordination chemistry and catalysis.



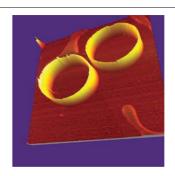
#### **COMMUNICATIONS**

#### 5615

Self-organization of Mn<sub>12</sub> single-molecule magnets into ring structures induced by breath-figures as templates

Jordi Gómez-Segura, Olga Kazakova, Julia Davies, Patrick Josephs-Franks, Jaume Veciana and Daniel Ruiz-Molina\*

Cooling evaporation of a CH<sub>2</sub>Cl<sub>2</sub> solution of Mn<sub>12</sub> clusters on HOPG initiates the formation of water droplets that act as templates for the formation of self-assembled molecular magnetic rings.



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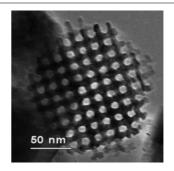
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#### 5618

## Growth of porous single-crystal Cr<sub>2</sub>O<sub>3</sub> in a 3-D mesopore

Kun Jiao, Bin Zhang, Bin Yue, Yu Ren, Shixi Liu, Shirun Yan, Calum Dickinson, Wuzong Zhou\* and Heyong He\*

Single-crystal Cr<sub>2</sub>O<sub>3</sub> with regular mesopores has been synthesized using mesoporous silica KIT-6 as a template and characterized by using XRD, HRTEM and nitrogen adsorption/desorption.

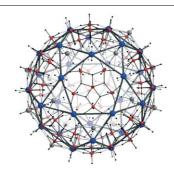


#### 5621

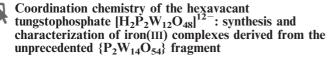
#### Ferrimagnetically ordered nanosized polyoxomolybdatebased cluster spheres

Bogdan Botar,\* Paul Kögerler,\* Achim Müller, Ricardo Garcia-Serres and Craig L. Hill\*

Step-wise substitution of two different magnetic heterometal cations in a spherical keplerate capsule is achieved under reducing conditions. Ferrimagnetic interactions are observed for the first time for this cluster type.

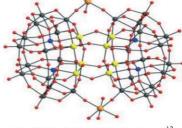


#### 5624



Béatrice Godin, Jacqueline Vaissermann, Patrick Herson, Laurent Ruhlmann, Michel Verdaguer and Pierre Gouzerh\*

The cluster  $[H_{12}P_4W_{28}Fe_8O_{120}]^{16-}$  derives from the previously unobserved tetravacant Dawson anion  $[P_2W_{14}O_{54}]^{14-}$  and displays the rare cubic Fe<sub>8</sub> topology. It acts as a ligand for two Co(II) ions in  $[\{Co(H_2O)_4\}_2\{H_{12}P_4W_{28}Fe_8O_{120}\}]^{12-}$ .

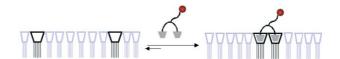


### $\left[\{Co(H_2O)_4\}_2\{H_{12}P_4W_{28}Fe_8O_{120}\}\right]^{12-}$

#### Dynamic multivalent recognition of cyclodextrin vesicles

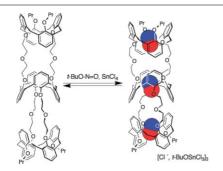
Choon Woo Lim, Bart Jan Ravoo\* and David N. Reinhoudt\*

Cyclodextrin vesicles have dynamic host membranes that recognize guest molecules through multivalent host-guest interaction reminiscent of multivalent binding of a ligand with receptors in a biological membrane.



5630



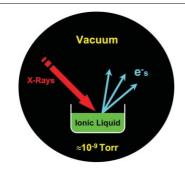


#### A procedure for filling calixarene nanotubes

Valentina Sgarlata, Voltaire G. Organo and Dmitry M. Rudkevich\*

Alkyl nitrites readily transfer nitrosonium into calixarenebased synthetic nanotubes thus offering a mild, effective and precise method to fill them.

5633

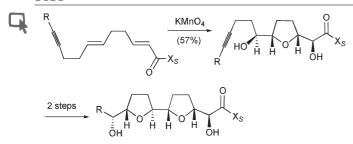


# Ionic liquids *in vacuo*; solution-phase X-ray photoelectron spectroscopy

Emily F. Smith, Ignacio J. Villar Garcia, David Briggs and Peter Licence\*

The *in situ* monitoring of catalysis in room temperature ionic liquid (RTIL) solutions is fundamental to the understanding of catalytic processes and the role of RTILs in catalytic turnover; we describe how XPS can be used to give information on both pure RTILs and catalytically-active RTIL-based solutions.

5636

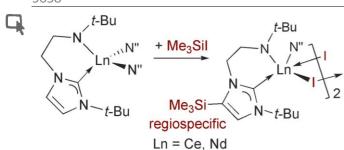


# A metal—oxo mediated approach to the synthesis of 21,22-diepi-membrarollin

Yulai Hu and Richard C. D. Brown\*

The asymmetric synthesis of 21,22-diepi-membrarollin (14) is reported. Key features include the use of highly selective oxidative cyclisations mediated by metal—oxo species to form the six stereogenic centres present in the bis-THF core.

5638



# Regioselective C-H activation of lanthanide-bound N-heterocyclic carbenes

Polly L. Arnold\* and Stephen T. Liddle

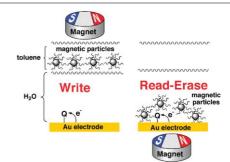
The reaction of  $\text{Ln}(\text{L})\text{N}''_2$  (Ln = Nd, Ce;  $\text{L} = t\text{-BuNCH}_2\text{CH}_2[\text{C}\{\text{NCHCHN}t\text{-Bu}\}]}$ ,  $\text{N}'' = \text{N}(\text{SiMe}_3)_2)$  with trimethylsilyl iodide regiospecifically functionalises the carbene backbone at the C4-carbene ring position to afford the silylated complex Ln(L')N''I;  $\text{Ln}(\text{L}')\text{N}''_2$  is also reported ( $\text{L}' = t\text{-BuNCH}_2\text{CH}_2[\text{C}\{\text{NC}(\text{SiMe}_3)\text{CHN}t\text{-Bu}\}]$ ).

#### 5641

A quinone-functionalized electrode in conjunction with hydrophobic magnetic nanoparticles acts as a "Write-Read-Erase" information storage system

Eugenii Katz and Itamar Willner\*

Integration of hydrophobic magnetic nanoparticles with a quinone-functionalized Au electrode in a water-toluene two-phase assembly yields a "Write-Read-Erase" information processing system.

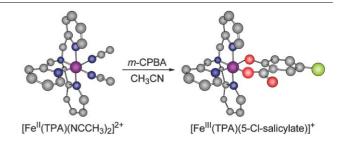


#### 5644

# Self-hydroxylation of perbenzoic acids at a nonheme iron(II) center

Na Young Oh, Mi Sook Seo, Mi Hee Lim, Mark B. Consugar, Mi Joo Park, Jan-Uwe Rohde, Jaehong Han, Kwan Mook Kim, Jinheung Kim, Lawrence Que, Jr\* and Wonwoo Nam\*

Treatment of mononuclear nonheme iron(II) complexes bearing two *cis*-labile sites with perbenzoic acids results in the self-hydroxylation of the aromatic ring to form the corresponding iron(III)–salicylate complexes.

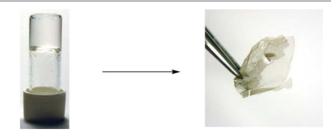


### 5647

# Robust gels created using a self-assembly and covalent capture strategy

Christine S. Love, Victor Chechik, David K. Smith,\* Ian Ashworth and Colin Brennan

The self-assembly of dendritic building blocks containing multiple terminal alkenes on their surfaces yields soft gel-phase materials – subsequent Grubbs' metathesis leads to covalent cross-linking between the alkenes and the formation of robust swellable gels.

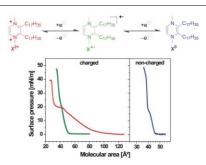


#### 5650

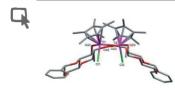
# *N,N'*-Dimethyl-2,3-dialkylpyrazinium salts as redox-switchable surfactants? Redox, spectral, EPR and surfactant properties

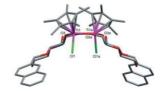
Michael Schmittel,\* Mukul Lal, Karlheinz Graf,\* Gunnar Jeschke, Irina Suske and Josef Salbeck

Pyrazinium salts  $(X^0 \rightleftharpoons X^{+\bullet})$  may become useful novel redox-switchable surfactant systems that can even be complemented by the third redox stage  $(X^{2+})$ , if some restrictions are accommodated.



5653



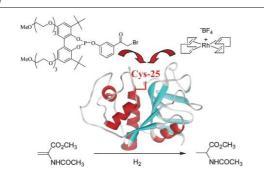


#### Sugar ligands in organotitanium complexes

Daniela Küntzer, Lars Jessen and Jürgen Heck\*

Using ligands derived from D-glucose, dinuclear organotitanium compounds with interesting structural features were synthesized.

5656

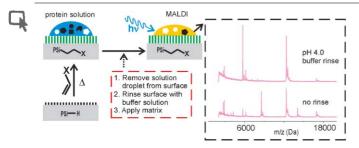


# Merging homogeneous catalysis with biocatalysis; papain as hydrogenation catalyst

Lavinia Panella, Jaap Broos, Jianfeng Jin, Marco W. Fraaije, Dick B. Janssen, Margot Jeronimus-Stratingh, Ben L. Feringa, Adriaan J. Minnaard and Johannes G. de Vries\*

Papain, modified at Cys-25 with a monodentate phosphite ligand and complexed with Rh(COD)<sub>2</sub>BF<sub>4</sub>, is an active catalyst in the hydrogenation of methyl 2-acetamidoacrylate.

5659



# Functionalized porous silicon surfaces as MALDI-MS substrates for protein identification studies

Tadesse Z. Mengistu, Leroi DeSouza and Sylvie Morin\*

Alkyl monolayer modified porous silicon functional surfaces are employed for selective binding of proteins from complex mixtures (through washing of the deposited mixture spot using appropriate buffer) and MALDI-MS is used to detect the components retained on the surface.

5662

 $Si(NH)_x(NH_2)_y(NMe_2)_z$  gel +  $PdCl_2$  THF

Yellow powder  $1000 \, ^{\circ}C, NH_3$  Mesoporous  $Pd/Si_3N_4$ 

## General method of preparation of mesoporous M/Si<sub>3</sub>N<sub>4</sub> nano-composites *via* a non-aqueous sol-gel route

Fei Cheng,\* Stephen M. Kelly, Nigel A. Young, Stephen Clark, M. Grazia Francesconi, Frédéric Lefebvre and John S. Bradley

A high-surface-area mesoporous Pd/Si<sub>3</sub>N<sub>4</sub> nanocomposite is obtained by pyrolysis of a silicon palladium imide–chloride complex which was synthesized by reaction of silicon diimide gel with palladium chloride.

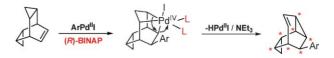
#### 5665

### 7 Pal

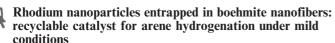
#### Palladium-catalyzed, stereoselective rearrangement of a tetracyclic allyl cyclopropane under arylation

Jörg Storsberg, Min-Liang Yao, Nüket Öcal, Armin de Meijere, Arnold E. W. Adam and Dieter E. Kaufmann\*

The first example of a stereoselective  $\pi$ , $\sigma$  domino-Heck reaction under concomitant rearrangement of the tetracyclic allylcyclopropane *endo*,*exo*-bishomobarrelene proceeds *via* an intramolecular insertion reaction into a cyclopropane  $\sigma$ -bond, generating 7 chiral centers.

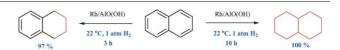


#### 5667

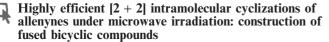


In Soo Park, Min Serk Kwon, Namdu Kim, Jae Sung Lee, Kyung Yeon Kang and Jaiwook Park\*

A new recyclable rhodium catalyst was synthesized by a simple procedure from readily available reagents, which showed high activities in the hydrogenation of various arenes under 1 atm  $\rm H_2$  at room temperature.

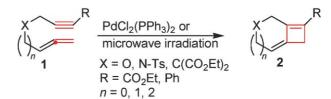


### 5670



Chang Ho Oh,\* Arun Kumar Gupta, Dai In Park and Nakjoong Kim

A Pd-catalyzed- and a microwave-mediated [2 + 2] cycloaddition of various 1,n-allenynes were developed. Particularly, the microwave-irradiated [2 + 2] cycloaddition of allenynes can provide a simple, general, and eco-friendly synthetic method to fused bicyclo[m,2,0]alkadienes.

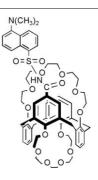


### 5673

# Novel fluorogenic calix[4]arene-bis(crown-6-ether) for selective recognition of thallium(I)

Galina G. Talanova,\* Ebony D. Roper, Nicole M. Buie, Maryna G. Gorbunova, Richard A. Bartsch and Vladimir S. Talanov

A new fluorogenic, dansyl group-containing derivative of *1,3-alternate* calix[4]arene-bis(crown-6-ether) embodies the first example of a calixarene-based fluorescent chemosensor for selective recognition of Tl(I).



#### 5676

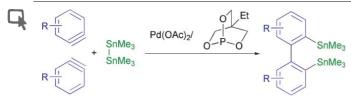
$$\begin{array}{c} O \\ R^1 \end{array} \begin{array}{c} + \begin{array}{c} Ar_2 ln(OH) \end{array} \begin{array}{c} Rh(I)L_n \\ \hline THF/H_2O \end{array} \begin{array}{c} Ar \\ R^1 \end{array} \begin{array}{c} O \\ R^2 \end{array}$$

# Rhodium-catalysed 1,4-addition of diarylindium hydroxides to $\alpha,\beta$ -unsaturated carbonyl compounds

Tomoya Miura and Masahiro Murakami\*

Diarylindium(III) hydroxides react with  $\alpha,\beta$ -unsaturated carbonyl compounds in the presence of a rhodium catalyst to afford the 1,4-addition products, demonstrating the utility of diarylindium(III) hydroxide as an aryl source with rhodium catalysts.

#### 5678



# Palladium-catalysed dimerisation-distannylation of arynes: synthesis and reaction of 2,2'-distannylbiaryls

Hiroto Yoshida,\* Kenji Tanino, Joji Ohshita and Atsutaka Kunai\*

Biaryl skeletons were assembled from arynes and distannanes depending upon the palladium-bicyclic phosphite complex-catalysed dimerisation—distannylation reaction. The resulting 2,2'-distannylbiaryls were convertible into variously substituted biaryls by the use of their carbon—tin bonds.

#### 5681

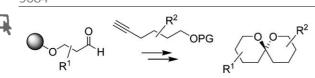


# Multifunctional cadmium single source precursor for the selective deposition of CdO or CdS by a solution route

Graziella Malandrino,\* Sebastiana T. Finocchiaro, Patrizia Rossi, Paolo Dapporto and Ignazio L. Fragalà

The novel adduct Cd(tta)<sub>2</sub>-tmeda represents a multipurpose single source, and has been reproducibly and selectively applied to the preparation of nanostructured CdS or CdO.

### 5684



146 compounds 7 steps on the solid support up to 45% overall yield

#### Solid phase synthesis of a spiro[5.5]ketal library

Stefan Sommer and Herbert Waldmann

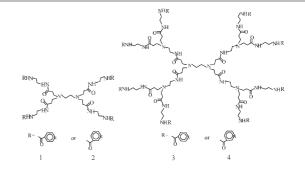
A spiro[5.5]ketal library embodying the core structure of numerous biologically active natural products was synthesized employing a double intramolecular hetero Michael reaction as a key transformation.

#### 5687

# A 7.72% efficient dye sensitized solar cell based on novel necklace-like polymer gel electrolyte containing latent chemically cross-linked gel electrolyte precursors

Li Wang, Shibi Fang,\* Yuan Lin, Xiaowen Zhou and Miyu Li

Novel necklace-like polymer gel electrolytes containing latent chemically cross-linked gel electrolyte precursors were prepared for quasi-solid dye sensitized solar cells with a highest efficiency of 7.72% and an active area of  $0.25~\text{cm}^2$  under AM1.5 condition at  $100~\text{mW}~\text{cm}^{-2}$  irradiation.



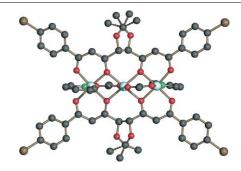
#### 5690



# Structural diversity in the assembly of helicate-type nickel( $\Pi$ ) complexes with enantiopure bis( $\beta$ -diketonate) ligands

Markus Albrecht,\* Sabrina Dehn, Gerhard Raabe and Roland Fröhlich

Structural diversity is observed in the formation of dinuclear and trinuclear nickel(II) complexes of chiral bis( $\beta$ -diketonate) ligands and is investigated by different analytical methods.



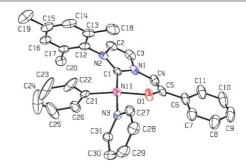
#### 5693



# Synthesis, structure, and olefin polymerization with nickel(II) N-heterocyclic carbene enolates

Benjamin E. Ketz, Xavier G. Ottenwaelder and Robert M. Waymouth\*

Two novel N-heterocyclic carbene enolate nickel complexes have been prepared and shown to be active for ethylene and propylene polymerization to yield linear polymers.



### 5696

# Organolithium-mediated conversion of $\beta$ -functionalised aziridines into alkynyl amino alcohols and diamines

Jianhui Huang and Peter O'Brien\*

Dihydrofuran and dihydropyrrole *N*-triisopropylbenzenesulfonyl aziridines are transformed into alkynyl amino alcohols and diamines respectively using 3 equiv. *sec*-butyllithium–PMDETA in THF; use of *n*-butyllithium–(–)-sparteine in Et<sub>2</sub>O gave an alkynyl amino alcohol in 60% ee.

$$\begin{array}{c} \text{3 eq } ^{\text{S}}\text{BuLi} \\ \text{3 eq PMDETA} \\ \hline \text{THF, } -78 \, ^{\circ}\text{C, } 1 \text{ h} \\ \text{then rt for } 3 \text{ h} \\ \text{X = O} \\ \text{X = NSO}_{2}\text{Ar} & \text{Ar = 2,4,6-(}^{\text{i}}\text{Pr}\text{)}_{3}\text{C}_{6}\text{H}_{2} \\ \end{array}$$

5699

Hidekazu Miyaji, Gilles Gasser, Stephen J. Green, Yann Molard, Sharon M. Strawbridge and James H. R. Tucker

Selective electrochemical sensing of acidic organic molecules via a novel guest-to-host proton transfer reaction

# DUANANE Salon Ligand -for Asymmetric Nozaki-Hivama-Kishi Reaction-

(1R,2R,4R,5R)-2,5-Bis(3,5-di-tert-butyl-2-hydroxybenzylideneamino)bicyclo[2.2.1]heptane (1a) 100mg [B2652]

(1*S*,2*S*,4*S*,5*S*)-2,5-Bis(3,5-di-*tert*-butyl-2-hydroxybenzylideneamino)-bicyclo[2.2.1]heptane (1b) 100mg [

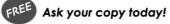
100mg [B2653]

DIANANE-Salen ligand 1 is a useful reagent for the asymmetric Nozaki-Hiyama-Kishi (NHK) Reaction as a ligand for transition metal complexes. Such complexes can be used as highly enantioselective catalysis to obtain chiral secondary alcohols in high enantiopurity.

A. Berkessel, D. Menche, C. A. Sklorz, M. Schröder, I. Paterson, *Angew. Chem. Int. Ed.*, **42**, 1032 (2003); I. Paterson, H. Bergmann, D. Menche, A. Berkessel, *Org. Lett.*, **6**, 1293 (2004).



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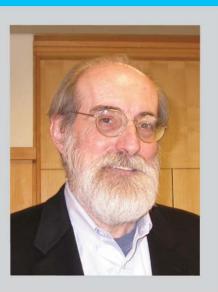
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