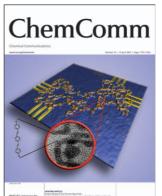
#### IN THIS ISSUE

#### ISSN 1359-7345 CODEN CHCOFS (14) 1793-1924 (2005)



#### Cover

See Sunil Varughese and V. R. Pedireddi, page 1824. Supramolecular assemblies are synthesised through dative bonds as well as hydrogen bonds; the resultant host structure accommodates varied guest molecules. Image reproduced by permission of Sunil Varughese and V. R. Pedireddi from Chem. Commun., 2005, 1824.



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#### Inside cover

See Kasper Nørgaard and Thomas Bjørnholm, page 1812. Supramolecular chemistry on water – towards self-assembling molecular electronic circuitry. Image reproduced by permission of Kasper Nørgaard and Thomas Bjørnholm from *Chem. Commun.*, 2005, 1812.

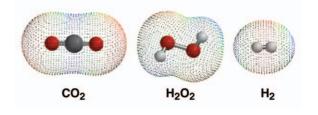
#### **40TH ANNIVERSARY ARTICLE**

#### 1807

#### Pursuing practical elegance in chemical synthesis

#### Ryoji Noyori

Green chemistry/technology is indispensable for the survival of our future generations.



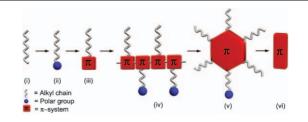
#### FEATURE ARTICLE

#### 1812

# Supramolecular chemistry on water – towards self-assembling molecular electronic circuitry

Kasper Nørgaard and Thomas Bjørnholm\*

This feature article describes the self-assembly of electroactive molecules at the air/water interface, emphasizing the structural and electronic characterizations of the resulting supramolecular architectures.



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#### 1824

#### Hydrogen bond mediated open-frame networks in coordination polymers: supramolecular assemblies of Pr(III) and 3,5-dinitro-4-methylbenzoic acid with aza-donor compounds

Sunil Varughese and V. R. Pedireddi\*

A coordination assembly of 3,5-dinitro-4-methylbenzoic acid and Pr(III), synthesized by hydrothermal methods, forms a host structure (stable up to 300 °C) through C–H $\cdots$ O hydrogen bonds, and accommodates different types of guest species.

#### 1827

Synthesis of elliptical vanadoborates housing bimetallic centers  $[Zn_4(B_2O_4H_2)(V_{10}B_{28}O_{74}H_8)]^{8-}$  and  $[Mn_4(C_2O_4)(V_{10}B_{28}O_{74}H_8)]^{10-}$ 

Mingmei Wu, Teresa S-C. Law, Herman H-Y. Sung, Jiwen Cai and Ian D. Williams\*

The hydrothermal synthesis of three new vanadoborate compounds with elliptical ( $V_{10}B_{28}O_{74}H_8$ ) clusters is described. The clusters contain pairs of bimetallic Zn<sub>2</sub> or Mn<sub>2</sub> units.

#### 1830

# Fluorescent dendrimers with a peptide cathepsin B cleavage site for drug delivery applications

Sabine Fuchs, Henning Otto,\* Stefan Jehle, Peter Henklein and A. Dieter Schlüter\*

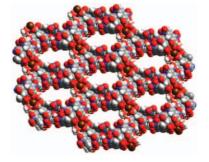
Synthesis, cellular uptake, and intracellular localization of a multifunctionally equipped, first generation (G1) dendrimer carrying a pentapeptide with a cathepsin B cleavage site, chelating ligands for Pt<sup>2+</sup>-complexation, and a dansyl fluorescence label.

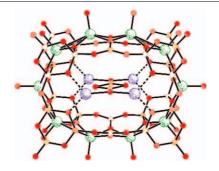
#### 1833

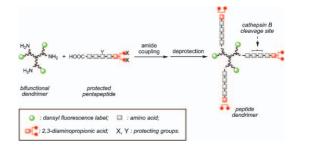
# Micro-emulsion synthesis of monodisperse surface stabilized silicon nanocrystals

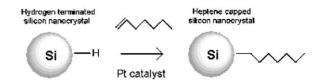
Richard D. Tilley,\* Jamie H. Warner, Kazushige Yamamoto, Isao Matsui and Hiroyuki Fujimori

Silicon nanocrystals with a uniform size distribution were synthesized in inverse micelles using powerful hydride reducing agents.









1836

1839



#### X-Ray crystallographic signature of supramolecular triple helix formation from a water soluble synthetic tetrapeptide

Apurba Kumar Das, Debasish Haldar, Raghurama P. Hegde, N. Shamala\* and Arindam Banerjee\*

A water soluble synthetic tetrapeptide containing Aib residue adopts an "S"-shaped molecular structure that self-assembles to form a water mediated supramolecular triple helix using hydrogen bonding interactions in the solid state.

#### A tunable solid-state fluorescence system consisting of organic salts of anthracene-2,6-disulfonic acid with primary amines

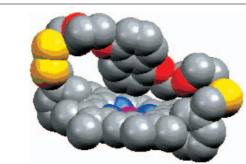
Yuji Mizobe, Norimitsu Tohnai,\* Mikiji Miyata\* and Yasuchika Hasegawa

Organic salts composed of anthracene-2,6-disulfonic acid and linear alkylamines provide a tunable solid-state fluorescence system, which facilitates high throughput combinatorial screening of fluorescence properties inherent to molecular arrangements of anthracene moieties.

#### 1842

RNH<sub>2</sub>

Organic salts



1D

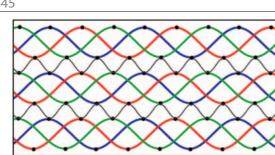
### Dynamic synthesis of a macrocycle containing a porphyrin and an electron donor

Amy L. Kieran, Sofia I. Pascu, Thibaut Jarrosson, Maxwell J. Gunter and Jeremy K. M. Sanders\*

A remarkably efficient synthesis of a new porphyrin heterodimer by dynamic disulfide chemistry and a new unexpected way of templating using an electron acceptor is reported.

1845

q



# Water-assisted self-assembly of harmonic single and triple helices in a polymeric coordination complex

Gareth O. Lloyd, Jerry L. Atwood and Leonard J. Barbour\*

Combination of  $Cd^{2+}$ , water and two flexible ligands of different length produces a coordination polymeric structure containing both single and triple helices.

1848

# Fluorescence enhancement by hydroperoxides based on a change in the intramolecular charge transfer character of benzofurazan

Maki Onoda,\* Hidetoshi Tokuyama, Seiichi Uchiyama, Ken-ichi Mawatari, Tomofumi Santa, Kiyoko Kaneko, Kazuhiro Imai and Kazuya Nakagomi

Novel fluorescent reagents for hydroperoxides were developed. Strong fluorescence signals were produced by changing the intramolecular charge transfer character of the fluorophore.

#### 1851

#### Aluminium(III) adsorption: a soft and simple method to prevent TiO<sub>2</sub> deactivation during salicylic acid photodegradation

Maria Isabel Franch, José Peral, Xavier Domènech and José A. Ayllón\*

Aluminium(III) adsorption is presented as a soft and simple method to prevent  $TiO_2$  deactivation during salicylic acid photodegradation that, in addition, increases the elimination rate of the organic substrate.

#### 1854

# Directed palladation: fine tuning permits the catalytic 2-alkenylation of indoles

Elena Capito, John M. Brown and Alfredo Ricci

A C-H activating Pd-catalysed alkenylation of indole is regiospecific for 2-substitution when the nitrogen carries a 2-pyridylmethyl substituent.

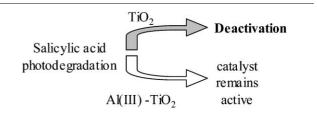
#### 1857

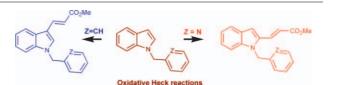
#### Polystyrenes with chiral phosphoramide substituents as Lewis base catalysts for asymmetric addition of allyltrichlorosilane: enhancement of catalytic performance by polymer effect

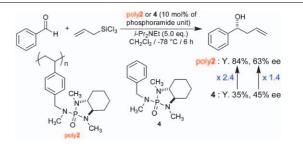
#### Toshiyuki Oyama,\* Hiroki Yoshioka and Masao Tomoi

In the asymmetric addition of allyltrichlorosilane to benzaldehyde, polystyrenes with chiral phosphoramide substituents as Lewis base catalysts showed up to 2.4 times better catalytic activity and 1.4 times higher enantioselectivity than the corresponding low-molecular-weight analogues.

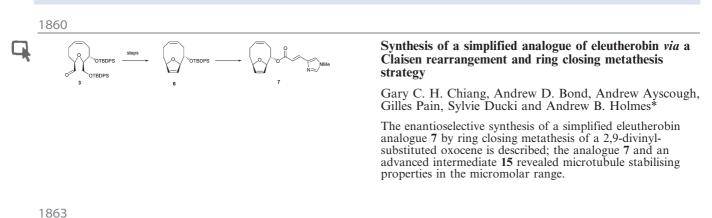








AgNO<sub>3</sub>

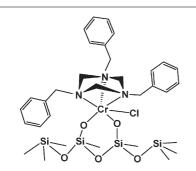


# One-step process to fabricate Ag-polypyrrole coaxial nanocables

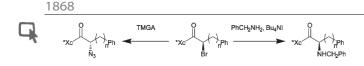
Aihua Chen, Haiqiao Wang and Xiaoyu Li\*

Ag-polypyrrole nanocables were fabricated in aqueous solution at room temperature through a redox reaction between silver nitrite and pyrrole, using poly(vinyl pyrrolidone) (PVP) as assistant agent.

#### 1865



CH-CH2



### Single-site heterogeneous Cr-based catalyst for the selective trimerisation of ethylene

Cristina N. Nenu and Bert M. Weckhuysen\*

TAC- $Cr^{3+}/SiO_2$  complexes are highly active and selective ethylene trimerisation catalysts and possess single-site catalytic behaviour, an unusual property for heterogeneous catalysts.

Controlling diastereoselectivity in the reactions of enantiomerically pure α-bromoacyl-imidazolidinones with nitrogen nucleophiles: substitution reactions with retention or inversion of configuration<sup>‡</sup>

N. R. Treweeke, P. B. Hitchcock, D. A. Pardoe and S. Caddick\*

Substitution reactions of  $\alpha$ -bromoacyl-imidazolidinones with N-nucleophiles can be carried out with retention or inversion by inducing or avoiding bromide epimerisation.

#### 1871

#### Asymmetric amplification in asymmetric alternating copolymerization of cyclohexene oxide and carbon dioxide

Koji Nakano, Tamejiro Hiyama and Kyoko Nozaki\*

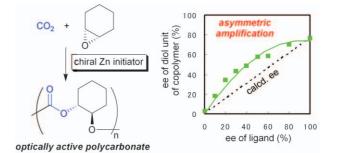
Asymmetric amplification in the copolymerization of cyclohexene oxide and carbon dioxide is demonstrated using chiral zinc complexes, prepared from diethylzinc, diphenyl(pyrrolidin-2-yl)methanol, and ethanol.

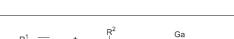
#### 1874

#### Regioselective allylgallation of terminal alkynes

Phil Ho Lee,\* Yunkiu Heo, Dong Seomoon, Sundae Kim and Kooyeon Lee

The reactions of terminal alkynes with allylgallium reagents generated *in situ* from gallium and allyl bromides gave the corresponding 1,4-dienes in good yield *via* Markovnikov addition in THF at 70  $^{\circ}$ C.





 $B^{r}$  THF, 70°C  $R^{1}$ 4~10 h 53~96%  $R^{1} = n \cdot C_{6}H_{13}$ , PhCH<sub>2</sub>, HO(CH<sub>2</sub>)<sub>4</sub>, Ph, 4-Me-C<sub>6</sub>H<sub>4</sub>, 4-*n*-C<sub>5</sub>H<sub>11</sub>-C<sub>6</sub>H<sub>4</sub>,

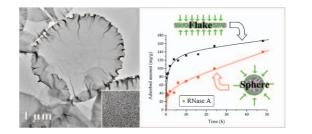
4-MeO-C<sub>6</sub>H<sub>4</sub>, 4-CF<sub>3</sub>-C<sub>6</sub>H<sub>4</sub>,  $R^2$  = H, Me

#### 1877

# Fabrication of lotus-leaf-like nanoporous silica flakes with controlled thickness

Wei Shan, Bo Wang, Yahong Zhang and Yi Tang\*

Lotus-leaf-like nanoporous silica flakes with controlled thickness have been synthesized and have shown superior performance in adsorbing enzymes to their microspheric analogues.

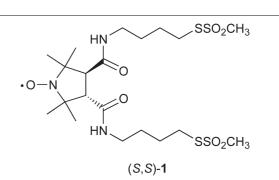


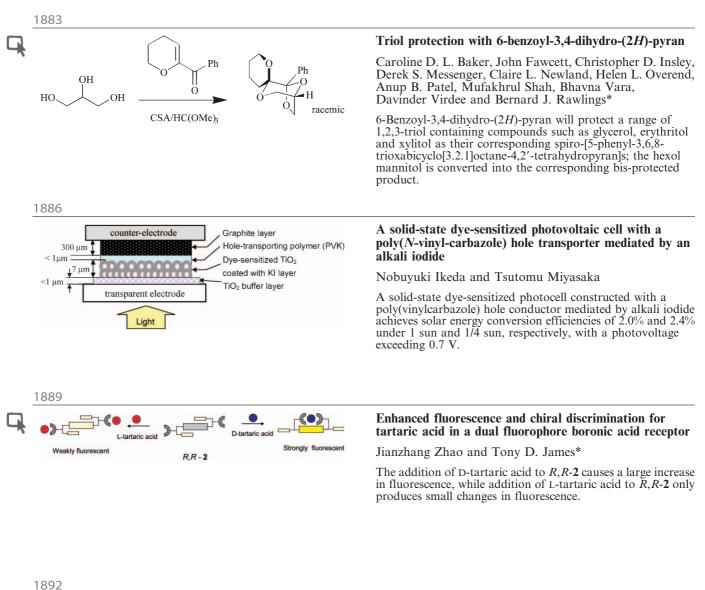
#### 1880

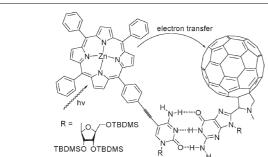
Synthesis of  $C_2$ -chiral bifunctionalised spin labels and their application to troponin C

Shunsuke Chatani, Motoyoshi Nakamura, Hidenobu Akahane, Naoki Kohyama, Masayasu Taki, Toshiaki Arata and Yukio Yamamoto\*

An enantiomeric pair of  $C_2$ -chiral bifunctionalised spin labels having a pyrrolidine nitroxide moiety, whose configurations were determined by X-ray diffraction, was prepared and applied to troponin C whose binding mode of double disulfide linkage was characterised by EPR spectroscopy.







# Synthesis and photophysics of a porphyrin–fullerene dyad assembled through Watson–Crick hydrogen bonding

Jonathan L. Sessler,\* Janarthanan Jayawickramarajah, Andreas Gouloumis, Tomás Torres,\* Dirk M. Guldi,\* Stephen Maldonado and Keith J. Stevenson\*

The new Watson—Crick base-pairing derived porphyrinfullerene dyad I displays a lifetime for the photoinduced charge separated state that is significantly enhanced relative to those observed for previous Watson–Crick tethered electron transfer model systems.

#### 1895

#### Suppressed electron hopping in a Au nanoparticle/H<sub>2</sub>S system: development towards a H<sub>2</sub>S nanosensor

Junfeng Geng, Michael D. R. Thomas, Douglas S. Shephard and Brian F. G. Johnson\*

We herein report and discuss electron transport within a Au/ H<sub>2</sub>S nanoscale device and thereby highlight a phenomenon that may be used in the development of a novel on-chip H<sub>2</sub>S sensor.



#### Second-generation organocatalysts for the highly enantioselective dynamic kinetic resolution of azlactones

Albrecht Berkessel,\* Santanu Mukherjee, Felix Cleemann, Thomas N. Müller and Johann Lex

Bifunctional organocatalysts of the thiourea-tert-amine type, carrying two "matched" elements of chirality, effect the alcoholytic dynamic kinetic resolution of a variety of azlactones with up to 95% ee.

#### 1901

#### Highly chemoselective reduction of aromatic nitro compounds to the corresponding hydroxylamines catalysed by plant cells from a grape (Vitis vinifera L.)

Feng Li, Jingnan Cui,\* Xuhong Qian,\* Rong Zhang and Yi Xiao

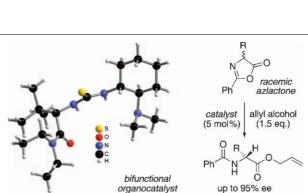
Cells from a grape (Vitis vinifera L.) reduce aromatic nitro compounds under mild conditions to the corresponding hydroxylamines with unprecedented chemoselectivity.

#### 1904

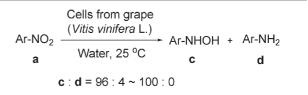
Biocatalytic racemisation of  $\alpha$ -hydroxycarboxylic acids at physiological conditions

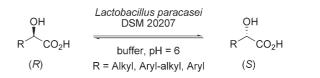
Silvia M. Glueck, Barbara Larissegger-Schnell, Katrin Csar, Wolfgang Kroutil and Kurt Faber\*

Biocatalytic racemisation of  $\alpha$ -hydroxycarboxylic acids at physiological conditions was achieved using whole cells of Lactobacillus paracasei DSM 20207.

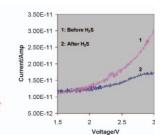


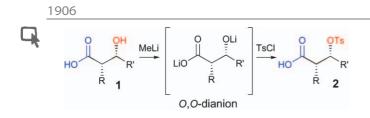
organocatalyst





3.00E-11 2.50E-1 2.00E-11 articla 3 1.50E-1 1.00E-11 SiO 5 00E-12 Si 1.5

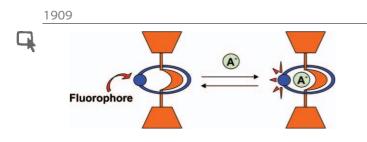




# Novel chemoselective tosylation of the alcoholic hydroxyl group of $syn-\alpha,\beta$ -disubstituted $\beta$ -hydroxy carboxylic acids

Yikang Wu\* and Ya-Ping Sun

 $\beta$ -OH carboxylic acids were selectively activated at the  $\beta$  position *via* the O,O-dianions, which made it possible to prepare *anti*  $\alpha$ , $\beta$ -disubstituted  $\beta$ -lactones directly from the *syn* aldols.



# Anion directed synthesis of a hydrogensulfate selective luminescent rotaxane

David Curiel and Paul D. Beer\*

A new photo-active rhenium(I) bipyridyl based rotaxane has been synthesised making use of a strategy founded on anion templation. By virtue of the unique interlocked structural cavity, the rotaxane selectively senses hydrogensulfate using luminescence spectroscopy.

# Encapsulation of metal particles within the wall structure of mesoporous carbons

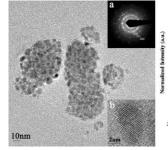
S. M. Holmes,\* P. Foran, E. P. L. Roberts and J. M. Newton

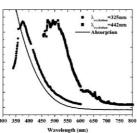
Incorporating metal particles into a mesoporous silica structure, prior to carbonisation and dissolution of the silica, has allowed the synthesis of a metal containing mesoporous carbon. The carbon structure has the metal particles embedded in the walls to prevent pore blockage and reduce leaching of the metal.

1914

Q

1912



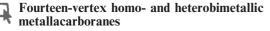


# Anhydrous solution synthesis of germanium nanocrystals from the germanium(II) precursor Ge[N(SiMe<sub>3</sub>)<sub>2</sub>]<sub>2</sub>

Henry Gerung, Scott D. Bunge, Timothy J. Boyle,\* C. Jeffrey Brinker and Sang M. Han

A convenient, simple, single source solution synthesis of Ge nanocrystals *via* thermal reduction of Ge(II) precursor  $Ge[N(SiMe_3)_2]_2$  in a non-coordinating solvent at 300 °C and 1 atm Ar.

#### 1917



David Ellis, Maria Elena Lopez, Ruaraidh McIntosh, Georgina M. Rosair and Alan J. Welch\*

Reduction of 4-(*p*-cymene)-4,1,12-*closo*-RuC<sub>2</sub>B<sub>10</sub>H<sub>12</sub> followed by metallation with cobalt-, ruthenium- or nickel-ligand fragments affords 14-vertex homo- and heterobimetallic metallacarboranes with 1,14,2,10-RuM'C<sub>2</sub>B<sub>10</sub> bicapped hexagonal antiprismatic architectures.

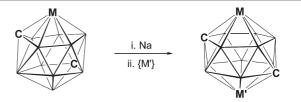


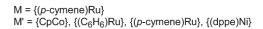
RSCADS-24080410-COLOUR

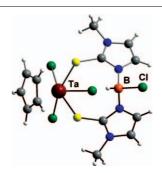
# Novel poly(methimazolyl)borate complexes of niobium(V) and tantalum(V)

Anthony F. Hill\* and Matthew K. Smith

The reactions of  $[MCl_4(\eta-C_5H_5)]$  (M = Nb, Ta) with Ph<sub>3</sub>Sn{HB(mt)<sub>3</sub>} (mt = methimazolyl) provide structurally characterised complexes of the novel chlorobis(methimazolyl)borate ligand,  $[MCl_3(\eta-C_5H_5){\kappa^2-S,S'-HClB(mt)_2}]$ , the first examples of early transition metal poly(methimazolyl)borate complexes.







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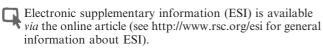
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