

## Cover

Asymmetric two-center catalysis applied to the direct enantioselective aldol reaction and catalytic cyanosilylation of aldehydes and ketones.



Chemical biology articles published in this journal also appear in the *Chemical Biology Virtual Journal*: [www.rsc.org/chembiol](http://www.rsc.org/chembiol)

## contents

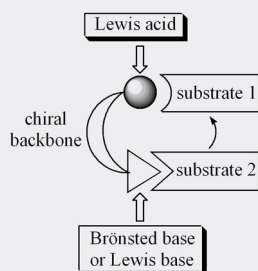
## FEATURE ARTICLE

1989

## Recent progress in asymmetric two-center catalysis

Masakatsu Shibasaki,\* Motomu Kanai and Ken Funabashi

Recent progress using two types of enantioselective two-center catalysts, Lewis acid–Brønsted base and Lewis acid–Lewis base bifunctional complexes, is described.



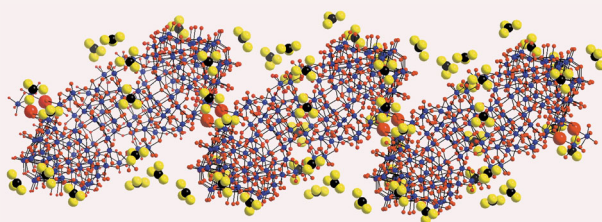
## COMMUNICATIONS

2000

Urea as ‘*deus ex machina*’ in giant molybdenum blue type cluster synthesis: an unusual hybrid compound with perspectives for related nano, supramolecular and extended structures

Achim Müller,\* Soumyajit Roy, Marc Schmidtman and Hartmut Bögge

Protonated urea can be used as ‘glue’ for anionic ring shaped metal–oxide based nanoobjects allowing—due to the comparable complementary hydrogen bonding sites of both—an effective route for the covalent linking of giant anionic clusters.

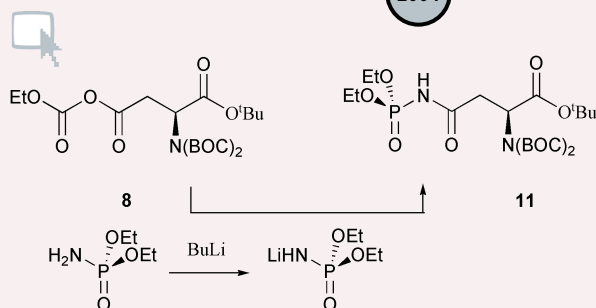


2004

## A new synthesis of phosphoramidates: inhibitors of the key bacterial enzyme aspartate semi-aldehyde dehydrogenase

Luke A. Adams, Russell J. Cox,\* Jennifer S. Gibson, M. Belén Mayo-Martín, Magnus Walter and William Whittingham

A new and mild synthesis of phosphoramidates is described: potassium salts of carboxylic acids are treated with ethylchloroformate and the resulting activated anhydride-carbonates are then treated with  $\text{LiNHP(O)(OEt)}_2$  *in situ*.

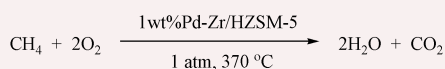


2006



### Enhanced activity and stability of Zr-promoted Pd/HZSM-5 catalyst for low-temperature methane combustion

Chun-Kai Shi, Le-Fu Yang,\* Xiang-E. He and Jun-Xiu Cai



CH<sub>4</sub> Conversion = 100%; Gas Hourly Space Velocity = 48000 h<sup>-1</sup>

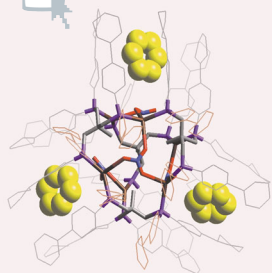
At 370 °C, 1 wt% Pd-Zr/HZSM-5 completely converts CH<sub>4</sub> to CO<sub>2</sub> and H<sub>2</sub>O by catalytic combustion and possesses high thermal/hydrothermal stability. Feed composition: CH<sub>4</sub> (vol. 2%), O<sub>2</sub> (vol. 8%) and N<sub>2</sub> balance; GHSV = 48000 h<sup>-1</sup>

2008



### Assembly of a coordination cage with four aromatic channel receptors on the outside

Philip W. Miller, Mark Nieuwenhuyzen, Xingling Xu and Stuart L. James\*



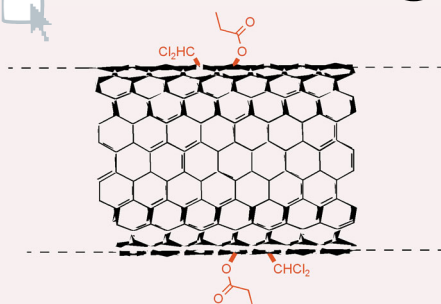
Coordination cages can include guests inside them, but the binding of guests on the exterior is less well explored. Pseudo-tetrahedral silver coordination cages with four aromatic channel receptors on the outside are described.

2010



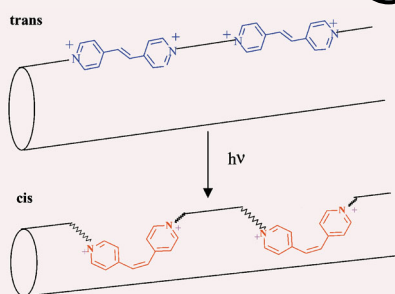
### Sidewall functionalization of single-walled carbon nanotubes through electrophilic addition

Nikos Tagmatarchis, Vasilios Georgakilas, Maurizio Prato\* and Hisanori Shinohara\*



Electrophilic addition of chloroform to SWNTs followed by hydrolysis resulted in the addition of hydroxy groups to the surface of the nanotubes; further esterification with propionyl chloride led to the corresponding ester derivatives, which allowed us to identify their structure, also providing better solubility in organic solvents.

2012

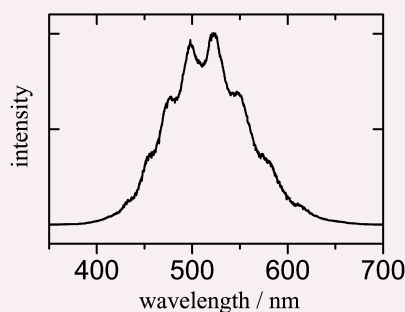


### Photochemical modification of the surface area and tortuosity of a *trans*-1,2-bis(4-pyridyl)ethylene periodic mesoporous MCM organosilica

Mercedes Alvaro, Belén Ferrer, Hermenegildo García\* and Fernando Rey

A photoactive MCM-41 that changes its area, pore volume and pore size upon irradiation has been prepared by grafting a stilbene into the walls.

2014



### Fine structural photoluminescence spectra of silica-supported zirconium oxide and its photoactivity in direct methane conversion

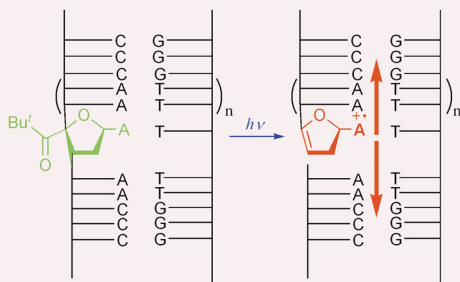
Hisao Yoshida,\* Manohar G. Chaskar, Yuko Kato and Tadashi Hattori

Highly dispersed zirconium oxide on silica exhibits fine structure in phosphorescence emission spectra. The vibration energy of the photoactive Zr–O–Si linkage is estimated to be 955 cm<sup>-1</sup>. The luminescence species can promote the photoinduced non-oxidative methane coupling at room temperature.

2016

**Charge transfer through DNA triggered by site selective charge injection into adenine**

Thomas Kendrick and Bernd Giese\*

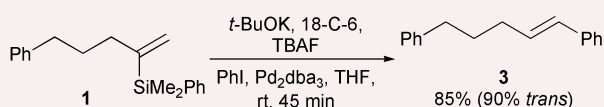
Distance independent charge transfer through DNA double strands *via* (A:T)<sub>n</sub> sequences was observed following site selective charge injection into an adenine.

2018

**The direct use of phenyldimethylsilanes in silicon assisted palladium catalysed cross coupling**

James C. Anderson,\* Stéphane Anguille and Rosalyn Bailey

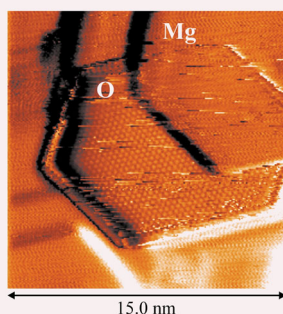
A vinyl-phenylsilane can be used as a masked vinyl organometallic for cross coupling reactions with phenyl iodide to provide the cine substitution product in high yield.



2020

**Atom resolved evidence for a defective chemisorbed oxygen state at a Mg(0001) surface**

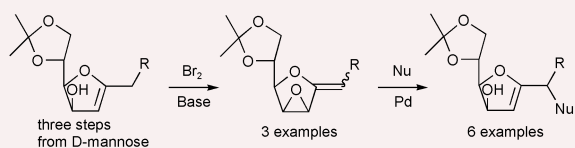
Albert F. Carley, Philip R. Davies, Rhys V. Jones, K. R. Harikumar and M. Wyn Roberts

A chemisorbed oxygen state, compatible with O<sup>δ-</sup>, has been revealed for the first time by scanning tunnelling microscopy at the interface between a (1 × 1)-O structure and overlying magnesium atoms.

2022

**One-pot synthesis of 1-*exo*-alkylidene-2,3-anhydro furanoses: convenient precursors for *exo*-glycals and functionalized *C*-glycals**

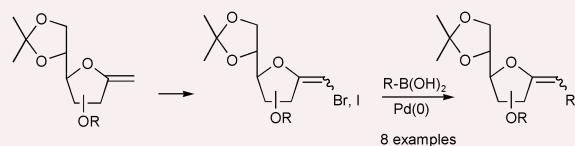
Ana M. Gómez,\* Ana Pedregosa, Serafín Valverde and J. Cristóbal López\*

1-*exo*-Methylene-2,3-anhydro furanoses, obtained from *C*-glycals in a one-pot, three step operation can be readily transformed into functionalized *C*-glycals by palladium-catalyzed nucleophilic addition.

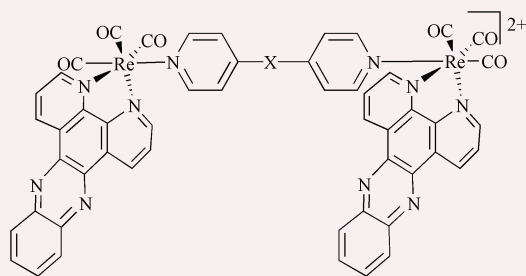
2024

**A general method for convergent synthesis of functionalized *exo*-glycals based on halogenation and Suzuki cross-coupling of 1-*exo*-methylene sugars**

Ana M. Gómez,\* Gerardo O. Danelón, Ana Pedregosa, Serafín Valverde and J. Cristóbal López\*

Functionalized *exo*-glycals can be readily obtained by palladium catalyzed Suzuki cross-coupling of halo-*exo*-glycals with boronic acids.

2026

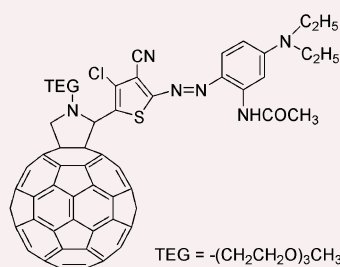


### A facile synthetic route to bimetallic Re<sup>I</sup> complexes containing two dppz DNA intercalating ligands

Clive Metcalfe, Michelle Webb and Jim A. Thomas\*

Using commercially available starting materials, the two-step synthesis of metallo-intercalators with two coplanar dppz ligands is described. Preliminary DNA binding studies indicate that these systems are capable of inter-duplex cross-linking.

2028

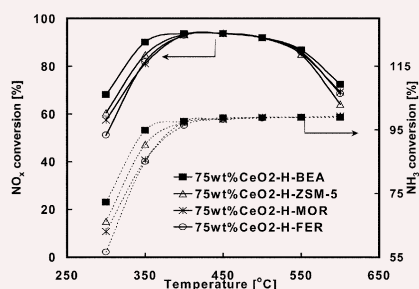


### Solar cells based on a fullerene-azothiophene dyad

Michele Maggini,\* Giorgia Possamai, Enzo Menna, Gianfranco Scorrano, Nadia Camaioni,\* Giovanni Ridolfi, Giuseppe Casalbore-Miceli, Lorenzo Franco, Marco Ruzzi and Carlo Corvaja\*

Solar cells made from a fulleropyrrolidine functionalized with a thienylazobenzeneamine derivative show power conversion efficiencies up to 0.37% under white light illumination of  $80 \text{ mW cm}^{-2}$  intensity.

2030

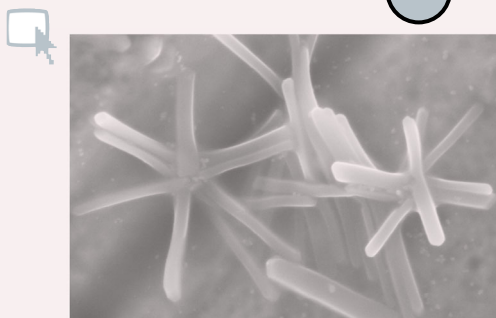


### Very active CeO<sub>2</sub>-zeolite catalysts for NO<sub>x</sub> reduction with NH<sub>3</sub>

K. Krishna,\* G. B. F. Seijger, C. M. van den Bleek and H. P. A. Calis

Selective catalytic reduction of NO with NH<sub>3</sub> over high weight percentage CeO<sub>2</sub>-zeolites showed excellent NO<sub>x</sub> [%] conversions at very high space velocities under simulated exhaust gas conditions in the presence of H<sub>2</sub>O.

2032

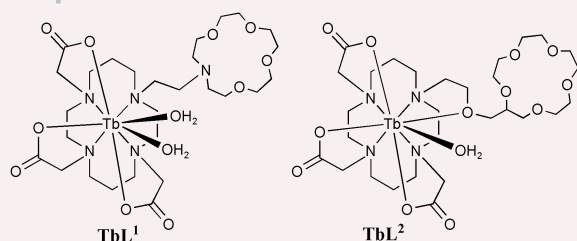


### Starlike nanostructures of polyoxometalates K<sub>3</sub>[PMo<sub>12</sub>O<sub>40</sub>]·nH<sub>2</sub>O synthesized and assembled by an inverse microemulsion method

Xian-Hua Zhang, Su-Yuan Xie,\* Zhi-Yuan Jiang, Li-Chuan Zhou, Zhao-Xiong Xie, Rong-Bin Huang and Lan-Sun Zheng

The starlike nanostructure of the polyoxometalates, K<sub>3</sub>[PMo<sub>12</sub>O<sub>40</sub>]·nH<sub>2</sub>O, was synthesized in a nonionic inverse microemulsion system, surfactant (C<sub>12-18</sub>EO<sub>9</sub>)/cyclohexane/water.

2034

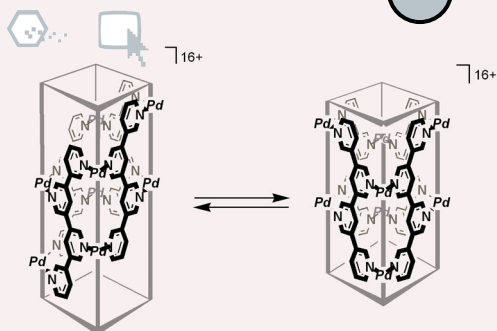


### Luminescent terbium(III) complexes with pendant crown ethers responding to alkali metal ions and aromatic antennae in aqueous solution

Cong Li and Wing-Tak Wong\*

The maximum amplifications of the luminescence intensity of TbL<sup>1</sup> containing aza-15-crown-5 reached a factor of 47 upon addition of the aromatic antenna sodium *p*-chlorobenzoate; the luminescence lifetime of TbL<sup>2</sup> with a pendant 15-crown-5 increased by 65% to 2.95 ms at an [Na<sup>+</sup>] concentration of 0.13 M in aqueous solution.

2036

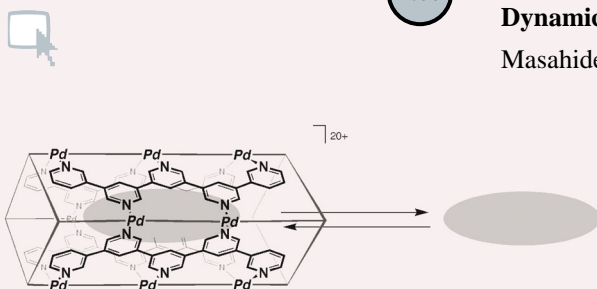


### Spectroscopic and crystallographic studies on the stability of self-assembled coordination nanotubes

Masaru Aoyagi, Shohei Tashiro, Masahide Tominaga, Kumar Biradha and Makoto Fujita\*

Tetrakis(3,5-pyridine) ligand gives two isomers of coordination nanotubes on complexation with (en)Pd(NO<sub>3</sub>)<sub>2</sub>, one of which is isolated and crystallographically analyzed, while two isomers are shown to be in slow equilibrium despite the presence of sixteen Pd–N bonds in the tube framework.

2038



### Dynamic aspects in host–guest complexation by coordination nanotubes

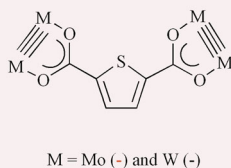
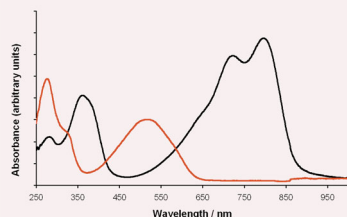
Masahide Tominaga, Shohei Tashiro, Masaru Aoyagi and Makoto Fujita\*

Rod-like guests are in one-dimensional motion within self-assembled coordination nanotubes: they stay in the tubes without flipping along its length at room temperature, but exchange intermolecularly at high temperature.

2040

### Thienyl carboxylate ligands bound to M<sub>2</sub> quadruple bonds involving molybdenum and tungsten. Models for dimetallated polythiophenes

Matthew J. Byrnes and Malcolm H. Chisholm\*

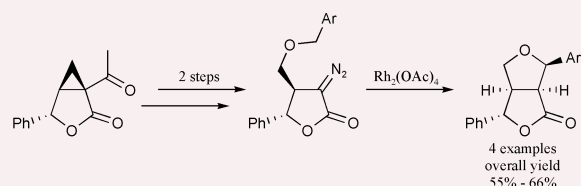


Thienyl-carboxylate and -dicarboxylate groups attached to dinuclear centers (M = Mo or W) having MM quadruple bonds show interesting electronic properties and provide insight into the probable nature of related dimetallated polythiophenes.

2042

### An efficient synthesis of *endo,exo*-furofuranone derivatives

Nigel A. Swain, Richard C. D. Brown\* and Gordon Bruton

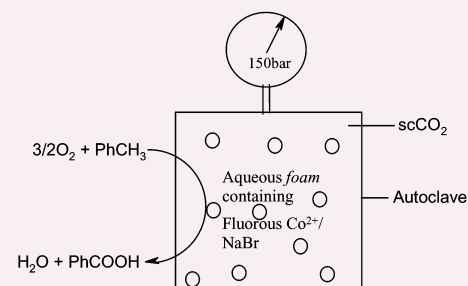


The ring openings of 1-acetyl-4-phenyl-3-oxabicyclo[3.1.0]hexane afforded  $\alpha$ -acetyl- $\gamma$ -butyrolactones that underwent a novel diazo-transfer reaction, followed by C–H insertion, to provide a series of *endo,exo*-furofuranone analogues.

2044

### Aqueous emulsion containing fluorous cobalt species in supercritical CO<sub>2</sub> for catalytic air oxidation of toluene

Jie Zhu, Alan Robertson and Shik Chi Tsang\*

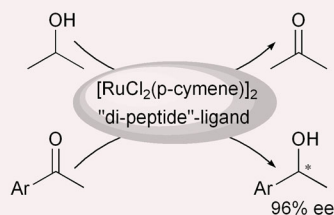


An aqueous emulsion containing ionic Co<sup>2+</sup> and Br<sup>-</sup> species stabilised by fluorous surfactant-like species in supercritical CO<sub>2</sub>-air acts as a *nano-reactor* with excellent interfacial contacts of all necessary hydrophilic/hydrophobic species, which renders safe operation of catalytic aerial oxidation of toluene at high yields without use of acetic acid.

2046

**Novel simple and highly modular ligands for efficient asymmetric transfer-hydrogenation of ketones**

Isidro M. Pastor, Patrik Västilä and Hans Adolfsson\*

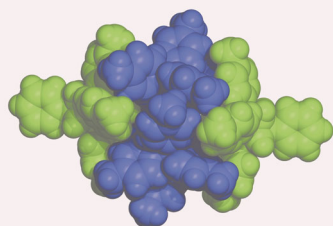


Novel simple and highly modular dipeptide-analogue ligands combined with [RuCl<sub>2</sub>(p-cymene)]<sub>2</sub> were demonstrated to efficiently catalyze the reduction of ketones under hydrogen transfer conditions with enantioselectivities up to 96%.

2048

**Monocarbaborane anion chemistry. An interesting encapsulation of the Pd<sub>2</sub>I<sub>2</sub>{P(C<sub>6</sub>H<sub>4</sub>-4-Me)<sub>3</sub>}<sub>4</sub>}<sup>2+</sup> cation by a pair of [PhCB<sub>9</sub>H<sub>4</sub>I(C<sub>6</sub>H<sub>4</sub>Me)<sub>4</sub>]<sup>-</sup> anions**

Andreas Franken, Colin A. Kilner, Mark Thornton-Pett and John D. Kennedy

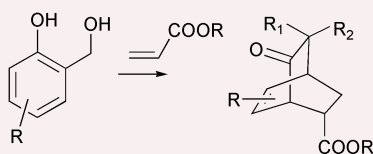


The [Pd<sub>2</sub>I<sub>2</sub>{P(C<sub>6</sub>H<sub>4</sub>-4-Me)<sub>3</sub>}<sub>4</sub>}<sup>2+</sup> salt of the [1-Ph-*closo*-1-CB<sub>9</sub>H<sub>4</sub>-10-I-6,7,8,9-(C<sub>6</sub>H<sub>4</sub>-4-Me)<sub>4</sub>]<sup>-</sup> anion exhibits an unusual neutral supramolecular assembly in the solid state in which the dication is encapsulated by two four-armed 'tetrapus' monoanionic units.

2050

**Cycloaddition of cyclohexa-2,4-dienones with electron deficient 2π partners: a novel and stereoselective route to functionalised bicyclo[2.2.2]octenones**

Vishwakarma Singh,\* Shantanu Pal and Shaikh M. Mobin

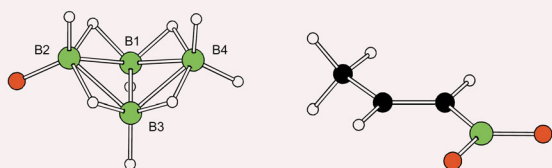


A regio- and stereoselective synthesis of functionalised bicyclo[2.2.2]octanes *via* cycloaddition of cyclohexadienones and electron deficient 2π partners is described.

2052

**Unexpected formation of new fluoroboranes from the reaction of NMe<sub>4</sub>B<sub>3</sub>H<sub>8</sub> with BF<sub>3</sub> and MeC≡CH: *exo*-2-FB<sub>4</sub>H<sub>9</sub> and *trans*-MeCH=CHBF<sub>2</sub>**

Mark A. Fox, Robert Greatrex\* and Daniel L. Ormsby

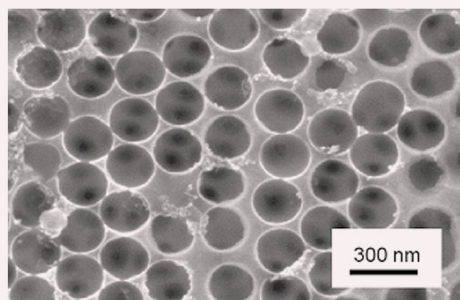


The new fluoroboranes *exo*-2-FB<sub>4</sub>H<sub>9</sub> and *trans*-MeCH=CHBF<sub>2</sub> have been obtained unexpectedly and in good yield from the reaction of tetramethylammonium octahydrotriborate (NMe<sub>4</sub>B<sub>3</sub>H<sub>8</sub>) with boron trifluoride and propyne (MeC≡CH).

2054

**Macroporous germanium by electrochemical deposition**

L. K. van Vugt, A. F. van Driel, R. W. Tjerkstra, L. Bechger, W. L. Vos, D. Vanmaekelbergh and J. J. Kelly\*

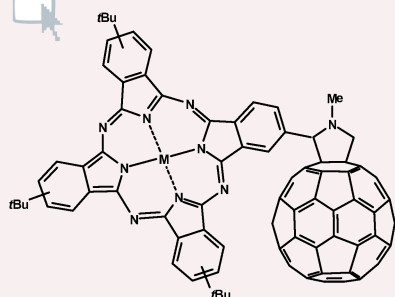


A macroporous germanium-air sphere matrix is obtained by electrodeposition in a template formed from a dried suspension of silica spheres.

2056

**Charge-transfer states in strongly coupled phthalocyanine fullerene ensembles**

Dirk M. Guldi,\* Andreas Gouloumis, Purificación Vázquez and Tomás Torres\*



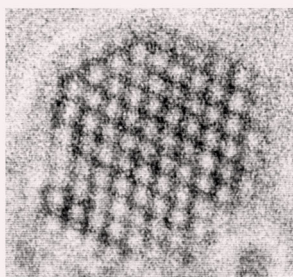
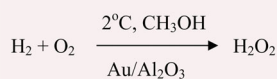
**ZnPc-C<sub>60</sub>** (M = Zn)  
**H<sub>2</sub>Pc-C<sub>60</sub>** (M = H<sub>2</sub>)

Fluorescence and transient absorption measurements show that in strongly coupled **ZnPc-C<sub>60</sub>** and **H<sub>2</sub>Pc-C<sub>60</sub>** dyads charge-separated states are formed. Large  $-\Delta G_{CR}^\circ$  and small  $\lambda$  assist in stabilising **ZnPc<sup>+</sup>-C<sub>60</sub><sup>-</sup>/H<sub>2</sub>Pc<sup>+</sup>-C<sub>60</sub><sup>-</sup>**.

2058

**Direct formation of hydrogen peroxide from H<sub>2</sub>/O<sub>2</sub> using a gold catalyst**

Philip Landon, Paul J. Collier, Adam J. Papworth, Christopher J. Kiely and Graham J. Hutchings\*

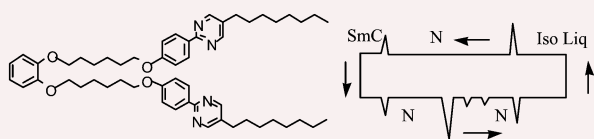


Supported Au catalysts are very selective for the direct formation of hydrogen peroxide from H<sub>2</sub>/O<sub>2</sub> mixtures at 2 °C. The rate of H<sub>2</sub>O<sub>2</sub> synthesis is markedly increased if Au–Pd alloy nanoparticles are generated by the addition of Pd.

2060

**Kinetically induced intermolecular association: unusual enthalpy changes in the nematic phase of a novel dimeric liquid-crystalline molecule**

Atsushi Yoshizawa\* and Akihisa Yamaguchi



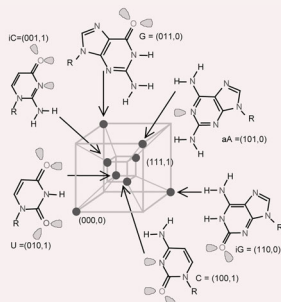
A novel liquid crystal in which two mesogenic groups are connected *via* catechol was found to show unusual enthalpy changes in the nematic phase on heating from the monotropic SmC phase.

2062

**A parity code interpretation of nucleotide alphabet composition**

Dónall A. Mac Dónaill\*

A numerical representation of nucleotide recognition features is proposed. So interpreted, the nucleotide alphabet appears to be structured as a digital parity code, offering a possible explanation of nucleotide alphabet composition.

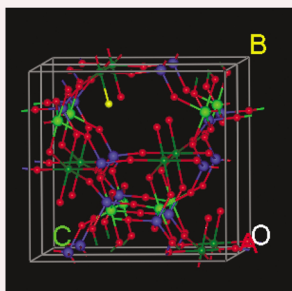


2064

**Synthesis, characterization of an AIPO-CJ<sub>2</sub> analogue containing heteroatomic Eu**

Lei Zhang, Caiyi Lu and Yingcai Long\*

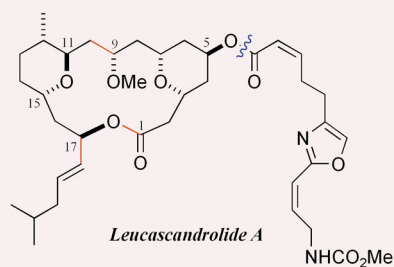
A microporous aluminophosphate AIPO-CJ<sub>2</sub> containing heteroatomic Eu was synthesized and Eu was proved to substitute the Al(v) site.



2066

**A formal total synthesis of leucascandrolide A**

Peter Wipf\* and Jonathan T. Reeves

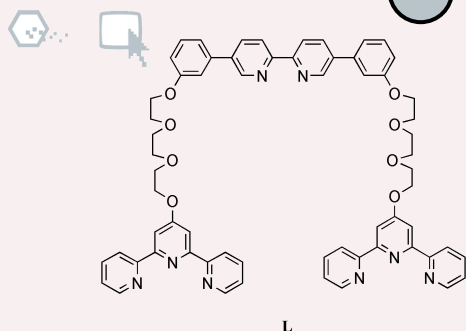


Highlights of this convergent synthesis of the macrocyclic core of the marine macrolide leucascandrolide A include a bi-directional synthesis strategy, an arene–pyran conversion, an alkyne hydrozirconation–transmetalation–aldehyde addition, and a Mitsunobu macrocyclization.

2068

**Formation of a [1 + 1] metallomacrocycle from a heterotripic ligand containing two terpy and one bipy metal-binding domains**

Christopher B. Smith,\* Edwin C. Constable,\* Catherine E. Housecroft and Benson M. Kariuki

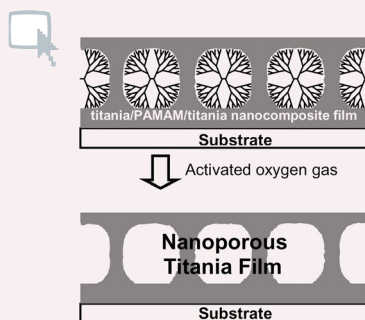


The heterotripic ligand **L** forms a single 1 + 1 complex with iron(II) in which only the terpy domains are coordinated.

2070

**Replication of dendrimer monolayer as nanopores in titania ultrathin film**

Jianguo Huang, Izumi Ichinose and Toyoki Kunitake\*

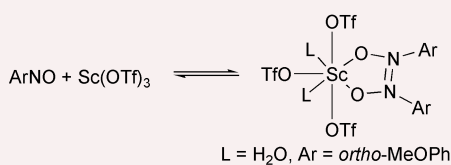


An ultrathin titania film with molecular-sized cavities was synthesized by treating a *ca.* 8 nm thick  $(\text{TiO}_2)_3(\text{dendrimer})(\text{TiO}_2)_2$  sandwich film with activated oxygen gas.

2072

**A novel scandium *ortho*-methoxynitrosobenzene-dimer complex: mechanistic implications for the nitroso-Diels–Alder reaction**

Andrew P. Lightfoot, Robin G. Pritchard, Hayley Wan, John E. Warren and Andrew Whiting\*

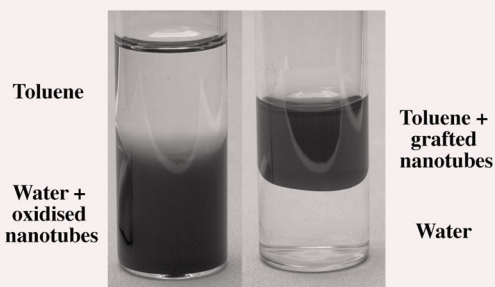


Arylnitroso dienophiles exist in equilibrium with their dimeric counterparts, which in turn form stable bidentate complexes with scandium(III) triflate and react with cyclohexadiene to give the corresponding Diels–Alder adduct at the same rate as the normal thermal process.

2074

**Polystyrene grafted multi-walled carbon nanotubes**

M. S. P. Shaffer\* and K. Koziol



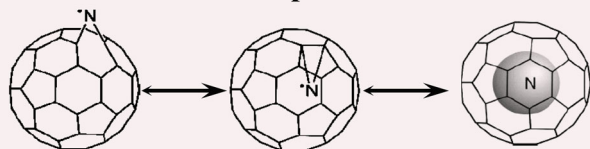
Free radical polymerisation of styrene in the presence of an aqueous dispersion of multi-walled carbon nanotubes leads to the formation of a polymer-grafted nanotube product that is compatible with a range of solvents.



2076

 **$^{14}\text{N}@C_{60}$  formation in a nitrogen rf-plasma**

Houjin Huang,\* Masafumi Ata and Matthias Ramm

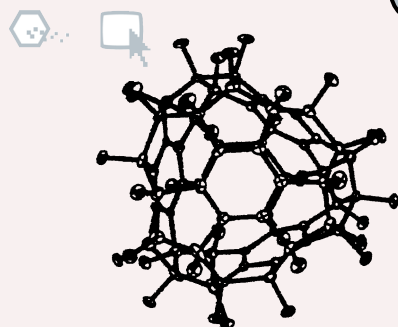
**In rf-plasma**

Atomic nitrogen was encapsulated inside a vaporized  $C_{60}$  molecule in rf-plasma, which was confirmed by ESR.

2078

**Single crystal X-ray structure of tetrahedral  $C_{60}F_{36}$ : the most aromatic and distorted fullerene**

Peter B. Hitchcock and Roger Taylor\*

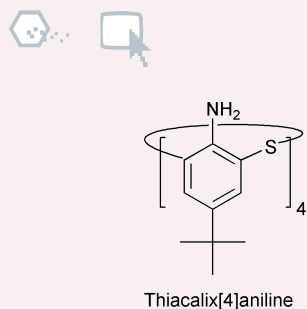


Tetrahedral  $C_{60}F_{36}$  is shown by its single-crystal X-ray structure to be the most aromatic (and distorted) fullerene derivative, having four planar hexagons with almost equal bond lengths, the average of which (1.373 Å) is the same as in  $C_{60}F_{18}$ ; one exceptionally long FC–CF bond (1.665 Å) corresponds to the similarly long bond in  $C_{60}F_{18}$  (a motif of  $T C_{60}F_{36}$ ) and is likely to be the site of oxygen insertion in  $C_{60}F_{36}O$

2080

**'Thiacalix[4]aniline' as a highly specific extractant for Au(III) and Pd(II) ions**

Hiroshi Katagiri, Nobuhiko Iki,\* Yoshiaki Matsunaga, Chizuko Kabuto and Sotaro Miyano\*

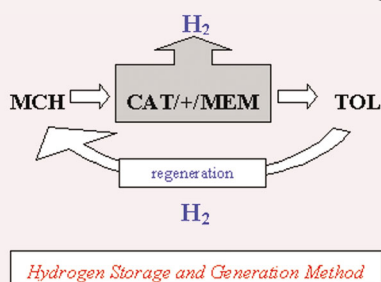


Thiacalix[4]aniline extracted Au(III) and Pd(II) ions specifically from acidic solutions among 41 metal ions including soft metal ions such as Hg(II), Cd(II), Zn(II), Pb(II) and Cu(II).

2082

**Pure hydrogen production from methylcyclohexane using a new high performance membrane reactor**

Paloma Ferreira-Aparicio,\* Inmaculada Rodríguez-Ramos and Antonio Guerrero-Ruiz

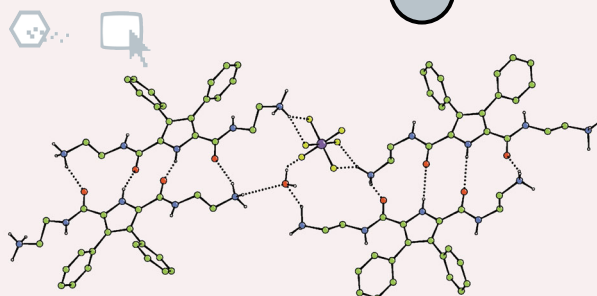


A novel membrane reactor integrated by a Pd-porous stainless steel composite membrane and a Pt/Al<sub>2</sub>O<sub>3</sub> catalyst has been developed for H<sub>2</sub> generation from methylcyclohexane (MCH). This reactor–separator assembly constitutes a high efficiency system to obtain the H<sub>2</sub> stored in the form of liquid MCH with yields close to 100%—an interesting alternative for H<sub>2</sub> storage and production.

2084

**Pendant arm pyrrolic amide cleft anion receptors**

Korakot Navakhun, Philip A. Gale,\* Salvatore Camiolo, Mark E. Light and Michael B. Hursthouse

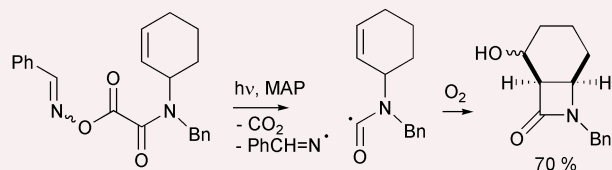


Amine, ammonium and amide pendant arm 2,5-diamidopyrrole cleft species have been synthesized. The pendant arm has been shown to alter the anion affinity of the receptor with the bis-amine receptor showing high selectivity for HSO<sub>4</sub><sup>−</sup>.

2086

### Preparation of oxime oxalate amides and their use in free-radical mediated syntheses of lactams

Eoin M. Scanlan and John C. Walton\*

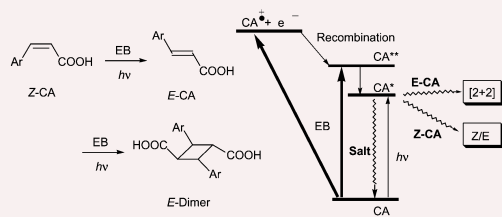


Oxime oxalate amides are a new class of radical precursors that cleanly yield aminoacyl radicals and hence  $\beta$ - and  $\gamma$ -lactams.

2088

### Radiation-induced reactions *via* the lowest excited states in cinnamic acid crystals

Yasunari Maekawa,\* Tomonori Inaba, Hiroki Hobo, Tadashi Narita, Hiroshi Koshikawa, Seongyun Moon, Jun Kato and Masaru Yoshida

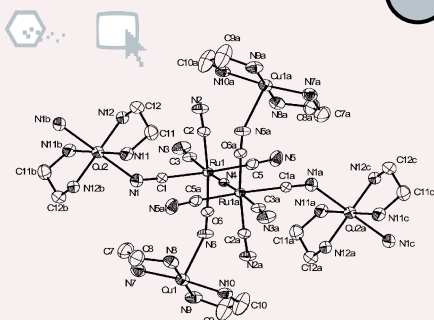


Radiation-induced reactions of cinnamic acid derivatives have been examined and compared with photoreactions in the crystalline state; all the reaction products were exactly the same as those of the photoreactions, indicating that the reactions proceed only *via* the lowest excited state to give [2 + 2] cycloadducts, *E/Z* isomerization products, or starting molecules.

2090

### 1-D polymer containing the [Ru–N–Ru] $\mu$ -nitrido moiety: crystal structure and magnetic properties of $\{[\text{Cu}(\text{en})_2]_3[\text{Ru}_2\text{N}(\text{CN})_{10}]\cdot\text{ClO}_4\}_n$ (*en* = 1,2-diaminoethane)

Xian-Ru Sun, Jiang-Lin Liang, Chi-Ming Che,\* Nianyong Zhu, X. X. Zhang and Song Gao

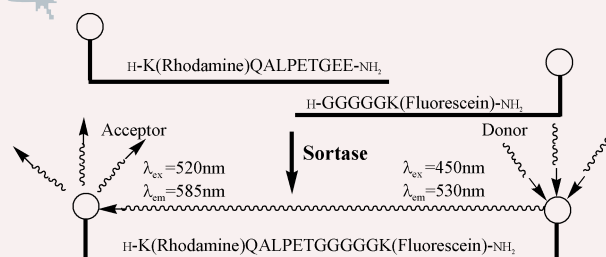


The  $\mu$ -nitrido–ruthenium unit bridged 1-D coordination polymer was formed from reaction of  $\text{K}_5[\text{Ru}_2\text{N}(\text{CN})_{10}]$  with  $[\text{Cu}(\text{en})_2][(\text{ClO}_4)_2]$ , characterised by X-ray crystallography and variable temperature susceptibility measurements showed a weak ferromagnetic interaction between the Cu(II) ions in 1-D polymer.

2092

### An economical and preparative orthogonal solid phase synthesis of fluorescein and rhodamine derivatized peptides: FRET substrates for the *Staphylococcus aureus* sortase SrtA transpeptidase reaction

Ryan G. Kruger, Patrick Dostal and Dewey G. McCafferty\*

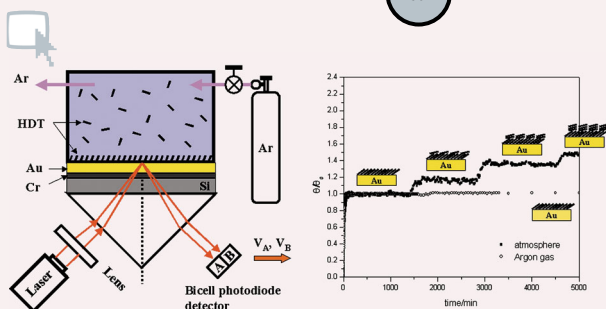


A general method of synthesizing peptide substrates containing rhodamine and fluorescein FRET donor/acceptor pairs placed at site-specific locations within a peptide sequence.

2094

### *In-situ* analysis of stepwise self-assembled 1,6-Hexanedithiol multilayers by surface plasmon resonance measurements

Soonwoo Chah, Janos H. Fendler and Jongheop Yi\*

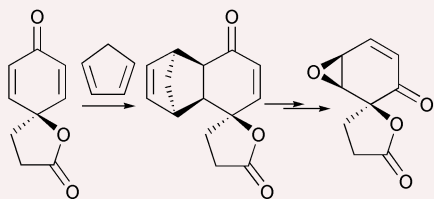


1,6-Hexanedithiol (HDT) forms  $6.9 \pm 1.0$  Å thick defect-free monolayers on gold substrates if the solution is purged by argon during the adsorption while long term (>1000 min) exposure of the substrate to alcoholic HDT results in the stepwise formation of multilayers in the absence of argon purging.

2096

### Efficient synthesis of a 4,5-epoxy-2-cyclohexen-1-one derivative bearing a spiro lactone *via* a Diels–Alder reaction with high $\pi$ -facial selectivity: a synthetic study towards scyphostatin

Ryukichi Takagi, Wataru Miyanaga, Yukiko Tamura and Katsuo Ohkata\*

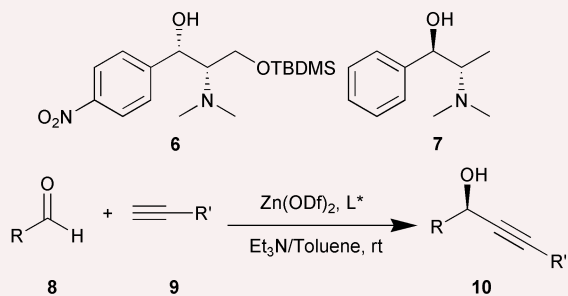


The Diels–Alder reaction of spiro lactones with cyclopentadiene afforded the adduct with high  $\pi$ -facial selectivity; a hydrophilic analogue of scyphostatin was synthesized from the Diels–Alder adduct.

2098

### Zn(ODf)<sub>2</sub>: preparation and application in asymmetric alkylation of aldehydes

Zili Chen, Wennan Xiong and Biao Jiang\*

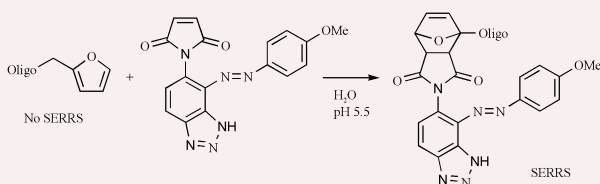


A new Lewis acid, Zn(ODf)<sub>2</sub>, first prepared from commercially available 3,3,4,4-tetrafluoro[1,2]oxathietane 2,2-dioxide, was used to catalyze highly enantioselective alkylation of aldehydes in the presence of some ligands to afford the corresponding propargylic alcohols in high yields with up to 99% ee.

2100

### A new approach to oligonucleotide labelling using Diels–Alder cycloadditions and detection by SERRS

Ljiljana Fruk, Antonio Grondin, W. Ewen Smith and Duncan Graham\*

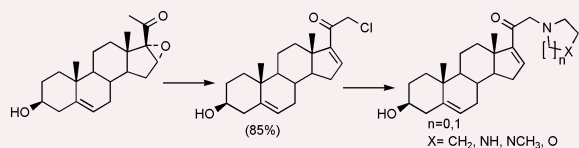


Diels–Alder cycloaddition has been used to attach a benzotriazole maleimide dye to a diene tagged oligonucleotide in an aqueous coupling reaction. This makes the oligonucleotide SERRS active and gives a distinctly different spectrum to that of the maleimide dye.

2102

### Facile C<sub>21</sub> functionalization through a novel functional group transfer reaction in 16 $\alpha$ ,17 $\alpha$ -epoxy-3 $\beta$ -hydroxypregn-5-en-20-one and its applications

Navdeep K. Girdhar and Mohan Paul S. Ishar\*

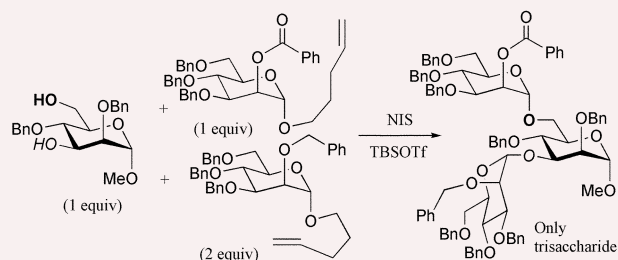


An efficient functionalization of C<sub>21</sub> in pregnane series through a novel functional group transfer reaction in a 16,17-epoxy steroid is described.

2104

### One pot/two donors/one diol give one differentiated trisaccharide: powerful evidence for reciprocal donor–acceptor selectivity (RDAS)

Bert Fraser-Reid,\* J. Cristóbal López,\* K. V. Radhakrishnan, M. V. Nandakumar, Ana M. Gómez and Clara Uriel



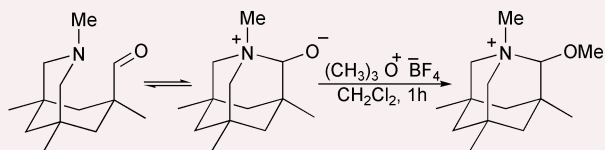
Three component, one-pot reactions involving equimolar amounts of the acceptor diol and both armed and disarmed donors presented simultaneously, produce a *single* double-differential glycosidation product; this phenomenon provides evidence for Reciprocal Donor Acceptor Selectivity (RDAS).

2106



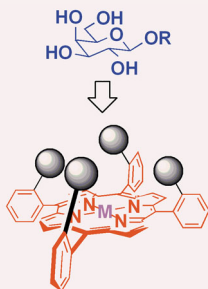
### Structure and chemistry of a zwitterionic amine–aldehyde adduct

Anthony J. Kirby,\* Igor V. Komarov,\* Vitaliy A. Bilenko, John E. Davies and Jeremy M. Rawson



The first crystal structure of the zwitterionic tetrahedral addition product of a tertiary amino-group to an aldehyde reveals the vital contribution of a molecule of water of solvation.

2108



### Urea porphyrins as simple receptors for sugars

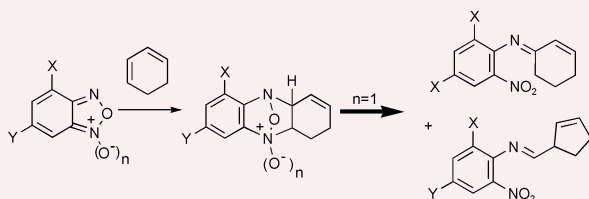
Kalliopi Ladomenou and Richard P. Bonar-Law

Urea-functionalised porphyrins with amino acid side chains are shown to bind carbohydrate derivatives strongly ( $10^4 < K < 10^6$ ) and with unusual selectivity in dichloromethane.

2110

### A novel reactivity pattern of nitro-benzofuroxans and -benzofurazans: the heterodiene behaviour of the five-membered ring

Régis Goumont,\* Muriel Sebban and François Terrier\*

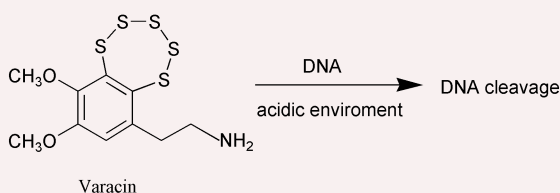


Evidence is presented that the annelated ring of nitrobenzofuroxans and nitrobenzofurazans may act as a heterodiene contributor, thus highlighting the multifaceted reactivity of these compounds.

2112

### Acid-accelerated DNA-cleaving activities of antitumor antibiotic varacin

Alex H. F. Lee, Albert S. C. Chan and Tianhu Li\*



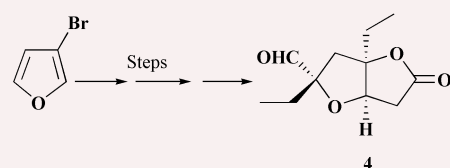
It is demonstrated for the first time in this report that the authentic molecular structure of varacin is capable of causing DNA-cleavage chemically with high efficiency, a process that can be accelerated by its acidic surroundings.

2114



### An enantioselective synthetic pathway towards plakortones

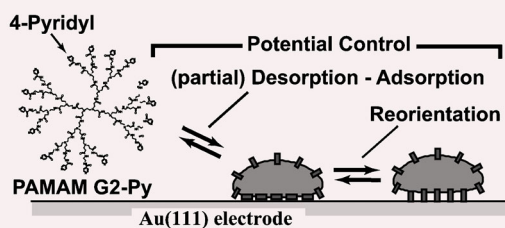
Hing Ken Lee and Henry N. C. Wong\*



Enantioselective synthesis of bicyclic lactone **4**, a core structure of plakortones, is described and its absolute configuration was confirmed by an X-ray crystallographic analysis of its precursor **24**.

2116

### Dynamic dendrimer at electrified interface: potential dependent adsorption–desorption and reorientation of a 4-pyridyl-modified PAMAM dendrimer



Takamasa Sagara,\* Kumi Nagata, Hiroaki Tsuruta and Naotoshi Nakashima

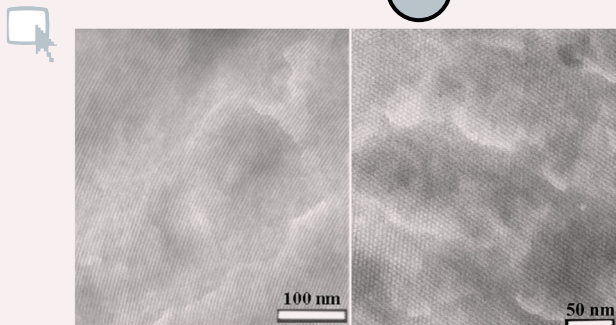
A dendrimer (PAMAM G2), the periphery of which was modified with 4-pyridyl groups, is found to exhibit potential dependent dynamic behaviour on a Au(111) electrode surface.

2118

### Periodic mesoporous organosilica from micellar oligomer template solution

Safia Hamoudi and Serge Kaliaguine\*

A thick walled highly ordered periodic mesoporous organosilica (PMO) having two-dimensional hexagonal symmetry was first synthesised using a bridged silsesquioxane  $(\text{CH}_3\text{O})_3\text{Si}-\text{CH}_2-\text{CH}_2-\text{Si}(\text{CH}_3\text{O})_3$  as precursor and polyoxyethylene non-ionic surfactant (Brij-56) as template.

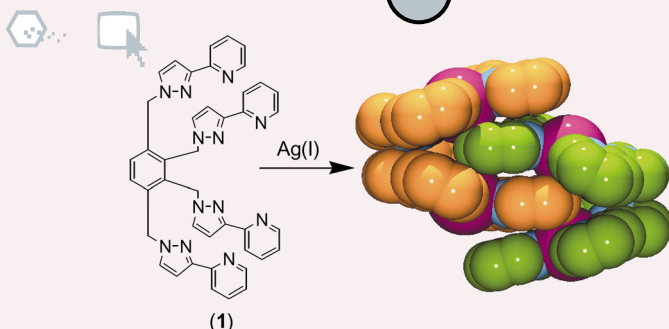


2120

### A self-complementary molecular cleft

David A. McMorran\* and Peter J. Steel

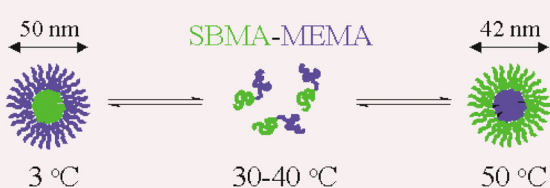
Reaction of the new ligand **1** with silver(I) salts generates a novel self-complementary molecular cleft, which forms dimers in the solid state, stabilised by intermolecular  $\pi$ -stacking interactions and C–H...M interactions.



2122

### Synthesis and aqueous solution properties of a well-defined thermo-responsive schizophrenic diblock copolymer

J. V. M. Weaver, S. P. Armes\* and V. Bütün



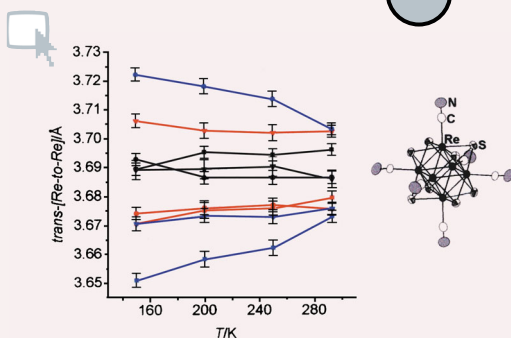
Near-monodisperse ‘schizophrenic’ diblock copolymers based on 2-(*N*-morpholino)ethyl methacrylate (MEMA) and a sulfobetained 2-(dimethylamino)ethyl methacrylate (SBMA) were synthesized in very high yield by GTP; these novel thermo-responsive copolymers dissolve molecularly at 30–40 °C, form SBMA-core micelles at 3 °C and form MEMA-core micelles above 50 °C.

2124

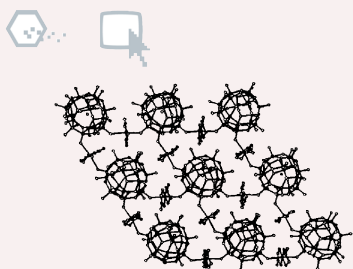
### Jahn–Teller distortion of the open-shell 23-electron chalcogenide rhenium cluster cores in crystals of the series, $\{[\text{Re}_6\text{Q}_8]^{3+}(\text{X}^-)_6\}^{3-}$ (Q = S, Se; X = Cl, CN)

Stéphane A. Baudron, André Deluzet, Kamal Boubekeur and Patrick Batail\*

Comparison of 14 precise crystal structures of the  $\text{Re}_6$  cluster cores at different low temperatures reveals that the open-shell (23 electron) cores undergo a Jahn–Teller distortion of their parent 24 electron octahedral cores and that  $D_{4h}$  and  $D_{2h}$  forms may co-exist in the solid state.



2126

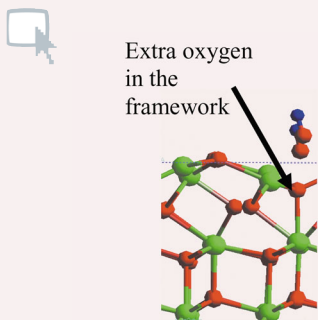


**First hexadecavanadate compound: hydrothermal synthesis and characterization of a three-dimensional framework  $[\{\text{Cu}(1,2\text{-pn})_2\}_7\{\text{V}_{16}\text{O}_{38}(\text{H}_2\text{O})_2\}_2]\cdot 4\text{H}_2\text{O}$**

Bi-Zhou Lin\* and Shi-Xiong Liu

Each new mixed-valence  $[\text{V}_{16}\text{O}_{38}(\text{H}_2\text{O})]^{7-}$  cluster is connected with seven others through seven bridging  $[\text{Cu}(1,2\text{-pn})_2]^{2+}$  groups into a three-dimensional open-framework structure.

2128



**Evidence of surface reconstructions and incorporation of oxygen into the oxide framework on the hydroxylated  $\text{La}_2\text{O}_3\{001\}$  surface**

Maria Alfredsson,\* C. Richard A. Catlow, Anastasia Paulidou and Roger M. Nix

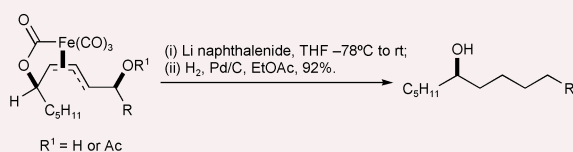
By performing *first-principles* Molecular Dynamics simulations at 300 K, we show that water dissociation on the A- $\text{La}_2\text{O}_3\{001\}$  surface is associated with a surface reconstruction, yielding a surface structure that is oxygen rich.

2130



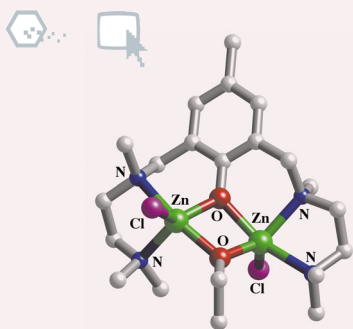
**Reductive decomplexation of  $\pi$ -allyltricarbonyliron lactone complexes; a new route to stereo-defined 1,7-diols and 2,3-diene-1,7-diols**

Christopher J. Hollowood and Steven V. Ley\*



Treatment of  $\pi$ -allyltricarbonyliron lactone complexes bearing an adjacent leaving group, with lithium naphthalenide causes decomplexation to acyclic dienols in excellent yield and without any scrambling of the allylic centre.

2132



**Metalloenzyme inspired dizinc catalyst for the polymerization of lactide**

Charlotte K. Williams, Neil R. Brooks, Marc A. Hillmyer\* and William B. Tolman\*

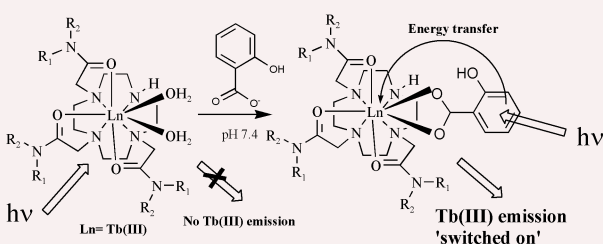
A new dizinc-monoalkoxide complex supported by a dinucleating ligand was structurally characterized and shown to be a highly active catalyst for the controlled polymerization of lactide.

2134



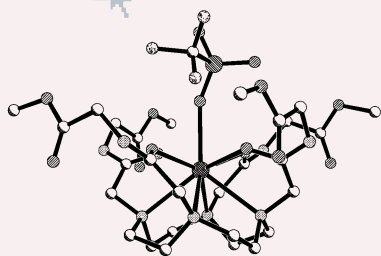
**Delayed lanthanide luminescence sensing of aromatic carboxylates using heptadentate triamide Tb(III) cyclen complexes: the recognition of salicylic acid in water**

Thorfinnur Gunnlaugsson,\* Andrew J. Harte, Joseph P. Leonard and Mark Nieuwenhuyzen



The coordinately unsaturated Tb complexes possess two labile metal-bound water molecules that can be displaced upon metal chelation to aromatic carboxylic anions such as salicylic acid in water, which gives rise to large enhancements in the Tb(III) luminescence.

2136



### Rapid hydrolytic cleavage of the mRNA model compound HPNP by glycine based macrocyclic lanthanide ribonuclease mimics

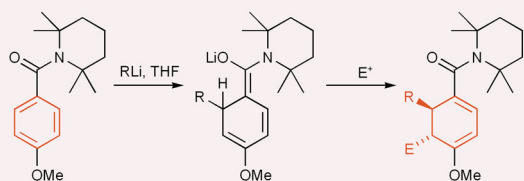
Thorfinnur Gunnlaugsson,\* R. Jeremy H. Davies, Mark Nieuwenhuyzen, Clarke S. Stevenson, Romain Viguier and Sinead Mulready

The lanthanide ion based macrocyclic complexes **Ln·1** mimic the hydrophobic nature of ribonucleases, where the lanthanide ion induce the formation of a hydrophobic cavity in **1**, which gives rise to a large order of magnitude enhancement in the hydrolytic cleavage of HPNP under physiological conditions.

2138

### Carbolithiation of aromatic rings: cyclohexadienes from *N*-aroyl-2,2,6,6-tetramethylpiperidines

Jonathan Clayden,\* Yann J. Y. Foricher and Ho Kam Lam

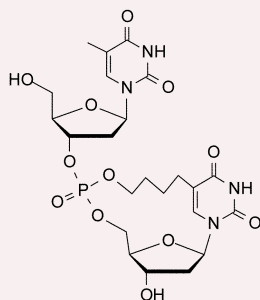


Instead of promoting ortholithiation, a tetramethylpiperidine-derived amide group directs organolithiums to attack aromatic rings, leading to dearomatization.

2140

### Tandem ring-closing metathesis and hydrogenation towards cyclic dinucleotides

Philip Børsting and Poul Nielsen\*

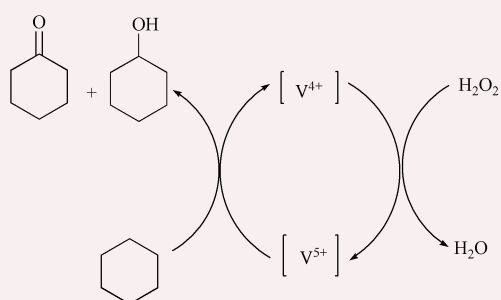


A new synthetic concept in the construction of conformationally restricted nucleic acid model structures is presented. Stable saturated cyclic phosphotriester structures are obtained using a ruthenium based precatalyst for both RCM and hydrogenation.

2142

### A highly efficient oxidation of cyclohexane over VPO catalysts using hydrogen peroxide

Unnikrishnan R. Pillai and Endalkachew Sahle-Demessie\*



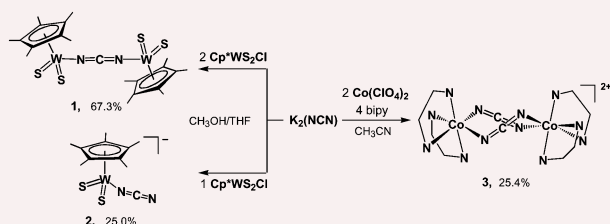
A highly efficient oxidation of cyclohexane to cyclohexanol and cyclohexanone is accomplished over calcined vanadium phosphorus oxide (VPO) catalysts in a relatively mild condition using hydrogen peroxide under a nitrogen atmosphere.

2144



### Use of dipotassium cyanamide for the synthesis of cyanoimido (NCN<sup>2-</sup>) complexes of tungsten and cobalt

Rong Cao and Kazuyuki Tatsumi\*

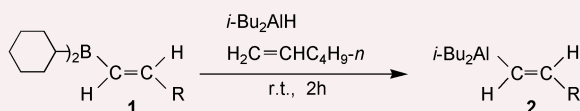


Three cyanoimido complexes synthesized from dipotassium cyanamide,  $(\text{Cp}^*\text{WS}_2)_2(\mu\text{-NCN})$  (**1**),  $\text{K}[(\text{Cp}^*\text{WS}_2)(\text{NCN})]$  (**2**) and  $\{[(\text{bipy})_2\text{Co}]_2(\mu\text{-NCN})_2\}(\text{ClO}_4)_2$  (**3**), and their X-ray derived structures are reported.

2146

**Transfer of alk-1-enyl group from boron to aluminium: a novel way to prepare (*E*)-alk-1-enyldiisobutylalanes**

Masayuki Hoshi\* and Kazuya Shirakawa

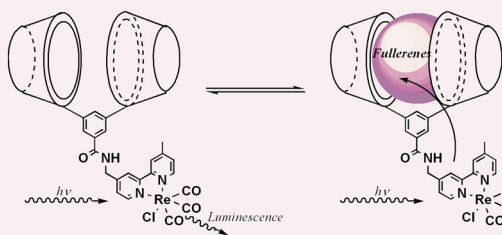


Treatment of (*E*)-alk-1-enyldicyclohexylboranes **1** with diisobutylaluminium hydride (DIBAL-H) in the presence of hex-1-ene at room temperature results in transfer of the alk-1-enyl group from boron to aluminium to give (*E*)-alk-1-enyldiisobutylalanes **2** with retention of configuration at the double bond.

2148

**Fullerene sensors based on calix[5]arene**

Takeharu Haino, Hiromi Araki, Yoshihisa Fujiwara, Yoshifumi Tanimoto and Yoshimasa Fukazawa\*

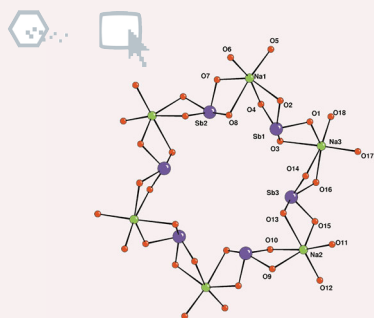


The combination of supramolecular concepts and luminescence techniques is the key for the successful generation of selective supramolecular sensors. A new class of fullerene sensors based on calix[5]arenes has produced the highly sensitive detection of C<sub>60</sub> and C<sub>70</sub>.

2150

**A twenty-four membered mixed-metal macrocycle; Synthesis and structure of *cyclo*-[(3-Me-1,2-C<sub>6</sub>H<sub>3</sub>O<sub>2</sub>)<sub>2</sub>SbNa(THF)<sub>2</sub>]<sub>6</sub>**

Michael A. Paver,\* Jonathan S. Joy and Michael B. Hursthouse

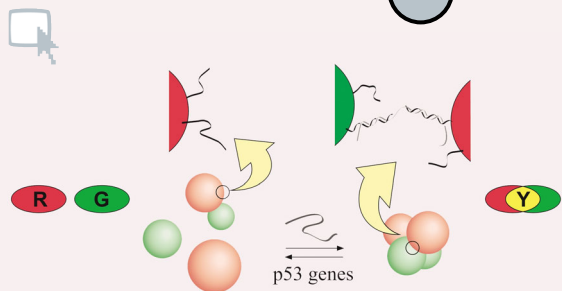


The structure and synthesis of the first example of a twenty-four membered mixed p-/s-block macrocycle, *cyclo*-[(3-Me-1,2-C<sub>6</sub>H<sub>3</sub>O<sub>2</sub>)<sub>2</sub>SbNa(THF)<sub>2</sub>]<sub>6</sub> is reported, consisting of a cyclic array of alternating Sb and Na metal centres doubly bridged by catecholato groups.

2152

**Colorimetric SNP analysis using oligonucleotide-modified nanoparticles**

Toshihiro Ihara,\* Yasushi Chikaura, Shojiro Tanaka and Akinori Jyo

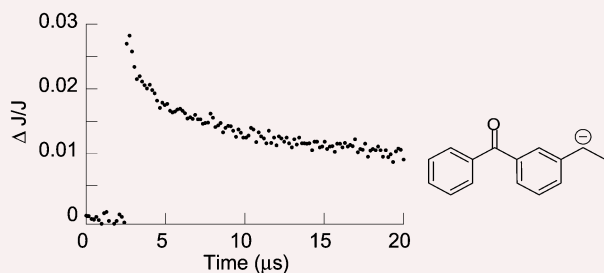


Novel colorimetry for gene analysis has been developed using selective aggregation of DNA-modified nanospheres. The signal was observed by fluorescence microscopy and FRET.

2154

**Increasing the life expectancy of carbanions by zeolite inclusion**

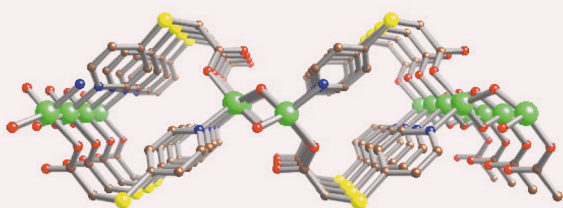
Michelle N. Chrétien, Gonzalo Cosa, Hermenegildo García\* and J. C. Scaiano\*



Carbanions are long lived in zeolites, where they show Grignard-like behaviour.



2156



### A new Zn(II) coordination polymer with 4-pyridylthioacetate: assemblies of homo-chiral helices with sulfide sites

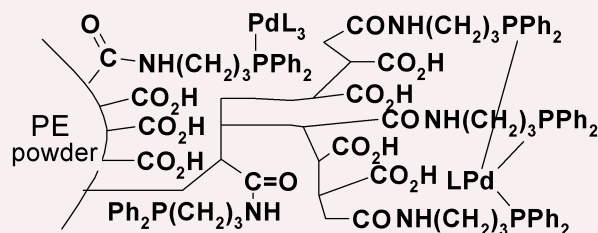
Mitsuru Kondo,\* Makoto Miyazawa, Yasuhiko Irie, Reiko Shinagawa, Tomonori Horiba, Akira Nakamura, Tetsuyoshi Naito, Kenji Maeda, Shunji Utsuno and Fumio Uchida

The reaction of  $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  with 4-pyridylthioacetic acid (Hpyta) in the presence of triethylamine produces a new coordination polymer  $[\text{Zn}(\text{pyta})(\text{OH})]$ , which is constructed by the alternating assembly of two types of homo-chiral helical columns.

2158

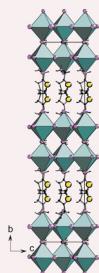
### Functionalized hyperbranched grafts on polyethylene powder for support of Pd(0)-phosphine catalyst

David E. Bergbreiter,\* Andrew M. Kippenberger and Guoliang Tao



Poly(acrylic acid) grafts on polyethylene (PE) powder are converted to uniformly loaded insoluble polymeric phosphine ligands (loadings of  $>0.1 \text{ mmol g}^{-1}$ ) that complex Pd(0) catalysts useful in allylic substitution chemistry. Such supported catalysts can be reused without detectable Pd leaching.

2160

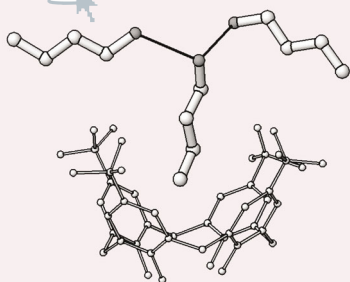


### $(\text{C}_4\text{H}_9\text{SCH}_2\text{NH}_3)_2(\text{CH}_3\text{NH}_3)\text{Pb}_2\text{I}_7$ : non-centrosymmetrical crystal structure of a bilayer hybrid perovskite

Xu-Hui Zhu, Nicolas Mercier,\* Amédée Riou, Philippe Blanchard and Pierre Frère

The analysis of the crystal structure of  $(\text{C}_4\text{H}_9\text{SCH}_2\text{NH}_3)_2(\text{CH}_3\text{NH}_3)\text{Pb}_2\text{I}_7$ , displaying a well-ordered acentric inorganic  $\text{Pb}_2\text{I}_7^{3-}$  bilayer, is reported, and compared to the related monolayer hybrid perovskite.

2162

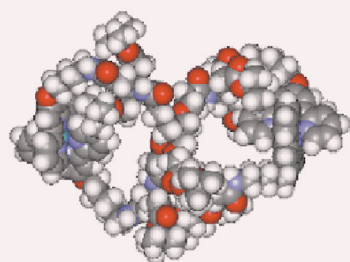


### Pseudopolymorphism in the *p*-tert-butylcalix[4]arene—*n*-butylamine system: directing the structural motifs

Konstantin A. Udachin, Gary D. Enright, Philip O. Brown and John A. Ripmeester\*

*p*-tert-Butylcalix[4]arene forms three compounds with *n*-butylamine, two weakly interacting guest–host compounds of 1:1 and 1:2 stoichiometry, as well as a hydrogen-bonded 3:1 compound containing some *n*-butylamine molecules not coordinated to the host.

2164

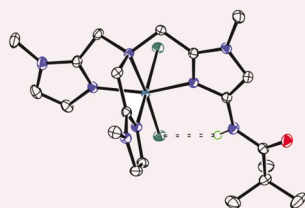


### Spirometallo dendrimers: terpyridine-based intramacromolecular cyclization upon complexation

George R. Newkome,\* Kyung Soo Yoo and Charles N. Moorefield

Intramacromolecular cyclization *via* terpyridine–metal–terpyridine complex formation has facilitated the creation of dendrimer-based spiranes.

2166

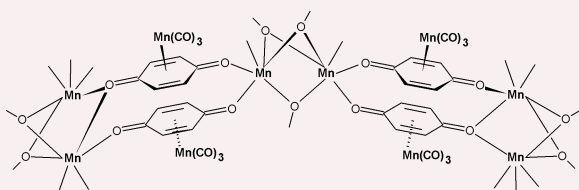


### Structure and properties of an Fe(III) complex containing a novel amide functionalized polyimidazole ligand

Lionel E. Cheruzel, Jianping Wang, Mark S. Mashuta and Robert M. Buchanan\*

A novel amide functionalized polyimidazole tripod ligand has been synthesized and used to prepare a mononuclear Fe(III) complex that has been characterized by X-ray crystallography and other physical methods.

2168



### A coordination network containing metal-organometallic secondary building units based on $\pi$ -bonded benzoquinone complexes

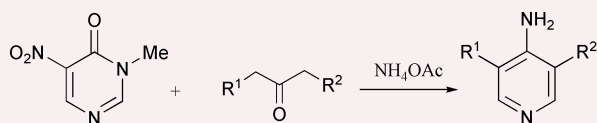
Moonhyun Oh, Gene B. Carpenter and Dwight A. Sweigart\*

Thermal treatment of ( $\eta^5$ -semiquinone) $Mn(CO)_3$  and  $Mn(OAc)_2$  in MeOH-DMSO produces a neutral 3D metal-organometallic network (MOMN) consisting of pairs of  $Mn^{2+}$  ions linked by ( $\eta^4$ -benzoquinone) $Mn(CO)_3^-$  spacers.

2170

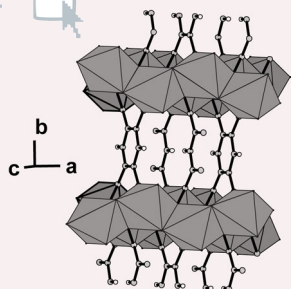
### Facile synthesis of functionalized 4-aminopyridines

Nagatoshi Nishiwaki,\* Mayumi Azuma, Mina Tamura, Kazushige Hori, Yasuo Tohda and Masahiro Ariga\*



Functionalized 4-aminopyridines are readily available by ring transformation by ring transformation of nitropyrimidinone with active methylene compounds in the presence of ammonium acetate.

2172

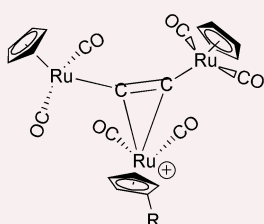


### [ $Fe_2(C_{10}O_8H_2)$ ]: An antiferromagnetic 3D iron(II) carboxylate built from ferromagnetic edge-sharing octahedral chains (MIL-62)

M. Sanselme, J. M. Grenèche, M. Riou-Cavellec\* and G. Férey\*

MIL-62 or [ $Fe_2(C_{10}O_8H_2)$ ] is the first three-dimensional iron hybrid compound based on ferromagnetic chains coupled antiferromagnetically by  $\pi$ -delocalized 1,2,4,5-benzenetetracarboxylates.

2174

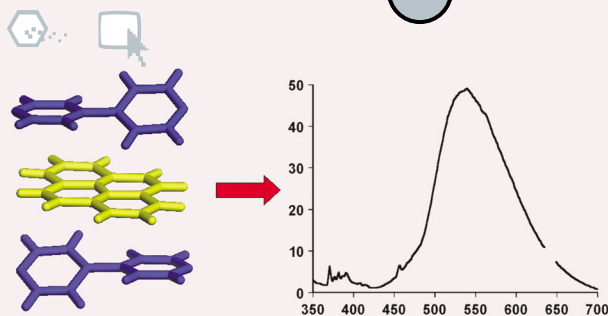


### Reactions of metalloalkynes. New $C_2$ bonding mode in a trimetallic complex

Christopher S. Griffith, George A. Koutsantonis,\* Brian W. Skelton and Allan H. White

A trimetallic cationic complex not containing metal-metal bonds has been synthesised which represents a new type of bonding mode for the  $C_2^{2-}$  ligand. Our investigation is suggestive of a labile ligand-metal interaction appearing to involve fluxional motion of the  $C_2^{2-}$  ligand about the bimetallic core.

2176

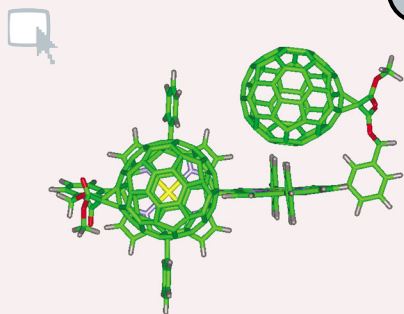


**Exciplex fluorescence of  $\{[\text{Zn}(\text{bipy})_{1.5}(\text{NO}_3)_2]\cdot\text{CH}_3\text{OH}\cdot 0.5\text{pyrene}\}_n$ : a coordination polymer containing intercalated pyrene molecules (bipy = 4,4'-bipyridine)**

Brian D. Wagner,\* Gregory J. McManus, Brian Moulton and Michael J. Zaworotko\*

Pyrene-bipyridine exciplex fluorescence is used to probe the polarity of the cavities in a ladder coordination polymer.

2178

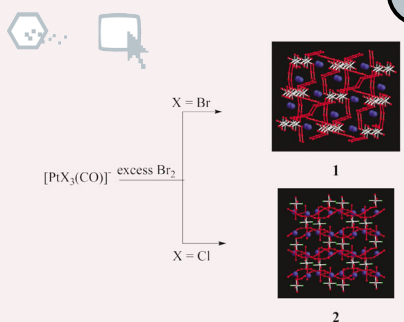


**Strong intramolecular chromophore interactions in novel bis([60]fullerene)-oligoporphyrin nanoarrays**

Davide Bonifazi and François Diederich\*

The synthesis of novel nanodimensional dyads was accomplished by *Bingel* reaction of a series of *meso,meso*-linked oligoporphyrin bis-malonates with  $\text{C}_{60}$ . Distinct conformational effects, together with changes in the porphyrin-centred UV-Vis absorption and a large quenching of the porphyrin fluorescence provide evidence for strong fullerene-porphyrin interactions in these systems.

2180



**Polymeric anionic networks using dibromine as a crosslinker; the preparation and crystal structure of  $[(\text{C}_4\text{H}_9)_4\text{N}]_2[\text{Pt}_2\text{Br}_{10}](\text{Br}_2)_7$  and  $[(\text{C}_4\text{H}_9)_4\text{N}]_2[\text{PtBr}_4\text{Cl}_2](\text{Br}_2)_6$**

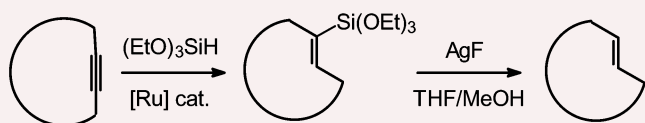
Michael Berkei, Jamie F. Bickley, Brian T. Heaton\* and Alexander Steiner

The reaction of  $\text{M}[\text{PtX}_3(\text{CO})]$  ( $\text{M}^+ = [(\text{C}_4\text{H}_9)_4\text{N}]^+$ ,  $\text{X} = \text{Br}, \text{Cl}$ ) with an excess of  $\text{Br}_2$  gives the new platinum(IV) salts,  $[(\text{C}_4\text{H}_9)_4\text{N}]_2[\text{Pt}_2\text{Br}_{10}](\text{Br}_2)_7$ , **1**, and  $[(\text{C}_4\text{H}_9)_4\text{N}]_2[\text{PtBr}_4\text{Cl}_2](\text{Br}_2)_6$ , **2**, which, in the solid state, contain strong Br Br interactions resulting in the formation of polymeric networks.

2182

**A chemo- and stereoselective reduction of cycloalkynes to (*E*)-cycloalkenes**

Alois Fürstner\* and Karin Radkowski



A sequence comprising a ruthenium catalyzed hydrosilylation followed by a protodesilylation reaction mediated by AgF allows for the mild and highly stereoselective conversion of cycloalkynes into (*E*)-cycloalkenes.

xxvi

Dates, venues and contact details of forthcoming events.

## COPIES OF CITED ARTICLES

The Library and Information Centre (LIC) of the RSC offers a first class Document Delivery Service for items in Chemistry and related subjects. Contact the LIC, The Royal Society of Chemistry, Burlington House, Piccadilly, London W1V 0BN, UK.

This service is only available from the LIC in London and not the RSC in Cambridge.

## ADVANCE CONTENTS LISTS

Contents lists in advance of publication are available on the web via [www.rsc.org/chemcomm](http://www.rsc.org/chemcomm) – or take advantage of our free e-mail alerting service ([www.rsc.org/ej\\_alert](http://www.rsc.org/ej_alert)) to receive notification each time a new list becomes available.

## ADVANCE ARTICLES AND ELECTRONIC JOURNAL

Free site-wide access to Advance Articles and the electronic form of this journal is provided with a full-rate institutional subscription. See [www.rsc.org/ejs](http://www.rsc.org/ejs) for more information.

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



Supplementary crystallographic data are available: see article for further information.



Electronic supplementary information is available on <http://www.rsc.org/esi>: see article for further information.

Dalton Discussion 6

Dalton Division

# ORGANOMETALLIC CHEMISTRY AND CATALYSIS

University of York, UK  
9 - 11 September 2003

**Chairman:** Professor Robin N Perutz *University of York, UK*

The Discussion will bring together experts in a rapidly progressing area that makes significant contributions to chemical development.

### Main themes will include:

- The Links to Enzymes and Biological Chemistry
- New Chemistry of C-H and C-F activation
- Asymmetric Catalysis and Polymerisation
- Organometallic Materials and Reactivity
- Mechanism and Method

### Call for Papers

Offers of papers related to the four themes for presentation/discussion or for poster presentation, are now invited. Please send a brief abstract (1 A4 page maximum) as soon as possible, and no later than **9 December 2002** (discussion papers) and **10 June 2003** (posters) to: Christine Hall, RSC, Burlington House, Piccadilly, London W1J 0BA UK  
tel: +44 (0) 20 7440 3336 fax: +44 (0) 20 7734 1227 email: [hallc@rsc.org](mailto:hallc@rsc.org)



**RSC**  
ROYAL SOCIETY OF CHEMISTRY

- Adams, Luke A., 2004  
 Adolfsson, Hans, 2046  
 Alfredsson, Maria, 2128  
 Alvaro, Mercedes, 2012  
 Anderson, James C., 2018  
 Anguille, Stéphane, 2018  
 Aoyagi, Masaru, 2036, 2038  
 Araki, Hiromi, 2148  
 Ariga, Masahiro, 2170  
 Armes, S. P., 2122  
 Ata, Masafumi, 2076  
 Azuma, Mayumi, 2170  
 Bailey, Rosalyn, 2018  
 Batail, Patrick, 2124  
 Baudron, Stéphane A., 2124  
 Bechger, L., 2054  
 Bergbreiter, David E., 2158  
 Berkei, Michael, 2180  
 Bickley, Jamie F., 2180  
 Bilenko, Vitaliy A., 2106  
 Biradha, Kumar, 2036  
 Blanchard, Philippe, 2160  
 Bögge, Hartmut, 2000  
 Bonar-Law, Richard P., 2108  
 Bonifazi, Davide, 2178  
 Børsting, Philip, 2140  
 Boubekeur, Kamal, 2124  
 Brooks, Neil R., 2132  
 Brown, Philip O., 2162  
 Brown, Richard C. D., 2042  
 Bruton, Gordon, 2042  
 Buchanan, Robert M., 2166  
 Büttin, V., 2122  
 Byrnes, Matthew J., 2040  
 Cai, Jun-Xiu, 2006  
 Calis, H. P. A., 2030  
 Camaioni, Nadia, 2028  
 Camiolo, Salvatore, 2084  
 Cao, Rong, 2144  
 Carley, Albert F., 2020  
 Carpenter, Gene B., 2168  
 Casalbore-Miceli, Giuseppe, 2028  
 Catlow, C. Richard A., 2128  
 Chah, Soonwoo, 2094  
 Chan, Albert S. C., 2112  
 Chaskar, Manohar G., 2014  
 Che, Chi-Ming, 2090  
 Chen, Zili, 2098  
 Cheruzel, Lionel E., 2166  
 Chikaura, Yasushi, 2152  
 Chisholm, Malcolm H., 2040  
 Chrétien, Michelle N., 2154  
 Clayden, Jonathan, 2138  
 Collier, Paul J., 2058  
 Constable, Edwin C., 2068  
 Corvaja, Carlo, 2028  
 Cosa, Gonzalo, 2154  
 Cox, Russell J., 2004  
 Danelón, Gerardo O., 2024  
 Davies, John E., 2106  
 Davies, Philip R., 2020  
 Davies, R. Jeremy H., 2136  
 Deluzet, André, 2124  
 Diederich, François, 2178  
 Dónaill, Dónall A. Mac, 2062  
 Dostal, Patrick, 2092  
 Enright, Gary D., 2162  
 Fendler, Janos H., 2094  
 Férey, G., 2172  
 Ferreira-Aparicio, Paloma, 2082  
 Ferrer, Belén, 2012  
 Foricher, Yann J. Y., 2138  
 Fox, Mark A., 2052  
 Franco, Lorenzo, 2028  
 Franken, Andreas, 2048  
 Fraser-Reid, Bert, 2104  
 Frère, Pierre, 2160  
 Fruk, Ljiljana, 2100  
 Fujita, Makoto, 2036, 2038  
 Fujiwara, Yoshihisa, 2148  
 Fukazawa, Yoshimasa, 2148  
 Funabashi, Ken, 1989  
 Fürstner, Alois, 2182  
 Gale, Philip A., 2084  
 Gao, Song, 2090  
 García, Hermenegildo, 2012, 2154  
 Georgakilas, Vasilios, 2010  
 Gibson, Jennifer S., 2004  
 Giese, Bernd, 2016  
 Girdhar, Navdeep K., 2102  
 Gómez, Ana M., 2022, 2024, 2104  
 Gouloumis, Andreas, 2056  
 Goumont, Régis, 2110  
 Graham, Duncan, 2100  
 Greatrex, Robert, 2052  
 Grenèche, J. M., 2172  
 Griffith, Christopher S., 2174  
 Grondin, Antonio, 2100  
 Guerrero-Ruiz, Antonio, 2082  
 Guldi, Dirk M., 2056  
 Gunnlaugsson, Thorfinnur, 2134, 2136  
 Haino, Takeharu, 2148  
 Hamoudi, Safia, 2118  
 Harikumar, K. R., 2020  
 Harte, Andrew J., 2134  
 Hattori, Tadashi, 2014  
 He, Xiang-E., 2006  
 Heaton, Brian T., 2180  
 Hillmyer, Marc A., 2132  
 Hitchcock, Peter B., 2078  
 Hobo, Hiroki, 2088  
 Hollowood, Christopher J., 2130  
 Hori, Kazushige, 2170  
 Horiba, Tomonori, 2156  
 Hoshi, Masayuki, 2146  
 Housecroft, Catherine E., 2068  
 Huang, Houjin, 2076  
 Huang, Jianguo, 2070  
 Huang, Rong-Bin, 2032  
 Hursthouse, Michael B., 2084, 2150  
 Hutchings, Graham J., 2058  
 Ichinose, Izumi, 2070  
 Ihara, Toshihiro, 2152  
 Iki, Nobuhiko, 2080  
 Inaba, Tomonori, 2088  
 Irie, Yasuhiko, 2156  
 Ishar, Mohan Paul S., 2102  
 James, Stuart L., 2008  
 Jiang, Biao, 2098  
 Jiang, Zhi-Yuan, 2032  
 Jones, Rhys V., 2020  
 Joy, Jonathan S., 2150  
 Jyo, Akinori, 2152  
 Kabuto, Chizuko, 2080  
 Kaliaguine, Serge, 2118  
 Kanai, Motomu, 1989  
 Kariuki, Benson M., 2068  
 Katagiri, Hiroshi, 2080  
 Kato, Jun, 2088  
 Kato, Yuko, 2014  
 Kelly, J. J., 2054  
 Kendrick, Thomas, 2016  
 Kennedy, John D., 2048  
 Kiely, Christopher J., 2058  
 Kilner, Colin A., 2048  
 Kippenberger, Andrew M., 2158  
 Kirby, Anthony J., 2106  
 Komarov, Igor V., 2106  
 Kondo, Mitsuru, 2156  
 Koshikawa, Hiroshi, 2088  
 Koutsantonis, George A., 2174  
 Koziol, K., 2074  
 Krishna, K., 2030  
 Kruger, Ryan G., 2092  
 Kunitake, Toyoki, 2070  
 Ladomenou, Kalliopi, 2108  
 Lam, Ho Kam, 2138  
 Landon, Philip, 2058  
 Lee, Alex H. F., 2112  
 Lee, Hing Ken, 2114  
 Leonard, Joseph P., 2134  
 Ley, Steven V., 2130  
 Li, Cong, 2034  
 Li, Tianhu, 2112  
 Liang, Jiang-Lin, 2090  
 Light, Mark E., 2084  
 Lightfoot, Andrew P., 2072  
 Lin, Bi-Zhou, 2126  
 Liu, Shi-Xiong, 2126  
 Long, Yingcai, 2064  
 López, J. Cristóbal, 2022, 2024, 2104  
 Lu, Caiyi, 2064  
 McCafferty, Dewey G., 2092  
 McManus, Gregory J., 2176  
 McMorran, David A., 2120  
 Maeda, Kenji, 2156  
 Maekawa, Yasunari, 2088  
 Maggini, Michele, 2028  
 Mashuta, Mark S., 2166  
 Matsunaga, Yoshiaki, 2080  
 Mayo-Martín, M. Belén, 2004  
 Menna, Enzo, 2028  
 Mercier, Nicolas, 2160  
 Metcalfe, Clive, 2026  
 Miller, Philip W., 2008  
 Miyana, Wataru, 2096  
 Miyano, Sotaro, 2080  
 Miyazawa, Makoto, 2156  
 Mobin, Shaikh M., 2050  
 Moon, Seongyun, 2088  
 Moorefield, Charles N., 2164  
 Moulton, Brian, 2176  
 Müller, Achim, 2000  
 Mulready, Sinead, 2136  
 Nagata, Kumi, 2116  
 Naito, Tetsuyoshi, 2156  
 Nakamura, Akira, 2156  
 Nakashima, Naotoshi, 2116  
 Nandakumar, M. V., 2104  
 Narita, Tadashi, 2088  
 Navakhun, Korakot, 2084  
 Newkome, George R., 2164  
 Nielsen, Poul, 2140  
 Nieuwenhuyzen, Mark, 2008, 2134, 2136  
 Nishiwaki, Nagatoshi, 2170  
 Nix, Roger M., 2128  
 Oh, Moonhyun, 2168  
 Ohkaya, Katsuo, 2096  
 Ormsby, Daniel L., 2052  
 Pal, Shantanu, 2050  
 Papworth, Adam J., 2058  
 Pastor, Isidro M., 2046  
 Paulidou, Anastasia, 2128  
 Paver, Michael A., 2150  
 Pedregosa, Ana, 2022, 2024  
 Pillai, Unnikrishnan R., 2142  
 Possamai, Giorgia, 2028  
 Prato, Maurizio, 2010  
 Pritchard, Robin G., 2072  
 Radhakrishnan, K. V., 2104  
 Radkowski, Karin, 2182  
 Ramm, Matthias, 2076  
 Rawson, Jeremy M., 2106  
 Reeves, Jonathan T., 2066  
 Rey, Fernando, 2012  
 Ridolfi, Giovanni, 2028  
 Riou, Amédée, 2160  
 Riou-Cavellec, M., 2172  
 Ripmeester, John A., 2162  
 Roberts, M. Wyn, 2020  
 Robertson, Alan, 2044  
 Rodríguez-Ramos, Inmaculada, 2082  
 Roy, Soumyajit, 2000  
 Ruzzi, Marco, 2028  
 Sagara, Takamasa, 2116  
 Sahle-Demessie, Endalkachew, 2142  
 Sanselme, M., 2172  
 Scaiano, J. C., 2154  
 Scanlan, Eoin M., 2086  
 Schmidtmann, Marc, 2000  
 Scorrano, Gianfranco, 2028  
 Sebban, Muriel, 2110  
 Seijger, G. B. F., 2030  
 Shaffer, M. S. P., 2074  
 Shi, Chun-Kai, 2006  
 Shibasaki, Masakatsu, 1989  
 Shinagawa, Reiko, 2156  
 Shinohara, Hisanori, 2010  
 Shirakawa, Kazuya, 2146  
 Singh, Vishwakarma, 2050  
 Skelton, Brian W., 2174  
 Smith, Christopher B., 2068  
 Smith, W. Ewen, 2100  
 Steel, Peter J., 2120  
 Steiner, Alexander, 2180  
 Stevenson, Clarke S., 2136  
 Sun, Xian-Ru, 2090  
 Swain, Nigel A., 2042  
 Sweigart, Dwight A., 2168  
 Tagmatarchis, Nikos, 2010  
 Takagi, Ryukichi, 2096  
 Tamura, Mina, 2170  
 Tamura, Yukiko, 2096  
 Tanaka, Shojiro, 2152  
 Tanimoto, Yoshifumi, 2148

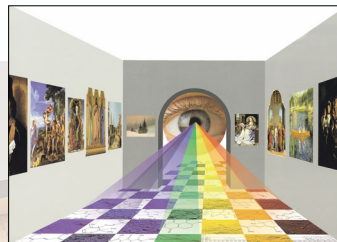
- Tao, Guoliang, 2158  
 Tashiro, Shohei, 2036, 2038  
 Tatsumi, Kazuyuki, 2144  
 Taylor, Roger, 2078  
 Terrier, François, 2110  
 Thomas, Jim A., 2026  
 Thornton-Pett, Mark, 2048  
 Tjerkstra, R. W., 2054  
 Tohda, Yasuo, 2170  
 Tolman, William B., 2132  
 Tominaga, Masahide, 2036, 2038  
 Torres, Tomás, 2056  
 Tsang, Shik Chi, 2044  
 Tsuruta, Hiroaki, 2116  
 Uchida, Fumio, 2156
- Udachin, Konstantin A., 2162  
 Uriel, Clara, 2104  
 Utsuno, Shunji, 2156  
 Valverde, Serafín, 2022, 2024  
 van den Bleek, C. M., 2030  
 van Driel, A. F., 2054  
 van Vugt, L. K., 2054  
 Vanmaekelbergh, D., 2054  
 Västilä, Patrik, 2046  
 Vázquez, Purificación, 2056  
 Viguier, Romain, 2136  
 Vos, W. L., 2054  
 Wagner, Brian D., 2176  
 Walter, Magnus, 2004  
 Walton, John C., 2086  
 Wan, Hayley, 2072
- Wang, Jianping, 2166  
 Warren, John E., 2072  
 Weaver, J. V. M., 2122  
 Webb, Michelle, 2026  
 White, Allan H., 2174  
 Whiting, Andrew, 2072  
 Whittingham, William, 2004  
 Williams, Charlotte K., 2132  
 Wipf, Peter, 2066  
 Wong, Henry N. C., 2114  
 Wong, Wing-Tak, 2034  
 Xie, Su-Yuan, 2032  
 Xie, Zhao-Xiong, 2032  
 Xiong, Wennan, 2098  
 Xu, Xingling, 2008  
 Yamaguchi, Akihisa, 2060
- Yang, Le-Fu, 2006  
 Yi, Jongheop, 2094  
 Yoo, Kyung Soo, 2164  
 Yoshida, Hisao, 2014  
 Yoshida, Masaru, 2088  
 Yoshizawa, Atsushi, 2060  
 Zaworotko, Michael J., 2176  
 Zhang, Lei, 2064  
 Zhang, X. X., 2090  
 Zhang, Xian-Hua, 2032  
 Zheng, Lan-Sun, 2032  
 Zhou, Li-Chuan, 2032  
 Zhu, Jie, 2044  
 Zhu, Nianying, 2090  
 Zhu, Xu-Hui, 2160

NOTE: An asterisk in the heading of each paper indicates the author who is to receive any correspondence.

## The Chemistry of Art

BY M BERRY, C OSBORNE, A PEPPIN

Produced in collaboration with the National Gallery, this resource pack explores the close relationship between the seemingly diverse worlds of Chemistry and the Arts. An exciting resource for both student and teacher it outlines a range of activities for pre- and post-16 students of Chemistry and Art. Printed in full colour throughout, the pack includes ten free A3 prints including *Titian - Bacchus and Ariadne*, *Renoir - Boating on the Seine* and *Canaletto - The Stonemason's Yard*. A must for both chemistry, and art, lovers alike.



### The pack includes:

- A guide to using the pack
- A3-sized prints of 10 paintings from the National Gallery, London
- A booklet with historical information on each painting, including details on the part science played in cleaning, conservation and restoration
- A booklet of experiments for pre-16 students
- A booklet for post-16 students

RESOURCE PACK · 2000 · ISBN 1 85709 282 1 · £19.50

10 free A3 prints of National Gallery paintings with every pack!

[www.rsc.org/is/books/art.htm](http://www.rsc.org/is/books/art.htm)

ROYAL SOCIETY OF CHEMISTRY *Investing in Chemical Science*

Orders & further details Sales & Customer Care Dept  
 Royal Society of Chemistry · Thomas Graham House  
 Science Park · Milton Road · Cambridge · CB4 0WF · UK

T +44(0)1223 432360 · F +44(0)1223 426017 · E [sales@rsc.org](mailto:sales@rsc.org)  
 Or visit our websites: [www.rsc.org](http://www.rsc.org) and [www.chemsoc.org](http://www.chemsoc.org)  
 Registered Charity No. 207890

**RS·C**  
 ROYAL SOCIETY OF CHEMISTRY