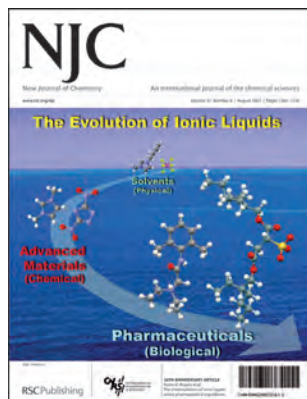


## IN THIS ISSUE

ISSN 1144-0546 CODEN NJCHES 31(8) 1381–1536 (2007)



### Cover

See Robin D. Rogers *et al.*, p. 1429. The evolution of ionic liquids from solvents of unknown toxicity to active pharmaceutical ingredients is illustrated. Image reproduced with permission from Robin Rogers.

## CHEMICAL SCIENCE

### C57

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



## LETTERS

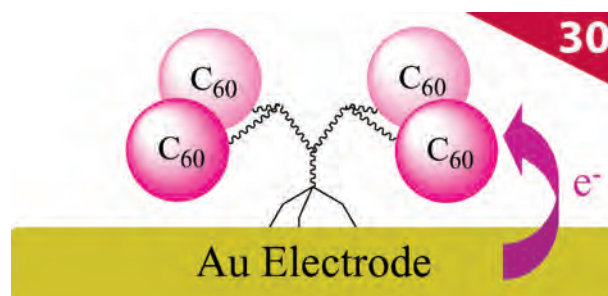


### 1395

#### Fullerodendrimers with a tris-isothiocyanate core allowing their anchoring onto gold electrodes

Jose Antonio Camerano, Miguel Angel Casado,\*  
Uwe Hahn, Jean-François Nierengarten,\*  
Emmanuel Maisonhaute\* and Christian Amatore\*

**30th Anniversary article:** Electrochemical studies of dendrimers with peripheral fullerene subunits and a tris-isothiocyanate core adsorbed onto electrodes revealed that electron transfer to the C<sub>60</sub> subunits occurs through space at a short electrode–C<sub>60</sub> distance.



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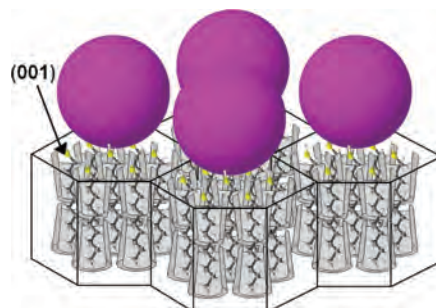
## LETTERS

1400

**Ordered arrangement of gold nanoparticles on an  $\alpha$ -cyclodextrin–dodecanethiol inclusion compound produced by magnetron sputtering**

L. Barrientos, N. Yutronic, F. del Monte, M. C. Gutiérrez and P. Jara\*

An ordered self-assembly of gold nanoparticles onto microcrystal faces of an  $\alpha$ -cyclodextrin–dodecanethiol inclusion compound by means of a magnetron sputtering technique was obtained. Preferential deposition on the (001) plane of the crystal occurs because –SH groups from the guest molecules found within the  $\alpha$ -cyclodextrin protrude into that plane.

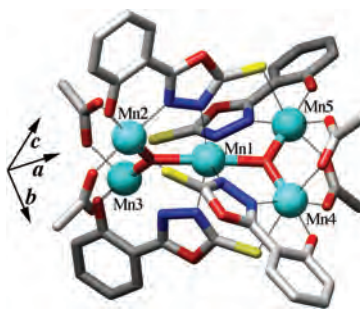


1403

**Synthesis, crystal structure and magnetic properties of a new mixed-valence  $[\text{Mn}_4^{\text{III}}\text{Mn}^{\text{II}}]$  pentanuclear complex**

Chahrazed Beghidja, Guillaume Rogez\* and Richard Welter\*

A novel pentanuclear mixed-valence manganese  $[\text{Mn}_4^{\text{III}}\text{Mn}^{\text{II}}]$  complex has been synthesized, structurally and magnetically characterized and presents a butterfly-type spin topology with competing antiferromagnetic interactions.

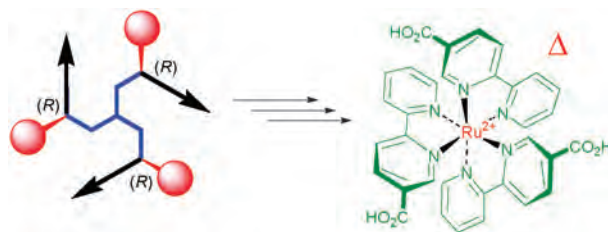


1407

**Enantiomeric programming in tripodal transition metal scaffolds**

Nicholas C. Fletcher,\* Ciarán Martin and Heather J. Abraham

A new route to the isolation of enantiopure the tris-chelate complexes ( $\Delta$ ) and ( $\Lambda$ )- $\text{fac-}[\text{Ru}(\text{L}^1)_3]^{2+}$  has been achieved where the transition metal centre retains the memory of a simple chiral tripodal tether without protracted crystallisation or chromatographic procedures.

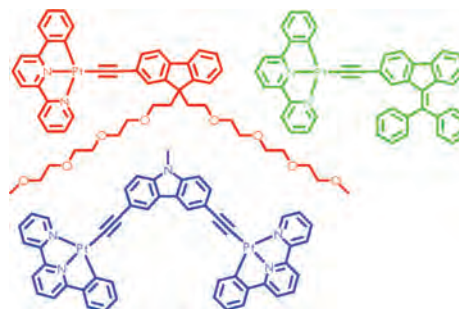


1412

**Design and preparation of neutral substituted fluorene- and carbazole-based platinum(II)–acetylide complexes**

Julie Batcha Seneclauze, Pascal Retailleau and Raymond Ziessel\*

Novel platinum(II) complexes have been engineered from fluorene or carbazole frameworks carrying various flexible and rigid appendages.



# Lust and Love

## Is it more than chemistry?

By Gabriele and Rolf Froböse

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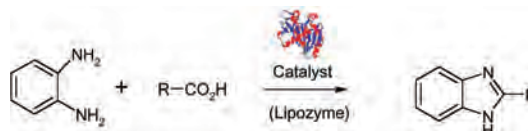
## LETTERS

1417

**First simple and mild synthesis of 2-alkylbenzimidazoles involving a supported enzymatic catalyst**

Gilbert Renard\* and Dan A. Lerner

New one step enzymatic synthesis of 2-alkyl-benzimidazoles from free acids using Lipozyme in an organic solvent as catalyst.

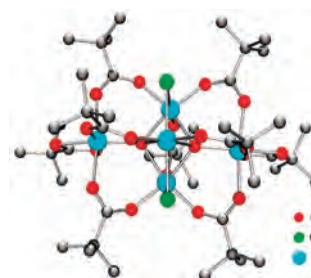


1421

**Solid state synthesis of  $[V_5O_2(Me_3CCO_2)_9Cl_2]$** 

E. Carolina Sañudo, Joan Ribas and Richard E. P. Winpenny\*

A new pentanuclear vanadium(III) cluster is reported that has an  $S = 1$  spin ground state.

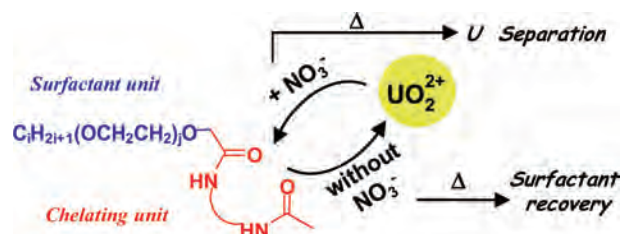


1424

**Nonionic metal-chelating surfactants mediated solvent-free thermo-induced separation of uranyl**

Chantal Larpent,\* Sylvain Prévost, Laurence Berthon, Thomas Zemb and Fabienne Testard

The cloud point extraction of  $U(VI)$  is efficiently achieved by using thermo-responsive uranyl-binding functional surfactants.



## PAPERS

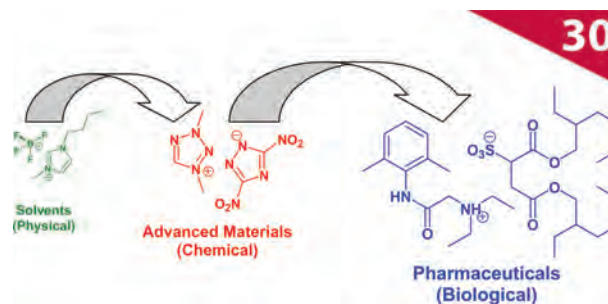


1429

**The third evolution of ionic liquids: active pharmaceutical ingredients**

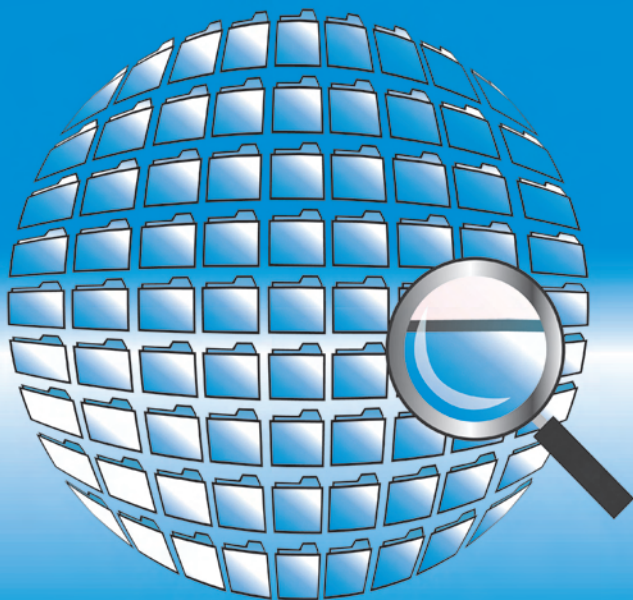
Whitney L. Hough, Marcin Smiglak, Héctor Rodríguez, Richard P. Swatloski, Scott K. Spear, Daniel T. Daly,\* Juliusz Pernak,\* Judith E. Grisel, Richard D. Carliss,\* Morgan D. Soutullo, James H. Davis, Jr.\* and Robin D. Rogers\*

**30th Anniversary article:** Ionic liquids deserve consideration as not only solvents, but as materials with tunable biological, as well as the well known physical and chemical, properties of ILs.





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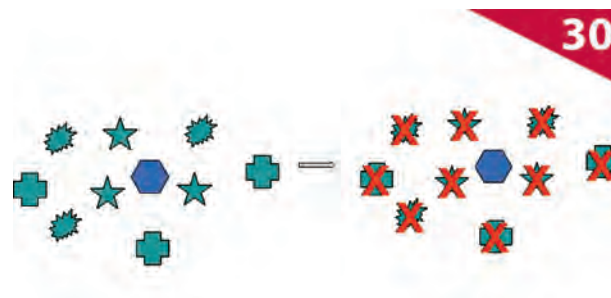
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1437

### Metal-directed assembly of combinatorial libraries—principles and establishment of equilibrated libraries with oligopyridine ligands

Barbara Brisig, Edwin C. Constable\* and Catherine E. Housecroft

**30th Anniversary article:** Dynamic libraries of cobalt(II) complexes of oligopyridine ligands have been quantified by NMR methods and a new type of destructive amplification demonstrated.

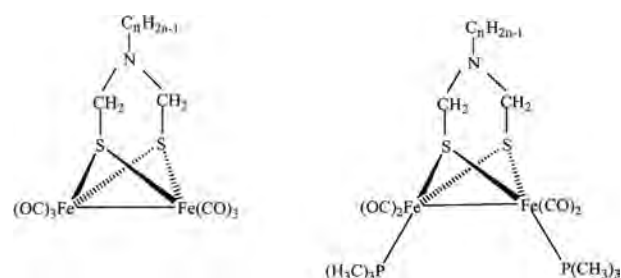


1448

### (*N*-C<sub>*n*</sub>H<sub>2*n*-1</sub>)-1,3-Azapropanedithiolate (*n* = 5, 6, 7)-bridged diiron complexes as mimics for the active site of [FeFe]-hydrogenases: the influence of the bridge on the diiron complex

Youtao Si, Chengbing Ma, Mingqiang Hu, Hui Chen, Changneng Chen\* and Qiutian Liu

A new series of (*N*-C<sub>*n*</sub>H<sub>2*n*-1</sub>)-1,3-azapropanedithiolate-bridged diiron compounds have been synthesized, and the influence of different ADT bridges on the diiron complexes has been studied.

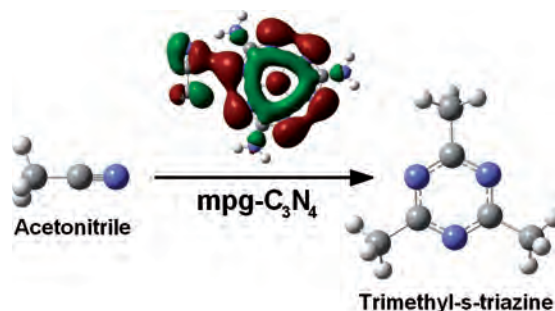


1455

### Mesoporous graphitic carbon nitride as a versatile, metal-free catalyst for the cyclisation of functional nitriles and alkynes

Frédéric Goettmann, Anna Fischer, Markus Antonietti and Arne Thomas\*

Due to its electronic properties, mesoporous graphitic C<sub>3</sub>N<sub>4</sub> proved to be an effective metal-free catalyst for the cyclotrimerisation of nitriles and alkynes, being able to accommodate functional substrates like alcohols, halogenides, aromatic molecules and carboxylates.

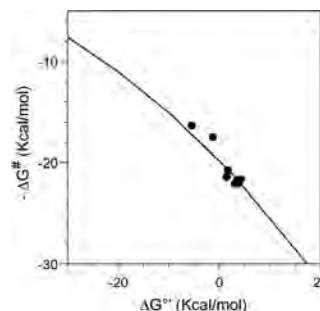


1461

### Oxidation of phenols employing polyoxometalates as biomimetic models of the activity of phenoloxidase enzymes

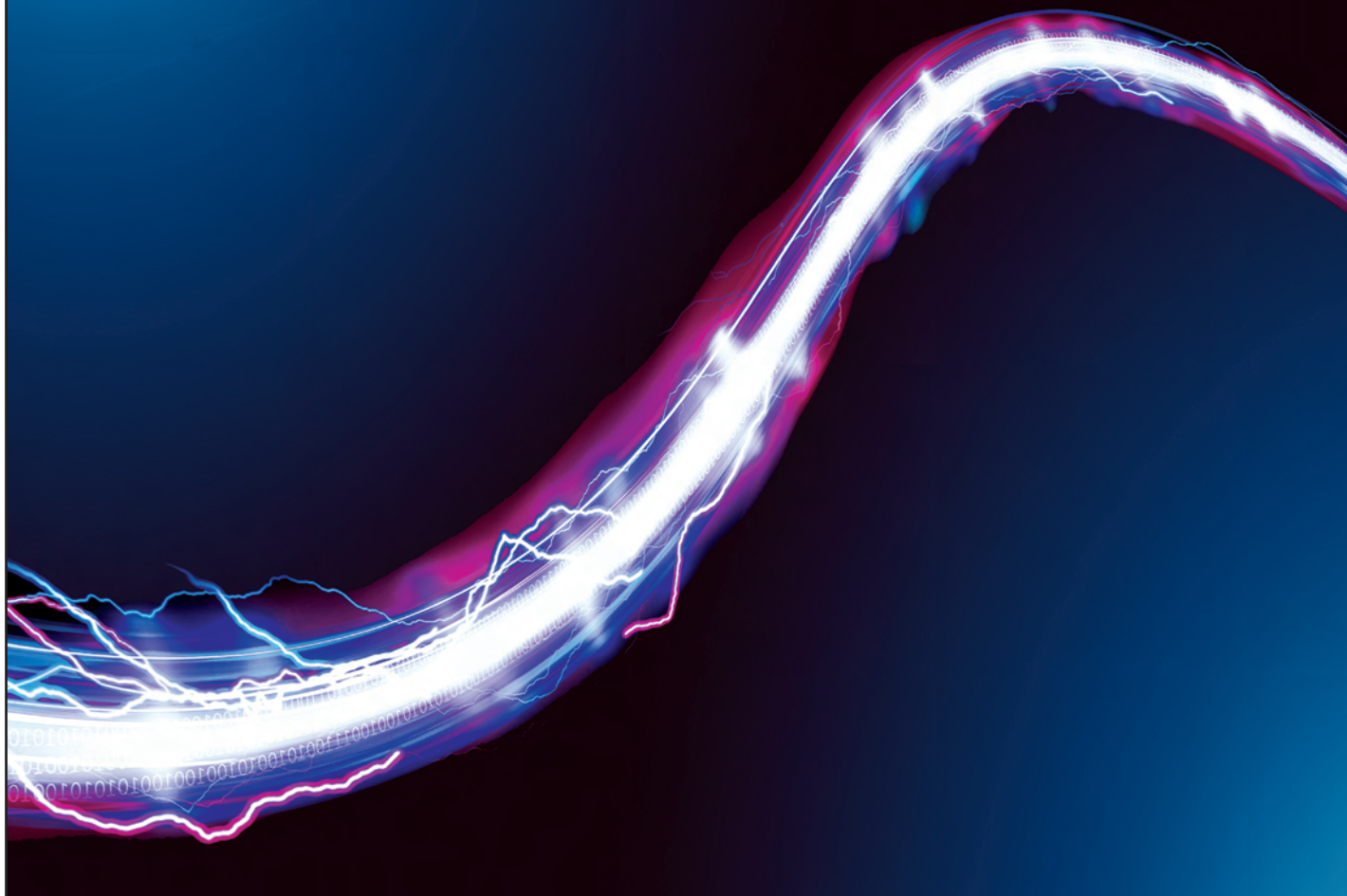
Carlo Galli,\* Patrizia Gentili,\* Ana Sofia Nunes Pontes, Jose A. F. Gamelas and Dmitry V. Evtuguin

Marcus plot for the oxidation of substituted phenols by SiW<sub>11</sub>V, in buffered (pH = 4) aqueous solution at 50 °C.



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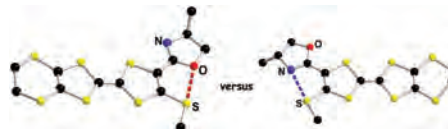


1468

**O...S vs. N...S intramolecular nonbonded interactions in neutral and radical cation salts of TTF-oxazoline derivatives: synthesis, theoretical investigations, crystalline structures, and physical properties**

Céline Réthoré, Augustin Madalan, Marc Fourmigué,\*  
Enric Canadell, Elsa B. Lopes, Manuel Almeida,  
Rodolphe Clérac and Narcis Avarvari\*

Intramolecular O...S or N...S nonbonded interactions are established in a series of neutral and conducting radical cation salts of TTF-oxazoline derivatives.

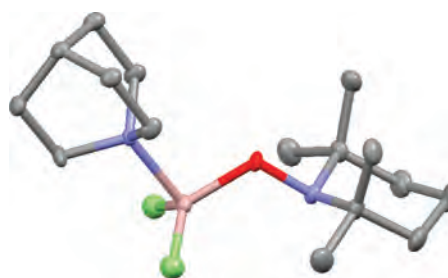


1484

**Synthesis and characterisation of tetramethylpiperidinyloxiide (TEMPO) complexes of group 13 metal hydrides**

Cameron Jones\* and Richard P. Rose

The first examples of nitroxide-group 13 hydride complexes (*e.g.* see picture) have been prepared in reactions of 2,2',6,6'-tetramethylpiperidinyloxiide (TEMPO) with quinuclidine adducts of aluminium trihydride or gallium trihydride, [MH<sub>3</sub>(quinuclidine)]. The outcome of the reaction of TEMPO with [InH<sub>3</sub>(quinuclidine)] is also reported.

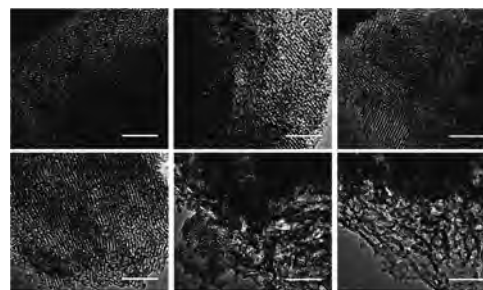


1488

**Mesostructural control of non-silica-based hybrid mesoporous film composed of aluminium ethylenediphosphonate using triblock copolymer and their TEM observation**

Tatsuo Kimura\* and Kazumi Kato

Mesostructural control of non-silica-based hybrid mesoporous films composed of aluminium ethylenediphosphonate prepared using different amounts of EO<sub>80</sub>PO<sub>30</sub>EO<sub>80</sub> was investigated in detail by TEM observations.



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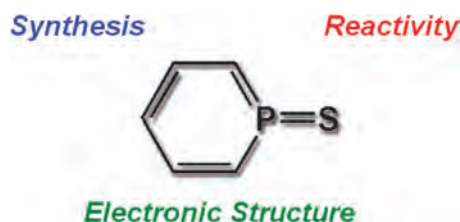


1493

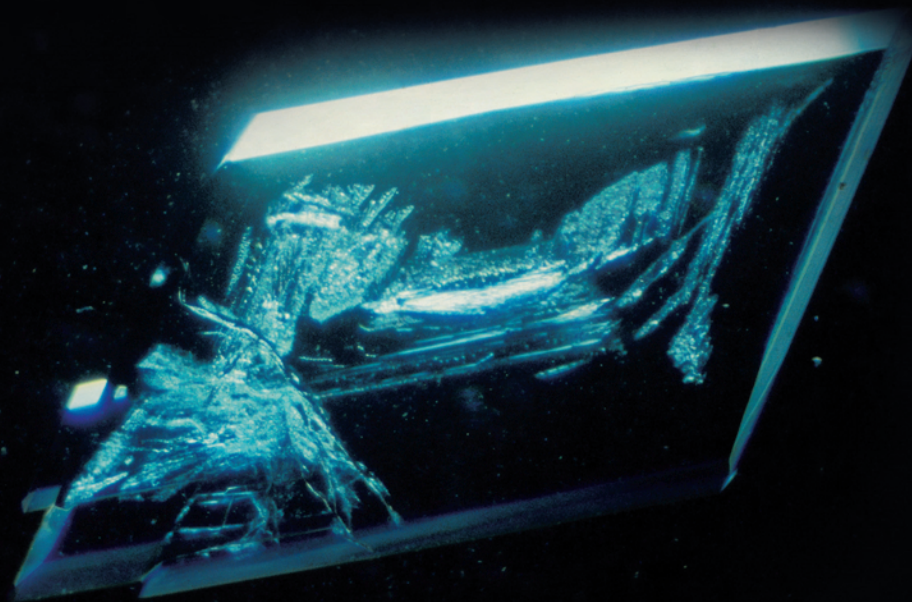
**Experimental and theoretical study of phosphinine sulfides**

Audrey Moores, Thibault Cantat, Louis Ricard,  
Nicolas Mézailles and Pascal Le Floch\*

The synthesis and first X-ray characterisation of phosphinine sulfides are presented as well as their electronic structure.



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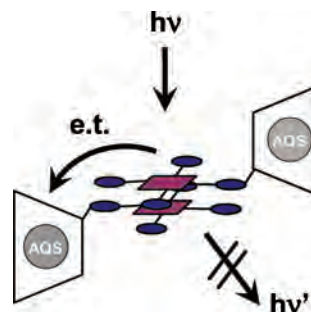
## PAPERS

1499

**Spectroscopic and self-association behavior of a porphyrin- $\beta$ -cyclodextrin conjugate**

A. Puglisi, R. Purrello, E. Rizzarelli, S. Sortino\* and G. Vecchio\*

A novel porphyrin-cyclodextrin conjugate shows a marked tendency to self-arrange as a supramolecular dimer, exhibiting strong exciton coupling. Incorporation of suitable guests within the cyclodextrin cavity significantly influences the spectroscopic properties of the dimer and facilitates the occurrence of intramolecular photoinduced electron transfer between the guest and the porphyrin unit.

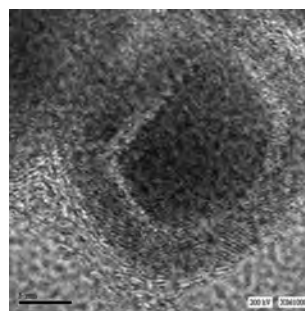


1507

**Air-stable Fe and Co crystalline nanocomposite particles prepared by a single-step swelling of metal precursors within polystyrene microspheres of narrow size distribution**

Nava Shpaisman and Shlomo Margel\*

Polystyrene microspheres dispersed in aqueous solution have been used to entrap  $\text{Fe}_3(\text{CO})_{12}$  or  $\text{Co}_2(\text{CO})_8$  by a single-step swelling process of methylene chloride and benzene emulsion droplets containing these complexes, followed by thermal decomposition to obtain air-stable Fe and Co nanoparticles.

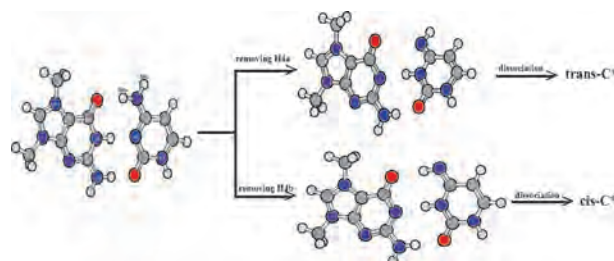


1514

**Pairing strength and proton characters of the N7,N9-dimethylated GC and AT base pairs: a density functional theory investigation**

Dianxiang Xing, Xiaohua Chen and Yuxiang Bu\*

Methylation of purine moieties at their N7 and N9 sites may significantly change the pairing strength and proton properties of GC and AT base pairs.

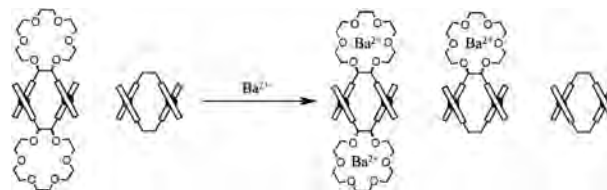


1525

**Electrostatic control of the formation of heteroleptic transition metal helicates**

Christian J. Baylies, Lindsay P. Harding, John C. Jeffery, Ryan Moon, Craig R. Rice\* and T. Riis-Johannessen

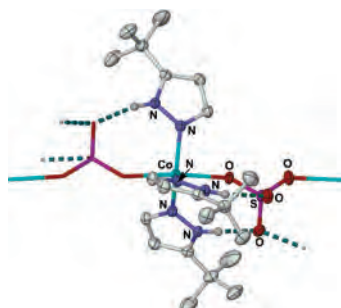
The potentially hexadentate ditopic ligand  $\text{L}^1$  which contains both N-donor and O-donor binding domains forms a dinuclear double helicate with zinc ions ( $[\text{Zn}_2(\text{L}^1)_2](\text{ClO}_4)_4$ ) and can further coordinate barium ions. This coordination of  $\text{Ba}^{2+}$  changes the recognition properties of the ligand *via* electrostatic effects.



## PAPERS



1530

**A comparison of different methods for fitting susceptibility data of cobalt(II) coordination polymers in a new cobalt(II)/sulfate 1-D chain**

Leigh F. Jones, Colin A. Kilner and Malcolm A. Halcrow\*

An empirical approach to modelling susceptibility data for a 1-D cobalt(II) coordination polymer gives identical or superior results to two different Heisenberg chain models, while avoiding errors induced by neglecting zero-field splitting.

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