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#### IN THIS ISSUE

ISSN 1144-0546 CODEN NJCHES 32(7) 1081-1268 (2008)



#### Cover

See Collomb et al., pp. 1117–1123. The cover image shows oligomeric structures being deposited onto a platinum electrode, represented here as a shiny disk. This depiction is housed in a cube formed by some of the cyclic voltammograms recorded during the electrodeposition process. The slight transparency of the frame allows the gorgeous mountains surrounding Grenoble to be viewed in the background. Image reproduced by permission of Marie-Noëlle Collomb from New J. Chem., 2008, 32, 1117.



#### Inside Cover

See Bünzli et al., pp. 1140–1152. The cover page illustrates the staining of HeLa (cervix cancer) cells stained by a bimetallic europium helicate, which penetrates into their cytoplasm. as demonstrated by the nucleus-staining agent acridine orange (AO, in green). Image reproduced by permission of Jean-Claude Bünzli from New J. Chem., 2008, **32**, 1140.

#### CHEMICAL SCIENCE

#### C49

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 and significant scientific advances.

### **Chemical Science**

July 2008/Volume 5/Issue 7

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#### **LETTER**

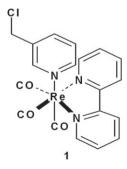


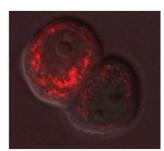
#### 1097

3-Chloromethylpyridyl bipyridine fac-tricarbonyl rhenium: a thiol-reactive luminophore for fluorescence microscopy accumulates in mitochondria

Angelo J. Amoroso, Richard J. Arthur, Michael P. Coogan,\* Jonathan B. Court, Vanesa Fernández-Moreira, Anthony J. Hayes, David Lloyd, Coralie Millet and Simon J. A. Pope

1 is a thiol-selective rhenium fluorophore with a long lifetime and a large Stokes shift that accumulates in the mitochondria of human breast adenocarcinoma cells, providing a <sup>3</sup>MLCT analogue of the MitoTracker<sup>™</sup> probes.





1 in MCF-7 cells

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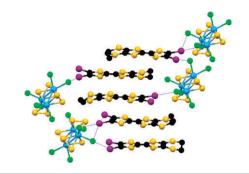
#### **LETTERS**

#### 1103

Halogen bonding interactions with the IMo<sub>3</sub>S<sub>7</sub>Cl<sub>6</sub>l<sup>2</sup> cluster anion in the mixed valence salt [EDT-TTFI<sub>2</sub>]<sub>4</sub>[Mo<sub>3</sub>S<sub>7</sub>Cl<sub>6</sub>] · CH<sub>3</sub>CN

Antonio Alberola, Marc Fourmigué,\* Carlos J. Gómez-García, Rosa Llusar\* and Sonia Triguero

Electrocrystallization of iodinated TTF molecules in presence of trinuclear [Mo<sub>3</sub>S<sub>7</sub>Cl<sub>6</sub>]<sup>2-</sup> cluster anions provides the first example of radical salts with halogen bonding interactions at the organic/inorganic interface.

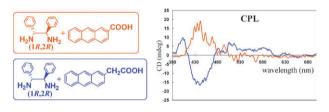


#### 1110

#### Control of circularly polarized luminescence (CPL) properties by supramolecular complexation

Yoshitane Imai,\* Kenta Kawano, Yoko Nakano, Kakuhiro Kawaguchi, Takunori Harada, Tomohiro Sato, Michiya Fujiki, Reiko Kuroda and Yoshio Matsubara\*

The sign CPL of a chiral 2<sub>1</sub>-helical columnar organic fluorophore was successfully controlled by changing an achiral fluorescence component molecule and not by using a chiral component molecule with opposite chirality.

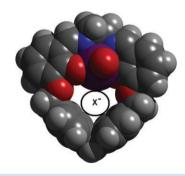


#### 1113

#### Specific recognition of fluoride anion using a metallamacrocycle incorporating a uranyl-salen unit

Massimo Cametti, Antonella Dalla Cort, Luigi Mandolini,\* Maija Nissinen and Kari Rissanen\*

This newly synthesised neutral receptor binds fluoride anions in DMSO with a high affinity constant  $(K > 10^6 \text{ M}^{-1})$  while exhibiting a negligible affinity  $(K \le 10 \text{ M}^{-1})$  towards otherwise effective competitors, such as acetate, phosphate and cyanide anions.



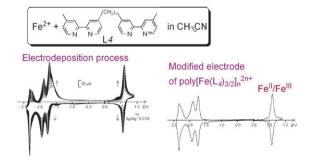
#### **PAPER**

#### 1117

Electrochemical behaviour of interaction between Fe<sup>2+</sup> with bisbipyridyl ligands in CH<sub>3</sub>CN. Application to an easy electrochemical procedure for tailoring films of  $Fe(bpy)_3^{2+}$  like cores (bpy = 2,2'-bipyridine)

Jean Lombard, Jean-Claude Leprêtre, Damien Jouvenot, Alain Deronzier\* and Marie-Noëlle Collomb\*

A simple electrochemical procedure to tailor very robust thin films containing the Fe(bpy)<sub>3</sub><sup>2+</sup>-like core, based on the electroreductive precipitation of soluble oligomers formed by mixing Fe<sup>2+</sup> and alkyl bridged bis-bipyridyl ligands.





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#### 1124

Palladium(0) nanoparticles encapsulated in diaminemodified glycidyl methacrylate polymer (GMA-CHDA) applied as catalyst of Suzuki-Miyaura cross-coupling reaction

Anna M. Trzeciak,\* Ewa Mieczyńska, Józef J. Ziółkowski, Wiktor Bukowski, Agnieszka Bukowska, Jarosław Noworól and Janina Okal

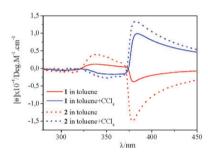
Diamine-modified glycidyl methacrylate polymer was used to encapsulate Pd(0) nanoparticles 4–15 nm in diameter, applied as a catalyst of Suzuki–Miyaura reactions.

#### 1131

Influence of the gelator structure and solvent on the organisation and chirality of self-assembling fibrillar networks

Quoc Nghi Pham, Nicolas Brosse, Céline Frochot, Dominique Dumas, Alexandre Hocquet and Brigitte Jamart-Grégoire\*

CD experiments show that the nature of the solvent can modify the chirality of self-assembled aggregates.

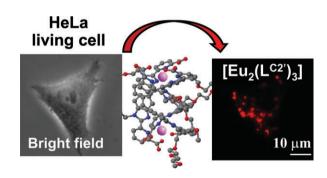


#### 1140

Effect of the length of polyoxyethylene substituents on luminescent bimetallic lanthanide bioprobes

Emmanuel Deiters, Bo Song, Anne-Sophie Chauvin, Caroline D. B. Vandevyver and Jean-Claude G. Bünzli

The self-assembled Eu<sup>III</sup> bimetallic helicate with a new homoditopic ligand fitted with hexakis(oxyethylene) pendants displays high thermodynamic stability, no cytotoxicity, and stains the cytoplasm of HeLa cells.

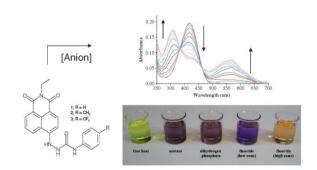


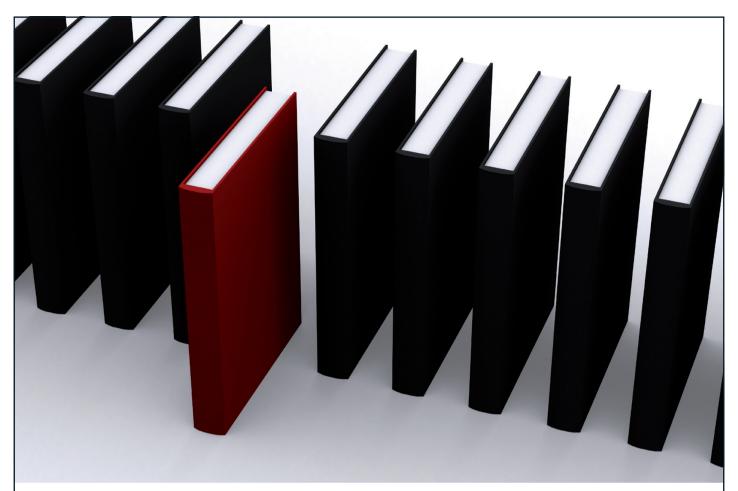
#### 1153

Colorimetric 'naked-eye' and fluorescent sensors for anions based on amidourea functionalised 1,8-naphthalimide structures: anion recognition *via* either deprotonation or hydrogen bonding in DMSO

Haslin Dato Paduka Ali, Paul E. Kruger\* and Thorfinnur Gunnlaugsson\*

The sensing of anions using charge neutral colorimetric sensors is described. We demonstrate that the anion recognition has significant effect on both the absorption and the flourescence emission spectra.





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#### 1162

#### Insights on the chemistry of a,c-biladienes from a CSPT investigation

Roberto Paolesse,\* Adriano Alimelli, Arnaldo D'Amico, Mariano Venanzi, Gionata Battistini, Marco Montalti, Daniel Filippini, Ingemar Lundström and Corrado Di Natale

A computer set and a web camera have been exploited as spectroscopic technique to characterize novel features of the a,c-biladiene chemistry.

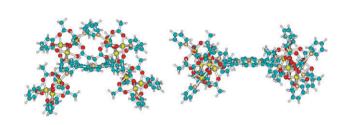


#### 1167

Contrasting photoelectrochemical behaviour of two isomeric supramolecular dyes based on meso-tetra(pyridyl)porphyrin incorporating four (µ<sub>3</sub>-oxo)- triruthenium(III) clusters

André Luiz Barboza Formiga, Ana Flavia Nogueira, Koiti Araki and Henrique Eisi Toma\*

Two isomeric, saddle shaped and planar supramolecular dyes based on porphyrin-ruthenium clusters have been investigated, exhibiting contrasting photoelectrochemical in dye sensitized solar cells.



#### 1175

#### Synthesis of "calixarene-like" N,N-ditosyldiaza[3.3](1,4)naphthalenophanes

Huu-Anh Tran, Julie Collins and Paris E. Georghiou\*

A series of new tetrahomodiazacalix[2]naphthalenes, containing 2,3-dialkoxy-substituted naphthalene units and showing highly symmetrical and conformationally rigid "calixarene-like" 1,3- alternate type structures, have been synthesized and some of their properties are reported.

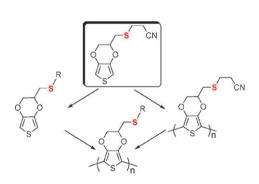


#### 1183

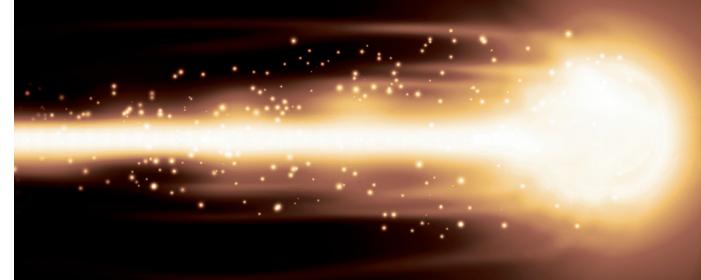
#### A versatile building block for EDOT or PEDOT functionalization

Mirela Balog, Houari Rayah, Franck Le Derf\* and Marc Sallé\*

An EDOT-based building block bearing a thiolate function has been synthesized and exploited for a convenient access to various monomers, as well as for the direct functionalization of preformed PEDOT-based films.



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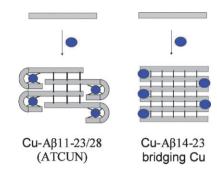
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#### 1189

#### Amyloid fibrils: modulation of formation and structure by copper(II)

Vincent Pradines, Alina Jurca Stroia and Peter Faller\*

The role of Cu<sup>II</sup>-complexation of amyloidogenic peptides on the formation and structure of aggregates were analyzed. The results mimicked various facets of biological relevant peptides/ protein-aggregation. Important mechanistic features are the ability of Cu<sup>II</sup> to associate the peptides by bridging coordination, the structural changes induced by Cu<sup>II</sup> binding and their effect on peptide-peptide interactions.

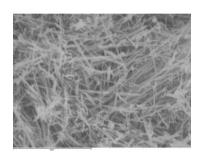


#### 1195

#### An electrochemical comparison of manganese dioxide microparticles versus α and β manganese dioxide nanorods: mechanistic and electrocatalytic behaviour

Christopher Batchelor-McAuley, Lidong Shao, Gregory G. Wildgoose, Malcolm L. H. Green and Richard G. Compton\*

The comparative electrochemical behaviour of both  $\alpha$ - and β-nanorods of manganese dioxide (MnO<sub>2</sub>) and microparticles of predominantly β-phase manganese dioxide is investigated at pHs close to neutral.

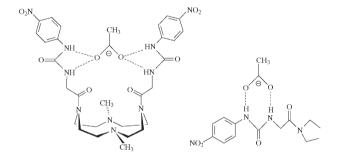


#### 1204

#### New branched macrocyclic ligand and its side-arm, two urea-based receptors for anions: synthesis, binding studies and crystal structure

Mauro Formica, Vieri Fusi,\* Eleonora Macedi, Paola Paoli, Giovanni Piersanti, Patrizia Rossi, Giovanni Zappia and Pierfrancesco Orlando

Synthesis and binding properties of two new urea based receptors in binding anions such as chloride and acetate. The effect of preorganized side-arms in binding acetate.

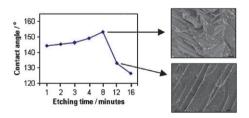


#### 1215

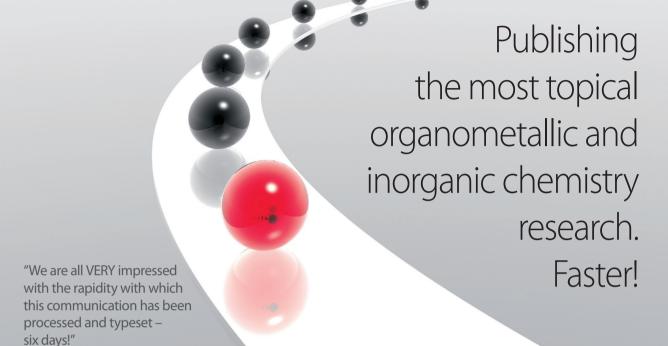
#### Assessment of roughness and chemical modification in determining the hydrophobic properties of metals

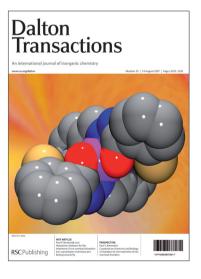
Iain A. Larmour, Graham C. Saunders and Steven E. J. Bell\*

An investigation of roughness and surface energy, criteria essential for increasing hydrophobicity of industrially significant metals, allows a reappraisal of the simple 'etch and coat' techniques thereby providing a general design protocol.



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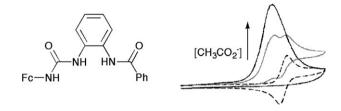


#### 1221

#### Anion-triggered electrodeposition in ferrocenefunctionalised ortho-phenylenediamine-based receptors

Marta Arroyo, Peter R. Birkin, Philip A. Gale,\* Sergio E. García-Garrido and Mark E. Light

Ferrocene-functionalised anion receptors based on an orthophenylenediamine scaffold have been shown to undergo aniontriggered electrochemical deposition. This process may offer a new way of detecting anionic species in solution.

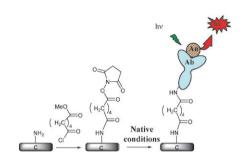


#### 1228

#### Covalent immobilization of antibodies on electrochemically functionalized carbon surfaces

Stéphanie Dauphas, Anne Corlu, Christiane Guguen-Guillouzo, Soraya Ababou-Girard, Olivier Lavastre and Florence Geneste\*

An effective and general protocol of functionalization has been successfully used to covalently anchor sensitive biomolecules such as antibodies to carbon surfaces.

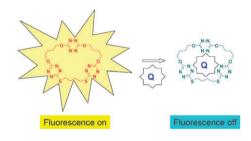


#### 1235

#### Preparation and physicochemical studies of new multiple rings s-tetrazines

Yong-Hua Gong, Pierre Audebert,\* Gilles Clavier, Fabien Miomandre, Jie Tang, Sophie Badré, Rachel Méallet-Renault and Elliot Naidus

Supramolecular arrangement of tetrazines can enhance fluorescence quenching.

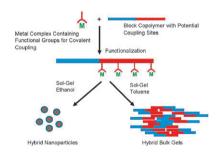


#### 1243

#### Solvent effects in the formation of hybrid materials based on titanium alkoxide-polysiloxane precursors

Sorin Ivanovici, Christoph Rill, Thomas Koch, Michael Puchberger and Guido Kickelbick\*

Depending on the solvent, i.e. ethanol or toluene, either nanoparticles or gels were obtained using polysiloxane-metal alkoxide precursors in the sol-gel process.



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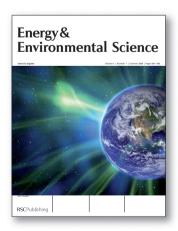


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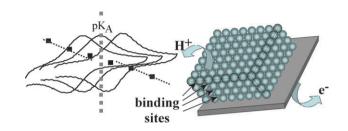
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#### 1253

#### Binding site control in a layer-by-layer deposited chitosan-carbon nanoparticle film electrode

Liza Rassaei, Michael J. Bonné, Mika Sillanpää and Frank Marken\*

pH-dependent chemisorption and physisorption processes are shown to occur with chitosan in a carbon nanoparticle composite film acting as the active binding site.



#### 1259

#### Anodic oxidation of indenofluorene. Electrodeposition of electroactive poly(indenofluorene)

Joëlle Rault-Berthelot,\* Cyril Poriel, Frédéric Justaud and Frédéric Barrière

Poly(indenofluorene) films are electrochemically deposited on anode surfaces and compared with polyfluorene films.

$$\frac{E^1}{ox} \xrightarrow{E^2} \frac{0.0 \text{ V}}{ox} \xrightarrow{\text{Poly(IF)}} r$$

#### **AUTHOR INDEX**

Ababou-Girard, Soraya, 1228 Alberola, Antonio, 1103 Ali, Haslin Dato Paduka, Alimelli, Adriano, 1162 Amoroso, Angelo J., 1097 Araki, Koiti, 1167 Arroyo, Marta, 1221 Arthur, Richard J., 1097 Audebert, Pierre, 1235 Badré, Sophie, 1235 Balog, Mirela, 1183 Barrière, Frédéric, 1259 Batchelor-McAuley, Christopher, 1195 Battistini, Gionata, 1162 Bell, Steven E. J., 1215 Birkin, Peter R., 1221 Bonné, Michael J., 1253 Brosse, Nicolas, 1131 Bukowska, Agnieszka, 1124 Bukowski, Wiktor, 1124 Bünzli, Jean-Claude G., 1140 Cametti, Massimo, 1113 Chauvin, Anne-Sophie, 1140 Clavier, Gilles, 1235 Collins, Julie, 1175 Collomb, Marie-Noëlle, 1117 Compton, Richard G., 1195 Coogan, Michael P., 1097 Corlu, Anne, 1228 Court, Jonathan B., Dalla Cort, Antonella, 1113 D'Amico, Arnaldo, 1162

Dauphas, Stéphanie, 1228 Deiters, Emmanuel, 1140 Deronzier, Alain, 1117 Di Natale, Corrado, 1162 Dumas, Dominique, Faller, Peter, 1189 Fernández-Moreira, Vanesa, 1097 Filippini, Daniel, 1162 Formica, Mauro, 1204 Formiga, André Luiz Barboza, 1167 Fourmigué, Marc, 1103 Frochot, Céline, 1131 Fujiki, Michiya, 1110 Fusi, Vieri, 1204 Gale, Philip A., 1221 García-Garrido, Sergio E., 1221 Geneste, Florence, 1228 Georghiou, Paris E., 1175 Gómez-García, Carlos J., 1103 Gong, Yong-Hua, 1235 Green, Malcolm L. H., 1195 Guguen-Guillouzo. Christiane, 1228 Gunnlaugsson, Thorfinnur, 1153 Harada, Takunori, 1110 Hayes, Anthony J., 1097 Hocquet, Alexandre, 1131 Imai, Yoshitane, 1110 Ivanovici, Sorin, 1243 Jamart-Grégoire, Brigitte, 1131

Jouvenot, Damien, 1117 Justaud, Frédéric, 1259 Kawaguchi, Kakuhiro, 1110 Kawano, Kenta, 1110 Kickelbick, Guido, 1243 Koch, Thomas, 1243 Kruger, Paul E., 1153 Kuroda, Reiko, 1110 Larmour, Iain A., 1215 Lavastre, Olivier, 1228 Le Derf, Franck, 1183 Leprêtre, Jean-Claude, 1117 Light, Mark E., 1221 Lloyd, David, 1097 Llusar, Rosa, 1103 Lombard, Jean, 1117 Lundström, Ingemar, 1162 Macedi, Eleonora, 1204 Mandolini, Luigi, 1113 Marken, Frank, 1253 Matsubara, Yoshio, 1110 Méallet-Renault, Rachel, 1235 Mieczyńska, Ewa, 1124 Millet, Coralie, 1097 Miomandre, Fabien, 1235 Montalti, Marco, 1162 Naidus, Elliot, 1235 Nakano, Yoko, 1110 Nissinen, Maija, 1113 Nogueira, Ana Flavia, 1167 Noworól, Jarosław, 1124 Okal, Janina, 1124 Orlando, Pierfrancesco, 1204

Paolesse, Roberto, 1162 Paoli, Paola, 1204 Pham, Quoc Nghi, 1131 Piersanti, Giovanni, 1204 Pope, Simon J. A., 1097 Poriel, Cyril, 1259 Pradines, Vincent, 1189 Puchberger, Michael, 1243 Rassaei, Liza, 1253 Rault-Berthelot, Joëlle, Rayah, Houari, 1183 Rill, Christoph, 1243 Rissanen, Kari, 1113 Rossi, Patrizia, 1204 Sallé, Marc, 1183 Sato, Tomohiro, 1110 Saunders, Graham C., 1215 Shao, Lidong, 1195 Sillanpää, Mika, 1253 Song, Bo, 1140 Stroia, Alina Jurca, 1189 Tang, Jie, 1235 Toma, Henrique Eisi, 1167 Tran, Huu-Anh, 1175 Triguero, Sonia, 1103 Trzeciak, Anna M., 1124 Vandevyver, Caroline D. B., 1140 Venanzi, Mariano, 1162 Wildgoose, Gregory G., 1195 Zappia, Giovanni, 1204 Ziółkowski, Józef J., 1124

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