IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS (16) 2053–2184 (2005)

Cover
See Masato Kodaka *et al.* page 2080.
A new nano-biomachine has been created from microtubules (MTs) and hetero-bifunctional polymer particles bearing pyruvate kinase, which is propelled on glass surfaces coated with kinesin by use of self-supplying ATP.
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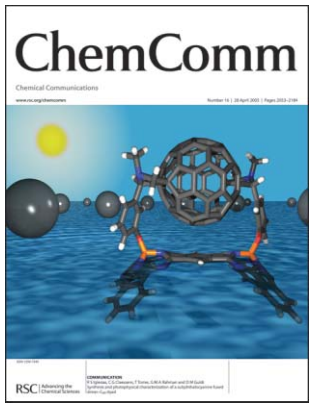


Inside cover
See Tomas Torres, Dirk M. Guldi *et al.* page 2113.
Bringing together non-planar π-extended surfaces: Singular subphthalocyanine-based "wavy" aromatic surfaces, matching the visible region of the solar spectrum, transfer energy to other electroactive moieties like fullerene.
Image reproduced by permission of Rodrigo S. Iglesias, Christian G. Claessens, Tomas Torres, G.M. Aminur Rahman and Dirk M. Guldi, *Chem. Commun.*, 2005, 2113.

EDITORIAL

Forthcoming launch of new journal *Molecular BioSystems*

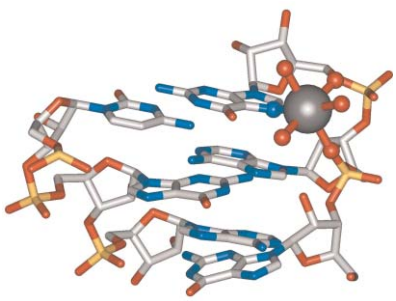
We are delighted to announce that next month sees the publication of the first issue of the RSC's exciting **new interdisciplinary journal *Molecular BioSystems***.

FEATURE ARTICLE

Detection of RNA nucleobase metalation by NMR spectroscopy

Yoshiyuki Tanaka* and Kazunari Taira*

In this feature article, the NMR spectroscopic behavior of the metal ion-binding motif of hammerhead ribozymes upon the metalation and the roles of the metal ion at the motif are described.



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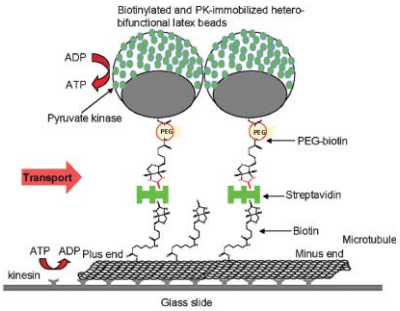

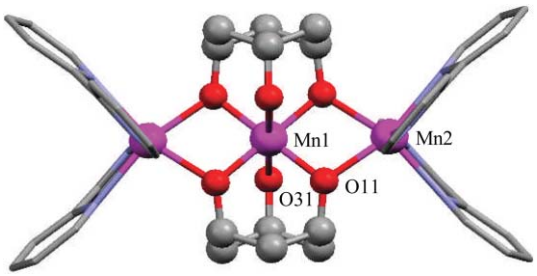

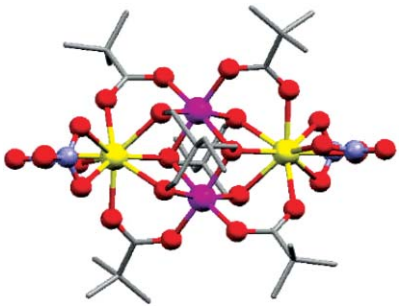

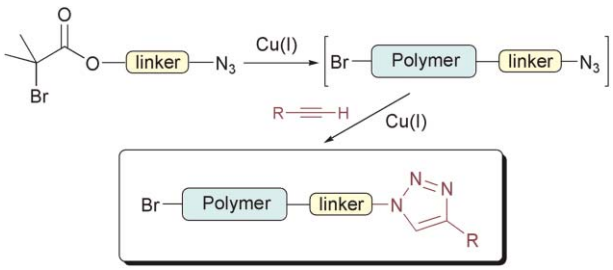

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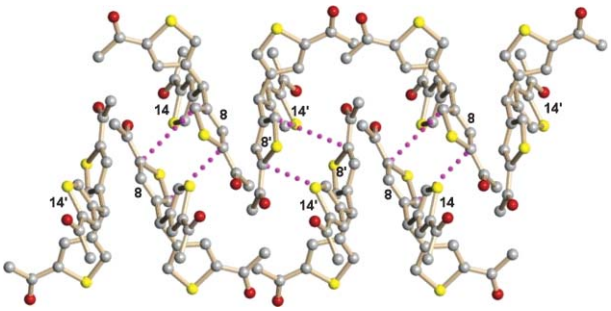
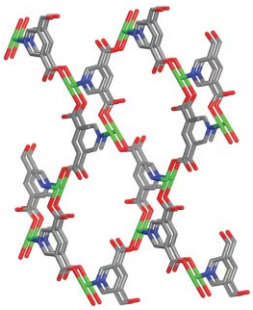


The first example of a crystalline guest-free form of the tris(5-acetyl-3-thienyl)methane (TATM) host material

Paul S. Sidhu, Gary D. Enright, Konstantin A. Udachin and John A. Ripmeester*

The product can be obtained by leaching guests out of inclusion compounds, which is apparently accompanied by a single-crystal-to-single-crystal transition.

2095

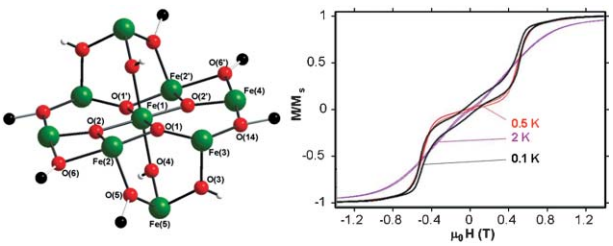


Terminal co-ligand directed synthesis of a neutral, non-interpenetrated (10,3)-*a* metal–organic framework

Jarrod F. Eubank, Rosa D. Walsh and Mohamed Eddaoudi*

A neutral, non-interpenetrated porous metal–organic framework (MOF) having (10,3)-*a* topology, Cu(3,5-PDC)(DMF)(pyr), has been constructed *via* the assembly of the achiral tri-connected building blocks 3,5-pyridinedicarboxylate (3,5-PDC) and $CuN(CO_2)_2$, synthesized *in situ*. Similarly, a 2D structure having (6,3) topology has been generated, each by means of terminal co-ligand directed synthesis.

2098

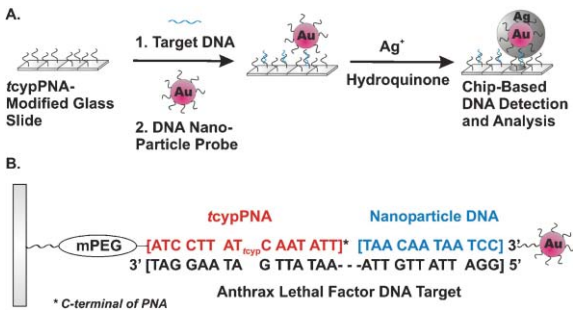


Formal encapsulation of $[Fe(H_2O)_6]^{3+}$ by $\{Fe_2(hpdta)\}$ units gives a system of $S = 13/2$ Fe^{III}_9 oxo clusters showing magnetic hysteresis

Wolfgang Schmitt, Christopher E. Anson, Wolfgang Wernsdorfer and Annie K. Powell*

Solvothermal synthesis leads to a system containing nonanuclear Fe(III) aggregates with spin ground states of 13/2 displaying hysteresis below 1.8 K.

2101



Cyclopentane-modified PNA improves the sensitivity of nanoparticle-based scanometric DNA detection

Jonathan K. Pokorski, Jwa-Min Nam, Rafael A. Vega, Chad A. Mirkin and Daniel H. Appella*

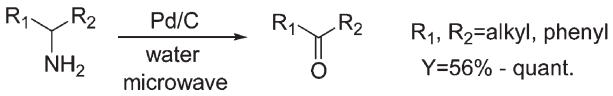
Lowering the limit of DNA detection is important for the development of new diagnostics. We show that using *trans*-cyclopentane-modified PNA as a target capture strand improves the detection limit of a known DNA detection assay. The success of this work depended highly on the improved properties of cyclopentane-modified PNA compared to regular PNA.

2104

Microwave-assisted direct transformation of amines to ketones using water as an oxygen source

Akira Miyazawa,* Kan Tanaka, Toshiyasu Sakakura, Masashi Tashiro, Hideki Tashiro, G. K. Surya Prakash and George. A. Olah

A novel Pd/C catalyzed direct transformation of amines to ketones, *retro*-reductive amination, was achieved in water as an oxygen source under microwave irradiation in fair to good yield.

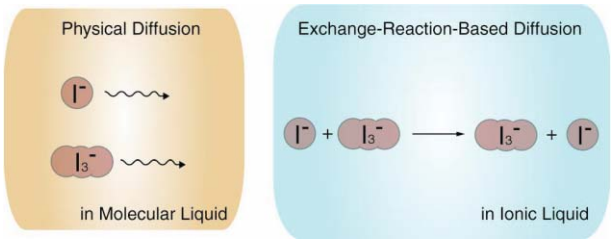


2107

Anomaly of charge transport of an iodide/tri-iodide redox couple in an ionic liquid and its importance in dye-sensitized solar cells

Ryuji Kawano and Masayoshi Watanabe*

Fast charge transport based on the exchange reaction of an I^-/I_3^- redox couple, which has been observed in ionic liquids due to their high ionic strength but not in molecular liquids, contributes to the high performance of dye-sensitized solar cells using the ionic liquids in spite of their high viscosity.

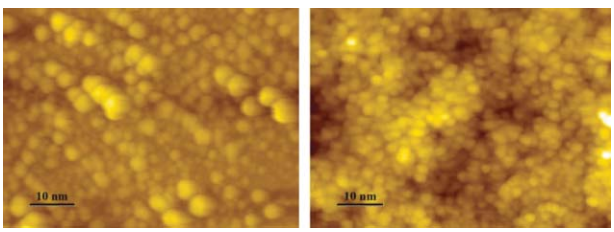


2110

Synthesis of single-phase anatase nanocrystallites at near room temperatures

Walid A. Daoud* and John H. Xin

This article describes the formation of single-phase nanocrystalline anatase titanium dioxide under ambient pressure and at near room temperatures. Large quantities of single-phase anatase solids can be produced by this method.

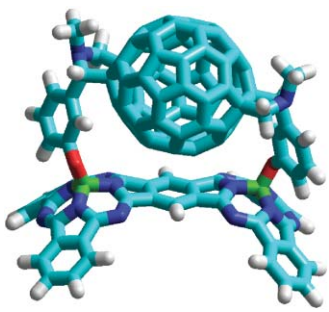


2113

Synthesis and photophysical characterization of a subphthalocyanine fused dimer–C_{60} dyad

Rodrigo S. Iglesias, Christian G. Claessens, Tomas Torres,* G. M. Aminur Rahman and Dirk M. Guldi*

A C_{60}–SubPc dimer bisadduct was synthesized and characterized. Its photophysical behaviour shows a cascade of back and forth energy transfer events from the SubPc dimer to the C_{60} moiety.



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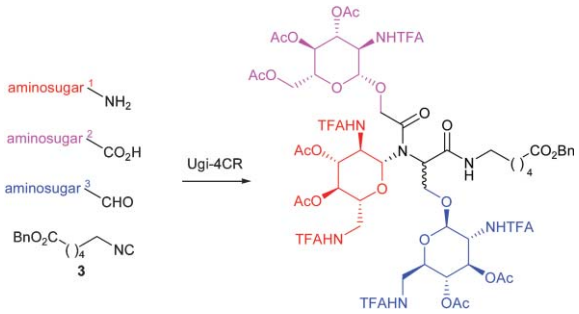
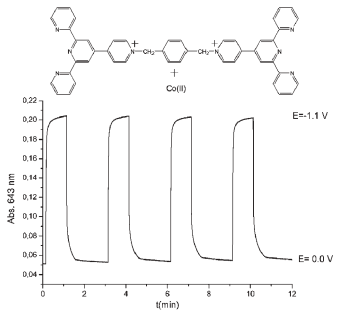


Synthesis of multivalent aminoglycoside mimics *via* the Ugi multicomponent reaction

Bernhard Westermann* and Simon Dörner

Multivalent neoglycoconjugates with 2,6-diamino-2,6-dideoxyglucose moieties can be obtained by an Ugi multicomponent approach leading to mono-, di- and tri-valent carbohydrate clusters.

2119

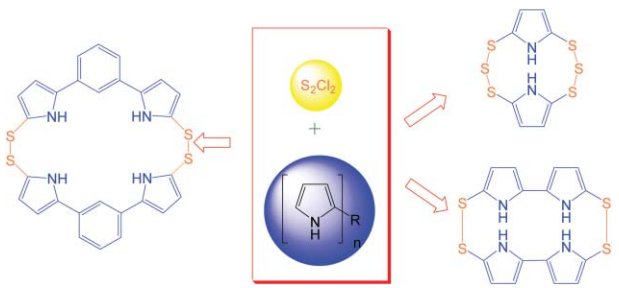


A new Co(II)-metalloviologen-based electrochromic material integrated in thin multilayer films

Dirk G. Kurth,* Jesús Pitarch López and Wen-Fei Dong

A metallosupramolecular coordination polyelectrolyte prepared by the reaction of cobalt(II) with a novel bisterpyridine ligand has been assembled as the active component in electrochromic films by sequential deposition using electrostatic layer-by-layer self-assembly.

2122

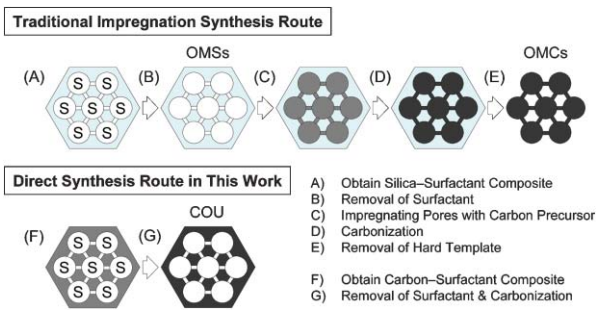


Straightforward synthesis of sulfur bridged oligopyrrolic macrocycles

David Sanchez-Garcia, Thomas Köhler, Daniel Seidel, Vincent Lynch and Jonathan L. Sessler*

Treatment of appropriate α,α′-free pyrrolic precursors with sulfur dichloride allows for the facile, one-step production of di- and trisulfide linked oligopyrrolic macrocycles.

2125



Synthesis of ordered mesoporous carbons with channel structure from an organic–organic nanocomposite

Shunsuke Tanaka, Norikazu Nishiyama,* Yasuyuki Egashira and Korekazu Ueyama

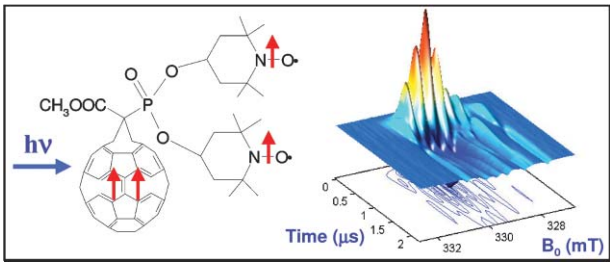
Mesoporous carbons with ordered channel structure (COU-1) have been successfully fabricated *via* a direct carbonization of an organic–organic nanocomposite using a thermally-decomposable triblock copolymer and a thermosetting polymer.

2128

First observation of the hyperfine structure of an excited quintet state in liquid solution

Lorenzo Franco, Martina Mazzoni, Carlo Corvaja,* Valentina P. Gubskaya, Lucia Sh. Berezhnaya and Ildus A. Nuretdinov

Photoexcitation of a fullerene-linked bisnitroxide gives a hyperfine resolved transient EPR spectrum, assigned to a quintet state generated by spin coupling of the nitroxides and the fullerene excited triplet.

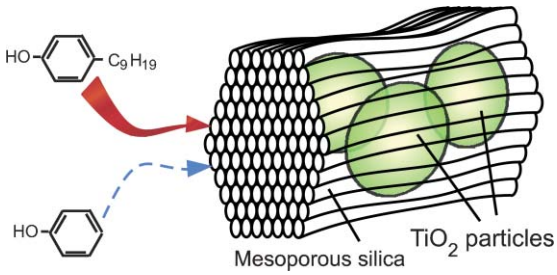


2131

Direct nanocomposite of crystalline TiO_2 particles and mesoporous silica as a molecular selective and highly active photocatalyst

Kei Inumaru,* Takashi Kasahara, Masataka Yasui and Shoji Yamanaka

Well-crystallised TiO_2 particles (P-25) were directly incorporated into surfactant-templated mesoporous silica particles (pore diameter: 2.7 nm), and the composite material showed molecular selective and enhanced photocatalysis for decomposition of 4-nonylphenol.

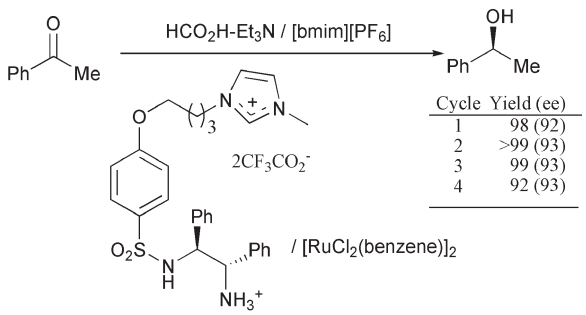


2134

A recyclable catalyst for asymmetric transfer hydrogenation with a formic acid–triethylamine mixture in ionic liquid

Ikuo Kawasaki, Kazuya Tsunoda, Tomoko Tsuji, Tomoko Yamaguchi, Hiroki Shibuta, Nozomi Uchida, Masayuki Yamashita and Shunsaku Ohta*

A novel task-specific ionic ligand with an imidazolium salt moiety was synthesized, and its catalytic ability and recyclability for asymmetric transfer hydrogenation with a formic acid–triethylamine mixture in ionic liquid [bmim][PF_6] was examined.

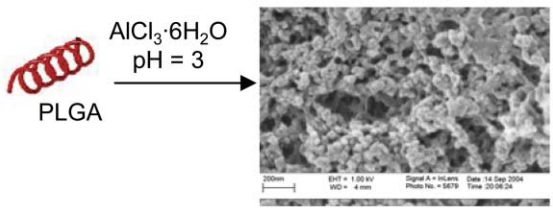


2137

Helical poly-L-glutamic acid templated nanoporous aluminium oxides

Jeng-Shiung Jan and Daniel F. Shantz*

The synthesis of porous aluminium oxide made in the presence of helical poly-L-glutamic acid is reported.



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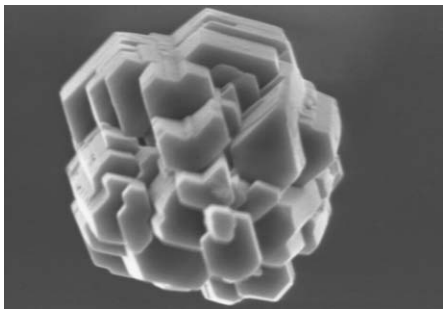
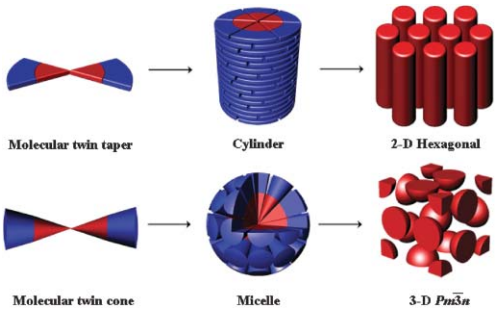


Aragonite growth on single-crystal substrates displaying a threefold axis

Boaz Pokroy* and Emil Zolotoyabko

Pseudo-hexagonal tablets of aragonite (a metastable polymorph of $CaCO_3$) were grown epitaxially under calcite-stable conditions by using carbonate free single-crystal substrates with a threefold axis oriented normal to the substrate surface.

2143

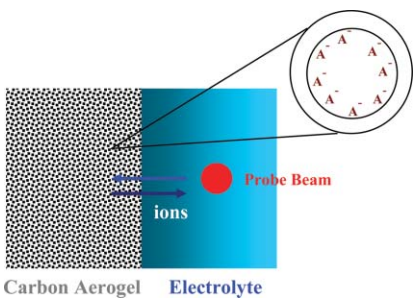


Generation dependent mesophase behavior in extended amphiphilic dendrons in the shape of macromolecular dumbbells

Byoung-Ki Cho, Anurag Jain, Sol M. Gruner and Ulrich Wiesner*

X-Ray scattering studies on 2nd and 3rd generation extended amphiphilic dendrons with identical hydrophilic volume fractions suggest 2-D hexagonal columnar and $Pm\bar{3}n$ micellar cubic mesophases, respectively, elucidating the role of shape induced interface curvature in mesophase formation.

2146

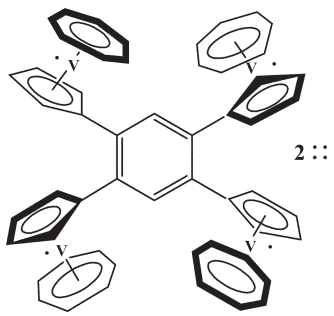


Double layer properties of carbon aerogel electrodes measured by probe beam deflection and AC impedance techniques

Gabriel A. Planes, María C. Miras and César A. Barbero*

The first use of probe beam deflection techniques to measure double layer properties, especially the potential of minimum charge (*pmc*), of highly porous materials is described.

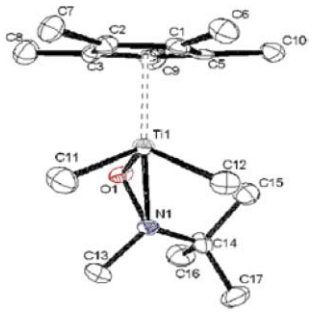
2149

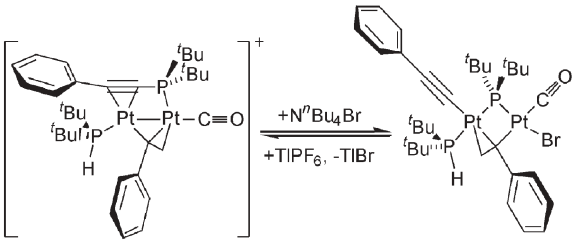


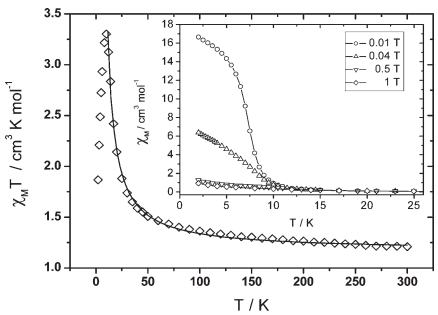
1,2,4,5-Tetra([5]trovacenyl)benzene: an organometallic tetraradical displaying pronounced electro- and magnetocommunication

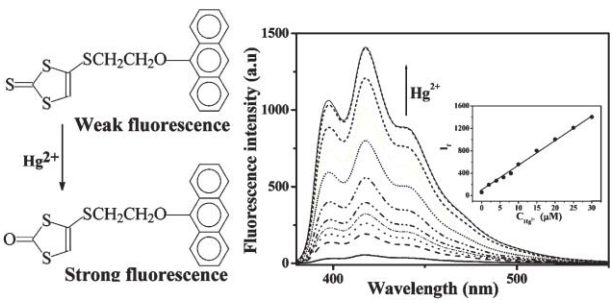
Christoph Elschenbroich,* Olav Schiemann, Olaf Burghaus and Klaus Harms

Considerable twist angles between the central benzene spacer and peripheral [5]trovacenyl-probe axes do not prevent the title molecule from exhibiting spin–spin exchange coupling J and redox splitting $\delta E_{1/2}$ for the reductions **2**$^{\ddot{}}$ (0 → −ÿ Ù → 2−ÿ Ù → 3−ÿ Ù → 4−ÿ Ù); $\delta E_{1/2}$ values for the oxidations **2**$^{\ddot{}}$ (0 → +ÿ Ù → 2+ÿ Ù → 3+ÿ Ù → 4+) are unresolved, however.









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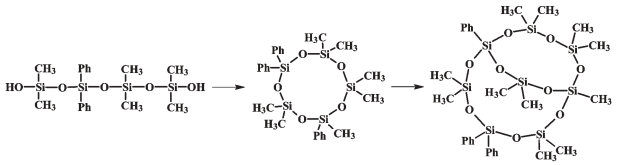
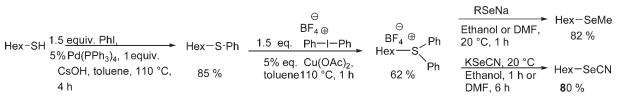


Rational synthesis of asymmetric bicyclic siloxane

Wenmei Xue, Mayfair C. Kung and Harold H. Kung*

A rational and versatile method to synthesize bicyclosiloxane of design structures is presented. The method is used to synthesize a new, asymmetric bicyclo[7.5.3]octasiloxane and other bicyclosiloxanes.

2167

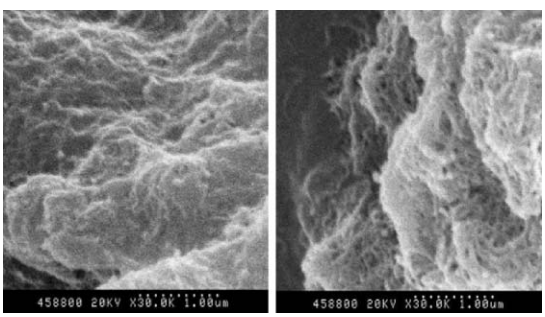


Synthesis of primary-alkyl selenols and selenides from primary-alkyl thiols involving diphenyl sulfonium salts

Alain Krief,* Willy Dumont and Michael Robert

Hexyl thiol has been transformed to hexyl selenol and related selenides and selenocyanate by substitution of the corresponding hexyldiphenylsulfonium tetrafluoroborate with selenium nucleophiles.

2169

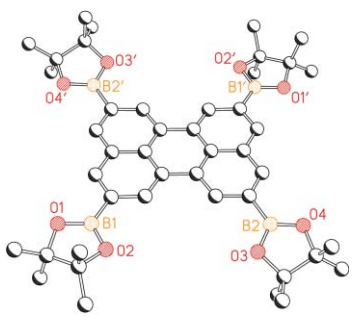


Electrochemically deposited nanocomposite of chitosan and carbon nanotubes for biosensor application

Xi-Liang Luo, Jing-Juan Xu, Jin-Li Wang and Hong-Yuan Chen*

A simple and controllable electrodeposition method for the formation of a chitosan–carbon nanotube nanocomposite film on an electrode surface was proposed and further used for the construction of an enzyme–chitosan–carbon nanotube composite based biosensor.

2172



Selective Ir-catalysed borylation of polycyclic aromatic hydrocarbons: structures of naphthalene-2,6-bis(boronate), pyrene-2,7-bis(boronate) and perylene-2,5,8,11-tetra(boronate) esters

David N. Coventry, Andrei S. Batsanov, Andrés E. Goeta, Judith A. K. Howard, Todd B. Marder* and Robin N. Perutz

The selectivity of the Ir-catalysed reaction of pyrene and perylene with $B_2(pin)_2$ provided pyrene-2,7-$(Bpin)_2$ and perylene-2,5,8,11-$(Bpin)_4$ *via* direct borylation at positions which are otherwise difficult to functionalise.

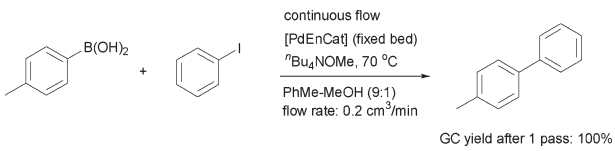
COMMUNICATIONS

2175

Efficient batch and continuous flow Suzuki cross-coupling reactions under mild conditions, catalysed by polyurea-encapsulated palladium (II) acetate and tetra-*n*-butylammonium salts

Connie K. Y. Lee, Andrew B. Holmes,* Steven V. Ley,* Ian F. McConvey, Bushra Al-Duri, Gary A. Leeke, Regina C. D. Santos and Jonathan P. K. Seville

[PdEnCat]™40 promotes Suzuki reactions in $scCO_2$ at 40 °C and in continuous flow mode in conventional organic solvents at 70 °C.

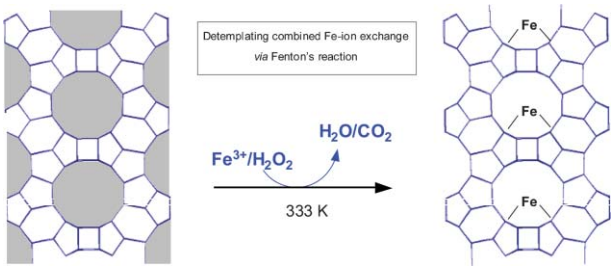


2178

One-pot catalyst preparation: combined detemplating and Fe ion-exchange of BEA through Fenton's chemistry

I. Melián-Cabrera, F. Kapteijn* and J. A. Moulijn

BEA zeolite has been simultaneously detemplated and Fe-exchanged by treating the parent zeolite with a Fenton's-type reagent (Fe^{3+}–H_2O_2) at low temperature. This *one-pot* process simplifies and speeds up considerably the preparation route.



ADDITIONS AND CORRECTIONS

2181

Reversible Michael addition of thiols as a new tool for dynamic combinatorial chemistry

Baolu Shi and Michael F. Greaney

AUTHOR INDEX

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

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