

IN THIS ISSUE

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Cover

See Jacqueline K. Barton *et al.*, pp. 4565–4579.

Metallo-insertors eject the mismatched bases and stack within the DNA duplex. Metallo-intercalators stack between base pairs but do not disrupt interstrand base–base interactions.

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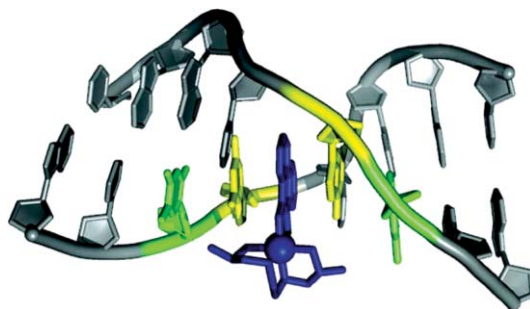
FEATURE ARTICLES

4565

Metallo-intercalators and metallo-insertors

Brian M. Zeglis, Valerie C. Pierre and Jacqueline K. Barton*

The design of octahedral metal complexes that bind DNA non-covalently and react with site-specificity is described. We focus on complexes that bind utilizing metallo-intercalation or that target single base mismatches through metallo-insertion.

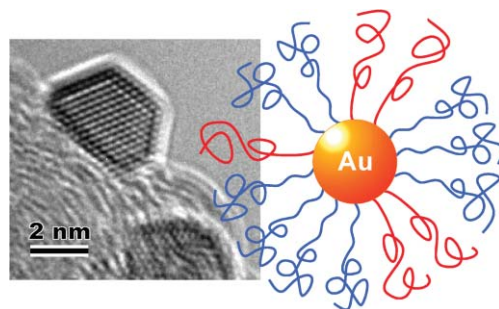


4580

Recent advances in polymer protected gold nanoparticles: synthesis, properties and applications

Jun Shan and Heikki Tenhu*

The use of various functionalized polymers as stabilizers to design metal core–organic shell hybrid nanoparticles has attracted increasing interest for different applications. The feature article reviews recent reports published from 2004 to the beginning of 2007 on the synthesis of polymer protected gold nanoparticles (AuNPs), and also comments on their properties and applications.



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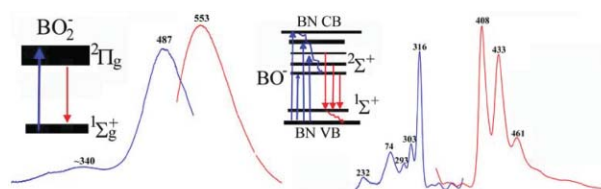
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4599

Boron–oxygen luminescence centres in boron–nitrogen systems

Chengchun Tang,* Yoshio Bando, Chunyi Zhi and Dmitri Golberg

Closed-shell BO_2^- and BO^- anions are proposed as high-efficiency luminescence centres in boron–nitrogen systems. The system makes the anions localized which leads to a radiation transition. A blue excited green emission of BO_2^- in a boron–nitrogen polymer and a UV-excited blue emission of BO^- in a hexagonal boron nitride are observed for the first time.

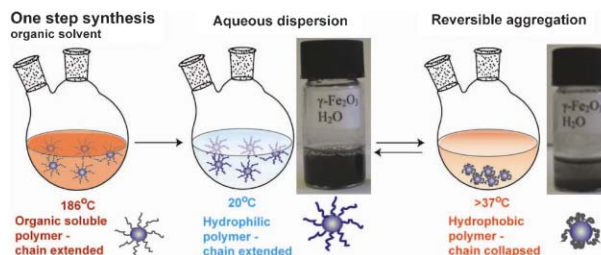


4602

One-step synthesis of monodisperse water-soluble ‘dual-responsive’ magnetic nanoparticles

Ian Robinson, Cameron Alexander, Le T. Lu, Le D. Tung, David G. Fernig and Nguyen T. K. Thanh*

Thermo-responsive polymers are used for the synthesis of magnetic nanoparticles in organic solvent at high temperature. Upon cooling, the polymer shell becomes hydrophilic, facilitating the transfer of the nanoparticles to water.

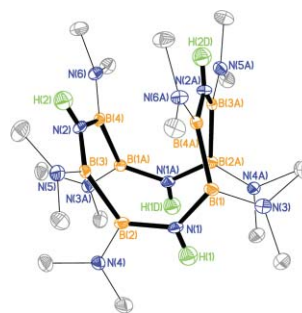


4605

A new cyclic borazine species $\text{B}_8(\text{NH})_4(\text{NMe}_2)_8$ containing a twelve-membered B_8N_4 ring

George Bramham, Jonathan P. H. Charmant, Alistair J. R. Cook, Nicholas C. Norman,* Christopher A. Russell* and Saowanit Saithong

The reaction between $\text{B}_2(\text{NMe}_2)_4$ and two equivalents of $[\text{NH}_4][\text{PF}_6]$ in thf at room temperature affords the new cyclic borazine $\text{B}_8(\text{NH})_4(\text{NMe}_2)_8$ containing a non-planar twelve-membered ring with alternating $\text{B}_2(\text{NMe}_2)_2$ and NH units.

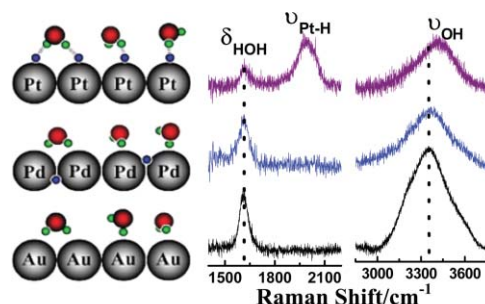


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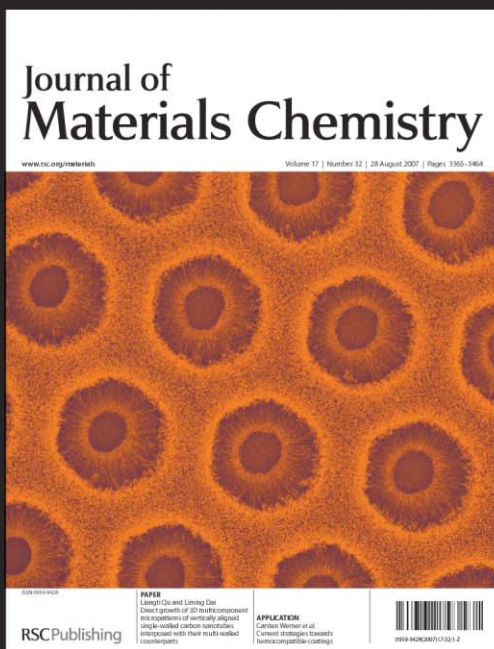
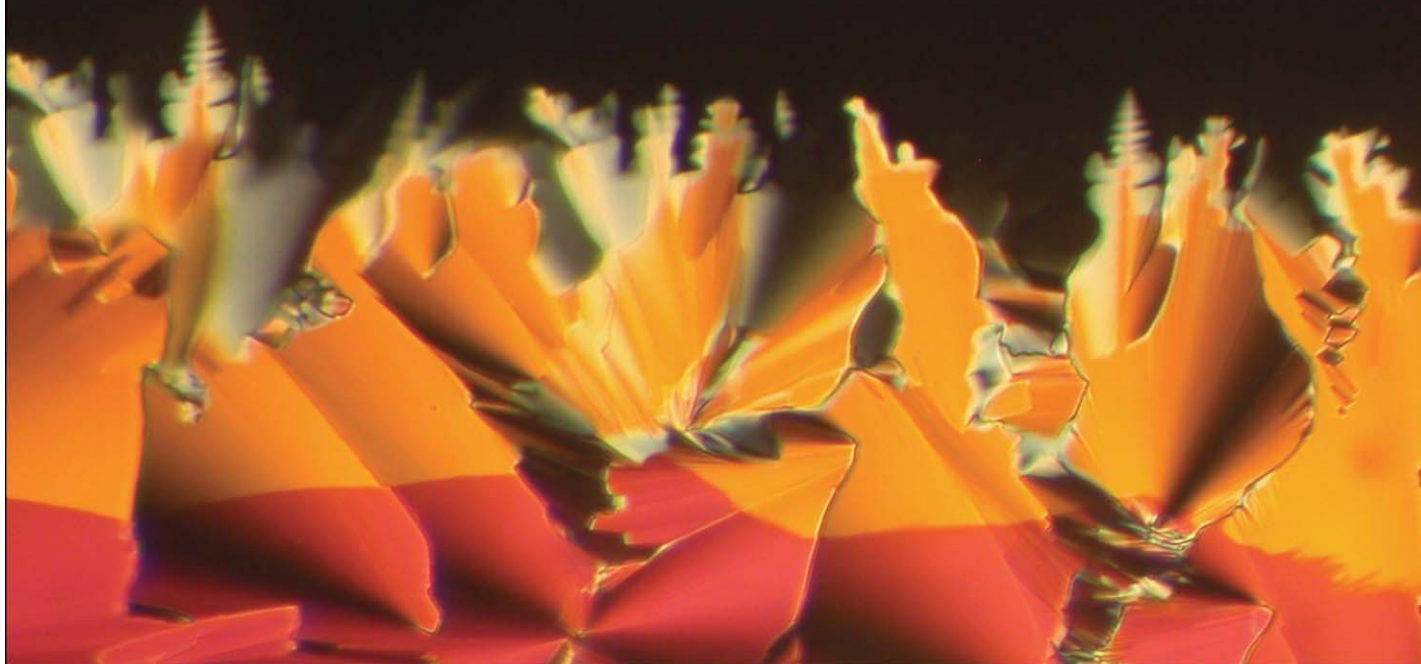
Characterization of surface water on Au core Pt-group metal shell nanoparticles coated electrodes by surface-enhanced Raman spectroscopy

Yu-Xiong Jiang, Jian-Fen Li, De-Yin Wu,* Zhi-Lin Yang, Bin Ren, Jia-Wen Hu, Yuan L. Chow and Zhong-Qun Tian*

The strategy of ‘borrowing SERS activity’ and core–shell nanoparticles were utilized to obtain the first SERS (also Raman) spectra of water on Pt and Pd surfaces, and a conceptual model is proposed.



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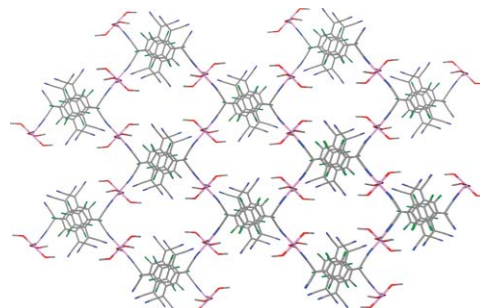
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4611

Conversion of a porous material based on a Mn^{II} -TCNQF₄ honeycomb net to a molecular magnet upon desolvation

Nazario Lopez, Hanhua Zhao, Andrey V. Prosvirin, Abdellatif Chouai, Michael Shatruk and Kim R. Dunbar*

Removal of methanol molecules from the interstices of a metal-organic framework based on a 2-D hexagonal Mn^{II} -TCNQF₄ net results in stronger magnetic interactions and leads to a glassy magnetically ordered state; the magnetic behavior can be reversibly cycled upon solvation-desolvation of the material.

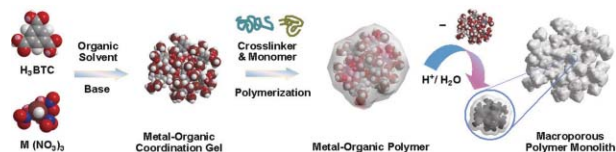


4614

Macroporous polymer monoliths fabricated by using a metal-organic coordination gel template

Junfa Yin, Gengliang Yang,* Hailin Wang and Yi Chen

A macroporous polymer monolith with a narrow size distribution and a 3-D skeleton was fabricated by using a metal-organic coordination gel template. The monolith has potential applications in high-throughput and high-efficiency separation of proteins.

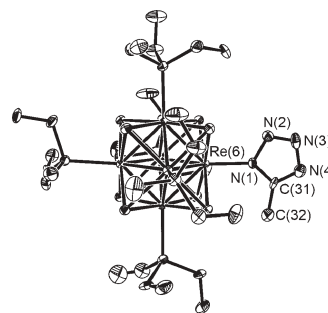


4617

Synthesis and electrochemical study of the first tetrazolate hexanuclear rhenium cluster complex

Lisa F. Szczepura,* Meghan K. Oh and Stanley A. Knott

The linkage isomers $[\text{Re}_6\text{Se}_8(\text{PET}_3)_5(1,5\text{-MeN}_4\text{C})]^+$ and $[\text{Re}_6\text{Se}_8(\text{PET}_3)_5(2,5\text{-MeN}_4\text{C})]^+$ were generated upon reaction of tetrabutylammonium azide with the corresponding acetonitrile complex, $[\text{Re}_6\text{Se}_8(\text{PET}_3)_5(\text{NCCH}_3)]^{2+}$; these are the first (tetrazolato)rhenium complexes reported to date.

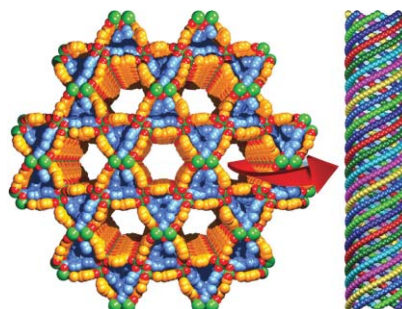


4620

A 3D chiral nanoporous coordination framework consisting of homochiral nanotubes assembled from octuple helices

Xiang-Rong Hao, Xin-Long Wang, Chao Qin, Zhong-Min Su,* En-Bo Wang,* Ya-Qian Lan and Kui-Zhan Shao

A 3D chiral nanoporous coordination framework consisting of homochiral nanotubes with a 19.4 Å by 22.4 Å aperture is formed by the parallel alignment of eight infinite helical chains.



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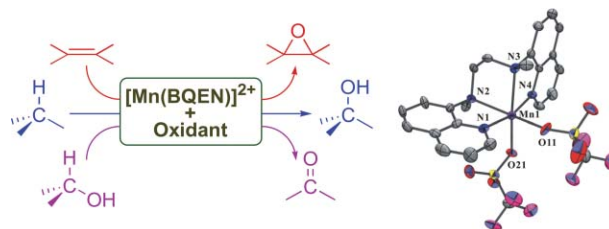
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4623

A highly efficient non-heme manganese complex in oxygenation reactions

Kasi Nehru, Soo Jeong Kim, In Young Kim, Mi Sook Seo, Youngmee Kim, Sung-Jin Kim, Jinheung Kim and Wonwoo Nam*

A non-heme manganese(II) complex shows a high catalytic activity in the epoxidation of olefins by iodosyl benzene and in the oxidation of olefins, alcohols and alkanes by peracetic acid; a mechanism involving metal-based oxidants is proposed for the oxidation reactions.

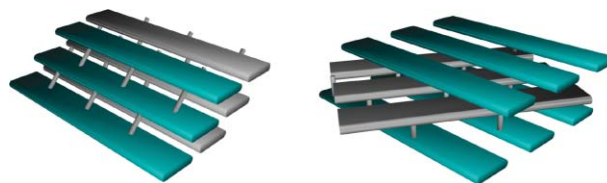


4626

Molecular tectonics: polymorphism and enhancement of network dimensionality by a combination of primary and secondary hydrogen bond sites

Pierre Dechambenoit, Sylvie Ferlay,* Mir Wais Hosseini* and Nathalie Kyritsakos

The combination of a dicationic tecton bearing four NH and two OH groups, as primary and secondary hydrogen bond donor sites, respectively, and $[\text{M}(\text{CN})_4]^{2-}$ anions leads to the formation of two polymorphs.

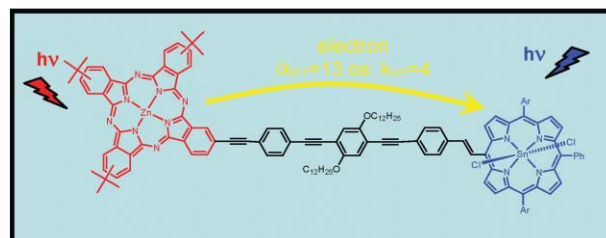


4629

Strongly coupled zinc phthalocyanine–tin porphyrin dyad performing ultra-fast single step charge separation over a 34 Å distance

Jérôme Fortage, Erik Göransson, Errol Blart, Hans-Christian Becker,* Leif Hammarström* and Fabrice Odobel*

In the title dyad, light excitation of the zinc phthalocyanine or the tin porphyrin induces a quantitative ultra-fast charge separation leading to $(^+)ZnPC$ -bridge- $(^-)SnPCl_2$.

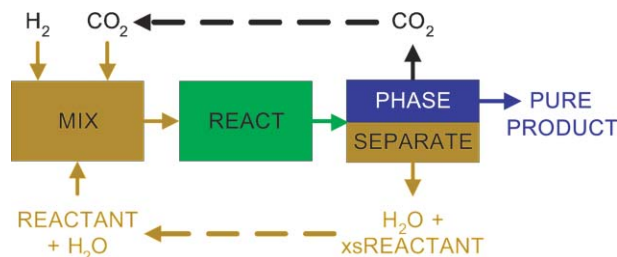


4632

Maximising opportunities in supercritical chemistry: the continuous conversion of levulinic acid to γ -valerolactone in CO_2

Richard A. Bourne, James G. Stevens, Jie Ke and Martyn Poliakoff*

Phase behaviour is manipulated during the hydrogenation of aqueous levulinic acid in supercritical CO_2 to separate almost pure γ -valerolactone from water and unreacted acid.



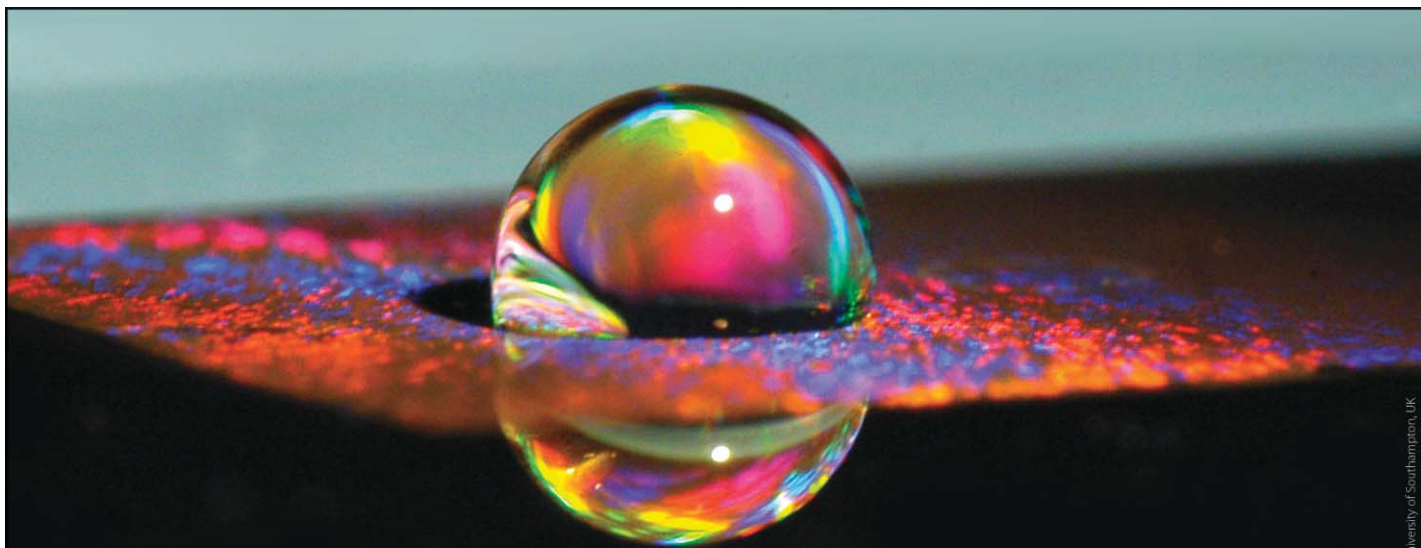


Image courtesy of Steve Shrimpton, University of Southampton, UK

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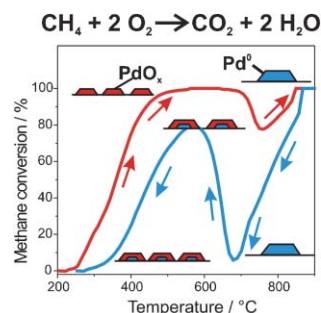
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4635

Insight into the structure of supported palladium catalysts during the total oxidation of methane

Jan-Dierk Grunwaldt,* Niels van Vegten and Alfons Baiker

A correlation between structure and activity during the total oxidation of methane over flame-made Pd/ZrO₂ is made by combining XAS, XRD and on-line catalytic data up to 900 °C and it is demonstrated that highly dispersed palladium, preferentially in an oxidized state, is most active.

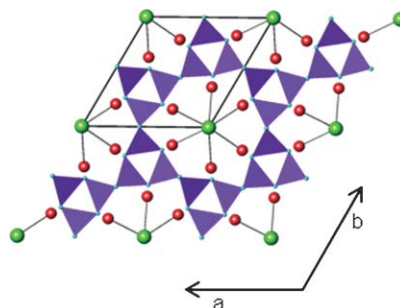


4638

Zeolite-like nitride–chlorides with a predicted topology

Andrew J. D. Barnes, Timothy J. Prior and M. Grazia Francesconi*

Ba₃Ta₃N₆Cl and Ba₁₅Ta₁₅N₃₃Cl₄ are the first multinary nitride–chlorides to contain tantalum and the first to adopt a zeolite-like structure. The Si-containing analogue, Ba₃Si₃N₅OCl, was found to be isostructural with Ba₃Ta₃N₆Cl. All three compounds display a framework structure that has been predicted for SiO₂.

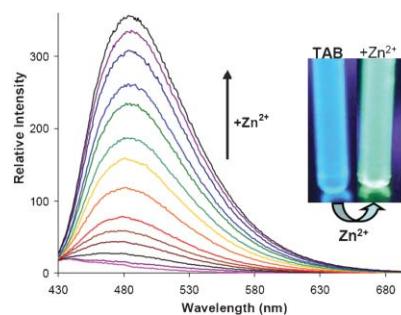


4641

“Turn-on” fluorescent sensor for the selective detection of zinc ion by a sterically-encumbered bipyridyl-based receptor

Ashlyn E. Dennis and Rhett C. Smith*

A sterically-encumbered 5,5′-distyryl-2,2′-bipyridyl derivative that enforces a 1 : 1 metal-to-ligand ratio acts as a selective turn-on sensor for Zn²⁺ in THF.

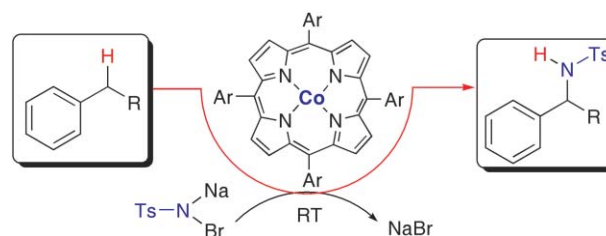


4644

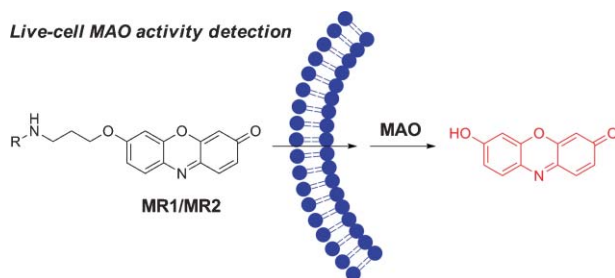
Cobalt-catalyzed intermolecular C–H amination with bromamine-T as nitrene source

Jeremiah D. Harden, Joshua V. Ruppel, Guang-Yao Gao and X. Peter Zhang*

Cobalt, supported by porphyrin ligands, is capable of catalyzing intermolecular nitrene insertion of sp³ C–H bonds with bromamine-T as the nitrene source, forming the desired tosyl-protected amines with NaBr as the by-product.



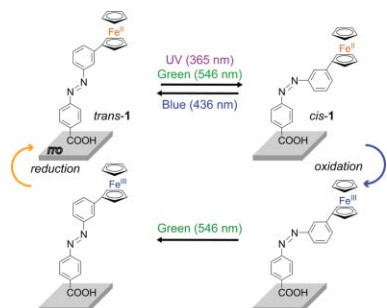
4647

**Live-cell MAO activity detection****Activity-based fluorescent reporters for monoamine oxidases in living cells**

Aaron E. Albers, Katherine A. Rawls and Christopher J. Chang*

The authors present the syntheses and biological applications of Monoamine Oxidase Reporters 1 and 2 (MR1 and MR2), two first-generation fluorescent reagents for monitoring MAO activity *in vitro* and in living cells.

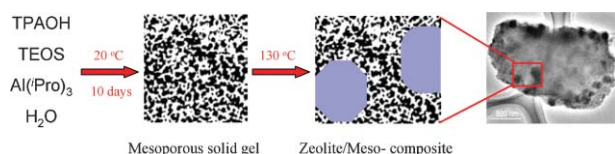
4650

**Reversible photochromism of a ferrocenylazobenzene monolayer controllable by a single green light source**

Kosuke Namiki, Aiko Sakamoto, Masaki Murata, Shoko Kume and Hiroshi Nishihara*

A reversible photoswitching system with a single green light controlled by an electrochemical redox reaction was constructed. The system consists of a 3-ferrocenylazobenzene modified ITO substrate as a photo- and redox-responsive electrode.

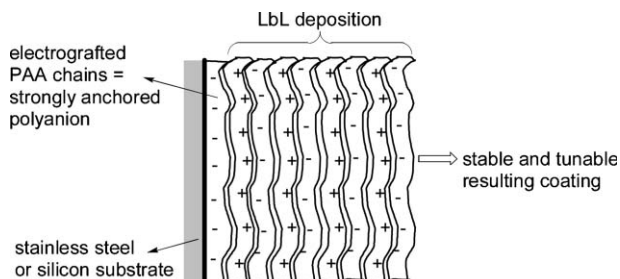
4653

**Single-template synthesis of zeolite ZSM-5 composites with tunable mesoporosity**

Jia Wang, Johan C. Groen, Wenbo Yue, Wuzong Zhou and Marc-Olivier Coppens*

Hierarchically structured composites (TUD-C) with ZSM-5 crystals embedded in a well-connected mesoporous matrix were synthesized by employing only one organic templating/scaffolding molecule (TPAOH). Micro- and mesopores form separately under different conditions, allowing a high degree of controllability.

4656

**Combination of electrografting and layer-by-layer deposition: an efficient way to tailor polymer coatings of (semi)-conductors**

Aurélia Charlot, Sabine Gabriel, Christophe Detrembleur, Robert Jérôme and Christine Jérôme*

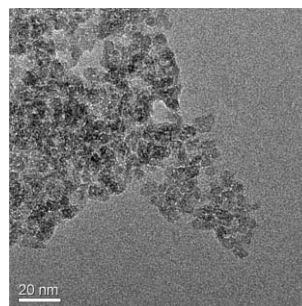
Combination of the advantages of the electrografting and the layer-by-layer deposition processes was found to be a novel, simple and highly versatile concept to tailor strongly adhering coatings to (semi)-conducting surfaces imparting them with tunable specific properties.

4659

Hexafluorotitanate salts containing organic cations: use as a reaction medium and precursor to the synthesis of titanium dioxide

David Gutiérrez-Tauste, Xavier Domènech, Concepción Domingo and José A. Ayllón*

The straightforward modification of commercial hexafluorotitanic acid with organic derivatives containing a tetraalkylammonium cation produced stable precursor solutions with only a small fraction of water, which were then used as a reaction medium for the synthesis of nanocrystalline TiO_2 .



4662

Yttrium metallocene borane chemistry: isolation of 9-BBN substitution and coordination complexes in a single crystal, $\{(\text{C}_5\text{Me}_5)_2\text{Y}[\eta^3\text{-C}_3\text{H}_4(\text{BC}_8\text{H}_{14})]\}$ and $\{(\text{C}_5\text{Me}_5)_2\text{Y}(\mu\text{-H})_2\text{BC}_8\text{H}_{14}\}$

William J. Evans,* Sara E. Lorenz and Joseph W. Ziller

$(\text{C}_5\text{Me}_5)_2\text{Y}(\eta^3\text{-C}_3\text{H}_5)$ reacts with 9-borabicyclo[3.3.1]nonane to form single crystals containing *both* a borane substitution product, $(\text{C}_5\text{Me}_5)_2\text{Y}[\eta^3\text{-C}_3\text{H}_4(\text{BC}_8\text{H}_{14})]$, and a borane coordination complex, $(\text{C}_5\text{Me}_5)_2\text{Y}(\mu\text{-H})_2\text{BC}_8\text{H}_{14}$, which could arise from a series of reactions including borane addition, $\beta\text{-H}$ elimination, adduct formation, and metalation.

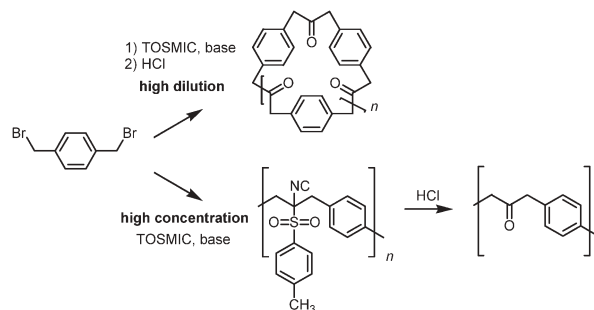


4665

Synthesis of poly(*para*-phenylene)(2-isocyano-2-tosylpropane-1,3-diyl), poly(*para*-phenylene)-(2-oxopropane-1,3-diyl) and oligo(cyclopentadienones) via carbonylative coupling of α,α' -dibromoxylene

Robert G. Potter and Thomas S. Hughes*

The carbonylative coupling of dibromoxylene yields the previously unreported poly(*para*-phenylene)(2-isocyano-2-tosylpropane-1,3-diyl), which can be hydrolyzed to give poly(*para*-phenylene)(2-oxopropane-1,3-diyl). Knoevenagel condensations of this polyketone with benzil to give a low band-gap polytetraaryl cyclopentadienone are modeled in the synthesis of a novel tetraaryl cyclopentadienone dimer.

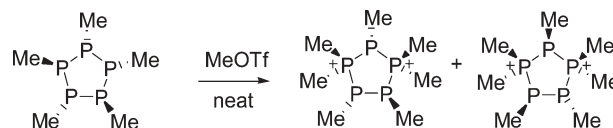


4668

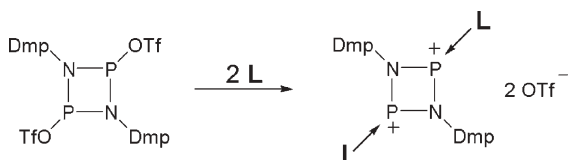
Synthesis and characterization of elusive cyclo-di- and -tri-phosphino-1,3-diphosphonium salts: fundamental frameworks in *catena*-organophosphorus chemistry

Susanne D. Riegel, Neil Burford,* Michael D. Lumsden and Andreas Decken

Methylation of cyclophosphines, or cyclophosphinophosphonium cations using MeOTf in the absence of solvent is a versatile high-yield approach to prepare cyclopolyphosphinodiphosphonium ions, including the first derivatives of 2,4,5-triphosphino-1,3-diphosphonium dications, representing new *catena*-phosphorus frameworks.



4671

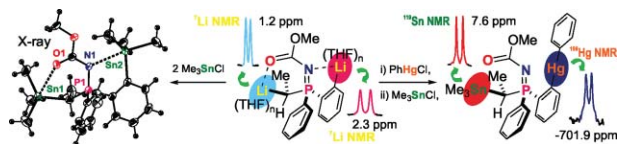


Bifunctional diphosphorus Lewis acids from cyclodiphosphadiazanes

Reagan J. Davidson, Jan J. Weigand, Neil Burford,*
T. Stanley Cameron, Andreas Decken and
Ulrike Werner-Zwanziger

The coordination chemistry of phosphorus as an acceptor has been diversified with the discovery of donor–acceptor complexes involving cyclodiphosphadiazanes with 4-dimethylaminopyridine or trimethylphosphine ligands.

4674

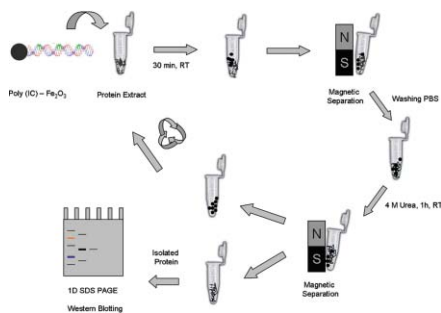


$C_{\alpha}C_{ortho}$ -Dimetalated phosphazene complexes

Jesús García López, Ignacio Fernández,
Manuel Serrano Ruiz and Fernando López Ortiz*

The first $C_{\alpha}C_{ortho}$ dilithium complex of a phosphazene has been synthesized as a single stereoisomer and has been structurally characterized in solution. The complex is monomeric, with the dianion acting as an $N-C_{ortho}$ and $O-C_{\alpha}$ chelate. Transmetalation with Me_3SnCl and $PhHgCl$ afforded the first $C_{\alpha}C_{ortho}$ homo- and hetero-bimetallic phosphazene complexes, which contain a desymmetrised Ph_2PN moiety.

4677

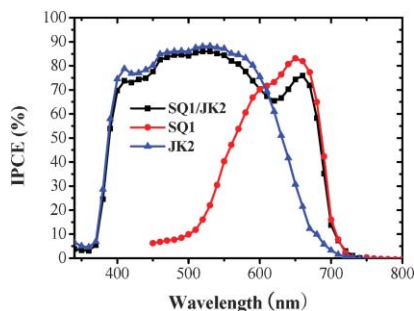


Superparamagnetic γ - Fe_2O_3 nanoparticles with tailored functionality for protein separation

Mohammed Ibrahim Shukoor, Filipe Natalio,
Muhammad Nawaz Tahir, Vadim Ksenofontov,
Helen Annal Therese, Patrick Theato, Heinz C. Schröder,
Werner E. G. Müller* and Wolfgang Tremel*

Polymer coated superparamagnetic γ - Fe_2O_3 nanoparticles derivatized with a synthetic double-stranded RNA [poly(IC)] allow separation of a single 35 kDa protein from a crude protein extract.

4680



Efficient co-sensitization of nanocrystalline TiO_2 films by organic sensitizers

Jun-Ho Yum, Song-Rim Jang, Pablo Walter, T. Geiger,
F. Nüesch, Sanghoon Kim, Jaeyung Ko, Michael Grätzel
and Mohammad K. Nazeeruddin*

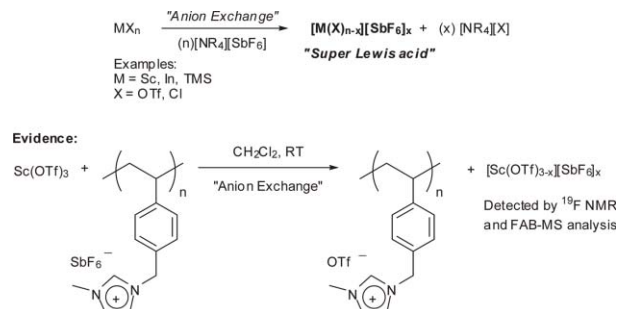
Two organic sensitizers SQ1 and JK2 having complementary spectral absorption in the visible region led to a panchromatic response upon co-sensitization with a nanocrystalline TiO_2 mesoporous film. The co-sensitized solar cell exhibited high incident photon to current conversion efficiency of 86%.

4683

Activation of Lewis acid catalysts in the presence of an organic salt containing a non-coordinating anion: its origin and application potential

Jin Hong Kim, Ji Woong Lee, Ueon Sang Shin, Jin Yong Lee, Sang-gi Lee and Choong Eui Song*

In the presence of a soluble organic salt containing non-coordinating anion (*e.g.*, [bmim][SbF₆] or [NR₄][SbF₆]), the catalytic activity of Lewis acid (MX_n) was dramatically enhanced due to the anion exchange between the Lewis acid and organic salt.

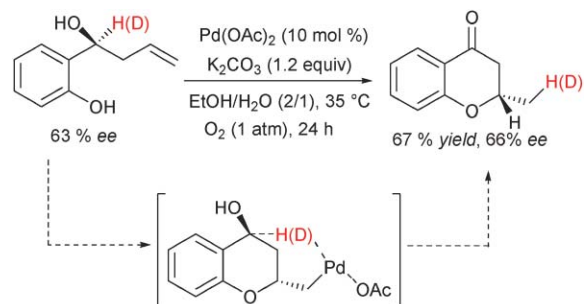


4686

Synthesis of chromanones: a novel palladium-catalyzed Wacker-type oxidative cyclization involving 1,5-hydride alkyl to palladium migration

Zuhui Zhang, Chongfeng Pan and Zhiyong Wang*

A series of 2-methylchromanone derivatives have been prepared by using a novel palladium-catalyzed Wacker-type oxidative cyclization, in which a 1,5-hydride alkyl to palladium migration and a direct chirality transfer were involved.

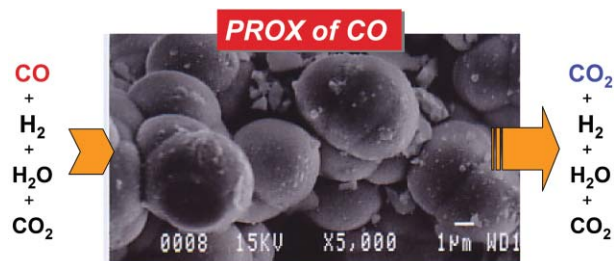


4689

Low-temperature PROX (preferential oxidation) on novel CeO₂-supported Cu-cluster catalysts under fuel-cell operating conditions

Mizuki Tada, Rajaram Bal, Xindong Mu, Rudy Coquet, Seitaro Namba and Yasuhiro Iwasawa*

Cu(I)-clusters on CeO₂ prepared by hydrothermal synthesis using CTAB were found to be highly active and selective for preferential oxidation (PROX) of CO in excess H₂ with H₂O and CO₂ under practical fuel-cell operating conditions.

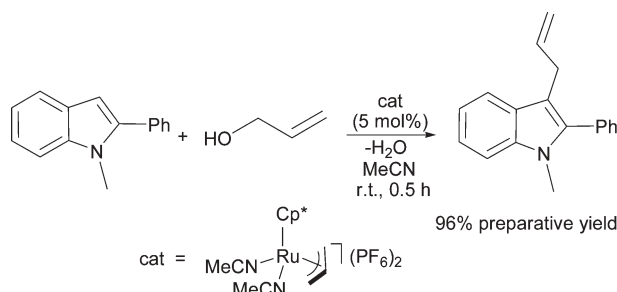


4692

Fast, efficient Ru(IV)-catalysed regioselective allylation of indoles using allyl alcohol (without additives) under mild conditions

Alexey B. Zaitsev, Stefan Gruber and Paul S. Pregosin*

A regioselective and environmentally friendly catalytic synthesis of allyl indole compounds, using allyl alcohol (no additives, no leaving groups), and a Ru(IV) catalyst, is reported.




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