# Chem Comm

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#### Cover

The structures of squalene and hopene against a background of hops.

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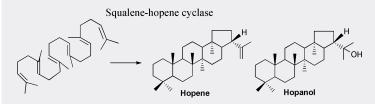
# contents

#### FEATURE ARTICLE



### Squalene-hopene cyclase: catalytic mechanism and substrate recognition

Tsutomu Hoshino and Tsutomu Sato

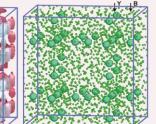


Rapid progress on the catalytic mechanism and substrate recognition by squalene—hopene cyclase, which has occurred only in the last several years, is reported. A series of site-directed mutation experiments and some squalene analogues have provided deep insight into the polycyclization mechanism and catalytic sites in conjunction with the information from X-ray crystal data.

### COMMUNICATIONS



## Three-dimensional imaging of $YB_{56}$ by high-resolution electron microscopy



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Takeo Oku

The three-dimensional potential map of a  $YB_{56}$  crystal with a size below 20 nm was obtained by inverse Fourier transformation of three-dimensional phases and amplitudes, this method is useful for three-dimensional structural analysis of nanocrystals.

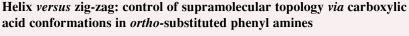
# White line EXAFS 0 100 200 300 400 500 Time (sees)

## Susceptibility of a heterogeneous catalyst, Rh/γ-alumina, to rapid structural change by exposure to NO

Tom Campbell, Andrew J. Dent, Sofia Diaz-Moreno, John Evans, Steven G. Fiddy, Mark A. Newton and Sandra Turin

Metal particles in a Rh/ $\gamma$ -Al $_2$ O $_3$  catalyst of differing particle size are oxidised by NO/He within 5 seconds at 313 K; rapid, highly exothermic dissociative chemisorption of NO is the initial step.





Jason E. Field and D. Venkataraman



Depending on the conformation of the carboxylic acids, bridged bis(benzoic acid) systems can potentially form three types of supramolecular motifs, including the helix. Through internal hydrogen bonding, this conformation, and thus the overall supramolecular structure, may be controlled.



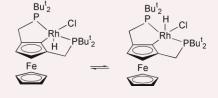
310

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## Synthesis and reactivity of a ferrocene-derived PCP-pincer ligand

Edward J. Farrington, Eloisa Martinez Viviente, B. Scott Williams, Gerard van Koten and John M. Brown

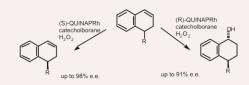
A ferrocene analogue of well-established pincer ligands shows two equilibrating diastereomers in its chlororhodium complex.



## Efficient kinetic resolution in hydroboration of 1,2-dihydronaphthalenes

Kenji Maeda and John M. Brown

1-Substituted 1,2-dihydronaphthalenes undergo kinetic resolution during asymmetric hydroboration with Rh–QUINAP complexes.

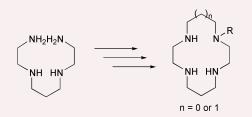


An organic te

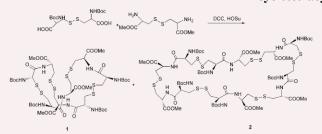
# An organic template approach for the synthesis of selectively functionalised tetraazacycloalkanes

Frédéric Boschetti, Franck Denat, Enrique Espinosa and Roger Guilard

Selectively functionalised tetraazacycloalkanes are obtained from the open-chain tetraamine by using a bisaminal moiety acting both as a template agent and as a N-protecting group.



Unusual cyclo-tetra and hexa peptidation of bis-boc-cystine with cystinedi-OMe: one step preparation of the novel 32- and 48-membered cyclotetracystine and cyclohexacystine



S. Ranganathan, K. M. Muraleedharan, M. Vairamani, A. C. Kunwar and A. Ravi Sankar

The unprecedented formation of 32- and 48-membered macrocycles that inscribe 4 and 6 cystine units, in the peptidation of bis-Boc-cystine with cystine-di-OMe is reported.

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# The first samarium ( $\Pi$ )-mediated stereoselective spirocyclization onto an aromatic ring

Hiroaki Ohno, Shin-ichiro Maeda, Mitsuaki Okumura, Ryutaro Wakayama and Tetsuaki Tanaka

The first samarium(II)-mediated spirocyclisation onto an aromatic ring was achieved by the reaction of methyl 4-(4-oxoalkyl)benzoates with  $SmI_2$  in the presence of i-PrOH and HMPA.

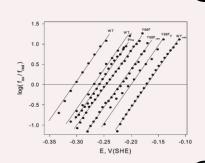
MeO<sub>2</sub>C WO

MeO<sub>2</sub>C

# Redox control of the P450cam catalytic cycle: effects of Y96F active site mutation and binding of a non-natural substrate

Vytas Reipa, Martin P. Mayhew, Marcia J. Holden and Vincent L. Vilker

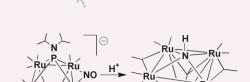
Nernst plots of purified cytochrome P450cam and Y96F mutant with and without camphor or styrene as substrates.



# $\label{lem:mixed_phosphinidene} \textbf{Mixed nitrosyl/phosphinidene and nitrene/phosphinidene clusters of ruthenium}$

Ludmila Scoles, Brian T. Sterenberg, Konstantin A. Udachin and Arthur J. Carty

Reaction of  $[Ru_5(CO)_{15}(\mu_4\text{-PNPr}^i_2)]$  with  $[PPN][NO_2]$  led to the cluster complex  $[PPN][Ru_5(CO)_{13}(\mu\text{-NO})(\mu_4\text{-PNPr}^i_2)]$  which is transformed into the novel cluster  $[Ru_5(CO)_{10}(\mu\text{-CO})_2(\mu_3\text{-CO})(\mu_4\text{-NH})(\mu_3\text{-PNPr}^i_2)]$  via treatment with triflic acid.



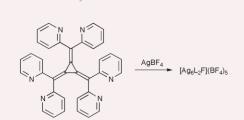
# 322

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## Hexa(2-pyridyl)[3]radialene: self-assembly of a hexanuclear silver array

Peter J. Steel and Christopher J. Sumby

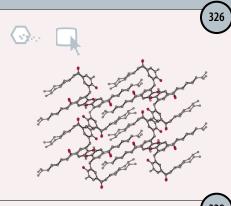
Reaction of the new ligand hexa(2-pyridyl)[3]radialene with silver tetrafluoroborate results in the formation of a  $M_6L_2$  cage with an encapsulated  $\mu_3$ -fluorido anion.



# Hexakis(2-pyridyl)- and hexakis(3-pyridyl)[3]radialene: novel, water-soluble [3]radialenes with potential utility for supramolecular chemistry

Kouzou Matsumoto, Yukako Harada, Takeshi Kawase and Masaji Oda These radialenes, the first members of radialenes having azine groups,

These radialenes, the first members of radialenes having azine groups, are stable, moderately electron poor radialenes showing the corresponding anion radicals and dianions upon both electrochemical and alkali metal reduction.



# Para-acyl calix[4]arenes: amphiphilic self-assembly from the molecular to the mesoscopic level

Patrick Shahgaldian, Michele Cesario, Philippe Goreloff and Anthony W. Coleman

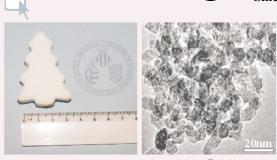
Non-contact mode imaging of amphiphilic solid nanoparticles shows flattened spherical structures of 190 nm in diameter and 50 nm in width, the crystal structure of the molecules shows an unusual partially interdigitated tilted packing system.

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# [30]Heptaphyrin(1.1.1.1.0.0): an aromatic expanded porphyrin with a 'figure eight' like structure

Christophe Bucher, Daniel Seidel, Vincent Lynch and Jonathan L. Sessler

The new heptapyrrolic macrocycle, [30]heptaphyrin(1.1.1.1.1.0.0), is aromatic as judged from its spectral features. Nonetheless, it adopts a 'figure eight'-like structure in the solid state.



## Silica-based powders and monoliths with bimodal pore systems

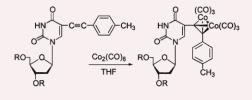
Jamal El Haskouri, David Ortiz de Zárate, Carmen Guillem, Julio Latorre, Maite Caldés, Aurelio Beltrán, Daniel Beltrán, Ana B. Descalzo, Gertrudis Rodríguez-López, Ramón Martínez-Máñez, M. Dolores Marcos and Pedro Amorós

A simple chemical technique for obtaining new bimodal porous silicabased materials admitting variable contents of different heteroelements is presented. The resulting materials can be easily moulded as porous monoliths of significantly large dimensions.

## Synthesis of dicobalt hexacarbonyl 5-p-tolylethynyl-2'-deoxyuridine

Noor Esho, Brian Davies, Janet Lee and Roman Dembinski

Reactions of 5-*p*-tolylethynyl-2'-deoxyuridine and 3',5'-di-O-acetyl-5-*p*-tolylethynyl-2'-deoxyuridine with  $Co_2(CO)_8$  in THF gave 5-*p*-tol $C_2[Co_2(CO)_6]$ -2'-deoxyuridine and 3',5'-di-O-acetyl-5-*p*-tol $C_2[Co_2(CO)_6]$ -2'-deoxyuridine (92 and 66%).



Evidence for through-framework electron transfer in intrazeolite photochemistry. Case of  $Ru(bpy)_3^{2+}$  and methylviologen in novel delaminated ITQ-2 zeolite

Avelino Corma, Vicente Fornés, María S. Galletero, Hermenegildo García and J. C. Scaiano

Emission and laser flash photolysis firmly proves that in zeolite, photoinduced electron transfer between a donor and an acceptor separated in non-connected compartments can occur through the walls.



## Possible high-pressure structures of sulfur trioxide

Toomas Tamm and Pekka Pyykkö

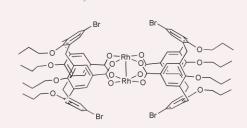
Calculations with the linearized augmented plane wave method indicate that several high-density forms of sulfur trioxide should be accessible at pressures above 29 GPa, with densities up to 1.7 times larger than the presently known forms of solid  $SO_3$ .



## Calixarenes as ligands for transition-metal catalysts: a bis(calix[4]arene-11,23-dicarboxylato) dirhodium complex

Jürgen Seitz and Gerhard Maas

A novel dirhodium tetracarboxylate complex is described in which two calix[4]arene macrocycles are connected through upper-rim bridging by a Rh–Rh unit. It is potentially useful for diastereoselective and regioselective carbene transfer reactions with diazo compounds.

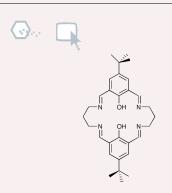


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# Compartmental Schiff-base ligands as selective double-loaded extractants for $copper(\Pi)$

Daniel Black, Alexander J. Blake, Rachel L. Finn, Leonard F. Lindoy, Azizollah Nezhadali, Gholamhossein Rougnaghi, Peter A. Tasker and Martin Schröder

The Robson compartmental macrocyclic ligand derived from the condensation of derivatives of 2,6-diformylphenol and diamines has been prepared for the first time in its free ligand form, and shows efficient transport and extraction of Cu(II).



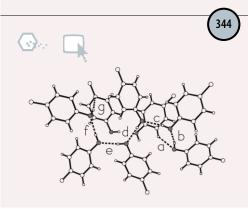
(342)

# Microwave-assisted preparation of dialkylimidazolium tetrachloroaluminates and their use as catalysts in the solvent-free tetrahydropyranylation of alcohols and phenols

Vasudevan V. Namboodiri and Rajender S. Varma

$$\begin{array}{c|c} & & \\ & &$$

Microwave-assisted preparation of dialkylimidazolium tetrachloroaluminates and their use as catalysts in the solvent-free tetrahydropyranylation of alcohols and phenols is described.



## Unusually long cooperative chain of seven hydrogen bonds. An alternative packing type for symmetrical phenols

Praveen K. Thallapally, Amy K. Katz, H. L. Carrell and Gautam R. Desiraju

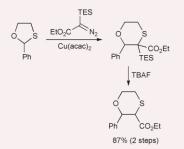
Conformational flexibility in a symmetrical tris-phenol leads to close packed structures that are also characterised by an extended though finite cooperative chain of hydrogen bonds.

## (346)

## A ring expansion reaction of 1,3-oxathiolanes

Maria Ioannou, Michael J. Porter and Fabienne Saez

The carbene-mediated ring expansion of 1,3-oxathiolanes proceeds efficiently provided a silylated diazo compound is used. Subsequent removal of the silyl group can be achieved in high yield by fluoride treatment.



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# Tetraalkylammonium pentaorganosilicates: the first highly stable silicates with five hydrocarbon ligands

Sirik Deerenberg, Marius Schakel, Adrianus H. J. F. de Keijzer, Mirko Kranenburg, Martin Lutz, Anthony L. Spek and Koop Lammertsma

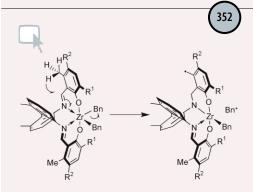
Several tetraalkylammonium pentaorganosilicates, derived from 9,9-spirobi(9*H*,9-silafluorene) were prepared from the corresponding lithium silicates and isolated and characterized as storable high melting solids.

# | This |

## Fabrication of compact silver nanoshells on polystyrene spheres through electrostatic attraction

A. G. Dong, Y. J. Wang, Y. Tang, N. Ren, W. L. Yang and Z. Gao

Nanoshells composed of close-packed silver nanocrystals have been fabricated on PS spheres *via* direct electrostatic adsorption at appropriate pH; the thickness and roughness of the shell can be readily controlled through a layer-by-layer technique.



# Problems and solutions for alkene polymerisation catalysts incorporating Schiff-bases; migratory insertion and radical mechanisms of catalyst deactivation

Paul D. Knight, Adam J. Clarke, Brian S. Kimberley, Richard A. Jackson and Peter Scott

Steric blocking of an intramolecular 1,2-migratory insertion reaction of a zirconium salicylaldiminato complex leads to a long-lived catalyst for ethene polymerisation, but promotes a new radical catalyst decomposition mechanism in certain instances.

# 

## Crosslinking a palladium(II) polymer gives a laminated sheet structure

Zengquan Qin, Michael C. Jennings and Richard J. Puddephatt

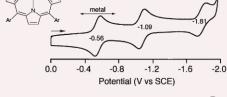
Chains of a zigzag coordination polymer containing bis(pyridyl) bridging groups between palladium(II) centres can be arranged to give a laminated sheet structure by a biomimetic approach in which hydrogen bonding involving amide groups is the key feature.

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Evidence that gold(III) porphyrins are *not* electrochemically inert: facile generation of gold(II) 5,10,15,20-tetrakis(3,5-di-*tert*-butylphenyl)porphyrin

Karl M. Kadish, Wenbo E, Zhongping Ou, Jianguo Shao, Paul J. Sintic, Kei Ohkubo, Shunichi Fukuzumi and Maxwell J. Crossley

Reduction of a gold(III) porphyrin occurs at the central metal ion to give the first known gold(II) porphyrin overturning the long held assumption that reduction of such complexes only occurs at the macrocycle.



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Anion sensing 'venus flytrap' hosts: a modular approach

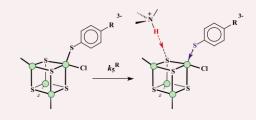
Lagili O. Abouderbala, Warwick J. Belcher, Martyn G. Boutelle, Peter J. Cragg, Jaspreet Dhaliwal, Muriel Fabre, Jonathan W. Steed, David R. Turner and Karl J. Wallace

A series of readily assembled tripodal hosts for anions have been prepared. The new materials show a remarkable anion chelate effect.



Ligand movement modulates the rate of proton transfer in reactions of  $[Fe_4S_4Cl_4]^{2-}$ 

Adrian J. Dunford and Richard A. Henderson



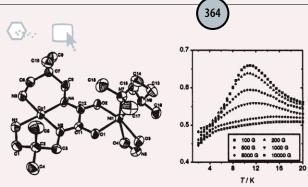
Both nucleophilic attack of  $4\text{-RC}_6\text{H}_4\text{S}^-$  at  $[\text{Fe}_4\text{S}_4\text{Cl}_4]^{2^-}$  and subsequent protonation are facilitated by electron-withdrawing R-substituents, indicating that Fe-thiolate bond length changes modulate the rate of proton transfer.



A stable metal coordination polymer gel based on a calix[4]arene and its 'uptake' of non-ionic organic molecules from the aqueous phase

Bengang Xing, Ming-Fai Choi and Bing Xu

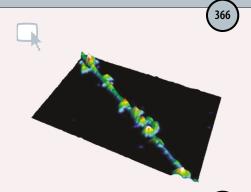
A coordination polymer based, stable organogel ('metallogel'), which 'uptakes' neutral organic molecules from the aqueous phase, may serve as an artificial system to mimic the uptake processes of alkylotrophs.



Synthesis and characterization of  $[Cu(Me_2oxpn)Ni(NO_2)-(tmen)](ClO_4)$ : a single ferrimagnetic dinuclear  $Cu^{II}-Ni^{II}$  complex acting as weak molecule-based magnet

Javier Tercero, Carmen Diaz, Joan Ribas, José Mahía and Miguel Maestro

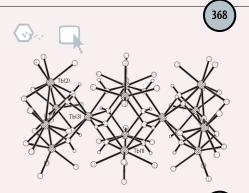
A new heterodinuclear Ni<sup>II</sup>–Cu<sup>II</sup> complex shows ferromagnetic ordering at low temperature. It is one of the very few compounds made from isolated molecules that lead to cooperative magnetic behavior.



## Directly observed covalent coupling of quantum dots to single-wall carbon nanotubes

Bobak R. Azamian, Karl S. Coleman, Jason J. Davis, Neal Hanson and Malcolm L. H. Green

Metal nanoparticles have been covalently coupled to single-walled carbon nanotube termini and side-walls, with the process monitored by atomic force microscopy.



# Toward constructing nanoscale hydroxo-lanthanide clusters: syntheses and characterizations of novel tetradecanuclear hydroxo-lanthanide clusters

Ruiyao Wang, Datong Song and Suning Wang

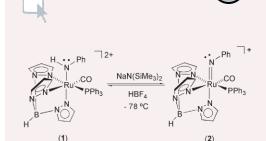
An unprecedented new member of hydroxo–lanthanide cluster compounds,  $Ln_{14}(\mu_4\text{-OH})_2(\mu_3\text{-OH})_{16}(\mu\text{-}\eta^2\text{-acac})_8(\eta^2\text{-acac})_{16}\text{, that contains a 'hollow' }Ln_6$  octahedron, has been synthesized and characterized. The core structure of the  $Ln_{14}$  (Ln = Tb) molecule is shown here.



# Zipping up 'the crushed fullerene' $C_{60}H_{30}$ : $C_{60}$ by fifteen-fold, consecutive intramolecular $H_2$ losses

Berta Gómez-Lor, Carola Koper, Roel H. Fokkens, Edward J. Vlietstra, Thomas J. Cleij, Leonardus W. Jenneskens, Nico M. M. Nibbering and Antonio M. Echavarren

MALDI TOF-MS (positive-ion mode) of tribenzo[l:l':l'']benzo[1,2-e:3,4-e':5,6-e'']triacephenanthrylene (1a,  $C_{60}H_{30}$ ) gives  $C_{60}^{+}$  by multiple intramolecular cyclodehydrogenation reactions.

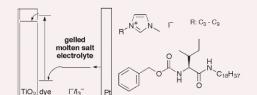


Synthesis of the  $Ru^{IV}$  amido complex  $[TpRu(CO)(PPh_3)(NHPh)][OTf]_2$  (Tp = hydridotris(pyrazolyl)borate; OTf = trifluoromethanesulfonate) and deprotonation to form an octahedral and  $d^4$  imido complex: computational study of  $Ru^{IV}$ -imido bonding

K. N. Jayaprakash, Aaron M. Gillepsie, T. Brent Gunnoe and David P. White

Octahedral and d<sup>4</sup> imido complexes are rarely observed. This report details the generation of the thermally unstable imido complex

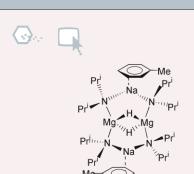
[TpRu(CO)(PPh<sub>3</sub>)(NPh)][OTf] at low temperature along with a computational study of the bonding in the imido complex.



# Quasi-solid-state dye-sensitized solar cells using room temperature molten salts and a low molecular weight gelator

Wataru Kubo, Takayuki Kitamura, Kenji Hanabusa, Yuji Wada and Shozo Yanagida

A dye-sensitized solar cell fabricated using imidazolium iodide, iodine and a gelator as a solvent-free quasi-solid-state electrolyte showed a 5.0% conversion efficiency and high-temperature stability.



## Hydride encapsulation in s-block metal inverse crown chemistry

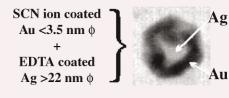
Daniel J. Gallagher, Kenneth W. Henderson, Alan R. Kennedy, Charles T. O'Hara, Robert E. Mulvey and René B. Rowlings

The first example of hydride encapsulation within a mixed alkali metal–magnesium amide is described, extending yet further the range of so called inverse crown complexes.

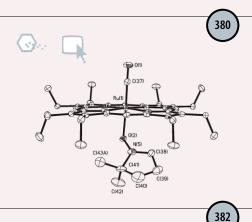


# Size quantized formation and self-assembly of gold encased silver nanoparticles

Eliza Hutter and Janos H. Fendler



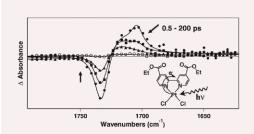
Mixing aqueous dispersions of thiocyanate ion coated small (<3.5 nm diameter) gold nanoparticles and EDTA covered larger (>22 nm diameter) silver nanoparticles, results in the formation of robust gold encased silver nanoparticles; in contrast to using larger (>11 nm diameter) gold nanoparticles which forms chained structures.



# Nitrones are suitable ligands for heme models: X-ray crystal structure of the first metalloporphyrin nitrone complex

Jonghyuk Lee, Brendan Twamley and George B. Richter-Addo

Some nitrones are products of heme-dependent metabolism of N-containing compounds. This study shows, for the first time, that nitrones are good ligands for heme models.



# Picosecond time-resolved infrared spectroscopic investigation of excited state dynamics in a $Pt^\pi$ diimine chromophore

Julia A. Weinstein, David C. Grills, Michael Towrie, Pavel Matousek, Anthony W. Parker and Michael W. George

This is the first application of picosecond time-resolved infrared (TRIR) spectroscopy to a d<sup>8</sup> metal chromophore, Pt(4,4'-(CO<sub>2</sub>Et)<sub>2</sub>-2,2'-bpy)Cl<sub>2</sub>, leading to an MLCT assignment of the lowest excited state with an 8.7 ps lifetime.

# $(N) = \{M\} = \{Ru(\rho - cym)(S-S)\}; X = CI \}$ $(N) = \{M\} = \{Ru(\rho - cym)(S-S)\}; X = CI \}$ $(N) = \{M\} = \{Ru(\rho - cym)(S-S)\}; X = CI \}$ $(N) = \{M\} = \{$

## Molybdenum alkynyls as alkynyl transfer reagents

Julio Pérez, Lucía Riera, Víctor Riera, Santiago García-Granda, Esther García-Rodríguez and Daniel Miguel

New alkynyl complexes [Mo(C $\equiv$ CR)( $\eta^3$ -allyl)(CO)<sub>2</sub>(phen)], easily prepared and handled, efficiently transfer the alkynyl group to other metal fragments under mild conditions, a property that correlates with their long Mo–C(alkynyl) bond distances.



## Investigation of the factors controlling the regioselectivity of the hydroboration of fluoroolefins

P. Veeraraghavan Ramachandran and Michael P. Jennings

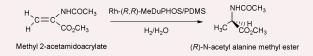
$$C_6F_{13}$$
 $X$ 
 $X$ 
 $C_6F_{13}$ 
 $X = Cl:$ 
 $X = Chx:$ 
 $X = C$ 

Either Markovnikov or anti-Markovnikov regioselectivity can be achieved at will during the hydroboration—oxidation of perfluoroalkyl(aryl)ethylenes by varying the hydroborating agent.



## Aqueous enantioselective hydrogenation of methyl 2-acetamidoacrylate with Rh–MeDuPHOS occluded in PDMS

Adi Wolfson, Sofie Janssens, Ivo Vankelecom, Shimona Geresh, Moshe Gottlieb and Moti Herskowitz



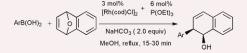
Asymmetric hydrogenation of methyl 2-acetamidoacrylate was performed in water with occluded Rh–MeDuPHOS in a PDMS polymer film. Due to low leaching of catalyst into water and the lack of solubility in the aqueous medium, the recyclable system represents an excellent example of 'green' chemistry.



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## Rhodium-catalysed addition of arylboronic acids to oxabenzonorbornadienes

Masahiro Murakami and Hideyuki Igawa



A rhodium(I) complex having P(OEt)<sub>3</sub> ligands catalyses the addition reaction of boronic acids to oxabenzonorbornadienes, affording *cis*-2-aryl-1,2-dihydro-1-naphthol stereoselectively, and in good yield without concomitant deboronation of the boronic acid.

### ADDITIONS AND CORRECTIONS



Haoguo Zhu, Deborah J. Jones, Jerzy Zajac, Jacques Rozière and Roger Dutartre Periodic large mesoporous organosilicas from lyotropic liquid crystal polymer templates



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