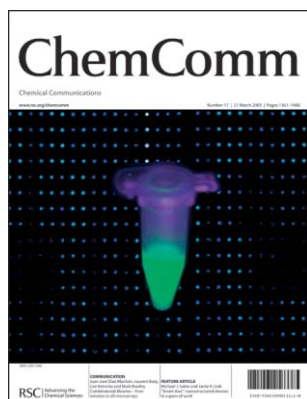


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ISSN 1359-7345 CODEN CHCOFS (11) 1361–1488 (2005)

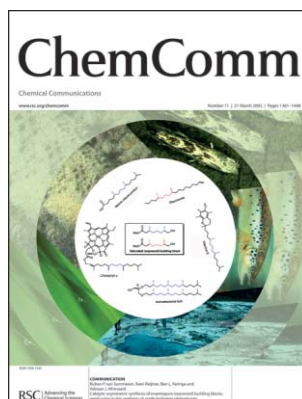


Cover

See Mark Bradley *et al.*, page 1384.

Enzymatic modifications of split and mix libraries were followed by “pulling down” onto a 2-dimensional DNA microarray, *via* PNA tagging; this allowed complete library interrogation of all members of the split and mix library.

Image reproduced by permission of Juan José Díaz-Mochón, Laurent Bialy, Lise Keinicke and Mark Bradley from *Chem. Commun.*, 2005, 1384.



Inside cover

See Adriaan J. Minnaard *et al.*, page 1387.

This is the first reaction to allow the synthesis of multiple stereocentres in hydrocarbon chains and has been used to synthesise two naturally occurring insect pheromones.

Image reproduced by permission of Ruben P. van Summeren, Sven Reijmer, Ben L. Feringa and Adriaan J. Minnaard from *Chem. Commun.*, 2005, 1387.

CHEMICAL TECHNOLOGY

T9

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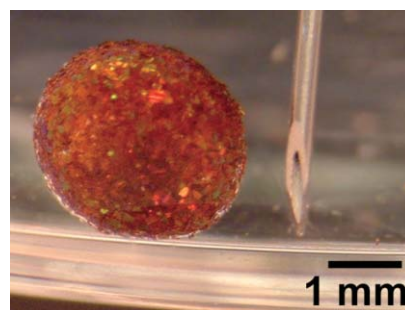
FEATURE ARTICLE

1375

“Smart dust”: nanostructured devices in a grain of sand

Michael J. Sailor and Jamie R. Link

This article discusses the construction of submillimetre functional photonic crystals made from porous silicon. The various optical, chemical and mechanical properties that allow these materials to perform sensing, communication, signal processing and motive functions are described.



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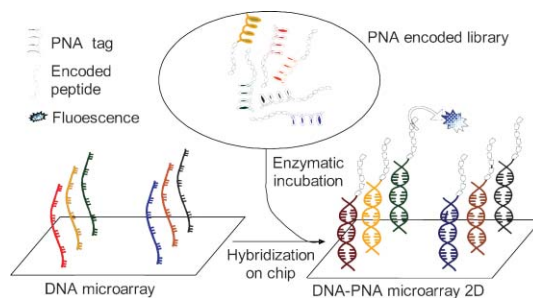
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1384

Combinatorial libraries – from solution to 2D microarrays

Juan José Díaz-Mochón, Laurent Bialy, Lise Keinicke and Mark Bradley*

The method presented allows all members of a split and mix library to be analysed using PNA as tag. This strategy converts solution assays into 2D microarrays.

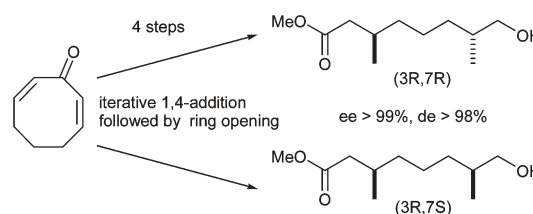


1387

Catalytic asymmetric synthesis of enantiopure isoprenoid building blocks: application in the synthesis of apple leafminer pheromones

Ruben P. van Summeren, Sven J. W. Reijmer, Ben L. Feringa* and Adriaan J. Minnaard*

The facile preparation of versatile enantiopure saturated isoprenoid building blocks *via* a catalytic asymmetric protocol is reported. This new methodology was applied to the total synthesis of two pheromones.

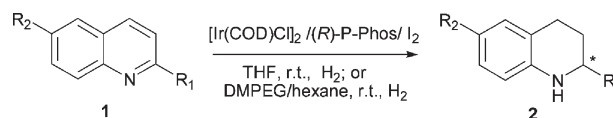


1390

Air-stable Ir-(P-Phos) complex for highly enantioselective hydrogenation of quinolines and their immobilization in poly(ethylene glycol) dimethyl ether (DMPEG)

Lijin Xu, Kim Hung Lam, Jianxin Ji, Jing Wu, Qing-Hua Fan,* Wai-Hung Lo and Albert S. C. Chan*

The title catalyst was found to be highly effective in the asymmetric hydrogenation of quinoline derivatives and could be recovered and reused up to eight times.

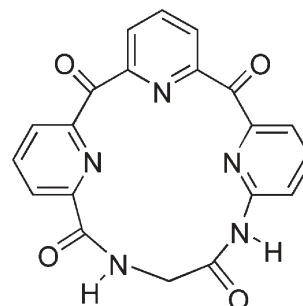


1393

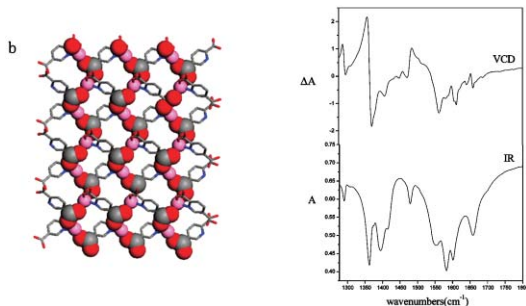
A new macrocycle demonstrates ditopic recognition properties

Jiachang Gong and Bruce C. Gibb*

The synthesis and binding properties of a macrocyclic decorated with seven hydrogen bond acceptors and two hydrogen bond donating amide groups is reported. The host binds alkyl ammonium salts in a manner that is dependent on the nature of both cation and anion.



1396

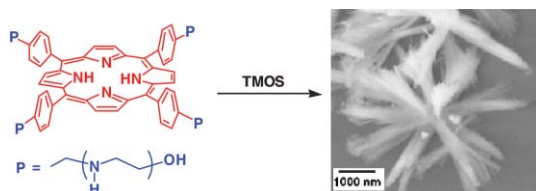


A chiral layered Co(II) coordination polymer with helical chains from achiral materials

Ge Tian, Guangshan Zhu,* Xiaoyu Yang, Qianrong Fang, Ming Xue, Jinyu Sun, Yan Wei* and Shilun Qiu*

A novel layered coordination polymer $\text{Co}(\text{PDC})(\text{H}_2\text{O})_2 \cdot \text{H}_2\text{O}$ containing two helical chains was synthesized, and the resultant crystals were not racemic as evidenced by the observation of strong signals in vibrational circular dichroism (VCD) spectra.

1399

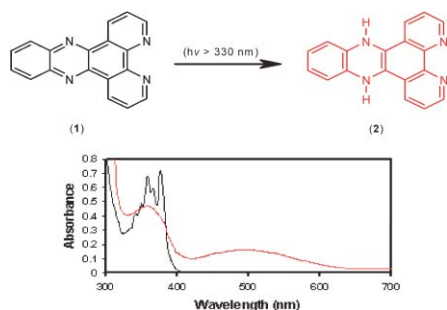


Synthesis of poly(ethyleneimine)s-silica hybrid particles with complex shapes and hierarchical structures

Ren-Hua Jin* and Jian-Jun Yuan

Polymers with different architecture possessing linear poly(ethyleneimine) PEI backbone self-assembled into crystalline aggregates in aqueous medium, on which hydrolytic condensations of silicon alkoxide took place rapidly to give structured silicas with aster, leaf and sponge shape.

1402

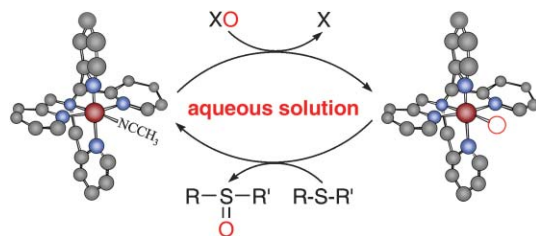


Reduction of dipyrido-[3,2-*a*:2',3'-*c*]-phenazine (dppz) by photolysis in ethanol solution

David A. McGovern, Ania Selmi, John E. O'Brien, John M. Kelly* and Conor Long

Photolysis of **1** in ethanol causes complete conversion to **2** as shown by NMR. Calculations show that the red colour of **2** is due to a low-lying intramolecular charge transfer state.

1405



Formation, stability, and reactivity of a mononuclear nonheme oxoiron(IV) complex in aqueous solution

Chivukula V. Sastri, Mi Sook Seo, Mi Joo Park, Kwan Mook Kim and Wonwoo Nam*

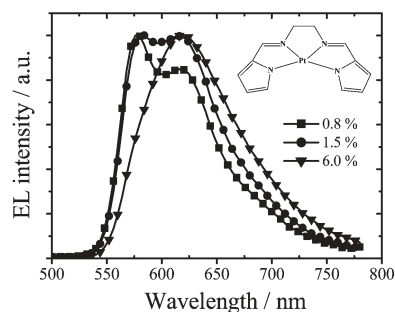
A mononuclear nonheme oxoiron(IV) complex bearing a pentadentate N5 ligand was prepared in aqueous solution; the pH dependence of its stability and reactivity was reported along with the mechanistic details of sulfide oxidation by the oxoiron(IV) species.

1408

High-efficiency red electrophosphorescence based on neutral bis(pyrrole)-diimine platinum(II) complex

Hai-Feng Xiang, Siu-Chung Chan, Kitty Kit-Ying Wu, Chi-Ming Che* and P. T. Lai

Efficient red electroluminescence from the excimer or oligomer of neutral phosphorescent bis(pyrrole)-diimine Pt(II) complex has been achieved with maximum external quantum efficiency, luminous efficiency, power efficiency and brightness of 6.5%, 9.0 cd A⁻¹, 4.0 lm W⁻¹ and 11 100 cd m⁻², respectively.

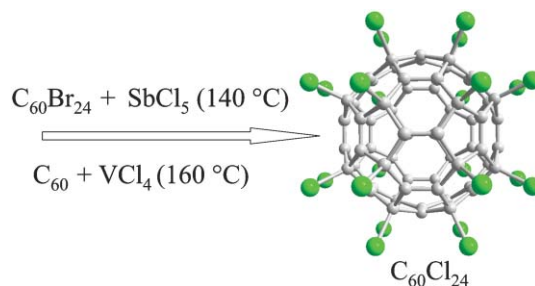


1411

Preparation and crystallographic characterization of C₆₀Cl₂₄

Natalia B. Shustova, Alexey A. Popov, Lev N. Sidorov, Andrew P. Turnbull, Erhard Kemnitz and Sergey I. Troyanov*

C₆₀Cl₂₄ has been synthesized by the chlorination of C₆₀Br₂₄ with SbCl₅ or C₆₀ with VCl₄. The X-ray single crystal structure of C₆₀Cl₂₄·2Br₂ confirmed the molecular T_h symmetry in good agreement with the IR data and theoretical calculations.

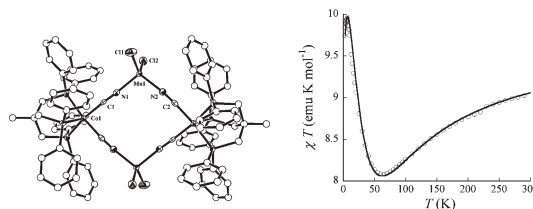


1414

A high spin molecular square based on square pyramidal Co^{II} and tetrahedral Mn^{II} centers: [Mn^{II}Cl₂]₂{Co^{II}(triphos)(CN)₂]₂

Ferdi Karadas, Eric J. Schelter, Andrey V. Prosvirin, John Bacsá and Kim R. Dunbar*

A molecular square of Co^{II} and Mn^{II} has been crystallographically and magnetically characterized. The molecule exhibits a high spin S = 4 ground state with g = 2.02 and J = -9.0 cm⁻¹.

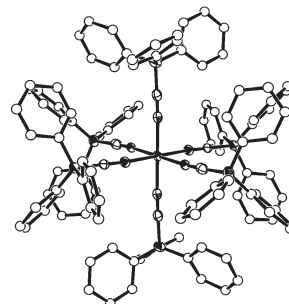


1417

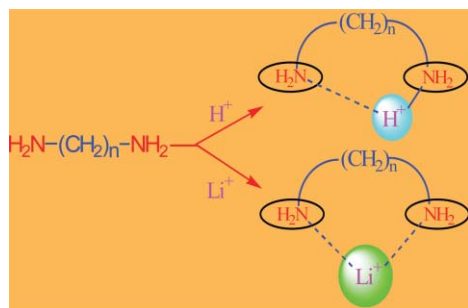
Unexpected conversion of a hexacyanometallate to a homoleptic nitrile complex with triphenylborane substituents

Eric J. Schelter, Mikhail Shatruk, Robert A. Heintz, José Ramón Galán-Mascarós and Kim R. Dunbar*

The reaction of excess triphenylborane with tetraethylammonium hexacyanochromate results in a borane adduct of the cyanometallate that involves a surprising isomerization of the cyanide ligands to yield a homoleptic, N-bound cyanoborate complex of Cr^{III}.



1420

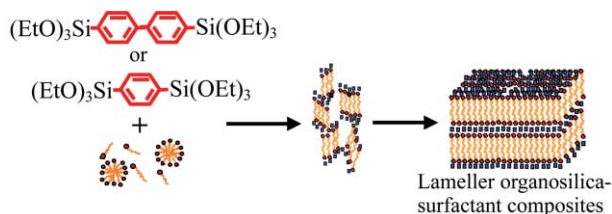


The effect of spacer chain length on ion binding to bidentate α,ω -diamines: Contrasting ordering for H^+ and Li^+ ion affinities

M. Kiran Kumar, J. Srinivasa Rao, S. Prabhakar, M. Vairamani* and G. Narahari Sastry*

Electrospray ionisation mass spectrometry studies and quantum chemical calculations indicate that bidentate ligation of Li^+ ion to the diamines leads to symmetric bridging and exhibits contrasting relative affinity orderings compared to that of proton for α,ω -diamines.

1423

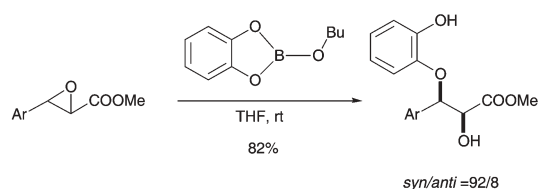


Organosilicate-surfactant lamellar mesophase with molecular-scale periodicity in the silicate layers

Kentaro Okamoto, Mahendra P. Kapoor and Shinji Inagaki*

The synthesis of lamellar mesophases of organosilicate-surfactant composites with periodicity within the silicate layers due to periodic arrangement of phenylene- and biphenylene-silica moieties.

1426

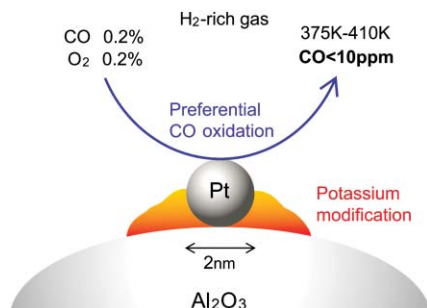


Mild metal-free *syn*-stereoselective ring opening of activated epoxides and aziridines with aryl borates

Mauro Pineschi,* Ferruccio Bertolini, Robert M. Haak, Paolo Crotti and Franco Macchia

A conceptually new, simple and practical method for the *syn*-nucleophilic displacement of aryl and vinyl epoxides and aryl aziridines with (substituted) phenols, using aryl borates as activating nucleophiles under neutral conditions, is reported.

1429



Preferential CO oxidation promoted by the presence of H_2 over $K-Pt/Al_2O_3$

Yuji Minemura, Shin-ichi Ito, Toshihiro Miyao, Shuichi Naito, Keiichi Tomishige and Kimio Kunimori*

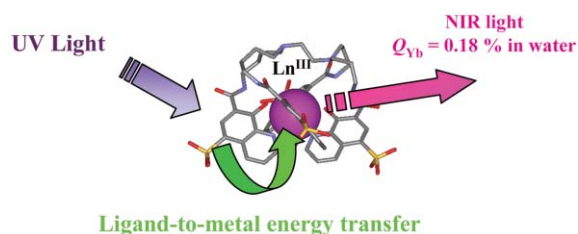
In preferential CO oxidation in H_2 -rich gas, $K-Pt/Al_2O_3$ ($K/Pt = 10$) was very effective in decreasing CO concentration below 10 ppm in the 375–410 K range; furthermore, the activity of CO oxidation was promoted drastically by the presence of H_2 .

1432

Lanthanide 8-hydroxyquinoline-based podates with efficient emission in the NIR range

Daniel Imbert,* Steve Comby, Anne-Sophie Chauvin and Jean-Claude G. Bünzli

A tetrapodal ligand bearing 8-hydroxyquinoline chromophores forms stable Ln^{III} complexes in aqueous solution at physiological pH, with no bound water in the inner coordination sphere, and is a very good sensitizer of Yb^{III} (and Nd^{III}) NIR luminescence.

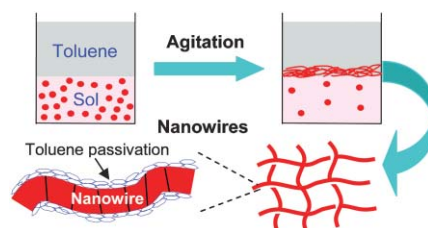


1435

Wet-chemical templateless assembly of metal nanowires from nanoparticles

T. Maddanimath, A. Kumar, J. D'Arcy-Gall, P. G. Ganesan, K. Vijayamohan and G. Ramanath*

A simple, room-temperature, templateless technique to synthesize networks of organically-passivated Au and Ag nanowires from biphasic liquid mixtures of aqueous hydrosols of the metal nanoparticles, and toluene.

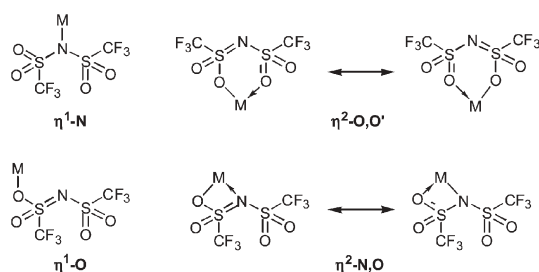


1438

Coordination chemistry of the bis(trifluoromethylsulfonyl)imide anion: molecular interactions in room temperature ionic liquids

D. Bridget Williams, Michael E. Stoll, Brian L. Scott, David A. Costa and Warren J. Oldham, Jr.*

Room temperature ionic liquids composed of bis(trifluoromethylsulfonyl)imide anions and dialkylimidazolium cations stabilize monomeric ligand deficient transition metal complexes *via* four distinct binding modes.

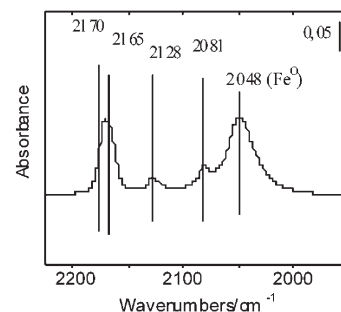


1441

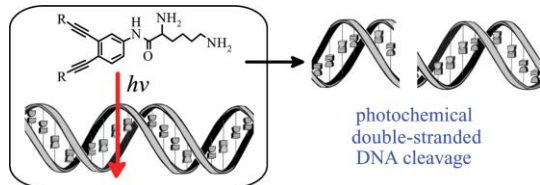
Low temperature CO oxidation over iron-containing MCM-41 catalysts

Ágnes Szegedi, Mihály Hegedűs, József L. Margitfalvi* and Imre Kiricsi

Unusual high activity of iron-containing MCM-41 catalyst in low temperature CO oxidation is reported. The high activity is attributed to the formation of metallic iron after reduction in hydrogen above 773 K.



1444

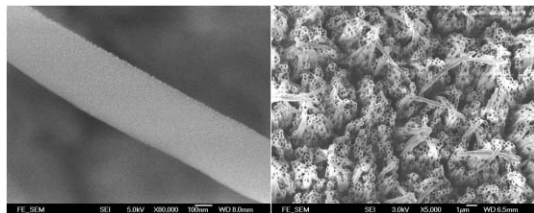


Lysine–enediynes conjugates as photochemically triggered DNA double-strand cleavage agents

Serguei V. Kovalenko and Igor V. Alabugin*

Statistical analysis of DNA-photocleavage by two types of lysine–enediynes conjugates confirms that more double-strand breaks are produced than can be accounted for by coincident single-strand breaks.

1447

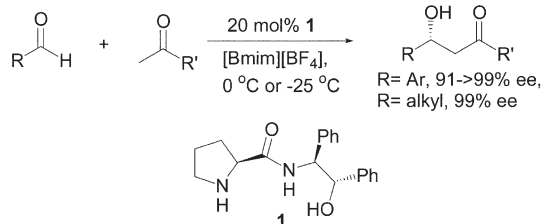


A simple and convenient route to prepare poly(vinylidene fluoride trifluoroethylene) copolymer nanowires and nanotubes

R. K. Zheng,* Y. Yang, Y. Wang, J. Wang,
H. L. W. Chan, C. L. Choy, C. G. Jin and X. G. Li

The title compounds have been prepared by a high-temperature vacuum infiltration method.

1450

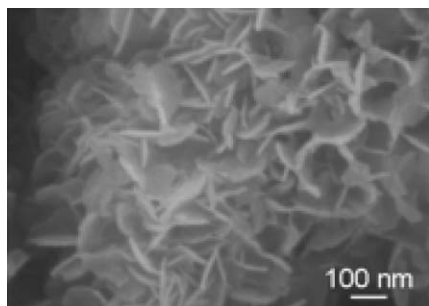


Asymmetric direct aldol reaction catalyzed by an L-prolinamide derivative: considerable improvement of the catalytic efficiency in the ionic liquid

Hai-Ming Guo, Lin-Feng Cun, Liu-Zhu Gong,*
Ai-Qiao Mi and Yao-Zhong Jiang*

High enantioselectivities ranging from 91% to >99% ees for aromatic aldehydes and 99% ees for aliphatic aldehydes were obtained by performing the organocatalyst **1** catalyzed direct aldol reactions in ionic liquids.

1453



Nanoplalelet-based reconstructed hydrotalcites: towards more efficient solid base catalysts in aldol condensations

S. Abelló, F. Medina,* D. Tichit, J. Pérez-Ramírez,
Y. Cesteros, P. Salagre and J. E. Sueiras

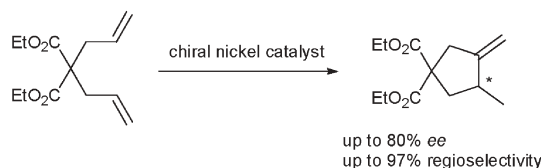
The rehydration of Mg–Al hydrotalcites in the liquid phase using ultrasounds or a high stirring speed leads to nanoplalets with surface areas around $400 \text{ m}^2 \text{ g}^{-1}$, further overcoming the limited accessibility of hydroxyl groups in the interlayer space. These materials display catalytic activities in aldol condensations up to 8 times higher than the best catalytic system reported.

1456

Nickel catalysed asymmetric cycloisomerisation of diethyl diallylmalonate

Christian Böing, Giancarlo Franciò and Walter Leitner*

Cationic nickel catalysts comprising chiral phosphoramidite or azaphospholene ligands affect the cycloisomerisation of diethyl diallylmalonate to give the corresponding methyl-substituted *exo*-methylenecyclopentane derivative with unprecedented high levels of regioselectivity *and* enantioselectivity, opening a promising synthetic strategy for the formation of chiral 5-membered carbocycles.

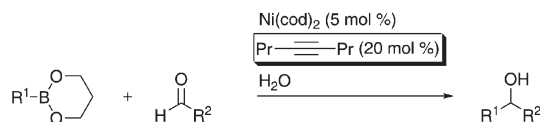


1459

Alkynes as activators in the nickel-catalysed addition of organoboronates to aldehydes

Go Takahashi, Eiji Shirakawa,* Teruhisa Tsuchimoto and Yusuke Kawakami

Alkynes, good reaction partners of organometallic compounds, assist a nickel catalyst to promote the addition of organoboronates to aldehydes, where H₂O (1.0 equiv or as a solvent) is a crucial activator.

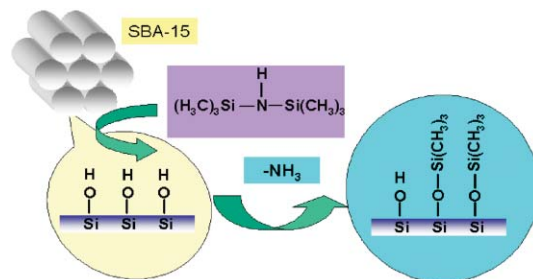


1462

Enhancement in the reducibility of cobalt oxides on a mesoporous silica supported cobalt catalyst

Dae Jung Kim, Brian C. Dunn, Paul Cole, Greg Turpin, Richard D. Ernst, Ronald J. Pugmire, Min Kang, Ji Man Kim and Edward M. Eyring*

The silylation of SBA-15 enhances the reducibility of cobalt oxides on a SBA-15 supported cobalt catalyst, and consequently increases the catalytic activity for Fischer–Tropsch synthesis of hydrocarbons from syngas and selectivity for longer chain products.

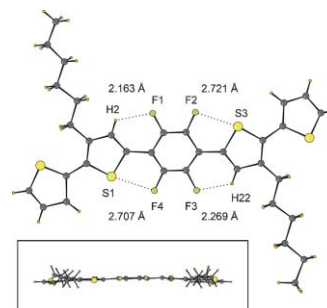


1465

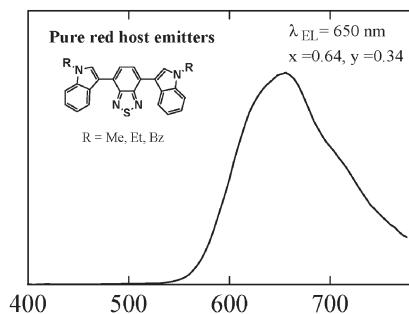
Hexyl-substituted oligothiophenes with a central tetrafluorophenylene unit: crystal engineering of planar structures for p-type organic semiconductors

David J. Crouch, Peter J. Skabara,* Martin Heeney, Iain McCulloch, Simon J. Coles and Michael B. Hursthouse

Rigidification has been achieved in thiophene–tetrafluorophenylene architectures through strong S⋯F and H⋯F intramolecular interactions; the resulting materials are promising candidates for p-type organic field effect transistors



1468

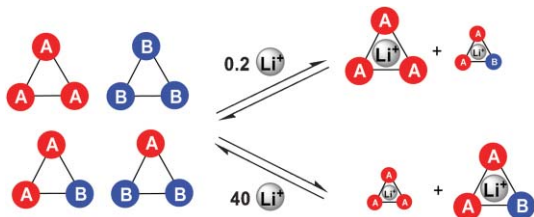


Bisindoles containing a 2,1,3-benzothiadiazole unit: novel non-doping red organic light-emitting diodes with excellent color purity

Qiang Fang,* Bing Xu, Biao Jiang,* Haitao Fu, Xiaoyao Chen and Amin Cao

Novel bisindole-based red fluorescent materials were prepared and used as non-doping red emitters to give the devices emitting saturated red color with a chromaticity coordinate matching the CIE 1931 standard red color very well.

1471

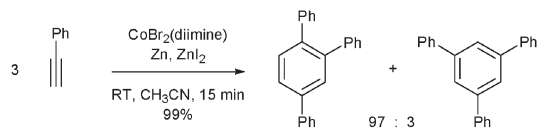


Selection experiments with dynamic combinatorial libraries: the importance of the target concentration

Isabelle Saur and Kay Severin*

The lithium ion concentration has a strong influence on the outcome of selection experiments with a dynamic mixture of self-assembled receptors.

1474

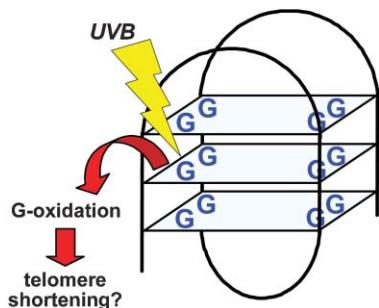


A simple cobalt catalyst system for the efficient and regioselective cyclotrimerisation of alkynes

Gerhard Hilt,* Thomas Vogler, Wilfried Hess and Fabrizio Galbiati

A simple cobalt catalyst effects efficient cyclotrimerisation of terminal and internal alkynes to yield the unsymmetrical products in excellent regioselectivities.

1476



Selective guanine oxidation by UVB-irradiation in telomeric DNA

Kiyohiko Kawai,* Mamoru Fujitsuka and Tetsuro Majima*

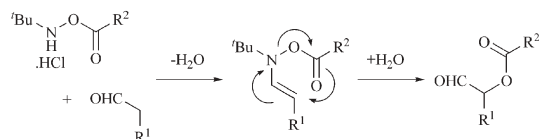
The combination of the transient absorption measurement and DNA damage quantification by HPLC clearly demonstrated the preferential excitation of guanine and its decomposition by UVB-irradiation in quadruplex DNA.

1478

A simple method for the α -oxygenation of aldehydes

Cory S. Beshara, Adrian Hall, Robert L. Jenkins, Teyrnon C. Jones, Rachael T. Parry, Stephen P. Thomas and Nicholas C. O. Tomkinson*

Treatment of a series of aldehydes with *N*-*tert*-butyl-*O*-benzoyl hydroxylamine hydrochloride gives the corresponding α -oxygenated carbonyl *via* a proposed pericyclic rearrangement process.

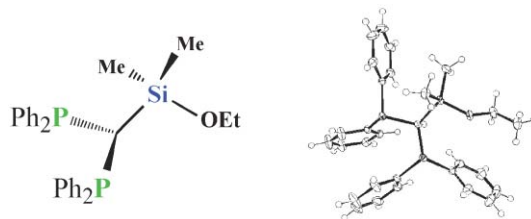


1481

Easy one-pot synthesis of new dppm-type linkers for immobilizations

Frederik Piestert, Rachid Fetouaki, Mona Bogza, Thomas Oeser and Janet Blümel*

Symmetric and unsymmetric chelate phosphines ($R_2P(R'_2P)CHSiMe_2(OEt)$) incorporating ethoxysilyl groups are synthesized, and investigated by X-ray and single-crystal ^{31}P CP/MAS. One representative ligand is shown to coordinate a nickel complex.

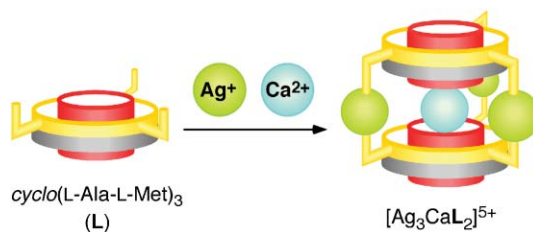


1484

Heterogeneous assembly of silver(I) and calcium(II) ions accompanying a dimer formation of *cyclo*(L-Ala-L-Met)₃

Tomoko Okada, Kentaro Tanaka, Motoo Shiro and Mitsuhiro Shionoya*

A cyclic hexapeptide, *cyclo*(L-Ala-L-Met)₃ (L), allows quantitative, heterogeneous assembly of three Ag^+ and one Ca^{2+} ion in a dimer formation.




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