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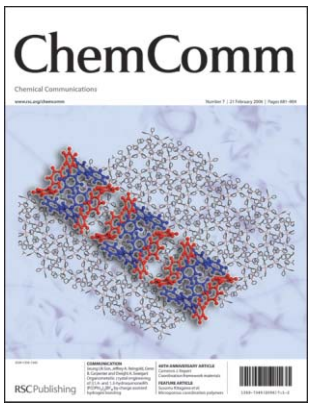

Cover

See Dwight A. Sweigart *et al.*, page 708.

Charge assisted hydrogen bonding in the ionic complex $[(\eta^6\text{-hydroquinone})Rh\text{-}(P(OPh)_3)_2]^+BF_4^-$ results in a solid state structure featuring hydrophobic channels of aromatic phenyl rings. Image reproduced by permission of Seung Uk Son, Jeffrey A. Reingold, Gene B. Carpenter and Dwight A. Sweigart from *Chem. Commun.*, 2006, 708.

Inside cover

See Hans-Joachim Knölker *et al.*, page 711.

Key intermediate of the first enantioselective total synthesis of the potent lipid peroxidation inhibitor neocarazostatin B. Image reproduced by permission of Regina Czerwonka, Kethiri R. Reddy, Elke Baum and Hans-Joachim Knölker from *Chem. Commun.*, 2006, 711.

CHEMICAL SCIENCE

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant scientific advances.

Chemical Science

February 2006/Volume 3/Issue 2

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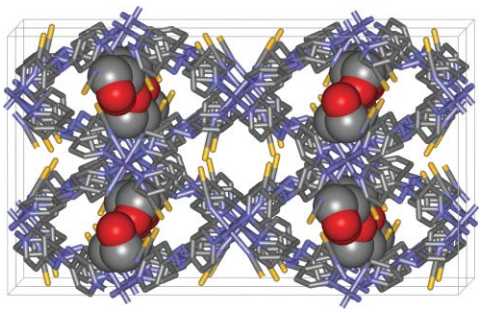
40TH ANNIVERSARY ARTICLE



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FEATURE ARTICLE

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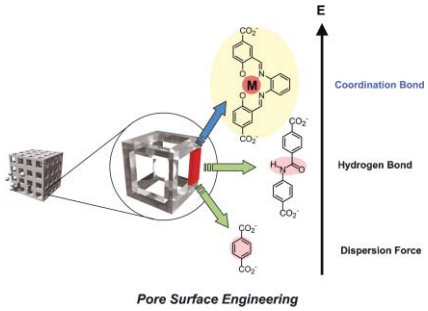
Pore surface engineering of microporous coordination polymers

Susumu Kitagawa,* Shin-ichiro Noro and Takayoshi Nakamura

Pore surface properties of microporous coordination polymers are easily modified using metalloligands, which introduce coordinatively unsaturated metal centers onto the channel surface.



Pore Surface Engineering

COMMUNICATIONS

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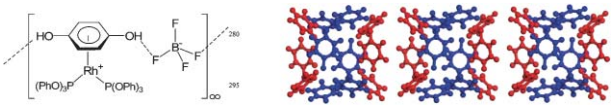
Organometallic crystal engineering of [(1,4- and 1,3-hydroquinone)Rh(P(OPh)$_3$)$_2$]BF$_4$ by charge assisted hydrogen bonding

Seung Uk Son, Jeffrey A. Reingold, Gene B. Carpenter and Dwight A. Sweigart*

The ionic complexes [(1,4- and 1,3-hydroquinone)Rh(P(OPh)$_3$)$_2$]-BF$_4$ form porous organometallic structures dictated by charge assisted hydrogen bonding.



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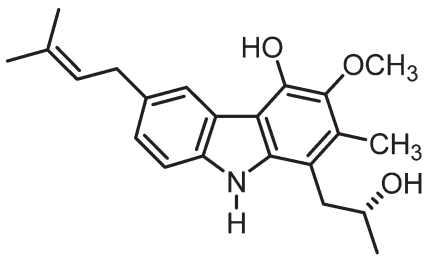
First enantioselective total synthesis of neocarazostatin B, determination of its absolute configuration and transformation into carquinostatin A

Regina Czerwonka, Kethiri R. Reddy, Elke Baum and Hans-Joachim Knölker*

The first enantioselective total synthesis of neocarazostatin B, the determination of its absolute configuration and transformation into carquinostatin A are described.



(*R*)-(–)-neocarazostatin B

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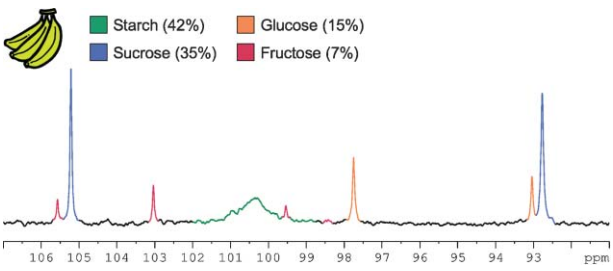
Use of ionic liquids in the study of fruit ripening by high-resolution ^{13}C NMR spectroscopy: 'green' solvents meet green bananas

Diego A. Fort, Richard P. Swatloski, Patrick Moyna,* Robin D. Rogers* and Guillermo Moyna*

Banana pulps at any ripening stage can be completely dissolved in solvent systems based on the ionic liquid (IL) 1-*n*-butyl-3-methylimidazolium chloride ([C$_4$mim]Cl), and variations in the carbohydrate composition of the fruit analyzed directly on the resulting solutions using high-resolution ^{13}C NMR spectroscopy.



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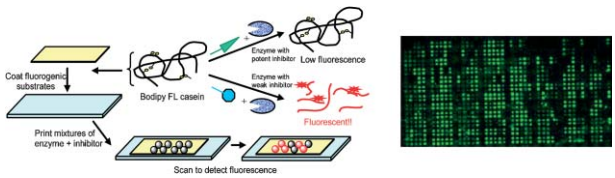

Activity-based high-throughput profiling of metalloprotease inhibitors using small molecule microarrays

Jun Wang, Mahesh Uttamchandani, Li Ping Sun and Shao Q. Yao*

A high-throughput small molecule microarray (SMM) method that enables quick and cost-effective identification of potent inhibitors of metalloproteases in an activity-dependent manner is described. This offers a rapid means for inhibitor discovery and inhibitor fingerprinting.

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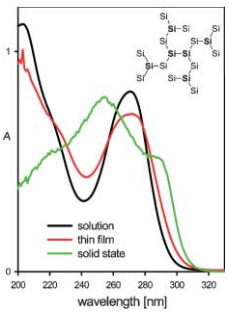

Novel double-cored oligosilane dendrimers—conformational dependence of the UV absorption spectra

C. Krempner,* M. Köckerling and C. Mamat

The X-ray data and the UV absorption behaviour of the novel double-cored oligosilane dendrimers $\{[Me(Me_3Si)_2Si–Me_2Si]_2SiMe\}_2$ (**4**) and $\{[Me(Me_3Si)_2Si–Me_2Si]_2SiMe–SiMe_2\}_2$ (**5**) reveal the extent of σ-conjugation in these molecules to be determined by steric interactions and the conformation of the longest chains.

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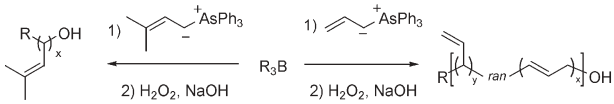

Boron-mediated polymerization of ylides derived from allylic arsonium salts: influence of the double bond substitution on the outcome

Régis Mondière, Jean-Philippe Goddard, Mickaël Huiban, Géraldine Carrot, Thierry Le Gall* and Charles Mioskowski*

The polymerization of ylides derived from arsonium salts containing either an allyl or a 3,3-dimethylallyl group in the presence of boron compounds was shown to afford new oligomers or polymers: poly(propenylene/propenylidene) random copolymers, and polyprenylidenes, respectively.

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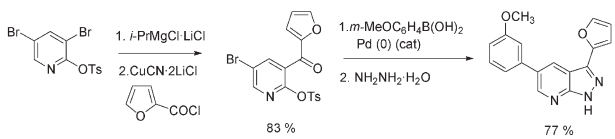


Regioselective functionalization of trisubstituted pyridines using a bromine–magnesium exchange

Hongjun Ren and Paul Knochel*

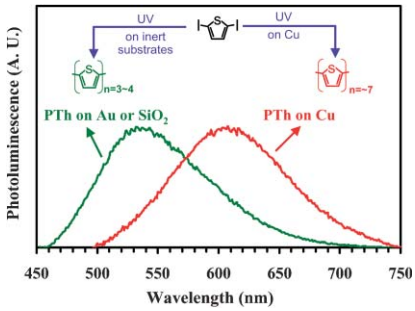
A tosyloxyl substitution in position 2 allows the realisation of a highly regioselective Br/Mg exchange reaction on 3,5-dibromopyridine derivatives using *iso*-PrMgCl·LiCl. The resulting functionalized pyridylmagnesium reagents react with various electrophiles in position 3. Acylated pyridines of this type can be readily converted into pyrazolo [3,4-*b*] pyridines.

729

Synthesis-in-place of highly-conjugated oligothiophene micropatterns *via* photo-activated Ullmann coupling on copper surface

Sudarshan Natarajan and Seong H. Kim*

In contrast to the traditional thermally-activated Ullmann coupling, a photo-activated Ullmann coupling for facile synthesis of oligothiophene and polythiophene films and micropatterns is reported.



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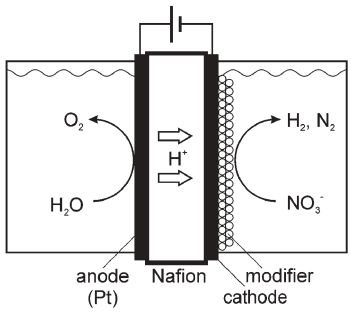
Electrocatalytic nitrate hydrogenation over an H^+-conducting solid polymer electrolyte membrane–modified cathode assembly

Masato Machida,* Kiwako Sato, Isao Ishibashi, Mohammad Abul Hasnat and Keita Ikeue

Selective electrocatalytic hydrogenation of NO_3^- to N_2 in water has successfully been achieved at room temperature using a membrane–electrode assembly (MEA) consisting of an H^+-conducting solid polymer electrolyte (Nafion-117) and a surface-modified Pt cathode.



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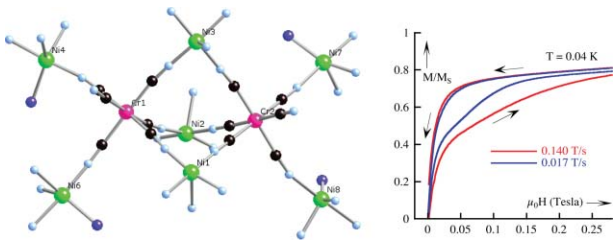
One step assembly of a nonanuclear $Cr^{III}_2Ni^{II}_7$ bimetallic cyanide bridged complex

Jean-Noël Rebilly, Laure Catala, Eric Rivière, Régis Guillot, Wolfgang Wernsdorfer and Talal Mallah*

The reaction of hexacyanochromate(III) with a mononuclear Ni^{II} complex bearing a bulky tridentate macrocycle leads in one step to a nonanuclear Cr_2Ni_7 complex that presents fast tunnelling of the magnetization at low temperature.



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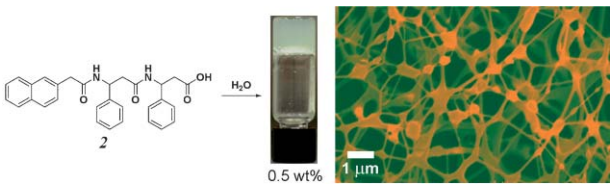
Supramolecular hydrogels based on β-amino acid derivatives

Zhimou Yang, Gaolin Liang and Bing Xu*

A new class of supramolecular hydrogels that consist of β-amino acids may confer proteolytic resistance to the hydrogels for biomedical applications.



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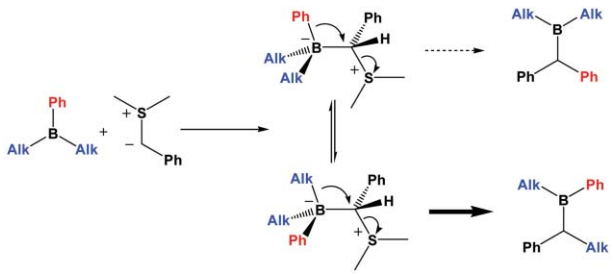

Is phenyl a good migrating group in the rearrangement of organoborates generated from sulfur ylides?

Raphaël Robiette, Guang Yu Fang, Jeremy N. Harvey* and Varinder K. Aggarwal*

We report here on the unexpected low migratory aptitude of the phenyl group observed in the titled reaction and the computational investigation we carried out in order to understand the results obtained.

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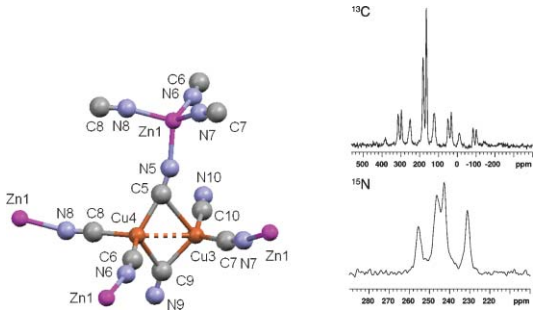

A paramagnetic Cu(I)/Cu(II)/Zn(II) coordination polymer with multiple CN-binding modes and its solid-state NMR characterization

Liang Ouyang, Pedro M. Aguiar, Raymond J. Batchelor, Scott Kroeker* and Daniel B. Leznoff*

A mixed-valent $[Cu(en)_2][Zn(NC)_4(CuCN)_2]$ 2-D layered polymer has been prepared using tetrahedral $[Zn(CN)_4]^{2-}$ as a starting material. It has six inequivalent cyanides in four bonding modes and readily observable ^{13}C and ^{15}N MAS NMR spectra.

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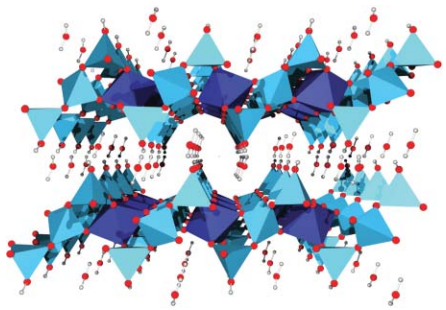

Synthesis and crystal structure of $AlH_2P_3O_{10}\cdot 2H_2O$; a new structure-type for layered acid phosphates

Steven K. Rishi, Benson M. Kariuki, Neal J. Checker, John Godber and Adrian J. Wright*

A new structure-type for a series of layered metal phosphate phases is reported following this study of $AlH_2P_3O_{10}\cdot 2H_2O$. This layered structure, with accessible hydroxyl groups, has potential for a number of important applications, including hosts for novel organic–inorganic hybrids.

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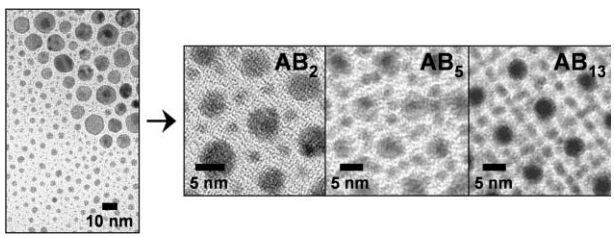
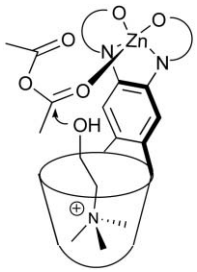
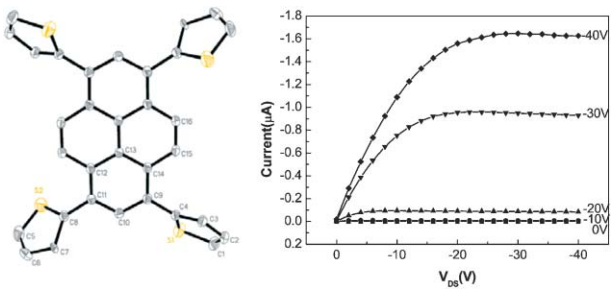


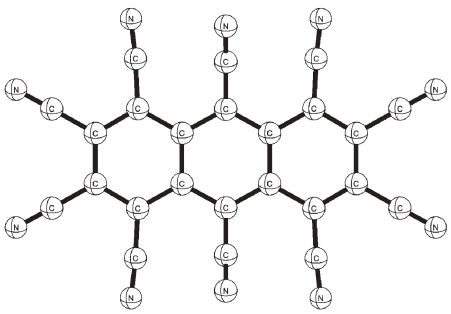
One-pot synthesis of bi-disperse FePt nanoparticles and size-selective self-assembly into AB_2, AB_5, and AB_{13} superlattices

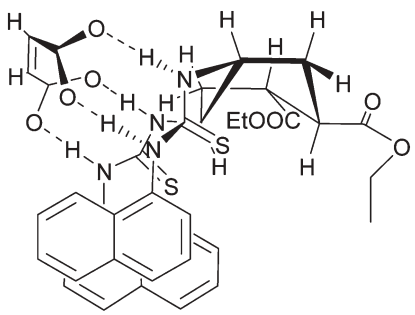
Amandeep K. Sra, Trevor D. Ewers, Qiang Xu, Henny Zandbergen and Raymond E. Schaak*

By chemically modifying the nucleation burst that generates monodisperse FePt nanocrystals, a mixture of Pt and Fe_xPt_{1-x} nanoparticles forms during a one-pot reaction; size-selective precipitation yields a bi-disperse population of Fe_xPt_{1-x} nanoparticles, which can assemble into binary superlattices.









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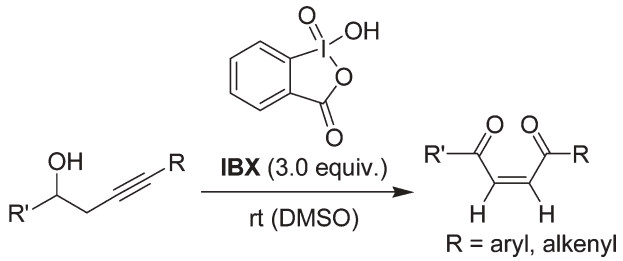

A new method for the synthesis of *Z*-enediones *via* IBX-mediated oxidative rearrangement of 2-alkynyl alcohol systems

Benedikt Crone and Stefan F. Kirsch*

o-Iodoxybenzoic acid (IBX) was found to mediate the selective conversion of 2-alkynyl alcohols into *Z*-enediones under notably mild conditions *via* an unprecedented rearrangement mechanism (33–65% yield, 13 examples).

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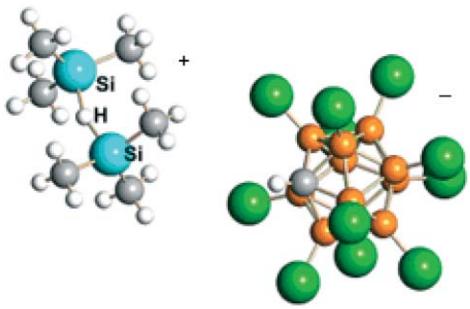
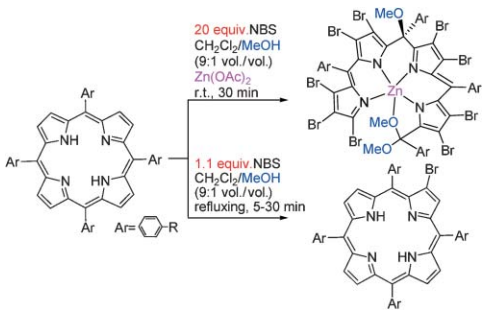


Novel weak coordination to silylium ions: formation of nearly linear Si–H–Si bonds

Stephan P. Hoffmann, Tsuyoshi Kato, Fook S. Tham and Christopher A. Reed*

The weakly coordinating carborane anion in ion-like trialkylsilyl species $R_3Si(CHB_{11}Cl_{11})$ can be displaced by nucleophiles as weak as *ortho*-dichlorobenzene, SO_2 and trialkylsilanes, the latter forming nearly linear hydride bridges in $R_3Si–H–SiR_3^+$ cations.

770



Unexpected bromination ring-opening of tetraarylporphyrins

Chao Liu, Dong-Mei Shen and Qing-Yun Chen*

An unexpected, mild, efficient bromination ring-opening method has been developed for convenient synthesis of various novel biladienes or brominated porphyrins by controlling the amounts of NBS used.

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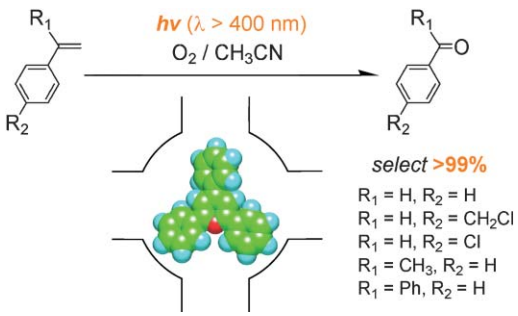
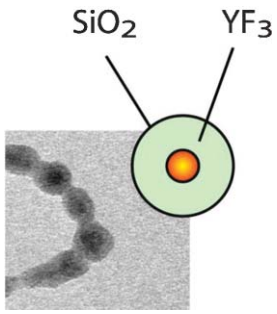
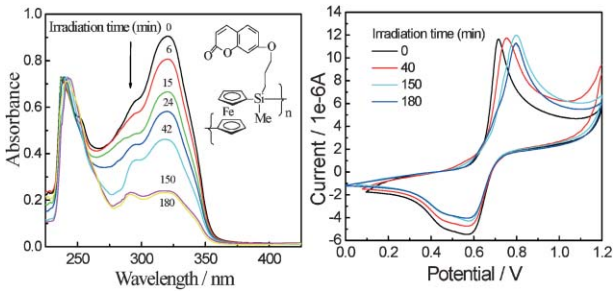


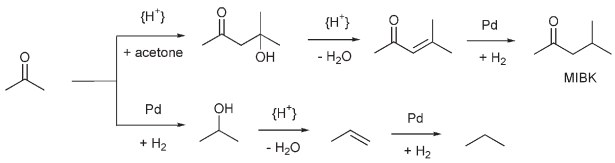
Visible light-induced highly selective transformation of olefin to ketone by 2,4,6-triphenylpyrylium cation encapsulated within zeolite Y

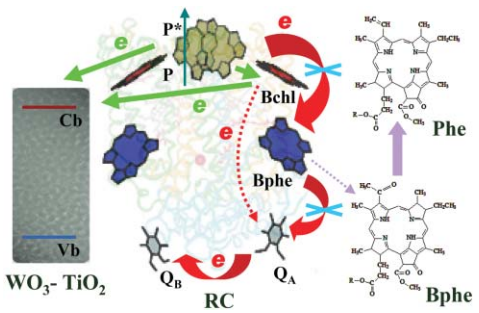
Yasuhiro Shiraishi,* Naoya Saito and Takayuki Hirai

2,4,6-Triphenylpyrylium cation encapsulated within zeolite Y promotes highly selective transformation of olefins to ketones with molecular oxygen, under visible light ($\lambda > 400$ nm) irradiation at room temperature.









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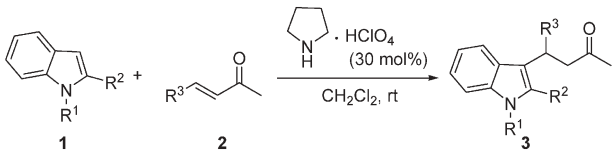
Organocatalytic C3-selective Friedel–Crafts alkylations of indoles with α,β-unsaturated ketones

Dong-Ping Li, Ying-Cen Guo, Yu Ding and Wen-Jing Xiao*

The organocatalytic C3-selective Friedel–Crafts alkylations of indoles with simple ketone electrophiles in the presence of pyrrolidine (30 mol%) and $HClO_4$ (30 mol%) in CH_2Cl_2 at an ambient temperature resulted in β-indolylketones in high yields.



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