



The following Communications have been judged by at least two referees to be “very important papers” and will be published online at [www.angewandte.org](http://www.angewandte.org) soon:

S. T. Scroggins, Y. Chi, J. M. J. Fréchet\*

**Polarity-Directed One-Pot Asymmetric Cascade Reactions Mediated by Two Catalysts in an Aqueous Buffer**

A. B. Chaplin, A. S. Weller\*

**B–H Activation at a Rhodium(II) Center: A Missing Link in the Transition-Metal-Catalyzed Dehydrocoupling of Amine–Boranes**

I. U. Khan, D. Zwanziger, I. Böhme, M. Javed, H. Naseer, S. W. Hyder, A. G. Beck-Sickinger\*

**Breast Cancer Diagnosis by Neuropeptide Y Analogues: From Synthesis to Clinical Application**

Y.-S. Li,\* F.-Y. Liang, H. Bux, A. Feldhoff, W.-S. Yang, J. Caro\*

**Metal–Organic Framework Molecular Sieve Membrane: Supported ZIF-7 Layer with High Hydrogen Selectivity by Microwave-Assisted Seeded Growth**

S. Yamago,\* Y. Watanabe, T. Iwamoto

**Synthesis of [8]Cycloparaphenylene from a Square-Shaped Tetranuclear Platinum Complex  $[\{\text{Pt}(\text{cod})(4,4'\text{-biphenyl})\}_4]$**

S. M. Lang, T. M. Bernhardt,\* R. N. Barnett, U. Landman\*

**Methane Activation and Catalytic Ethylene Formation on Free  $\text{Au}_2^+$**

E. Kang, H. Su Min, J. Lee, M. H. Han, H. J. Ahn, I.-C. Yoon, K. Choi, K. Kim, K. Park, I. C. Kwon\*

**Nanobubbles from Gas-Generating Polymeric Nanoparticles for Ultrasound Imaging of Living Subjects**

A. M. Todea, A. Merca, H. Bögge, T. Glaser, J. M. Pigga, M. L. Langston, T. Liu, R. Prozorov, M. Luban, C. Schröder, W. H. Casey, A. Müller\*

**Porous Capsules  $\{(\text{M})\text{M}_5\}_{12}\text{Fe}^{\text{III}}_{30}$  ( $\text{M} = \text{Mo}^{\text{VI}}, \text{W}^{\text{VI}}$ ): Sphere-Surface Supramolecular Chemistry with Twenty Ammonium Ions, Related Solution Properties, and Tuning of Magnetic Exchange Interactions**

G. Alcaraz,\* L. Vendier, E. Clot, S. Sabo-Etienne\*

**Ruthenium Bis( $\sigma\text{-B-H}$ ) Aminoborane Complexes from Dehydrogenation of Amine–Boranes: Trapping of  $\text{H}_2\text{B-NH}_2$**

## Books

Experiments in Green and Sustainable Chemistry

Herbert W. Roesky, Dietmar Kennepohl

reviewed by M. Oberthür \_\_\_\_\_ 25

## Author Profile



*“The secret of being a successful scientist is to have co-workers who are better than you ever were.*

*My favorite subject at school was chemistry ...”*

This and more about Anthony P. Davis can be found on page 26.

Anthony P. Davis \_\_\_\_\_ 26

## News



M. Beller



S. Buchholz



C. Feldmann



M. Suhm



H. Waldmann

New Members of the Editorial Board of *Angewandte Chemie*:

M. Beller, S. Buchholz, C. Feldmann, M. Suhm, and H. Waldmann \_\_\_\_\_ 27



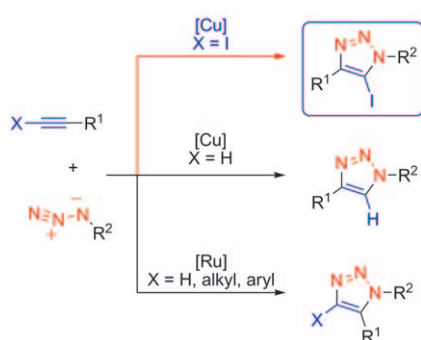
**A fruitful endeavor:** Bent-core or banana mesogens may form chiral liquid-crystal-line phases even though the molecules themselves are achiral. In the examples provided, short-range orientational and positional order alone caused the formation of chiral isotropic liquids from achiral molecules (see AFM image of nanofilaments in one such liquid crystal).

## Highlights

### Liquid Crystals

I. Dierking\* \_\_\_\_\_ 29–30

A New Twist on Chirality: Formation of Chiral Phases from Achiral Molecules in “Banana” Liquid Crystals through Elastic Deformations

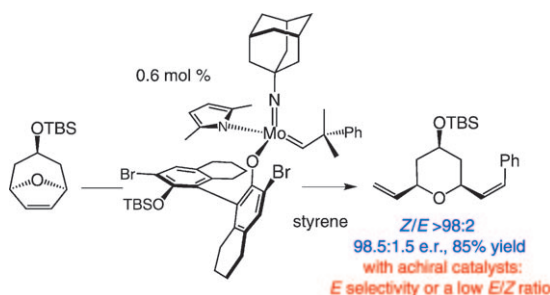


**Clicking along nicely:** Few methods have been reported to be an efficient entry to trisubstituted triazoles with high regioselectivity. This challenge has inspired a search for new reactivity and the development of new chemical approaches. The development of an efficient, robust, one-pot procedure as a route to highly decorated trisubstituted triazoles will be an added bonus to the range of click reactions (see scheme).

### Synthetic Methods

C. Spiteri, J. E. Moses\* \_\_\_\_\_ 31–33

Copper-Catalyzed Azide–Alkyne Cycloaddition: Regioselective Synthesis of 1,4,5-Trisubstituted 1,2,3-Triazoles



**More than meets the eye:** The use of chiral olefin metathesis catalysts should not be viewed as relevant only to cases that require control of absolute stereochemistry: such chiral catalysts often offer levels

of efficiency, product selectivity, and *E/Z* stereoselectivity that are unattainable with the achiral variants (see example; TBS = *tert*-butyldimethylsilyl).

## Minireviews

### Olefin Metathesis

A. H. Hoveyda,\* S. J. Malcolmson, S. J. Meek, A. R. Zhugralin \_\_\_\_\_ 34–44

Catalytic Enantioselective Olefin Metathesis in Natural Product Synthesis. Chiral Metal-Based Complexes that Deliver High Enantioselectivity and More

#### For the USA and Canada:

ANGEWANDTE CHEMIE International Edition (ISSN 1433-7851) is published weekly by Wiley-VCH, PO Box 191161, 69451 Weinheim, Germany. Air freight and mailing in the USA by Publications Expediting Inc., 200 Meacham Ave., Elmont, NY 11003. Periodicals

postage paid at Jamaica, NY 11431. US POSTMASTER: send address changes to *Angewandte Chemie*, Journal Customer Services, John Wiley & Sons Inc., 350 Main St., Malden, MA 02148-5020. Annual subscription price for institutions: US\$ 9442/8583 (valid for print and electronic / print or electronic delivery); for

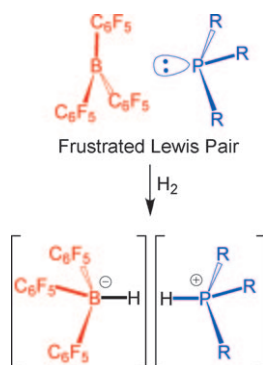
individuals who are personal members of a national chemical society prices are available on request. Postage and handling charges included. All prices are subject to local VAT/sales tax.

## Reviews

### Frustrated Lewis Pairs

D. W. Stephan,\* G. Erker\* — 46–76

Frustrated Lewis Pairs: Metal-free  
Hydrogen Activation and More



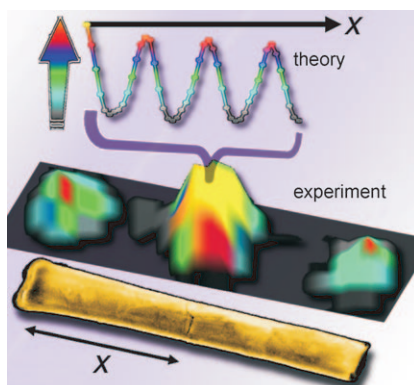
**Born of frustration:** Sterically encumbered Lewis acid and Lewis base combinations do not form “classical” Lewis acid/base adducts. Rather, the unquenched Lewis acidity and basicity of such sterically “frustrated Lewis pairs (FLPs)” is available to heterolytically activate hydrogen (see picture) and can be subsequently utilized for hydrogenation catalysis. FLPs also react with a variety of other small molecules.

## Communications

### Surface Plasmon Polaritons

M. L. Pedano, S. Li, G. C. Schatz,\*  
C. A. Mirkin\* — 78–82


 Periodic Electric Field Enhancement  
Along Gold Rods with Nanogaps



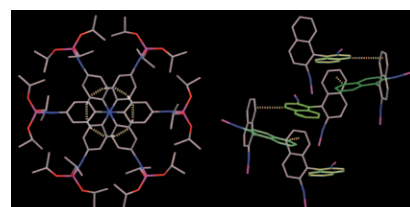
**A periodic dependence** on the Au segment length is observed for the electric field at the nanogap of long-segment Au nanostructures. An optimized geometry of these platforms leads to an intense surface-enhanced Raman scattering (SERS) signal at the nanogap (see picture). Information about molecular transport and vibrational spectra may therefore be simultaneously obtained.

### Self-Assembly

T. Moriuchi,\* M. Nishina,  
T. Hirao\* — 83–86

 Arylimidovanadium(V) Complexes for a  
Tridendritic Centrosymmetric Structural  
Motif or Axial Chirality

**For V's a jolly good fellow:** A one-pot reaction of aniline derivatives with VO-(OiPr)<sub>3</sub> in the presence of NaH affords either trinuclear arylimidovanadium(V) triisopropoxide with a tridendritic centrosymmetric structure (see picture, left) or axially chiral binuclear arylimidovanadium(V) triisopropoxide (right), wherein self-assembly creates a highly ordered molecular arrangement in the solid state.

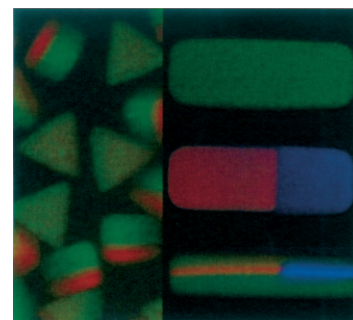


### Flow Lithography

K. W. Bong, K. T. Bong, D. C. Pregibon,  
P. S. Doyle\* — 87–90

 Hydrodynamic Focusing Lithography

**Micro sandwiches:** The new technique of hydrodynamic focusing lithography (HFL) utilizes stacked microfluidic flows for polymer microparticle synthesis. The method can improve the throughput of flow lithography for multifunctional particles and produce more complex chemically patterned particles (see examples).





# Frontiers of Chemistry: From Molecules to Systems

A One-Day Symposium

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(near the Eiffel Tower and Les Invalides)

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Nobel Prize 2007



Jean-Marie Lehn  
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Roger Y. Tsien  
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Ada Yonath  
Nobel Prize 2009



Luisa De Cola



Alan R. Fersht



Marc Fontecave



Michael Grätzel



Michel Orrit



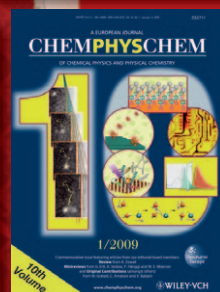
Nicolas Winssinger

## Posters

will be displayed also online from 1st April.

[www.chembiophyschem.org](http://www.chembiophyschem.org)

Celebrating 10 Years of



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## Topics

catalysis, biochemical imaging,  
chemical biology, bionanotechnology,  
proteomics, spectroscopy, solar cells

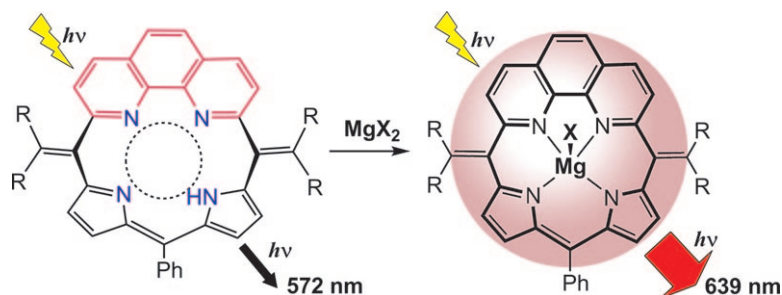


## Molecular Recognition

M. Ishida, Y. Naruta,\* F. Tani — 91–94



A Porphyrin-Related Macrocycle with an Embedded 1,10-Phenanthroline Moiety: Fluorescent Magnesium(II) Ion Sensor



**Room for accommodation:** A novel porphyrin-related macrocycle was constructed by replacement of the dipyrromethene unit with a 1,10-phenanthroline moiety. This macrocycle is capable of complexation and fluorescent detection of

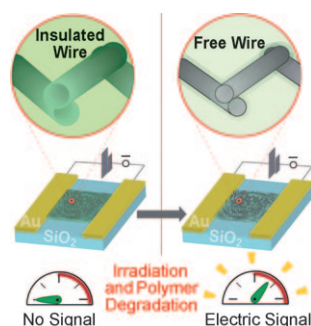
$\text{Mg}^{2+}$  with high selectivity over other physiologically relevant metal ions such as  $\text{Na}^+$ ,  $\text{K}^+$ , and  $\text{Ca}^{2+}$ . It functions well as a fluorescent sensor for  $\text{Mg}^{2+}$  even in HEPES buffered aqueous DMSO solution (pH 7.4).

## Radiation Sensors

J. M. Lobe, T. M. Swager\* — 95–98



Radiation Detection: Resistivity Responses in Functional Poly(Olefin Sulfone)/Carbon Nanotube Composites



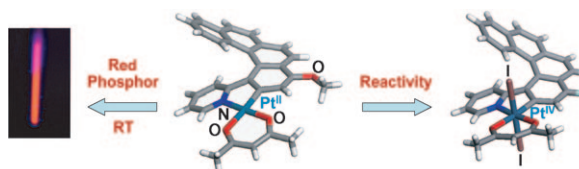
**Detection of gamma rays** is shown using a non-scintillating organic-based sensor composed of poly(olefin sulfone)/carbon nanotube blends. Functionalization of the polymers can be performed after polymerization to tailor their structure with different pyrene and bismuth-containing moieties not accessible by copolymerization, and a systematic improvement in sensitivity is achieved in this way.

## Helicenes

L. Norel, M. Rudolph, N. Vanthuyne, J. A. G. Williams, C. Lescop, C. Roussel, J. Autschbach,\* J. Crassous,\* R. Réau\* — 99–102



Metallahelicenes: Easily Accessible Helicene Derivatives with Large and Tunable Chiroptical Properties



**Enantiopure metallahelicenes** have been prepared by cyclometalation of 2-pyridyl-substituted benzophenanthrenes followed by resolution using chiral HPLC.

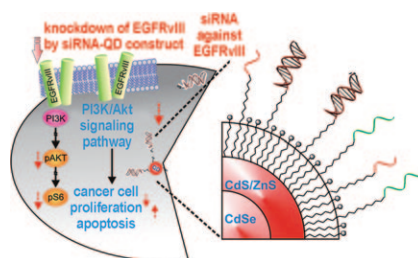
They are red phosphors at room temperature and their chiroptical properties can be modulated by oxidation of the metal center to the oxidation state IV.

## Bionanotechnology

J. Jung, A. Solanki, K. A. Memoli, K. Kamei, H. Kim, M. A. Drahl, L. J. Williams, H.-R. Tseng, K.-B. Lee\* — 103–107



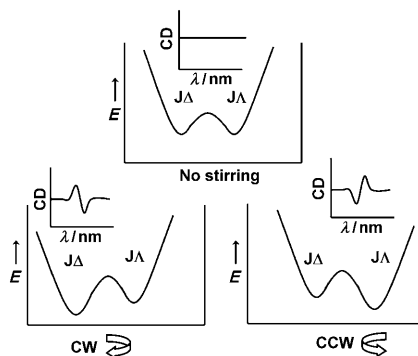
Selective Inhibition of Human Brain Tumor Cells through Multifunctional Quantum-Dot-Based siRNA Delivery



**More than one job:** Quantum dots (QDs) conjugated with thiol-modified small interfering RNA (siRNA) were functionalized with thiol-modified RGD and HIV-Tat peptides. These multifunctional QDs were used for the targeted delivery and tracking of siRNA molecules for the knockdown of the EGFRvIII gene, which led to the downregulation of the PI3K-Akt signaling pathway and the apoptosis of malignant brain cancer cells.



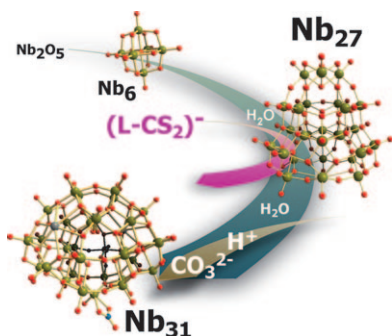
**J-aggregates respond dynamically** to vortices created by stirring. The CD signal inverts with stirring sense and its intensity increases. Prolonged stirring leads to deposition of chiral aggregates on the cuvette wall, the chirality of the deposits depends on the stirring sense. Stirring shifts the equilibrium of a racemic mixture towards the side chosen (and favored) by the stirring sense (see picture, CW = clockwise, CCW = counter clockwise stirring).



## Nanoscale Chirality

A. D'Urso, R. Randazzo, L. Lo Faro, R. Purrello\* 108–112

Vortexes and Nanoscale Chirality

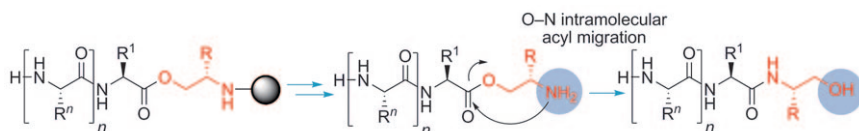


**Big, bigger, biggest:** Polyoxoniobate anions  $[\text{HNb}_{27}\text{O}_{76}]^{16-}$  and  $[\text{H}_{10}\text{Nb}_{31}\text{O}_{92}(\text{CO}_3)]^{23-}$  incorporate pentagonal  $\text{Nb}(\text{Nb})_5$  building blocks; the central Nb ion is seven-coordinate within the clusters. The  $\text{Nb}_{27}$  species was observed using ESI-MS, thus demonstrating some solution stability; the  $\text{Nb}_{31}$  species is chiral and incorporates a carbonate ligand in the outer section of the cluster. The two species are the largest polyoxoniobates reported to date.

## Polyoxoniobates

R. Tsunashima, D.-L. Long, H. N. Miras, D. Gabb, C. P. Pradeep, L. Cronin\* 113–116

The Construction of High-Nuclearity Isopolyoxoniobates with Pentagonal Building Blocks:  $[\text{HNb}_{27}\text{O}_{76}]^{16-}$  and  $[\text{H}_{10}\text{Nb}_{31}\text{O}_{93}(\text{CO}_3)]^{23-}$



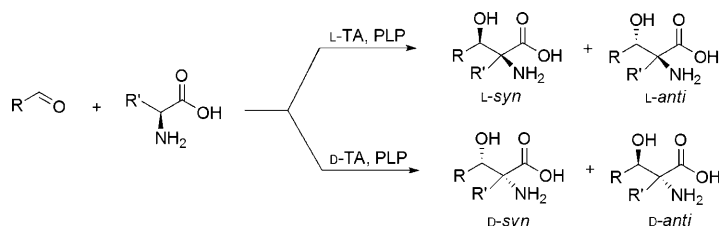
**Getting the better of troublemakers:** C-terminal peptide alcohols cannot be synthesized by conventional solid-phase peptide synthesis (SPPS) because of the absence of a free carboxylic group to attach to the resin. This problem was

circumvented by anchoring a  $\beta$ -amino alcohol residue to the resin to provide a starting point for SPPS. An intramolecular O–N acyl shift completed the synthesis of the desired peptides (see scheme).

## Solid-Phase Peptide Synthesis

J. Tailhades, M. A. Gidel, B. Grossi, J. Lécaillon, L. Brunel, G. Subra, J. Martinez, M. Amblard\* 117–120

Synthesis of Peptide Alcohols on the Basis of an O–N Acyl-Transfer Reaction



**New donors—new products:** Threonine aldolases (L-TA, D-TA) have now been found to accept donors other than glycine. In a simple asymmetric biocatalytic aldol reaction alanine, serine, and cysteine

reacted with a range of simple acceptor aldehydes to yield  $\alpha$ -substituted serine derivatives (see scheme; PLP = pyridoxal phosphate).

## Enzyme Catalysis

K. Fesko, M. Uhl, J. Steinreiber, K. Gruber, H. Griengl\* 121–124

Biocatalytic Access to  $\alpha,\alpha$ -Dialkyl- $\alpha$ -amino Acids by a Mechanism-Based Approach

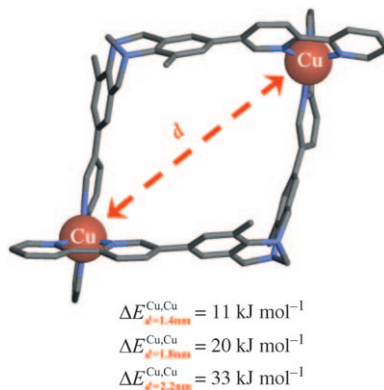


## Helical Structures

N. Dalla Favera, U. Kiehne, J. Bunzen,  
S. Hytteballe, A. Lützen,\*  
C. Piguet\* ————— 125–128



Intermetallic Interactions Within Solvated Polynuclear Complexes: A Misunderstood Concept



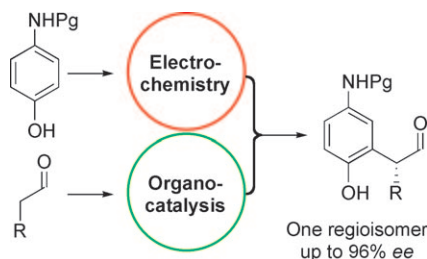
**The entry of the gladiators:** Two effects oppose each other for control of the intermetallic interactions within polynuclear (supra)molecular helicates in solution (see picture). Coulombic interactions produce large intermetallic repulsion at short distance, and solvation effects result in a large intermetallic attraction for small pseudo-spherical ions with short intermetallic separations  $d$ .

## Organocatalysis

K. L. Jensen, P. T. Franke, L. T. Nielsen,  
K. Daasbjerg, K. A. Jørgensen\* 129–133



Anodic Oxidation and Organocatalysis: Direct Regio- and Stereoselective Access to *meta*-Substituted Anilines by  $\alpha$ -Arylation of Aldehydes



**What's the potential?** An anodic oxidation/organocatalytic  $\alpha$ -arylation of aldehydes using substituted electron-rich aromatic compounds has been developed. The method gives access to *meta*-substituted anilines and dihydrobenzofurans in good yields and excellent enantioselectivity (see scheme; Pg = protecting group). This method is an example of a new concept combining organocatalysis with electrochemistry.

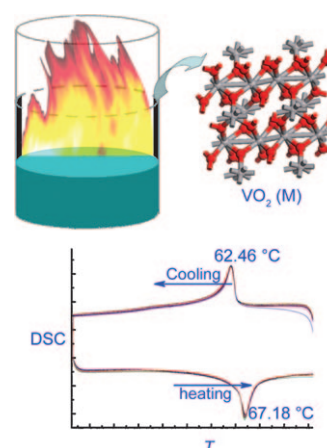
## Vanadium Oxides

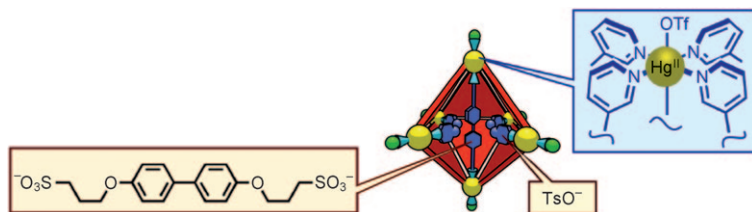
C. Z. Wu, J. Dai, X. D. Zhang, J. L. Yang,  
F. Qi, C. Gao, Y. Xie\* ————— 134–137



Direct Confined-Space Combustion Forming Monoclinic Vanadium Dioxides

**Burning an ethanolic solution** of vanadyl(IV) acetylacetonate in a glass beaker affords monoclinic  $\text{VO}_2$  [ $\text{VO}_2(\text{M})$ ], and thus brings this formerly expensive oxide into the realm of conventional laboratory synthesis. Differential scanning calorimetry (DSC) showed consistent heating and cooling curves (see picture) for 50 reversible transitions between  $\text{VO}_2(\text{M})$  and the higher-temperature rutile phase of  $\text{VO}_2$ .





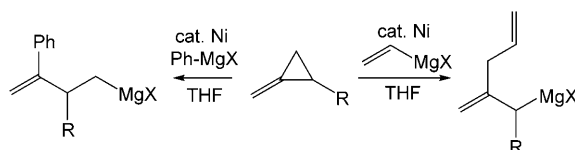
**Interior decorating in nanospace:** One or two rod-shaped bisulfonate bridging ligands were incorporated into a self-assembled Hg<sup>II</sup> capsule by the site-selective replacement of inner TfO<sup>-</sup> ligands. TsO<sup>-</sup> ligands were arranged inside the

resulting capsule, in which the bisulfonate ligand(s) connected two opposite Hg<sup>II</sup> vertices, by ligand exchange of the remaining inner TfO<sup>-</sup> ligands (see picture). Tf = trifluoromethanesulfonyl, Ts = *p*-toluenesulfonyl.

## Molecular Capsules

S. Hiraoka,\* M. Kiyokawa, S. Hashida, M. Shionoya\* 138–143

Site-Selective Internal Cross-Linking between Mercury(II)-Centered Vertices of an Octahedral Mercury(II) Capsule by a Rod-Shaped Ditopic Ligand



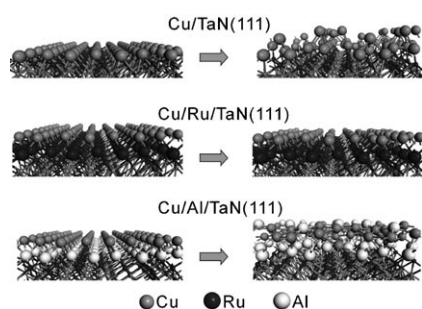
**Unwringing the ring:** Methylenecyclopropanes reacted with vinyl and aryl Grignard reagents in the presence of a nickel catalyst to afford vinyl- and arylmagnesium products, respectively, through a

selective C–C bond cleavage (see scheme). The reaction provides a new method for the preparation of substituted homoallyl and allyl Grignard reagents.

## C–C Activation

J. Terao,\* M. Tomita, S. P. Singh, N. Kambe\* 144–147

Nickel-Catalyzed Regioselective Carbomagnesation of Methylene-cyclopropanes through a Site-Selective Carbon–Carbon Bond Cleavage

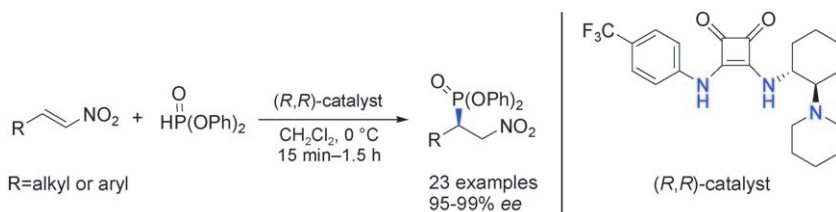


**Better than Elmer's glue:** Three necessary conditions for enhancement of solid interfacial interactions guide materials design to create strong, stable composites for interfacial adhesion. Ab initio molecular dynamics simulations were used to study copper adhesion on TaN-(111) surfaces with a variety of intervening metals to enhance adhesion (see picture). The predicted adhesion phenomena agree well with experimental observations.

## Thin Films

B. Han, J. Wu,\* C. Zhou, B. Chen, R. Gordon, X. Lei, D. A. Roberts, H. Cheng\* 148–152

First-Principles Simulations of Conditions of Enhanced Adhesion Between Copper and TaN(111) Surfaces Using a Variety of Metallic Glue Materials



**Michael's a square:** An easily prepared squaramide catalyst that promotes the highly enantioselective Michael addition reaction of diphenyl phosphite to a range

of nitroalkenes is described. This method leads to chiral  $\beta$ -nitro phosphonates, which are precursors to biologically active  $\beta$ -amino phosphonic acids.

## Asymmetric Catalysis

Y. Zhu, J. P. Malerich, V. H. Rawal\* 153–156

Squaramide-Catalyzed Enantioselective Michael Addition of Diphenyl Phosphite to Nitroalkenes



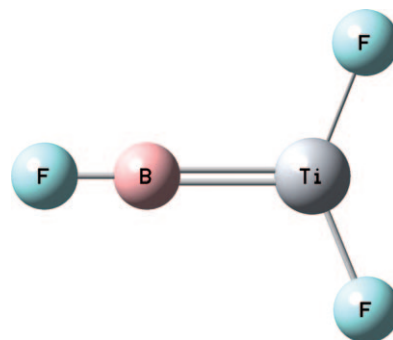
## Metal Borylenes

X. Wang, B. O. Roos,  
L. Andrews\* 157–160



Calculations and Matrix Infrared Spectra of Terminal Borylene Complexes  $\text{FB}=\text{MF}_2$

**Laser-ablated** titanium, zirconium, and hafnium atoms react with  $\text{BF}_3$  during condensation in excess argon to form the first group 4 borylene complexes,  $\text{FB}=\text{MF}_2$  (see structure). The products are identified from matrix infrared spectra and characterized by density functional and CASSCF/CASPT2 methods.

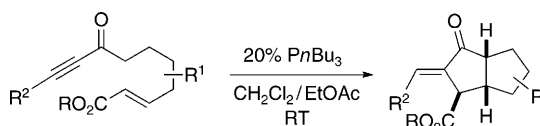


## Homogeneous Catalysis

J. E. Wilson, J. Sun, G. C. Fu\* 161–163



Stereoselective Phosphine-Catalyzed Synthesis of Highly Functionalized Diquinanes



**Two rings to rule them all:** A versatile method has been developed for the room-temperature synthesis of diquinanes from acyclic precursors, thereby generating two rings, three stereocenters, and a double

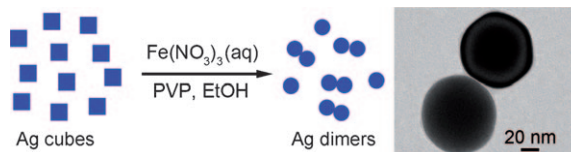
bond with high selectivity. The products of the double cyclization can be derivatized with excellent diastereoselection into an array of highly functionalized compounds.

## Nanostructures

W. Li, P. H. C. Camargo, L. Au, Q. Zhang,  
M. Rycenga, Y. Xia\* 164–168



Etching and Dimerization: A Simple and Versatile Route to Dimers of Silver Nanospheres with a Range of Sizes



**Two by two, hurrah! Hurrah!** Dimers of Ag nanospheres with a range of sizes were generated by etching Ag nanocubes with  $\text{Fe}(\text{NO}_3)_3$  in ethanol in the presence of poly(vinyl pyrrolidone) (PVP). These well-

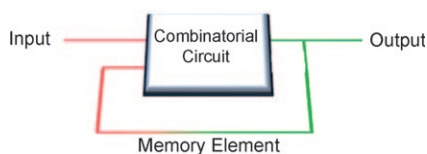
defined dimers (see TEM image) enable systematic study of the hot-spot phenomenon in surface-enhanced Raman scattering (SERS).

## Molecular Devices

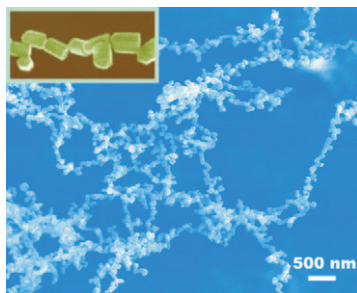
G. de Ruiter, E. Tartakovsky, N. Oded,  
M. E. van der Boom\* 169–172



Sequential Logic Operations with Surface-Confined Polypyridyl Complexes Displaying Molecular Random Access Memory Features



**Having a selective memory:** Osmium(II)-based monolayers on glass substrates are versatile platforms for the generation of several sequential logic circuits with multiple inputs which are able to display random access memory (RAM) functionality in the form of a set/reset latch. Additionally, the type of logic displayed, for example, sequential or combinatorial, can be controlled by keeping the current state static or dynamic.



**Pretty vacancy:** The formation energy of Al vacancies in aluminum nitride is decreased by doping with nonmagnetic scandium ions. These vacancies are shown to be the cause of the room-temperature ferromagnetism in the resulting 1D hexagonal nanoprisms of AlN:Sc (see micrograph), a result that is confirmed by first-principles calculations. The doping approach provides a new route to dilute magnetic semiconductor materials.

### Ferromagnetic Nanomaterials

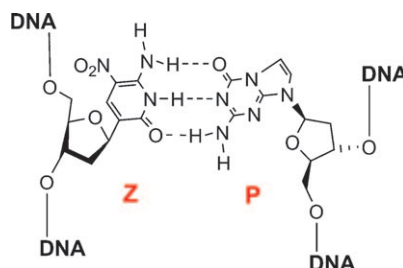
W. W. Lei, D. Liu, Y. M. Ma,\* X. Chen, F. B. Tian, P. W. Zhu, X. H. Chen, Q. L. Cui,\* G. T. Zou — 173–176

Scandium-Doped AlN 1D Hexagonal Nanoprisms: A Class of Room-Temperature Ferromagnetic Materials



### Cleaning up polymerase chain reactions:

DNA polymerases are found that copy two additional nucleotide letters (Z and P) in an expanded DNA alphabet to support six-letter polymerase chain reactions (PCR). Incorporated into external primers in a threefold multiplexed PCR, primers containing Z and P gave much cleaner results than standard multiplexed PCR.



### Non-Natural Base Pairs

Z. Y. Yang, F. Chen, S. G. Chamberlin, S. A. Benner\* — 177–180

Expanded Genetic Alphabets in the Polymerase Chain Reaction



**Silver service:** Two simple compounds,  $\text{H}_2\text{O}\cdots\text{Ag}-\text{Cl}$  and  $\text{H}_2\text{S}\cdots\text{Ag}-\text{Cl}$  (see picture), formed by interaction of either  $\text{H}_2\text{O}$  or  $\text{H}_2\text{S}$  with  $\text{AgCl}$ , are detected by rotational spectroscopy.  $\text{AgCl}$  is produced by laser ablation of silver in the presence of



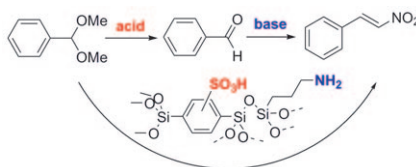
$\text{CCl}_4$  and then picks up  $\text{H}_2\text{O}$  or  $\text{H}_2\text{S}$ .  $\text{H}_2\text{O}\cdots\text{Ag}-\text{Cl}$  is isomorphous with its hydrogen- and halogen-bonded analogues  $\text{H}_2\text{O}\cdots\text{H}-\text{Cl}$  and  $\text{H}_2\text{O}\cdots\text{Cl}-\text{F}$ , while  $\text{H}_2\text{S}\cdots\text{Ag}-\text{Cl}$  is similarly related to  $\text{H}_2\text{S}\cdots\text{H}-\text{Cl}$  and  $\text{H}_2\text{S}\cdots\text{Cl}-\text{F}$ .

### A “Silver” Bond?

S. J. Harris, A. C. Legon,\* N. R. Walker,\* D. E. Wheatley — 181–183

Experimental Detection and Properties of  $\text{H}_2\text{O}\cdots\text{Ag}-\text{Cl}$  and  $\text{H}_2\text{S}\cdots\text{Ag}-\text{Cl}$  by Rotational Spectroscopy

**Two in one:** A periodic mesoporous phenylene silica (PMO) with acidic framework walls and basic pore channels was obtained by using protecting-group techniques. This approach allows location of the acidic groups in the hydrophobic benzene layers and of the amine groups in the hydrophilic silica layers. The bifunctional material is an efficient catalyst for the tandem conversion of benzaldehyde dimethyl acetal into 2-nitrovinylbenzene (see scheme).



### Bifunctional Catalysis

S. Shylesh,\* A. Wagener, A. Seifert, S. Ernst, W. R. Thiel\* — 184–187

Mesoporous Organosilicas with Acidic Frameworks and Basic Sites in the Pores: An Approach to Cooperative Catalytic Reactions



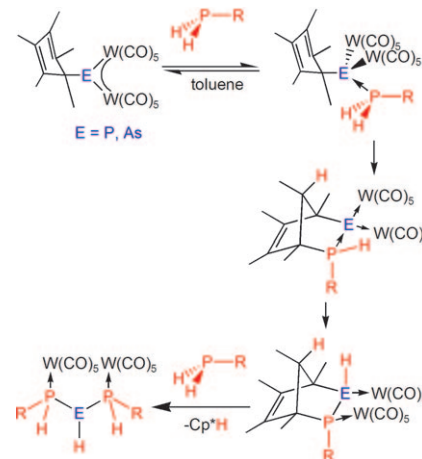
## Main-Group Chemistry

M. Scheer,\* C. Kuntz, M. Stubenhofer,  
M. Zabel, A. Y. Timoshkin — **188–192**



Stepwise Expansion of a Cp\* Ring at  
Pentelidene Complexes and  
Stereoselective Formation of  
Triphosphines

**One at a time:** Stepwise opening and final removal of the  $\eta^1$ -bound Cp\* substituents in the bridged pentelidene complexes  $[\text{Cp}^*\text{E}\{\text{W}(\text{CO})_5\}_2]$  ( $\text{E} = \text{P}, \text{As}$ ) occurs by the reaction with primary phosphines. Not only novel diphospha- and arsaphospha-norbornenes are obtained, but also diastereomerically pure complexed triphosphines. All reaction steps were monitored by NMR spectroscopy, and compounds structurally characterized.



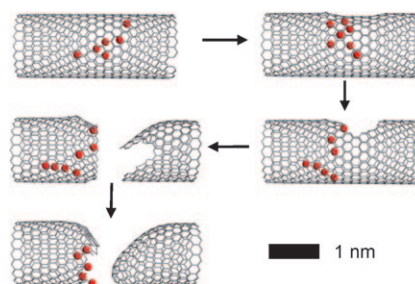
## Carbon Nanotubes

A. Chuvilin,\* A. N. Khlobystov,\*  
D. Obergfell, M. Haluska, S. Yang, S. Roth,  
U. Kaiser\* — **193–196**



Observations of Chemical Reactions at  
the Atomic Scale: Dynamics of Metal-  
Mediated Fullerene Coalescence and  
Nanotube Rupture

**Demolition with dysprosium:** Aberration-corrected transmission electron microscopy allows chemical transformations to be observed at the atomic scale. Formation of dysprosium clusters inside carbon nanotubes, rupture of nanotube sidewalls, and formation of end-caps were observed in situ.



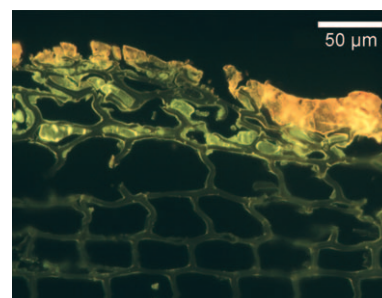
## Historic Materials

J.-P. Echard,\* L. Bertrand,\* A. von Bohlen,  
A.-S. Le Hô, C. Paris, L. Bellot-Gurlet,  
B. Soulier, A. Lattuati-Derieux, S. Thao,  
L. Robinet, B. Lavédrine,  
S. Vaiedelich — **197–201**



The Nature of the Extraordinary Finish of  
Stradivari's Instruments

**What is Stradivari's "secret"?** The composition of the mythical varnish that coats Stradivari's violins has raised controversial assumptions for the past two centuries. By using a complementary array of analytical tools, the chemical microstratigraphy of these varnishes has been established. The results provide information on the materials and techniques that were used by the Master, with a detailed characterization of the varnish.



## Enzyme Catalysis

B. Pickel, M.-A. Constantin, J. Pfannstiel,  
J. Conrad, U. Beifuss,\*  
A. Schaller\* — **202–204**



An Enantiocomplementary Dirigent  
Protein for the Enantioselective Laccase-  
Catalyzed Oxidative Coupling of Phenols

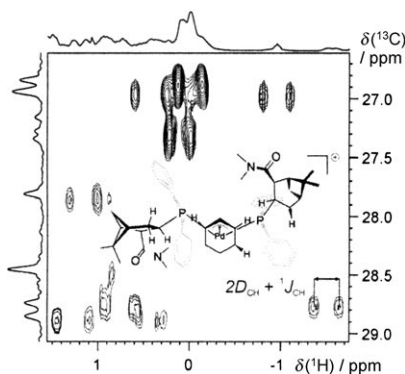


**(+)- or (-)-pinoresinol: that is the question.** Which of the two enantiomeric lignans is formed during laccase-catalyzed phenol coupling of (*E*)-coniferyl alcohol (**1**) depends on the dirigent protein. In the presence of the first

enantiocomplementary dirigent protein AtDIR6, (-)-**2** is formed (78% ee). Preferential formation of (+)-**2** is observed in the presence of the dirigent protein FiDIR1, whereas only racemic **2** is formed in the absence of dirigent proteins.



**Hide and seek!** The reactive intermediate in the title reaction has eluded conventional structure determination for years. With the help of residual dipolar couplings the conformation in solution could be determined (see picture). The sensitive intermediate was aligned in a liquid-crystalline phase containing poly( $\gamma$ -benzyl-L-glutamate), and the orientation of the ligands was determined through local order tensors.



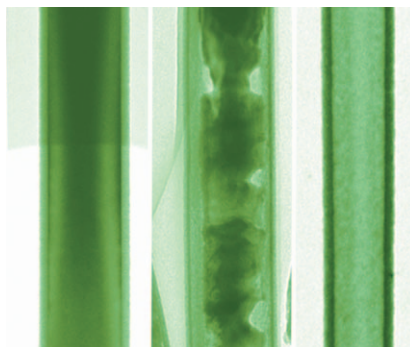
### NMR Spectroscopy

B. Böttcher, V. Schmidts, J. A. Raskatov, C. M. Thiele\* — 205–209

Determination of the Conformation of the Key Intermediate in an Enantioselective Palladium-Catalyzed Allylic Substitution from Residual Dipolar Couplings



**Removing the core:** A new approach for the construction of nanotubes is based on a photocatalytic effect. When  $\text{TiO}_2$ -ZnO core-shell nanowires in aqueous solution are irradiated with UV light,  $\text{TiO}_2$  nanotubes with uniform, tunable walls form (see picture).



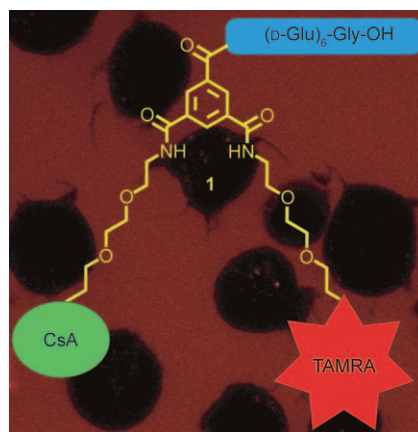
### Metal Oxide Nanotubes

D. S. Kim,\* Y. Yang, H. Kim, A. Berger, M. Knez, U. Gösele, V. Schmidt — 210–212

Formation of Metal Oxide Nanotubes in Neutral Aqueous Solution Based on a Photocatalytic Effect



**Trimesic acid amide** serves as a scaffold for a lipophilic cyclophilin inhibitor, a fluorescent rhodamine dye (TAMRA), and a  $(\text{D-Glu})_6$  oligopeptide residue. Although the affinity of **1** for intracellular cyclophilin A (CypA) is very high, fluorescence measurements indicate complete exclusion from the cell. CypA-induced chemotaxis of lymphocytes is inhibited by **1** since extracellular cyclophilins are responsible for the physiological signal.



### Enzyme Inhibitors

M. Malešević, J. Kühling, F. Erdmann, M. A. Balsley, M. I. Bukrinsky, S. L. Constant, G. Fischer\* — 213–215

A Cyclosporin Derivative Discriminates between Extracellular and Intracellular Cyclophilins



Supporting information is available on [www.angewandte.org](http://www.angewandte.org) (see article for access details).



A video clip is available as Supporting Information on [www.angewandte.org](http://www.angewandte.org) (see article for access details).

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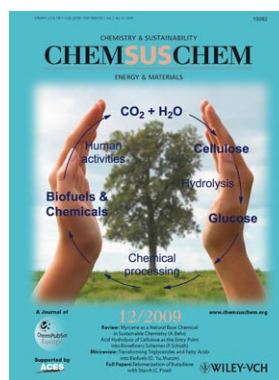
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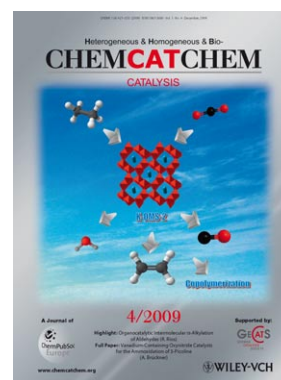
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