



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 soon:

A. Schlossbauer, S. Warncke, P. E. Gramlich, J. Kecht, A. Manetto, T. Carell, T. Bein*

A Programmable DNA-Based Molecular Valve for Colloidal Mesoporous Silica

M. Walz, M. Schirmer, F. Vollnhals, T. Lukasczyk, H.-P. Steinrück, H. Marbach*

Electrons as “Invisible Ink”! Fabrication of Nanostructures by Local Electron Beam Induced Activation of SiO_x

J. Zhang, X.-J. Wu, Z. Wang, Yu Chen, X. Wang, M. Zhou, H. Scheer, K. Zhao*

Single Fused Gene Approach to Photo-Switchable and Fluorescent Biliproteins

Y. Sohma,* Q. Hua, J. Whittaker, M. A. Weiss, S. B. H. Kent*
Design and Folding of [GluA4(OβThrB30)]Insulin (Ester Insulin), a Minimal Proinsulin Surrogate Chemically Convertible into Human Insulin

M. W. Powner, J. D. Sutherland

Phosphate-Mediated Interconversion of Ribo- and Arabino-Configured Prebiotic Nucleotide Intermediates

S. Yang, X. Feng,* L. Wang, K. Tang, J. Maier, K. Müllen*

Graphene-Based Nanosheets with Sandwich Structure

J. Esteban, J. V. Ros-Lis, R. Martínez-Máñez,* M. D. Marcos, M. Moragues, J. Soto, F. Sancenón

Sensitive and Selective Chromogenic Sensing of Carbon Monoxide Using Metalated Binuclear Rhodium Complexes

T. Ikawa, A. Takagi, Y. Kurita, K. Saito, K. Azechi, M. Egi, K. Kakiguchi, Y. Kita, S. Akai*

Preparation of Borylbenzynes and their use in the Regioselective Diels–Alder Reaction: Synthesis of Functionalized Arylboronates

Björn O. Roos (1937–2010)

Guide to Fluorine NMR for Organic Chemists

William R. Dolbier

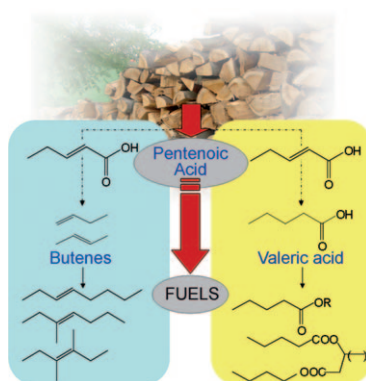
Obituary

W. Kutzelnigg _____ 4334

Books

reviewed by V. Gouverneur _____ 4335

Woodn't it be nice? Pentenoic acid is a possible answer to various challenges associated with cellulose-derived biofuels. Starting from (ligno)cellulose, enables a range of potential biofuels to become accessible. Such biofuels are compatible with today's engines and could be prepared without the need for external hydrogen.



Highlights

Biofuels

R. Palkovits* _____ 4336–4338

Pentenoic Acid Pathways for Cellulosic Biofuels

Reviews

Nobel Lectures

A. Yonath* _____ 4340–4354

Polar Bears, Antibiotics, and the Evolving Ribosome (Nobel Lecture)

V. Ramakrishnan* _____ 4355–4380

Unraveling the Structure of the Ribosome (Nobel Lecture)

T. A. Steitz* _____ 4381–4398

From the Structure and Function of the Ribosome to New Antibiotics (Nobel Lecture)

A complex structure: The 2009 Nobel Prize was awarded for investigations into the structure and function of the ribosome, the protein factory of the cell. The Laureates describe first hand the course of the discoveries in this area, from the beginning of their research to the current detailed understanding.



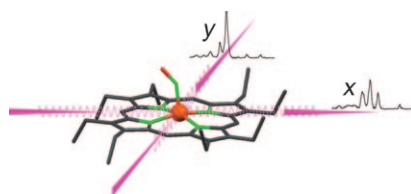
Communications

Vibrational Spectroscopy

J. W. Pavlik, A. Barabanschikov,
A. G. Oliver, E. E. Alp, W. Sturhahn,
J. Zhao, J. T. Sage,
W. R. Scheidt* _____ 4400–4404



Probing Vibrational Anisotropy with Nuclear Resonance Vibrational Spectroscopy

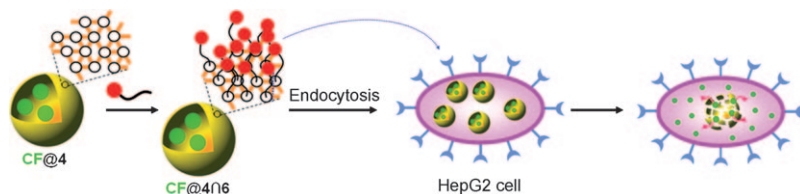


In-depth probing: A NRVS single-crystal study (NRVS = nuclear resonance vibrational spectroscopy) has provided detailed information on the in-plane modes of nitrosyl iron porphyrinate [Fe(oep)(NO)] (see picture; oep = octaethylporphyrin). The axial nitrosyl ligand controls the direction of the in-plane iron motion.

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.



Open Sesame! A synthetic approach to stimuli-responsive polymer nanocapsules has been developed. The reductively labile polymer nanocapsule allows for not only

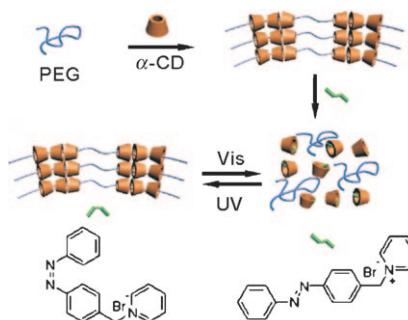
facile, noncovalent surface modification but also the release of encapsulated cargo in response to a predefined redox stimulus in an intracellular environment.

Polymer Nanostructures

E. Kim, D. Kim, H. Jung, J. Lee, S. Paul, N. Selvapalam, Y. Yang, N. Lim, D. C. G. Park, K. Kim* — 4405 – 4408

Facile, Template-Free Synthesis of Stimuli-Responsive Polymer Nanocapsules for Targeted Drug Delivery

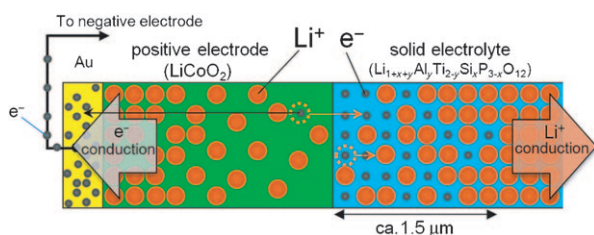
Competitive advantage: The reversible assembly and disassembly of a polyethylene glycol (PEG)/ α -cyclodextrin (α -CD) pseudopolyrotaxane (PPR) hydrogel is achieved (see picture). In a ternary system with a photoresponsive azobenzene compound, alternating UV and visible irradiation causes reversible sol–gel transitions. Thus the widely studied PEG/ α -CD PPR hydrogel is proved to be “active” in supramolecular chemistry.



Rotaxane Hydrogels

X. J. Liao, G. S. Chen, X. X. Liu, W. X. Chen, F. E. Chen, M. Jiang* — 4409 – 4413

Photoresponsive Pseudopolyrotaxane Hydrogels Based on Competition of Host–Guest Interactions



Electron holography reveals how lithium ions are distributed during the charge/discharge cycle of a lithium battery. A steep potential drop and a gradually

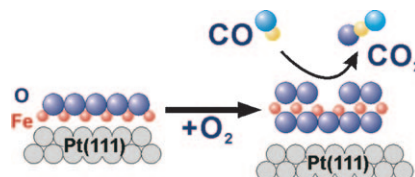
extended slope (ca. 1.5 μm) due to the electrical double layer are formed near the electrode/electrolyte interface, where the resistance to lithium ion transfer occurs.

Lithium Batteries

K. Yamamoto,* Y. Iriyama,* T. Asaka, T. Hirayama, H. Fujita, C. A. J. Fisher, K. Nonaka, Y. Sugita, Z. Ogumi — 4414 – 4417

Dynamic Visualization of the Electric Potential in an All-Solid-State Rechargeable Lithium Battery

Thickness matters: Ultrathin oxide films on metals can greatly enhance catalytic activity, for example, in CO oxidation on an FeO(111) film grown on a Pt(111) substrate. Under the reaction conditions, the bilayer FeO film restructures to form a trilayer OFeO film (see picture). Experimental evidence for the structure/morphology of the film and theoretical modeling of the mechanism of its formation and CO oxidation on its surface are presented.



Thin-Film Catalysis

Y.-N. Sun, L. Giordano, J. Goniakowski, M. Lewandowski, Z.-H. Qin, C. Noguera, S. Shaikhutdinov,* G. Pacchioni,* H.-J. Freund — 4418 – 4421

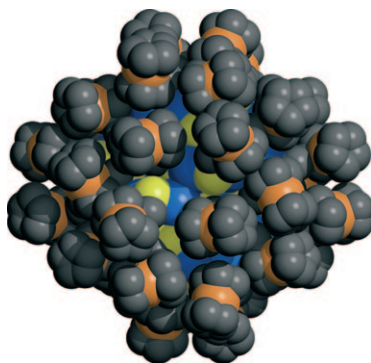
The Interplay between Structure and CO Oxidation Catalysis on Metal-Supported Ultrathin Oxide Films

Enriched with Iron

S. Ahmar, D. G. MacDonald,
N. Vijayaratnam, T. L. Battista,
M. S. Workentin,
J. F. Corrigan* ————— 4422 – 4424



A Nanoscopic 3D Polyferrocenyl
Assembly: The Triacontakaihexa-
(ferrocenylmethylthiolate)
[Ag₄₈(μ₄-S)₆(μ_{2/3}-SCH₂Fc)₃₆]



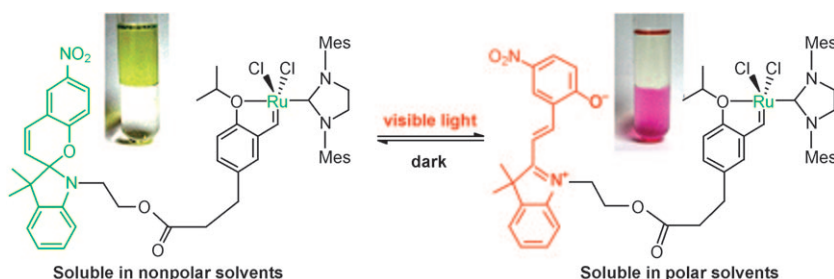
The molecular nanocluster [Ag₄₈(μ₄-S)₆(μ_{2/3}-SCH₂Fc)₃₆] (**1**) (see picture; Ag blue, S yellow, Fe orange, C gray; Fc = ferrocenyl) has been prepared in good yield and characterized by single-crystal X-ray diffraction. The 36 ferrocenylmethylthiolate ligands envelop the Ag–S core. Cyclic voltammetry of **1** displays one reversible oxidation wave.

Homogeneous Catalysis

G. Liu, J. Wang* ————— 4425 – 4429



Recycling a Homogeneous Catalyst
through a Light-Controlled Phase Tag



A homogeneous ruthenium–carbene complex was tagged with a light-responding nitrobenzospiropyran group to control its solubility through reversible conversion between its neutral (lipophilic)

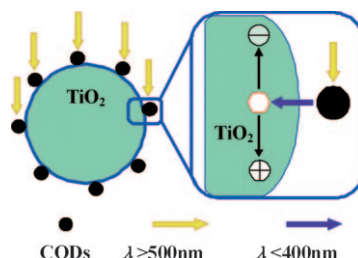
and ionic (lipophobic) states using light irradiation (see scheme; Mes = mesityl). This tagged complex has significant catalytic activity in ring-closing metathesis reactions and was recycled several times.

Quantum Dots

H. T. Li, X. D. He, Z. H. Kang,* H. Huang,
Y. Liu,* J. L. Liu, S. Y. Lian, C. H. A. Tsang,
X. B. Yang, S.-T. Lee* ————— 4430 – 4434



Water-Soluble Fluorescent Carbon
Quantum Dots and Photocatalyst Design



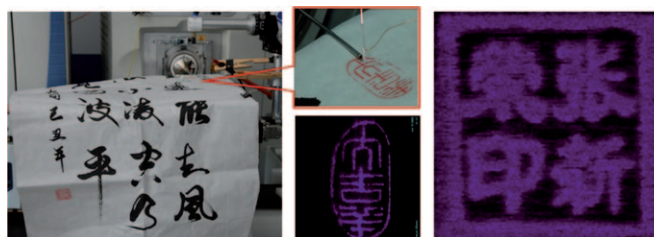
Size control: A one-step alkali metal-assisted electrochemical method for the fabrication of carbon quantum dots (CQDs) with size-dependent photoluminescence is presented (see picture). Their upconversion luminescence may provide a way for the development of novel photocatalysts.

Imaging Mass Spectrometry

Y. Liu, X. Ma, Z. Lin, M. He, G. Han,
C. Yang, Z. Xing, S. Zhang,*
X. Zhang ————— 4435 – 4437

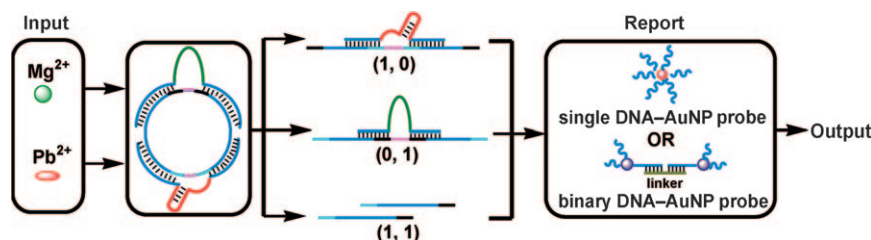


Imaging Mass Spectrometry with a Low-
Temperature Plasma Probe for the
Analysis of Works of Art



What a picture! Imaging mass spectrometry of seal patterns on paintings and calligraphy was achieved by using a mass spectrometric technique with a low-tem-

perature plasma probe. The non-invasive probe can distinguish genuine seals from counterfeit examples with good spatial resolution.



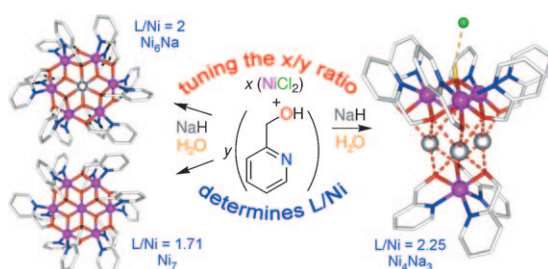
It's logical! A set of DNAzyme-based Boolean logic gates consists of a series of supramolecular structures (see picture). Two metal ions (Mg^{2+} and Pb^{2+}) act as inputs and gold nanoparticle (AuNP)/

DNA probes as output reporters for colorimetric detection. Fast performance of the logic system at ambient temperature is achieved.

Molecular Logic

S. Bi, Y. Yan, S. Hao,
S. Zhang* 4438–4442

Colorimetric Logic Gates Based on
Supramolecular DNAzyme Structures



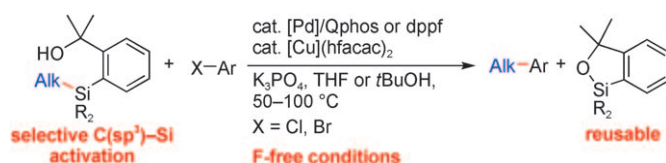
Cubanes and beyond: Diversity and originality characterize the Ni^{II} complexes obtained from sodium (pyridine-2-yl)methanolate. The ligand/metal ratio and the presence of Na^+ are key parameters to explain the formation of Ni_4Na_3 , Ni_6Na , or

Ni_7 polynuclear complexes with magnetically interacting centers. Such observations are relevant to the possible in situ formation of unexpected and possibly overlooked active species in catalytic reactions.

Cluster Chemistry

J. Zhang, P. Teo, R. Pattacini,
A. Kermagoret, R. Welter, G. Rogez,
T. S. A. Hor, P. Braunstein* 4443–4446

Structural Effects of Sodium Cations in
Polynuclear, Multicubane-Type Mixed
Na–Ni Complexes



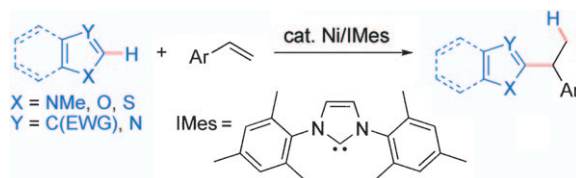
Cross-Si-ing the Jordan: Cross-coupling reactions of 2-(2-hydroxyprop-2-yl)phenyl-substituted alkylsilanes with a variety of aryl halides proceed in the presence of

palladium and copper catalysts. The use of K_3PO_4 base allows for highly chemoselective alkyl coupling with both primary and secondary alkyl groups (Alk).

Cross-Coupling

Y. Nakao,* M. Takeda, T. Matsumoto,
T. Hiyama* 4447–4450

Cross-Coupling Reactions through the
Intramolecular Activation of
Alkyl(triorgano)silanes



In the nickel of time: A nickel/carbene catalyst effects the hydroheteroarylation of vinylarenes to give 1,1-diarylethanes that

contain various heteroaryl moieties with excellent regioselectivity. EWG = electron-withdrawing group.

C–H Activation

Y. Nakao,* N. Kashiwara, K. S. Kanyiva,
T. Hiyama* 4451–4454

Nickel-Catalyzed Hydroheteroarylation of
Vinylarenes

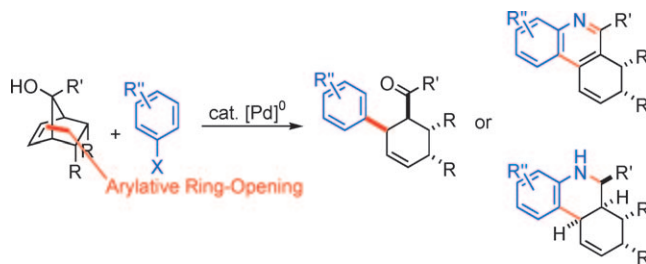


Domino Reactions

M. Waibel, N. Cramer* — 4455–4458



Palladium-Catalyzed Arylative Ring-Opening Reactions of Norbornenols: Entry to Highly Substituted Cyclohexenes, Quinolines, and Tetrahydroquinolines



Going retro: Palladium-catalyzed retro-allylations from norbornene-derived tertiary alcohols participate in coupling reactions with aryl- or vinylhalides to provide tetrasubstituted cyclohexenes

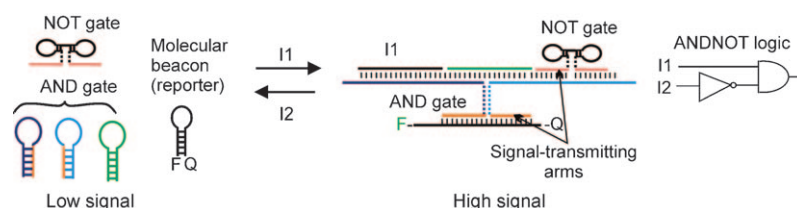
with excellent regio- and diastereoselectivity (see scheme). This procedure was also exploited in domino reactions to access highly functionalized quinolines and tetrahydroquinolines.

DNA Logic Gates

A. Lake, S. Shang,
D. M. Kolpashchikov* — 4459–4462



Molecular Logic Gates Connected through DNA Four-Way Junctions



Simply logical: This study introduces connectable molecular logic gates made of DNA. Transfer of oligonucleotide input/output signals from gate to gate is

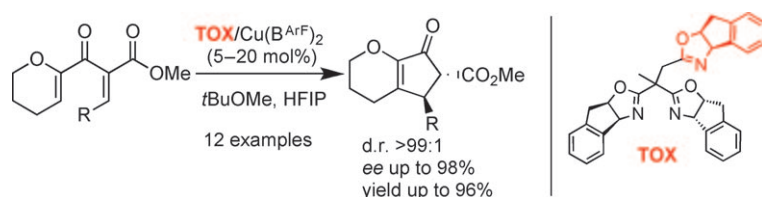
achieved by the formation of complexes that contain DNA four-way junctions when the signal is high; these complexes disassemble when the signal is low.

Asymmetric Catalysis

P. Cao, C. Deng, Y.-Y. Zhou, X.-L. Sun,
J.-C. Zheng, Z. Xie, Y. Tang* — 4463–4466



Asymmetric Nazarov Reaction Catalyzed by Chiral Tris(oxazoline)/Copper(II)



Beverly Hills copper(II): A highly efficient catalytic asymmetric Nazarov reaction has been developed through control of the enantioselectivity of the cyclization step, affording chiral O-heterohexahydroinde-

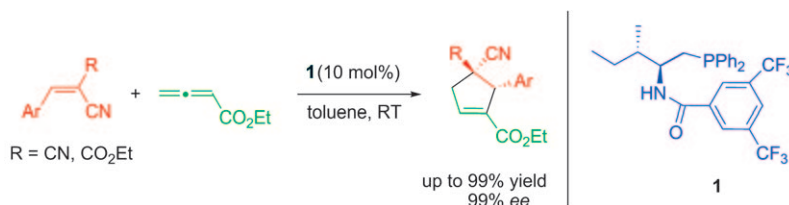
nones in excellent yields with excellent enantioselectivity and diastereoselectivity. HFIP = hexafluoro-2-propanol, BArF = tetrakis[3,5-bis(trifluoromethyl)phenyl] borate.

Organocatalysis

H. Xiao, Z. Chai, C.-W. Zheng, Y.-Q. Yang,
W. Liu, J.-K. Zhang,
G. Zhao* — 4467–4470



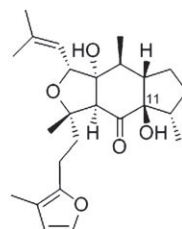
Asymmetric [3+2] Cycloadditions of Allenates and Dual Activated Olefins Catalyzed by Simple Bifunctional N-Acyl Aminophosphines



Bifunctional catalyst: Simple bifunctional N-Acyl aminophosphines such as **1** were developed to catalyze the first asymmetric [3+2] cycloaddition between allenates and dual activated olefins. The cycloaddi-

tion reactions afford multifunctional chiral cyclopentenes with exclusive regioselectivity, and good to excellent enantioselectivity and yields.

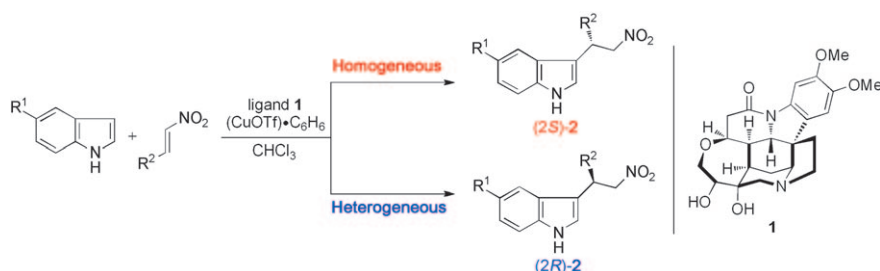
On the defense: Sesterterpenoid **1** and its 11-dehydroxy derivative, which possess a unique C₂₅ skeleton, have been isolated from the glandular trichomes of *Leucosceptrum canum*. They have potent anti-feedant activities and inhibitory effects against pathogenic fungi, which suggest a role of sesterterpenoids in plant defense.


 leucosceptroid A (**1**)

Defensive Sesterterpenoids

S.-H. Luo, Q. Luo, X.-M. Niu, M.-J. Xie, X. Zhao, B. Schneider, J. Gershenzon, S.-H. Li* — 4471–4475

Glandular Trichomes of *Leucosceptrum canum* Harbor Defensive Sesterterpenoids



Asymmetric Catalysis

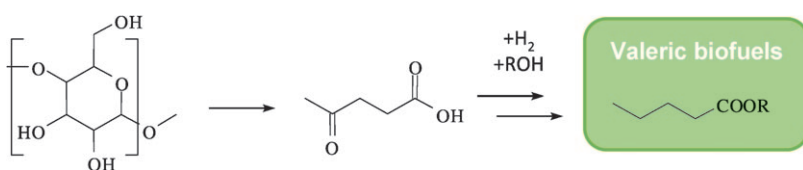
H. Y. Kim, S. Kim, K. Oh* — 4476–4478

Orthogonal Enantioselectivity Approaches Using Homogeneous and Heterogeneous Catalyst Systems: Friedel–Crafts Alkylation of Indole



With or without support? The complementary homogeneous and heterogeneous catalyst systems have been developed for the catalytic asymmetric Friedel–Crafts alkylation of indoles with nitroalkenes, in

which either of the enantiomeric products **2** could be selectively obtained under the suitable reaction conditions (i.e. with or without an added solid support; see scheme).



Cellulosic Biofuels

J.-P. Lange,* R. Price, P. M. Ayoub, J. Louis, L. Petrus, L. Clarke, H. Gosselink — 4479–4483

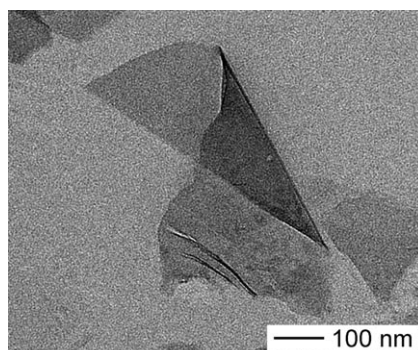
Fueling the future: Valeric esters can be produced by acid hydrolysis of lignocellulose to levulinic acid, followed by hydrogenation to valeric acid and its subse-

quent esterification (see scheme). Valeric biofuels are fully compatible for blending with gasoline or diesel, and have passed a road trial of 250 000 km.

Valeric Biofuels: A Platform of Cellulosic Transportation Fuels



The evolution of sheet morphology for single-crystal ceria nanosheets with a thickness of about 2.2 nm and lateral dimensions up to 4 μm (see picture), involves two-dimensional self-organization of the initially formed ceria nanocrystals, followed by recrystallization. Ceria nanosheets exhibit an unusually large optical band gap energy due to the quantum size effect associated with their extremely small thickness.



Nanomaterials

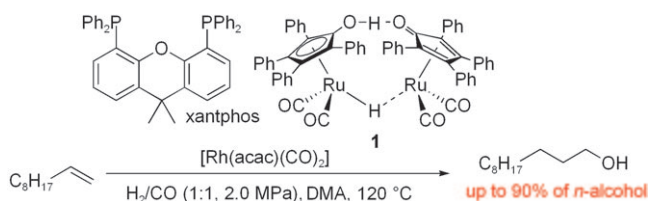
T. Yu, B. Lim,* Y. Xia* — 4484–4487

Aqueous-Phase Synthesis of Single-Crystal Ceria Nanosheets



Alcohol Synthesis

K. Takahashi, M. Yamashita, T. Ichihara,
K. Nakano, K. Nozaki* — 4488 – 4490

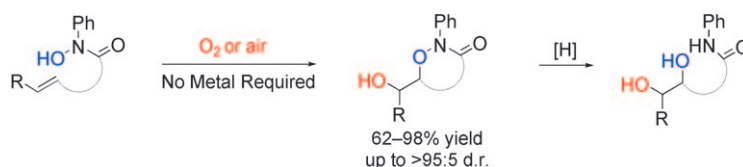


A dual catalyst system has been developed for tandem hydroformylation/hydrogenation to produce *n*-undecanol from 1-decene in one pot. A combination of xantphos/[Rh(acac)(CO)₂] and Shvo's

catalyst (**1**) afforded the best results (see scheme; acac = acetylacetonate, DMA = *N,N*-dimethylacetamide). Polar solvents effectively suppressed the formation of undecyl formate.

Synthetic Methods

V. A. Schmidt,
E. J. Alexanian* — 4491 – 4494



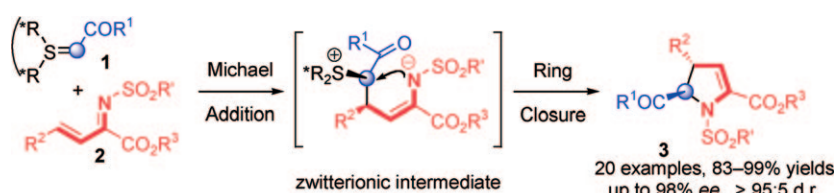
Metal-Free, Aerobic Dioxxygenation of Alkenes Using Hydroxamic Acids

One dioxxygenation please, hold the metal: In the presence of either oxygen or air as the sole oxidant and external oxygen atom source, a variety of unsaturated hydroxa-

mic acids afford cyclic hydroxamates that are readily converted into 1,2-diols, with the potential for high levels of reaction stereocontrol.

Cycloadditions

L.-Q. Lu, J.-J. Zhang, F. Li, Y. Cheng, J. An,
J.-R. Chen,* W.-J. Xiao* — 4495 – 4498



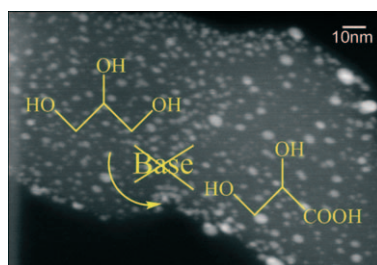
Tuning Electronic and Steric Effects: Highly Enantioselective [4+1] Pyrroline Annulation of Sulfur Ylides with α,β -Unsaturated Imines

A change in tune: A novel [4+1] annulation between atropisomeric sulfur ylides **1** and unsaturated imines **2** was developed. The method allows the synthesis of enantioenriched pyrroline products **3** in

high yield and with excellent stereocontrol. The origin of stereoinduction was primarily rationalized by a conformational analysis of the ylides.

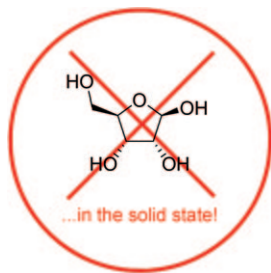
Catalytic Oxidation

A. Villa, G. M. Veith,
L. Prati* — 4499 – 4502



Selective Oxidation of Glycerol under Acidic Conditions Using Gold Catalysts

Skip the bases! H-mordenite-supported PtAu nanoparticles are highly active and selective in the oxidation of glycerol under acidic conditions, which allows the direct preparation of free acids (see picture). The high selectivity for C₃ compounds results from the negligible formation of H₂O₂, in contrast to PtAu nanoparticles supported on activated carbon.

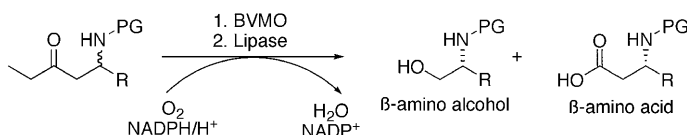


Better late than never! The β -furanose form of D-ribose, present in countless biomolecules, does not occur in the crystalline compound. X-ray diffraction and NMR experiments show that D-ribose occurs in two crystal forms that contain β - and α -pyranose forms in various ratios.

Structure Determination

D. Šišak, L. B. McCusker,*
G. Zandomenghi, B. H. Meier,*
D. Bläser, R. Boese,* W. B. Schweizer,
R. Gilmour, J. D. Dunitz* — 4503–4505

The Crystal Structure of D-Ribose—At Last!



To the left or to the right? The regioselective insertion of oxygen in Baeyer–Villiger monooxygenase (BVMO) catalyzed oxidations not only affords the

expected protected β -amino alcohol, but can also be used to provide access to β -amino acids as exemplified for β -leucine (see scheme; PG = protecting group).

Enzymatic Synthesis

J. Rehdorf, M. D. Mihovilovic,
U. T. Bornscheuer* — 4506–4508

Exploiting the Regioselectivity of Baeyer–Villiger Monooxygenases for the Formation of β -Amino Acids and β -Amino Alcohols



Supporting information is available on www.angewandte.org (see article for access details).



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

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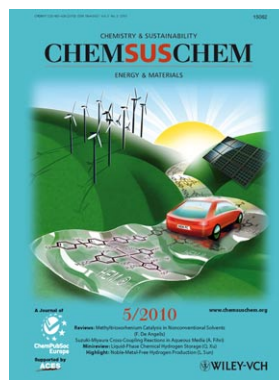
Check out these journals:



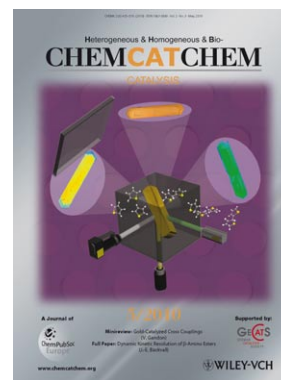
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