Contents

VIP *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:*

Y. Fu, Q. Dai, W. Zhang, J. Ren, T. Pan, C. He**
AlkB Domain of Mammalian ABH8 Catalyzes Hydroxylation of 5-Methoxycarbonylmethyluridine at the Wobble Position of tRNA

M. Roth, P. Kindervater, H.-P. Raich, J. Bargon, H. W. Spiess, K. Münnemann**
Continuous ^{1}H and ^{13}C Signal Enhancement in NMR Spectroscopy and MRI Using Parahydrogen and Hollow Fiber Membranes

*H. Zheng, J. Gao**
Highly Specific Heterodimerization Mediated by Quadrupole Interactions

M. Willis, M. Götz, A. K. Kandalam, G. F. Ganteför, P. Jena**
Hyperhalogens: A New Class of Highly Electronegative Species

*V. Mazumder, M. Chi, K. L. More, S. Sun**
Synthesis and Characterization of Multimetallic Pd/Au and Pd/Au/FePt Core/Shell Nanoparticles

*P. Chakraborty, I. Krivokapic, R. Bronisz, C. Enachescu, A. Hauser**
Giant Variation of the Singlet–Quintet Intersystem Crossing Rate Constant in an Iron(II) High-Spin Complex as a Function of Temperature

*S.-Y. Moon, J.-S. Bae, E. Jeon, J.-W. Park**
Organic Sol–Gel Synthesis: Solution-Processable Microporous Organic Networks

*D. V. Esposito, S. T. Hunt, A. L. Stottlemyer, K. D. Dobson, B. E. McCandless, R. W. Birkmire, J. G. Chen**
Low-Cost Hydrogen-Evolution Catalysts Based on Monolayer Platinum on Tungsten Monocarbide (WC) Substrates

K. Sasaki, H. Naohara, Y. Cai, Y. M. C. Liu, M. B. Vukmirovic, J. X. Wang, R. R. Adzic
Platinum-Monolayer-Protected Cores: High-Stability Electrocatalysts for Fuel-Cell Cathodes

Author Profile

"My favorite subject at school was mathematics. My first experiment which I did together with a friend at the age of 11 was an oxyhydrogen gas explosion …"
This and more about Helmut Werner can be found on page 8070.

Books

Electrochemistry of Functional Supramolecular Systems

Paola Ceroni, Alberto Credi, Margherita Venturi

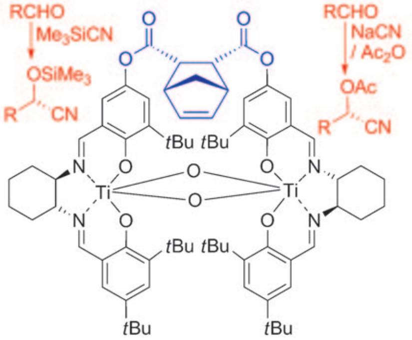
Highlights

Sticky business: Marine mussels (see picture) affix themselves to rocks with a system of threads and adhesive plaques. Emerging results are showing that iron–protein interactions help mussels stick by playing two roles: initiating material formation and enhancing mechanical performance.

Biological Materials Chemistry

Contents

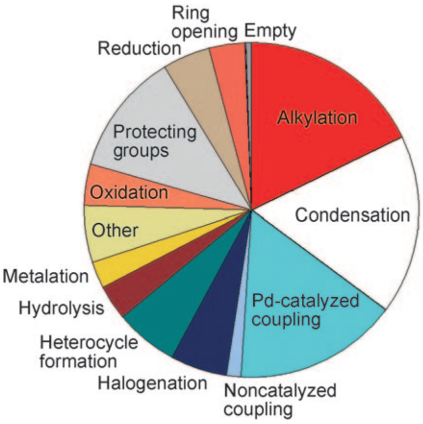
Enantioselective Catalysis



Joined at the hip: By linking two salen ligands together with a strap of appropriate size and shape, the effectiveness of a bimetallic titanium(salen) complex as a catalyst for asymmetric cyanohydrin synthesis can be increased by up to two orders of magnitude. The optimal catalyst is active at a catalyst loading as low as 0.0005 mol% and will accept both trimethylsilyl cyanide and sodium cyanide/acetic anhydride as the cyanide source (see scheme).

Minireviews

Small Focused Libraries

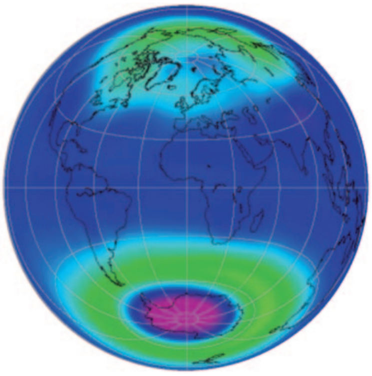


Helping chemists help chemists: What reactions do medicinal chemists use in drug discovery? (The pie chart shows a snapshot from one unit at GlaxoSmithKline.) What criteria do they use to select synthetic methodology? Why are arrays (small focused libraries) so powerful in the lead-optimization process? These questions are considered in this Minireview, which also describes attempts to expand the number of robust reactions available to medicinal chemists.

Reviews

The Ozone Layer

Since the industrial revolution began about 150 years ago, the concentration of greenhouse gases such as CO_2 in the atmosphere has increased dramatically, with corresponding consequences for the climate. For over 25 years, destruction of the ozone layer (pink and green regions on the globe), which is caused by chlorofluorocarbons, has also been observed. The future development of the ozone layer and of the climate are closely related to each other.



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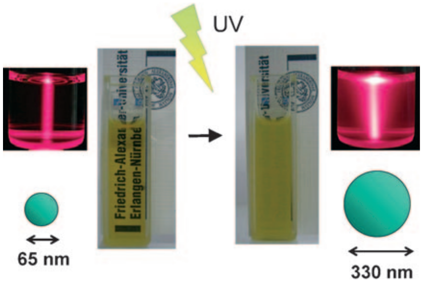
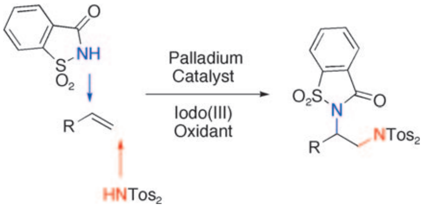
Light controls size: A novel type of self-organized supramolecular nanoparticles can change their size upon irradiation with UV light (see picture). The doubly responsive system combines a light-triggered size with a pH-induced switching between nanoscale aggregates and molecular building blocks. The nano-objects form by a combination of ionic and π–π interactions between macro-ions and dye ions.

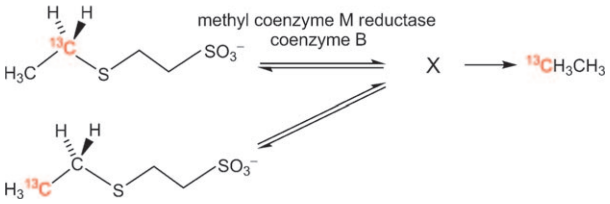


Nanoparticles

Adding 2Ns: Palladium catalysis introduces two nitrogen groups in a new regio and chemoselective diamination of non-activated alkenes that proceeds under entirely intermolecular reaction control. This palladium-catalyzed reaction employs commercial nitrogen sources in combination with a hypervalent iodo(III) reagent as oxidant (see scheme; Tos = toluenesulfonyl).



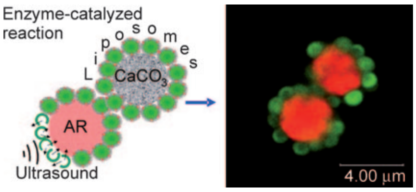
Synthetic Methods



The key nickel enzyme for methanogenesis (MCR) catalyzes the formation of CH_3D and CH_2D_2 in a deuterated medium. CH_2D_2 is formed by an exchange of deuterium into the *S*-methyl group of the substrate. Deuterium is incorporated at both carbon atoms of the *S*-ethyl group of ethyl coenzyme M, and a ^{13}C label is rapidly scrambled within the ethyl group (see scheme). Thus, at least one intermediate is formed and the isotope exchange pattern is consistent with formation of a σ-alkane–nickel complex.

Enzymatic C–H Activation

VIP



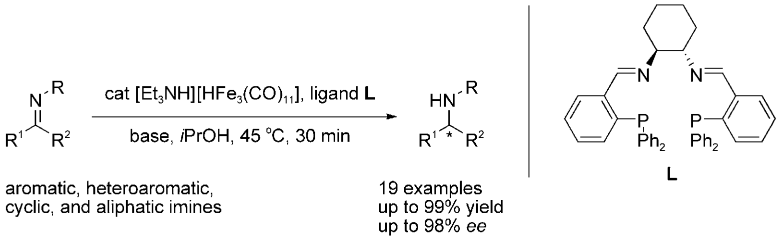
Breaking out: Liposomes that are adsorbed onto porous $CaCO_3$ particles and that contain the peroxidase substrate Amplex Red (AR) are disrupted by ultrasonic treatment. The substrate is released and diffuses into the inner part of the multicompartment containers where the peroxidase enzyme is found, and the enzymatic reaction is triggered. This approach may be useful for the simultaneous delivery of multiple molecules into cells.

Enzyme Reactions in Microparticles

Iron Catalysis

S. Zhou, S. Fleischer, K. Junge, S. Das,
D. Addis, M. Beller* ______ **8121–8125**

Enantioselective Synthesis of Amines: General, Efficient Iron-Catalyzed Asymmetric Transfer Hydrogenation of Imines

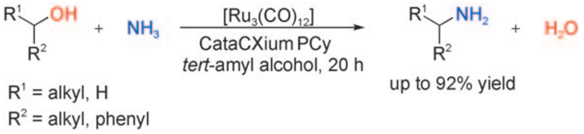


In the iron age: A readily accessible, active iron catalyst serves in the straightforward, catalytic transfer hydrogenation of imines (see scheme). A series of imines are converted into chiral amines in high yields and very good enantioselectivities. This method should find broad application in the search for bioactive chiral amines.

Amination

S. Imm, S. Bähn, L. Neubert,
H. Neumann, M. Beller* ___ **8126–8129**

An Efficient and General Synthesis of Primary Amines by Ruthenium-Catalyzed Amination of Secondary Alcohols with Ammonia



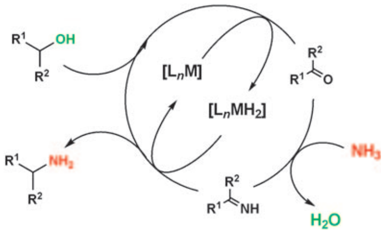
Atom efficiency and selectivity are the key features of the first homogeneously catalyzed amination of secondary alcohols with ammonia to give the corresponding primary amines (see scheme). This novel amination method relies on the commercially available catalyst $[Ru_3(CO)_{12}]$/cataCXium PCy and does not require any additional source of hydrogen.

Amination

D. Pingen, C. Müller,
D. Vogt* ______ **8130–8133**

Direct Amination of Secondary Alcohols Using Ammonia

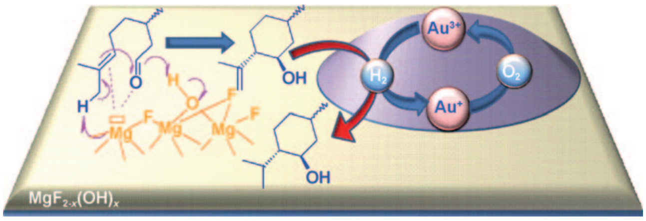
Hydrogen shuttle: For the first time secondary alcohols and ammonia can be directly converted into primary amines with a selectivity of up to 99% by using a simple ruthenium/phosphine catalyst (see scheme; R^1, R^2 = alkyl, aryl, alkenyl; M = $[Ru_3(CO)_{12}]$; and L = phosphine ligand).



Gold Catalysis

A. Negoi, S. Wuttke, E. Kemnitz,*
D. Macovei, V. I. Parvulescu,
C. M. Teodorescu,
S. M. Coman* ______ **8134–8138**

One-Pot Synthesis of Menthol Catalyzed by a Highly Diastereoselective Au/MgF_2 Catalyst

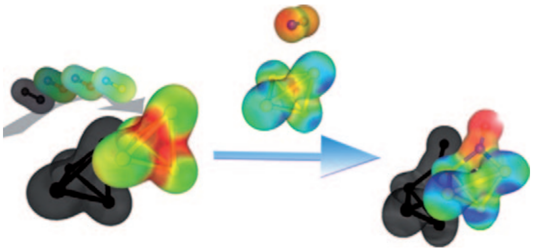


No toxic compounds such as KCN and no thermal activation is required for the preparation of Au/MgF_2 complexes by a simple and facile "incipient wetness impregnation" method in which hydrogen tetrachloroaurate ($HAuCl_4$) is the gold precursor. One of the complexes prepared exhibits unique catalytic properties and serves as a heterogeneous catalyst for the highly diastereoselective one-pot synthesis of (±)-menthol from citronellal (see picture).

P,N Compounds

T. Köchner, S. Riedel, A. J. Lehner,
H. Scherer, I. Raabe, T. A. Engesser,
F. W. Scholz, U. Gellrich, P. Eiden,
R. A. Paz Schmidt, D. A. Plattner,
I. Krossing* ________ **8139 – 8143**

The Reaction of White Phosphorus with $NO^+/NO_2^+[Al(OR^F)_4]^-$: The $[P_4NO]^+$ Cluster Formed by an Unexpected Nitrosonium Insertion

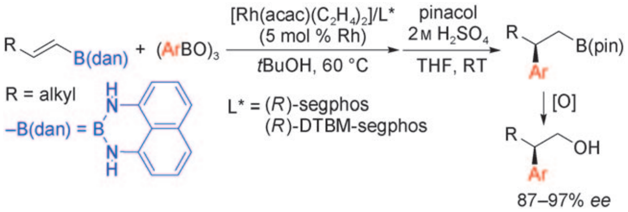


An appealing couple: The unprecedented insertion of the nitrosonium cation into a tetrahedral edge of white phosphorus forms the highly reactive $[P_4NO]^+$ cation (see picture). The synthesis, characterization, and applications are discussed, and $NO_2[Al(OC(CF_3)_3)_4]$ is presented as an easily synthesized oxidant.

Rhodium Catalysis

K. Sasaki, T. Hayashi* ________ **8145 – 8147**

Rhodium-Catalyzed Asymmetric Conjugate Addition of Arylboroxines to Borylalkenes: Asymmetric Synthesis of β-Arylalkylboranes

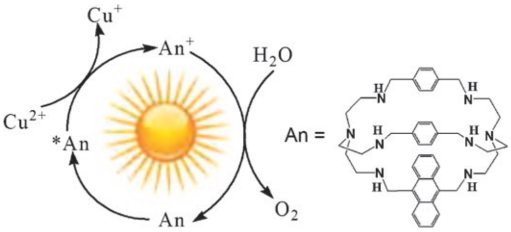


Asymmetric conjugate addition of arylboroxines to borylalkenes proceed in the presence of a chiral bisphosphine/rhodium complex as a catalyst to give chiral β-arylalkylboranes with high enantioselectivities (see scheme). $[O] = H_2O_2/NaOH$.

Photoreduction

H.-G. Hao, X.-D. Zheng,
T.-B. Lu* ________ **8148 – 8151**

Photoinduced Catalytic Reaction by a Fluorescent Active Cryptand Containing an Anthracene Fragment

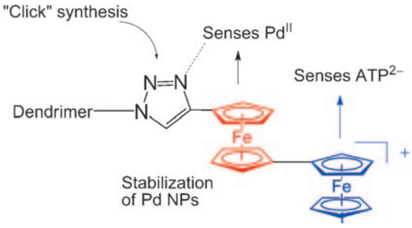


Tripping the light fantastic: A fluorescently active cryptand containing an anthracene fragment catalyzes the photoinduced reduction of Cu^{II} to Cu^{I} with simultaneous oxidation of water to oxygen (see scheme).

Dendrimers

R. Djeda, A. Rapakousiou, L. Liang,
N. Guidolin, J. Ruiz,
D. Astruc* ________ **8152 – 8156**

Click Syntheses of 1,2,3-Triazolylbiferrocenyl Dendrimers and the Selective Roles of the Inner and Outer Ferrocenyl Groups in the Redox Recognition of ATP^{2-} and Pd^{2+}



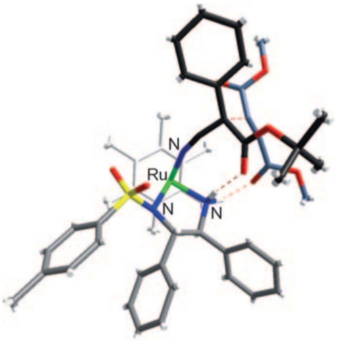
This way and that: Triazolylbiferrocenyl dendrimers can be synthesized with up to 729 termini. Oxidation results in isolable mixed-valence dendrimers (see picture). In electrochemical studies, these species can recognize ATP^{2-} and Pd^{II}, and they can be used to stabilize Pd nanoparticle catalysts.

Synthetic Methods

Y. Hasegawa, I. D. Gridnev,
T. Ikariya* ______ **8157–8160**

Enantioselective and *Z*/*E*-Selective Conjugate Addition of α-Substituted Cyanoacetates to Acetylenic Esters Catalyzed by Bifunctional Ruthenium and Iridium Complexes

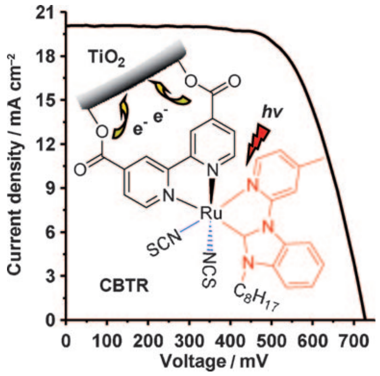
Metal-based catalysts: The title reaction provided the chiral adducts in high yields, excellent enantiomeric excess, and high *Z*/*E* selectivity. A combined NMR/DFT study revealed a key intermediate for the stereoselective reaction and a possible reaction mechanism (see the optimized transition-state structure).



Photosensitizers

W.-C. Chang, H.-S. Chen, T.-Y. Li,
N.-M. Hsu, Y. S. Tingare, C.-Y. Li, Y.-C. Liu,
C. Su,* W.-R. Li* ______ **8161–8164**

Highly Efficient N-Heterocyclic Carbene/Pyridine-Based Ruthenium Sensitizers: Complexes for Dye-Sensitized Solar Cells



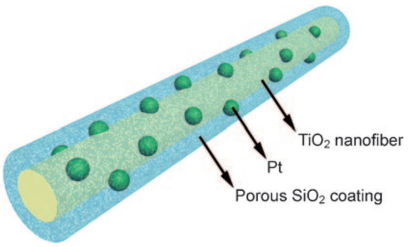
A new generation: The incorporation of N-heterocyclic carbene/pyridine-based ruthenium sensitizers derived from benzimidazolium salts into dye-sensitized solar cells results in superior current densities, cell voltages, and photoelectric conversion efficiencies. The performance of a solar cell sensitized with CBTR (see picture) exceeded that of the traditional N719 cell.

Nanostructures

Y. Dai, B. Lim, Y. Yang, C. M. Cobley, W. Li,
E. C. Cho, B. Grayson, P. T. Fanson,
C. T. Campbell, Y. Sun,
Y. Xia* ______ **8165–8168**

A Sinter-Resistant Catalytic System Based on Platinum Nanoparticles Supported on TiO_2 Nanofibers and Covered by Porous Silica

Holey support: The generation of a porous coating of SiO_2 on Pt-decorated TiO_2 nanofibers enables the preparation of a sinter-resistant catalytic system (see picture). The Pt nanoparticles could resist sintering at temperatures up to 750 °C in air, as the SiO_2 coating acts as a physical barrier that slows down surface migration, but the system remained catalytically active because of the porous nature of the coating.

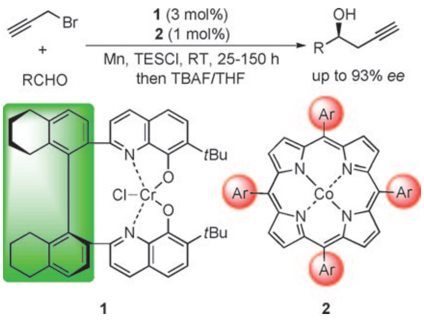


Asymmetric Catalysis

D. L. Usanov,
H. Yamamoto* ______ **8169–8172**

Asymmetric Nozaki–Hiyama Propargylation of Aldehydes: Enhancement of Enantioselectivity by Cobalt Co-Catalysis

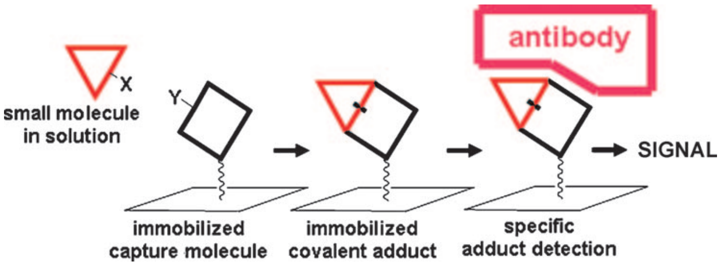
It takes two to tango! A combination of partially reduced chiral H_8-TBOx chromium catalyst **1** and achiral cobalt porphine co-catalyst **2** (Ar = *p*-anisyl) led to an enhancement in enantioselectivity by suppression of the background process that presumably proceeds through an organomanganese species.



Molecular Recognition

K. Mannerstedt, A. M. Jansson, J. Weadge, O. Hindsgaul* ________ 8173 – 8176

Small-Molecule Sensing: A Direct Enzyme-Linked Immunosorbent Assay for the Monosaccharide Kdo



Captured and bound! Kdo, a monosaccharide, and an immobilized capture molecule form a covalent adduct that can be detected by adduct-specific antibodies (see scheme). The recognition yields a signal that is proportional to the amount of Kdo present in solution. This small-molecule sensor should be applicable for any small molecule that can react to give an immunogenic adduct.

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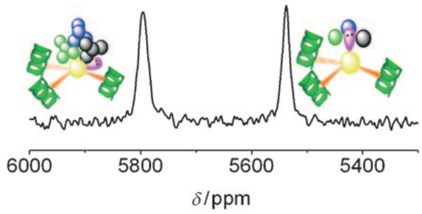
^{207}Pb NMR Spectroscopy

K. P. Neupane, V. L. Pecoraro* ________ 8177 – 8180

Probing a Homoleptic PbS_3 Coordination Environment in a Designed Peptide Using ^{207}Pb NMR Spectroscopy: Implications for Understanding the Molecular Basis of Lead Toxicity

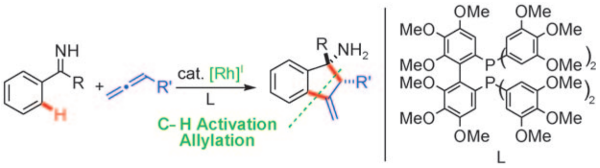


The lead-inhibited active site of a zinc-binding metalloenzyme in a thiol-rich coordination environment (PbS_3) has been modeled by homoleptic three-strand coiled-coil peptides and characterized using natural-abundance ^{207}Pb NMR spectroscopy (see picture: ^{207}Pb NMR signals from two binding sites of the same protein). ^{207}Pb NMR spectroscopy could thus be used to identify and characterize important human proteins associated with lead toxicity.

C–H Activation

D. N. Tran, N. Cramer* ____ 8181 – 8184

syn-Selective Rhodium(I)-Catalyzed Allylations of Ketimines Proceeding through a Directed C–H Activation/Allene Addition Sequence

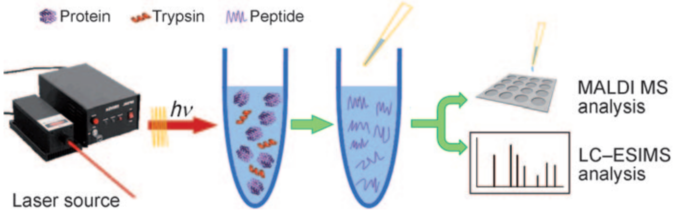


On a Rh-oll: Rhodium(I)-catalyzed C–H activations of ketimines and subsequent carborhodation of an allene led to an allyl metal species, which then allylated the imine directing group to give highly functionalized methylene dihydroindenyl amines (see scheme) with excellent regio- and diastereoselectivity.

Fast Proteolysis

G. Yao, C. Deng,* X. Zhang, P. Yang ________ 8185 – 8189

Efficient Tryptic Proteolysis Accelerated by Laser Radiation for Peptide Mapping in Proteome Analysis

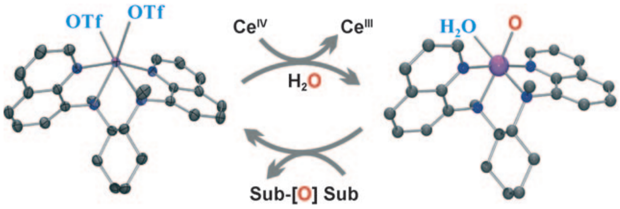


Back to basics: Coupled with MALDI-TOF MS, laser-assisted proteolysis (see schematic illustration) enabled rapid protein digestion and peptide mapping without the need for enzyme immobilization to increase the efficiency of tryptic digestion. Protein solutions containing trypsin were digested in less than a minute upon irradiation at 808 nm with a laser.

Enzyme Models

S. C. Sawant, X. Wu, J. Cho, K.-B. Cho, S. H. Kim, M. S. Seo, Y.-M. Lee, M. Kubo, T. Ogura, S. Shaik, W. Nam* **8190 – 8194**

Water as an Oxygen Source: Synthesis, Characterization, and Reactivity Studies of a Mononuclear Nonheme Manganese(IV) Oxo Complex

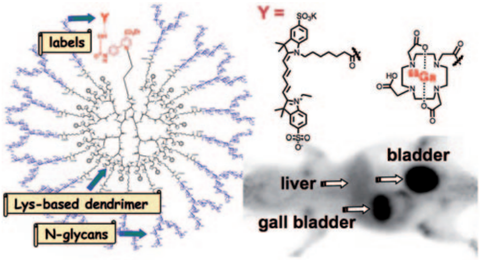


The source of the problem: Experiments with isotopically labeled water can be used to unambiguously assign the source of oxygen in a nonheme manganese(IV) oxo complex. The complex, which was generated using water as an oxygen source and cerium(IV) as an oxidant (see picture), shows reactivities in the activation of C–H bonds of alkyl-functionalized aromatic molecules and the oxidation of aromatic substrates (sub) and benzyl alcohol.

Glycan Imaging

K. Tanaka,* E. R. O. Siwu, K. Minami, K. Hasegawa, S. Nozaki, Y. Kanayama, K. Koyama, W. C. Chen, J. C. Paulson, Y. Watanabe, K. Fukase* ___ **8195 – 8200**

Noninvasive Imaging of Dendrimer-Type N-Glycan Clusters: In Vivo Dynamics Dependence on Oligosaccharide Structure

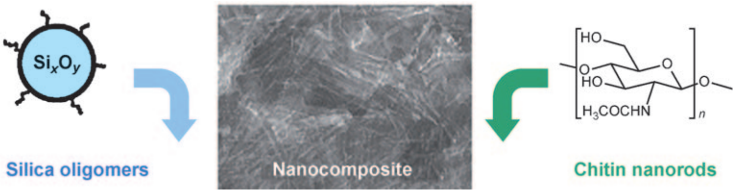


Body image: Self-activating Huisgen 1,3-dipolar cycloaddition and 6π azaelectrocyclization of lysine-based dendrimers (see picture) enable the in vivo dynamics and organ-specific accumulation of N-glycans to be visualized. The sugar structure and glycosyl bond linkages of N-glycans control the whole-body trafficking of the clusters in nude mice and a cancer model.

Mesoporous Materials

B. Alonso,* E. Belamie* ___ **8201 – 8204**

Chitin–Silica Nanocomposites by Self-Assembly



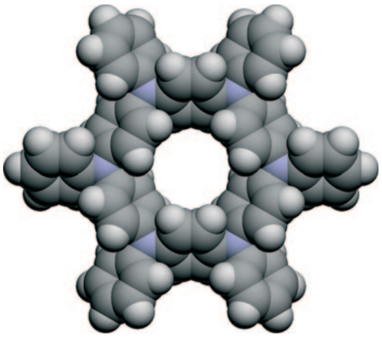
A new family of chitin–silica nanocomposites has been synthesized by using a versatile colloid-based combination of self-assembly and sol–gel chemistry (see picture). Various textures and morphologies can be obtained by adjusting the evaporation-based processes or by applying external fields. After calcination, textures and birefringence are preserved in the resulting mesoporous silicas.

Cyclophanes

A. Ito,* Y. Yokoyama, R. Aihara, K. Fukui, S. Eguchi, K. Shizu, T. Sato, K. Tanaka* ___ **8205 – 8208**

Preparation and Characterization of *N*-Anisyl-Substituted Hexaaza[1_6]paracyclophane

Localized or delocalized? For the first time, a cyclic oligoaniline, hexaaza[1_6]paracyclophane, has been prepared (see picture; carbon: gray; nitrogen: blue; hydrogen: light gray). The macrocycle exhibits a high electron-donating ability, and furthermore, the spin of the corresponding radical cation was delocalized over the macrocyclic molecular backbone.



Heteroarenes

J. Wei,* B. Han, Q. Guo, X. Shi, W. Wang, N. Wei —— **8209 – 8213**

1,5,9-Triazacoronenes: A Family of Polycyclic Heteroarenes Synthesized by a Threefold Pictet–Spengler Reaction

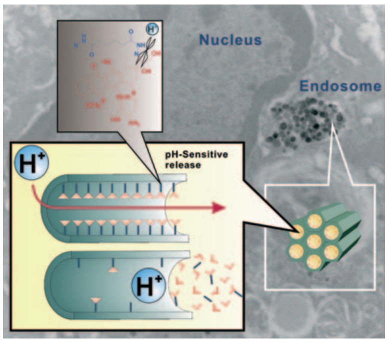
We are family: Triazacoronene derivatives have been synthesized in four steps from veratrole by using a threefold Pictet–Spengler reaction as the key step (see picture). They have good photophysical and electronical properties, thermal stability, and solubility, thus rendering them promising candidates as electron-transport materials.

Drug Delivery

C.-H. Lee, S.-H. Cheng, I.-P. Huang, J. S. Souris, C.-S. Yang, C.-Y. Mou, L.-W. Lo* —— **8214 – 8219**

Intracellular pH-Responsive Mesoporous Silica Nanoparticles for the Controlled Release of Anticancer Chemotherapeutics

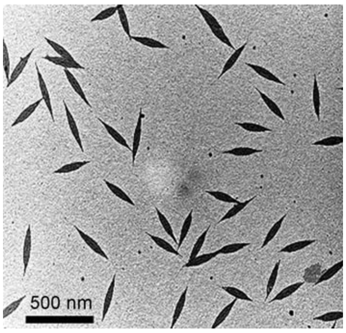
Cut here to cure: Doxorubicin attached to pH-sensitive mesoporous silica nanoparticles (MSN-hydrazone-Dox) shows potential in the chemotherapeutic treatment of liver cancer. Hydrolysis of the pH-sensitive hydrazone bond in the acidic environment of endosomes/lysosomes (see picture) releases Dox intracellularly from the MSN nanochannels, resulting in highly efficient apoptotic cell death.



Micelles

A. Presa Soto, J. B. Gilroy, M. A. Winnik,* I. Manners* —— **8220 – 8223**

Pointed-Oval-Shaped Micelles from Crystalline-Coil Block Copolymers by Crystallization-Driven Living Self-Assembly

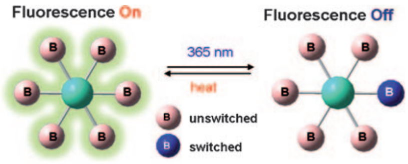


Getting in shape: Stable pointed-oval-shaped micelles of uniform size and shape (see TEM image) were prepared by extending the crystallization-driven living self-assembly method to crystalline core-forming polyferrocenylsilane diblock copolymers with corona-forming coblocks of poly(2-vinylpyridine) and polyphosphazene. The pointed-oval-shaped micelles were subsequently used as precursors to hierarchical micelle architectures.

Photoisomerization

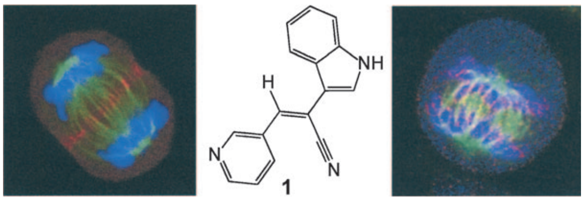
C. Baik, S. K. Murphy, S. Wang* —— **8224 – 8227**

Switching of a Single Boryl Center in π-Conjugated Photochromic Polyboryl Compounds and Its Impact on Fluorescence Quenching



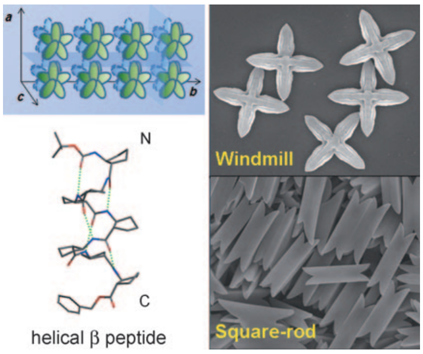
All for one and one for all: Molecules with multiple conjugated photochromic boryl units undergo photoisomerization on a single boryl unit only. This single boryl switching causes fluorescence quenching of the entire molecule, which is greatly amplified with increasing numbers of switchable boryl units in the molecule.

Chemical Biology



Relocation, relocation: Inactivation of the mitotic kinesin MKLP-2 by a specific small-molecule inhibitor (**1**) leads to failure in the recruitment of the chromosome passenger protein (survivin, red) to the central spindle (microtubules, green) during anaphase chromosome segregation (DNA, blue).

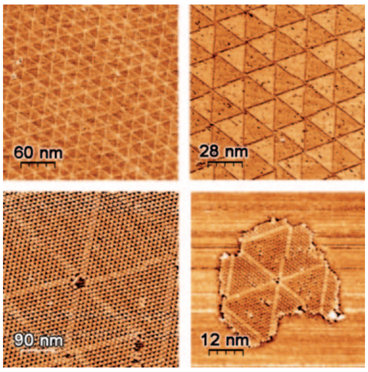
Self-Assembly



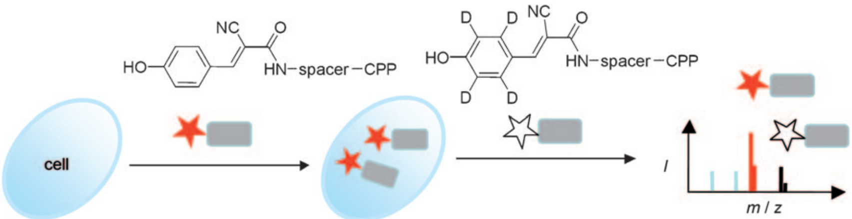
Fighting against windmills: Highly homogeneous, well-defined, and finite "windmill"- and square-rod-shaped supramolecular architectures were formed by the self-assembly of a short helical β peptide in aqueous solution (see picture). The reproducible formation of the unprecedented 3D shapes could be controlled by the use of a surfactant of different concentrations.

Surface Analysis

Well-ordered superarrays of exceptionally large period (22 nm) and involving a substantial number of hexahydroxytriphenylene molecules (20×20 superlattice) form on a Ag(111) surface. The superstructure (see picture; triangular pattern) is an intrinsic property of the system and, remarkably, it does not depend on global surface coverage (lower right: partial structure).



Cell-Penetrating Compounds

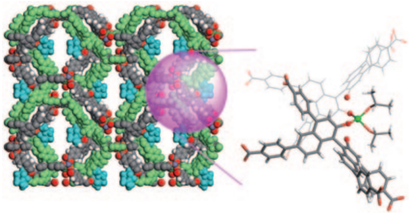


Putting a number on it: MALDI-TOF MS enabled direct quantification of the cellular uptake of cell-penetrating peptides (CPPs) by MDA-MB-231 breast cancer cells. This sensitive general strategy (see schematic representation), which requires no purification or separation steps, relies on the enhancement and discrimination of the MS signals of an α-cyano-4-hydroxycinnamic acid tag in a neutral α-cyano-4-hydroxycinnamic methyl ester matrix.

Metal–Organic Frameworks

L. Ma, C.-D. Wu, M. M. Wanderley,
W. Lin* ———— 8244 – 8248

Single-Crystal to Single-Crystal Cross-Linking of an Interpenetrating Chiral Metal–Organic Framework and Implications in Asymmetric Catalysis

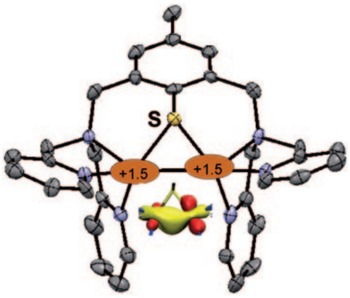


Support framework: Post-synthesis modification of an interpenetrating Zn-based chiral metal–organic framework with Ti(O*i*Pr)$_4$ results in a Lewis acidic catalyst (see picture; gray C, white H, red O, green Ti) with modest enantioselectivity in the asymmetric addition of diethylzinc to aldehydes. The Ti(O*i*Pr)$_4$-treated framework contains single-crystal to single-crystal cross-linking of the two interpenetrating networks.

Bioinorganic Chemistry

S. Torelli,* M. Orio, J. Pécaut, H. Jamet,
L. Le Pape, S. Ménage ———— 8249 – 8252

A $\{Cu_2S\}^{2+}$ Mixed-Valent Core Featuring a Cu–Cu Bond

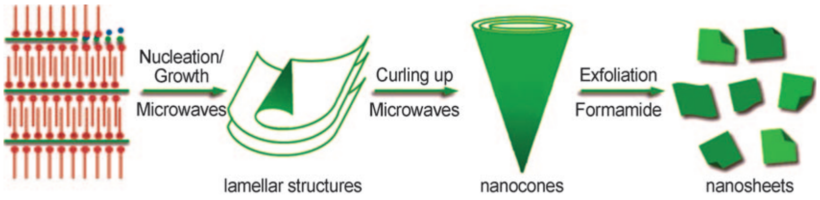


Not so far away from me: Reductive cleavage of a disulfide ligand with Cu^I leads to the formation of a new mixed-valent $Cu^{II}Cu^I$ complex (see picture). Combined X-ray and theoretical investigations highlight the presence of a striking Cu_2S core containing a Cu–Cu bond, and solution studies also indicate a high degree of delocalization.

Nanostructures

X.H. Liu, R. Ma,* Y. Bando,
T. Sasaki ———— 8253 – 8256

Layered Cobalt Hydroxide Nanocones: Microwave-Assisted Synthesis, Exfoliation, and Structural Modification

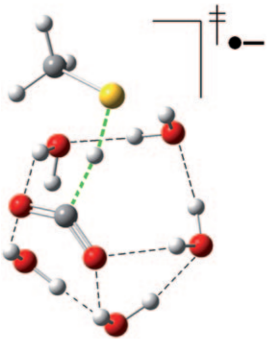


Layered cobalt hydroxide nanocones intercalated with dodecyl sulfate (DS) ions (see scheme; OH^- blue, Co green dots, DS ions red) could be synthesized by the microwave-assisted rolling of lamellar structures. The cones could be exfoliated into cobalt hydroxide nanosheets and converted into CoOOH and Co_3O_4 nanocones.

CO_2 Activation

R. F. Höckendorf, C.-K. Siu,*
C. van der Linde, O. P. Balaj,
M. K. Beyer* ———— 8257 – 8259

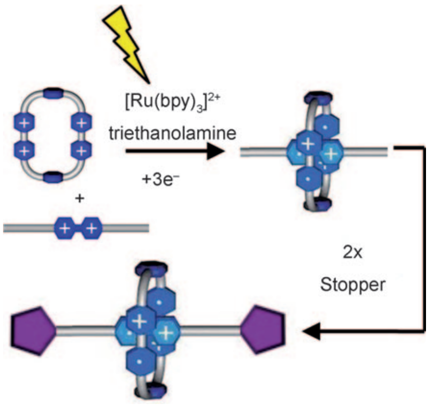
Selective Formic Acid Synthesis from Nanoscale Electrochemistry



Hydrogen-atom transfer from a thiol group to the CO_2 radical anion is a fast and selective downhill process in a gas-phase water cluster. This suggests that placing a thiol group near the site of electron transfer to CO_2 in a nanostructured electrochemical environment allows the selective formation of formic acid (see picture; dark gray C, light gray H, red O, yellow S).

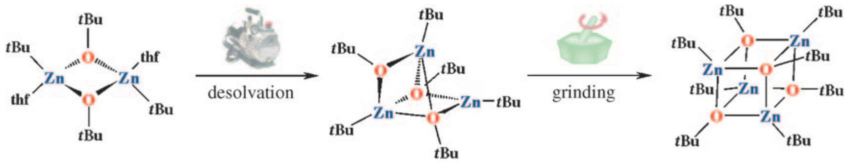
Contents

Self-Assembly



A radical interaction has been employed as the recognition motif in the template-directed synthesis of a [2]rotaxane composed of cyclobis(paraquat-*p*-phenylene) and a viologen derivative. The ruthenium tris(bipyridine)/triethanolamine system is used as the electron-transfer photocatalyst to generate the necessary radical cation components that result in the formation of an inclusion complex. A stoppering reaction follows to form the mechanical bond.

Mechanochemistry

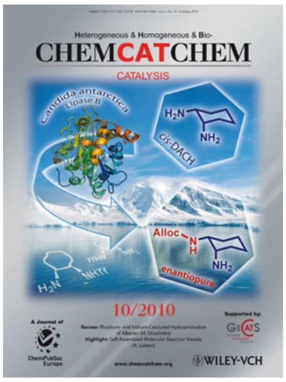


Zinc links: Solid-state desolvation of the dimeric alkoxide [{*t*BuZn(μ-O*t*Bu)(thf)}$_2$] leads to a trimer [{*t*BuZnO*t*Bu}$_3$] with a unique core structure; subsequent grinding affords the tetrameric cubane [{*t*BuZnO*t*Bu}$_4$]. This approach demonstrates a new direction in the generation of metal alkoxide clusters.

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).

Service



Vacancy

GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN

The Faculty of Chemistry wishes to appoint a

W3-Professor for "Organic Chemistry"

to commence on the 1st of April 2012.

The professor is expected to perform research and teaching in organic chemistry and strengthen the research interests of the Institute of Organic and Biomolecular Chemistry. Applicants should have excellent qualifications in the field of organic synthesis. Participation in existing or planned research initiatives of the faculty in "molecular catalysis" and "functional biomolecular chemistry" is expected.

The requirements for an appointment as a professor are specified by § 25 of the Niedersächsischen Hochschulgesetzes of February 26th, 2007 (Nds. GVBl. 2007 S. 69). The Stiftungsuniversität Göttingen has the right to make this appointment. Further details are available on request.

Applications from scientists working abroad are particularly welcome. A part time appointment is in principle possible. Appropriately qualified severely handicapped applicants will be given preference. The University would like to increase the percentage of women in areas in which they are under-represented and thus encourages suitably qualified women to apply.

Online applications with CV, publications list and details of teaching and research experience should be received not later than **December 5th, 2010.** Applications by regular mail are accepted.

Online link for applications and further information:
http://www.uni-goettingen.de/de/78566.html