

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:

A. Staubitz, A. Presa, I. Manners*

Iridium-Catalyzed Dehydrocoupling of Primary Amine–Borane Adducts: A Route to High Molecular Weight Polyaminoboranes, Boron–Nitrogen Analogues of Polyolefins

S. Gerlich, M. Gring, H. Ulbricht, K. Hornberger,* J. Tüxen, M. Mayor,* M. Arndt*

Matter-Wave Metrology as a Complementary Tool for Mass Spectrometry

V. L. Blair, L. M. Carrella, W. Clegg, B. Conway, R. W. Harrington, L. M. Hogg, J. Klett, R. E. Mulvey,* E. Rentschler, L. Russo
Tuning the Basicity of Synergic Bimetallic Reagents: Switching the Regioselectivity of Direct Dimetalation of Toluene from 2,5- to 3,5-Positions

M. Jung, H. Kim, K. Baek, K. Kim*

Synthetic Ion Channel Based on Metal–Organic Polyhedra

J.-J. Li, T.-S. Mei, J.-Q. Yu*

Synthesis of Indolines and Tetrahydroisoquinolines from Arylethylamines by Palladium(II)-Catalyzed C–H Activation Reactions

S. Srinivasan, V. K. Praveen, R. Philip, A. Ajayaghosh*

Bioinspired Superhydrophobic Coatings of Carbon Nanotubes and Linear Systems Based on the "Bottom-up" Self-Assembly Approach

S. G. Srivatsan, N. J. Greco, Y. Tor*

Highly Emissive Fluorescent Nucleoside Signals the Activity of Toxic Ribosome-Inactivating Proteins

News

Biomaterials:

Awards to Langer and Fratzl _____ 5360

Organic Chemistry:

Itami Honored _____ 5280

Handbook of Chemical Glycosylation

Alexei V. Demchenko

Dynamic Stereochemistry of Chiral Compounds

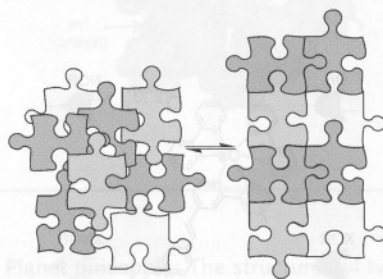
Christian Wolf

Books

reviewed by D. B. Werz _____ 5281

reviewed by U. Bornscheuer _____ 5282

Solving the puzzle of how to piece together the building blocks of a multi-component aggregate should become easier by an improved mastery of reversible orthogonal interactions. In this way the complexity and emergence of artificial multicomponent assemblies may approach those of natural systems.

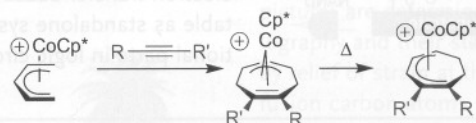


Highlights

Reversible Interactions

M. Schmittl,* K. Mahata — 5284–5286

Diversity and Complexity through Reversible Multiple Orthogonal Interactions in Multicomponent Assemblies



The magnificent seven: [4+3] cyclizations of unsaturated building blocks to cycloheptane derivatives have been established for some time; now [3+2+2] and more

recently [5+2] cyclizations open new routes to cycloheptane derivatives (see scheme: $\text{Cp}^* = \text{C}_5\text{Me}_5$).

Cycloheptane Syntheses

H. Butenschön* — 5287–5290

Seven-Membered Rings by Cyclization at Transition Metals: [4+3], [3+2+2], [5+2]

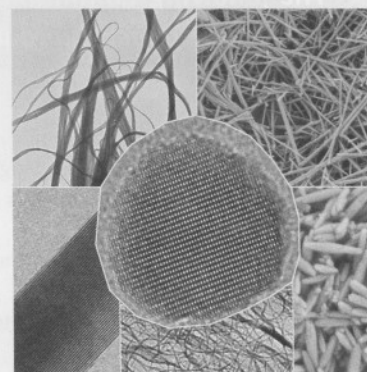
Minireviews

Sol-Gel Processes

N. Pinna,*
M. Niederberger* ————— 5292–5304

Surfactant-Free Nonaqueous Synthesis of Metal Oxide Nanostructures

As few starting materials as possible: Metal oxide nanoparticles and metal-oxide-based organic-inorganic hybrid nanostructures can be prepared in organic solvents under exclusion of water and in the absence of surfactants. Selected chemical formation mechanisms, advantages and limitations of these approaches in comparison to surfactant-directed routes, potential applications and technological aspects are briefly discussed in this Minireview.

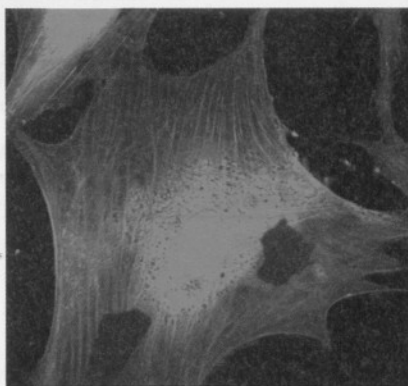


Reviews

Artificial Life

S. Mann* ————— 5306–5320

Life as a Nanoscale Phenomenon



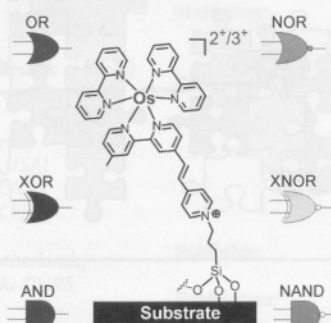
From little to large: Dimensional constraints are critical for the gathering, processing, and transmission of chemical-based information with the consequence that nanoscale miniaturization is fundamental to the emergence and sustainability of cellular life. The deep significance of this relationship is analyzed in this Review.

Communications

VIP Boolean Logic

T. Gupta,
M. E. van der Boom* ————— 5322–5326

Redox-Active Monolayers as a Versatile Platform for Integrating Boolean Logic Gates



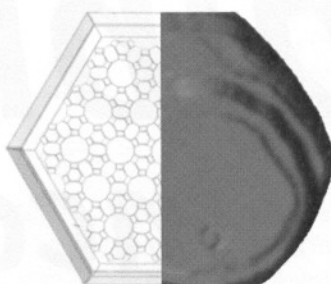
A layer of logic: A series of Boolean operations has been demonstrated with redox-active monolayers of osmium and ruthenium complexes on glass substrates. High stability, selective reactivity, and reversible redox-chemistry, coupled with significant optical changes, make these monolayers versatile logic gates. The electron-transfer-based systems are suitable as standalone systems or as operational parts in logic circuits.

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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.

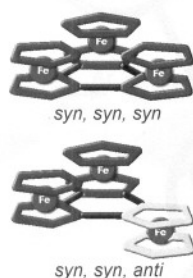
Scratching the surface: Atomic force microscopy has been utilized to study the surface of zeolite L (see AFM image of the hexagonal face of a crystal). Correlations between nanometer high features and the structural units have been determined, with the smallest unit protruding from the surface corresponding to a single cancrinite cage. The mechanism by which growth units attach depends on the crystallographic face.



Zeolite Crystal Growth

R. Brent, M. W. Anderson* – 5327–5330

Fundamental Crystal Growth Mechanism in Zeolite L Revealed by Atomic Force Microscopy



The “fusion” of three ferrocenes into a rigid cyclic array produces the *syn,syn,anti* and *syn,syn,syn* isomers of $[(\text{FeCp})_3(\text{trindenyl})]$ (see picture), the cations of which display different mixed-valence properties, namely multiple intervalence-transfer (IT) absorptions appear in the near-IR/IR spectra for the *syn,syn,anti* isomer, while a single band appears in the visible/near-IR spectrum for the *syn,syn,syn* isomer.

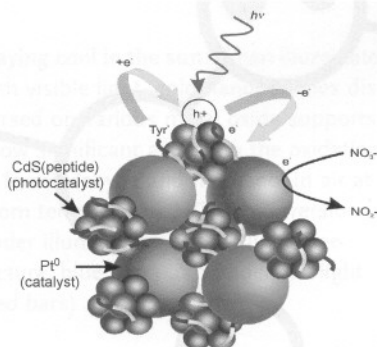
Mixed Valency

S. Santi,* L. Orian, A. Donoli, A. Bisello, M. Scapinello, F. Benetollo, P. Ganis, A. Ceccon* – 5331–5334

Synthesis of the Prototypical Cyclic Metallocene Triad: Mixed-Valence Properties of $[(\text{FeCp})_3(\text{trindenyl})]$ Isomers



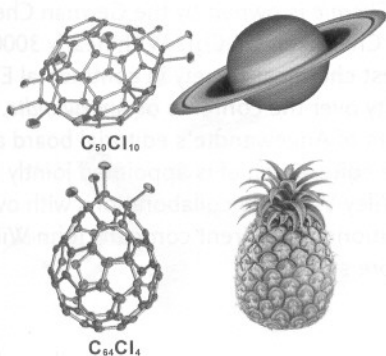
Better than the original: A hybrid nanoparticle system consisting of peptide-coated CdS and Pt nanoparticles acts as an enzyme mimic in the photoactivated reduction of nitrate (see picture). As compared to enzymes, the biotemplated nanoparticles exhibit enhanced activity, are optically activated, and can be used at elevated temperatures. Moreover, electron mediators and exogenous sacrificial electron donors are not needed.



Bio-Nanotechnology

J. M. Slocik, A. O. Govorov, R. R. Naik* – 5335–5339

Photoactivated Biotemplated Nanoparticles as an Enzyme Mimic



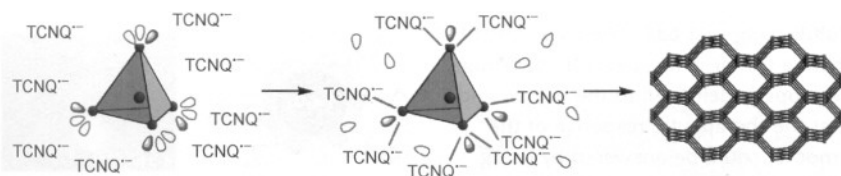
Planet pineapple: The structures of two isolated pentagon rule (IPR)-violating chlorofullerenes (C₅₀Cl₁₀ and C₆₄Cl₄; see picture) are determined by X-ray crystallography and their stabilities rationalized by relief of strain at the active pentagon-fusion carbon atoms whilst maintaining the aromaticity of their carbon skeletons.

IPR-Violating Fullerenes

X. Han, S. J. Zhou, Y. Z. Tan, X. Wu, F. Gao, Z. J. Liao, R.-B. Huang, Y.-Q. Feng, X. Lu, S. Y. Xie,* L.-S. Zheng – 5340–5343

Crystal Structures of Saturn-Like C₅₀Cl₁₀ and Pineapple-Shaped C₆₄Cl₄: Geometric Implications of Double- and Triple-Pentagon-Fused Chlorofullerenes





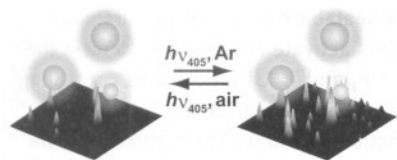
Step by step: Pentanuclear clusters (see picture) are synthesized as building units for the construction of three-dimensional, diamondlike networks. The ESI mass spectra of these clusters reveal that the

pentanuclear units maintain their structural integrity before condensing into frameworks, thereby allowing a successful step-by-step assembly.

Self-Assembly

Y. L. Bai, J. Tao,* R.-B. Huang,
L.-S. Zheng — 5344–5347

The Designed Assembly of Augmented Diamond Networks From Predetermined Pentanuclear Tetrahedral Units

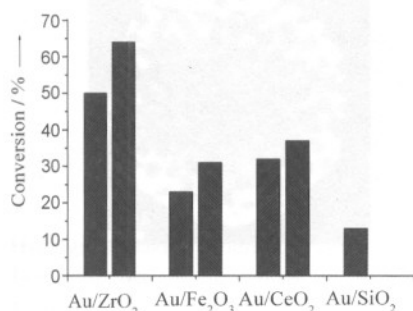


Single-particle fluorescence spectroscopy was used to investigate defect-mediated photoluminescence (PL) dynamics of undoped and Eu^{3+} -doped TiO_2 nanoparticles, and revealed that free excitons in the photoirradiated TiO_2 host can excite both interior and surface Eu^{3+} ions, while trapped excitons at the surface only excite the latter. The picture shows PL images of $\text{TiO}_2:\text{Eu}^{3+}$ nanoparticles during laser excitation in air and argon atmospheres.

Fluorescence Spectroscopy

T. Tachikawa, T. Ishigaki, J.-G. Li,
M. Fujitsuka, T. Majima* — 5348–5352

Defect-Mediated Photoluminescence Dynamics of Eu^{3+} -Doped TiO_2 Nanocrystals Revealed at the Single-Particle or Single-Aggregate Level

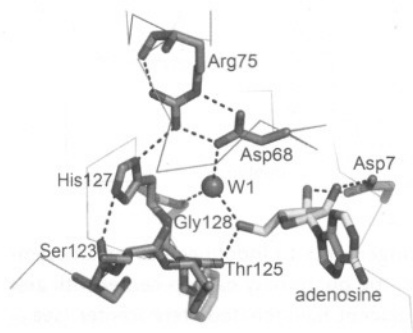


Staying cool in the sun: When illuminated with visible light, gold nanoparticles dispersed on various metal oxide supports show significant activity in the oxidation of formaldehyde and methanol in air at room temperature. HCHO conversion under illumination of blue light (see picture, blue bars) and under red light (red bars) are compared.

Nanostructured Catalysts

X. Chen, H.-Y. Zhu,* J.-C. Zhao,
Z.-F. Zheng, X.-P. Gao* — 5353–5356

Visible-Light-Driven Oxidation of Organic Contaminants in Air with Gold Nanoparticle Catalysts on Oxide Supports



Not so DUF: A DUF62 enzyme from the archaeon *Pyrococcus horikoshii* OT3 converts S-adenosyl-L-methionine (SAM) into adenosine through the nucleophilic attack of a hydroxide ion derived from water (see picture of the active site). The highly conserved nature of Asp68, Arg75, and His127 throughout the DUF62 protein superfamily suggests the wide-spread distribution of this novel catalytic activity in microorganisms. DUF = domain of unknown function.

Enzyme Catalysis

H. Deng, C. H. Botting,
J. T. G. Hamilton, R. J. M. Russell,
D. O'Hagan* — 5357–5361

S-Adenosyl-L-methionine:Hydroxide Adenosyltransferase: A SAM Enzyme

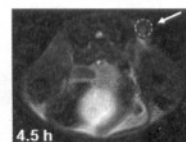
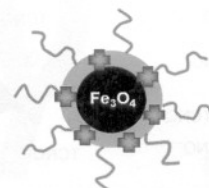
Multifunctional Nanoparticles

M. K. Yu, Y. Y. Jeong, J. Park, S. Park,
J. W. Kim, J. J. Min, K. Kim,
S. Jon* — 5362–5365



Drug-Loaded Superparamagnetic Iron Oxide Nanoparticles for Combined Cancer Imaging and Therapy In Vivo

Multitasking rust ball: The questions of where a tumor is located, whether drugs are properly delivered to the tumor, and what the therapeutic response of the tumor is, could be answered by using simple but smart, drug-loaded superparamagnetic iron oxide nanoparticles that can accumulate in tumor with high efficiency thanks to the presence of rationally engineered polymer coating layers.

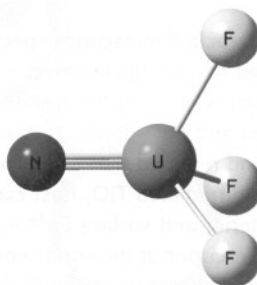


Multiple Bonds

L. Andrews,* X. Wang, R. Lindh,
B. O. Roos, C. J. Marsden — 5366–5370



Simple $N\equiv UF_3$ and $P\equiv UF_3$ Molecules with Triple Bonds to Uranium



UN-beatable? Laser-ablated uranium atoms activate NF_3 and PF_3 to form the $N\equiv UF_3$ and $P\equiv UF_3$ molecules containing novel terminal nitride and phosphide functional groups. These molecules are identified from matrix infrared spectra and theoretical methods. The $N\equiv UF_3$ molecule contains the strongest triple bond to uranium in a ternary compound.

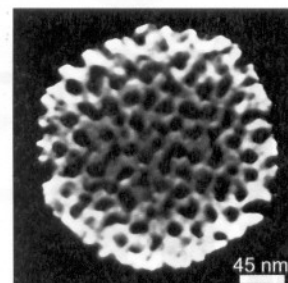
Mesoporous Metal

Y. Yamauchi,* A. Sugiyama, R. Morimoto,
A. Takai, K. Kuroda* — 5371–5373



Mesoporous Platinum with Giant Mesocages Templated from Lyotropic Liquid Crystals Consisting of Diblock Copolymers

Giant metal cages: Mesoporous Pt particles, with mesocages connected closely in three dimensions (see picture), are prepared by an electrodeposition process through soft templating from lyotropic liquid crystals of diblock copolymers. The size of the mesocages is the largest (about 15 nm) reported in mesoporous metals. The method can be extended to other metals and mesostructures, and the mesopores can be controlled over a range of pore sizes.

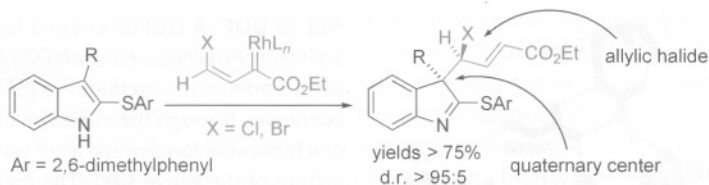


Synthetic Methods

V. Boyarskikh, A. Nyong,
J. D. Rainier* — 5374–5377



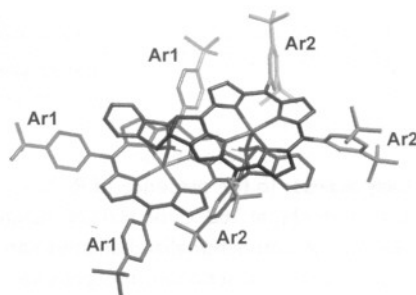
Highly Diastereoselective Sulfonium Ylide Rearrangements to Quaternary Substituted Indolines



Quat. centers: Sulfonium ylide intermediates generated from halogenated vinyl diazoacetates and 2-thioindoles in the presence of a Rh^{II} complex undergo highly diastereoselective [3,3] rear-

rangements to indolines having an asymmetric quaternary carbon center with an adjacent halogenated stereocenter (see scheme).

Positive discrimination: Palladium-catalyzed [3+2] annulation of meso-bromoporphyrin with norbornene derivatives efficiently provides novel chiral meso, β -fused porphyrins with a rigid structure (as shown). A chiral benzoazanorbornene-fused zinc porphyrin assembles selectively to form the slipped cofacial dimer in a heterochiral association, which allows construction of a heterodimer from two porphyrin components through chiral discrimination.



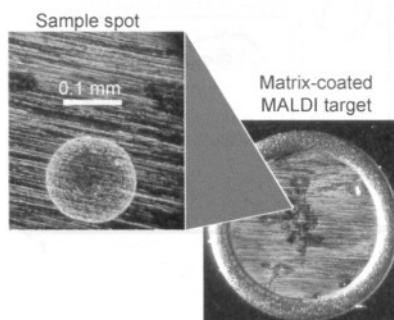
Self-Assembly

M. Mizumura, H. Shinokubo,*
A. Osuka* 5378–5381

Synthesis of Chiral Porphyrins through Pd-Catalyzed [3+2] Annulation and Heterochiral Self-Assembly



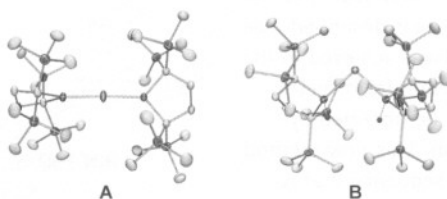
Getting a look-in: An optimized MALDI-MS procedure has been developed to detect endogenous primary metabolites directly in the cell extract. A detection limit corresponding to metabolites from less than a single cell has been attained, opening the door to single-cell metabolomics by mass spectrometry.



Analytical Methods

A. Amantonico, J. Y. Oh, J. Sobek,
M. Heinemann, R. Zenobi* 5382–5385

Mass Spectrometric Method for Analyzing Metabolites in Yeast with Single Cell Sensitivity



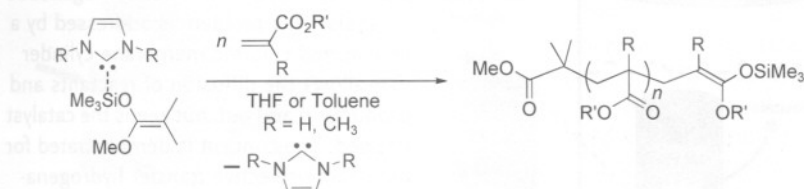
Hydrogens make a difference: The first 14-electron bis(silylene)palladium (A) and 12-electron bis(silyl)palladium complexes (B) are synthesized from a stable dialkylsilylene (see picture; gold: Pd; dark blue:

Si; light blue: C; magenta: H). The remarkable difference between the L-M-L angles of these two complexes is rationalized by applying the Walsh diagram.

Silylene Complexes

C. Watanabe, T. Iwamoto,* C. Kabuto,
M. Kira* 5386–5389

Fourteen-Electron Bis(dialkylsilylene)-palladium and Twelve-Electron Bis(dialkylsilyl)palladium Complexes



Neutral but versatile: N-heterocyclic carbenes are very efficient catalysts for the group-transfer polymerization of acrylates and methacrylates in both polar and

apolar media. These organocatalysts were also used to design *all*-(meth)acrylic di- and triblock copolymers.

Organocatalyzed Polymerization

J. Raynaud, A. Ciolino, A. Baceiredo,
M. Destarac, F. Bonnet, T. Kato,
Y. Gnanou,* D. Taton* 5390–5393

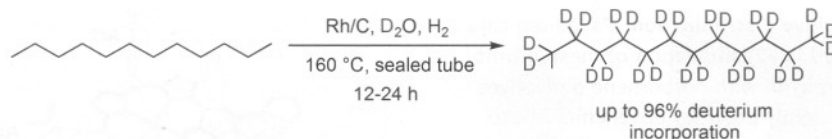
Harnessing the Potential of N-Heterocyclic Carbenes for the Rejuvenation of Group-Transfer Polymerization of (Meth)Acrylics

C–H Activation

T. Maegawa, Y. Fujiwara, Y. Inagaki,
H. Esaki, Y. Monguchi,
H. Sajiki* ————— 5394–5397



Mild and Efficient H/D Exchange of Alkanes Based on C–H Activation Catalyzed by Rhodium on Charcoal



Easy access: In the presence of Rh/C in D₂O under H₂ at 160 °C the H/D exchange reaction of unfunctionalized alkanes can easily occur (see scheme). Inexpensive

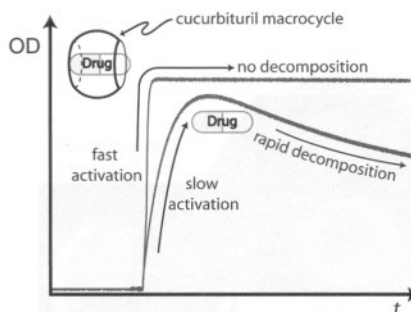
reagents and mild reaction conditions are used, and fully deuterated products can be obtained after a simple work up procedure.

Supramolecular Chemistry

N. Saleh,* A. L. Koner,
W. M. Nau* ————— 5398–5401



Activation and Stabilization of Drugs by Supramolecular pK_a Shifts: Drug-Delivery Applications Tailored for Cucurbiturils



Controlling the drug supply: UV and NMR spectroscopic studies show that drugs such as omeprazole and lansoprazole, popular drugs for the treatment of gastric acid related diseases, are stable for several weeks by using cucurbit[7]uril as a macrocyclic host (see scheme). The drugs are also more rapidly converted into their active forms by an acid-promoted reaction catalyzed by a supramolecular pK_a shift.

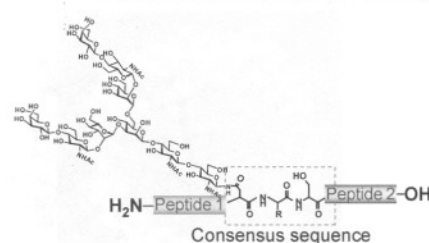
Glycopeptide Ligation

R. Okamoto, Y. Kajihara* — 5402–5406



Uncovering a Latent Ligation Site for Glycopeptide Synthesis

Serine in site: A native chemical ligation concept at the serine site is described (see picture). This method was achieved by the CNBr conversion reaction from methylcysteine, which could be obtained by selective S methylation. This new method allowed a consensus sequence that is generally incorporated in N-linked oligosaccharides to be used as a ligation site in the course of glycopeptide synthesis.

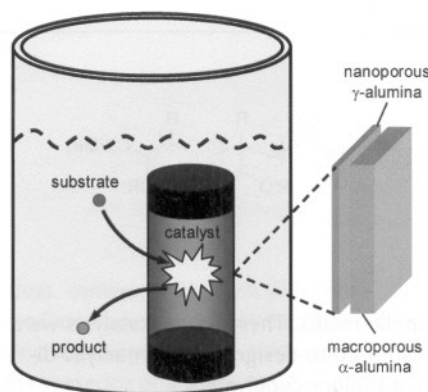


Applied Catalysis

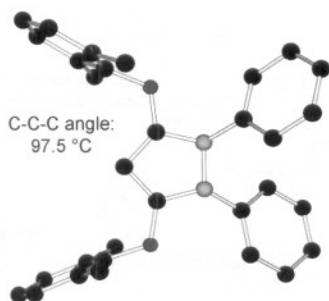
A. V. Gaikwad, V. Boffa, J. E. ten Elshof,
G. Rothenberg* ————— 5407–5410



Cat-in-a-Cup: Facile Separation of Large Homogeneous Catalysts



A cat with nine lives: Catalyst separation and recycling is the bane of homogeneous catalysis. This problem is addressed by a two-layered ceramic membrane cylinder that allows the diffusion of reactants and products in and out, but keeps the catalyst trapped. The concept is demonstrated for the enantioselective transfer hydrogenation of acetophenone to (S)-phenylethyl alcohol with large molecular catalysts anchored on Fréchet-type dendrimers.



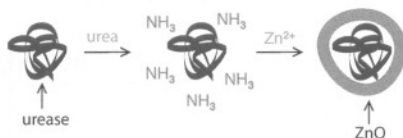
Push–push substitution patterns render allenes so flexible that the usually linear C=C=C fragment can be accommodated in a five-membered ring composed of only nitrogen and carbon atoms (see structure; C black, N blue, O red). These cyclic allenes appear to be strong donor η^1 ligands for alkali and transition metals.

Bent Allenes

V. Lavallo, C. A. Dyker,* B. Donnadieu, G. Bertrand* — 5411–5414

Synthesis and Ligand Properties of Stable Five-Membered-Ring Allenes Containing Only Second-Row Elements

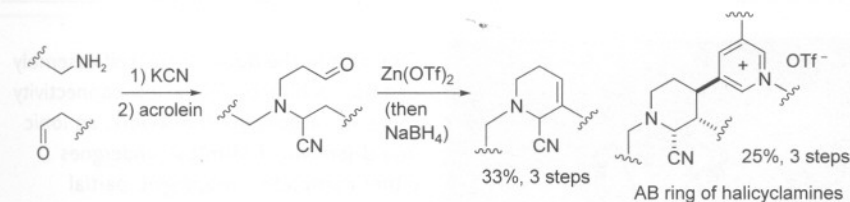
Reactor core: Hybrid core–shell urease–ZnO nanostructures have been synthesized (see picture). The crystallization takes place under mild biological conditions, thus ensuring its easy implementation in other room-temperature syntheses of oxide semiconductor materials.



Bio-Nanoreactors

R. de la Rica, H. Matsui* — 5415–5417

Urease as a Nanoreactor for Growing Crystalline ZnO Nanoshells at Room Temperature



Without the isolation of intermediates, 5,6-dihydropyridinium salts and their nitrile derivatives were prepared as shown in the scheme. Cyclization in the presence of an aminopentadienal led to the formation

of the AB ring system of the halocyclamines, or, under alternative conditions, the fused AB ring system of the manzamines. Tf = trifluoromethanesulfonyl.

Natural Products

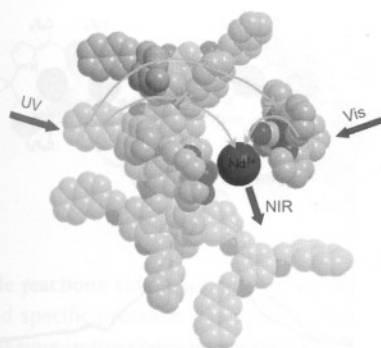
J.-C. Wypych, T. M. Nguyen, P. Nuhant, M. Bénéchie, C. Marazano* — 5418–5421

Further Insight from Model Experiments into a Possible Scenario Concerning the Origin of Manzamine Alkaloids

Supramolecular Chemistry

C. Giansante, P. Ceroni,* V. Balzani, F. Vögtle — 5422–5425

Self-Assembly of a Light-Harvesting Antenna Formed by a Dendrimer, a Ru^{II} Complex, and a Nd^{III} Ion



A luminescence mediator: An unusual lanthanide complex, exploiting a dendrimer and a ruthenium(II) complex as ligands, collects ultraviolet and visible light and exhibits luminescence in the near infrared region (see picture, N Blue, Ru brown, O red, C gray). In the absence of the ruthenium component the dendrimer is unable to transfer energy to the Nd^{III} ion, even though it is directly coordinated to it.

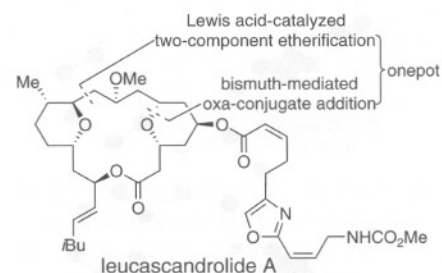
Natural Product Synthesis

P. A. Evans,* W. J. Andrews 5426–5429



A Sequential Two-Component Etherification/Oxa-Conjugate Addition Reaction: Asymmetric Synthesis of (+)-Leucascandrolide A Macrolactone

A smooth operator: The asymmetric synthesis of the macrolactone of (+)-leucascandrolide A (see structure) has been accomplished through a convergent route (longest linear sequence of 14 steps) in 20% overall yield. The assembly of the 1,5-bis(tetrahydropyran) core in a single operation provides the most concise synthetic approach developed to date.

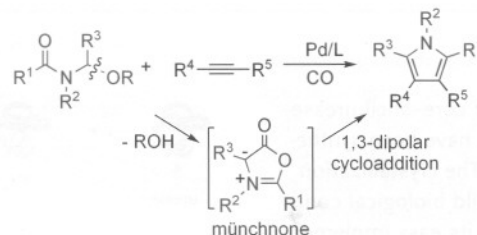


Cycloaddition

Y. Lu, B. A. Arndtsen* 5430–5433



Palladium Catalyzed Synthesis of Münchnones from α -Amidoethers: A Mild Route to Pyrroles



Having the munchies: A mild palladium-catalyzed method to activate the carbon–oxygen bond of α -amidoethers has been developed and applied to carbonylation chemistry (see scheme). A münchnone

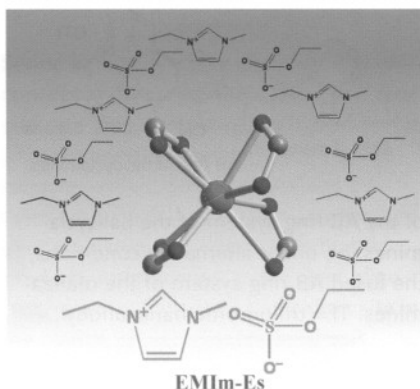
intermediate is generated in situ and undergoes a 1,3-dipolar cycloaddition with alkynes to give diversely substituted pyrroles.

Metal–Organic Frameworks

J. Zhang, S. Chen, X. Bu* 5434–5437



Multiple Functions of Ionic Liquids in the Synthesis of Three-Dimensional Low-Connectivity Homochiral and Achiral Frameworks



One foot in the door: In the self-assembly of a homochiral or achiral low-connectivity metal–dicarboxylate framework, an ionic liquid (shown: EMIm-Es) undergoes either complete entrapment, partial (cation-only), or no entrapment. The structure type depends on the ionic liquid and whether a structure-directing agent is used.

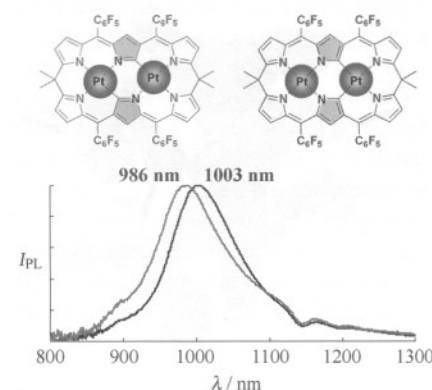
Calixphyrins

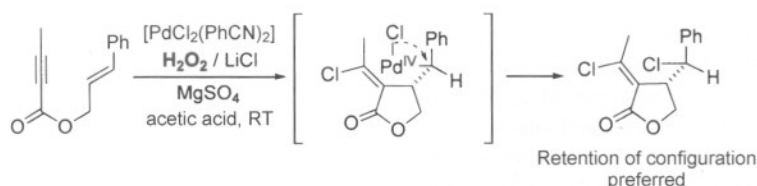
D.-H. Won, M. Toganoh, Y. Terada, S. Fukatsu, H. Uno, H. Furuta* 5438–5441



Near-Infrared Emission from Bis-Pt^{II} Complexes of Doubly N-Confused Calix[6]phyrins (1.1.1.1.1.1)

Light from confusion: A set of doubly N-confused calix[6]phyrins bearing two coordination sites (NNNC,NNNC or NNNN,NNCC) were synthesized. Their bis-Pt^{II} complexes exhibit near-infrared emission around 1000 nm, which could make these compounds ideal for biological applications.





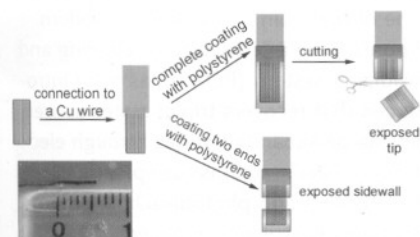
Gently does it: The Pd-catalyzed oxidative cyclization of enynes with hydrogen peroxide, a simple, inexpensive, and environmental benign oxidant, is proposed to proceed through a catalytic Pd^{II}/Pd^{IV} cycle in which the key C–Cl bond-

forming step is the formation of a Pd^{IV} intermediate (see scheme). This is followed by a direct reductive elimination to generate C–Cl bonds with retention of the configuration of the C(sp³) center.

Oxidative Cyclization

G. Yin, G. Liu* 5442–5445

Palladium-Catalyzed Oxidative Cyclization of Enynes with Hydrogen Peroxide as the Oxidant

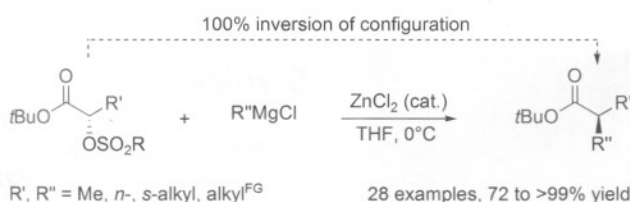


More than tips: The electrochemical properties of the tips and sidewalls of carbon nanotubes can be compared when specific regions are selectively masked with a nonconducting polymer coating (e.g. polystyrene) such that the electrolyte has access to one region only (see scheme). Surprisingly electrochemistry at carbon nanotube electrodes is not always facilitated by the nanotube tip.

Carbon Nanotubes

K. Gong, S. Chakrabarti, L. Dai* 5446–5450

Electrochemistry at Carbon Nanotube Electrodes: Is the Nanotube Tip More Active Than the Sidewall?



Zinc chloride does the trick and efficiently catalyzes the enantiospecific cross-coupling of α -hydroxy ester triflates with Grignard reagents under mild conditions. Enantiopure α -hydroxy esters are directly available from the chiral pool or by

diazotization of α -amino acids. Substantial variations in both reacting partners are tolerated making this methodology an attractive alternative to enolate alkylation featuring a reversal of polarity.

Synthetic Methods

C. Studte, B. Breit* 5451–5455

Zinc-Catalyzed Enantiospecific sp^3 – sp^3 Cross-Coupling of α -Hydroxy Ester Triflates with Grignard Reagents



Side reactions side-stepped: A D-amino acid specific protease was used for the first time in the chemoenzymatic synthesis of a native protein, the peptidyl prolyl *cis/trans* isomerase parvulin 10 from

E. coli (see scheme). Side reactions that complicate synthesis with L-amino acid specific enzymes are avoided in this approach.

Protein Synthesis by D-Peptidases

N. Wehofsky, A. Pech, S. Liebscher, S. Schmidt, H. Komeda, Y. Asano, F. Bordusa* 5456–5460

D-Amino Acid Specific Proteases and Native All-L-Proteins: A Convenient Combination for Semisynthesis

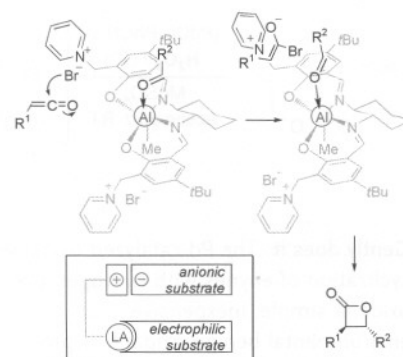
Dual-Activation Catalysis

T. Kull, R. Peters* — 5461–5464



Contact Ion Pair Directed Lewis Acid Catalysis: Asymmetric Synthesis of *trans*-Configured β -Lactones

Opposites attract. A novel concept for dual-activation catalysis takes advantage of the cooperative action of aprotic contact ion pair catalysis and Lewis acid catalysis. This strategy was used for the first *trans*-selective catalytic asymmetric [2+2] cyclocondensation of acyl halides with aliphatic aldehydes, furnishing *trans*-configured 3,4-disubstituted β -lactones with high stereoselectivity.

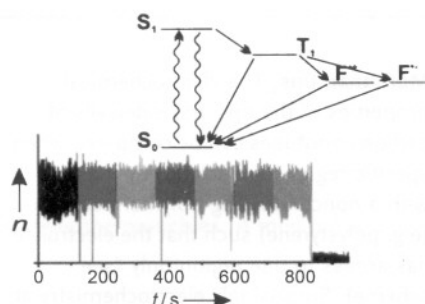


Fluorescence Spectroscopy

J. Vogelsang, R. Kasper, C. Steinhauer, B. Person, M. Heilemann, M. Sauer, P. Tinnefeld* — 5465–5469



A Reducing and Oxidizing System Minimizes Photobleaching and Blinking of Fluorescent Dyes



On the ROXS: Photobleaching represents one of the main limitations of modern fluorescence microscopy. A reducing and oxidizing system (ROXS) has been introduced that recovers triplet states as well as charge-separated states through electron-transfer reactions (see picture). Thus the blinking and photobleaching of fluorophores is strikingly reduced.



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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