



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. V. Geletii, B. Botar,* P. Kögerler, D. A. Hillesheim, D. G. Musaev, C. L. Hill*

An All-Inorganic, Stable, and Highly Active Tetraruthenium Homogeneous Catalyst for Water Oxidation

Z. Liu, A. Kumbhar, D. Xu, J. Zhang, Z. Sun, J. Fang*

Co-Reduction Colloidal Synthesis of III-V Nanocrystals: The Case of InP

Y. H. Sehlleier, A. Verhoeven, M. Jansen*

Observation of Direct Bonds Between Carbon and Nitrogen in Si-B-N-C Ceramic After Pyrolysis at 1400 °C

H. Braunschweig,* C. J. Adams, T. Kupfer, I. Mannes, R. Richardson, G. R. Whittell

A Paramagnetic Polymer by Ring-Opening Polymerization of a Strained [1]Vanadoarenophane

W. D. Pyrz, D. A. Blom, T. Vogt, D. J. Buttrely*

Direct Imaging of the MoVTeNbO M1 Phase Using an Aberration-Corrected High-Resolution Scanning Transmission Electron Microscope

Q. Zhang, T. P. Chou, B. Russo, S. A. Jenekhe, G. Cao*

Aggregation of ZnO Nanocrystallites for High Conversion Efficiency in Dye-Sensitized Solar Cells

Helmut Beinert (1913–2007)

Molecules and Medicine

Nanomaterials Chemistry

E. J. Corey, Barbara Czako, László Kürti

C. N. R. Rao, Achim Müller, Anthony K. Cheetham

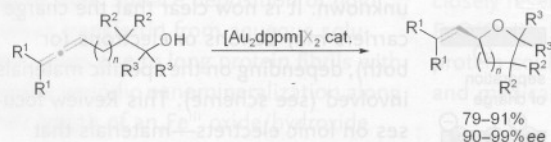
Obituary

P. M. H. Kroneck _____ 2172

Books

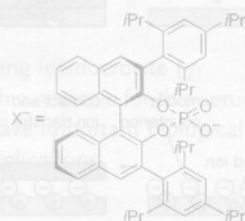
reviewed by R. E. Metternich,
C. S. Burgey _____ 2173

reviewed by U. Simon _____ 2174



A golden future: The recent discoveries in stereoselective gold catalysis are extremely promising. Transfer of chirality or the generation of new stereogenic centers from prochiral substrates on application of chiral gold catalysts occur with excel-

lent enantioselectivities. New concepts, such as the use of gold catalysts with chiral counterions, help to improve selectivities (see scheme, dppm = bis(diphenylphosphanyl)methane).



Highlights

Gold Catalysis

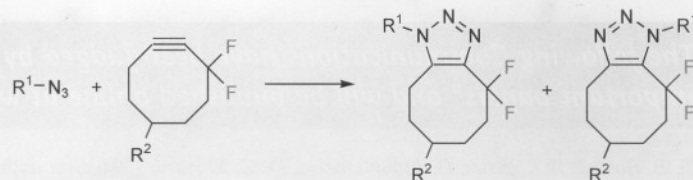
N. Bongers, N. Krause* — 2178–2181

Golden Opportunities in Stereoselective Catalysis

Click Chemistry

J.-F. Lutz* — 2182–2184

Copper-Free Azide–Alkyne
Cycloadditions: New Insights and
Perspectives



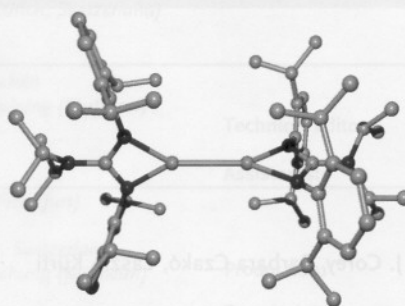
Clicking without copper: Copper-mediated azide–alkyne “click” cycloadditions (CuAAC) play a central role in contemporary synthetic chemistry but rely on transition-metal catalysts, which hamper their adoption in some biological appli-

cations. Recently, the strain-promoted and fluorine-activated cycloaddition of cyclooctynes and organic azides (see picture) was proposed as an interesting metal-free alternative to CuAAC.

Molecular Mg^I Compounds

M. Westerhausen* — 2185–2187

Molecular Magnesium(I) Compounds:
From Curiosity to Kudos



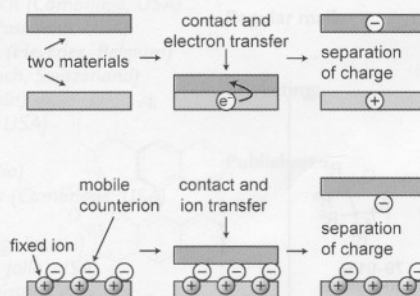
Two for one: Molecular magnesium(I) compounds (see structure: Mg light blue, N dark blue, C gray) with astonishing stability are now accessible in good yields. Decomposition reactions are observed at 170°C and 300°C, depending on the ligand present.

Reviews

Ionic Electrets

L. S. McCarty,
G. M. Whitesides* — 2188–2207

Electrostatic Charging Due to Separation
of Ions at Interfaces: Contact
Electrification of Ionic Electrets



The ancient Greeks described the phenomenon of contact electrification (“static electricity”), but the detailed mechanism of charge transfer remains unknown. It is now clear that the charge carriers may be ions or electrons (or both), depending on the specific materials involved (see scheme). This Review focuses on ionic electrets—materials that have a net electrostatic charge arising from an imbalance between cationic and anionic charges.

For the USA and Canada:

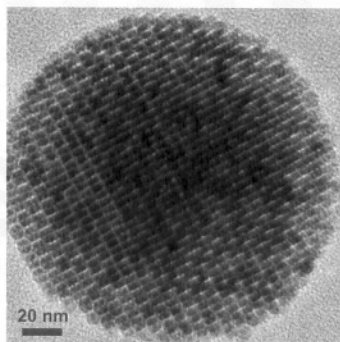
ANGEWANDTE CHEMIE International Edition (ISSN 1433-7851) is published weekly by Wiley-VCH, PO Box 191161, 69451 Weinheim, Germany. Air freight and mailing in the USA by Publications Expediting Inc., 200

Meacham Ave., Elmont, NY 11003. Periodicals postage paid at Jamaica, NY 11431. US POSTMASTER: send address changes to *Angewandte Chemie*, Wiley-VCH, 111 River Street, Hoboken, NJ 07030. Annual subscription price for institutions: US\$ 7225/6568 (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.

Communications

A supramolecular chemistry approach is used to make supercrystalline spherical colloidal superparticles (SPs, see picture) from nanoparticles. Detailed mechanistic studies show that the formation of the SPs is a two-step process. The major driving force for superparticle formation is the solvophobic interaction between nanoparticle building blocks and the growth solution; fine-tuning the interaction led to a size-controlled synthesis.



Colloids

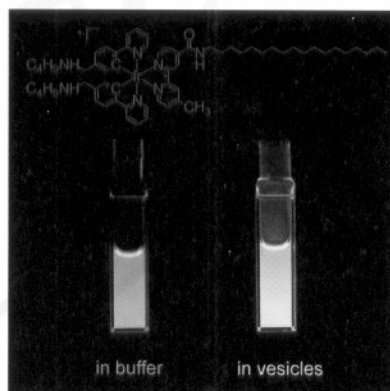
VIP

J. Zhuang, H. Wu, Y. Yang,
Y. C. Cao* — 2208–2212

Controlling Colloidal Superparticle
Growth Through Solvophobic Interactions



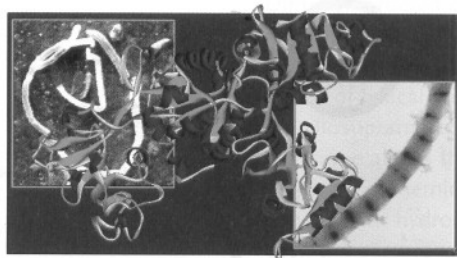
A colorful life: A new class of cyclometalated iridium(III)–polypyridine complexes have been discovered to exhibit environment-sensitive dual emission: In polar and nonpolar media the complexes show green and orange-yellow emission, respectively (see picture). This behavior has been utilized in the development of novel luminescent biological probes for avidin, estrogen receptor α , and human serum albumin.



Dual-Emissive Probes

K. K.-W. Lo,* K. Y. Zhang, S.-K. Leung,
M.-C. Tang — 2213–2216

Exploitation of the Dual-emissive
Properties of Cyclometalated Iridium(III)–
Polypyridine Complexes in the
Development of Luminescent Biological
Probes



Spotty iron: Surface deposition of holo human transferrin from aqueous solutions gives rise to long protein fibrils with regular periodic nanomineralization along their length of an Fe^{III} oxide/hydroxide

closely resembling lepidocrocite ($\gamma\text{-FeO}(\text{OH})$). Such a new role for this serum protein could have important biological and medical implications.

Iron Biomineralization

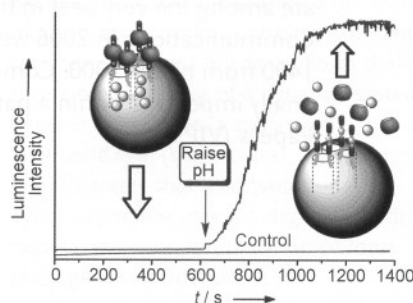
VIP

S. Ghosh, A. Mukherjee, P. J. Sadler,*
S. Verma* — 2217–2221

Periodic Iron Nanomineralization in
Human Serum Transferrin Fibrils



An open and closed case: pH-controllable nanovalves that operate in water have been produced by attaching [2]pseudorotaxanes to the surface of mesoporous silica nanoparticles. The nanovalves are able to contain guest molecules (rhodamine B, red circles) within the nanopores at acidic and neutral pH values but release them on command when the pH value is raised (see picture).

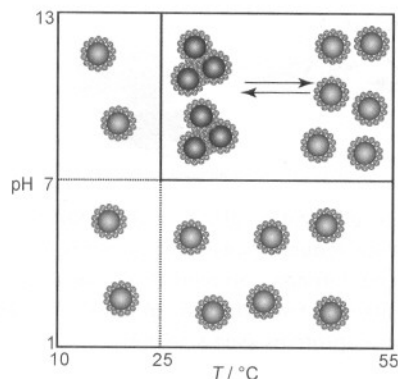


Molecular Devices

S. Angelos, Y.-W. Yang, K. Patel,
J. F. Stoddart,* J. I. Zink* — 2222–2226

pH-Responsive Supramolecular
Nanovalves Based on Cucurbit[6]uril
Pseudorotaxanes



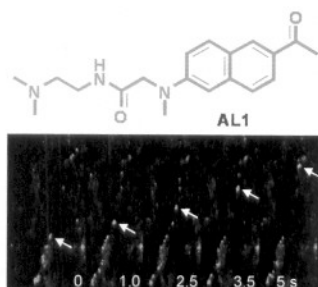


Controlled phase changes: Thermosensitive Au nanoparticles with tunable lower critical solution temperature have been prepared by coating the nanoparticles with a thermo- and pH-responsive hyperbranched polyelectrolyte. The globular, polyfunctional structure of the hyperbranched polymers offer new options to control phase-transition temperatures of the nanoparticles (see aggregation equilibrium in diagram).

Nanosensors

Y. Shen, M. Kuang, Z. Shen,* J. Nieberle, H. Duan,* H. Frey* — 2227–2230

Gold Nanoparticles Coated with a Thermosensitive Hyperbranched Polyelectrolyte: Towards Smart Temperature and pH Nanosensors

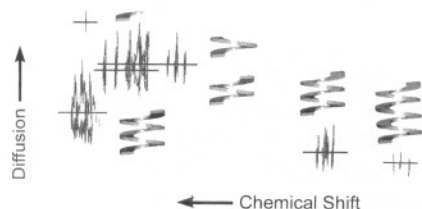


Move with the groove: Two-photon fluorescent pH probes and a two-photon lysotracker (AL1) can visualize acidic vesicles in live cells and living tissue for a long period of time without mistargeting and photobleaching problems. Using AL1, vesicles can be tracked in real time (see picture).

Fluorescent Probes

H. M. Kim, M. J. An, J. H. Hong, B. H. Jeong, O. Kwon, J.-Y. Hyon, S.-C. Hong, K. J. Lee, B. R. Cho* — 2231–2234

Two-Photon Fluorescent Probes for Acidic Vesicles in Live Cells and Tissue

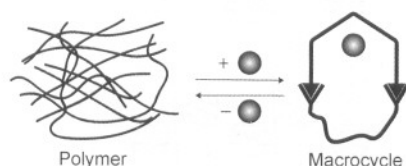


Diffusion ordered spectroscopy (DOSY) NMR experiments have been used to characterize a dynamic combinatorial library of helical strands and grid-type metallocsupramolecular architectures. The technique allows the deconvolution of very similar chemical structures differing only by their hydrodynamic radius. Moreover, the occurrence of springlike, extension–contraction conformational motions in helical strands can be revealed as a function of the temperature.

Constitutional Dynamic Chemistry

N. Giuseppone, J.-L. Schmitt, L. Allouche, J.-M. Lehn* — 2235–2239

DOSY NMR Experiments as a Tool for the Analysis of Constitutional and Motional Dynamic Processes: Implementation for the Driven Evolution of Dynamic Combinatorial Libraries of Helical Strands



Exchanging loose ends: The combination of a morphologically controlled core and reversible covalent linkages allows the reversible switching of a dynamic system between two states, a macrocyclic and a polymeric one (see picture). The process demonstrates that a constitutional dynamic system may undergo a constitutional change on modification of morphological information.

Dynamic Self-Assembly

S. Ulrich, J.-M. Lehn* — 2240–2243

Reversible Switching between Macrocyclic and Polymeric States by Morphological Control in a Constitutional Dynamic System

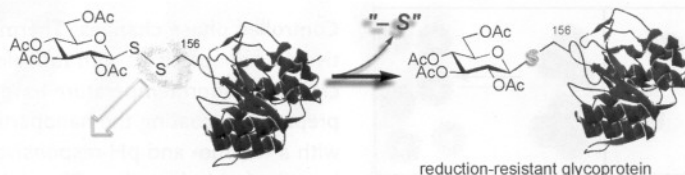


Protein Modification

G. J. L. Bernardes, E. J. Grayson,
S. Thompson, J. M. Chalker, J. C. Errey,
F. El Oualid, T. D. W. Claridge,
B. G. Davis* 2244–2247



From Disulfide- to Thioether-Linked
Glycoproteins



Strengthening the bond: The introduction of a thiol tag in combination with chemoselective ligation to form a disulfide-linked bioconjugate is a selective and useful method for site-selective protein glycosylation. The phosphine-mediated

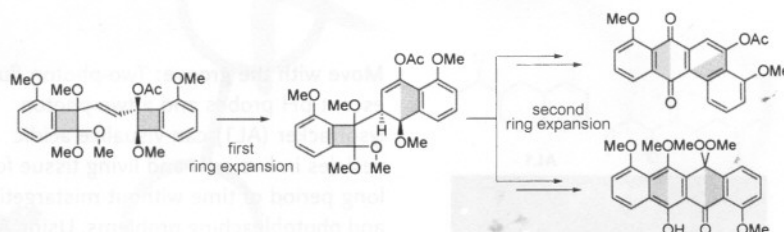
desulfurization of such glycoconjugates to their reductant-resistant thioether-linked counterparts completes a convergent, site-selective synthesis of thioether-linked glycoproteins (see scheme).

Polyaromatic Compounds

T. Suzuki, T. Hamura,
K. Suzuki* 2248–2252



Ring Selectivity: Successive Ring
Expansion of Two Benzocyclobutenes for
Divergent Access to Angular and Linear
Benzanthraquinones



Which ring shall it be? The successive thermal ring expansion of two benzocyclobutenes connected by an ethene bridge enables the expeditious synthesis of benzanthraquinones (see scheme). The

key to the success of this approach is the selective electrocyclic ring opening of one of the benzocyclobutene moieties in the initial stage of the process.

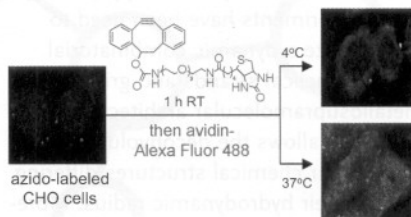


Live-Cell Imaging

X. Ning, J. Guo, M. A. Wolfert,
G. J. Boons* 2253–2255



Visualizing Metabolically Labeled
Glycoconjugates of Living Cells by
Copper-Free and Fast Huisgen
Cycloadditions



Cu^I-free click: 4-Dibenzocyclooctynol reacts, in the absence of a Cu^I catalyst, exceptionally fast with azido-containing saccharides and amino acids to give stable triazoles. A biotin-modified derivative is ideally suited for visualizing and tracking glycoconjugates of living cells that are metabolically labeled with azido-containing monosaccharides (see image).

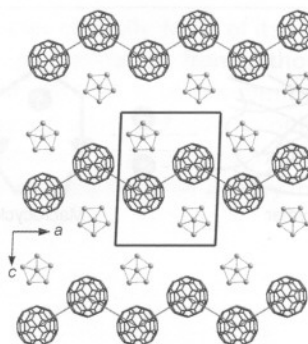


Cluster Compounds

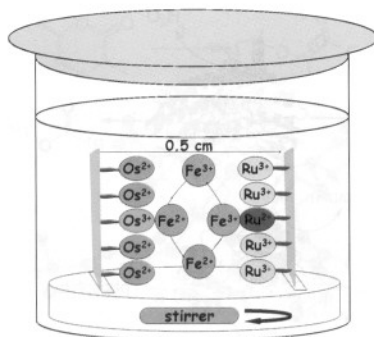
M. Schulz-Dobrick,
M. Jansen* 2256–2259

Intercluster Compounds Consisting of
Gold Clusters and Fullerides:
[Au₇(PPh₃)₇]⁺C₆₀²⁻·THF and [Au₈(PPh₃)₈]⁺(C₆₀)₂²⁻

Balls and bunches: [Au₇(PPh₃)₇]⁺C₆₀²⁻·THF (see picture) and [Au₈(PPh₃)₈]⁺(C₆₀)₂²⁻ are the first intercluster compounds consisting of gold clusters and fullerides. The interplay between long-range Coulomb interactions and short-range C–H–π and π–π interactions is responsible for the formation of well-crystalline compounds with a conspicuous segregation of the cations' and anions' partial structures.



Look who's talking: Redox-induced chemical communication between surface-confined osmium(II) and ruthenium(III) polypyridyl complexes in organic solvents has been demonstrated. Fe^{2+} was used as electron carrier (see picture), and the output signal of the monolayer reporter system was read optically with a conventional UV/Vis spectrophotometer in the transmission mode. Electron transfer takes place at surface–solution interfaces.



Chemical Communication

T. Gupta,
M. E. van der Boom* — 2260–2262

Chemical Communication between
Metal-Complex-Based Monolayers



Tandem Reactions

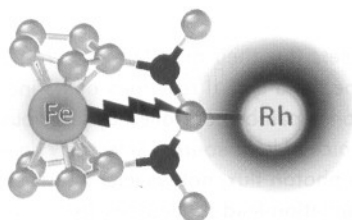
H. J. Bae, B. Baskar, S. E. An, J. Y. Cheong,
D. T. Thangadurai, I.-C. Hwang,
Y. H. Rhee* — 2263–2266

Gold(I)-Catalyzed Cycloisomerization of
3-Methoxy-1,6-enynes Featuring Tandem
Cyclization and [3,3]-Sigmatropic
Rearrangement



Golden reactivity: A new gold(I)-catalyzed cycloisomerization of 3-methoxy-1,6-enynes was discovered. Structurally simple 3-methoxy-1,6-enynes engage in a tandem cyclization/[3,3]-sigmatropic rearrangement to deliver a variety of 1-methoxy-1,4-cycloheptadienes (see

scheme). Notably, the reaction can be performed under very mild conditions and the synthetic utility of this reaction was demonstrated by facile conversion of the product into various cyclohept-4-en-1-ones.

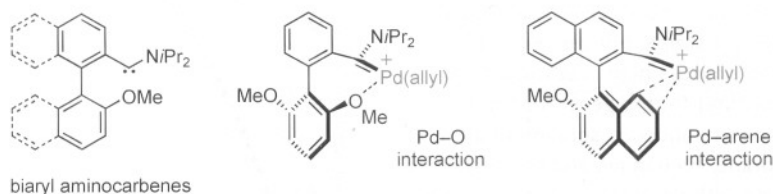


Jones'n for electrons: Various Rh complexes (see general structure) were formed with diaminocarbenes that contain 1,1'-disubstituted ferrocenes in their backbones. Electronic communication between the Fe centers in the redox-active carbenes and the coordinated transition metals was observed. For example, the oxidation potential of the Fe center in a bimetallic complex was found to depend on the electron density of the ligated Rh atom.

Redox-Active Ligands

D. M. Khramov, E. L. Rosen, V. M. Lynch,
C. W. Bielawski* — 2267–2270

Diaminocarbene[3]ferrocenophanes and
Their Transition-Metal Complexes



biaryl aminocarbenes

Similar yet very different: Biaryl aminocarbenes were prepared, characterized spectroscopically, and coordinated to an allylpalladium fragment (see scheme). In the resulting Pd complexes of these

bidentate hemilabile ligands, secondary Pd–O and Pd–arene interactions were observed that differ markedly from those encountered in complexes of the related biaryl phosphanes.

Aminocarbene Ligands

J. Vignolle, H. Gornitzka, B. Donnadieu,
D. Bourissou,*
G. Bertrand* — 2271–2274

Palladium–Oxygen and Palladium–Arene
Interactions in Complexes Derived from
Biaryl Aminocarbenes: Comparison with
Biaryl Phosphanes

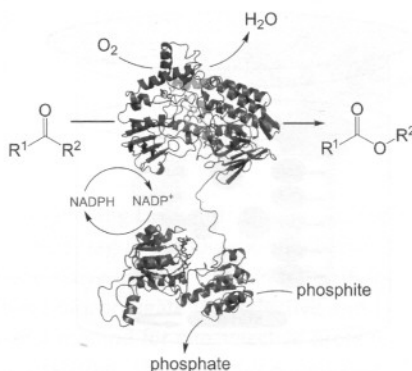


Biocatalysis

D. E. Torres Pazmiño, R. Snajdrova,
J. B. Baas, M. Ghobrial,
M. D. Mihovilovic,*
M. W. Fraaije* ————— 2275–2278



Self-Sufficient Baeyer–Villiger
Monooxygenases: Effective Coenzyme
Regeneration for Biooxygenation by
Fusion Engineering



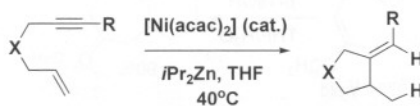
Two-in-one biocatalysts were engineered by the covalent fusion of NADPH-dependent Baeyer–Villiger monooxygenases to a phosphite dehydrogenase for coenzyme regeneration (see scheme). Not only the purified fusion proteins, but also whole cells and crude cell extracts containing the enzyme conjugates, could be used to catalyze biotransformations with high efficiency. NADP⁺ = nicotinamide adenine dinucleotide phosphate.

Synthetic Methods

M. Chen, Y. Weng, M. Guo, H. Zhang,
A. Lei* ————— 2279–2282



Nickel-Catalyzed Reductive Cyclization of
Unactivated 1,6-Enynes in the Presence of
Organozinc Reagents

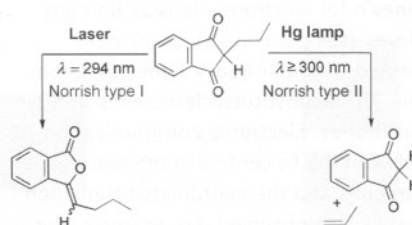


Pyrrolidine and tetrahydrofuran derivatives were synthesized in a highly stereoselective manner through the Ni-catalyzed reduction of the title compounds under mild conditions (see scheme). The product of cyclization is initially associated with both a Ni and a Zn species, the removal of which by elimination and hydrolysis corresponds to the formal incorporation of dihydrogen. acac = acetylacetonate; R = alkyl, aryl; X = N, O.

Reaction Control

C. Roscini, D. M. E. Davies, M. Berry,
A. J. Orr-Ewing,*
K. I. Booker-Milburn* ————— 2283–2286

Product Selection through Photon Flux:
Laser-Specific Lactone Synthesis



Lasers flux their muscles: The Norrish type I and type II reactions of 1,3-indandiones can be controlled by judicious choice of light source. Selectivity depends on photon flux, not wavelength. Laser irradiation lead to lactones (type I); conventional lamp irradiation gives diketones by fragmentation (type II, see scheme).

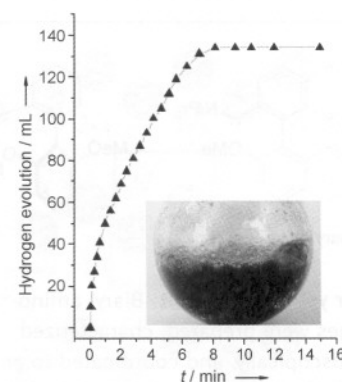
Hydrogen Generation

J.-M. Yan, X.-B. Zhang, S. Han,
H. Shioyama, Q. Xu* ————— 2287–2289

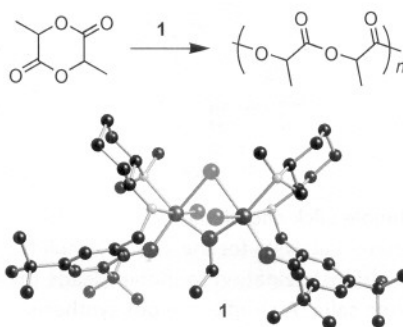


Iron-Nanoparticle-Catalyzed Hydrolytic
Dehydrogenation of Ammonia Borane for
Chemical Hydrogen Storage

Attractive hydrogen production? The amorphous Fe nanoparticles prepared following a simple but very efficient method possess high catalytic activity (see picture) for the generation of hydrogen from an aqueous solution of ammonia borane, even in air, and can readily be recycled with no obvious loss of catalytic activity.



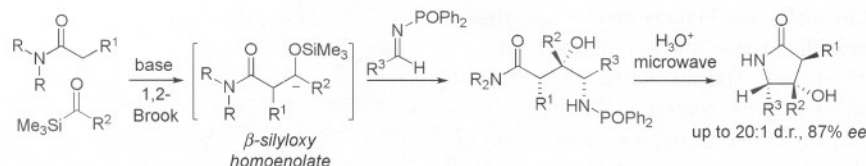
It loves LA! A unique chiral dinuclear indium complex **1** (see structure; In gray, Cl green, O red, N blue, C black) has been developed as a catalyst for the highly active, living ring-opening polymerization of lactide (LA). The catalyst retains the same reaction rate during two consecutive additions of lactide, and there is significant site control of polymer tacticity.



Lactide Polymerization

A. F. Douglas, B. O. Patrick,
P. Mehrkhodavandi* — 2290–2293

A Highly Active Chiral Indium Catalyst for
Living Lactide Polymerization



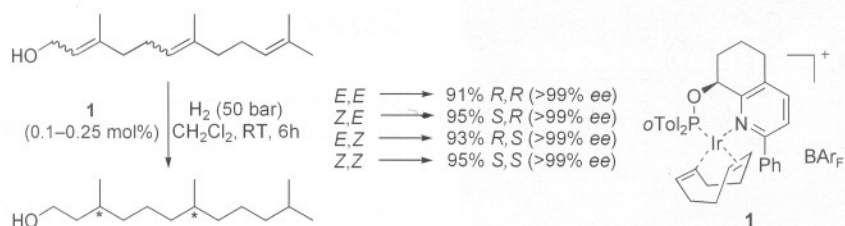
Multicomponent Reactions

R. B. Lettan, II, C. C. Woodward,
K. A. Scheidt* — 2294–2297

Highly Stereoselective Synthesis of
Substituted γ -Lactams from Acylsilanes

It takes three: The stereoselective synthesis of highly substituted γ -lactams from amide enolates, acylsilanes, and imines is reported. This multicomponent reaction accesses γ -amino- β -hydroxy amides in a single flask with good yields and excellent

levels of diastereoselectivity (see scheme). Exposure of the linear products to microwave irradiation and acidic conditions promotes a cyclization to form the corresponding γ -lactams in excellent yields.



Four isomers—one catalyst: The four stereoisomers of hexahydrofarnesol can be prepared with high enantio- and diastereoselectivity by using the same chiral iridium catalyst **1** with different *cis/trans* isomers of farnesol (see scheme;

BARF = tetrakis[bis-3,5-(trifluoromethyl)-phenyl]borate). Both the internal trialkyl-substituted $\text{C}=\text{C}$ bond and the allylic alcohol unit are hydrogenated with high facial selectivity.

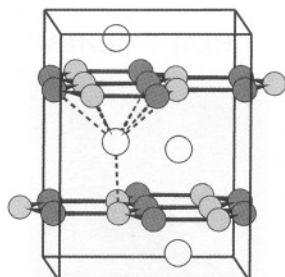
Asymmetric Catalysis

A. Wang, B. Wüstenberg,
A. Pfaltz* — 2298–2300

Enantio- and Diastereoselective
Hydrogenation of Farnesol and
O-Protected Derivatives: Stereocontrol by
Changing the $\text{C}=\text{C}$ Bond Configuration

Nonsymmetrical coordination favored:

The structure of BeB_2C_2 (see picture; Be white, B dark gray, C light gray) has been solved using near-edge fine-structure analysis of electron energy loss spectra and high-resolution powder diffractometry. It exhibits the unusual features of graphite-analogous B/C layers and a nonsymmetrical coordination of the beryllium atoms. The latter reveals a striking parallelism of the molecular and solid-state chemistries of Be compounds.



Beryllium Boride Carbide

K. Hofmann, X. Rocquefelte, J.-F. Halet,
C. Bähz, B. Albert* — 2301–2303

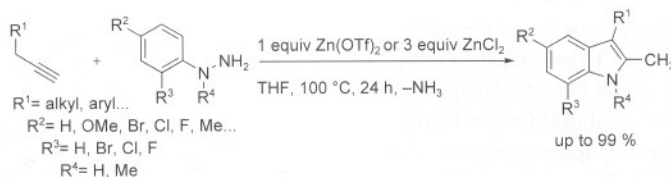
The η^6, η^1 -Coordination of Beryllium
Atoms in the Graphite Analogue BeB_2C_2

Indole Synthesis

K. Alex, A. Tillack, N. Schwarz,
M. Beller* _____ 2304–2307



Zinc-Promoted Hydrohydrazination of
Terminal Alkynes: An Efficient Domino
Synthesis of Indoles



Indole click chemistry: The quest for better catalysts for the intermolecular hydrohydrazination to indoles leads to zinc salts. A simple one-pot synthesis forms indoles from arylhydrazines and

terminal alkynes. The pharmacologically relevant indole building blocks are selectively formed in the presence of zinc triflate ($\text{Zn}(\text{OTf})_2$) or ZnCl_2 (see scheme).

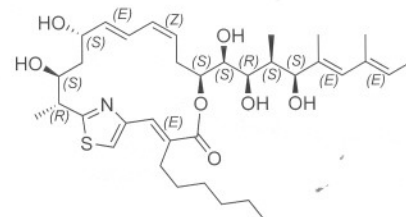
Structure Elucidation

M. Bock, K. Buntin, R. Müller,
A. Kirschning* _____ 2308–2311



Stereochemical Determination of
Thuggacins A–C, Highly Active Antibiotics
from the Myxobacterium *Sorangium*
cellulosum

Chemistry and biology meet in the structure elucidation of the antibiotics thuggacins A–C. The absolute configuration of all stereogenic centers in the thuggacins was confirmed through a combination of chemical derivatization, NMR analysis, molecular modeling, and bioinformatic analysis of the thuggacin biosynthetic genes.



Supporting information is available on the WWW
(see article for access details).



A video clip is available as Supporting Information
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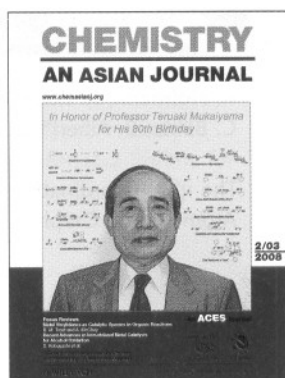
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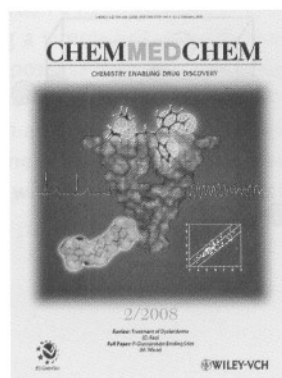
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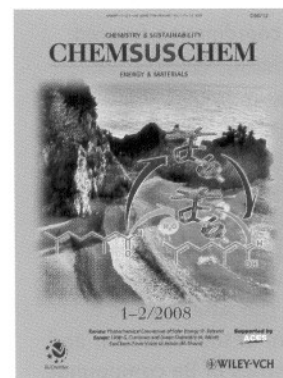
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