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:

*T. Lewis, M. Faubel, B. Winter, J. C. Hemminger**
CO_2 Capture in an Aqueous Solution of an Amine: Role of the Solution Interface

*Y. H. Kim, S. Banta**
Complete Oxidation of Methanol in an Enzymatic Biofuel Cell by a Self-Assembling Hydrogel Created from Three Modified Dehydrogenases

A. Bonet, C. Pubill-Ulldemolins, C. Bo, H. Gulyás,* E. Fernández**
Transition-Metal-Free Diboration by the Activation of Diboron Compounds with Simple Lewis Bases

*W. Liu, V. Khedkar, B. Baskar, M. Schürmann, K. Kumar**
Branching Cascades: A Concise Synthetic Strategy Targeting Diverse and Complex Molecular Frameworks

*M. Nakanishi, D. Katayev, C. Besnard, E. P. Kündig**
Synthesis of Fused Indolines by Palladium-Catalyzed Asymmetric C–C Coupling Involving an Unactivated Methylene Group

A. S. P. Frey, F. G. N. Cloke, M. P. Coles, L. Maron, T. Davin*
Facile Conversion of CO/H_2 into Methoxide at a Uranium(III) Center

A. W. Fay, M. A. Blank, C. C. Lee, Y. Hu, K. O. Hodgson,* B. Hedman,* M. W. Ribbe**
Spectroscopic Characterization of a Precursor Isolated from NifEN of an Iron–Molybdenum Cofactor

*V. Zinth, T. Dellmann, H.-H. Klauss, D. Johrendt**
Recovery of a Parentlike State in $\mathrm{Ba_{1-x}K_xFe_{1.86}Co_{0.14}As_2}$

Author Profile

"I enjoy the wee hours spent bouncing e-mails back and forth with my many good colleagues all over the world. The most important thing I learned is to hire students, postdocs, and young colleagues who are smarter than me ..."
This and more about Flemming Besenbacher can be found on page 6204.

News

F. H. Arnold

C. P. R. Hackenberger

K. C. Nicolaou

G. A. Somorjai

H. Waldmann

Books

Contents

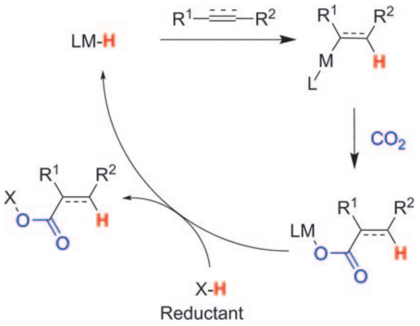
Highlights

Carboxylic Acid Synthesis

Y. G. Zhang,* S. N. Riduan **6210 – 6212**

Catalytic Hydrocarboxylation of Alkenes and Alkynes with CO_2

Taming the enemy: Great possibilities for the use of carbon dioxide as a renewable and environmentally friendly source of carbon in organic synthesis have been demonstrated through the hydrocarboxylation of simple alkenes and alkynes with CO_2 (see scheme). Several versatile methods for carboxylic acid synthesis have been developed on this basis.

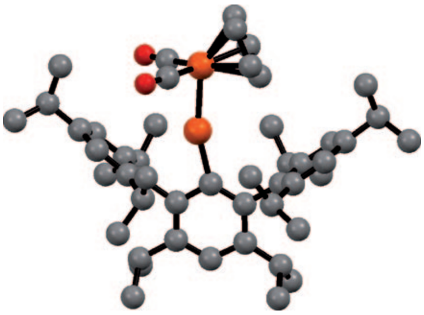


Low-Coordinate Complexes

P. L. Holland* **6213 – 6214**

Two-Coordinate Transition-Metal Centers With Metal–Metal Bonds

M–M bonds meet two-coordination: Systems with metal–metal bonds are of great interest in inorganic chemistry. A recent report describes the first example of a metal–metal bond to a two-coordinate transition-metal center (see structure, Fe orange, O red, C gray). The metal–metal bond in this “xenophilic complex” is best described as a dative bond.

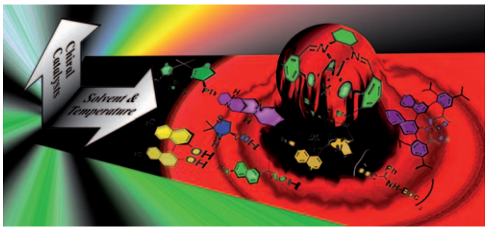


Minireviews

Asymmetric Catalysis

S. Piovesana, D. M. Scarpino Schietroma, M. Bella* **6216 – 6232**

Multiple Catalysis with Two Chiral Units: An Additional Dimension for Asymmetric Synthesis



Divide et Impera: A newly emerging aspect of catalysis that involves the use of two chiral catalysts simultaneously is described (see picture). This Minireview highlights the features of the two-catalyst reactions and the synthetic applications of the methods.

For the USA and Canada:
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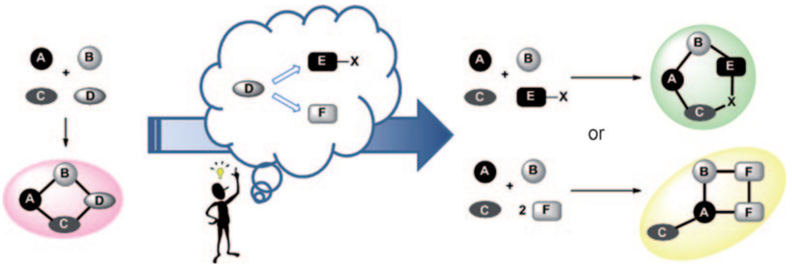
Reviews

Multicomponent Reactions

E. Ruijter, R. Scheffelaar,
R. V. A. Orru* ______ 6234 – 6246

Multicomponent Reaction Design in the Quest for Molecular Complexity and Diversity



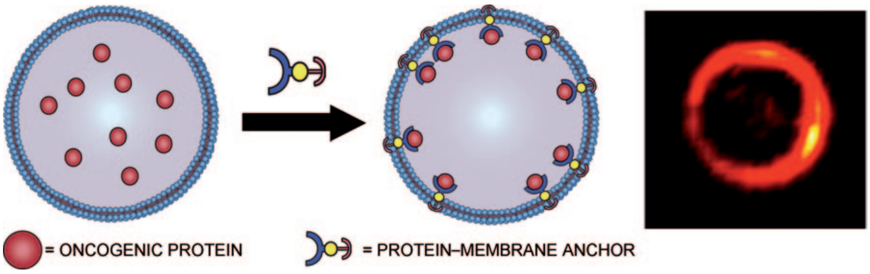
MCRs à la carte: Multicomponent reactions have become essential tools for the rapid generation of molecular complexity and diversity in chemical biology and drug discovery. These reactions are often discovered by serendipity, but rational design strategies are now playing an increasing role. Several such strategies are discussed in this Review.

Communications

Anticancer Agents

M. Avadisian, S. Fletcher, B. Liu, W. Zhao, P. Yue, D. Badali, W. Xu, A. D. Schimmer, J. Turkson, C. C. Gradinaru,*
P. T. Gunning* ______ 6248 – 6253

Artificially Induced Protein–Membrane Anchorage with Cholesterol-Based Recognition Agents as a New Therapeutic Concept

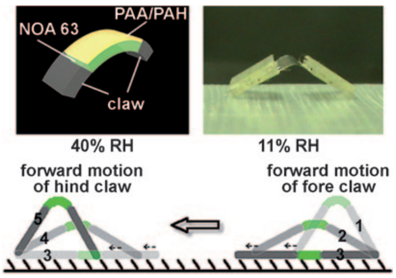


Keeping harm at bay: In an in vitro strategy to prevent the cellular motility of oncogenic STAT3 protein, protein–membrane anchorage was induced by the use of a rationally designed cholesterol-based protein–membrane anchor in breast-tumor cells. (The fluorescence image shows the localization of the protein to the liposome boundary of a multilamellar vesicle.)

Smart Materials

Y. Ma, Y. Zhang, B. Wu, W. Sun, Z. Li,
J. Sun* ______ 6254 – 6257

Polyelectrolyte Multilayer Films for Building Energetic Walking Devices



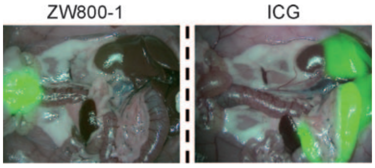
Fast and powerful: A polyelectrolyte multilayer film was used to fabricate a humidity-responsive actuator that can drive a walking device carrying a load 120 times heavier than the actuator to walk steadily on a ratchet substrate under periodic alternation of the relative humidity (RH) between 11 and 40% (see picture). NOA 63: Norland Optical Adhesive 63, PAA: poly(acrylic acid), PAH: poly(allylamine hydrochloride).

Fluorescent Probes

H. S. Choi, K. Nasr, S. Alyabyev, D. Feith, J. H. Lee, S. H. Kim, Y. Ashitate, H. Hyun, G. Patonay, L. Strekowski, M. Henary,* J. V. Frangioni* ________ **6258 – 6263**

Synthesis and In Vivo Fate of Zwitterionic Near-Infrared Fluorophores

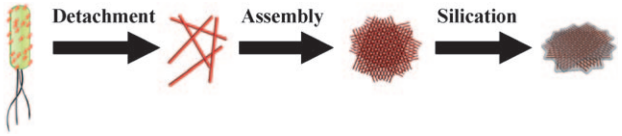
To address two fundamental and unsolved problems in optical imaging (nonspecific uptake of near-infrared fluorophores by normal tissues and organs and incomplete elimination of unbound targeted fluorophores from the body), novel zwitterionic near-infrared fluorophores (e.g., ZW800-1) were synthesized and their performance compared in vivo to conventional molecules (e.g., ICG) as a function of charge, charge distribution, and hydrophobicity (see picture).



Biomolecule Self-Assembly

B. Cao, H. Xu, C. Mao* ____ **6264 – 6268**

Controlled Self-Assembly of Rodlike Bacterial Pili Particles into Ordered Lattices

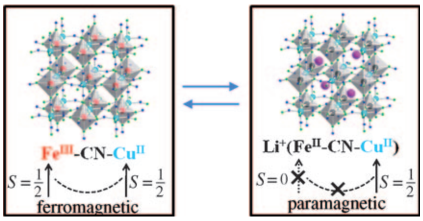


Pili pickup sticks: Rodlike type 1 bacterial pili particles (see picture, red) self-assemble into highly ordered nanostructures through molecular recognition in the presence of suitable inducers. 1D bundles, 2D double-layer lattices, and 3D multilayer lattices were produced by varying the nature and concentration of the inducers. The self-assembled pili serve as templates for nucleating and organizing inorganic nanomaterials such as silica.

Magnetic Materials

M. Okubo,* D. Asakura, Y. Mizuno, T. Kudo, H. S. Zhou,* A. Okazawa, N. Kojima, K. Ikedo, T. Mizokawa, I. Honma* ________ **6269 – 6273**

Ion-Induced Transformation of Magnetism in a Bimetallic CuFe Prussian Blue Analogue

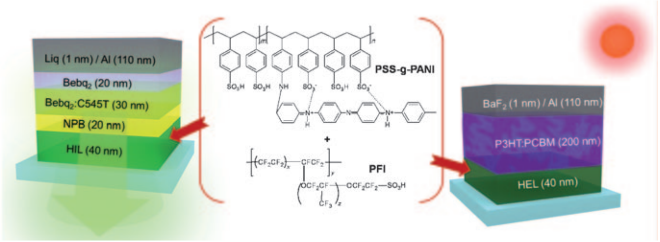


Li ions for degaussing: A Prussian blue analogue with Fe^{III} and Cu^{II} ions bridged by CN ligands underwent a ferromagnetic transition induced by ferromagnetic interactions between the Fe and Cu ions (see picture). Li ions penetrating into this ferromagnetic framework eliminated the ferromagnetic interaction and effected the formation of a paramagnetic framework. The ferromagnetism was recovered by extracting the Li ions.

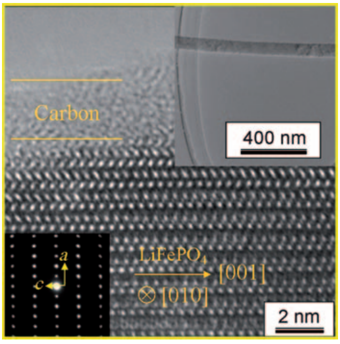
Organic Electronics

M.-R. Choi, T.-H. Han, K.-G. Lim, S.-H. Woo, D. H. Huh, T.-W. Lee* ________ **6274 – 6277**

Soluble Self-Doped Conducting Polymer Compositions with Tunable Work Function as Hole Injection/Extraction Layers in Organic Optoelectronics



Making light work: Polymer-based compositions with a perfluorinated ionomer (PFI) as hole injection/extraction layers are introduced for organic LEDs and organic photovoltaic cells. The work functions of the layers formed by single spin-coating could be tuned to improve device efficiency and device lifetime. The effects of the PFI surface layers on charge injection/extraction and device lifetime were investigated.



From the spinning room: $LiFePO_4$ is a promising cathode material for lithium batteries, but it suffers from slow mass and charge transport. Electrospinning is able to produce single-crystalline $LiFePO_4$ nanowires coated with amorphous carbon (see TEM images and small-angle electron diffraction pattern). Networks of these wires show very short diffusion lengths, thus leading to high rate performance and cycling capability.

Cathode Materials

C. Zhu, Y. Yu,* L. Gu,* K. Weichert,
J. Maier* ——— **6278 – 6282**

Electrospinning of Highly Electroactive Carbon-Coated Single-Crystalline $LiFePO_4$ Nanowires

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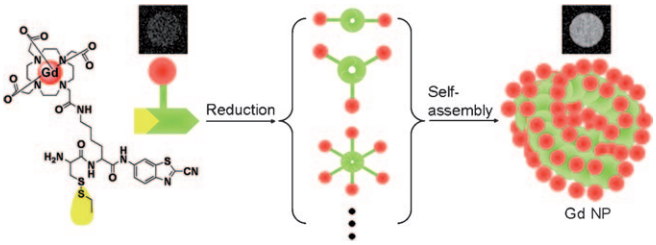

Gd smart: MRI contrast agents are presented that are based on a biocompatible condensation reaction. Upon reduction, a gadolinium-containing cell-permeable small-molecule probe condenses into cyclic oligomers that subsequently self-assemble into nanoparticles (NPs) with enhanced relaxivity (by 110% at 1.5 T and 35 °C, and 104% in live cells at 0.5 T).

Contrast Agents

G. Liang, J. Ronald, Y. Chen, D. Ye,
P. Pandit, M. L. Ma, B. Rutt,
J. Rao* ——— **6283 – 6286**

Controlled Self-Assembling of Gadolinium Nanoparticles as Smart Molecular Magnetic Resonance Imaging Contrast Agents

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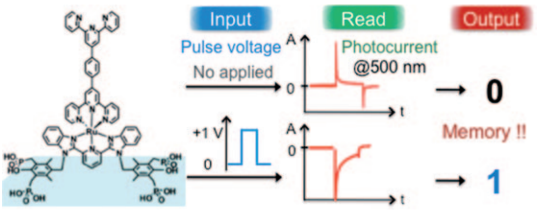

Forget me not: When an oxidizing voltage pulse was applied, ruthenium complexes immobilized on an ITO electrode showed a memory effect, and the original anodic photoresponse (see picture, above) changed to a cathodic one (below).

Molecular Devices

K. Terada, K. Kanaizuka, V. M. Iyer,
M. Sannodo, S. Saito, K. Kobayashi,
M. Haga* ——— **6287 – 6291**

Memory Effects in Molecular Films of Free-Standing Rod-Shaped Ruthenium Complexes on an Electrode

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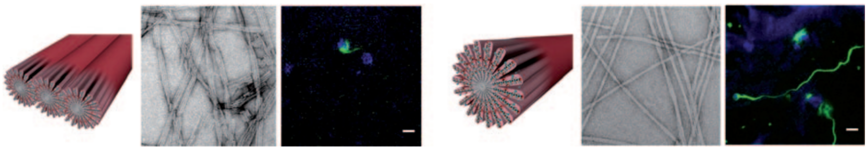


The power of independence: When exhibited on the surface of self-assembling peptide-amphiphile nanofibers, the hydrophobic laminin-derived IKVAV epitope induced nanofiber bundling through interdigitation with neighboring fibers and thus decreased the bioactivity of the resulting materials. The inclusion of charged amino acids in the peptide amphiphiles disrupted the tendency to bundle and led to significantly enhanced neurite outgrowth (see picture).

Supramolecular Biomaterials

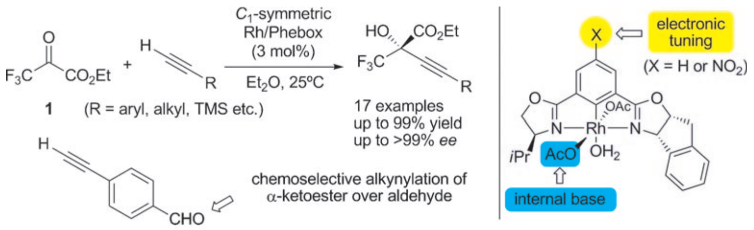
J. E. Goldberger, E. J. Berns, R. Bitton,
C. J. Newcomb, S. I. Stupp* **6292 – 6295**

Electrostatic Control of Bioactivity

Asymmetric Catalysis

T. Ohshima,* T. Kawabata, Y. Takeuchi,
T. Kakinuma, T. Iwasaki, T. Yonezawa,
H. Murakami, H. Nishiyama,
K. Mashima* ______ **6296 – 6300**

C_1-Symmetric Rh/Phebox-Catalyzed Asymmetric Alkynylation of α-Ketoesters

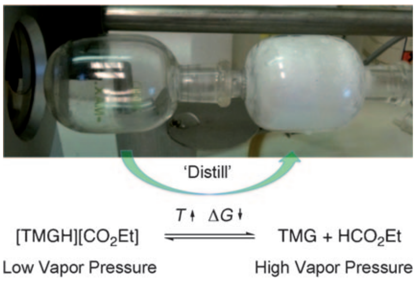


Thinking outside the box: A newly developed C_1-symmetric Rh/Phebox complex efficiently catalyzed the asymmetric alkynylation of α-ketoester **1** with various aryl and alkyl substituted terminal alkynes to provide the corresponding chiral tertiary propargylic alcohols with up to 99% *ee* (see scheme; TMS = trimethylsilyl).

Distillable Salts

A. W. T. King,* J. Asikkala, I. Mutikainen,
P. Järvi, I. Kilpeläinen* ______ **6301 – 6305**

Distillable Acid–Base Conjugate Ionic Liquids for Cellulose Dissolution and Processing



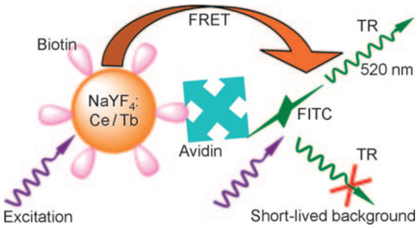
Heating up: Improved recyclability is necessary for ionic liquids destined for wood-based bioprocessing platforms. New "distillable" molten acid–base conjugates efficiently dissolve cellulose at temperatures of 100 °C. Increased temperature induces a shift of the acid–base equilibrium toward the neutral species (see picture, TMG = 1,1,3,3-tetramethylguanidine), thus affording a vapor pressure and allowing for distillation of the mixture.

Biosensors

D. T. Tu, L. Q. Liu, Q. Ju, Y. S. Liu,
H. M. Zhu, R. F. Li,
X. Y. Chen* ______ **6306 – 6310**

Time-Resolved FRET Biosensor Based on Amine-Functionalized Lanthanide-Doped $NaYF_4$ Nanocrystals

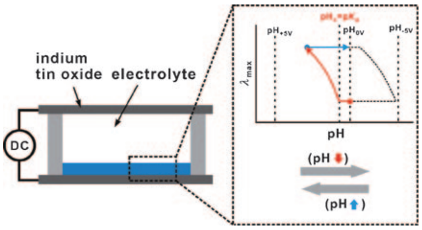
Background elimination and improved sensitivity were achieved by time-resolved (TR) detection with a FRET biosensor for traces of biomolecules such as avidin at concentrations down to 4.8 nM. As shown in the picture, UV excitation of biotinylated $NaYF_4$:Ce/Tb nanocrystals triggers energy transfer to fluorescein isothiocyanate (FITC), whose long-lived emission due to FRET can be distinguished from the short-lived background from direct excitation.



Optoelectronics

K. Hwang, D. Kwak, C. Kang, D. Kim,
Y. Ahn, Y. Kang* ______ **6311 – 6314**

Electrically Tunable Hysteretic Photonic Gels for Nonvolatile Display Pixels

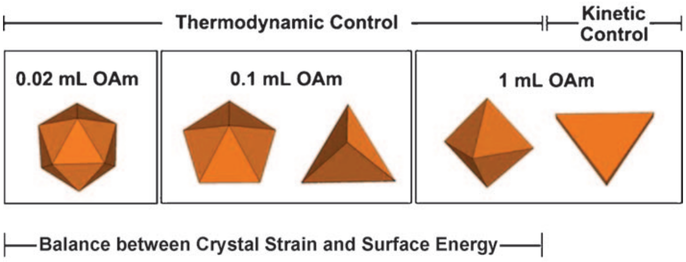


Plastic pixels: Electrically tunable photonic pixels exhibiting nonvolatile photonic colors are demonstrated by coupling the hysteretic optical properties of PS-*b*-P2VP block copolymer photonic gels with an electrochemically induced pH gradient. The optical volatility of photonic pixels was tuned by controlling the hysteresis strength and the conversion pH value, which were both highly dependent on the species of anions pairing with pyridinium groups.

Metal Nanocrystals

Z. Niu, Q. Peng, M. Gong, H. Rong, Y. Li* ———— 6315 – 6319

Oleylamine-Mediated Shape Evolution of Palladium Nanocrystals

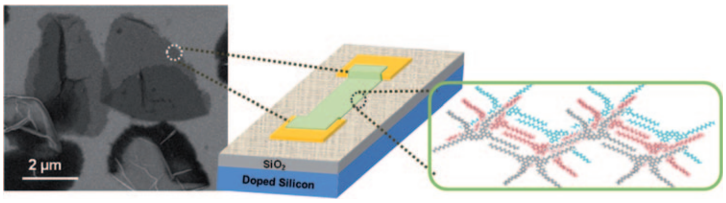


Shape control: Uniform Pd nanocrystals in the shape of icosa-, deca-, octa-, tetrahedron, and triangular plate were prepared in a hydrophobic system in which oleylamine (OAm) plays a crucial role in shape evolution by mediating the counterbalance between crystal strain and surface energy (see picture). The as-obtained Pd nanocrystals are catalytically active in the oxidation of formic acid.

Molecular Electronics

J. Yin, Y. Zhou, T. Lei, J. Pei* 6320 – 6323

A Butterfly-Shaped Amphiphilic Molecule: Solution-Transferable and Free-Standing Bilayer Films for Organic Transistors



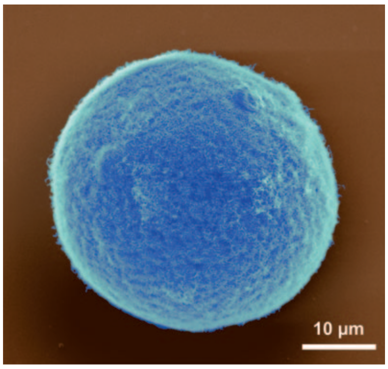
Butterflies in the stomach: Organic field-effect transistors containing a free-standing film self-assembled from an amphiphilic butterfly-shaped benzodithiophene derivative as the active layer (see picture) were fabricated by a solution transfer process. The direct self-assembly of the film from solution means that a substrate is not required for the film formation.

Amphiphiles

D. I. Rożkiewicz, B. D. Myers, S. I. Stupp* ———— 6324 – 6327

Interfacial Self-Assembly of Cell-like Filamentous Microcapsules

Spray-on: Peptide amphiphiles (PAs) and oppositely charged polymers can self-assemble into highly organized membranes (see picture) at the interface between two aqueous solutions. Nebulization was employed to spray the biopolymer into a solution of the peptide amphiphile and to template the formation of microcapsules that are loaded with a biopolymer solution and have surfaces that are decorated with nanoscale filaments.

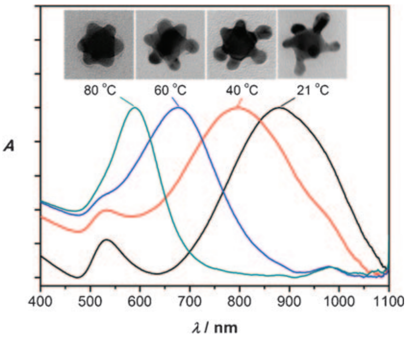


Nanocrystals

D. Y. Kim, T. Yu, E. C. Cho, Y. Ma, O O. Park, Y. Xia* ———— 6328 – 6331

Synthesis of Gold Nano-hexapods with Controllable Arm Lengths and Their Tunable Optical Properties

A star in the making: Gold nano-hexapods with controlled arm lengths were synthesized by selective growth on the vertices of octahedral Au seeds. Depending on the arm length, their surface plasmon resonance peaks shifted from the visible to the near-infrared region (see picture), which could be readily controlled by varying the amount of $HAuCl_4$, the reaction temperature, or both.

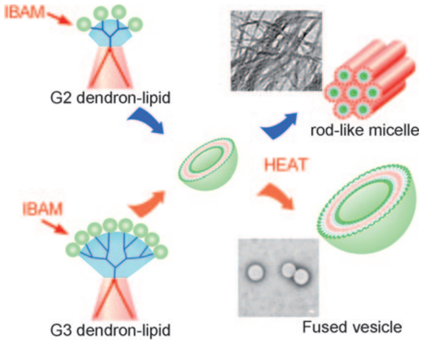


Dendrimer-Based Vesicles

K. Kono,* E. Murakami, Y. Hiranaka, E. Yuba, C. Kojima, A. Harada, K. Sakurai ______ 6332 – 6336

Thermosensitive Molecular Assemblies from Poly(amidoamine) Dendron-Based Lipids

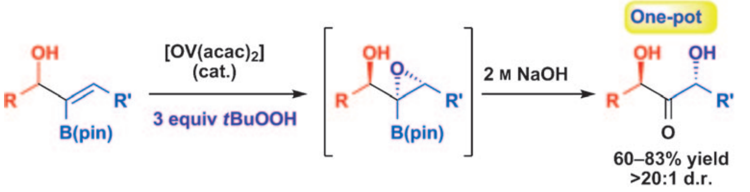
The heat is on: Vesicles formed from poly(amidoamine) dendron-based lipids with terminal isobutyramide (IBAM) groups undergo a temperature-dependent structural transition through a change in hydration of the vesicle surface. The vesicles are stable at low temperature, but form aggregates above a specific temperature and transform to inverted rodlike micelles or fused vesicles (see picture; G2/G3 = second/third generation).



Tandem Oxidations

M. M. Hussain, J. Hernández Toribio, P. J. Carroll, P. J. Walsh* ______ 6337 – 6340

Synthesis of 2-Keto-*anti*-1,3-diols by Chemoselective Tandem Oxidation of 2-B(pin)-Substituted Allylic Alcohols

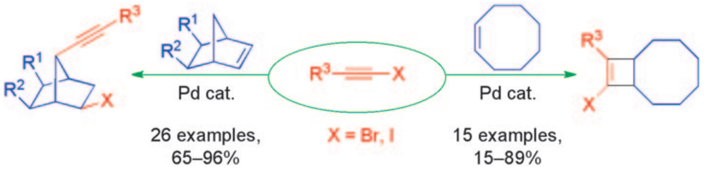


A new role for vinyl boronates: Vinyl boronate esters are well known as synthons for ketones and for their ability to participate in cross-coupling reactions. A tandem oxidation is introduced to convert 2-B(pin)-substituted allylic alcohols into 2-keto-*anti*-1,3-diols with high diastereoselectivity. Under these reaction conditions, the vinyl boronate ester is now a synthon for α-hydroxy ketones.

Synthetic Methods

Y. B. Li, X. H. Liu, H. F. Jiang,* B. F. Liu, Z. W. Chen, P. Zhou ______ 6341 – 6345

Palladium-Catalyzed Bromoalkynylation of C–C Double Bonds: Ring-Structure-Dependent Synthesis of 7-Alkynyl Norbornanes and Cyclobutenyl Halides



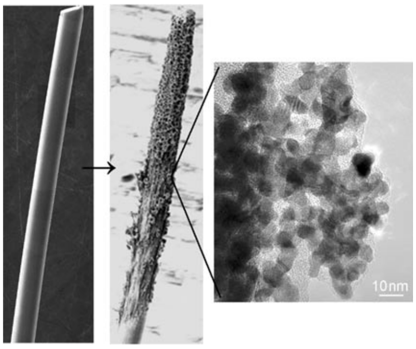
Strain versus flexibility: The palladium-catalyzed reaction of haloalkynes with norbornene derivatives leads to 7-alkynyl norbornane products (see scheme). Key to the success of this reaction is the formation of a “bridging” palladium species, which can rearrange to result in a C-7 functionalization. The ring-structure-dependent [2+2] cycloaddition of haloalkynes with cyclooctene has been achieved in moderate to good yields under similar conditions.

Nanoparticle Synthesis

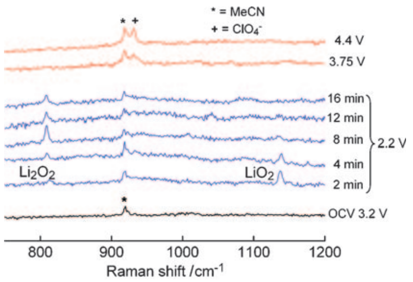
A. I. Yanson, P. Rodriguez, N. Garcia-Araez, R. V. Mom, F. D. Tichelaar, M. T. M. Koper* ______ 6346 – 6350

Cathodic Corrosion: A Quick, Clean, and Versatile Method for the Synthesis of Metallic Nanoparticles

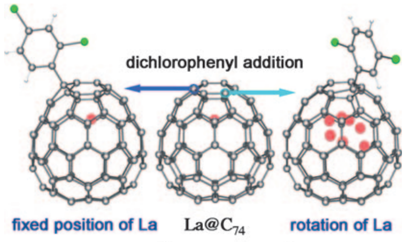
A simple and effective method for the synthesis of nanoparticles is reported based on extreme cathodic polarization of a metal, formation of cation-stabilized metal anions, and their agglomeration (see picture). The improved catalytic activity of these nanoparticles in the oxidation of carbon monoxide as well as methanol is shown using platinum.



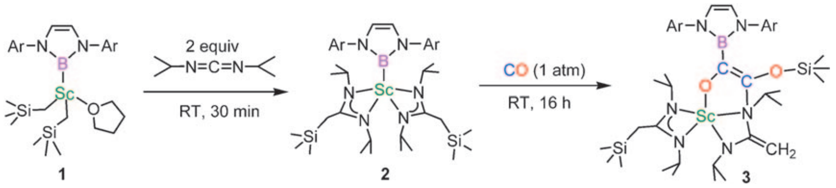
Taking the shortcut: Spectroscopic data (see picture) provide direct evidence that in non-aqueous Li^+ electrolyte, O_2 is reduced to O_2^-, which then forms LiO_2 on the electrode surface which disproportionates to Li_2O_2. On charging, Li_2O_2 decomposes directly, in a one-step reaction to evolve O_2 and does not pass through LiO_2 as an intermediate.



Insoluble fullerenes solubilized: Addition of dichlorophenyl radicals to insoluble La@C_{74} affords two series of regioisomers in which dichlorophenyl groups with different substitution patterns are singly bonded to one of two adjacent cage carbon atoms. X-ray diffraction studies reveal that the internal metal atom is responsible for such addition patterns, while addition to different sites modifies the motion of the metal atom (see picture).

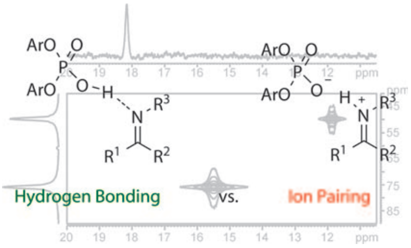


grey C, green Cl, red La



Among the first of their kind: Scandium boryl complex **1** and its Gd analogue were prepared by reaction of a boryl lithium compound with $[Ln(CH_2SiMe_3)_2(THF)_x][BPh_4]$ (Ln = Sc, Gd). Reaction of **1** with *N*,*N'*-diisopropylcarbodiimide gave bis(amidinate) complex **2**, which affords **3** by double CO insertion into the Sc–B bond, nucleophilic addition of an amidinate, and migration of the $SiMe_3$ to the resulting ketene moiety (see scheme).

Behind the scenes: NMR spectroscopy was used to distinguish hydrogen bonding and ion pairing in the activation of imines by a phosphate catalyst (see structures). Hydrogen-bond strength and the amount of the hydrogen-bonded species present are decisive for the catalytic reaction and can be manipulated by introducing substituents with different electronic properties. This insight should guide the development of more efficient catalytic systems.

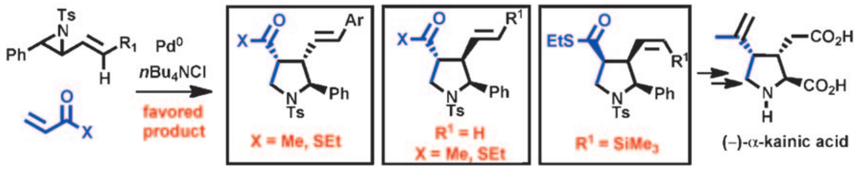


Contents

Annulation Reactions

M. A. Lowe, M. Ostovar, S. Ferrini, C. C. Chen, P. G. Lawrence, F. Fontana, A. A. Calabrese, V. K. Aggarwal* ____________ **6370 – 6374**

Palladium-Mediated Annulation of Vinyl Aziridines with Michael Acceptors: Stereocontrolled Synthesis of Substituted Pyrrolidines and Its Application in a Formal Synthesis of (−)-α-Kainic Acid

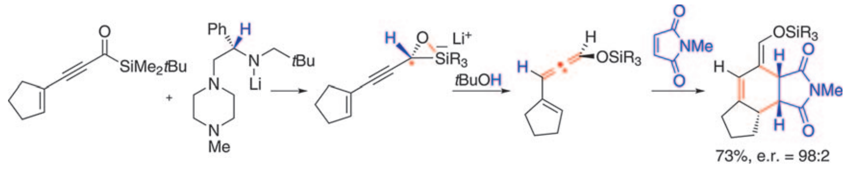


Just add salt: Vinyl aziridines have been treated with methyl vinyl ketone or ethyl thioacrylate in the presence of Pd^0 to give pyrrolidines with moderate to good diastereoselectivity. The presence of nBu$_4$NCl was critical to successful annulation. The synthetic utility of the methodology has been demonstrated in a short (formal) synthesis of (−)-α-kainic acid.

Siloxyallenes

M. Sasaki, Y. Kondo, M. Kawahata, K. Yamaguchi, K. Takeda* __ **6375 – 6378**

Enantioselective Synthesis of Siloxyallenes from Alkynoylsilanes by Reduction and a Brook Rearrangement and Their Subsequent Trapping in a [4+2] Cycloaddition



Two flavors of selectivity: An enantioselective Meerwein–Ponndorf–Verley-type reduction of alkynoylsilanes by a chiral lithium amide followed by a Brook rearrangement and S$_E$2′ electrophilic substitution provides the title compounds in a one-pot process. In the case of enynoylsilanes, the generated vinylallenes undergo in situ [4+2] cycloaddition to afford highly functionalized polycyclic compounds with unusual facial selectivity.

C–H Bond Activation

L. Ackermann,* A. V. Lygin, N. Hofmann ____________ **6379 – 6382**

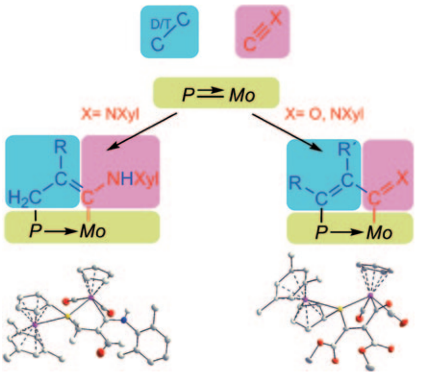
Ruthenium-Catalyzed Oxidative Annulation by Cleavage of C–H/N–H Bonds

Bond activation in action: Unprecedented ruthenium-catalyzed oxidative annulations of alkynes through cleavage of C–H bonds set the stage for an efficient 1(2H)-isoquinolone synthesis with ample scope (see scheme; tAm = *tert*-amyl). Mechanistic studies provided strong evidence for a rate-limiting C–H bond metalation through carboxylate assistance.

Phosphinidenes

M. A. Alvarez, M. E. García,* M. A. Ruiz,* J. Suárez ____________ **6383 – 6387**

Enhanced Nucleophilic Behavior of a Dimolybdenum Phosphinidene Complex: Multicomponent Reactions with Activated Alkenes and Alkynes in the Presence of CO or CNXyl

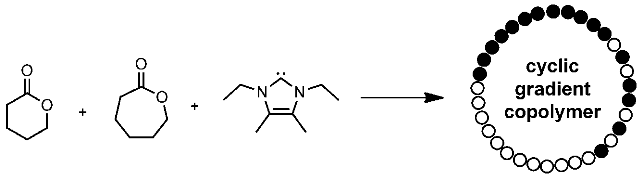


A ligand makes a difference: The reactivity of a dimolybdenum phosphinidene complex with alkenes and alkynes is substantially modified by the presence of two-electron donors such as CO or CNXyl (Xyl = xylyl). Under these multicomponent reaction conditions, rapid formation of phosphametallacyclopentene rings takes place at room temperature. These reactions proceed in all cases with very high chemo- and regioselectivity.

Gradient Polymers

E. J. Shin, H. A. Brown, S. Gonzalez,
W. Jeong, J. L. Hedrick,
R. M. Waymouth* ________ **6388 – 6391**

Zwitterionic Copolymerization: Synthesis of Cyclic Gradient Copolymers

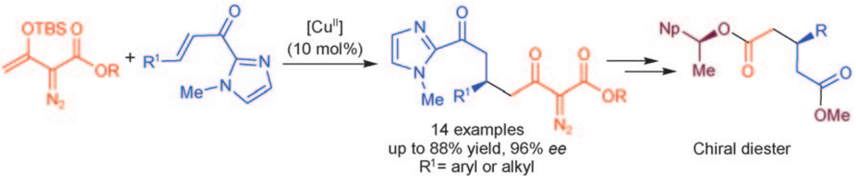


How to get rich fast: The zwitterionic copolymerization of δ-valerolactone (VL) and ε-caprolactone (CL) provides an expedient route to cyclic gradient copolymers. The faster ring-opening of VL relative to CL with N-heterocyclic carbenes, coupled with sufficiently long lifetimes of the growing zwitterions leads to a polymer structure comprised of VL-rich sequences that transition to CL-rich sequences in a cyclic macromolecule (see scheme).

Asymmetric Catalysis

X. Xu, W. Hu, M. P. Doyle* _ **6392 – 6395**

Highly Enantioselective Catalytic Synthesis of Functionalized Chiral Diazoacetoacetates



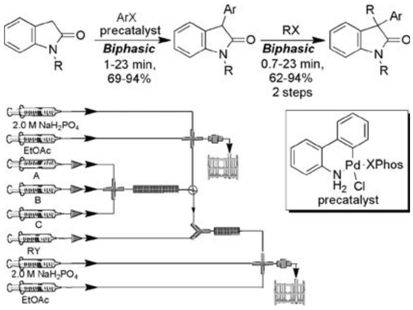
In addition: The Mukaiyama–Michael addition in the presence of a chiral copper(II) Lewis acid is a highly enantioselective and efficient method for the construction of a broad range of chiral γ-functionalized diazoacetoacetates. These products can be conveniently transformed into useful enantiomer-enriched 1,5-diesters (see scheme, Np = 1-naphthyl, TBS = *tert*-butyldimethylsilyl).

Continuous Synthesis

P. Li, S. L. Buchwald* _____ **6396 – 6400**

Continuous-Flow Synthesis of 3,3-Disubstituted Oxindoles by a Palladium-Catalyzed α-Arylation/Alkylation Sequence

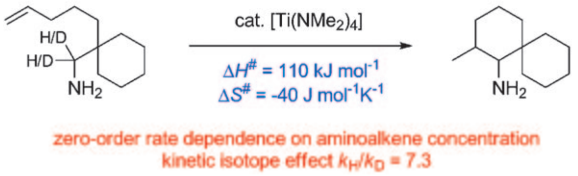
Facilitating chemistry: Key to the success of Pd-catalyzed α-arylation of oxindoles in continuous flow involved a biphasic system, a precatalyst, and a packed-bed microreactor. Furthermore, this reaction was integrated into a two-step continuous-flow sequence for rapid, modular, and efficient syntheses of 3,3-disubstituted oxindoles.



C–H Activation

I. Prochnow, P. Zark, T. Müller,*
S. Doye* ____________ **6401 – 6405**

The Mechanism of the Titanium-Catalyzed Hydroaminoalkylation of Alkenes

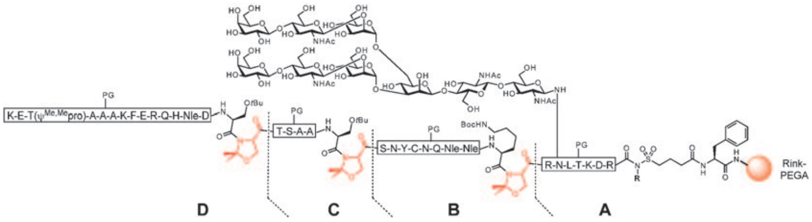


Kinetic studies on the intramolecular titanium-catalyzed hydroaminoalkylation of alkenes (see scheme) are consistent with theoretical results and lead to the conclusion that the rate-determining step of the catalytic cycle is the C–H activation at the α position to the nitrogen atom. The reaction has a high activation energy and involves a moderately ordered transition state.

Peptide Synthesis

C. Heinlein, D. Varón Silva, A. Tröster,
J. Schmidt, A. Gross,
C. Unverzagt* ______ **6406 – 6410**

Fragment Condensation of C-Terminal Pseudoproline Peptides without Racemization on the Solid Phase



Hot couplings without racemization: Protected peptides featuring C-terminal pseudoprolines were synthesized on a solid support, and these versatile building blocks were used in convergent peptide-segment couplings, which proceeded without racemization even under microwave conditions. The solubility-enhancing effect of pseudoproline residues facilitated the synthesis of complex RNase 39-mer glycopeptide thioesters.

Hydrogen Storage

A. Boddien, F. Gärtner, C. Federsel,
P. Sponholz, D. Mellmann, R. Jackstell,
H. Junge, M. Beller* ______ **6411 – 6414**

CO_2-"Neutral" Hydrogen Storage Based on Bicarbonates and Formates

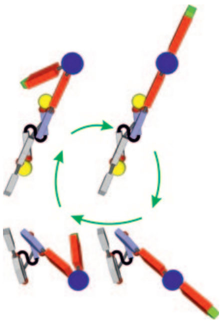
Let the circle be unbroken! One ruthenium catalyst generated in situ facilitates the selective hydrogenation of bicarbonates and carbonates, as well as CO_2 and base, to give formates and also the selective dehydrogenation of formates back to bicarbonates. The two reactions can be coupled, leading to a reversible hydrogen-storage system. dppm = 1,2-bis(diphenylphosphino)methane.

Molecular Motor

G. Haberhauer* ______ **6415 – 6418**

A Molecular Four-Stroke Motor

Round and round it goes: In the molecular four-stroke motor the forward and backward moving of the pushing blade of the motor is combined with the closing and opening of the blade in such a way that there is a net rotation about a virtual axis (see scheme). Thus, during one cycle, surrounding molecules should automatically be transported in a definite direction.



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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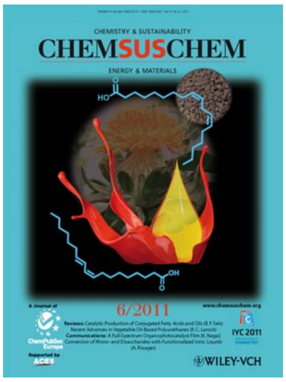

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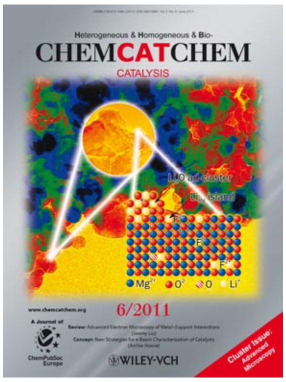

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