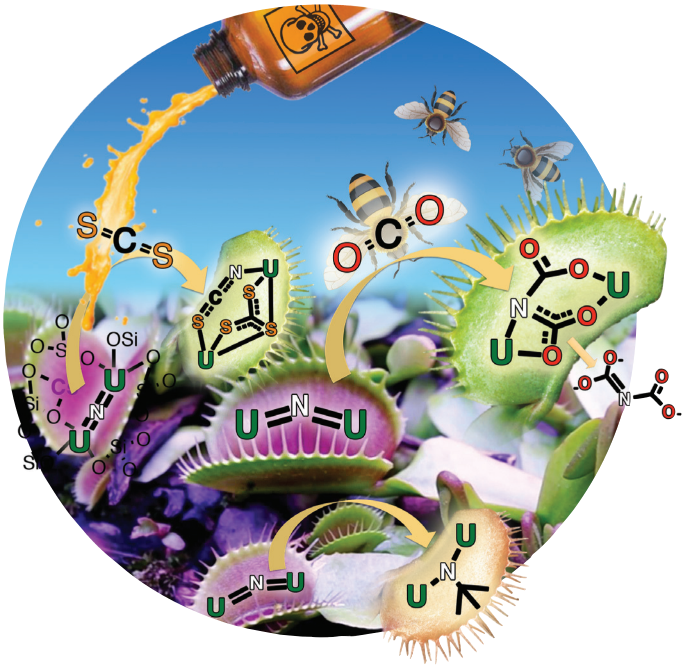
The Venus flytrap ...



... is used to illustrate the importance of a framework built from siloxide ligands and a Cs^+ ion in capturing abundant CO_2 and toxic CS_2 under ambient conditions and in promoting their reactions with a bridging nitride in a diuranium(IV) complex. In their Communication on page 4074 ff., M. Mazzanti et al. show how these processes lead to N–C bond formation and afford cyanate, thiocyanate, and unprecedented dicarbamate products.

How to contact us:

Editorial Office:
E-mail: angewandte@wiley-vch.de
Fax: (+49) 6201–606-331
Telephone: (+49) 6201–606-315

Reprints, E-Prints, Posters, Calendars:
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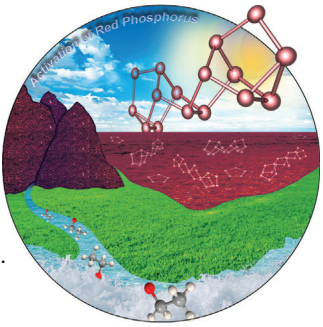
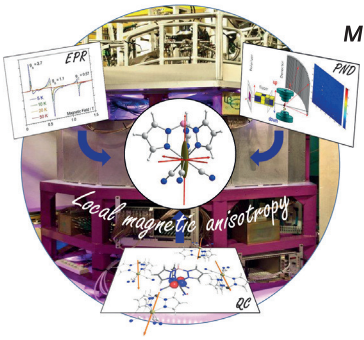
Red Phosphorus



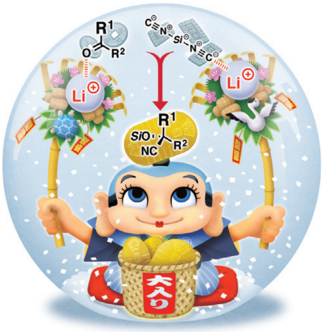
M. Shatruk, D. T. McQuade et al. describe the activation of red phosphorus by nucleophilic attack of KOEt to produce soluble polyphosphide species in their Communication on page 3904 ff. The reaction was scaled up by using a flow-chemistry approach. Picture designed by Kateryna Zavadska.

Magnetic Materials



In their Communication on page 3963 ff., B. Gillon, B. Le Guennic, R. Lescouëzec et al. report the low-temperature magnetic susceptibility tensor of an anisotropic low-spin iron(III) complex determined by polarized neutron diffraction.

Enantioselective Cyanosilylation



An acid–base cooperative catalytic system which activates both the ketone and lithium dicyanotrimethylsilicate is described by K. Ishihara and co-workers in their Communication on page 4021 ff.

Editorial

"... The key discoveries on which many commercial products are ultimately based are often the result of fundamental research performed with no (commercial) end-use even contemplated. It is remarkable that the idea of supporting truly fundamental research is under assault to varying degrees worldwide. Humankind will benefit from an environment where the emergence of completely new ideas is encouraged ..."
Read more in the Editorial by Ian Manners

Service

Author Profile

"My not-so-secret passion is stereochemistry. If I were not a scientist, I would be an astronaut ..."
This and more about Oliver Trapp can be found on page 3854.

News


A. Andrieu-Brunsen


I. Siewert


T. Magauer


F. R. Fischer


D. Jahn


A. Fürstner


B. List

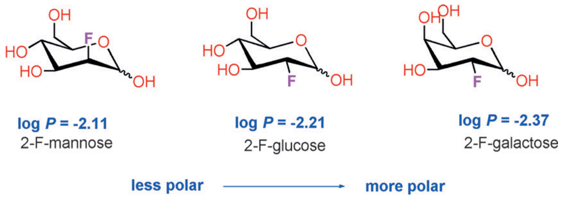

M. Pietsch


M. T. Reetz


M. Schnell

Highlights

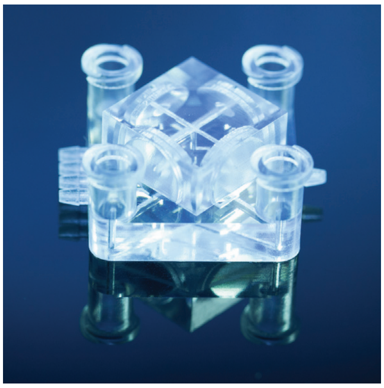
Fluorocarbons



Polar exploration: Recently, Linclau and co-workers disclosed a straightforward ^{19}F-NMR method for determining the log *P* values of fluorocarbons. The method is particularly useful for most polar compounds and provides a quantitative way to rationalize the more subtle stereoelectronic consequences of fluorine introduction.

Reviews

3D Printing



3D printing techniques are ideally suited to the fabrication of microfluidic devices. As structures are created by adding materials without the need for etching or dissolution, processing is environmentally friendly and economically efficient. It is expected that in the next few years, 3D printing will replace molding techniques for the fabrication of microfluidic devices.

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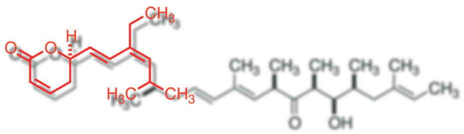
Drug Discovery

E. A. Crane, K. Gademann* **3882 – 3902**

Capturing Biological Activity in Natural Product Fragments by Chemical Synthesis



Less is more: The desired biological activity of structurally complex natural products can be captured in small, truncated fragments. This process is enabled by chemical synthesis, which guides the discovery process and allows the secrets enshrined in natural products to be unlocked.

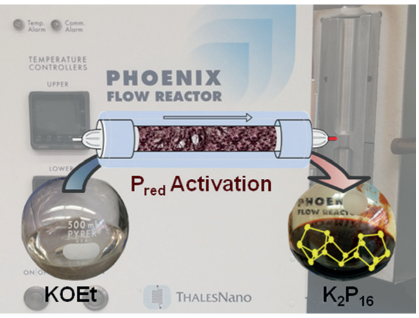
Communications

Red Phosphorus

A. Dragulescu-Andrasi, L. Z. Miller, B. Chen, D. T. McQuade,* M. Shatruk* **3904 – 3908**

Facile Conversion of Red Phosphorus into Soluble Polyphosphide Anions by Reaction with Potassium Ethoxide

Frontispiece

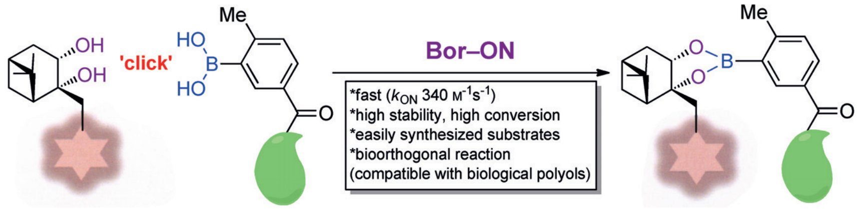


Let's get active! The reaction between red phosphorus (P_{red}) and potassium ethoxide (KOEt) in various organic solvents yields soluble polyphosphide anions. This simple method for the activation of P_{red} avoids the use of strong reducing agents such as alkali metals. The reaction was adapted to a packed-bed flow reactor to afford continuous, multigram synthesis of soluble polyphosphides.

Bioconjugation

B. Akgun, D. G. Hall* **3909 – 3913**

Fast and Tight Boronate Formation for Click Bioorthogonal Conjugation

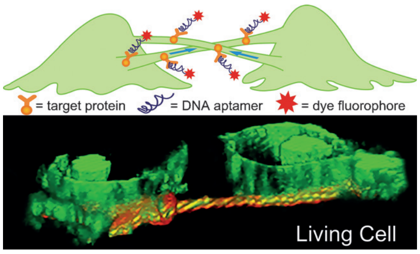


A click bioorthogonal reaction system was devised for the fast ligation of conjugatable derivatives of a rigid cyclic diol (nopoldiol) with an optimal boronic acid partner, 2-methyl-5-carboxymethylphenylboronic acid. The resulting boronates form reversibly within minutes at low concentrations in water. Efficient protein conjugation under physiological conditions was demonstrated with model proteins thioredoxin and albumin.

Aptamer Probes

N. Zhang, T. Bing, L. Shen, R. Song, L. Wang, X. Liu, M. Liu, J. Li, W. Tan,* D. Shangguan* **3914 – 3918**

Intercellular Connections Related to Cell–Cell Crosstalk Specifically Recognized by an Aptamer



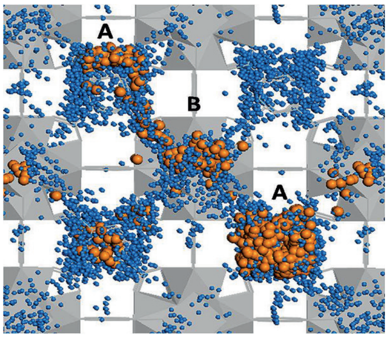
Unusual connections: Aptamer M17A2 generated by cell-SELEX specifically recognizes intercellular connections related to cell-cell crosstalk. These connections are homologous with tunneling nanotubes. Proteins were found to be transported through M17A2-binding connections.

Metal–Organic Frameworks

D. D. Borges, S. Devautour-Vinot,*
H. Jobic,* J. Ollivier, F. Nouar, R. Semino,
T. Devic, C. Serre, F. Paesani,*
G. Maurin ______ 3919 – 3924

Proton Transport in a Highly Conductive Porous Zirconium-Based Metal–Organic Framework: Molecular Insight

Proton conductivity: The superprotonic behavior of the water-stable UiO-66(Zr)-$(CO_2H)_2$ metal–organic framework (MOF) was examined at the molecular level by combining quasi-elastic neutron scattering measurements and aMS-EVB3 molecular dynamics simulations. The proton transport is shown to be assisted by the formation of a hydrogen-bonded network of water molecules that spans from the tetrahedral to the octahedral cages of this MOF.

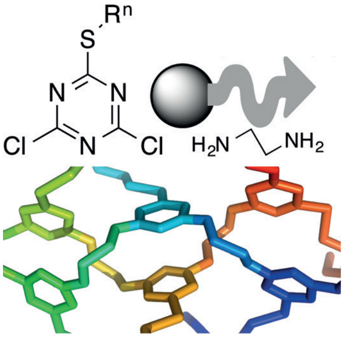


Sequence-Defined Polymers

J. W. Grate,* K.-F. Mo,
M. D. Daily ______ 3925 – 3930

Triazine-Based Sequence-Defined Polymers with Side-Chain Diversity and Backbone–Backbone Interaction Motifs

Inside Cover

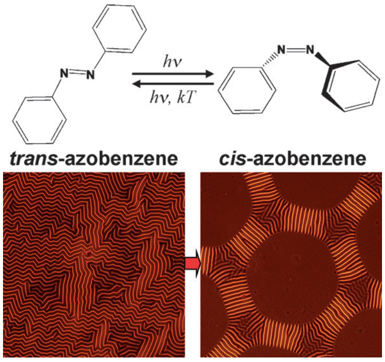


The sequence of monomers in macromolecules leads to diverse structures and functions. Nucleophilic aromatic substitution reactions of cyanuric chloride, using a submonomer solid-phase synthesis, have been harnessed to develop a new architecture for sequence-defined polymers with side-chain diversity and non-covalent backbone–backbone interactions.

Azopolymers

C. Zong, Y. Zhao, H. Ji, X. Han, J. Xie,
J. Wang, Y. Cao,* S. Jiang,*
C. Lu* ______ 3931 – 3935

Tuning and Erasing Surface Wrinkles by Reversible Visible-Light-Induced Photoisomerization



Surface wrinkles on azopolymer films can be optically erased by visible-light irradiation. The rapid reversible photoisomerization of the azobenzene units generates a significant local nanoscale force throughout the film, which leads to stress release and erasure of the wrinkles. Highly ordered wrinkling patterns with well-defined microstructures were fabricated by selective light exposure.

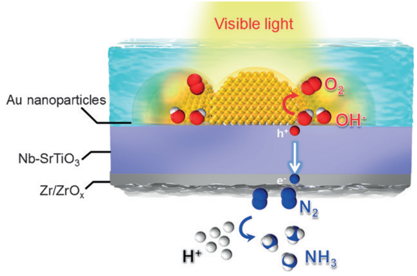
Graphene Materials

X. H. Song, Y. Y. Chen, M. C. Rong,
Z. X. Xie, T. T. Zhao, Y. R. Wang, X. Chen,*
O. S. Wolfbeis ______ 3936 – 3941

A Phytic Acid Induced Super-Amphiphilic Multifunctional 3D Graphene-Based Foam

A super-amphiphilic 3D graphene-based foam was prepared through a single-step approach using phytic acid, which acts as both a gelator and a dopant. The product shows 0° contact angle for both oil and water. The graphene foam was impregnated with a catalyst for epoxidation of alkenes and then showed very high catalytic efficiency even in the absence of a co-solvent and without need for stirring.

NH_3 sees the light of day: A highly selective and visible-light-responsive plasmonic NH_3 synthesis device containing a Au nanostructure and a Zr/ZrO_x thin film was developed. N_2 gas was reduced to NH_3 by using water as an electron donor through plasmon-induced charge separation under visible light irradiation.



Nitrogen Photofixation

T. Oshikiri, K. Ueno,
H. Misawa* ———— **3942 – 3946**

Selective Dinitrogen Conversion to Ammonia Using Water and Visible Light through Plasmon-induced Charge Separation

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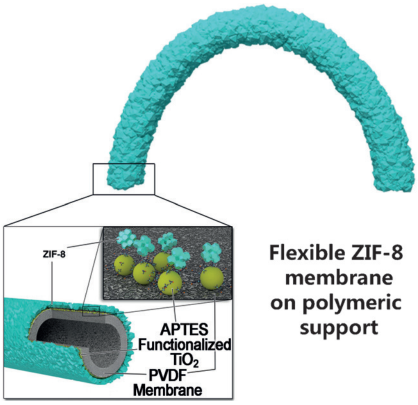

Molecular sieving behavior, with a high hydrogen permeance and a H_2/CO_2 selectivity of 7:1, is shown by ultrathin, continuous zeolitic imidazolate framework (ZIF-8) membranes prepared on polymeric supports. The ZIF-8 layer is flexible and adhered well to the support. This approach offers significant opportunities to exploit the unique properties of metal–organic frameworks in the fabrication of separation and sensing devices.

Molecular Sieving Membranes

J. Hou, P. D. Sutrisna, Y. Zhang,
V. Chen* ———— **3947 – 3951**

Formation of Ultrathin, Continuous Metal–Organic Framework Membranes on Flexible Polymer Substrates

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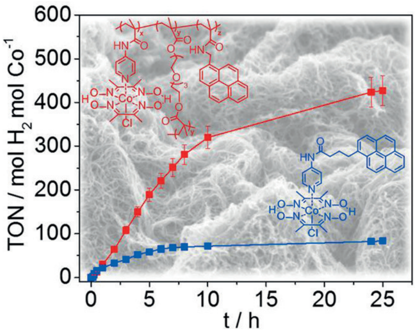

Giving it some gas: Hybrid carbon-nanotube-based electrodes can be constructed in a straightforward manner by the integration of a cobaloxime-containing copolymeric structure into a multiwall carbon nanotube matrix. The use of the cobaloxime-containing copolymer led to a significant improvement in the electrocatalytic hydrogen-evolution performance compared to the use of a monomeric cobaloxime (see figure).

H_2 Evolution

B. Reuillard, J. Warnan, J. J. Leung,
D. W. Wakerley, E. Reisner* **3952 – 3957**

A Poly(cobaloxime)/Carbon Nanotube Electrode: Freestanding Buckypaper with Polymer-Enhanced H_2-Evolution Performance

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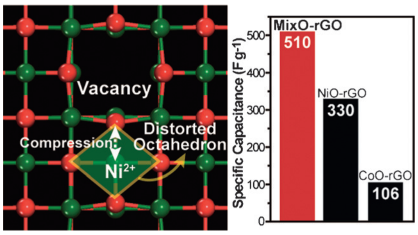


In full swing: A synergistic effect of transition-metal mixing led to anomalously high pseudocapacitance of a multicomponent transition-metal oxide, MixO-rGO, containing nickel, cobalt, and manganese cations. The high pseudocapacitance results from local distortions of the oxygen framework, which facilitate the redox swing of the key transition metal (see picture).

Energy Storage

H. J. Lee, J. H. Lee, S.-Y. Chung,*
J. W. Choi* ———— **3958 – 3962**

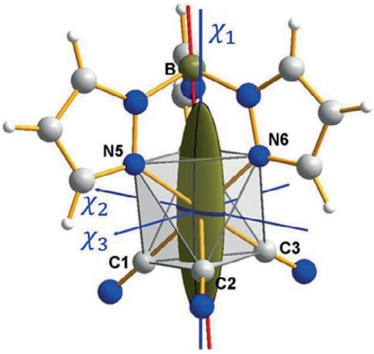
Enhanced Pseudocapacitance in Multicomponent Transition-Metal Oxides by Local Distortion of Oxygen Octahedra

Magnetic Materials

K. Ridier, A. Mondal, C. Boilleau, O. Cador, B. Gillon,* G. Chaboussant, B. Le Guennic,* K. Costuas, R. Lescouëzec* ______ 3963 – 3967

Polarized Neutron Diffraction to Probe Local Magnetic Anisotropy of a Low-Spin Fe(III) Complex

Inside Back Cover

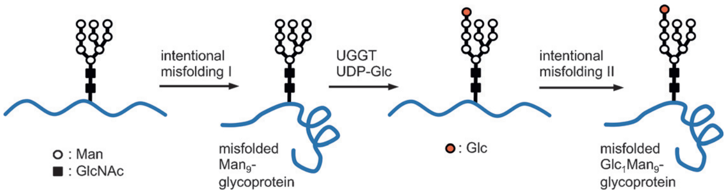


Molecular Magnetism: The low-temperature molecular magnetic susceptibility tensor of the anisotropic low-spin [Fe^{III}(Tp)(CN)$_3$]$^-$ complex (Tp = tris(pyrazolyl)borate; see picture) was determined by polarized neutron diffraction (PND). PND provided a unique, direct, and straightforward picture of the magnetic anisotropy and susceptibility tensors.

Protein Folding

M. Izumi, Y. Oka, R. Okamoto, A. Seko, Y. Takeda, Y. Ito,* Y. Kajihara* ______ 3968 – 3971

Synthesis of Glc$_1$Man$_9$-Glycoprotein Probes by a Misfolding/Enzymatic Glucosylation/Misfolding Sequence

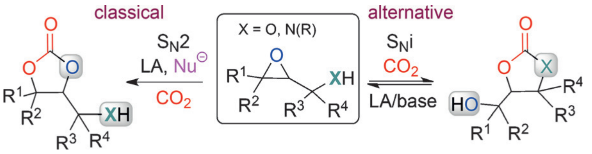


Go native: Native and misfolded Glc$_1$Man$_9$-glycoprotein probes were synthesized by using the title sequence. These probes were used to analyze the substrate preference of glucosidase II and the binding of misfolded glycoproteins to the lectin chaperone calreticulin, both of which are involved in the glycoprotein quality control system. Calreticulin was found to bind preferentially to a hydrophobic non-native glycoprotein whereas glucosidase II activity was not affected by glycoprotein conformation.

CO$_2$ Fixation

J. Rintjema, R. Epping, G. Fiorani, E. Martín, E. C. Escudero-Adán, A. W. Kleij* ______ 3972 – 3976

Substrate-Controlled Product Divergence: Conversion of CO$_2$ into Heterocyclic Products

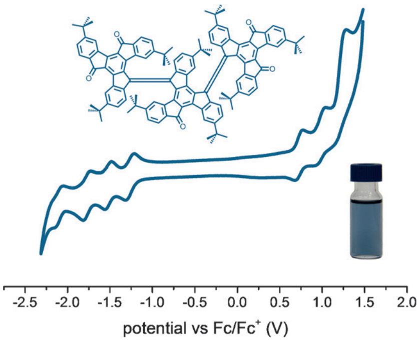


Two ways: A novel substrate-driven and divergent approach leads to a variety of heterocyclic products from a single epoxy alcohol/amine substrate. The different reactions paths are controlled by the reaction conditions. A new mechanism is proposed wherein the substrate activates the CO$_2$ molecule, thus leading to an intramolecular process and giving rise to formation of an alternative product. LA = Lewis acid.

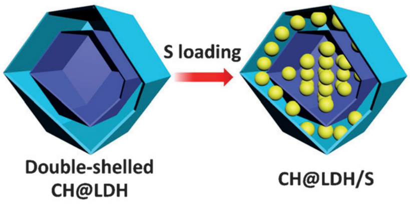
Extended π Systems

G. Zhang, V. Lami, F. Rominger, Y. Vaynzof, M. Mastalerz* __ 3977 – 3981

Rigid Conjugated Twisted Truxene Dimers and Trimers as Electron Acceptors



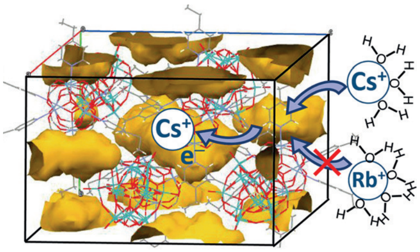
Twisted: Rigid truxenone oligomers with an extended π backbone (see example structure) were synthesized by oxidative dimerization reactions. The resulting extended conjugated systems, which dissolve well in common organic solvents, have large extinction coefficients and low-lying LUMO levels. Their suitability as electron acceptors for organic electronics has been demonstrated in bulk-heterojunction organic solar cells.



Nanocages with two shells of cobalt hydroxide and layered double hydroxides (CH@LDH) have been synthesized as a sulfur host for lithium–sulfur batteries. The hollow CH@LDH polyhedra with their complex shell structures were not only used for encapsulating a high content of sulfur, but they also provided functionalized surfaces for chemically bonding of polysulfides.

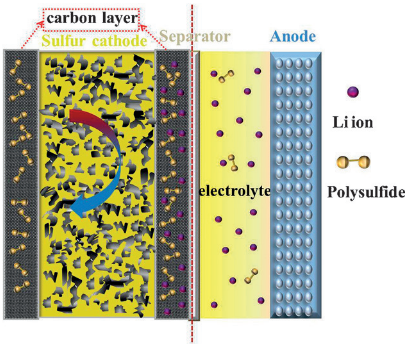
Lithium–Sulfur Batteries

Highly selective uptake of Cs$^+$ by an ionic crystal based on silicododecamolybdate is reported. Up to 3.8 mol(Cs$^+$) per mole of solid by cation-exchange and reduction of silicododecamolybdate. Other alkali-metal and alkaline-earth-metal cations were almost completely excluded (<0.2 mol mol(solid)$^{-1}$).

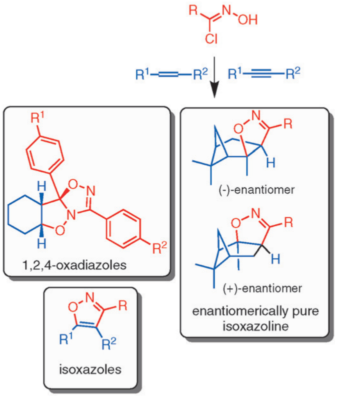


Ion-Selective Uptake

An integrated flexible sulfur cathode consisting of a carbon/sulfur/carbon sandwich structure coated on a polypropylene separator was prepared by the doctor-blade method. This sulfur cathode could enhance the electronic conductivity, toleration of volume expansion, and control of the polysulfide diffusion, thereby improving the electrochemical performance of lithium–sulfur batteries.



Electrochemistry

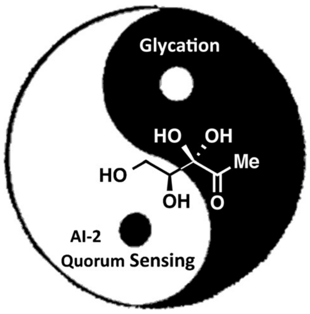


Water changes things: In water, nitrile oxides can be generated from oxime halides without using catalysts. Unexpectedly, the nitrile oxide generation proceeds under mild acidic conditions. The catalyst-free cycloaddition of the formed nitrile oxides with certain alkenes in water had excellent stereoselectivity, and it was applied to the synthesis of isoxazoles, novel oxadiazoles, and enantiomerically pure isoxazolines.

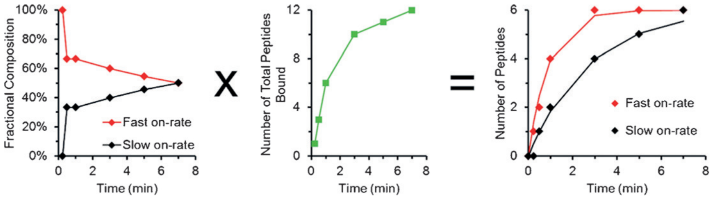
Heterocycles

Protein Modifications

Yin and yang: The quorum-sensing signaling molecule (4*S*)-4,5-dihydroxy-2,3-pentanedione assumes a yet unrecognized biochemical role and is capable of glycating DNA and proteins in a rapid and stereospecific manner. These results open new avenues toward tracking and understanding the fate and function of the elusive quorum-sensing signaling molecule.



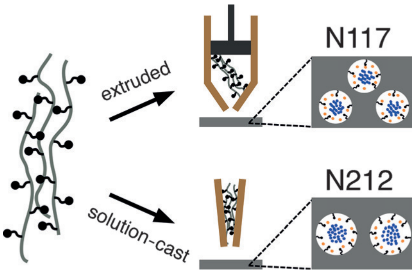
Affinity Measurements



The kinetic on- and off-rates of over 20000 individual ligands for their target protein were determined without the need to synthesize each individual ligand separately. Reproducible and accurate results were obtained by combining mRNA display and high-throughput DNA sequencing.

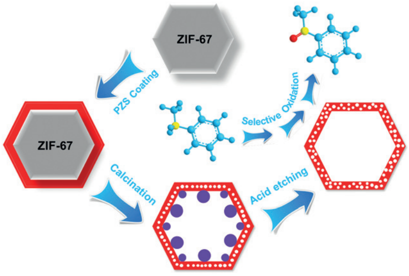
Water and Proton Transport

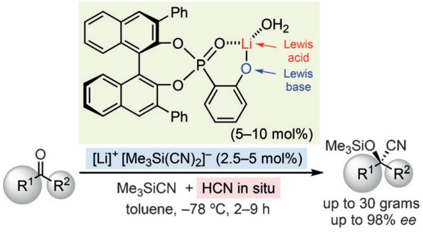
Casting is important: Differently cast Nafion membranes of identical chemical composition exhibit distinct nanoscale chemical constitutions of the water channels. The observed disproportional increase of undercoordinated water molecules in membranes with smaller channel diameters correlates with improved macroscopic water and proton transport properties under the same conditions.



Heterogeneous Catalysis

Highly efficient and selective: A synthetic route was developed to produce nitrogen, phosphorus, and sulfur co-doped hollow carbon shells which were used as a metal-free carbocatalyst. The carbocatalyst had a high surface area and showed superior activity in the selective oxidation of aromatic alkanes in aqueous solution.

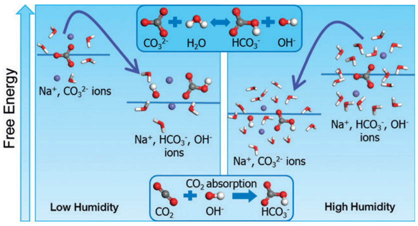




Joint effort: A highly enantioselective cyanosilylation of ketones was developed by using a chiral lithium phosphoryl phenoxide aqua complex as an acid/base cooperative catalyst. The pentacoordinate silicate generated in situ from Me_3SiCN/LiCN acts as a reactive cyano reagent. Moreover, a 30 gram scale reaction and the synthesis of the key precursor to (+)-13-hydroxyisocyclocelabenzine are described.

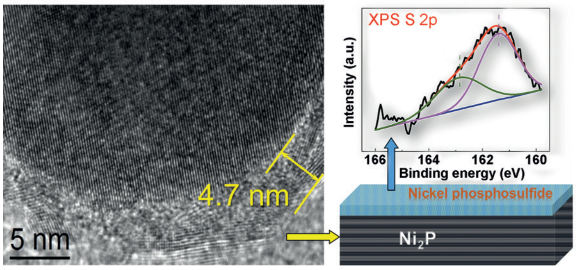
Homogeneous Catalysis

Back Cover



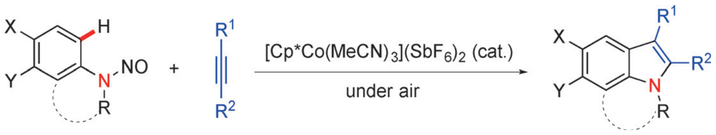
The presence of water confined in nanoscopic pores was shown to control the equilibrium between CO_2 and bicarbonate on adsorbent surfaces. This control allowed for facile sequestration of CO_2 from the air, and may influence the design of other adsorbent materials.

CO_2 Capture



Sulfur icing on the cake: Ni_2P, which is highly active in hydrodesulfurization and selective hydrogenation reactions, was obtained by reduction of $Ni_2P_2S_6$ at temperatures as low as 200–220 °C. A distinct sulfur-containing layer (see picture: blue) was observed at the surface of the Ni_2P catalyst, which is a direct observation of the so-called nickel phosphosulfide phase.

Hydrocarbon Processing



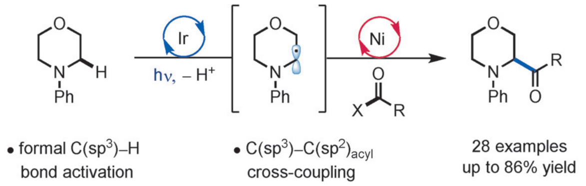
Cp* and Co.: The unique regioselectivity and reactivity of cobalt(III) in the direct cyclization of N-nitrosoanilines with alkynes for the expedient synthesis of a variety of N-substituted indoles is demonstrated. In the presence of a cobalt(III) catalyst, high regioselectivity was observed when using unsymmetrical *meta*-substituted N-nitrosoanilines. $Cp^* = C_5Me_5$.

C–H Activation

Cross-Coupling

C. L. Joe, A. G. Doyle* ______ **4040–4043**

Direct Acylation of C(sp^3)–H Bonds Enabled by Nickel and Photoredox Catalysis

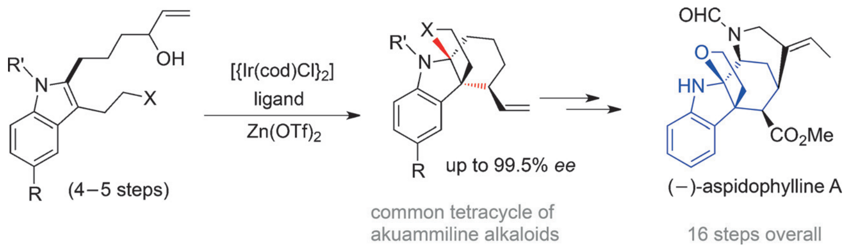


Teamwork: The direct functionalization of C(sp^3)–H bonds of *N*-aryl amines by acyl electrophiles is achieved, thus affording a diverse range of α-amino ketones at room temperature. C(sp^3)–H activation occurs by photoredox-mediated oxidation to generate α-amino radicals which are intercepted by nickel in catalytic C(sp^3)–C coupling.

Natural Product Synthesis

S.-Z. Jiang, X.-Y. Zeng, X. Liang, T. Lei, K. Wei, Y.-R. Yang* ______ **4044–4048**

Iridium-Catalyzed Enantioselective Indole Cyclization: Application to the Total Synthesis and Absolute Stereochemical Assignment of (–)-Aspidophylline A



The enantioselective total synthesis of (–)-aspidophylline A, including assignment of its absolute configuration has been accomplished. A key element of the synthesis is a highly enantioselective indole allylic alkylation/iminium cyclization cascade which was developed by employing a combination of Lewis acid activation and an iridium/ligand catalyst. cod = 1,5-cyclooctadiene, Tf = trifluoromethanesulfonyl.

Biological Inhibitors

S. Krautwald, C. Nilewski, M. Mori, K. Shiomi,* S. Ōmura,* E. M. Carreira* ______ **4049–4053**

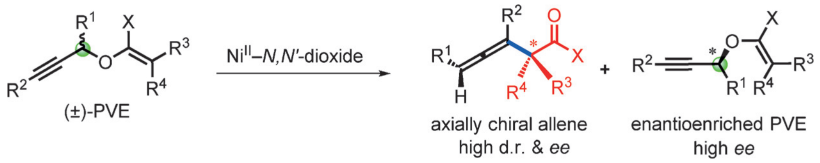
Bioisosteric Exchange of C_{sp^3}-Chloro and Methyl Substituents: Synthesis and Initial Biological Studies of Atpenin A5 Analogues

Changing places: Asymmetric synthesis and initial biological studies of two analogues of the complex II inhibitor atpenin A5 are reported. Bioisosteric exchange of C_{sp^3}-chloro and methyl substituents resulted in analogues with essentially identical biological activity as inhibitors of complex II.

Chirality Transfer

Y. B. Liu, X. H. Liu,* H. P. Hu, J. Guo, Y. Xia, L. L. Lin, X. M. Feng* **4054–4058**

Synergistic Kinetic Resolution and Asymmetric Propargyl Claisen Rearrangement for the Synthesis of Chiral Allenes

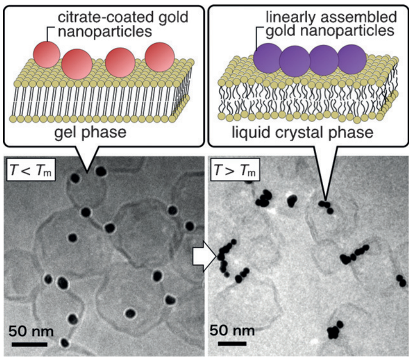


Selective about neighbors: A chiral nickel(II)–*N*,*N*′-dioxide complex catalyzed the highly efficient kinetic resolution and rearrangement of racemic propargyl vinyl ethers (PVEs) to afford a chiral allene along with the enantiomerically enriched substrate (see scheme). The complete chirality transfer and facially selective rearrangement enabled the simultaneous construction of an axially chiral allenic unit and a neighboring quaternary stereocenter.

Liposome Functionalization

K. Sugikawa,* T. Kadota, K. Yasuhara, A. Ikeda* ———— **4059–4063**

Anisotropic Self-Assembly of Citrate-Coated Gold Nanoparticles on Fluidic Liposomes

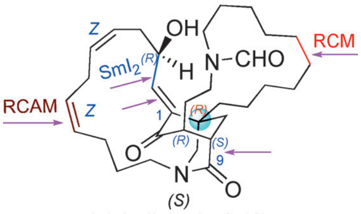


Burnt orange peel: Citrate-coated gold nanoparticles self-assembled into an anisotropic structure on lipid membranes by heating above the transition temperature of the lipid bilayer. The critical temperature for self-assembly was determined by lipid components.

Total Synthesis

L.-D. Guo, X.-Z. Huang, S.-P. Luo, W.-S. Cao, Y.-P. Ruan, J.-L. Ye, P.-Q. Huang* ———— **4064–4068**

Organocatalytic, Asymmetric Total Synthesis of (−)-Haliclonin A



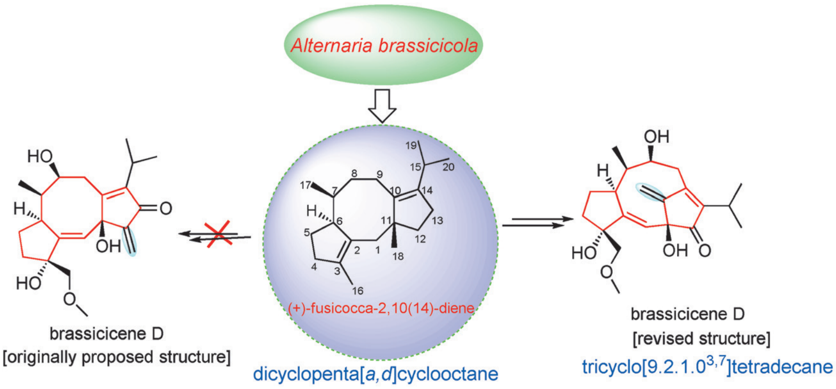
(−)-haliclonin A (**1**)

A natural product from the bench: Key steps in the first total synthesis of (−)-haliclonin A include an organocatalytic asymmetric conjugate addition of nitromethane with 3-substituted cyclohexenone, Pd-promoted cyclization, SmI_2-mediated intermolecular reductive coupling of enone with aldehyde, metathesis reactions (RCM and RCAM) to build the macrocyclic ring systems, and a direct oxidation of enol to enone.

Natural Products

Y. Tang, Y. Xue, G. Du, J. Wang, J. Liu, B. Sun, X.-N. Li, G. Yao, Z. Luo, Y. Zhang* ———— **4069–4073**

Structural Revisions of a Class of Natural Products: Scaffolds of Aglycon Analogues of Fusicoccins and Cotylenins Isolated from Fungi



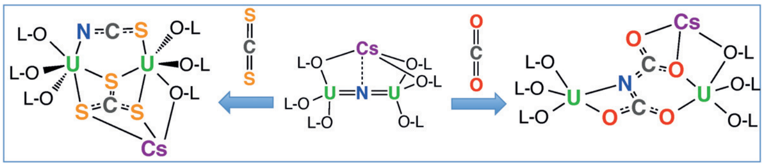
Brass tacks: A class of natural products (NPs) regarding the brassicicene C-type diterpenoids was revised and characterized as the first class of bridgehead double-bond-containing NPs with a bicyclo[6.2.1]undecane carbon skeleton. This study shows the potential of the application of computational prediction methods and biosynthetic logic-based structure elucidation to determining the structure and stability of NPs.

N–C Bond Formation

M. Falcone, L. Chatelain,
M. Mazzanti* ________ 4074–4078

Nucleophilic Reactivity of a Nitride-Bridged Diuranium(IV) Complex: CO_2 and CS_2 Functionalization

Front Cover

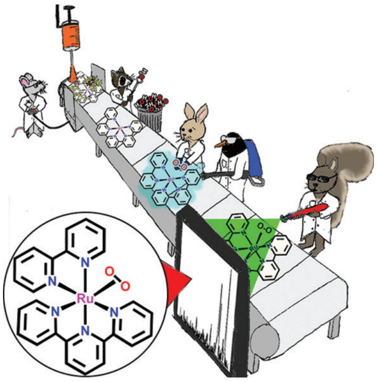


A nitride-bridged diuranium(IV) complex rapidly reacts with CS_2 and CO_2 at room temperature. These transformations afford cyanate and thiocyanate species by N–C bond formation and enable the unprecedented construction of a dicarbamate product (see scheme).

Vibrational Spectroscopy

E. M. Duffy, B. M. Marsh, J. M. Voss,
E. Garand* ________ 4079–4082

Characterization of the Oxygen Binding Motif in a Ruthenium Water Oxidation Catalyst by Vibrational Spectroscopy

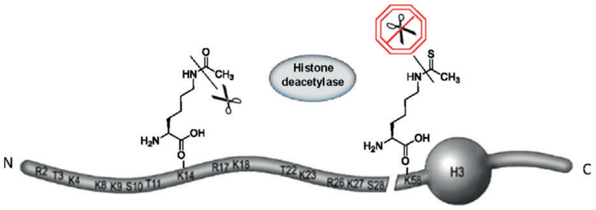


The O_2 binding motif in the $[Ru(tpy)(bpy)(O_2)]^{2+}$ catalytic water oxidation intermediate is determined by using mass spectrometry and cryogenic ion IR predissociation spectroscopy. The O–O stretch, identified through $^{18}O_2$ substitution, points to a singlet side-on bidentate O_2 complex. A comparison of experimental results with those from calculations show that DFT may inaccurately describe the Ru–O_2 interaction.

Post-translational Modifications

H. Xiong, N. M. Reynolds, C. Fan,
M. Englert, D. Hoyer, S. J. Miller,
D. Söll* ________ 4083–4086

Dual Genetic Encoding of Acetyl-lysine and Non-deacetylatable Thioacetyl-lysine Mediated by Flexizyme

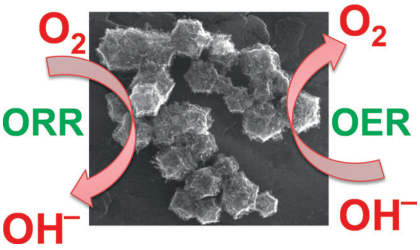


Director's cut: The Flexizyme technique is used to incorporate acetyl-lysine and the non-hydrolyzable thioacetyl-lysine into full-length proteins in vitro and site-specifically into human histone H3, either individually or in pairs. The thioacetyl group of the modified histone H3 could not be removed by the histone deacetylase sirtuin.

Electrocatalysis

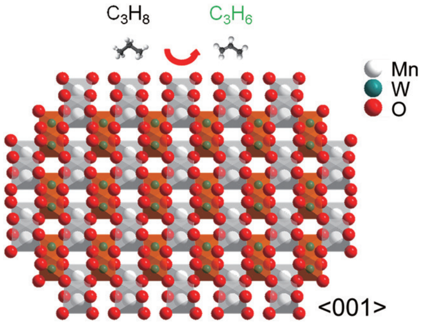
A. Aijaz, J. Masa, C. Rösler, W. Xia,
P. Weide, A. J. R. Botz, R. A. Fischer,*
W. Schuhmann,*
M. Muhler* ________ 4087–4091

$Co@Co_3O_4$ Encapsulated in Carbon Nanotube-Grafted Nitrogen-Doped Carbon Polyhedra as an Advanced Bifunctional Oxygen Electrode



An electrocatalyst consisting of $Co@Co_3O_4$ embedded in carbon nanotube-grafted N-doped carbon polyhedra formed in situ has been fabricated from metal–organic frameworks. The electrocatalyst shows high activity towards water oxidation and oxygen reduction and outperforms Pt-, Ir-, and Ru-based electrocatalysts.

Site isolation of surface manganese oxide species was obtained by the hydrothermal synthesis of nanostructured $MnWO_4$. In contrast to manganese oxide, which is a combustion catalyst, MnO_x chains on the exposed (010) crystal plane of $MnWO_4$ selectively catalyze the oxidative dehydrogenation of propane to propene.



Heterogeneous Catalysis

X. Li, T. Lunkenbein, V. Pfeifer, M. Jastak, P. K. Nielsen, F. Girgsdies, A. Knop-Gericke, F. Rosowski, R. Schlögl, A. Trunschke* —— **4092 – 4096**

Selective Alkane Oxidation by Manganese Oxide: Site Isolation of MnO_x Chains at the Surface of $MnWO_4$ Nanorods

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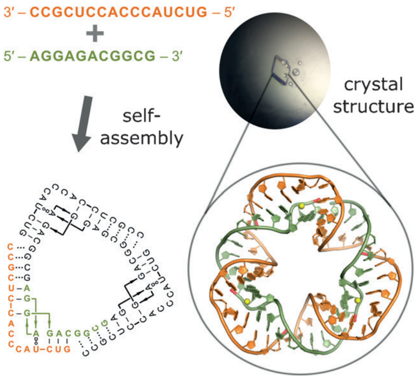
Design and characterization of RNA nanostructures: Two short oligonucleotides self-assemble cooperatively in solution to form the so far smallest circularly closed nanotriangle made entirely of double-stranded RNA. This nanoobject formed crystals, and its structure was determined by X-ray diffraction at 2.6 Å resolution.



RNA Nanostructures

M. A. Boerneke, S. M. Dibrov, T. Hermann* —— **4097 – 4100**

Crystal-Structure-Guided Design of Self-Assembling RNA Nanotriangles

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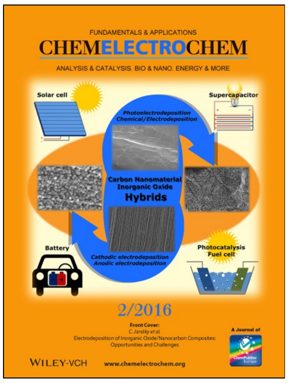
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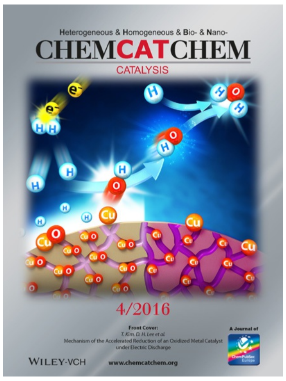
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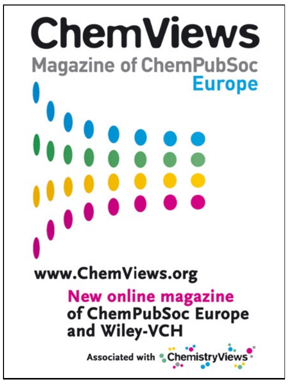
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