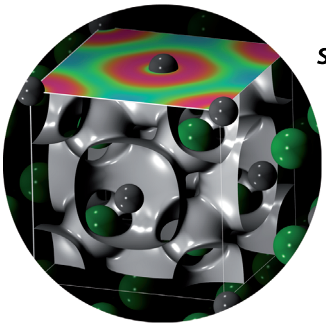
A scientific revolution in the home …

… began 125 years ago. The biologist Friedrich Reinitzer investigated cholesteryl benzoate, which he had extracted from carrots, under the polarizing microscope and observed the characteristic textures of cholesteric (and blue) phases. In their Essay on page 8798 ff., T. Geelhaar et. al. describe the development of liquid crystals from their discovery to their development and application in television screens and computer displays.

Heteroporphyrins

In their Communication on page 8898 ff., L. Latos-Grażyński, E. Pacholska-Dudziak, et al. describe the incorporation of a palladacyclopentadiene into a porphyrinoid frame by the replacement of the Te atom of a 21,23-ditelluraporphyrin by a Pd atom.



Solid-State Compounds

The first synthesis of magnesium carbide (Mg_2C) through the use of high-pressure and high-temperature methods is described by T. A. Strobel and co-workers in their Communication on page 8930 ff.

Bacterial Microfluidics

Hundreds of populations of bacteria were monitored inside microdroplets using the new technology of bacterial microfluidics. In their Communication on page 8908 ff., P. Garstecki et al. study the evolution of antibiotic resistance in real time.

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Editorial


Brady Haran


Martyn Poliakoff

„… We live in exciting times for the development of both chemistry and social media. The challenge is how to couple the excitement in the two fields. As in other areas of chemical activity, we believe that the answer is not to copy what has been done before but to harness the rapid rise of the next social medium …“
Read more in the Editorial by Martyn Poliakoff and Brady Haran.

Service

Author Profile

“My motto is keep on trying.
My favorite time of day is the half-hour after I wake up, but before I get up. …”
This and more about Alexandra M. Z. Slawin can be found on page 8786.

News


K. Müllen


A. Fürstner


L. F. Nazar


M. Scheer


T. C. Schmidt


R. E. Mulvey


B. Rieger


H. L. Anderson

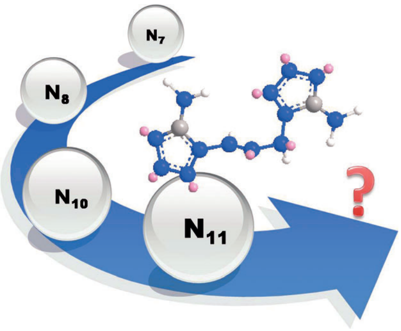

A. Llobet

Books

Highlights

High-Nitrogen Compounds

Aiming high: In the pursuit of new high-nitrogen structures, researchers have synthesized some interesting compounds with highly catenated chains of nitrogen atoms through a strategy of oxidative azo coupling of N–NH_2 moieties. This strategy opens opportunities for developing longer nitrogen chains in the field of high-nitrogen compounds.



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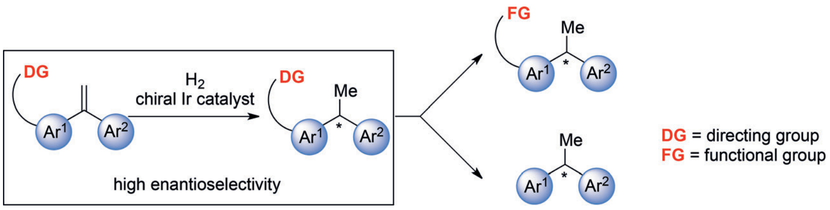
Asymmetric Hydrogenation

T. Besset,* R. Gramage-Doria,
J. N. H. Reek* ——— **8795 – 8797**

Remotely Controlled Iridium-Catalyzed Asymmetric Hydrogenation of Terminal 1,1-Diaryl Alkenes



Working together: The presence of a remote directing group on terminal 1,1-diaryl and 1,1-dialkyl alkenes led to high and unprecedented enantioselectivity in iridium-catalyzed asymmetric hydrogenation (see scheme). This strategy offers efficient synthetic pathways towards valuable enantiomerically enriched 1,1-diaryl and 1,1-dialkyl alkanes. Moreover, the directing group can be further functionalized.

Essays

Liquid Crystals

T. Geelhaar,* K. Griesar,
B. Reckmann ——— **8798 – 8809**

125 Years of Liquid Crystals—A Scientific Revolution in the Home

Front Cover

Patterns of communication: Reinitzer's discovery of liquid crystals in 1888 was followed by 30 years of scholarly dispute. One hundred years later, Pierre-Gilles de Gennes was awarded the Nobel Prize in Physics for his contribution to this scientific revolution. The commercial success of liquid crystals was achieved in display applications. Today more than 4 billion people use them in mobile communication devices. Painting: Detail from Raphael's *School of Athens* fresco.

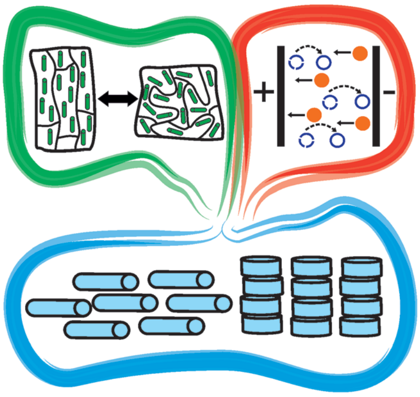
Reviews

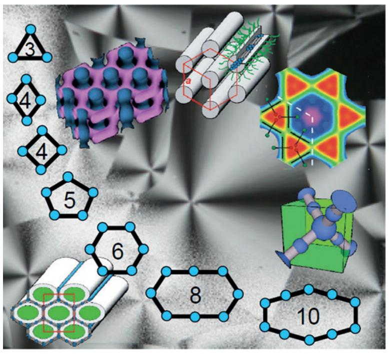
Liquid Crystals

E.-K. Fleischmann,
R. Zentel* ——— **8810 – 8827**

Liquid-Crystalline Ordering as a Concept in Materials Science: From Semiconductors to Stimuli-Responsive Devices

Activity from order: Liquid-crystalline materials (see picture; blue) are formed from anisotropic molecules. They are used in liquid-crystal displays (LCDs), the prototype of flat-panel displays. Moreover, the combination of order and mobility in these phases allows the realization of mechanical actuators (green) or the improvement of materials for organic electronics (red).



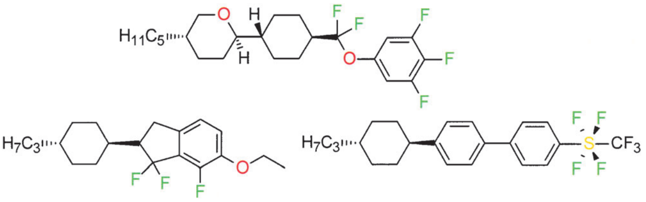


Liquid crystals on the way to complexity: Recent developments in liquid-crystalline materials have lead to new structures with enhanced complexity, including honeycombs and multicompartment structures, vesicular phases, and periodic and quasi-periodic arrays. New properties emerge, such as ferroelctricity and spontaneous achiral symmetry-breaking.

Liquid Crystals

C. Tschierske* ———— **8828 – 8878**

Development of Structural Complexity by Liquid-Crystal Self-assembly



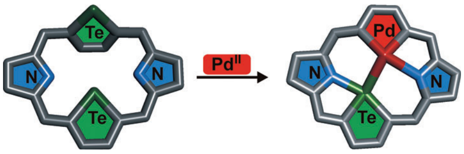
Liquid refreshment: Over the past 10 years liquid-crystal display (LCD) technology has been established as the leading display technology for televisions, PCs, and smartphones. The design of new materials to fulfill the stringent technical specifications with regard to electrooptical performance and reliability is getting more and more challenging, and the synthetic chemistry requires increasingly creative solutions.

Liquid Crystals

M. Bremer,* P. Kirsch,*
M. Klasen-Memmer,
K. Tarumi ———— **8880 – 8896**

The TV in Your Pocket: Development of Liquid-Crystal Materials for the New Millennium

Communications



Swinging palladaporphyrin: A palladacyclopentadiene has been incorporated into the porphyrinoid frame. A transformation of 21,23-ditelluraporphyrin triggered by coordination of palladium(II) resulted in the replacement of a tellurium atom by a palladium atom to form aromatic 21-pallada-23-telluraporphyrin. The nonplanar molecule is in equilibrium between two asymmetric forms.

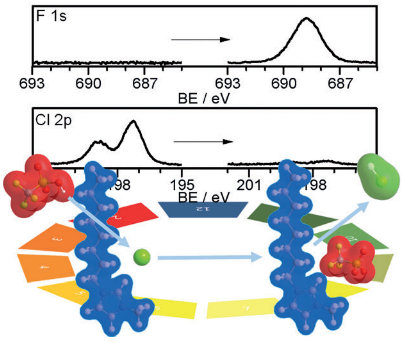
Heteroporphyrins

E. Pacholska-Dudziak,* M. Szczepaniak,
A. Książek,
L. Latos-Grażyński* ———— **8898 – 8903**

A Porphyrin Skeleton Containing a Palladacyclopentadiene

Frontispiece

A mechanistic study: In a Brønsted acid/base reaction, gaseous triflic acid (OTfH) transfers its proton to the basic Cl^- anion of the ionic liquid $[C_8C_1Im]Cl$ forming volatile HCl and the IL $[C_8C_1Im][TfO]$. This anion exchange reaction is monitored in the near-surface region quantitatively by X-ray photoelectron spectroscopy as a function of time (see picture; BE = binding energy).



Ionic Liquids

I. Niedermaier, N. Taccardi,
P. Wasserscheid, F. Maier*
H.-P. Steinrück* ———— **8904 – 8907**

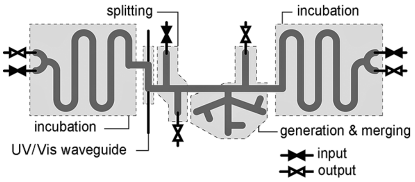
Probing a Gas/Liquid Acid–Base Reaction by X-ray Photoelectron Spectroscopy

Microfluidics

S. Jakiela, T. S. Kaminski, O. Cybulski, D. B. Weibel, P. Garstecki* _ **8908 – 8911**

Bacterial Growth and Adaptation in Microdroplet Chemostats

Back Cover

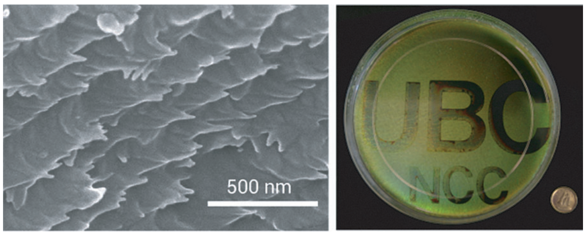


Getting your bugs in a row: A microfluidic device for manipulating and monitoring the continuous growth of populations of bacteria within microdroplets was developed (see scheme). This device allows for monitoring hundreds of populations of bacteria to study changes in growth rates and the effects of antibiotics, including the evolution of antibiotic resistance in real time.

Chiral Nematic Hydrogels

J. A. Kelly, A. M. Shukaliak, C. C. Y. Cheung, K. E. Shopsowitz, W. Y. Hamad, M. J. MacLachlan* ________ **8912 – 8916**

Responsive Photonic Hydrogels Based on Nanocrystalline Cellulose

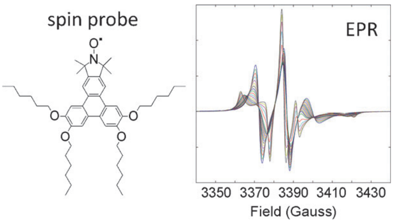


All in order: The self-assembly of nanocrystalline cellulose (NCC) with hydrogel precursors leads to nanocomposites with long-range chiral nematic order. The combination of chiral structure and hydrogel swelling behavior gives rise to iridescence that rapidly responds to various stimuli.

Molecular Dynamics

H. Gopee, A. N. Cammidge,* V. S. Oganesyan* ________ **8917 – 8920**

Probing Columnar Discotic Liquid Crystals by EPR Spectroscopy with a Rigid-Core Nitroxide Spin Probe



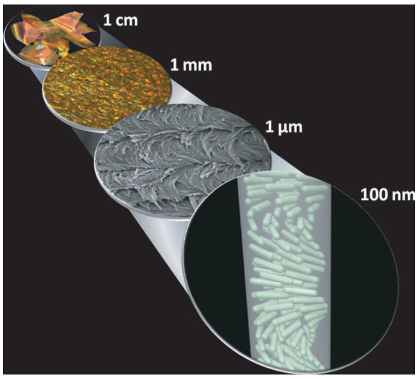
Discotics studied by EPR: The application of EPR spectroscopy to columnar discotic liquid crystals using a novel rigid-core nitroxide spin probe (see picture) is possible. EPR spectra measured at different temperatures across three phases of hexakis(*n*-hexyloxy)triphenylene show a strong sensitivity to the phase composition, molecular rotational dynamics, and columnar order.

Mesoporous Materials

M. K. Khan, M. Giese, M. Yu, J. A. Kelly, W. Y. Hamad, M. J. MacLachlan* ________ **8921 – 8924**

Flexible Mesoporous Photonic Resins with Tunable Chiral Nematic Structures

Colors of nature: Mimicking of the structural colors of nature was achieved by the preparation of easily accessible chiral nematic polymer composites based on phenol–formaldehyde resins templated by cellulose nanocrystals. Removal of the template led to mesoporous polymer films with unique optical and physical properties. The potential application of these materials in optical sensors was also demonstrated.

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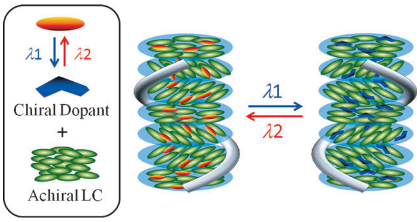
Supramolecular Chemistry

Y. Li, M. Wang, T. J. White, T. J. Bunning,
Q. Li* ________ **8925 – 8929**

Azoarenes with Opposite Chiral Configurations: Light-Driven Reversible Handedness Inversion in Self-Organized Helical Superstructures



On the other hand: Azoarene compounds with axially chiral binaphthyl units of the same and opposite chiral configurations were doped into achiral liquid crystals (LCs). They were found to efficiently induce self-organized helical superstructures, which could be reversibly tuned by light irradiation using *trans–cis* photoisomerization to change the handedness of the helix (see scheme) in LC hosts.

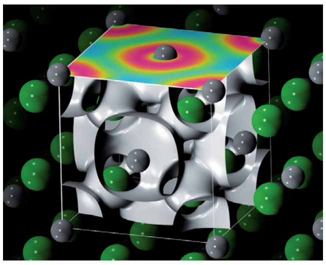
Magnesium Carbide

O. O. Kurakevych, T. A. Strobel,*
D. Y. Kim, G. D. Cody ____ **8930 – 8933**

Synthesis of Mg_2C: A Magnesium Methanide

Inside Back Cover

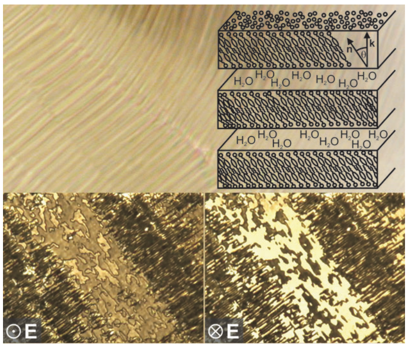
Ionic carbon: When magnesium and carbon combine in a 2:1 ratio above 15 GPa, a new antifluorite structure is formed. The compound, with composition Mg_2C (see picture), is highly ionic, with carbon in a very unusual C^{4-} methanide state.



Liquid Crystals

J. R. Bruckner, J. H. Porada, C. F. Dietrich,
I. Dierking,
F. Giesselmann* ________ **8934 – 8937**

A Lyotropic Chiral Smectic C Liquid Crystal with Polar Electrooptic Switching

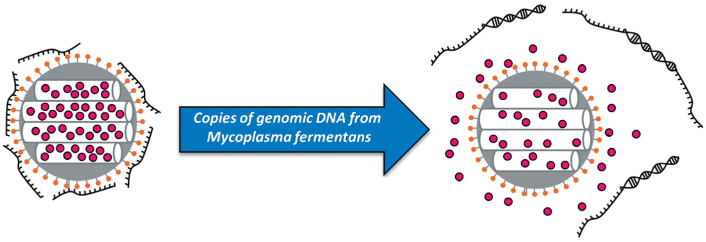


A lyotropic analogue of the ferroelectric smectic C* phase has been found. The lyotropic smectic C* phase shows macroscopic chirality effects, such as a helical ground state and polarity-dependent electrooptic switching, thus indicating the presence of a spontaneous electric polarization. The helicity implies communication of the chiral director twist across the achiral solvent layers separating adjacent layers of the chiral mesogens.

Gated Materials

E. Climent, L. Mondragón,
R. Martínez-Máñez,* F. Sancenón,
M. D. Marcos, J. R. Murguía, P. Amorós,
K. Rurack,* E. Pérez-Payá __ **8938 – 8942**

Selective, Highly Sensitive, and Rapid Detection of Genomic DNA by Using Gated Materials: *Mycoplasma* Detection

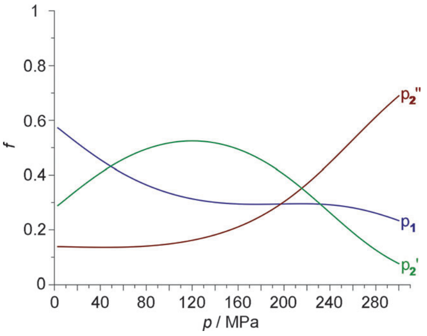


Come and gate it: DNA-capped mesoporous silica nanoparticles loaded with a dye are used to detect the common contaminate *Mycoplasma* in real contaminated cell-culture media without needing polymerase chain reaction (PCR) techniques, at a detection limit in the range of 70 DNA genome copies μL^{-1}.

Aβ-Monomers

C. E. Munte, M. Beck Erlach, W. Kremer, J. Koehler, H. R. Kalbitzer* ___ 8943 – 8947

Distinct Conformational States of the Alzheimer β-Amyloid Peptide Can Be Detected by High-Pressure NMR Spectroscopy

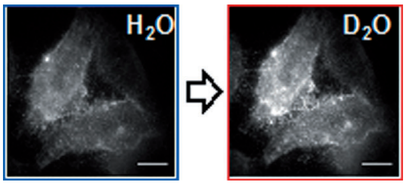


Folding under pressure: High-pressure NMR spectroscopy detects three different conformational states of the Aβ-peptide in solution: a compactly folded state **1**, a partially folded state **2**′, and a random-coil like state **2**″ (see plot, p = population). At ambient pressure the folded state **1** dominates which probably has a high affinity to fibrils and thus may promote fibril formation.

Fluorescence Microscopy

S. F. Lee,* Q. Vérolet, A. Fürstenberg* ___ 8948 – 8951

Improved Super-Resolution Microscopy with Oxazine Fluorophores in Heavy Water

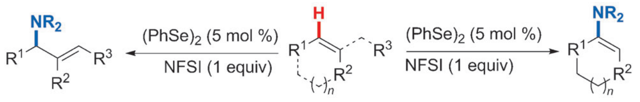


Brighter dyes in heavy water: A simple and cost-effective method increases the brightness of a whole class of commonly used red-emitting fluorophores, including ATTO655, ATTO680, and ATTO700. Replacing water (H_2O) by heavy water (D_2O) in the imaging buffer doubles the fluorescence quantum yield of these dyes and significantly improves the localization precision in super-resolution imaging.

Selenium Catalysis

J. Trenner, C. Depken, T. Weber, A. Breder* ___ 8952 – 8956

Direct Oxidative Allylic and Vinylic Amination of Alkenes through Selenium Catalysis

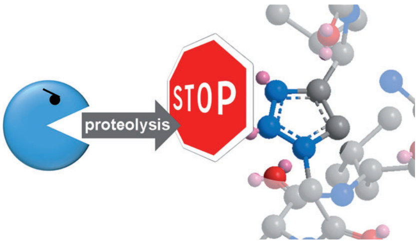


Bringing "N" into the game: The direct chemoselective nitrogenation of unactivated alkenes can be achieved through oxidative selenium catalysis (see scheme). This method provides a broad variety of allylic imides in yields of up to 89% using *N*-fluorobenzenesulfonimide (NFSI) as the terminal oxidant and nitrogen source. Furthermore, an unprecedented selenium-catalyzed vinylic C(sp^2)–H nitrogenation was discovered.

Peptidomimetics

I. E. Valverde, A. Bauman, C. A. Kluba, S. Vomstein, M. A. Walter, T. L. Mindt* ___ 8957 – 8960

1,2,3-Triazoles as Amide Bond Mimics: Triazole Scan Yields Protease-Resistant Peptidomimetics for Tumor Targeting

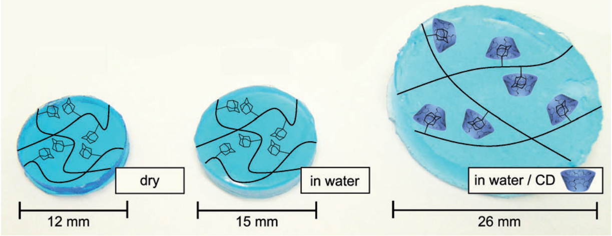


The triazole makes the difference: Replacement of amide bonds in the backbone of peptides by 1,4-disubstituted 1,2,3-triazole isosteres affords peptidomimetics with retained receptor affinity and cell-internalization properties, enhanced proteolytic stability, and improved tumor-targeting capabilities.

Smart Hydrogels

O. Peters, H. Ritter* ______ **8961 – 8963**

Supramolecular Controlled Water Uptake of Macroscopic Materials by a Cyclodextrin-Induced Hydrophobic-to-Hydrophilic Transition

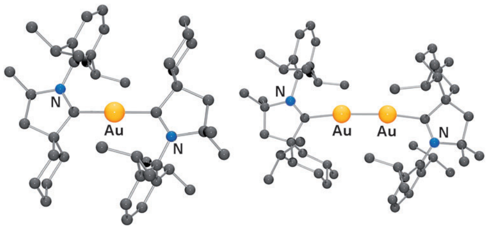


A swell memory: Samples of adamantyl-modified cross-linked hydrophilic polymers were swollen in water or aqueous cyclodextrin solution. The cyclodextrin dramatically enhanced the swelling (see picture). If the materials were twisted after heating above their glass-transition temperature and swollen in aqueous cyclodextrin solution, a shape-memory effect was observed.

Gold Complexes

D. S. Weinberger, M. Melaimi,
C. E. Moore, A. L. Rheingold, G. Frenking,
P. Jerabek, G. Bertrand* ____ **8964 – 8967**

Isolation of Neutral Mono- and Dinuclear Gold Complexes of Cyclic (Alkyl)(amino)carbenes

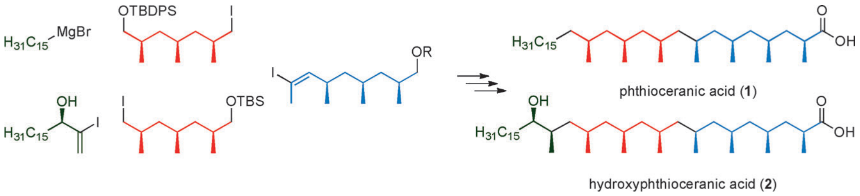


The smallest pieces of gold! Thanks to the presence of two π-accepting cyclic (alkyl)(amino)carbenes (CAACs),complexes featuring one and two atoms of gold in the formal oxidation state of zero can be isolated.

Natural Product Synthesis

M. C. Pischl, C. F. Weise, M.-A. Müller,
A. Pfaltz, C. Schneider* ____ **8968 – 8972**

A Convergent and Stereoselective Synthesis of the Glycolipid Components Phthioceranic Acid and Hydroxyphthioceranic Acid



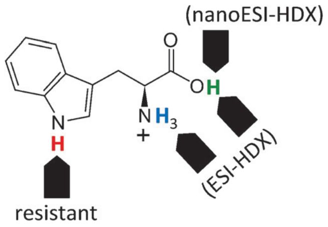
Simply convergent: The polydeoxypropionates **1** and **2** are important constituents of the cell wall of *Mycobacterium tuberculosis*. Key steps in their total synthesis include two Suzuki–Miyaura cross-coupling reactions and two highly diastereoselective iridium-catalyzed hydrogenations. The trideoxypropionates employed as central building blocks were prepared by sequential oxy-Cope rearrangement, hydrogenation, and enolate methylation.

Mass Spectrometry

S. Tittebrandt, M. Edelson-Averbukh,
B. Spengler,
W. D. Lehmann* ________ **8973 – 8975**

ESI Hydrogen/Deuterium Exchange Can Count Chemical Forms of Heteroatom-Bound Hydrogen

Out for the count: Hydrogen–deuterium exchange (HDX) performed in ESI droplets can distinguish chemically distinct forms of labile hydrogen. NanoESI exchanged mainly O-bound hydrogen atoms, whereas ESI also exchanged a subset of N-bound hydrogen atoms. The exchange behavior could be predicted. Thus, the combined use of nanoESI- and ESI-HDX can be applied to count chemically different forms of labile hydrogen atoms.



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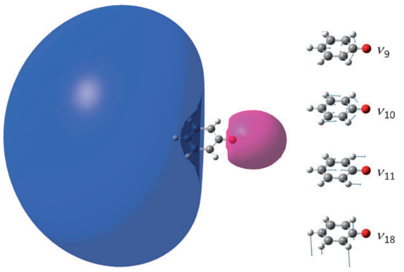
Photoelectron Spectroscopy

H. T. Liu, C. G. Ning, D. L. Huang,
P. D. Dau, L. S. Wang* —— **8976–8979**

Observation of Mode-Specific Vibrational Autodetachment from Dipole-Bound States of Cold Anions

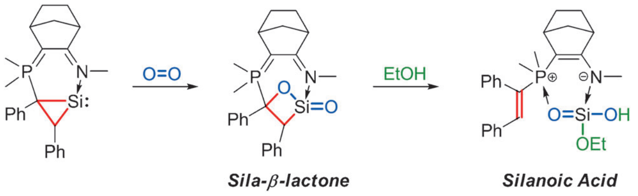
Dipole-bound states: Electron autodetachment of vibrationally excited dipole-bound states of phenoxide anions is observed by photoelectron spectroscopy. The wave function of a dipole-bound state and the observed normal modes are shown. The blue lobe of the orbital indicates that the electron is weakly bound to the dipole.



Main-Group Chemistry

R. Rodriguez, D. Gau, T. Troadec,
N. Saffon-Merceron, V. Branchadell,
A. Baceiredo,* T. Kato* —— **8980–8983**

A Base-Stabilized Sila-β-Lactone and a Donor/Acceptor-Stabilized Silanoic Acid

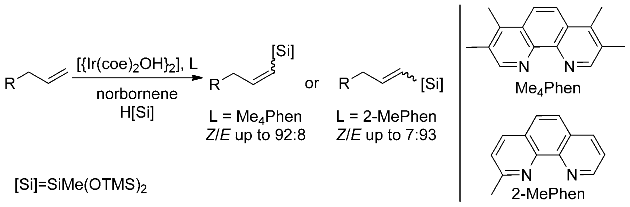


A stable base-stabilized sila-β-lactone was successfully synthesized and fully characterized. Interestingly, this sila-β-lactone shows a very unique reactivity toward ethanol, leading to the formation of an isolable donor/acceptor-stabilized silanoic acid.

C–H Functionalization

C. Cheng, E. M. Simmons,
J. F. Hartwig* —— **8984–8989**

Iridium-Catalyzed, Diastereoselective Dehydrogenative Silylation of Terminal Alkenes with $(TMSO)_2MeSiH$



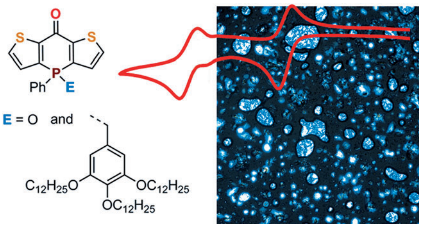
Ligands' choice: The title reaction was achieved under mild conditions with low catalyst loading. The diastereoselectivity of the reaction can be controlled by choosing the appropriate ancillary ligand (see scheme; coe = cyclooctene). The silylation products undergo further transformation such as oxidation or cross-coupling.

Phosphinine Lipids

X. M. He, J. B. Lin, W. H. Kan,
T. Baumgartner* —— **8990–8994**

Phosphinine Lipids: A Successful Marriage between Electron-Acceptor and Self-Assembly Features

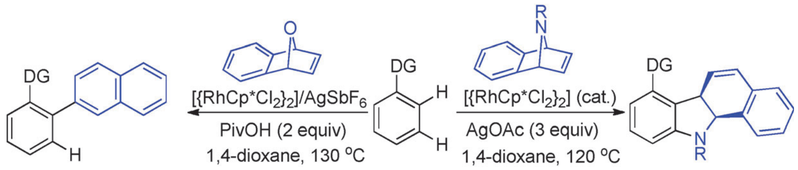
A push in the right direction: An electron-accepting organophosphorus system has been combined with self-assembly features to create a strongly electron-accepting liquid-crystalline material (see picture). The stability and behavior of the self-assembled liquid crystal could be controlled by adjusting weak intermolecular forces, such as hydrogen bonding and π–π interactions.



C–H Activation

Z. Qi, X. Li* **8995 – 9000**

Rhodium(III)-Catalyzed Coupling of Arenes with 7-Oxa/Azabenzonorbornadienes by C–H Activation

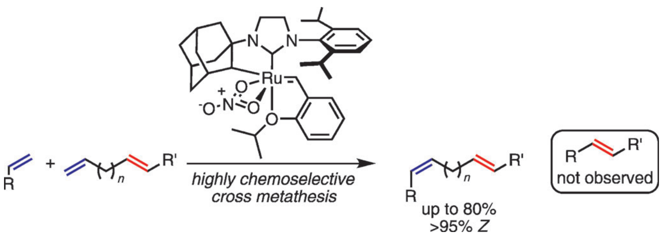


Under chelation assistance, rhodium(III) complexes can catalyze the redox-neutral coupling of arenes with 7-oxabenzonorbornadienes and the oxidative coupling of arenes with 7-azabenzonorbornadienes (see scheme; Cp* = C_5Me_5). A seven-membered rhodacycle containing a Rh–C(alkyl) bond has been established as the key intermediate.

Olefin Metathesis

J. S. Cannon, R. H. Grubbs* **9001 – 9004**

Alkene Chemoselectivity in Ruthenium-Catalyzed *Z*-Selective Olefin Metathesis



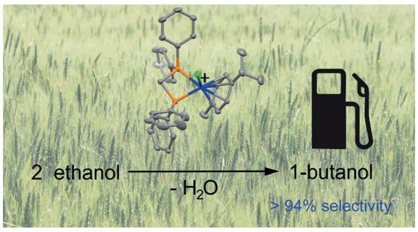
Chelated ruthenium catalysts can facilitate highly chemoselective olefin metathesis. Terminal and internal *Z* olefins reacted selectively to form new *Z* olefins in the presence of internal *E* olefins. Chemoselectivity for terminal olefins was also observed over both sterically hindered and electronically deactivated alkenes.

Ethanol Upgrading

G. R. M. Dowson, M. F. Haddow, J. Lee, R. L. Wingad, D. F. Wass* **9005 – 9008**

Catalytic Conversion of Ethanol into an Advanced Biofuel: Unprecedented Selectivity for *n*-Butanol

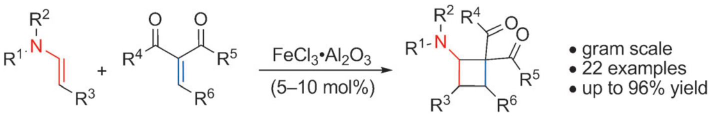
Taming the beast: Unprecedented selectivity of over 94% at good (20%+) conversion was observed for the upgrade of ethanol to the advanced biofuel 1-butanol with a ruthenium diphosphine catalyst (see picture; P orange, Ru blue). Preliminary mechanistic studies indicate that control over the notoriously uncontrolled acetaldehyde aldol condensation is critical for the high selectivity, and evidence was found for an on-metal condensation step.



Cycloaddition

F. de Nanteuil, J. Waser* **9009 – 9013**

Synthesis of Aminocyclobutanes by Iron-Catalyzed [2+2] Cycloaddition

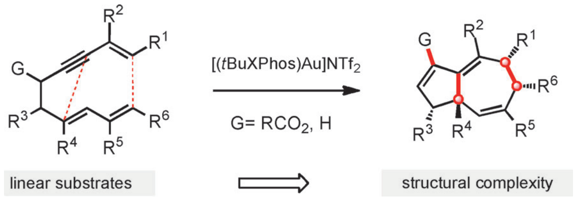


Fab Four: An iron-catalyzed [2+2] cycloaddition furnishes aminocyclobutanes with a broad range of substituents in excellent yields and diastereoselectivities. The products can be obtained on a gram scale and can be further converted to β-peptide derivatives in a few steps. Furthermore, a [4+2] cycloaddition between an aminocyclobutane and an olefin leads to the corresponding cyclohexylamines.

Homogeneous Catalysis

Z. Cao, F. Gagosz* ———— **9014 – 9018**

Gold-Catalyzed Tandem Cycloisomerization/Cope Rearrangement: An Efficient Access to the Hydroazulenic Motif

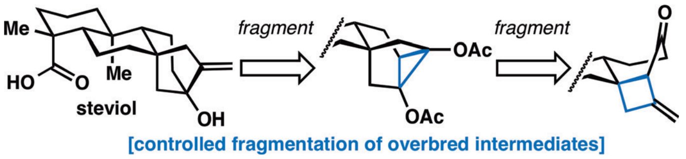


Simply complex: The title reaction proceeds at a low loading of catalyst (1 mol %) and allows an efficient and stereoselective access to the hydroazulenic motif, which is found in numerous natural products having significant biological activities. Tf = trifluoromethanesulfonyl, XPhos = 2-dicyclohexylphosphino-2′,4′,6′-triisopropylbiphenyl.

Total Synthesis

E. C. Cherney, J. C. Green, P. S. Baran* ———— **9019 – 9022**

Synthesis of *ent*-Kaurane and Beyerane Diterpenoids by Controlled Fragmentations of Overbred Intermediates

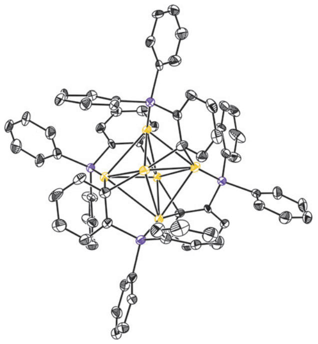


Efficient access to minimally oxidized members of the *ent*-kaurane and beyerane class of terpenes has been achieved by using a polyene cyclization precursor designed to directly yield oxidation at the axial C19-methyl group. Construction of the [3.2.1]bicyclic system found in the *ent*-kaurane skeleton was realized with two overbred intermediates. Wagner–Meerwein rearrangement of the [3.2.1]bicyclic system yields the beyerane skeleton of isosteviol.

Gold Clusters

E. S. Smirnova, A. M. Echavarren* ———— **9023 – 9026**

A Hexanuclear Gold Cluster Supported by Three-Center–Two-Electron Bonds and Aurophilic Interactions

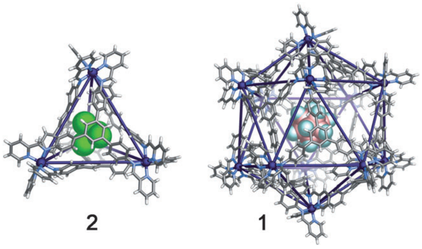


A heart of gold: The first hexanuclear gold cluster formed exclusively by gold(I) centers (see picture; Au yellow, C black, P purple) has been shown to be catalytically active for the activation of alkynes under homogeneous conditions.

Self-Assembly

R. A. Bilbeisi, T. K. Ronson, J. R. Nitschke* ———— **9027 – 9030**

A Self-Assembled [Fe^{II}$_{12}$L$_{12}$] Capsule with an Icosahedral Framework



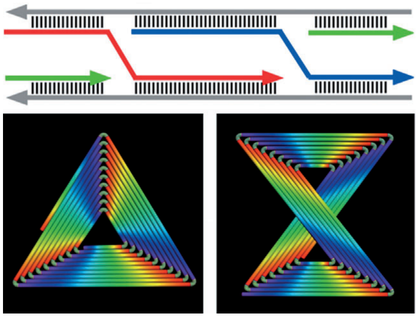
How about a different geometry? Depending on the reaction conditions, a threefold-symmetric triamine is observed to assemble into either the novel icosahedral [Fe^{II}$_{12}$L$_{12}$] capsule **1**, or tetrahedral [Fe^{II}$_4$L$_4$] capsule **2**. The two capsules have radically different cavity volumes and shapes, and are able to encapsulate guests of different size, shape, and charge.

Self-Assembly

D. Han, S. Jiang, A. Samanta, Y. Liu, H. Yan* ________ **9031 – 9034**

Unidirectional Scaffold-Strand Arrangement in DNA Origami

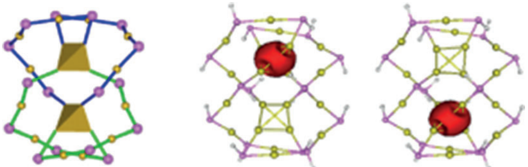
In a parallel universe: DNA origami structures based on modified parallel double-crossover tiles (see scheme) were constructed and a unidirectional (parallel) arrangement of the scaffold strand (gray lines) was used in the assembly of a variety of 2D and 3D DNA origami structures. This will greatly expand the diversity of DNA origami and enable their assembly into larger structures.



Gold Nanoclusters

L. Cheng,* Y. Yuan, X. Zhang, J. Yang* ________ **9035 – 9039**

Superatom Networks in Thiolate-Protected Gold Nanoparticles



The next super model: The Au_8^{4+} core of $[Au_{20}(SR)_{16}]$ can be viewed as two non-conjugate 4 center–2 electron (4c–2e) tetrahedral Au_4 superatoms. The four valence electrons are delocalized in each Au_4 unit as 4c–2e σ bonds. Chemical bonding analysis confirms that a 2e-superatom network exists in $[Au_{20}(SR)_{16}]$ (see picture: Au yellow, SR purple, superatoms tetrahedra/red), this model explains the properties of this species.

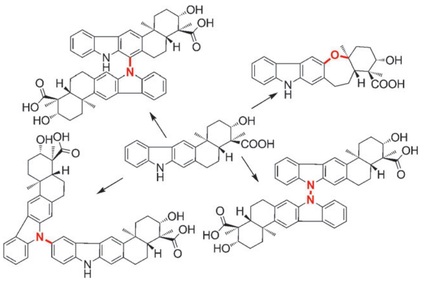
VIP

Bacterial Alkaloids

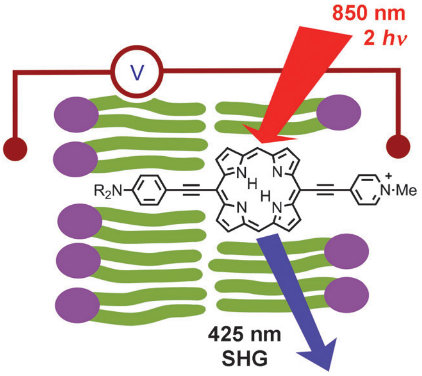
M. Baunach, L. Ding, T. Bruhn, G. Bringmann, C. Hertweck* ________ **9040 – 9043**

Regiodivergent N–C and N–N Aryl Coupling Reactions of Indoloterpenes and Cycloether Formation Mediated by a Single Bacterial Flavoenzyme

Radical diversification: Through the discovery of diverse indolosesquiterpene dimers in a strain heterologously expressing the xiamycin biosynthesis genes, the analysis of mutants, and biotransformation studies, it has been inferred that a single flavoprotein mediates N–C and N–N aryl coupling reactions, as well as the formation of a cyclic ether (oxiamycin). Synthetic emulation of this unusual transformation provides evidence for a radical-based mechanism.



Feeling the field! The intensity of second harmonic generation (SHG) from a porphyrin in a lipid bilayer is exceptionally sensitive to electric field, thus indicating that these dyes may be useful probes for electrical signals in excitable cells such as neurons. The porphyrin-based membrane probe (see picture, not to scale) gives a fast electro-optic response which is about 5–10 times greater than those of conventional styryl dyes.



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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GROUP LEADER POSITION IN CHEMICAL BIOLOGY AT THE CURIE INSTITUTE IN PARIS

The Curie Institute (http://www.curie.fr) is a world-class multidisciplinary cancer research center. With the creation of a research unit on Chemical Biology in January 2014, opportunities arise to develop novel programs related to small molecules as discovery tools (chemical genetics), medicinal chemistry, targeted therapies, especially in relation with biological membranes and/or signal transduction. Applications are open for a group leader position from outstanding organic or medicinal chemists who are involved in these areas of research.

A complete description of the offer can be downloaded at http://xfer.curie.fr/get/akIHxnoermZ/Call_Chemical%20biology_Institut%20Curie.pdf

Contact: ludger.johannes@curie.fr

Deadline for applications: September 15, 2013
Short-listed candidates will be invited to the Curie Institute at the beginning of October 2013

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The **Faculty of Natural Sciences** of Ulm University (Ulm, Germany) invites applications for a tenured

Professorship in Electrochemistry

at the W3 (o.L.) level in the Institute of Electrochemistry. The position is available for immediate appointment.

We seek an outstanding researcher with an excellent record of accomplishment in a modern area of experimental electrochemistry, whose work will strengthen the University's existing interdisciplinary research focus on energy conversion and storage, particularly in the field of photoelectrochemistry. The successful candidate will manifest the capacity and desire to collaborate across the boundaries of disciplines or faculties.

Teaching responsibilities cover the full spectrum of undergraduate and graduate-level courses in physical chemistry. In addition, active participation in the various programs of study offered by the Department of Chemistry or in those to which it contributes will be expected. Ready engagement in the academic self-governance of the Faculty is a necessity.

Prerequisites for appointment include an earned doctorate, pedagogical aptitude and additional academic qualifications according to § 47 LHG.

Ulm University is committed to increasing the representation of women in research and teaching; therefore, the University expressly encourages qualified female scientists to apply for this position. Ulm University is certified as a family-friendly institution, offering support for dual career hiring.

Interested candidates should submit an application with supporting documentation (curriculum vitae; academic transcripts; publication list, including up to three reprints; summary of current and proposed research programs; tabulation of research funding; brief description of teaching interests) **by 30 September 2013** to the Dean of the Faculty of Natural Sciences, Ulm University, Albert-Einstein-Allee 11, 89081 Ulm, Germany. Please mark **the envelope with reference number 67**. Additionally, candidates are asked to submit an electronic copy of their application in PDF form to the administrative assistant of the Faculty of Natural Sciences (birgit.koerner@uni-ulm.de).

Physically disabled applicants receive favorable consideration when comparably qualified.

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