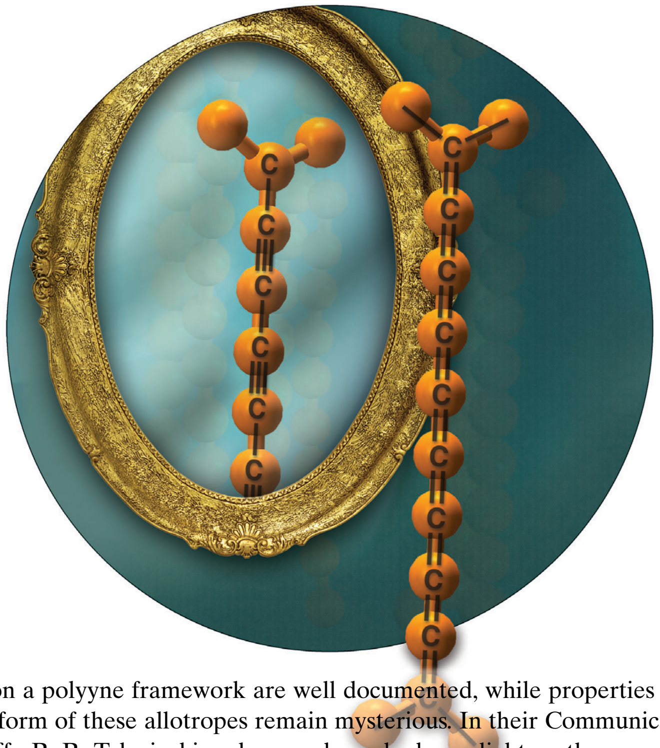
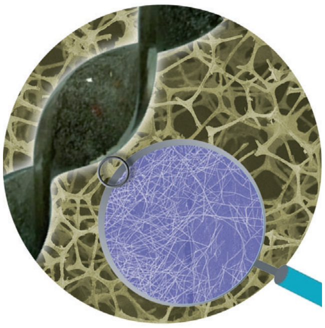
sp-Hybridized carbon allotropes …

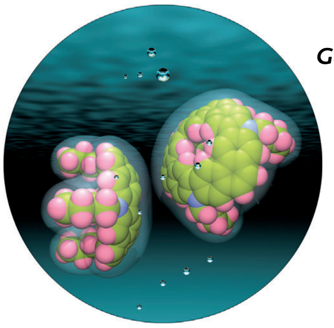


… based on a polyyne framework are well documented, while properties of the cumulenic form of these allotropes remain mysterious. In their Communication on page 1817 ff., R. R. Tykwinski and co-workers shed new light on the properties of cumulenes (such as bond length alternation) through the synthesis, spectroscopic study, and crystallographic analysis of cumulenes that contain up to nine consecutive double bonds (i.e., a [9]cumulene). Cover art: Annie Tykwinski; based on a concept from D. Wendinger.

Conducting Materials

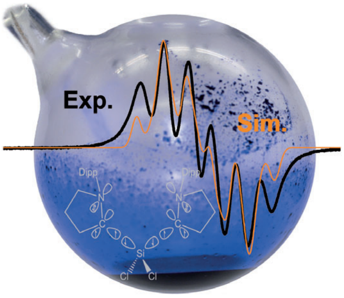
In their Communication on page 1654 ff., S. H. Yu and co-workers detail a new type of stretchable conductor based on a binary structure design, which enhances the electronic performance and electromechanical stability of the material.





Geodesic Polyarenes

In their Communication on page 1713 ff. D. Myśliwiec and M. Stępień describe the synthesis of chrysaorole. This strained system was obtained from a carbazole-based macrocyclic precursor by using a new “fold-in” strategy.



Main Group Chemistry

An air-stable silicon biradical was synthesized from a silicon(II) precursor. In their Communication on page 1801 ff., H. W. Roesky, I. Tkach, D. Stalke et al. observed a C–C bond formation during the reaction at room temperature.

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Service

Author Profile

"Chemistry is fun because it creates its own object (Berthelot).
My favorite way to spend a holiday is with a rental car, lots of time, and no itinerary …"
This and more about Mathias Christmann can be found on page 1624.

News


L. Emsley


M. Ephritikhine


L. Jullien


C. Bruneau


F. Babonneau


M. Suhm


M. Driess

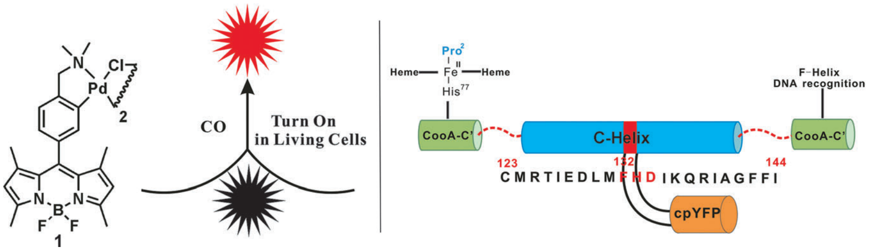

A. G. Beck-Sickinger


G. Rimbach

Books

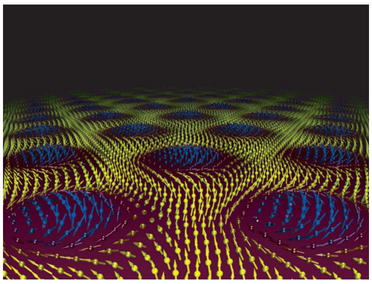
Highlights

Biosensing



All aglow: Both a fluorescent biosensor, composed of a circularly permuted yellow fluorescent protein (cpYFP), and a small-molecule fluorescent probe (**1**) for the detection of CO in living cells have been recently reported. Though different these novel probes were designed based on the unique binding ability of CO to transition-metal ions.

Magnetic Properties



Topologically stable magnetic screw-like nanostructures called skyrmions were designed by using the concept of topology and the guidance of theory. These particles in real space are found in non-centrosymmetric compounds such as MnSi. Skyrmions might have an enormous impact in the context of future spintronics applications.

Reviews

Antibacterial Silver

Silver shield: Silver is used in different forms as an antibacterial agent. Earlier, sparingly soluble silver salts were predominantly used, but today, silver nanoparticles (see picture for an SEM image of cubic silver nanoparticles) are gaining increasing importance. As silver is also toxic towards mammalian cells, there is the question of the therapeutic window in the cases of consumer products and medical devices.

For the USA and Canada:
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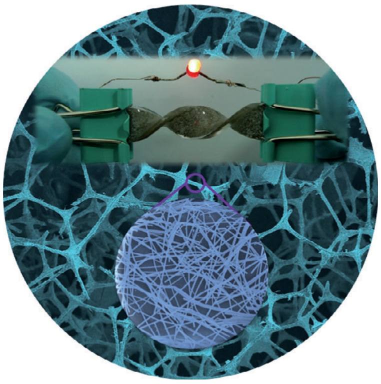
Communications



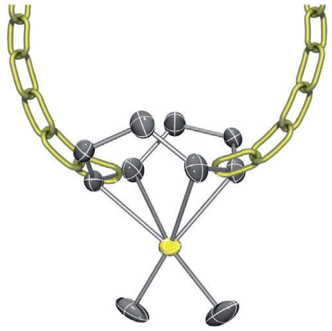
Stretching the role of a conductor: A new kind of polyurethane sponge–Ag nanowire–poly(dimethylsiloxane) (PUS-AgNW-PDMS) stretchable conductors can be easily fabricated based on a novel binary network structure design, which greatly enhances their electronic performance. These PUS-AgNW-PDMS elastomeric conductors show improved electromechanical stability compared to previously reported stretchable conductors.

Conducting Materials

J. Ge, H. B. Yao, X. Wang, Y. D. Ye,
J. L. Wang, Z. Y. Wu, J. W. Liu, F. J. Fan,
H. L. Gao, C. L. Zhang,
S. H. Yu* ______________ **1654 – 1659**

Stretchable Conductors Based on Silver Nanowires: Improved Performance through a Binary Network Design

Frontispiece



A Missing Gold Link: An Au^{III} alkene complex has been prepared and characterized by NMR spectroscopy and X-ray crystallography. Its bonding features have been analyzed by DFT calculations and natural bond orbital (NBO) analysis. In $[(cod)AuMe_2]^+$, the unequal Au–C bond lengths result from the domination of the preference of 1,5-cyclooctadiene (cod) for nonparallel double bonds over back donation from the metal which favors parallel double bonds.

Gold Complexes

E. Langseth, M. L. Scheuermann,
D. Balcells, W. Kaminsky, K. I. Goldberg,
O. Eisenstein, R. H. Heyn,
M. Tilset* ______________ **1660 – 1663**

Generation and Structural Characterization of a Gold(III) Alkene Complex

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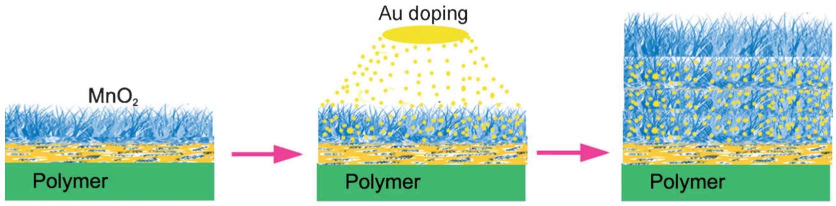

Electrochemical energy storage: The performance of MnO_2 as a pseudo-capacitive material was enhanced by doping electrodeposited MnO_2 with physically deposited gold atoms (see picture). The resulting MnO_2 electrodes showed an enhanced electronic conductivity and a remarkable stability under voltammetric cycling.

Electrochemistry

J. L. Kang, A. Hirata, L. J. Kang, X. Zhang,
Y. Hou, L. Y. Chen, C. Li, T. Fujita, K. Akagi,
M. W. Chen* ______________ **1664 – 1667**

Enhanced Supercapacitor Performance of MnO_2 by Atomic Doping

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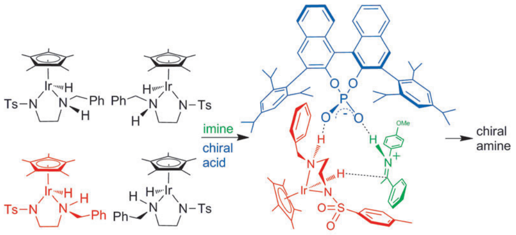

One of four: A chiral phosphoric acid enables asymmetric hydrogenation of imines with an achiral iridium catalyst by virtue of noncovalent interactions. These interactions lead to the formation of a highly organized ternary complex, and the hydride is transferred highly enantioselectively.

Asymmetric Hydrogenation

W. Tang, S. Johnston, J. A. Iggo,*
N. G. Berry, M. Phelan, L. Lian, J. Bacsa,
J. Xiao* ______________ **1668 – 1672**

Cooperative Catalysis through Noncovalent Interactions

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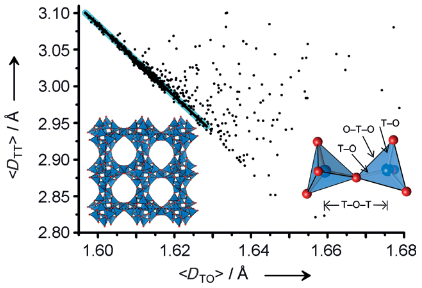


The huge pool of hypothetical zeolites can be screened for likely candidates for successful targeted synthesis on the basis of a set of reliable criteria derived from the observation that the local interatomic distances in all existing zeolites strictly obey several rules. For example, the average T–T and T–O distances ($<D_{TT}>$ and $<D_{TO}>$; T is Si, Al, P, or another element) in existing zeolites (graph region highlighted in cyan) have a linear relationship.

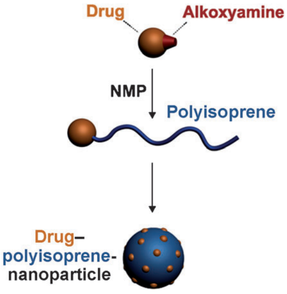
Zeolite Structures

Y. Li, J. Yu,* R. Xu ________ **1673 – 1677**

Criteria for Zeolite Frameworks Realizable for Target Synthesis

---

Magic rubber bullets: Novel anticancer nanoparticles made of well-defined polymer–drug conjugate amphiphiles are prepared by the controlled growth of a hydrophobic polyisoprene chain from a drug macroinitiator by using nitroxide-mediated polymerization (NMP; see picture). The resulting conjugates self-assembled into nanoparticles exhibiting high drug payloads and significant anticancer activities both in vitro and in vivo.



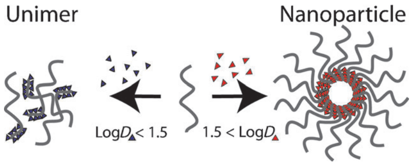
Polymer Nanoparticles

S. Harrisson, J. Nicolas,* A. Maksimenko, D. T. Bui, J. Mougin, P. Couvreur ________ **1678 – 1682**

Nanoparticles with In Vivo Anticancer Activity from Polymer Prodrug Amphiphiles Prepared by Living Radical Polymerization

---

Nanoparticles on demand: Upon the site-specific covalent attachment of hydrophobic molecules to one end of the biopolymer backbone, chimeric polypeptides (derived from elastin-like polypeptides) can self-assemble to form thermoresponsive nanoparticles suitable for drug delivery. Molecules with a distribution coefficient greater than 1.5 imparted sufficient amphiphilicity to drive self-assembly into sub-100 nm nanoparticles (see picture).

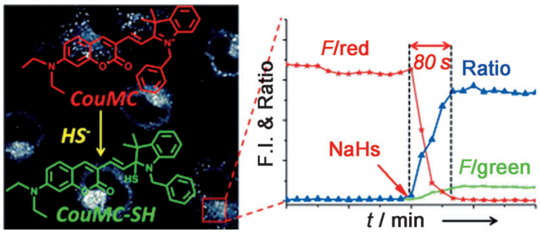


Drug-Delivery Systems

J. R. McDaniel, J. Bhattacharyya, K. B. Vargo, W. Hassouneh, D. A. Hammer, A. Chilkoti* **1683 – 1687**

Self-Assembly of Thermally Responsive Nanoparticles of a Genetically Encoded Peptide Polymer by Drug Conjugation

---



Quick: An exogenously induced quick increase of the H_2S concentration (80 s) in MCF-7 cells can be visualized by ratiometric imaging using a new probe (CouMC) that can target mitochondria.

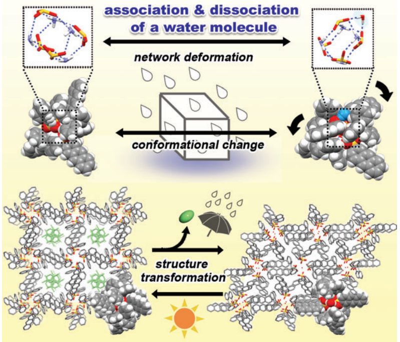
CouMC was constructed by combining merocyanine and coumarin fluorophores. The selective nucleophilic addition of HS^- to the merocyanine derivative at neutral pH is crucial for the rapid H_2S detection.

Fluorescence Imaging

Y. Chen, C. Zhu, Z. Yang, J. Chen, Y. He, Y. Jiao, W. He,* L. Qiu, J. Cen, Z. Guo* ________ **1688 – 1691**

A Ratiometric Fluorescent Probe for Rapid Detection of Hydrogen Sulfide in Mitochondria

Just add water: A cube-like hydrogen-bonding network in a fluorescent supramolecular cluster dynamically deforms upon the specific addition of a water molecule. The deformation is amplified through the conformational change of the cluster to result in the transformation of host frameworks. This transformation provides water-responsive guest-exclusion and fluorescent-modulation behaviors.

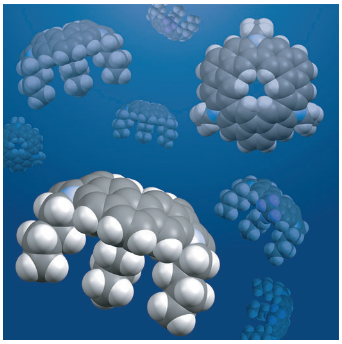


Supramolecular Chemistry

A. Yamamoto, T. Hamada, I. Hisaki,
M. Miyata, N. Tohnai* ____ **1709 – 1712**

Dynamically Deformable Cube-like Hydrogen-Bonding Networks in Water-Responsive Diamondoid Porous Organic Salts

Molecular jellyfish: A new family of bowl-shaped aromatic compounds swims into view (see picture). Quite unlike true jellyfish, chrysaoroles possess a rigid skeleton, which is assembled from fused carbazole units. Their synthesis involves a fold-in step to convert a macrocyclic precursor into the bowl-shaped target molecule.

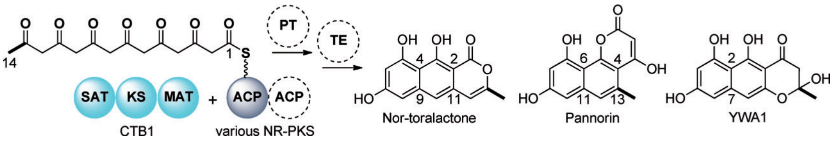


Geodesic Polyarenes

D. Myśliwiec, M. Stępień* _ **1713 – 1717**

The Fold-In Approach to Bowl-Shaped Aromatic Compounds: Synthesis of Chrysaoroles

Inside Back Cover

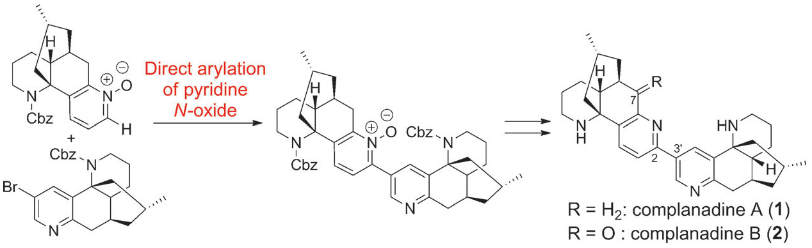


Playing by the rules: Combinatorial domain swaps among “deconstructed” non-reducing polyketide synthases (NR-PKSs) revealed the rules behind product assembly (see scheme). The control exerted by individual catalytic domains was found to be sufficiently great that heterocombinations of domains from different NR-PKSs synthesized products in a predictable manner.

Combinatorial Biosynthesis

A. L. Vagstad, A. G. Newman, P. A. Storm,
K. Belecki, J. M. Crawford,
C. A. Townsend* ________ **1718 – 1721**

Combinatorial Domain Swaps Provide Insights into the Rules of Fungal Polyketide Synthase Programming and the Rational Synthesis of Non-Native Aromatic Products



Twice as nice: Total syntheses of dimeric alkaloids, (−)-complanadines A (**1**) and B (**2**), were achieved from (−)-lycodine. The unsymmetrical motif was assembled through direct arylation of the pyridine *N*-oxide. The absolute configuration and specific rotations of complanadines A and B were identified. Cbz = Benzyloxycarbonyl.

Natural Products

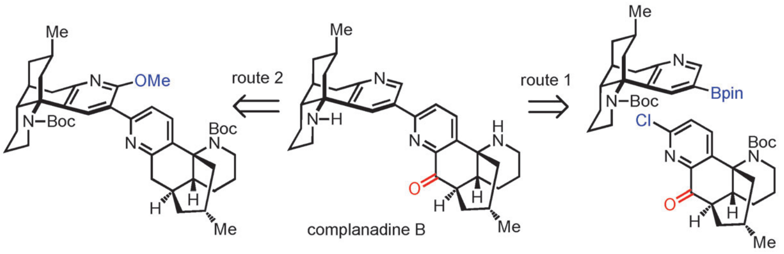
L. Zhao, C. Tsukano,* E. Kwon,
Y. Takemoto, M. Hirama __ **1722 – 1725**

Total Syntheses of Complanadines A and B

Natural Products

J. N. Newton, D. F. Fischer, R. Sarpong* ______ **1726 – 1730**

Synthetic Studies on Pseudo-Dimeric Lycopodium Alkaloids: Total Synthesis of Complanadine B

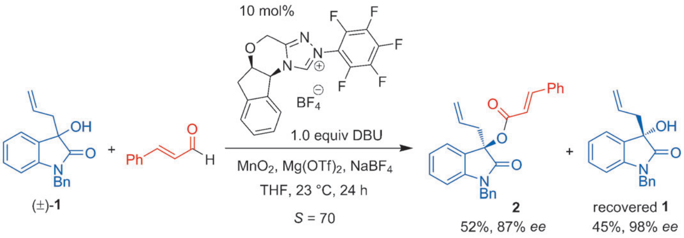


Two approaches to the total synthesis of the dimeric *Lycopodium* alkaloid complanadine B have been achieved. In the first approach (see scheme; route 1), a keto lycodine unit is coupled to another lycodine unit whereas in the latter approach (route 2), selective oxygenation of one of two pseudo-benzylic positions is achieved.

Asymmetric Catalysis

S. Lu, S. B. Poh, W.-Y. Siau, Y. Zhao* ______ **1731 – 1734**

Kinetic Resolution of Tertiary Alcohols: Highly Enantioselective Access to 3-Hydroxy-3-Substituted Oxindoles



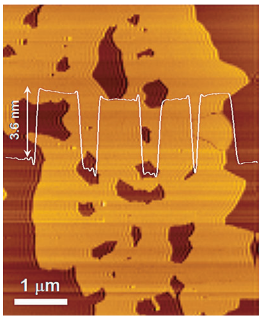
Enantioselective: The first highly enantioselective kinetic resolution of 3-hydroxy-3-substituted oxindoles has been developed through oxidative esterification catalyzed by a N-heterocyclic carbene (see picture). This method uses a simple procedure and provides 3-hydroxy-oxindoles with various substituents at the 3-position in excellent enantiopurity. *S* = selectivity.

Conjugated Polymers

Z. Lin, X. Wang* ______ **1735 – 1738**

Nanostructure Engineering and Doping of Conjugated Carbon Nitride Semiconductors for Hydrogen Photosynthesis

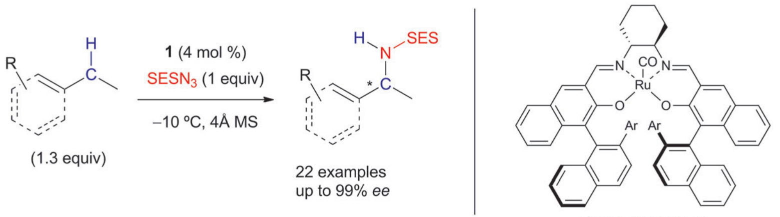
Going flat out: Simultaneous modifications of the textural, surface, and electronic structures of a rigid conjugated carbon nitride polymer has been achieved using direct co-condensation of urea and Ph$_4$BNa. This method gives boron-doped carbon nitride nanosheets (see picture) that optimize the capture of light, improve the charge-separation kinetics, and enhance the surface reactivity for hydrogen photosynthesis.



C–H Amination

Y. Nishioka, T. Uchida,
T. Katsuki* ________ 1739 – 1742

Enantio- and Regioselective Intermolecular Benzylic and Allylic C–H Bond Amination

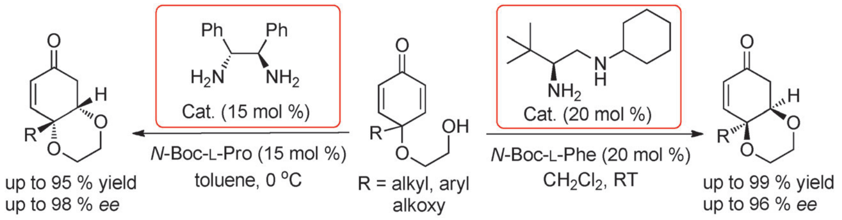


Smooth salen: Ru(CO)–salen complex **1** is an effective catalyst for asymmetric benzylic and allylic C–H bond amination using 2-(trimethylsilyl)ethanesulfonyl azide ($SESN_3$) as the nitrene source. The reaction proceeded with high enantioselectivity and excellent regioselectivity. An ethyl group can be selectively aminated, even in the presence of an *n*-propyl group. No migration or isomerization of the double bond was observed.

Asymmetric Catalysis

W. Wu, X. Li, H. Huang, X. Yuan, J. Lu,
K. Zhu, J. Ye* ________ 1743 – 1747

Asymmetric Intramolecular Oxa-Michael Reactions of Cyclohexadienones Catalyzed by a Primary Amine Salt



Michael brings the rings: An asymmetric intramolecular oxa-Michael reaction involving iminium activation has been developed. This reaction provides enantioenriched 1,4-dioxane derivatives with up to 99% yield and 98% *ee*. The method allows for concise and stereoselective access to stereodiverse, complex tetracyclic compounds containing a bicyclo[2.2.2]octan-2-one backbone with multiple chiral centers.

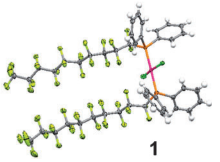
Synthetic Methods

S.-i. Kawaguchi, Y. Minamida, T. Ohe,
A. Nomoto, M. Sonoda,
A. Ogawa* ________ 1748 – 1752

Synthesis and Properties of Perfluoroalkyl Phosphine Ligands: Photoinduced Reaction of Diphosphines with Perfluoroalkyl Iodides

$$R_f\text{—I} + R_2P\text{—}PR_2 \xrightarrow{h\nu} R_fPR_2$$

$$n\text{-}C_{10}F_{21}PPh_2 \xrightarrow{[PdCl_2(PhCN)_2]} [PdCl_2(n\text{-}C_{10}F_{21}PPh_2)_2] \quad (\mathbf{1})$$


1

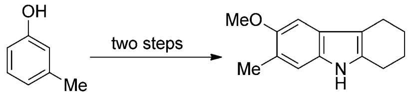
A ‘F’lurry of activity: The title reaction provides a convenient procedure for direct synthesis of perfluoroalkylated phosphines. The synthesized phosphine $n\text{-}C_{10}F_{21}PPh_2$ forms a complex with palladium(II) to give **1** and several runs of coupling reactions are attained with $n\text{-}C_{10}F_{21}PPh_2$ by using a fluorous/organic biphasic system.

Indole Synthesis

J. Zhang, Z. Yin, P. Leonard, J. Wu,
K. Sioson, C. Liu, R. Lapo,
S. Zheng* ________ 1753 – 1757

A Variation of the Fischer Indolization Involving Condensation of Quinone Monoketals and Aliphatic Hydrazines

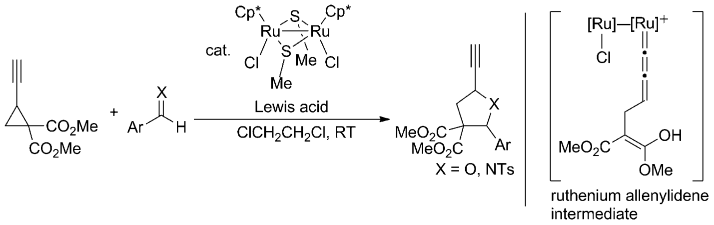
A new twist: A one-pot nitrous acid free, diazonium-free, and transition-metal-free variation of the Fischer indole synthesis has been developed. Condensation of quinone monoketals and aliphatic hydrazine hydrochlorides afforded indoles via intermediate alkylaryldiazenes. This method will complement the classical Fischer indole synthesis by providing indoles in two steps from widely available phenols under mild conditions.



Synthetic Methods

Y. Miyake, S. Endo, T. Moriyama,
K. Sakata,* Y. Nishibayashi* **1758 – 1762**

Ruthenium-Triggered Ring Opening of Ethynylcyclopropanes: [3+2] Cycloaddition with Aldehydes and Aldimines Involving Metal Allenylidene Intermediates



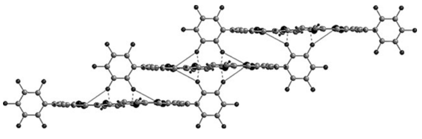
It's complex: Ruthenium-catalyzed [3+2] cycloaddition of ethynylcyclopropanes with aldehydes and aldimines has been found to give the corresponding 2-ethynyltetrahydrofurans or -pyrrolidines in high to excellent yields. In both cases, the formation of a ruthenium allenylidene complex as a key reactive intermediate is supported by density functional theory calculations. Cp* = η^5-C_5Me_5.

Antiaromaticity

T. Y. Gopalakrishna, J. S. Reddy,
V. G. Anand* **1763 – 1767**

Antiaromatic Supramolecules: F⋯S, F⋯Se, and F⋯π Intermolecular Interactions in 32π Expanded Isophlorins

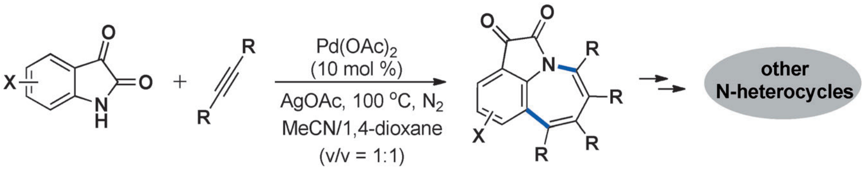
Count against: Stable and planar antiaromatic, expanded vinylogous isophlorins encourage chalcogen–fluorine noncovalent interactions. The wide cavity of the macrocycle accommodates covalently bound fluorine substituents, thus leading to multiple nonbonding interactions



Benzazepine Synthesis

L. Wang, J. Y. Huang, S. Y. Peng, H. Liu,
X. f. Jiang,* J. Wang* **1768 – 1772**

Palladium-Catalyzed Oxidative Cycloaddition through C—H/N—H Activation: Access to Benzazepines

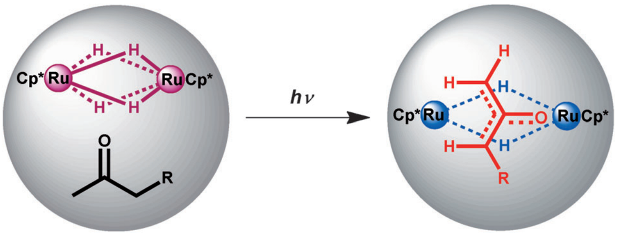


Rings beget rings: Benzazepines, well-known structural design elements in medicinal chemistry, are readily prepared by a one-pot palladium-catalyzed oxidative cycloaddition of isatins with various alkynes.

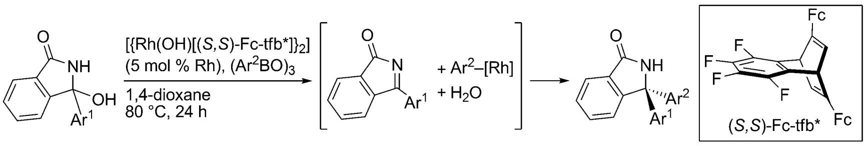
Photoexcited Hydride Cluster

H. Suzuki,* R. Shimogawa, Y. Muroi,
T. Takao, M. Oshima,
G. Konishi **1773 – 1776**

Bimetallic Activation of 2-Alkanones through Photo-Induced α-Hydrogen Abstraction Mediated by a Dinuclear Ruthenium Tetrahydride Complex



Hydrogen abstraction in the spotlight: UV irradiation (365 nm) of dinuclear ruthenium tetrahydride, [(Cp*Ru)(μ-H)$_4$(RuCp*)] (Cp* = η^5-C_5Me_5), in a 2-alkanone, such as acetone or 2-butanone, resulted in the formation of dinuclear oxatrimethylenemethane complexes, [(Cp*Ru)(μ-η^3:η^1-CH_2COCHR)(μ-H)$_2$(RuCp*)] (R = H and CH_3), through hydrogen abstraction from the α and α′ positions of the carbonyl group.



Water is out, aryl is in! Asymmetric synthesis of isoindoline-1-ones bearing an α-triaryl-substituted stereogenic center was realized in the enantioselective addition of arylboroxines to 3-aryl-3-hydroxyisoindolin-1-ones in the presence of a hydroxorhodium/chiral diene catalyst, where cyclic *N*-carbonyl ketimines were generated in situ by dehydration.

Asymmetric Arylation

T. Nishimura,* A. Noishiki, Y. Ebe, T. Hayashi* ______ **1777 – 1780**

Hydroxorhodium/Chiral Diene Complexes as Effective Catalysts for the Asymmetric Arylation of 3-Aryl-3-hydroxyisoindolin-1-ones

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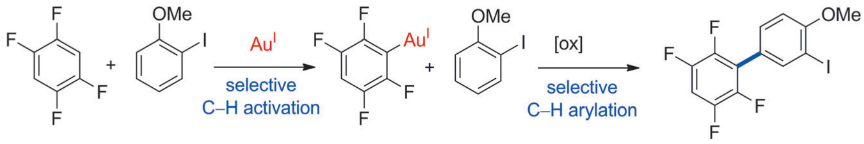

Gold brings us together: Taking advantage of the orthogonal reactivities of Au^I and Au^{III} towards C–H activation of electron-poor and electron-rich arenes, respectively, a novel approach for the synthesis of biaryls through double C–H activation is proposed. Stoichiometric studies demonstrate that these oxidative couplings occur with high selectivity at low temperature.

Oxidative Coupling

X. C. Cambeiro, T. C. Boorman, P. Lu, I. Larrosa* ______ **1781 – 1784**

Redox-Controlled Selectivity of C–H Activation in the Oxidative Cross-Coupling of Arenes

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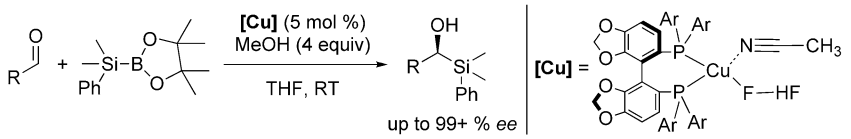

How to train your silane: A new family of chiral copper(I) complexes that bear a bifluoride counteranion were prepared and used in the first example of the enantioselective transfer of a silyl group to an aldehyde. This procedure provides fast access to non-racemic α-hydroxysilanes in high enantioselectivities.

Enantioselective Silylation

V. Cirriez, C. Rasson, T. Hermant, J. Petrignet, J. Díaz Álvarez, K. Robeyns, O. Riant* ______ **1785 – 1788**

Copper-Catalyzed Addition of Nucleophilic Silicon to Aldehydes

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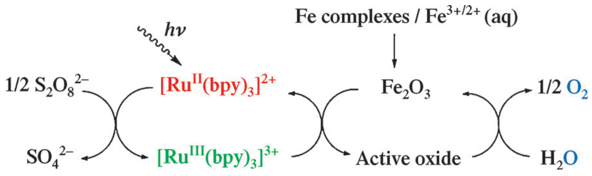


Ironing out a solution: Chemical and visible-light-driven water oxidation by iron complexes and iron salts at pH 7–9 has been investigated. The iron complexes and salts act as precatalysts (see scheme) to produce α-Fe_2O_3 nanoparticles that are the real catalyst for the water oxidation with a turnover number over 1000.

Water Oxidation

VIP

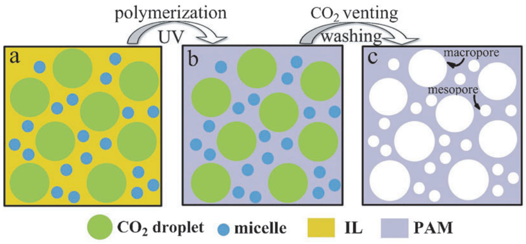
G. Chen, L. Chen, S. M. Ng, W. L. Man, T. C. Lau* ______ **1789 – 1791**

Chemical and Visible-Light-Driven Water Oxidation by Iron Complexes at pH 7–9: Evidence for Dual-Active Intermediates in Iron-Catalyzed Water Oxidation

Heterogeneous Catalysis

L. Peng, J. Zhang,* J. Li, B. Han, Z. M. Xue, G. Yang ________ 1792 – 1795

Macro- and Mesoporous Polymers Synthesized by a CO_2-in-Ionic Liquid Emulsion-Templating Route

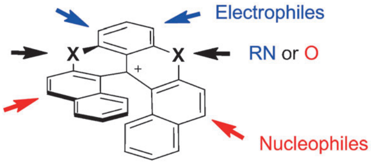


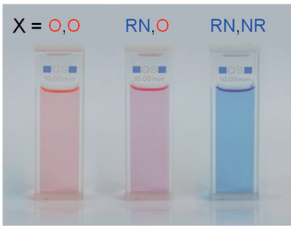
Poring over polymers: Highly porous polymers with hierarchical macro- and mesoporous structures were synthesized by using the title method and UV radiation. The porosity properties of the polymers can be easily tuned by controlling the CO_2 pressure used, and the polymers have potential applications in catalysis. IL = ionic liquid, PAM = polyacrylamide.

Helicenes

F. Torricelli, J. Bosson, C. Besnard, M. Chekini, T. Bürgi, J. Lacour* ________ 1796 – 1800

Modular Synthesis, Orthogonal Post-Functionalization, Absorption, and Chiroptical Properties of Cationic [6]Helicenes





Pick and choose: Novel cationic diaza-, azaoxo-, and dioxo[6]helicenes are readily prepared and functionalized selectively by orthogonal aromatic electrophilic and vicarious nucleophilic substitutions (see scheme). Reductions, cross-coupling, or condensation reactions introduce additional diversity and allow tuning of the absorption properties up to the near-infrared region. The diaza salts can be resolved into single enantiomers.

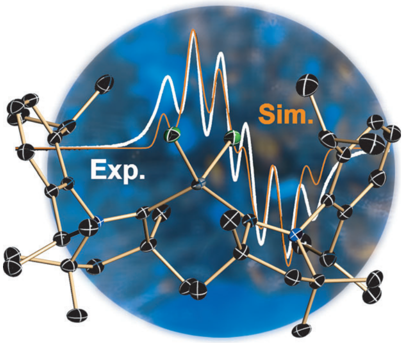
Biradicals

K. C. Mondal, H. W. Roesky,* M. C. Schwarzer, G. Frenking,* I. Tkach,* H. Wolf, D. Kratzert, R. Herbst-Irmer, B. Niepötter, D. Stalke* ____ 1801 – 1805

Conversion of a Singlet Silylene to a stable Biradical

Back Cover

Silicon becomes colored: Stable biradicals were prepared from an N-heterocyclic carbene stabilized $SiCl_2$ and a cyclic alkyl(amino)carbene, and characterized as two polymorphs. The deep-blue crystals of one polymorph are stable upon exposure to air for about a week, while the solution in THF decomposes rapidly when exposed to air. In a side reaction, the different carbene species react with each other under C–H activation and C–C bond formation in the presence of the biradical.



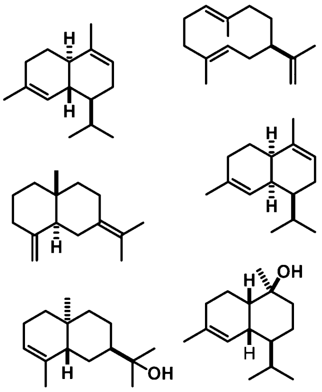
Hydroaminoalkylation

J. Dörfler, S. Doye* ________ 1806 – 1809

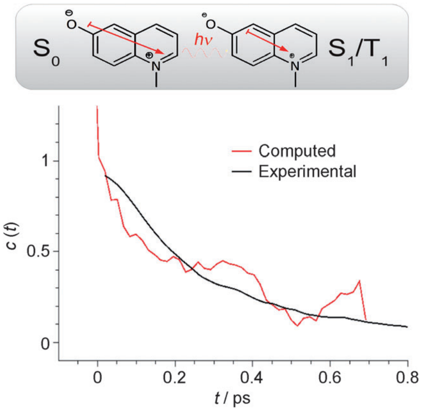
Aminopyridinato Titanium Catalysts for the Hydroaminoalkylation of Alkenes and Styrenes

The linear product is formed as the major product when in situ generated titanium complexes with aminopyridinato ligands are used as catalysts for hydroaminoalkylation reactions of styrenes (see scheme). The reaction is not limited to the use of *N*-methylanilines and for the first time can be performed with *N*-alkylanilines bearing alkyl groups larger than methyl, or even with dialkylamines. The best selectivities in favor of a linear product are better than 90:10.

Modern sequencing techniques deliver more and more genetic information about bacterial terpene cyclases. Chemical characterization of these enzymes must stay up to date with these developments. For this purpose a rapid and efficient method for the characterization of bacterial terpene cyclases by heterologous expression in *E. coli* and direct headspace analysis was developed. The products of six bacterial terpene cyclases have been identified (see structures).

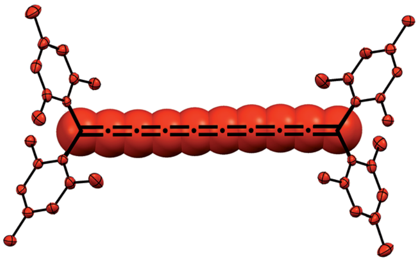


Terpene Biosynthesis



Beyond bulk dielectric relaxation: The experimentally observed time-dependent Stokes shift of a molecular probe (MQ) can be explained by molecular dynamics simulations in combination with DFT calculations. Decomposition of the MD trajectories shows that an important contribution to the time-dependent Stokes shift originates from a group of water molecules that strongly interact with the molecular dipole of MQ.

Molecular Dynamics Simulations



BLA = 0? Not so fast! A series of tetraarylcumulenes up to the length of a [9]cumulene has been synthesized and analyzed by X-ray crystallography. The structural data show a distinct reduction in bond-length alternation (BLA) as a function of molecule length, but this trend appears to reach a limit before a cumulenic structure with BLA = 0 is achieved.

Cumulenes

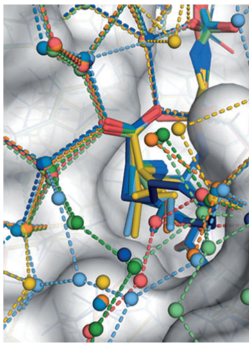
Front Cover

Protein–Ligand Complexes

A. Biela, N. N. Nasief, M. Betz, A. Heine, D. Hangauer,* G. Klebe* ___ 1822 – 1828

Dissecting the Hydrophobic Effect on the Molecular Level: The Role of Water, Enthalpy, and Entropy in Ligand Binding to Thermolysin

The hydrophobic effect is associated with the successive replacement of water molecules in the binding site of a protein by hydrophobic groups of the ligand. Although the hydrophobic effect is assumed to be entropy-driven, large changes in enthalpy and entropy are observed with the model system thermolysin. Structural changes in the binding features of the water molecules ultimately determine the thermodynamics of the hydrophobic effect.

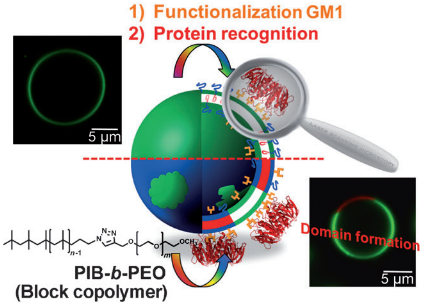


Hybrid Vesicles

M. Schulz, S. Werner, K. Bacia,* W. H. Binder* ___ 1829 – 1833

Controlling Molecular Recognition with Lipid/Polymer Domains in Vesicle Membranes

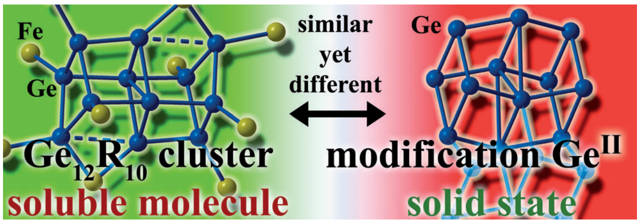
The molecular recognition between cholera toxin B and GM1-functionalized phospholipid/block copolymer hybrid membranes can be controlled by varying the lipid/block copolymer composition. Confocal laser scanning microscopy and fluorescence correlation spectroscopy were used to study the protein–receptor interaction and dynamic processes in the membrane.



Main-Group Chemistry

C. Schenk, F. Henke, A. Schnepf* ___ 1834 – 1838

$[Ge_{12}\{FeCp(CO)_2\}_8\{FeCp(CO)\}_2]$: A Ge_{12} Core Resembles the Arrangement of the High-Pressure Modification Germanium (II)



Similar yet different: The reaction of a GeBr solution with $K[FeCp(CO)_2]$ ($Cp = \eta\text{-}C_5H_5$) gives $[Ge_{12}\{FeCp(CO)_2\}_8\{FeCp(CO)\}_2]$ (**1**), whose oblong, highly cross-linked cluster core reveals a cut-out of the high-pressure solid-state structure of germanium (II) (see scheme). Mass spectrometric investigations on the gas-phase species $[Ge_6\{FeCp(CO)_2\}_6\{FeCp(CO)\}]^-$ (**2**) and theoretical calculations on **1** and **2** illuminate the formation of the metalloid cluster **1**.

Supporting information is available on www.angewandte.org (see article for access details).

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