



The following Communications have been judged by at least two referees to be “very important papers” and will be published online at www.angewandte.org soon:

K. Tedsree, A. T. Kong, S. C. Tsang*

Formate as a Surface Probe for Ru Nanoparticles in Liquid ^{13}C NMR Spectroscopy

A. Asati, S. Santra, C. Kaittanis, S. Nath, J. M. Perez*

Oxidase Activity of Polymer-Coated Cerium Oxide Nanoparticles

K. M. Gericke, D. I. Chai, N. Bieler, M. Lautens*

The Norbornene Shuttle: Multicomponent Domino Synthesis of Tetrasubstituted Helical Alkenes through Multiple C–H Functionalization

J.-Q. Wang, S. Stegmaier, T. F. Fässler*

$[\text{Co}@\text{Ge}_{10}]^{3-}$: An Intermetalloid Cluster with an Archimedean Pentagonal Prismatic Structure

News

Organic Chemistry:

A. Pfaltz Awarded _____ 844

Molecular Recognition:

J. Rebek Honored _____ 844

Inorganic Chemistry:

Prize to H. Braunschweig _____ 844

Author Profile

Christopher C. Cummins

_____ 845

Books

The Chemistry of Fungi

James R. Hanson

reviewed by P. Spiteller _____ 846

Handbook of Biomineralization

Edmund Bäuerlein, Peter Behrens,
Matthias Eppler

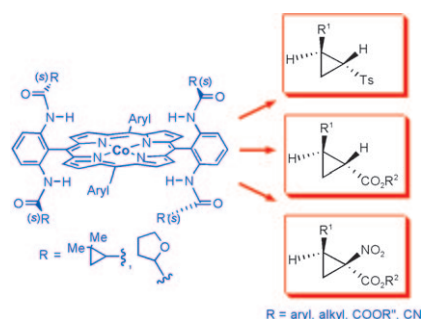
reviewed by L. Addadi _____ 847

Highlights

Asymmetric Catalysis

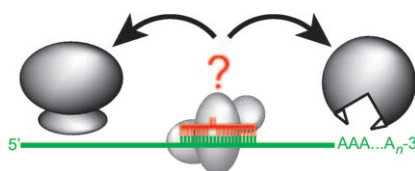
M. P. Doyle* _____ 850–852

Exceptional Selectivity in
Cyclopropanation Reactions Catalyzed by
Chiral Cobalt(II)–Porphyrin Catalysts



Toss the olefin into the porphyrin: The development of chiral cobalt(II)–porphyrin catalysts by straightforward coupling processes has made possible the additions of diazocarbonyl compounds to a broad spectrum of olefins to access functionalized cyclopropanes. The cyclopropanation reactions demonstrate high product yields, exceptional diastereoselectivity, and excellent enantiocontrol.

Inhibition or degradation? MicroRNAs have been considered primarily as inhibitors of translation, even though degradation of mRNAs also plays a role in their repressive potential. Two research groups have now quantified the extent to which each mechanism contributes to gene regulation by combining mass spectrometry with transcriptome profiling. The surprising conclusion is that translational inhibition plays only a minor role!



MicroRNA

S. Esslinger, K. Förstemann* _ 853–855

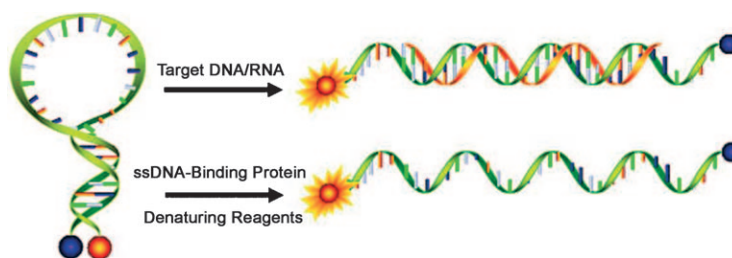
MicroRNAs Repress Mainly through
mRNA Decay

Minireviews

Bioanalysis

K. Wang,* Z. Tang, C. J. Yang, Y. Kim,
X. Fang, W. Li, Y. Wu, C. D. Medley, Z. Cao,
J. Li, P. Colon, H. Lin, W. Tan* **856–870**

Molecular Engineering of DNA: Molecular
Beacons



A spotlight on light signaling: Molecular beacons are specifically designed DNA hairpin structures (see picture) used as fluorescent probes for numerous bioanalytical applications, including gene detec-

tion, the monitoring of messenger RNA (mRNA), and biosensing. Recent studies have led to versatile strategies for the targeted optimization of molecular beacons. ssDNA = single-stranded DNA.

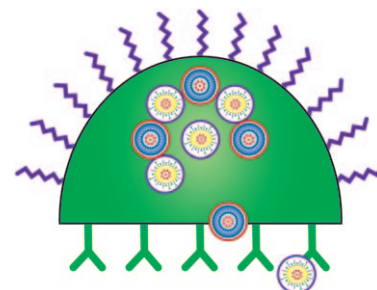
Reviews

Diagnostics and Drug Delivery

K. Riehemann,* S. W. Schneider,
T. A. Luger, B. Godin, M. Ferrari,
H. Fuchs* **872–897**

Nanomedicine—Challenge and
Perspectives

Future of nanomedicine: Multiple functions can be integrated into nanoparticle systems for drug delivery. The schematic representation of a third-generation nanovector illustrates this: On the outside are recognition units to interact with target cells and biological barriers, while inside are drug-loaded nanoparticles, which leave the vector at the correct moment and release their load.

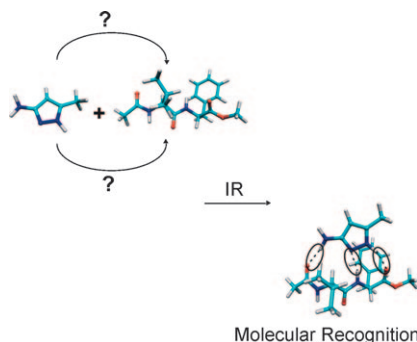


Communications

Gas-Phase Reactions

H. Fricke, A. Gerlach, C. Unterberg,
M. Wehner, T. Schrader,
M. Gerhards* **900–904**

Interactions of Small Protected Peptides
with Aminopyrazole Derivatives: The
Efficiency of Blocking a β -Sheet Model in
the Gas Phase



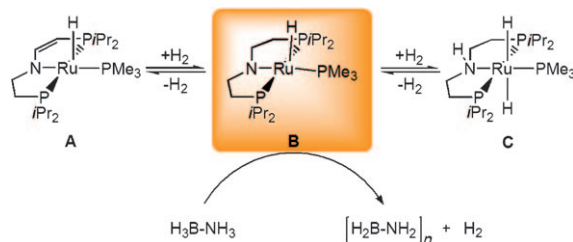
Binding motifs of aminopyrazole derivatives with different peptides in the gas phase are investigated by using mass- and isomer-selective IR/UV spectroscopy. The efficiency of blocking a β -sheet model is determined by analyzing the number and strength of hydrogen bonds (see picture). The investigations yield information on intrinsic molecular properties of beginning aggregation behavior, as might also occur in misfolding diseases.

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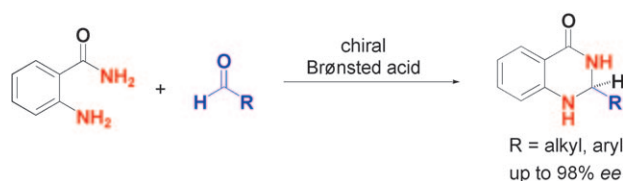
G“Ru”vy reactivity: The new ruthenium(II) complex having cooperative PNP enamido ligand **A** reversibly activates two equivalents H_2 under reversible hydroge-

nation of amido (**B**) and amino (**C**) complexes. **B** exhibits the highest reported activities in the dehydrocoupling of ammonia–borane.

Ammonia–Borane Dehydrogenation

M. Käß, A. Friedrich, M. Drees,
S. Schneider* 905–907

Ruthenium Complexes with Cooperative PNP Ligands: Bifunctional Catalysts for the Dehydrogenation of Ammonia–Borane



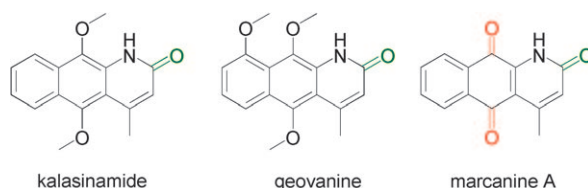
Surprisingly straightforward: A metal-free, highly enantioselective Brønsted acid catalyzed condensation/addition reaction has been developed for the construction of 2,3-dihydroquinazolinones starting from 2-aminobenzamide and aldehydes

(see scheme). This efficient approach provides 2,3-dihydroquinazolinones with a strong preference for the *S* enantiomers, which have higher biological activities than the *R* enantiomers.

Asymmetric Synthesis

M. Rueping,* A. P. Antonchick,
E. Sugiono, K. Grenader 908–910

Asymmetric Brønsted Acid Catalysis: Catalytic Enantioselective Synthesis of Highly Biologically Active Dihydroquinazolinones



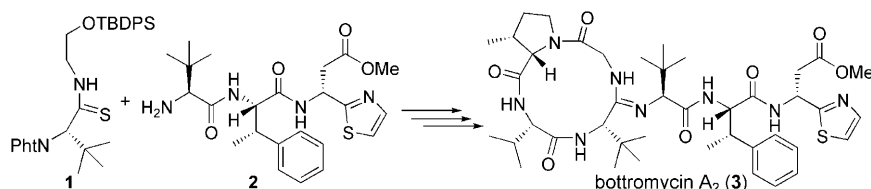
Two novel synthetic strategies were developed for the natural products geovanine, marcanine A, and kalasinamide. The nine-step synthesis of geovanine marks its first total synthesis. The three

compounds are known for their antimalarial and antitumor activity, and tests confirmed the high cytotoxicity of marcanine A.

Azaanthracenones

S. Lang, U. Groth* 911–913

Total Syntheses of Cytotoxic, Naturally Occurring Kalasinamide, Geovanine, and Marcanine A



After 50 years of persistence the 12-membered cyclic skeleton of bottromycin A_2 (**3**) has been confirmed by NMR experiments (HMBC), and the configurations of two tLeu residues have been

estimated by conformation analysis and NMR experiments. Furthermore, the key step in the synthesis of **3** involves the mercury-mediated formation of the amine of thioamide **1** and amine **2**.

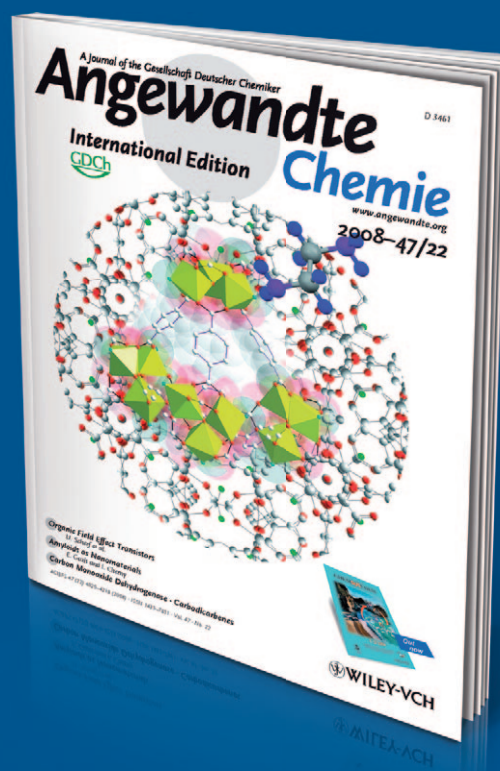
Natural Products

H. Shimamura, H. Gouda, K. Nagai,
T. Hirose, M. Ichioka, Y. Furuya,
Y. Kobayashi, S. Hirono, T. Sunazuka,*
S. Ōmura* 914–917

Structure Determination and Total Synthesis of Bottromycin A_2 : A Potent Antibiotic against MRSA and VRE



Incredibly INTERNATIONAL



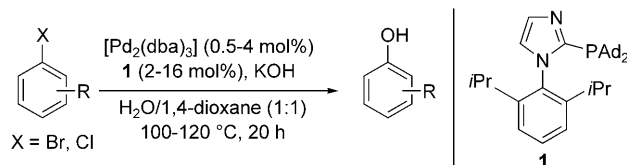
Although *Angewandte Chemie* is owned by the German Chemical Society (Gesellschaft Deutscher Chemiker, GDCh) and is published by Wiley-VCH in a charming small town in southwest Germany, it is international in every other respect. Authors and referees from around the globe contribute to its success. Most of the articles are submitted from China, USA, and Japan - only then comes Germany. Most of the referee reports come from Germany and the USA, but Japan and Western Europe are also well represented.



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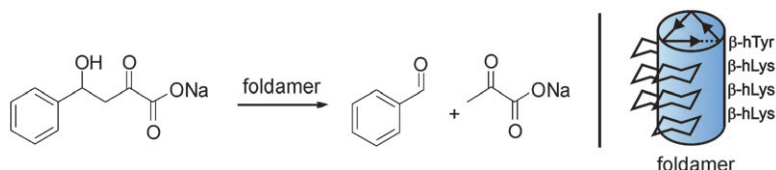
The phenol countdown: Novel imidazole-based phosphine ligands are synthesized on scales up to 100 g by a convenient lithiation–phosphorylation method. The phosphines are stable towards air and

moisture and are successfully applied as ligands in the palladium-catalyzed selective hydroxylation of aryl halides (see scheme, dba = dibenzylideneacetone).

Synthetic Methods

T. Schulz, C. Torborg, B. Schöffner, J. Huang, A. Zapf, R. Kadyrov, A. Börner, M. Beller* **918–921**

Practical Imidazole-Based Phosphine Ligands for Selective Palladium-Catalyzed Hydroxylation of Aryl Halides



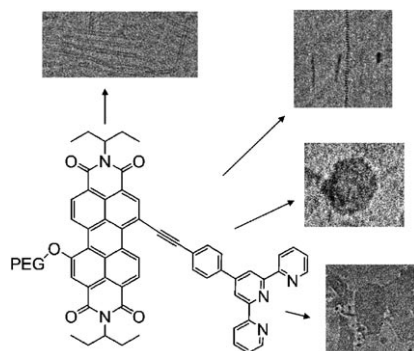
Neatly folded: A decameric β -peptide shows enzyme-like catalytic properties. The foldamer, which bears a terminal heptanoyl unit and displays a thermo-stable helical structure with an array of

ammonium-group side chains, accelerates a retroaldol reaction (see scheme) by more than three orders of magnitude through an imine mechanism.

Catalytic Foldamers

M. M. Müller, M. A. Windsor, W. C. Pomerantz, S. H. Gellman,* D. Hilvert* **922–925**

A Rationally Designed Aldolase Foldamer

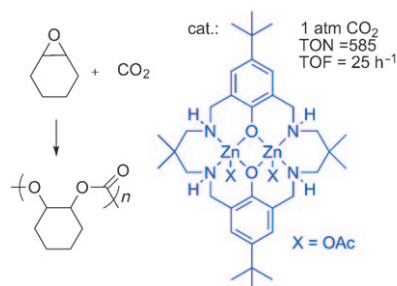


Four from one: Nanoscale ribbons, tubes, vesicles, and platelets can be formed from the self-assembly of a single covalent unit, which is based on an amphiphilic perylene diimide functionalized with a terpyridine ligand (see picture). The assembly diversity arises from the encoding of multiple inputs through hydrophobic interactions and metal coordination.

Self-Assembly

G. Golubkov, H. Weissman, E. Shirman, S. G. Wolf, I. Pinkas, B. Rybtchinski* **926–930**

Economical Design in Noncovalent Nanoscale Synthesis: Diverse Photofunctional Nanostructures Based on a Single Covalent Building Block



Low-pressure catalyst: A novel dizinc complex (**1**) having a macrocyclic ancillary ligand shows remarkable activity for the copolymerization of carbon dioxide and cyclohexene oxide, at only one atmosphere of CO_2 . TON = turnover number; TOF = turnover frequency.

Homogeneous Catalysis

M. R. Kemper, P. D. Knight, P. T. R. Reung, C. K. Williams* **931–933**

Highly Active Dizinc Catalyst for the Copolymerization of Carbon Dioxide and Cyclohexene Oxide at One Atmosphere Pressure

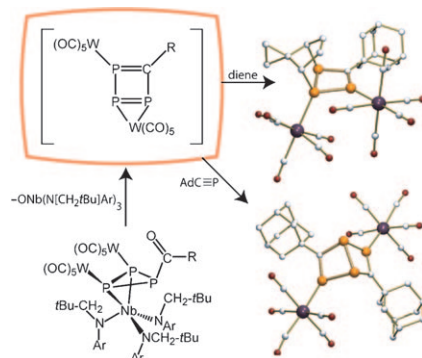


Phosphorus Chemistry

N. A. Piro, C. C. Cummins* — 934–938



Tetraphosphabenzenes Obtained via a Triphosphacyclobutadiene Intermediate



An acyl triphosphirene ligand transfers an O atom to Nb to liberate the putative triphosphacyclobutadiene intermediate $[RCP_3\{W(CO)_5\}_2]$, which engages in [2+4]-cycloaddition reactions with an organic diene and a phosphalkyne (see scheme; P orange, O red, W violet, C white). The latter reaction yields the Dewar isomer of a tetraphosphabenzene, which can be converted to a tetraphosphabenzvalene containing a Z-diphosphene.

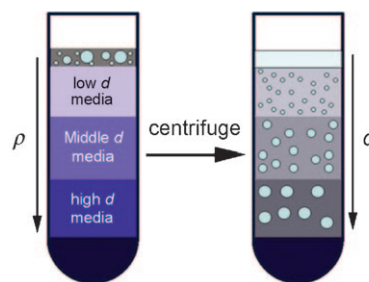
Nanocrystal Separation

X. M. Sun, S. M. Tabakman, W. S. Seo, L. Zhang, G. Y. Zhang, S. Sherlock, L. Bai, H. J. Dai* — 939–942



Separation of Nanoparticles in a Density Gradient: FeCo@C and Gold Nanocrystals

The right sort: A post-synthesis, liquid-phase separation method sorts nanoparticles by centrifugation in a medium with a density gradient. The particles are sorted according to particle size, clustering degree, and core density ρ (see picture; d = sedimentation distance). Solid–solid interactions between colloidal particles and stable phases are thus avoided. This versatile method allows for determination of the colloid size distribution in a suspension.

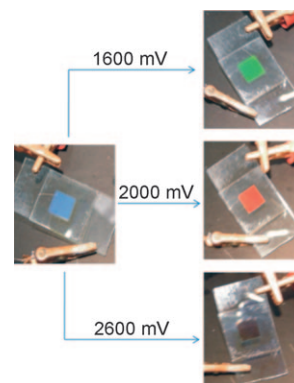


Photonic Crystals

D. P. Puzzo, A. C. Arsenault, I. Manners,* G. A. Ozin* — 943–947

Electroactive Inverse Opal: A Single Material for All Colors

I see the light: When an electroactive inverse polymer-gel opal is electrochemically oxidized and reduced, the lattice swells and shrinks, respectively. Concomitantly the wavelength of brightly diffracted light can be altered all the way from the ultraviolet through the visible to the near infrared (see picture).

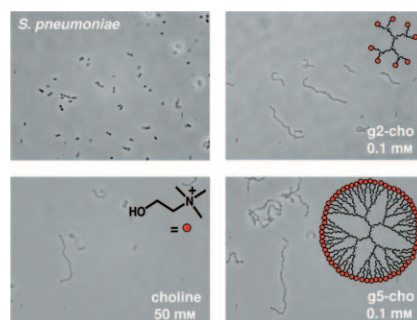


Antimicrobial Agents

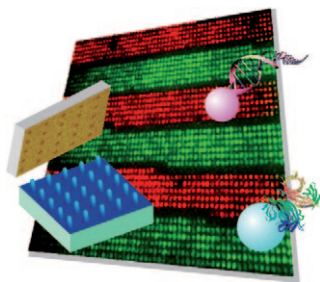
V. M. Hernández-Rocamora, B. Maestro, B. de Waal, M. Morales, P. García, E. W. Meijer, M. Merx,* J. M. Sanz* — 948–951



Multivalent Choline Dendrimers as Potent Inhibitors of Pneumococcal Cell-Wall Hydrolysis



Dendritic cell-wall mimics: Choline-binding proteins from *Streptococcus pneumoniae* recognize distinctive multivalent choline architectures on the bacterial cell wall. Choline-functionalized dendrimers are potent inhibitors of these essential enzymes, with a 10^3 – 10^4 -fold higher affinity than free choline, resulting in inhibition of autolysis and cell separation in bacterial cultures at low micromolar concentrations (see picture).



Paint by number? Magnetic nanoparticles (MNPs) coated with distinct biomolecules (see picture) can be assembled onto nanoelectrodes on a template under the control of magnetic and electric fields. The MNP–biomolecule conjugates can then be transferred from the template to a biocompatible polymer substrate. Arbitrary nanopatterns can be fabricated by the magnetic electric lithography process over a large area with a resolution down to 10 nm.

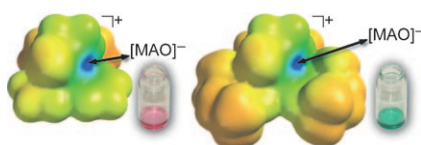
Biomolecular Nanopatterning

Z. Gu,* S. Huang, Y. Chen* — 952–955

Biomolecular Nanopatterning by Magnetic Electric Lithography



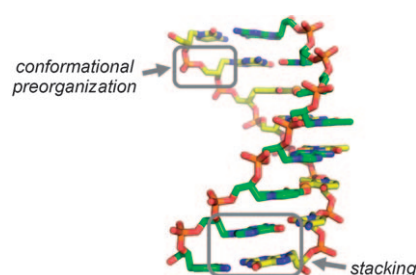
Big is beautiful: Activation of fluorenyl-based zirconocenes with methylaluminoxane (MAO) effects a red shift in the visible λ_{max} proportional to the size of the metallocene (see potential energy surfaces in picture). Polymerization activities correlate directly with color (λ_{max}), suggesting that bulky zirconocenium catalysts are weakly coordinating cations which, like weakly coordinating anions, diminish cation–anion interactions.



Cation–Anion Interactions

C. J. Price, H.-Y. Chen, L. M. Launer, S. A. Miller* — 956–959

Weakly Coordinating Cations as Alternatives to Weakly Coordinating Anions



A preorganized zipper: The entropic penalty for duplex formation is significantly smaller for the backbone-simplified nucleic acid analogue GNA (glycol nucleic acid) than for DNA. This finding is consistent with a conformational preorganization of the single strands in combination with especially favorable stacking interactions in the corresponding GNA duplex (see picture).

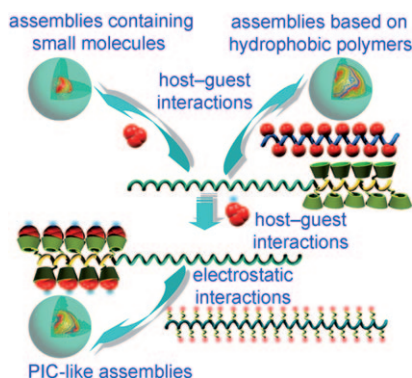
Duplex Structures

M. K. Schlegel, X. Xie, L. Zhang, E. Meggers* — 960–963

Insight into the High Duplex Stability of the Simplified Nucleic Acid GNA



First class delivery: Core–shell structured nanoassemblies could be constructed from a hydrophilic–hydrophilic block copolymer with one block containing β -cyclodextrin in the presence of hydrophobic guest compounds (see picture). The polymer can host various guest molecules, while the difference in sensitivity can be utilized to regulate release rate. By selecting appropriate guests, polyion complex (PIC) micelles could also be assembled.



Supramolecular Chemistry

J. X. Zhang, P. X. Ma* — 964–968

Polymeric Core–Shell Assemblies Mediated by Host–Guest Interactions: Versatile Nanocarriers for Drug Delivery

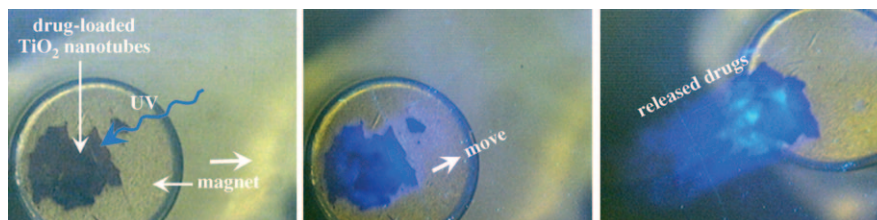


Photoinduced Drug Release

N. K. Shrestha, J. M. Macak,
F. Schmidt-Stein, R. Hahn, C. T. Mierke,
B. Fabry, P. Schmuki* — 969–972



Magnetically Guided Titania Nanotubes for Site-Selective Photocatalysis and Drug Release



Quick release: The spatial and temporal delivery of active molecules (dyes or drugs) can be precisely controlled by the photocatalytic activity of TiO_2 nanotubes (see picture). The cleavage of the link between the active molecule and the

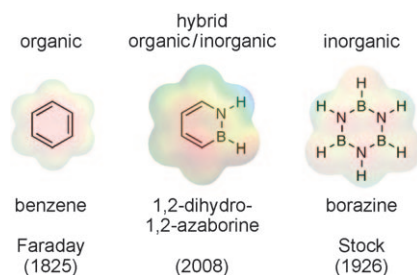
nanotubes, which are filled with magnetic Fe_3O_4 nanoparticles, occurs by photoinduced chain scission under UV light; the load can be released before photodegradation by action of photogenerated radicals can occur.

Boron Heterocycles

A. J. V. Marwitz, M. H. Matus,
L. N. Zakharov, D. A. Dixon,*
S.-Y. Liu* — 973–977



A Hybrid Organic/Inorganic Benzene



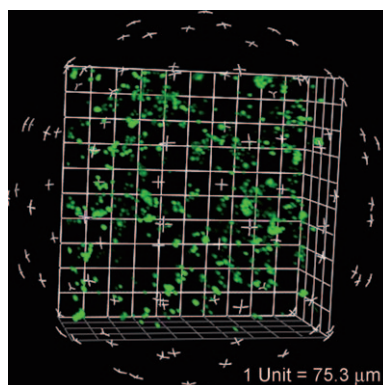
It isn't easy BN aromatic! 1,2-Dihydro-1,2-azaborine, a hybrid organic/inorganic benzene, is a stable aromatic molecule with features that are distinct from its isoelectronic “organic” (benzene) and “inorganic” (borazine) counterparts. Experimental structural, spectroscopic, and chemical data are fully supported by high-level calculations.

Hydrogel Materials

F. Khan, R. S. Tare, R. O. C. Oreffo,
M. Bradley* — 978–982



Versatile Biocompatible Polymer Hydrogels: Scaffolds for Cell Growth



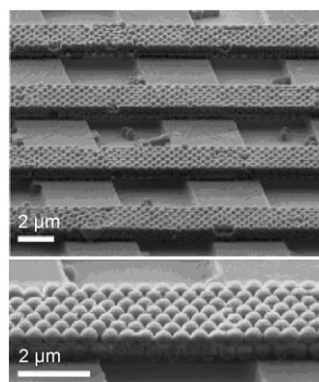
Gelling together: A three-dimensional, biocompatible hydrogel (see picture) was generated by combining two cationic polymers, chitosan and poly(ethylenimine). The hydrogels were stable under cell-culture conditions and facilitated cell proliferation, yet prevented dedifferentiation of primary human skeletal cells into fibroblasts. A variety of materials such as DNA, proteins, and peptides can be stably incorporated into the gel network.

Surface Assemblies

X. Y. Ling, I. Y. Phang, W. Maijenburg,
H. Schönherr, D. N. Reinhoudt,
G. J. Vancso, J. Huskens* — 983–987



Free-Standing 3D Supramolecular Hybrid Particle Structures



Make a stand: The formation of stable and ordered free-standing particle bridges and hollow capsule structures with controllable sizes and geometries is demonstrated by combining the directed assembly of submicrometer particles, transfer printing, and supramolecular layer-by-layer assembly.



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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