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:

Author Profile

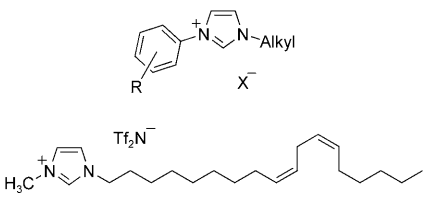
"When I was eighteen I wanted to o play football for Scotland. The greatest scientific advance of the last 50 years is the way biology is becoming a molecular science (chemistry) …"
This and more about David O'Hagan can be found on page 5604.

Books

Obituary

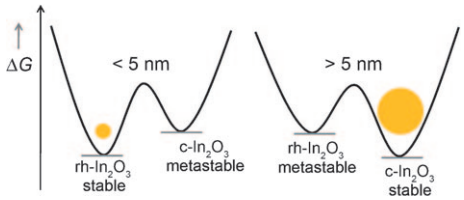
Highlights

Melting without heat: Attempts to design new ionic liquids (often functionalized) often lead to only "ionic solids". Two recent studies demonstrate very promising and viable ways to "liquify" systems that are based on the common structural motifs that still dominate the literature (see picture; Tf_2N^- = bis(trifluoromethylsulfonyl)imide.



Ionic Liquids

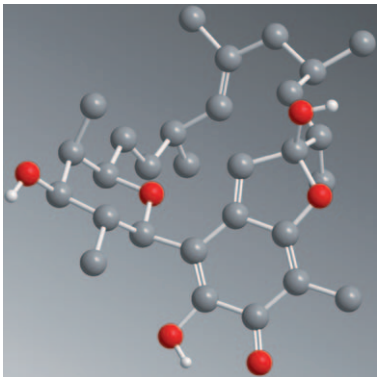
Contents



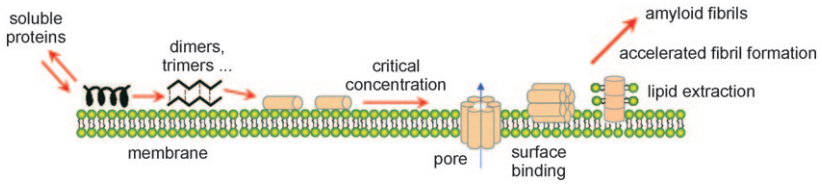
Size matters: Both high-pressure and nanoscale syntheses can lead to the same indium oxide polymorph. Recent work by Farvid et al. provide an explanation: metastable high-pressure rh-In_2O_3 is stabilized by surface forces in nanoscale particles, whereas in larger particles only the stable cubic c-In_2O_3 polymorph exists; this is evident in the energy diagrams.

Minireviews

The 'ansa' my friend: Kendomycin (see structure; O red, C gray) is a carbacyclic ansa compound having unusual structural features and extremely diverse biological activity. This Minireview provides a chronological and comprehensive portrayal of the synthetic work on the synthesis of the title compound from eight research groups. Thus far, five total syntheses and a number of fragment syntheses have been reported.



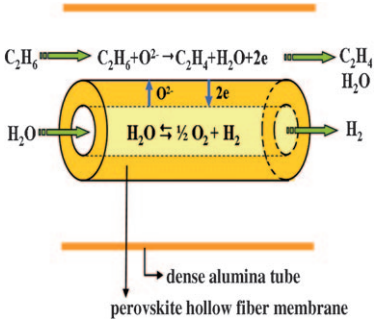
Reviews



Mutual disruption: Model systems have been used to investigate the mechanisms by which membrane surfaces influence the folding, oligomerization, and fibril formation of amyloidogenic proteins, and by which these oligomeric protein structures in turn disrupt membrane structural integrity (see picture). These studies have uncovered a number of key mechanistic features that contribute to cytotoxicity.

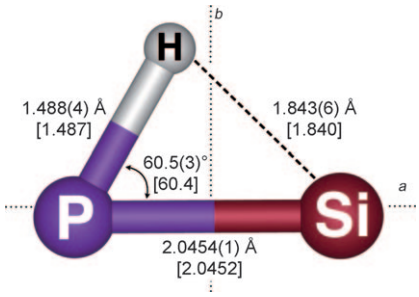
For the USA and Canada:
ANGEWANDTE CHEMIE International Edition (ISSN 1433-7851) is published weekly by Wiley-VCH, PO Box 191161, 69451 Weinheim, Germany. Air freight and mailing in the USA by Publications Expediting Inc., 200 Meacham Ave., Elmont, NY 11003. Periodicals postage paid at Jamaica, NY 11431. US POSTMASTER: send address changes to *Angewandte Chemie*, Journal Customer Services, John Wiley & Sons Inc., 350 Main St., Malden, MA 02148-5020. Annual subscription price for institutions: US$ 9442/8583 (valid for print and electronic / print or electronic delivery); for individuals who are personal members of a national chemical society prices are available on request. Postage and handling charges included. All prices are subject to local VAT/sales tax.

Communications



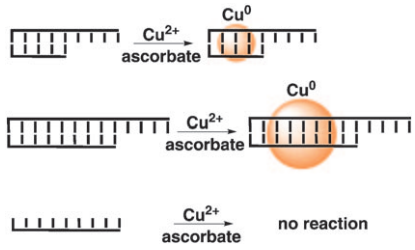
Burns at both ends: By coupling water splitting and ethane dehydrogenation in a perovskite (BCFZ; $BaCo_xFe_yZr_{1-x-y}O_{3-\delta}$) oxygen-permeable membrane reactor, hydrogen from water splitting was obtained on one side of the membrane, and ethylene was produced simultaneously on the other.

Water Splitting



Curiouser and curiouser: By combining high-resolution molecular spectroscopy in the centimeter and millimeter wave regions, and high-level coupled-cluster quantum-chemical calculations, the structure of the HPSi molecule has been determined. The bridged geometry of HPSi is in remarkable contrast to that of the C and/or N analogues, such as HCN/HNC, HCP, and HNSi, which are all linear.

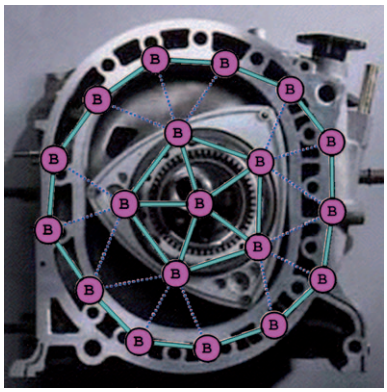
"Heavy" Hydrogen Cyanide



A helping strand: A method to selectively form copper nanoparticles in solution using double-stranded DNA has been developed. The size of the nanoparticles is controlled by the length of the dsDNA template, and single-stranded DNA did not act as a template (see scheme). Single-stranded overhangs in dsDNA were used to prepare a nanostructure in which two metallized dsDNA segments were linked together by a nonmetallized rigid linker.

DNA Nanofunctional Units

The magic roundabout: The B_{19}^- cluster behaves like a molecular Wankel engine (see picture) in which the two concentric boron rings rotate in opposite directions. During the rotation the cluster remains planar owing to a marginal rotational energy barrier.



Boron Chemistry

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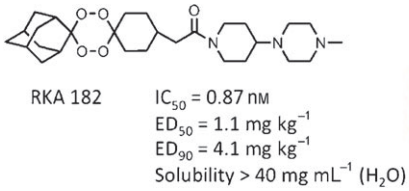
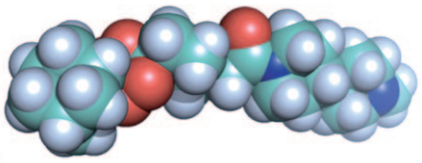
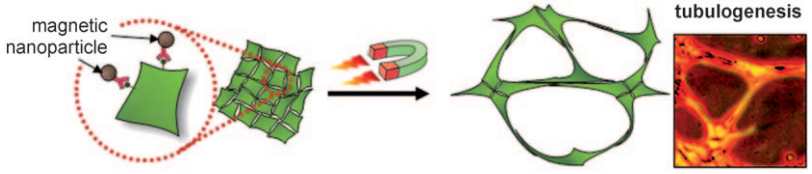




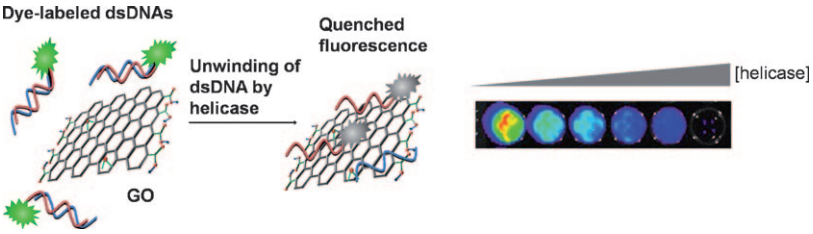
Fighting drug resistence: From a library of over 150 1,2,4,5-tetraoxanes, the candidate RKA182 was selected for preclinical development as an antimalarial agent. RKA182 has outstanding in vitro activity against resistant strains of *P. falciparum* and retains this level of activity against southeast asian isolates that failed artemisinin-based combination therapy.

Antimalarial Agents



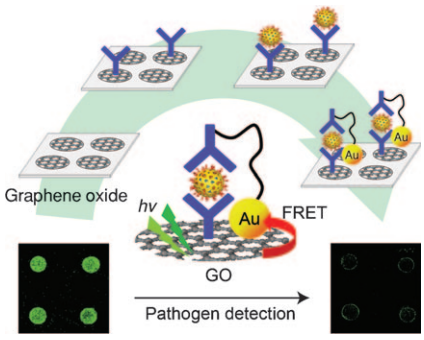
Magnetic attraction: Artificial control of cell activities is achieved by nanoscale magneto-activated cellular signaling (N-MACS), in which magnetic nanoparticles are selectively linked to cell surface receptors and aggregated by an external magnetic field. Such mechanocellular activation induces downstream cell signaling and initiates tubulogenesis in the preangiogenesis stage of endothelial cells (see picture).

Cellular Signaling



Time to unwind: Graphene oxide (GO) enables the quantitative measurement of helicase-dependent double-stranded DNA (dsDNA) unwinding activity in real time. GO selectively binds to unwound fluorescent-dye-labeled single-stranded DNA and quenches its fluorescence (see picture). The helicase activity is monitored by following the change in fluorescence.

DNA Unwinding



Don't FRET when I GO: Sensitive and selective rotavirus detection is achieved by using the photoluminescence of a graphene oxide (GO) array. The target cell was captured by the rotavirus-specific antibody immobilized on the GO array, and the binding event was monitored by observing the fluorescence quenching that results from fluorescence resonance energy transfer (FRET) between GO and gold nanoparticles linked to the antibodies (see picture).

Biosensors

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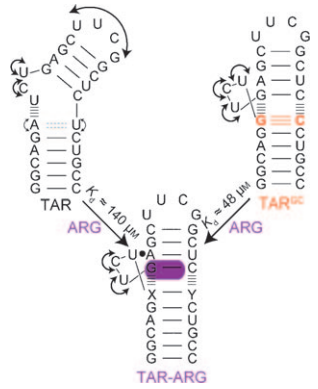
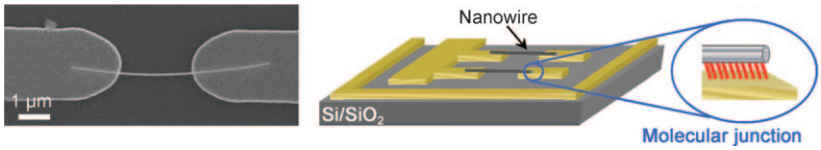


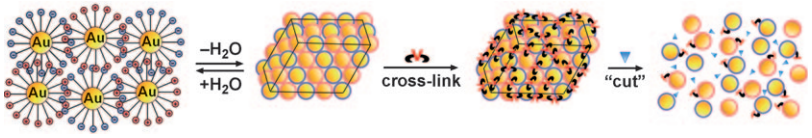
Window of opportunity: Using a single A-U to G-C mutation, the local and global dynamic characteristics of the transactivation response element (TAR) RNA was rationally altered over timescales extending up to milliseconds. This procedure allows it to mimic its bound state with the ligand argininamide (ARG). The mutant binds ARG with slightly enhanced affinity using a conformation indistinguishable from the wild-type sequence.

RNA Dynamics



Tunneling to freedom: Plasmons induced by laser irradiation influence the conductivity of a "suspended-wire" molecular junction (see picture). The current enhancement appears to be wavelength- and laser-power-dependent, and is in semi-quantitative agreement with theoretical models based on a photon-assisted tunneling mechanism.

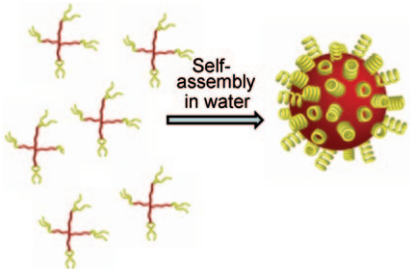
Plasmons



Seeing is believing: Nanoparticle crystals and core–shell crystals detect and amplify the presence of chemical and enzymatic analytes. These crystals are made insoluble in water by cross-linking their surface with dithiols incorporating analyte-specific groups. Upon addition of an analyte, these groups are cut, and the "punctured" crystals liberate millions of individual, brightly colored NPs (see picture).

Nanotechnology

Special delivery: An effective group A streptococci vaccine is formed from a delivery device consisting of well-defined dendritic structures with nanoscale dimensions (see picture). The structures are designed to display multiple copies of the minimal B-cell epitopes, which were in the optimal conformation on the surface of the nanoparticles. The nanoparticles can be administered without the aid of an adjuvant.



Drug Delivery

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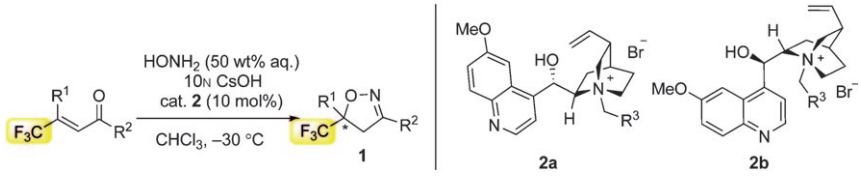
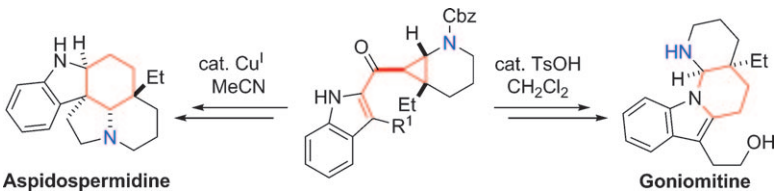


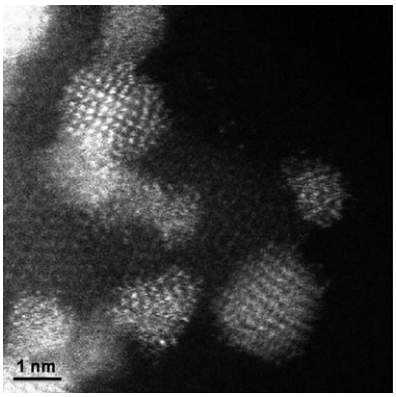
Cuts both ways: The title reaction consists of an addition/cyclization/dehydration sequence and affords the biologically important chiral 3,5-diaryl-5-(trifluoromethyl)-2-isoxazolines **1** in excellent yields with high *ee* values. The flexibility of accessing either the *S* or *R* enantiomers of the products has been achieved by the appropriate choice of phase-transfer catalyst (**2**).

Organocatalysis



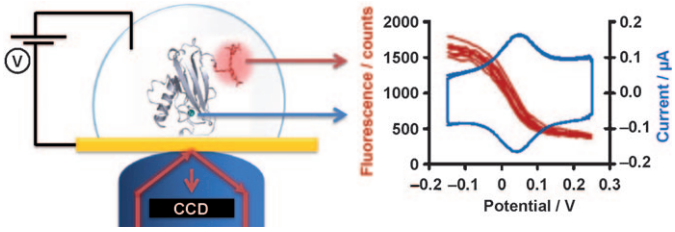
Mild control: Selective cyclization of aminocyclopropanes at either the N1 or C3 position of an indole ring was achieved by tuning the reaction conditions (see scheme). This strategy was applied to the formal synthesis of aspidospermidine and the total synthesis of goniomitine, which demonstrated significant cytotoxicity against several tumor cell lines (IC_{50} = 150–400 nM). Cbz = benzyloxycarbonyl, Ts = 4-toluenesulfonyl.

Alkaloids



The shape of gold: The title catalyst has been prepared through a colloidal deposition method. Scanning transmission electron microscopy studies confirmed that for the catalyst, gold clusters with a bilayer structure and a diameter of about 0.5 nm are not mandatory to achieve the high activity (see image).

Nanoparticles



Variations in the formal electrochemical potential (E_0) and electron-transfer rates (k_0) of the blue copper protein azurin have been directly observed. A new method, fluorescent cyclic voltammetry (FCV), was used to resolve the properties of 100–1000 proteins. On this scale, the presence of large variations in the values of both E_0 and k_0 could be established and several forms of heterogeneity were differentiated.

Electrochemistry

Contents

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).

Service

Corrigendum

In a series of papers predating the current frustrated Lewis pair (FLP) terminology, the hydrosilation of carbonyl[1] and imine[2] functions as well as the silation of alcohols[3] has been achieved. Strong kinetic arguments point towards a Si–H bond activation via a FLP-type mechanism in these processes. The authors would like to thank Prof. W. E. Piers for bringing this precedent to their attention.

[1] a) D. J. Parks, W. E. Piers, *J. Am. Chem. Soc.* **1996**, *118*, 9440 – 9441; b) D. J. Parks, J. M. Blackwell, W. E. Piers, *J. Org. Chem.* **2000**, *65*, 3090 – 3098; c) J. M. Blackwell, D. J. Morrison, W. E. Piers, *Tetrahedron* **2002**, *58*, 8247 – 8254.
[2] J. M. Blackwell, E. Sonmor, T. Scoccitti, W. E. Piers, *Org. Lett.* **2000**, *2*, 3921 – 3923.
[3] J. M. Blackwell, K. L. Foster, V. H. Beck, W. E. Piers, *J. Org. Chem.* **1999**, *64*, 4887 – 4892.

Angew. Chem. Int. Ed. **2010**, *49*

DOI 10.1002/anie.201002119