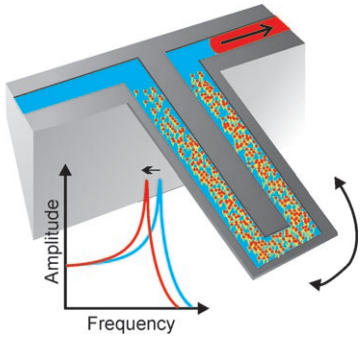
VIP The following Communications have been judged by at least two referees to be "very important papers" and will be published online at www.angewandte.org soon:

Books

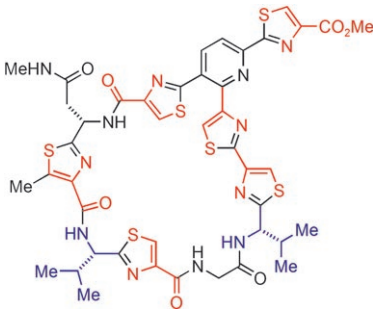
Highlights

Weighing biomolecules: Resonant cantilevers allow ultrasensitive weighing by detecting changes in the resonant frequency when mass is added to the cantilever. By placing the fluid inside the cantilever, particles can be measured sensitively under biologically relevant conditions and without labeling. Furthermore, cells can be weighed while flowing through the cantilever.



Micro-electromechanical Systems

Reviews

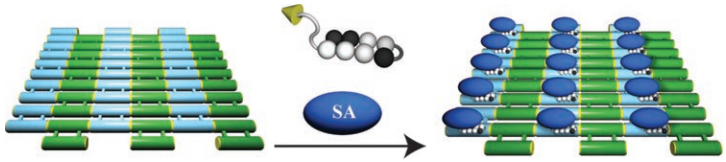


The building blocks of proteins, the amino acids, also serve as precursors to a wide range of natural products. The thiopeptide antibiotics, molecules with remarkable molecular architectures, are wonderful examples of how nature elaborates simple α-amino acids into complex arrays of heteroaromatic rings with potent biological activity. The picture shows the structure of amythiamicin D; its amino acid building blocks are highlighted in color.

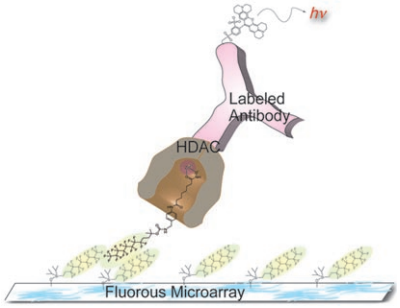
Thiopeptide Antibiotics

Contents

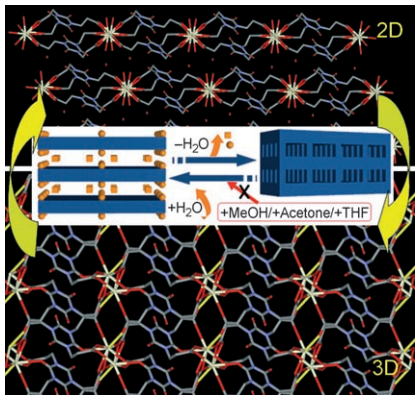
Communications



Molecular glue: A polyamide–biotin conjugate is capable of binding to specific sequences in a DNA nanostructure. These conjugates recruit streptavidin (SA) to a two-dimensional array of DNA (see schematic representation) and do not require any prior modification of the DNA.



Noncovalent immobilization is an attractive method for identifying inhibitors of histone deacetylases (HDACs). Fluorous-based small-molecule microarrays were validated as an effective method. Three enzymes and three assays (microarray, biochemical activity, and surface plasmon resonance) were used to identify inhibitors of HDACs and to compare them.



Shaping up: The two isomorphous 2D hybrid frameworks $\{[Ln(tci)(H_2O)_2]\cdot 2H_2O\}_n$ ($Ln = Ce^{III}$ or Pr^{III}, $tciH_3$ = tris(2-carboxyethyl)isocyanurate) were prepared using a highly flexible ligand. The frameworks show a single crystal to single crystal topochemical transformation from a two-dimensional (2D) to three-dimensional (3D) framework and vice versa (see picture) and exhibits selective adsorption properties of H_2O over MeOH and EtOH.

For the USA and Canada:
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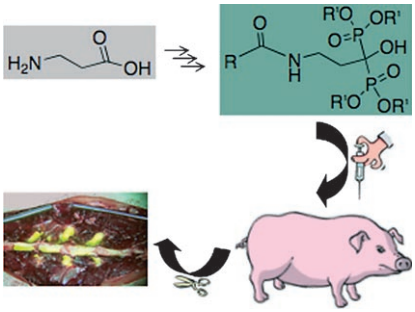
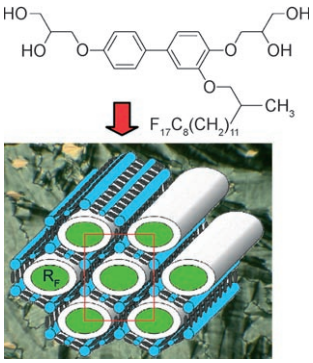
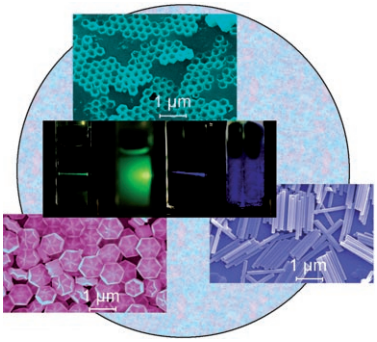


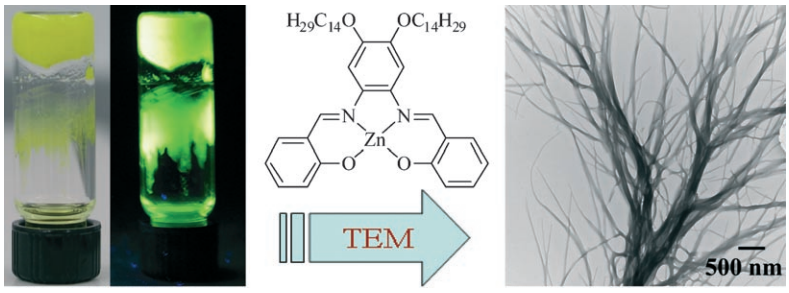
No fly in this oinkment: A targeted contrast agent allows real-time visualization of normal bones and hydroxyapatite crystals found in breast-cancer microcalcifications. Synthesis of the agent involves conjugation of a near-infrared fluorophore to methylester-protected pamidronate derivatives. Large-animal surgical models validate the effectiveness of the agent.

To the bursting point: The molecule shown forms a complex liquid-crystalline phase in which core–shell columns are embedded in a polygonal honeycomb formed by supramolecular cylinders (see picture; R_F = perfluorinated end groups). Temperature-induced anisotropic swelling of the cylinders occurs, and a transition to a lamellar phase is induced by "bursting" of the cylinders at the theoretical limit of the circumference-limited expansion.



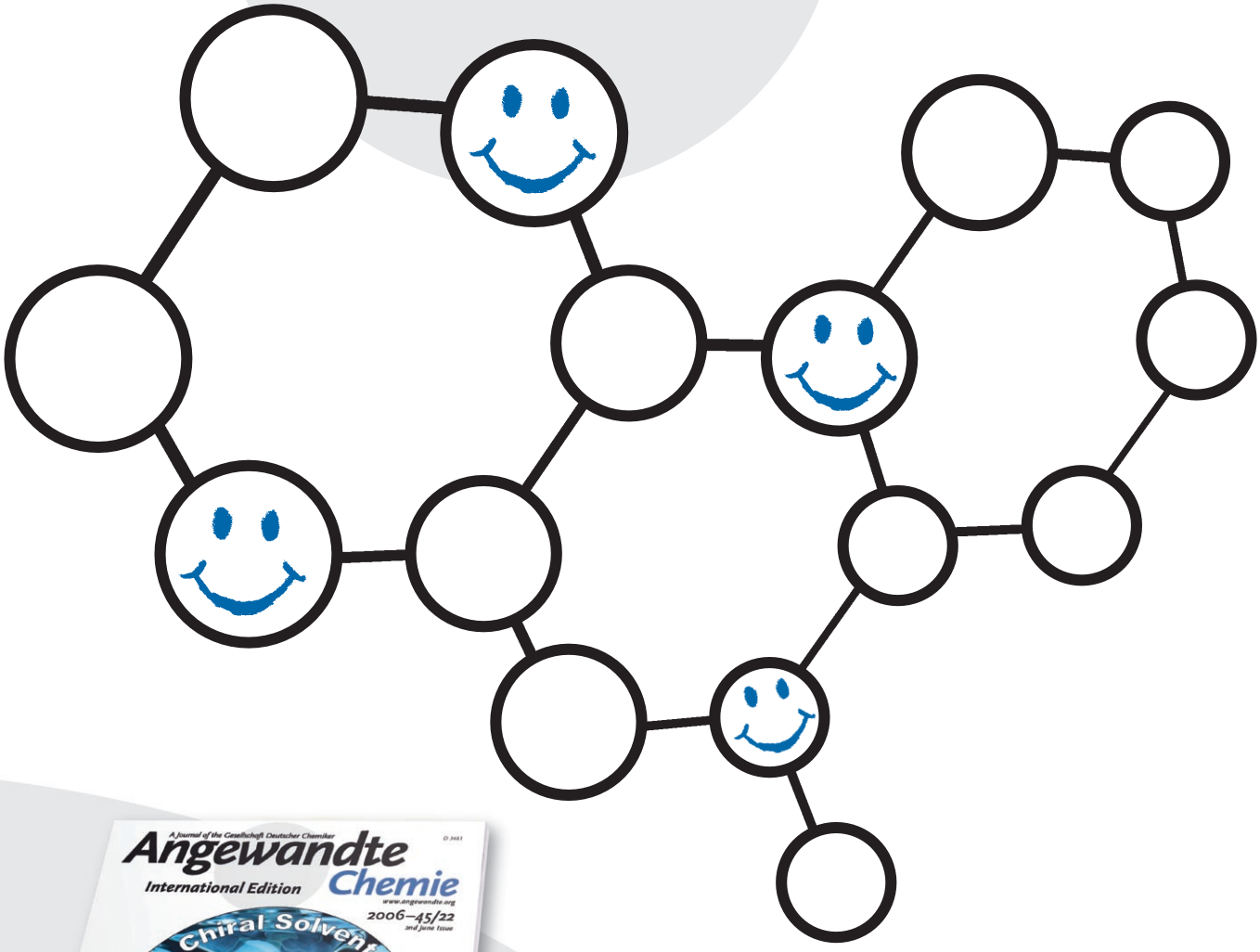
Array of light: Nanostructured arrays of $NaMF_4$ (M = rare earth metal) can be prepared by a hydrothermal method. The arrays consist of nanoparticles with well-controlled morphologies (tubes, disks, or rods), phases (cubic or hexagonal), and sizes (80–900 nm). Multicolor upconversion fluorescence is realized in arrays of $NaYF_4$ codoped with Er^{3+} and Yb^{3+} or with Tm^{3+} and Yb^{3+} (see picture).





Salphen the puzzle: Zn(salphen) complexes such as that shown organize into nanofibrils in the solid state. This assembly involves an intermolecular Zn···O interaction that stabilizes a polymeric structure with a $(ZnO)_n$ backbone. By tuning the peripheral substituents, luminescent gels may be prepared and the diameters of the fibers can be controlled.

Incredibly reader-friendly!



An aesthetically attractive cover picture that arouses curiosity, a well-presented and most informative graphical table of contents, and carefully selected articles that are professionally edited give *Angewandte Chemie* its distinctive character, which allows both easy browsing and further in-depth reading. Nearly 20 well-trained chemists, as well as eight further associates, work week in and week out to assemble reader-friendly issues and daily Early View articles online.

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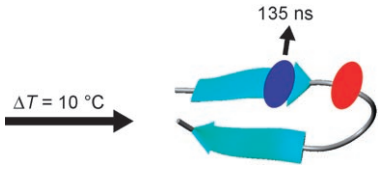
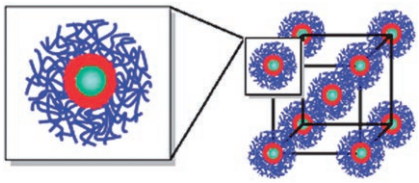


Fast dynamics and kinky turns: The designed peptide PG12 forms a β-hairpin stabilized by a D-Pro enhanced type-II′ β turn. Through a combination of $^{13}C'$ isotope labels and temperature-jump nonlinear infrared spectroscopy local folding events were observed on a sub-microsecond timescale, in which the turn region remains structured during the temperature jump, and midstrand region opens up on a 130-ns timescale.

Peptide Structural Dynamics

ABC gel: The triblock copolymer **PS-*b*-P2VP-*b*-PEO** undergoes simultaneous micellization and gelation, leading to high-storage-modulus materials that have fast responses to pH value, temperature, ionic strength, and shearing. The gel has a hierarchical structure (see picture) with spherical core–shell–corona micelles, which, in turn, pack closely into an ordered cubic structure.

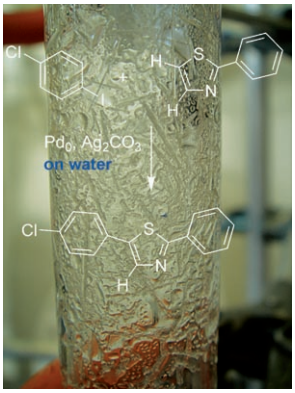


Gels

Appetite for copper: Ubiquitin is a hallmark of toxic aggregates in neurodegenerative disorders, where metal ions are believed to play a crucial role. Copper(II) ions have been found to bind to ubiquitin at a specific site involving the N-terminal nitrogen of Met 1 and three oxygen donor ligands in a tetragonal geometry. The affinity of this site for copper(II) is comparable to that of other amyloidogenic proteins involved in neurodegenerative disorders.

Copper–Ubiquitin Binding

Wetter is better: The direct arylation of thiazoles on water is quicker, cleaner, and higher-yielding than arylation in organic solvents. The reaction works under mild conditions for an array of aryl iodides, producing 2,5-diaryl thiazoles in excellent yields. Importantly, novel bi-heteroaryl compounds are produced without the requirement for stoichiometric organometallic coupling agents.



Arylation of Heteroarenes

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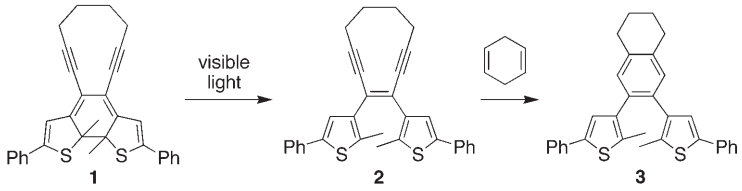
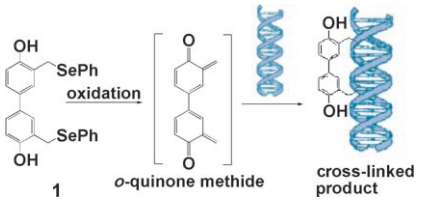
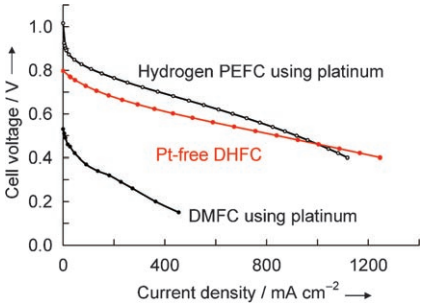


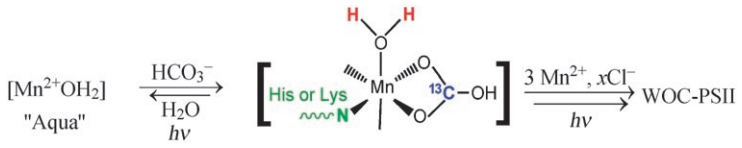
Visible changes: Visible light is used to create an active enediyne for Bergman cyclization by taking advantage of a well-known molecular photoswitch. Only isomer **2** has the enediyne structure required to produce a diradical that can be trapped as compound **3**. Isomer **2** is formed from the thermally stable isomer **1** by stimulating the ring-opening reaction with visible light.



Checking the traps: When a phenyl selenide compound such as **1** was oxidized with sodium periodate or irradiated, an *ortho*-quinone methide intermediate formed and reacted with a DNA duplex by cross-linking. In the crystal structure of a derivative of **1** the biphenyl unit is twisted, and this might explain how **1** can interact effectively with the DNA backbone.

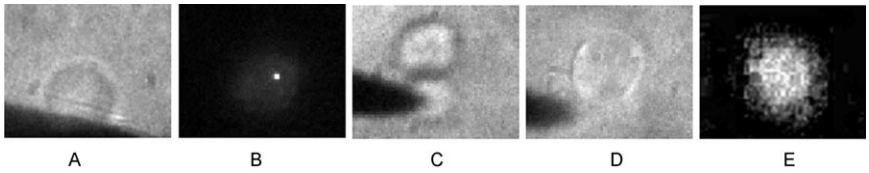


Move over, platinum: A Pt-free direct hydrazine fuel cell (DHFC), which uses an anion-exchange polymer electrolyte, shows a maximum power-generation performance of 0.5 W cm^{-2} (1250 mA cm^{-2} at 0.4 V). Its performance is comparable to that of the hydrogen polymer electrolyte fuel cell (PEFC) and far exceeds that of the direct methanol fuel cell (DMFC).

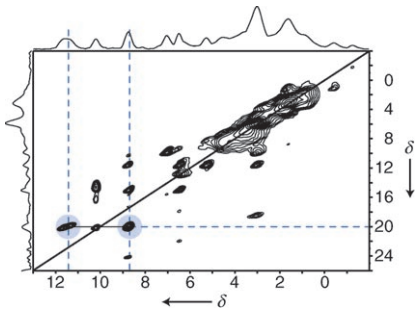


In the WOC: The structural role of bicarbonate in the assembly of the Mn_4Ca cluster of the water oxidizing complex (WOC) in photosystem II (PSII) is revealed by electron spin echo envelope modulation (ESEEM) spectroscopy. The results clearly indicate the presence of C (from a labeled carbonate) and N (from histidine or lysine residue) in the inner coordination sphere of the Mn^{2+} assembly intermediate.

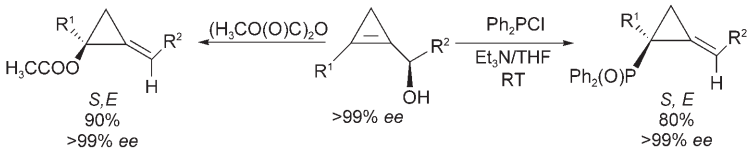
Contents



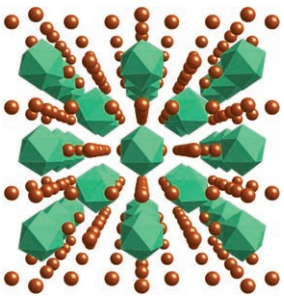
Solitary confinement: Single-molecule reactions were initiated by trapping and fusing liposomes and monitored by fluorescence imaging. The pictures show: an optical image of the liposome containing the enzyme (A), a fluorescence image of one labeled enzyme molecule in the liposome (B), an optical image of the enzyme and substrate liposomes prior to electrofusion (C), an optical image of the fused liposome (D), and a fluorescence image of the fused liposome after incubation (E).



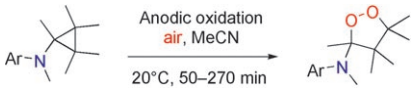
With or without water? In under two hours, an NMR spectroscopy experiment can determine whether the anhydrous form of an active pharmaceutical ingredient is present in a tablet formulation. Such a high-resolution spectrum constitutes a new analytical tool that should be routinely adopted in the characterization of pharmaceuticals.



With just a nudge (in the form of silica gel, an acidic ion-exchange resin, or heating at about 40 °C), the acetate derivatives of enantiomerically enriched cyclopropenyl alcohols undergo sigmatropic rearrangement to give alkylidenecyclopropanes with high *ee* values (see scheme). Similarly, the rearrangement of phosphinite derivatives at room temperature leads to phosphine oxide precursors of unusual chiral phosphine ligands. R^1, R^2 = alkyl, aryl.

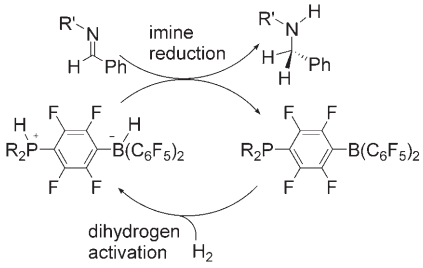


The homoleptic aqua complex of thorium(IV) is the first aqua complex of a tetravalent cation to be isolated in the solid state. High-energy X-ray scattering experiments demonstrate the same tenfold aqua coordination in solution. Green polyhedra $[Th(H_2O)_{10}]^{4+}$, brown spheres Br^-.



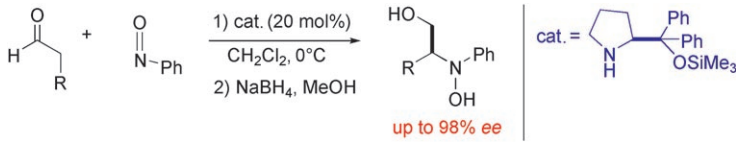
Electrical synthesizer: Results of cyclic voltammetric studies on a range of aminocyclopropanes in the absence or in the presence of oxygen are in full agreement with the currently accepted autocatalytic mechanism for the aerobic oxidation of these compounds. A simple and efficient procedure was developed for the electrosynthesis of the corresponding endoperoxides (see scheme), some of which exhibit moderate antimalarial activity.

Electrochemical Oxidation



Phosphonium borates of the form R_2PH-$(C_6F_4)BH(C_6F_5)_2$ are shown to be metal-free hydrogenation catalysts (see scheme) that effect reduction of sterically hindered imines and aziridines, as well as $B(C_6F_5)_3$-protected unhindered imines and nitriles, at relatively low H_2 pressures and temperatures.

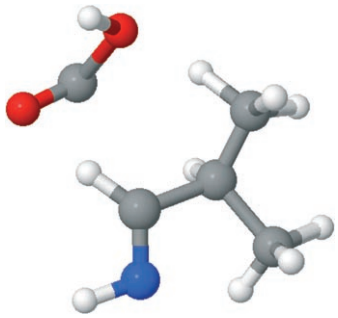
H_2 Activation



Donors not required: External hydrogen-bond donors are not required for a highly regio- and enantioselective oxyamination reaction of aldehydes with nitrosobenzene (see scheme). The reaction proceeds in the presence of the structurally simple organocatalyst (−)-(*S*)-α,α-diphenylprolinol trimethylsilyl ether to afford the oxyaminated compounds in good yields.

Organocatalysis

Breaking up is hard to do: The dominating negative-ion fragment formed by dissociative electron attachment (DEA) to amino acids or by their ionization through MALDI is $[M-H]^-$. Three different experimental techniques and molecular dynamics calculations are used to determine the site of hydrogen loss and which metastable decay pathways (for valine, see picture; blue nitrogen, red oxygen) dominate further decay.



Ion Fragmentation

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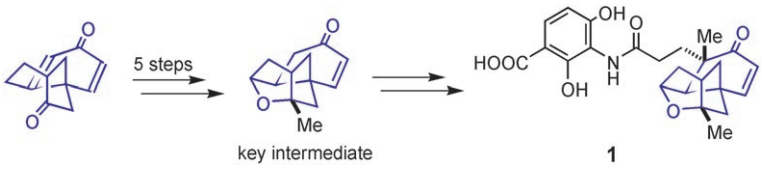
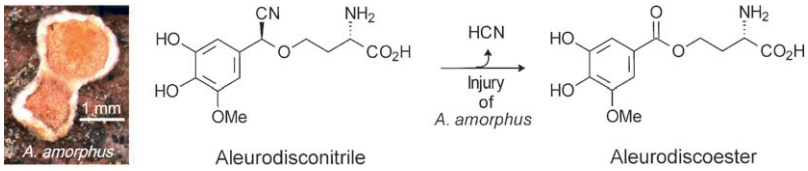


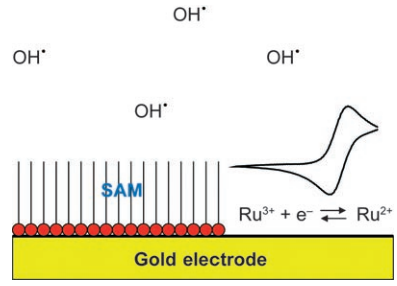
Short cut: In a new approach to the recently discovered antibiotic platensimycin (**1**), Nicolaou's late key intermediate is synthesised without the use of protecting groups in five steps from a readily available starting material.

Natural Product Synthesis



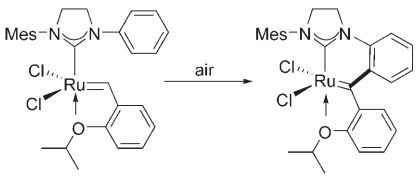
A mighty midget! When injured, the crust fungus *A. amorphus* (left in the picture) releases hydrocyanic acid by an oxidative mechanism so far unknown in nature. In contrast to cyanogenic glycosides in which the smooth hydrolysis of the glycosidic bond is essential for the liberation of hydrocyanic acid, in aleurodisconitrile the oxidation-prone aromatic moiety enables the release of hydrocyanic acid.

Chemical Defense



Breaking cover: Hydroxyl radicals OH• destroy the self-assembled monolayer (SAM) of hexanethiol on gold and mercury electrodes and thus allow the electrochemical response of the redox couple $Ru^{2+/3+}$ to be measured. On a completely SAM-covered electrode the $Ru^{2+/3+}$ signal is absent, thus the recovery of the signal following radical attack is a reliable measure of the radical activity.

Analytical Methods



Oxygen knocks it out: Olefin metathesis catalysts without steric hindrance in the *ortho* positions of the *N*-aryl substituents can be transformed into catalytically inactive ruthenium complexes through C–H activation (see scheme). This process presumably proceeds by a pericyclic reaction and is rendered irreversible by oxygen.

Ruthenium Alkylidene Complexes

Supporting information is available on the WWW (see article for access details).

A video clip is available as Supporting Information on the WWW (see article for access details).

Service