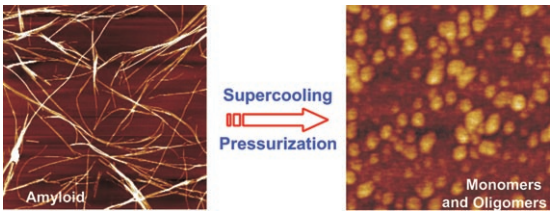
VIP *The following Communications have been judged by at least two referees to be "very important papers" and will be published online at www.angewandte.org soon:*

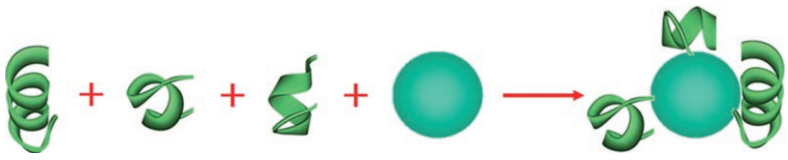
Books

Highlights



Amyloid Dissociation

Cold denaturation (including supercooling) and pressure perturbation are able to dissolve protein aggregates and, in some cases, amyloid fibrils (see picture). These studies provide additional details on the polymorphic forms of amyloid structures and their precursors as well as the transformation processes between polymorphic states.



Protein Structures

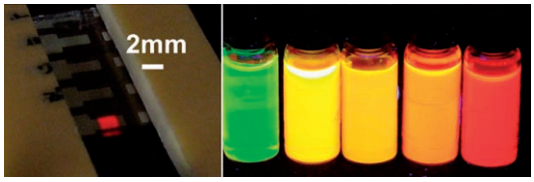
When Protein met Metal: The ability of metal ions to coordinate the assembly of specific supramolecular protein complexes (see schematic representation) enables the development of experimental and bioinformatic techniques for probing protein–protein interactions.

Contents

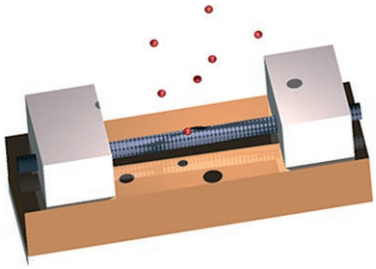
Minireviews

Sticking together: In the past few years, several compounds with stable Zn–Zn bonds have been reported, the existence of which was previously considered highly doubtful. Interest in this area was sparked by $[Zn_2(\eta^5\text{-}C_5Me_5)_2]$, in which the $[Zn–Zn]^{2+}$ unit is coordinated by two eclipsed C_5Me_5 ligands (see structure; Zn green, C gray). Homologous Cd and Hg species have been discovered as well.

Reviews



Small things bright and beautiful: research into light-emitting diodes (LEDs) made from semiconductor nanocrystals has advanced significantly in just one decade: external quantum efficiency has improved by over two orders of magnitude and highly saturated color emission is now the norm (see picture; nanocrystalbased LED and size-dependent photoluminescence of CdTe nanocrystals). The nanocrystal devices have potential advantages over purely organic LEDs such as spectrally pure emission.



Big things from small materials: The incorporation of carbon nanotubes (CNTs) into electronic devices has led to the development of extremely sensitive and compact chemical sensors (see the model of a transistor with a CNT between two electrodes). These sensors utilize the unique phenomena occurring at the surface of nanometer-sized structures for the detection of trace amounts of gas- and vapor-phase analytes.

For the USA and Canada:
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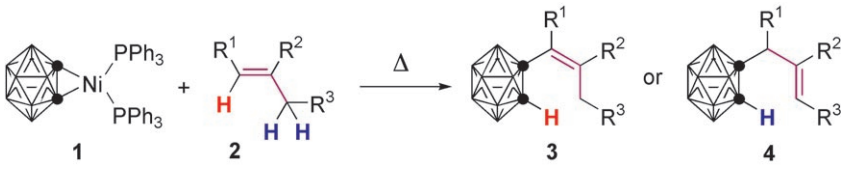
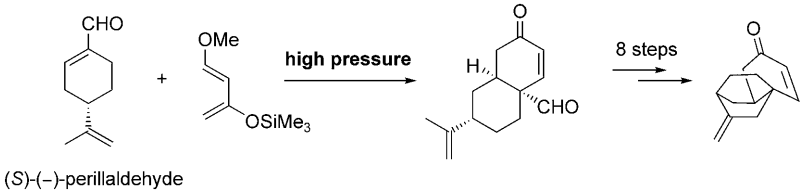
Communications



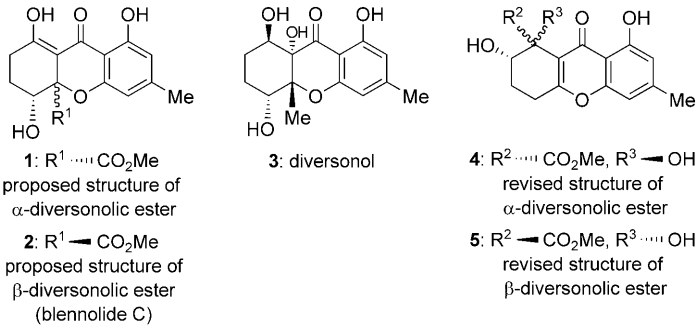
Happily coupled: A nickel–carboryne complex **1** reacts with substituted styrenes **2** to afford alkenylcarboranes in moderate to very good yields with excellent regio- and steroselectivity. Either the "Heck-type" (**3**) or the "ene-reaction-type" product (**4**) could be isolated (see scheme). A reaction mechanism that involves alkene insertion followed by successive β-H elimination and reductive elimination steps is proposed.

Coupling Reactions



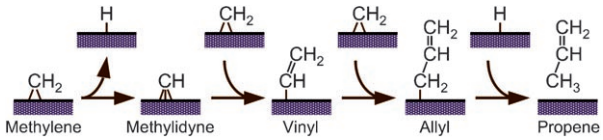
Bacteria under pressure! An efficient synthesis of the enantiopure tricyclic core of a recently discovered antibiotic, platencin, has been developed. This synthesis highlights a novel high-pressure Diels–Alder reaction of the flavoring agent (*S*)-(−)-perillaldehyde and an efficient SmI_2-mediated pinacol cyclization for the construction of the bicyclo[2.2.2]octane framework (see scheme).

Natural Product Synthesis



Expedient total syntheses of the originally proposed structures of the naturally occurring α- and β-diversonolic esters (**1** and **2**) and diversonol (**3**) lead to the revision of the structures of **1** and **2** to **4** and **5**, respectively (see structures).

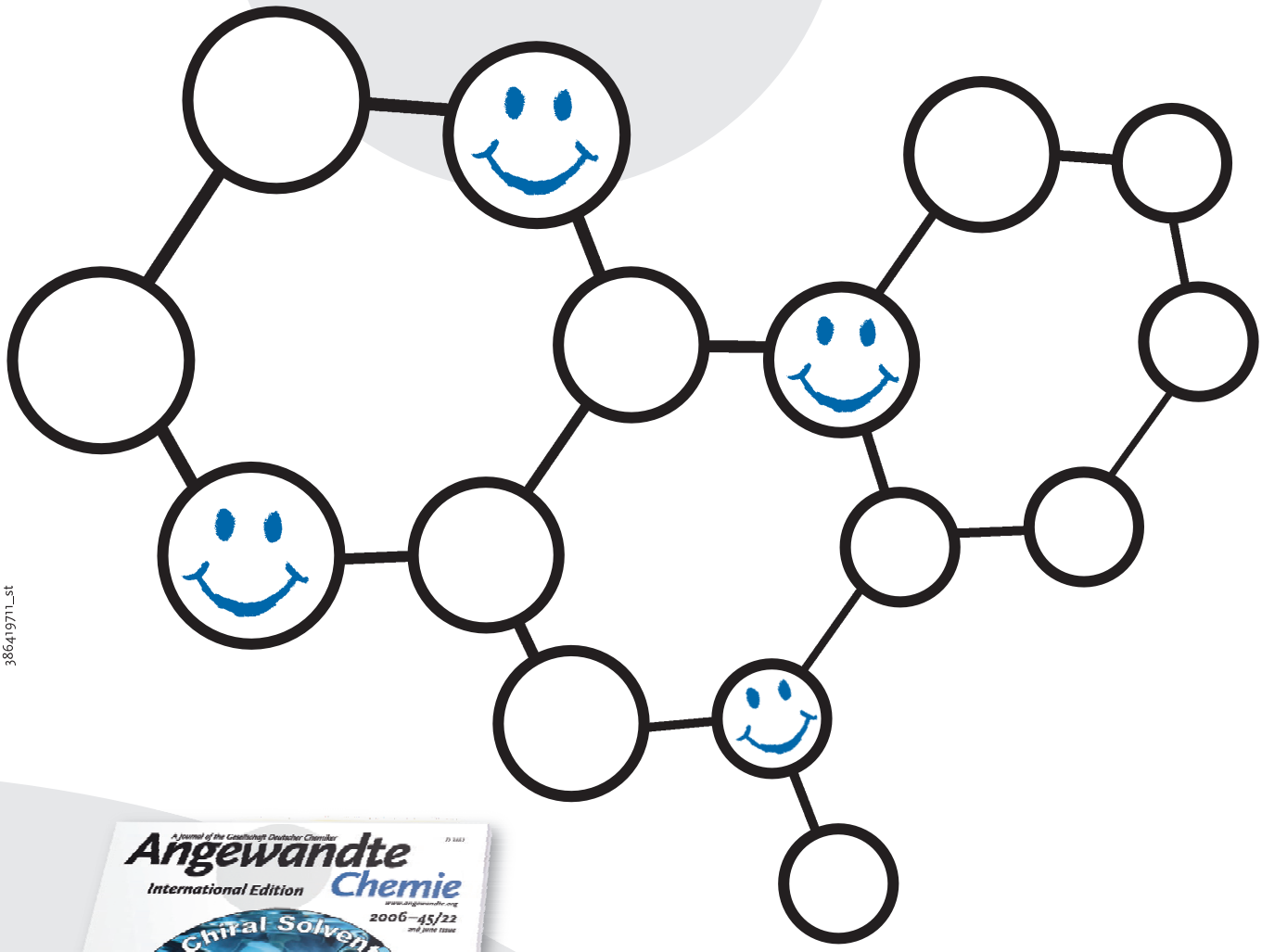
Natural Product Synthesis



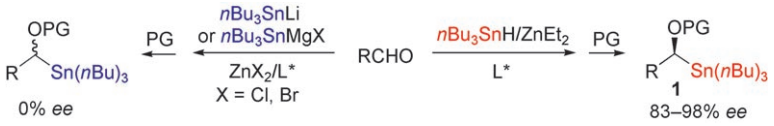
A four-step mechanism for thermal activation of methylene species on V(100) surfaces to generate propene is identified experimentally (see scheme). Dehydrogenation of methylene to methylidyne and coupling with another methylene group gives a vinyl intermediate, which reacts with a methylene group to form an allyl species, which is finally hydrogenated to propene. This provides evidence for the possible role of vinyl intermediates in Fischer–Tropsch synthesis.

Surface Chemistry

Incredibly reader-friendly!

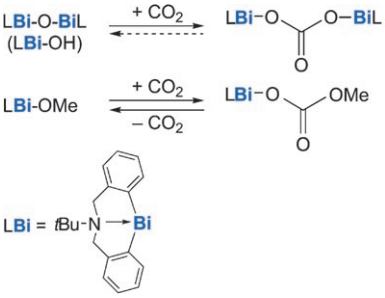


An aesthetically attractive cover picture that arouses curiosity, a well-presented and most informative graphical table of contents, and carefully selected articles that are professionally edited give *Angewandte Chemie* its distinctive character, which allows both easy browsing and further in-depth 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.



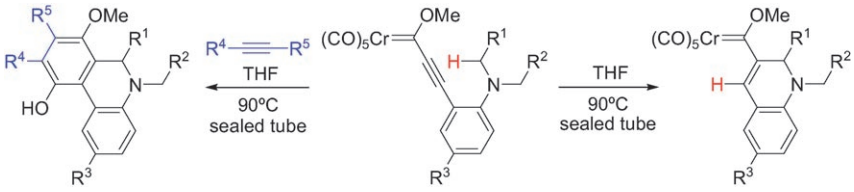
Li and Mg are pesky: A catalytic asymmetric synthesis of α-(hydroxyalkyl)-tri-*n*-butylstannanes (**1**) in good to excellent yields and enantioselectivities was achieved (see scheme; PG = protecting group; L* = chiral ligand). Compound **1** was isolated as an ester or thiocarbamate, and the reagent was prepared from equimolar amounts of nBu_3SnH and Et_2Zn in dimethoxyethane. Conditions employing lithium or magnesium ions suppress enantioselectivity.

Synthetic Methods



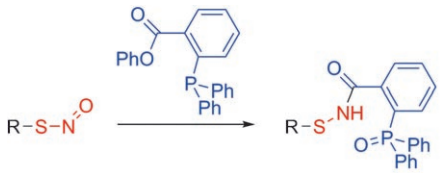
Keeping the lid on CO_2: Atmospheric CO_2 can be trapped irreversibly by hypervalent organobismuth oxide and hydroxide compounds, while an analogous alkoxide binds this greenhouse gas reversibly (see scheme). The hypervalent nature of the bismuth compounds is shown to play a decisive roll in these reactions.

CO_2 Fixation



Trigger happy: A new cascade process initiated by an unprecedented [1,5]-hydride transfer/cyclization of *ortho*-aminophenyl alkynyl Fischer carbene complexes leads to the formation of new 1,2-dihydroquinolinyl carbene complexes and 5,6-dihydrophenantridine derivatives (see scheme).

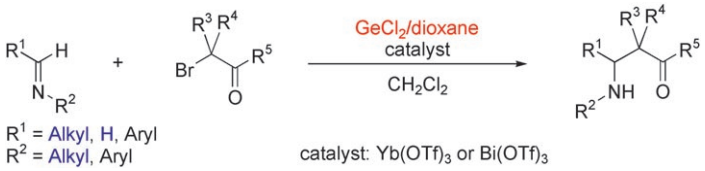
Synthetic Methods



"Nitroso" knows: A process has been developed which converts unstable *S*-nitrosothiols into stable sulfenamide analogues (see scheme). Reductive ligation proceeds rapidly in mixed organic solvent/water systems to give high yields. By applying this reaction, an efficient strategy for detecting S-nitrosylation in proteins and other biological systems is envisioned.

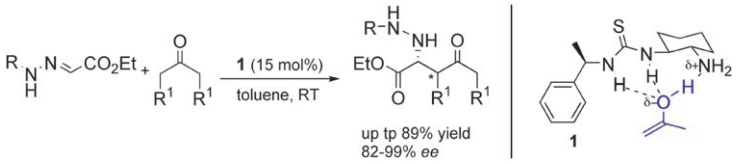
Nitrogen Oxides

Contents



A versatile metal: Germanium was effectively used in a novel and efficient method for the Mannich-type reaction between α-bromoketones and simple *N*-alkyl imines (see scheme). Germanium(II) acts as a reducing agent, forming a nucleophile for C–C bond formation. The Mannich adduct is effectively stabilized by the germanium center. Various *N*-alkylaldimines, including enolizable imines and formaldimines, can be used in this reaction system.

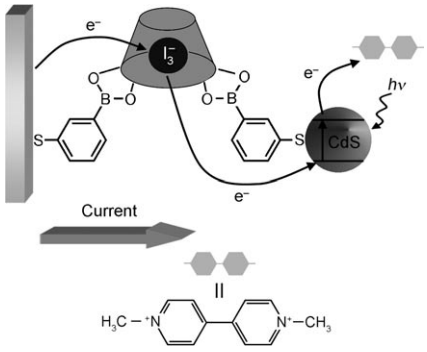
Synthetic Methods



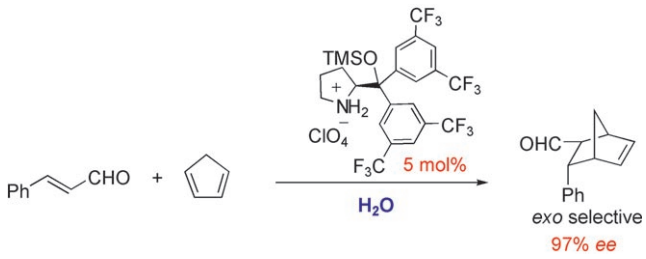
A tale of two mechanisms—enol versus enamine: Chiral primary amine–thiourea **1** catalyzes highly enantioselective Mannich-type addition of unmodified ketones to *N*-benzoylhydrazones (see scheme). The reaction does not require preformed enolate equivalents, and the computational data for the mechanism indicates a preference for **1**-complexed enol intermediates rather than enamine intermediates.

Organocatalysis

Changing direction: Gold electrodes have been linked to CdS nanoparticles through a β-cyclodextrin bridging unit (see scheme). The encapsulation of I_3^- or *N*,*N*′-dioctyl-4,4′-bipyridinium (octyl viologen) in the β-cyclodextrin cavities leads to enhanced photocurrents that are direction-controlled by the nature of the guest or by the addition of an inhibitor.



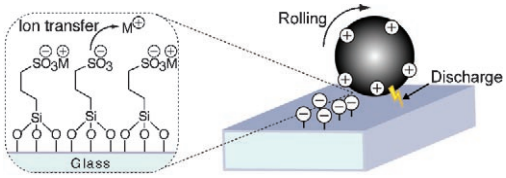
Photocurrent Generation



Water, water, everywhere: The title reaction predominantly affords the *exo* isomer with excellent enantioselectivity (see scheme; TMS = trimethylsilyl). The synthesis can be carried out without organic solvents and provides the products by distillation. Water increases the rate and enantioselectivity of the reaction.

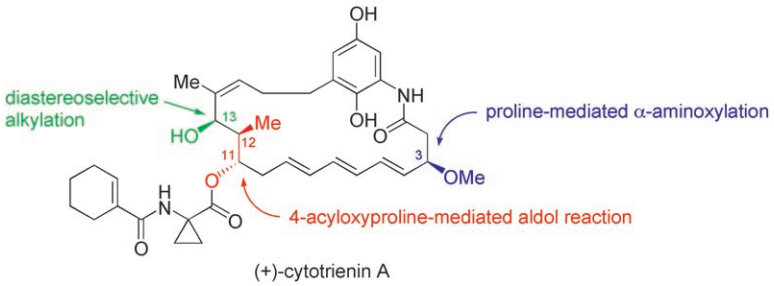
Synthetic Methods

Contents



Episodic breakdown: The dynamics of contact electrification of a metal sphere rolling across an insulating plate are investigated. The data are consistent with contact charging that involves the transfer of ions (see picture), interrupted by episodic discharge events that involve the dielectric breakdown of air.

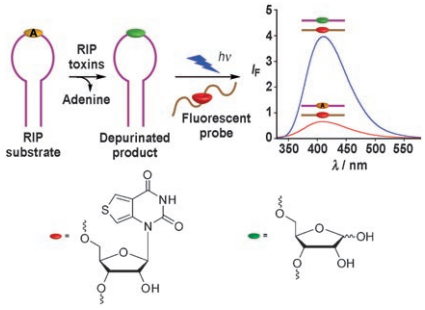
Contact Electrification



A star-studded lineup: (+)-Cytotrienin A was the target of an asymmetric total synthesis featuring an enantioselective aldol reaction, α-aminoxylation, deoxygenation, and a ring-closing metathesis to form the 21-membered macrolactam. This first total synthesis confirms the relative and absolute confguration of the molecule.

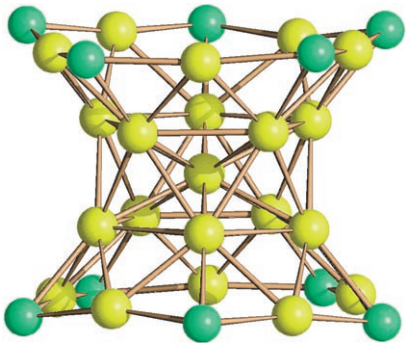
Natural Product Synthesis

Lethal weapon: The presence of RNA abasic sites generated by ribosome-inactivating proteins (RIPs) such as ricin can be detected. RNA depurination by toxins is signaled by the enhanced emission intensity of synthetically modified emissive RNA constructs that are complementary to the α-sarcin/ricin loop (see picture). This method is more efficient and precise than the use of radiolabeled substrates.



Fluorescent Probes

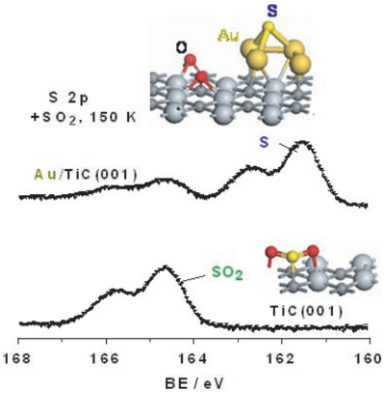
CO-vering gold: An organometallic approach to the synthesis of CO-protected Au–Fe nanoparticles led to solutions of colloids with hydrodynamic diameters between 4 and 300 nm, from which $[Au_{21}\{Fe(CO)_4\}_{10}]^{5-}$ (picture: metal frame; Au yellow, Fe green), $[Au_{22}\{Fe(CO)_4\}_{12}]^{6-}$, $[Au_{28}\{Fe(CO)_3\}_4\{Fe(CO)_4\}_{10}]^{8-}$, and $[Au_{34}\{Fe(CO)_3\}_6\{Fe(CO)_4\}_8]^{8-}$ were isolated. Their X-ray structures resemble those of gold–thiolate clusters.



Gold Nanoparticles

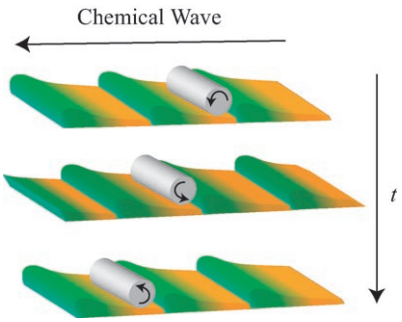
Contents

Activating gold: High-resolution photoemission spectroscopy and DFT calculations were used to study the interaction of SO_2 with Au/TiC(001) surfaces. Both revealed molecular adsorption of SO_2 on TiC(001) but complete dissociation of the S–O bonds on Au/TiC(001) (see picture). Au/TiC(001) cleaves S–O bonds more efficiently than Au/TiO_2(110) or Au/MgO(100) and decomposes SO_2 at temperatures as low as 150 K.

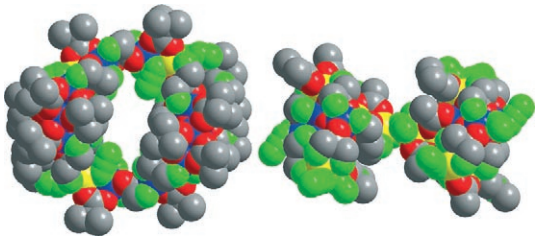


Surface Chemistry

It's alive! A polymer gel has been developed that can generate a peristaltic motion without external stimuli. The motion is produced by dissipating the chemical energy of an oscillating reaction that occurs inside the gel. Although the gel is solely composed of a synthetic polymer, it shows independent motion as if it were alive. The motion of the gel can be harnessed to transport objects with millimeter dimensions (see picture).

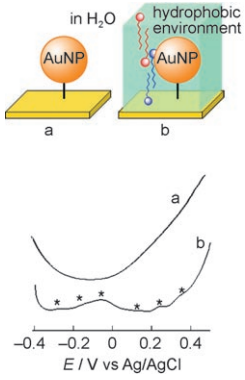


Polymer Gels



Double impact: The use of both azide and di-2-pyridylketone-derived ligands has provided new Mn_{24} (left) and Mn_{26} complexes (right) with loop and dumbbell structures that are made up of two covalently linked Mn_{12} and Mn_{13} units, respectively. Both complexes are single-molecule magnets, and the Mn_{26} complex displays the largest barrier for magnetization reversal in a $Mn^{II/III}$ complex known to date. Mn^{II} yellow, Mn^{III} blue, O red, N green, C gray.

Cluster Compounds



The synergistic effect of the two surfactants hexyltrimethylammonium bromide and sodium dodecylbenzenesulfonate allows the redox peaks of Au nanoparticles (AuNPs) to be observed in the differential pulse voltammogram of an AuNP-modified Au electrode in aqueous solution (b), whereas in the presence of Et_4NClO_4 alone no significant peaks ascribable to AuNP redox processes appear due to the high dielectric constant of water (a).

Electron Transfer

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).

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