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:

Author Profile

"The three things I would take to a desert island would be a bed, a hunter, and a chef.
My favorite author (fiction) is Penelope Fitzgerald, who is a superb wordsmith …"
This and more about Mike Hannon can be found on page 3114.

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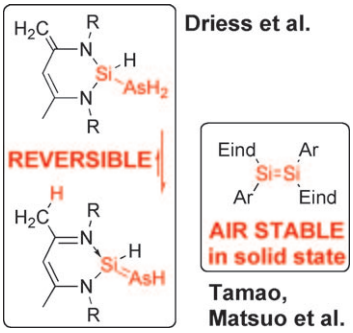
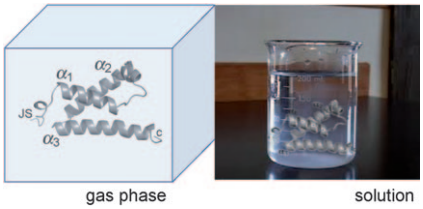


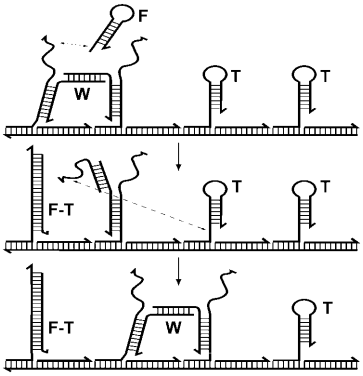
Two major breakthroughs in the chemistry of silicon compounds with double bonds have been reported recently: the reaction of a zwitterionic silylene with arsane yields the blue donor-stabilized arsasilene with an As=Si bond (see left picture). Secondly, the extremely bulky and rigid hydrindacenyl substituent Eind allows for the preparation of emissive disilenes that are stable in the solid state towards air and moisture (right picture).

Who needs water? The gas phase may seem an esoteric place to examine the structures of proteins, but a new study reveals that the solution fold of the protein KIX can be retained for significant time periods in a mass spectrometer. Once in this ideal laboratory environment, details of the higher order fold can be elucidated at the single amino acid level.



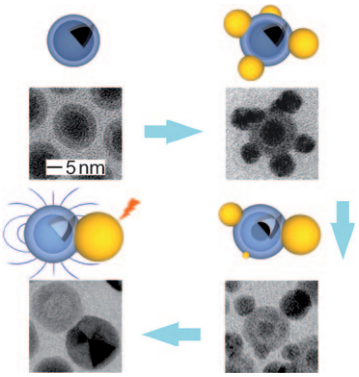
Reviews

Nucleic acid power: Molecular machines and devices made from DNA or RNA are becoming more complex and more versatile. Nucleic acids have been shown to be an exquisite material for the rational design of simple molecular switches, and researchers now envision the realization of molecular robots for nanotechnology, computers, as well as nanomachines that operate in vivo.



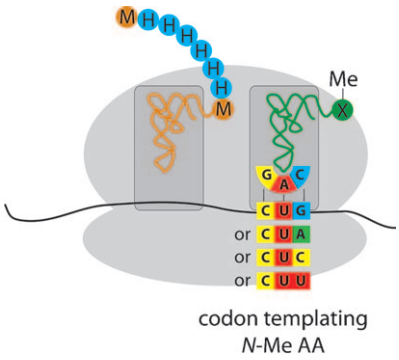
For the USA and Canada:
ANGEWANDTE CHEMIE International Edition (ISSN 1433-7851) is published weekly by Wiley-VCH, PO Box 191161, 69451 Weinheim, Germany. Air freight and mailing in the USA by Publications Expediting Inc., 200 Meacham Ave., Elmont, NY 11003. Periodicals postage paid at Jamaica, NY 11431. 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



Superparafragilistic: An amorphous seed-mediated strategy has been developed for the synthesis of hybrid nanoparticles (see images) that are composed of silver (yellow) and iron oxide (blue) nanodomains and exhibit unique optical properties. These properties originate from both the strong surface plasmon resonance of the silver and the strong superparamagnetic responses of the iron oxide nanodomains.

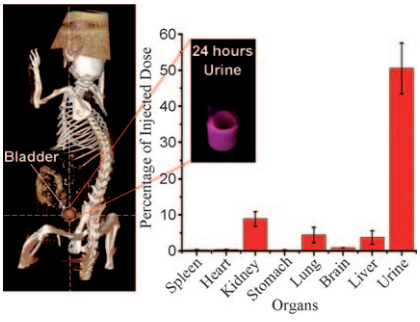
Hybrid Nanoparticles



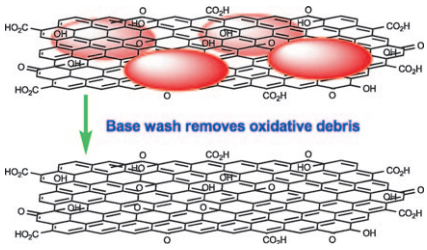
May the best codon win: *N*-methyl amino acids (*N*-Me AAs) are important modifications found in several nonribosomal peptide therapeutics. Previously, it was shown that three *N*-Me AAs are efficiently incorporated into peptides using a cell-free in-vitro translation system. Now, the incorporation of these *N*-Me AAs has been optimized by varying the template codon.

N-Methyl Amino Acids

Going to waste: Renal clearance of 2 nm glutathione-coated luminescent gold nanoparticles (GS-AuNPs) was more than 10 to 100 times better than that of the similarly sized nonluminescent AuNPs coated by bis(*p*-sulfonatophenyl)phenylphosphine and cysteine. Urinary excretion of the particles was imaged with X-ray computed tomography (see picture of a mouse after injection of GS-AuNPs) and luminescence techniques in real time.



Nanoparticles



It'll come out in the wash! Graphene oxide has been shown to be a stable complex of oxidative debris (red ellipses in the picture) strongly adhered to functionalized graphene-like sheets. Under basic conditions the oxidative debris is stripped from the graphene-like sheets, and the resulting graphene oxide is conducting and cannot easily be resuspended in water.

Graphene Oxide

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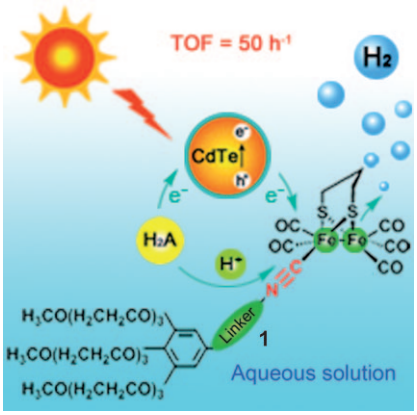
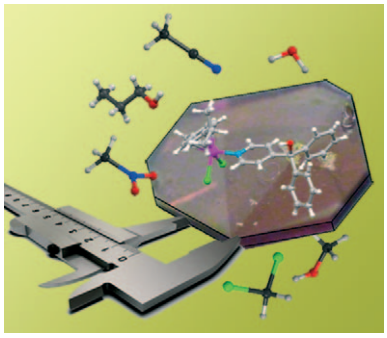
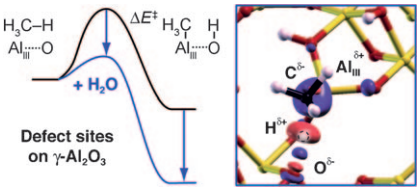


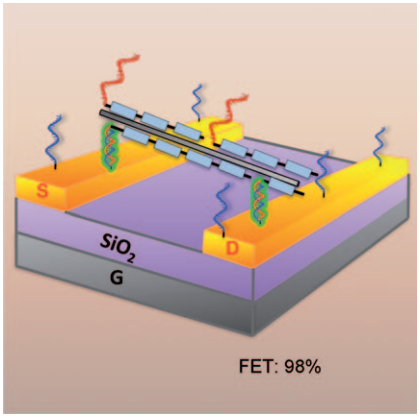
A robust, inexpensive, and efficient photocatalytic system consisting of an artificial water-soluble [FeFe]-H_2ase mimic **1**, CdTe quantum dots, and ascorbic acid (H_2A), for H_2 production in pure water at room temperature has been developed. With this system, 786 μmol (17.6 mL) H_2 were obtained after 10 h irradiation ($\lambda > 400$ nm) with TON up to 505 and TOF up to 50 h^{-1} under optimized conditions.

Backtracking the effect to the cause: The direct measure of the morphology of an organometallic molecular crystal can be used to rank experimentally the supramolecular synthons active in the packing and to estimate the solvation energies of the single crystallographic faces.





A low OH coverage, resulting from pretreatment at 700 °C, generates metastable three-coordinate Al_{III} sites and reactive (Al_{III},O) Lewis acid–base pairs on γ-alumina. Water plays a dual role by increasing the basicity of oxygen atoms without affecting the Lewis acidity of the Al_{III} sites and by stabilizing the metastable (110) termination, where these sites exist.



DNA block copolymer doing it all: A potentially scalable self-assembly method for single-walled carbon nanotubes (SWNTs) involves the use of amphiphilic DNA block copolymers. One such hybrid is able to cover the entire area of solution-based SWNT technologies, from selective dispersion to nondestructive functionalization to high-yield device fabrication such as field-effect transistors (see picture; S: source, G: gate, D: drain electrode).

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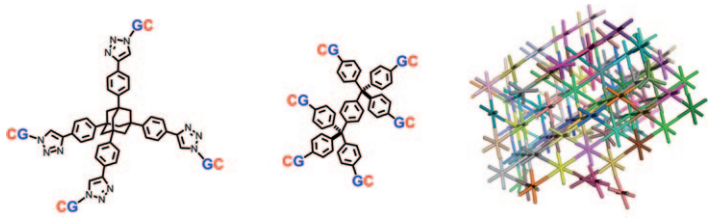
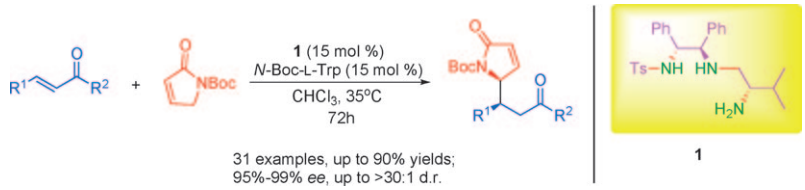


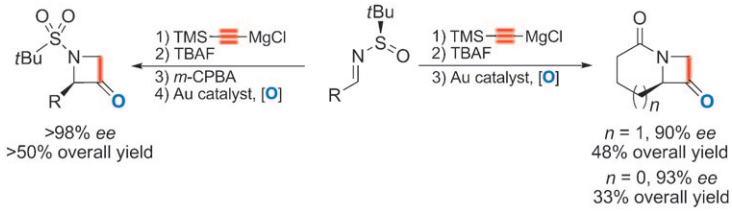
At arm's length: Branched DNA with exceptionally short sticky ends (see picture) assembles into a new material at temperatures where genomic DNA is fully denatured, if branching geometry and linker rigidity favor crystallization. The process is shown by modeling and for synthetic material assembled from dilute aqueous buffer solution.

DNA-Based Assembly



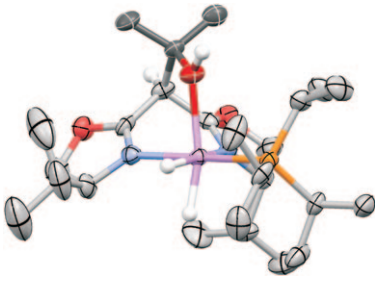
A direct line: A direct organocatalytic asymmetric vinylogous Michael addition of α,β-unsaturated γ-butyrolactams with α,β-unsaturated ketones has been developed (see scheme; Boc = *tert*-butoxycarbonyl, Trp = tryptophan, Ts = 4-toluenesulfonyl). The resulting Michael products, 5-substituted 3-pyrrolidin-2-ones, could be obtained in excellent yields with excellent enantio- and diastereoselectivity.

Asymmetric Catalysis



Chiral rings made easy: Chiral azetidin-3-ones have been easily prepared from chiral *N*-propargylsulfonamides, which in turn are readily accessible through chiral sulfinamide chemistry (see scheme). Using *tert*-butylsulfonyl as the protecting group avoids unnecessary deprotection and reprotection steps, and allows its removal from the azetidine ring under acidic conditions.

N-Heterocycles



BOX of tricks: Facile, reversible, and diastereoselective functionalizations of methylene C–H bonds with carbonyl compounds have been observed within chiral bis(oxazoline)/iridium complexes (see structure; O red, N blue, P orange, Ir purple). These reactions are described and discussed together with the classic C–H oxidative additions to iridium that occur within these same compounds.

C–H Activation

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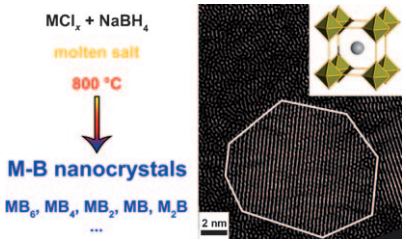
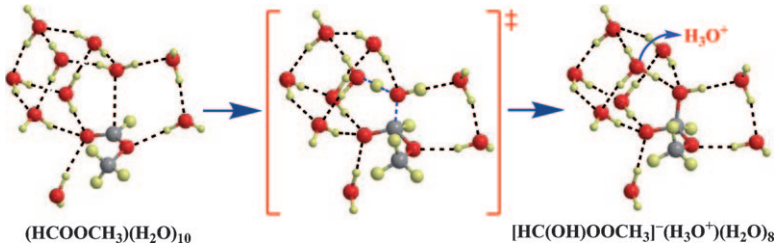


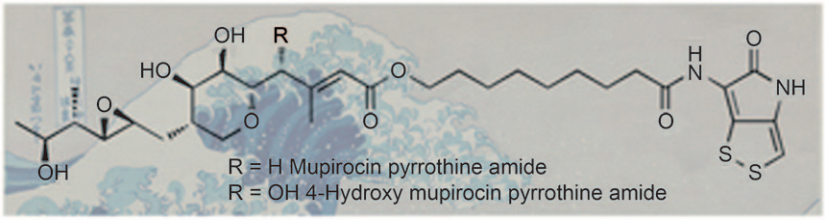
Mini B: An ionothermal process under relatively mild conditions (500–900 °C) provides the first versatile route towards nanocrystals of metal (Ca, Ce, Mo, Nb, Hf, Fe, Mn) hexaborides, tetraborides, diborides, and lower borides (see picture). Control over the nanoparticle size and the material texture is achieved to tune these functional materials.

Boride Nanoparticles



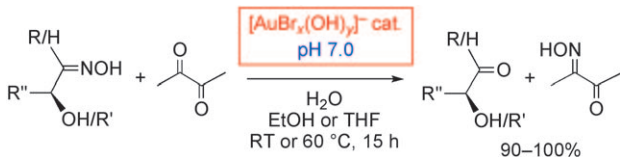
A step dance: Extensive cluster continuum model calculations verify that the stepwise hydration of a carbonyl group (see scheme: O red, H yellow, C gray) is more favorable than the widely suggested concerted pathway. It is also shown that for reliable calculations on the water-mediated proton transfer a large basis set and a suitable cluster continuum model are required.

Hydration of Carbonyl Groups



New drugs from marine bugs: The Japanese marine bacterium *Pseudoalteromonas* SANK73390 has been engineered to produce hybrid thiomarinol/pseudomonic acid compounds with potent activity against methicillin-resistant *Staphylococcus aureus* (MRSA). Previously unreported mupirocin and pyrrothine metabolites were isolated from wild-type and mutant strains and from mutagenesis experiments with mutant strains.

Antibiotics



Golden solution: A neutral solution of $AuBr_3$, containing $[AuBr_2(OH)_2]^-$ in equilibrium with $[AuBr_3(OH)]^-$ and $[AuBr_4]^-$, promotes the chemoselective hydrolysis of robust oximes into carbonyl compounds without racemization (see scheme). The food additive diacetyl acts as a NH_2OH-trapping agent, thus avoiding the formation of gold nanoparticles and allows the reaction to run catalytically.

Gold-Catalyzed Reactions

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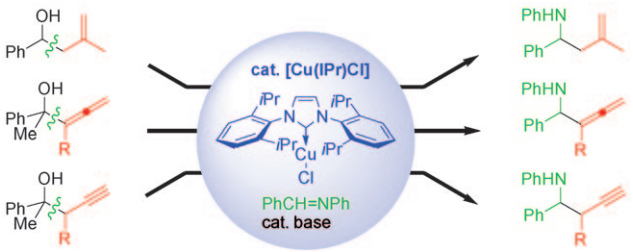
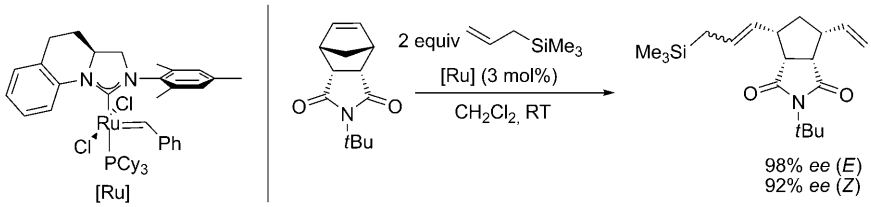


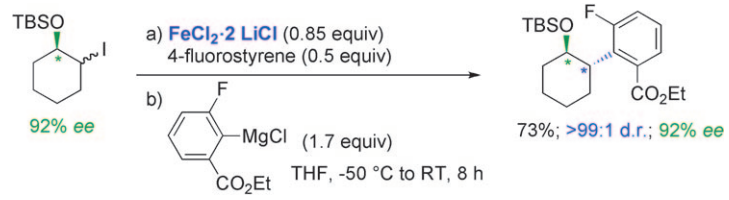
Cat. in the bag: The pictured copper complex can promote C–C bond cleavage through retro-allylation of homoallyl alcohols to form allylcopper species. This process is applicable to catalytic allylation of aldehydes and imines with homoallyl alcohols. The method has also been extended to regioselective allenylation and propargylation of imines.

Copper Catalysis



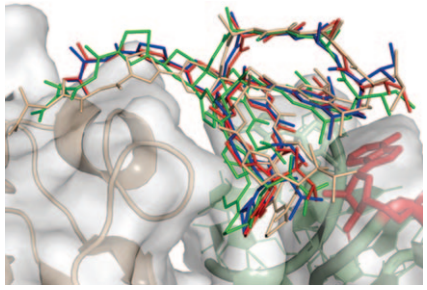
A bridge connects and efficiently transfers the chirality from the backbone of a N-heterocyclic carbene (NHC) to the metal center. The result is excellent enantioselectivities in the ruthenium-catalyzed, asymmetric ring-opening cross-metathesis of norbornenes with allyltrimethylsilane (see scheme).

Asymmetric Catalysis



***trans*-2-Arylcycloalcohol derivatives** are obtained in high diastereoselectivity by the iron-mediated cross-coupling of cyclic TBS-protected iodohydrines with aryl Grignard reagents (see scheme; TBS = *tert*-butyldimethylsilyl). The stereoconvergent cross-coupling of a chiral TBS-protected 2-iodocyclohexanol provides the 2-arylcyclohexanols with no loss of stereochemical purity, and is a valuable alternative to the enantioselective opening of symmetrical epoxides.

Stereoselective Cross-Coupling



Structural probing: The activity of thiostrepton and derivatives with targeted shape changes was determined at their ribosomal binding site by using semisynthesis, NMR structure determination, docking (see picture), and biological evaluation in an integrated fashion. This combination revealed important elements of molecular recognition within the embedded pharmacophore of the target, a composite RNA–protein complex.

Antibiotics

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

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Service