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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:***

Obituary

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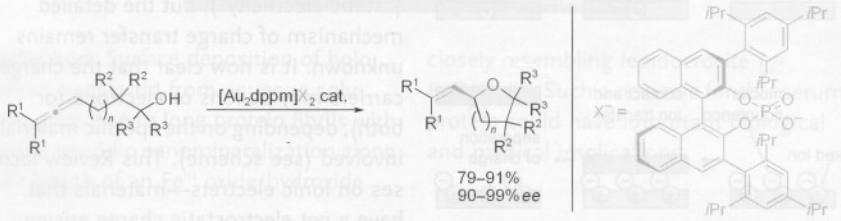
Highlights

Gold Catalysis



A golden future: The recent discoveries in stereoselective gold catalysis are extremely promising. Transfer of chirality or the generation of new stereogenic centers from prochiral substrates on application of chiral gold catalysts occur with excellent enantioselectivities. New concepts, such as the use of gold catalysts with chiral counterions, help to improve selectivities (see scheme, dppm = bis(diphenylphosphanyl)methane).

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Reviews

For the USA and Canada:
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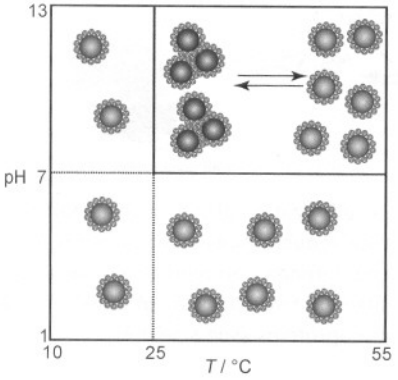
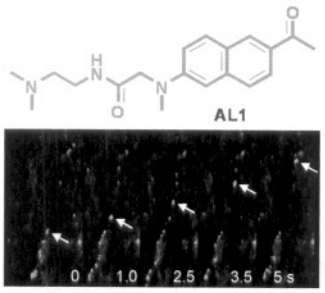
Communications



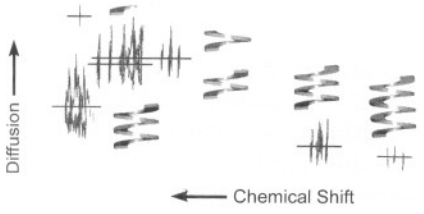
Controlled phase changes: Thermosensitive Au nanoparticles with tunable lower critical solution temperature have been prepared by coating the nanoparticles with a thermo- and pH-responsive hyperbranched polyelectrolyte. The globular, polyfunctional structure of the hyperbranched polymers offer new options to control phase-transition temperatures of the nanoparticles (see aggregation equilibrium in diagram).

Nanosensors



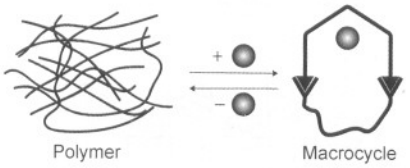
Move with the groove: Two-photon fluorescent pH probes and a two-photon lysotracker (AL1) can visualize acidic vesicles in live cells and living tissue for a long period of time without mistargeting and photobleaching problems. Using AL1, vesicles can be tracked in real time (see picture).

Fluorescent Probes



Diffusion ordered spectroscopy (DOSY) NMR experiments have been used to characterize a dynamic combinatorial library of helical strands and grid-type metallosupramolecular architectures. The technique allows the deconvolution of very similar chemical structures differing only by their hydrodynamic radius. Moreover, the occurrence of springlike, extension–contraction conformational motions in helical strands can be revealed as a function of the temperature.

Constitutional Dynamic Chemistry



Exchanging loose ends: The combination of a morphologically controlled core and reversible covalent linkages allows the reversible switching of a dynamic system between two states, a macrocyclic and a polymeric one (see picture). The process demonstrates that a constitutional dynamic system may undergo a constitutional change on modification of morphological information.

Dynamic Self-Assembly

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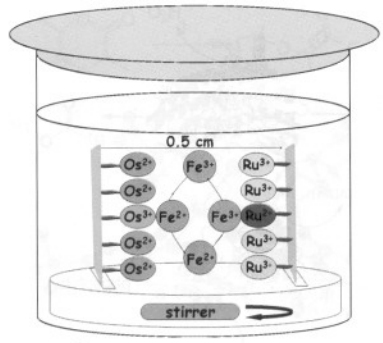
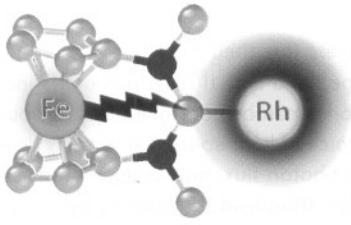
Look who's talking: Redox-induced chemical communication between surface-confined osmium(II) and ruthenium(III) polypyridyl complexes in organic solvents has been demonstrated. Fe^{2+} was used as electron carrier (see picture), and the output signal of the monolayer reporter system was read optically with a conventional UV/Vis spectrophotometer in the transmission mode. Electron transfer takes place at surface–solution interfaces.



Chemical Communication

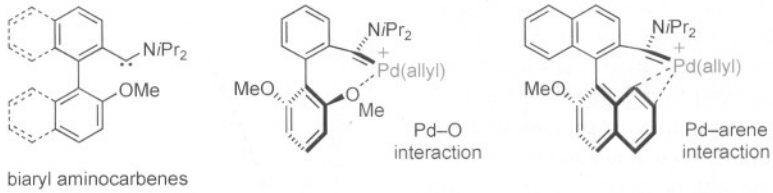
Tandem Reactions

Golden reactivity: A new gold(I)-catalyzed cycloisomerization of 3-methoxy-1,6-enynes was discovered. Structurally simple 3-methoxy-1,6-enynes engage in a tandem cyclization/[3,3]-sigmatropic rearrangement to deliver a variety of 1-methoxy-1,4-cycloheptadienes (see scheme). Notably, the reaction can be performed under very mild conditions and the synthetic utility of this reaction was demonstrated by facile conversion of the product into various cyclohept-4-en-1-ones.



Redox-Active Ligands

Jones'n for electrons: Various Rh complexes (see general structure) were formed with diaminocarbenes that contain 1,1′-disubstituted ferrocenes in their backbones. Electronic communication between the Fe centers in the redox-active carbenes and the coordinated transition metals was observed. For example, the oxidation potential of the Fe center in a bimetallic complex was found to depend on the electron density of the ligated Rh atom.



biaryl aminocarbenes

Aminocarbene Ligands

Similar yet very different: Biaryl aminocarbenes were prepared, characterized spectroscopically, and coordinated to an allylpalladium fragment (see scheme). In the resulting Pd complexes of these bidentate hemilabile ligands, secondary Pd–O and Pd–arene interactions were observed that differ markedly from those encountered in complexes of the related biaryl phosphanes.

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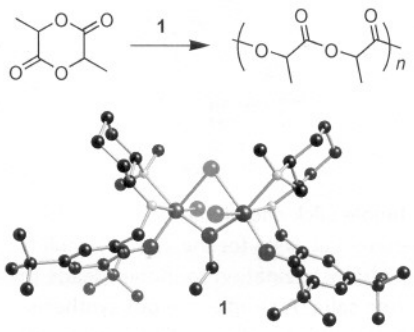
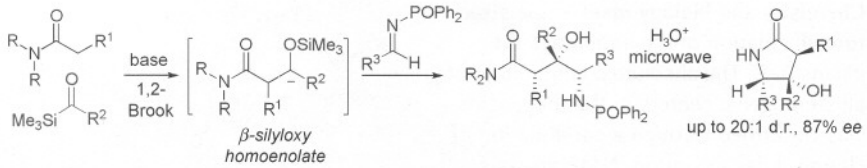
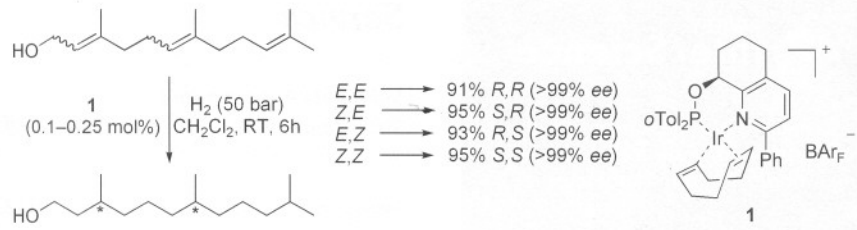
It loves LA! A unique chiral dinuclear indium complex **1** (see structure; In gray, Cl green, O red, N blue, C black) has been developed as a catalyst for the highly active, living ring-opening polymerization of lactide (LA). The catalyst retains the same reaction rate during two consecutive additions of lactide, and there is significant site control of polymer tacticity.



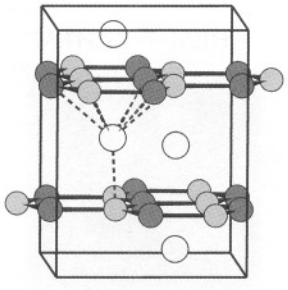


It takes three: The stereoselective synthesis of highly substituted γ-lactams from amide enolates, acylsilanes, and imines is reported. This multicomponent reaction accesses γ-amino-β-hydroxy amides in a single flask with good yields and excellent levels of diastereoselectivity (see scheme). Exposure of the linear products to microwave irradiation and acidic conditions promotes a cyclization to form the corresponding γ-lactams in excellent yields.



Four isomers–one catalyst: The four stereoisomers of hexahydrofarnesol can be prepared with high enantio- and diastereoselectivity by using the same chiral iridium catalyst **1** with different *cis/trans* isomers of farnesol (see scheme; BAr_F = tetrakis[bis-3,5-(trifluoromethyl)-phenyl]borate). Both the internal trialkyl-substituted C=C bond and the allylic alcohol unit are hydrogenated with high facial selectivity.

Nonsymmetrical coordination favored: The structure of BeB_2C_2 (see picture; Be white, B dark gray, C light gray) has been solved using near-edge fine-structure analysis of electron energy loss spectra and high-resolution powder diffractometry. It exhibits the unusual features of graphite-analogous B/C layers and a nonsymmetrical coordination of the beryllium atoms. The latter reveals a striking parallelism of the molecular and solid-state chemistries of Be compounds.



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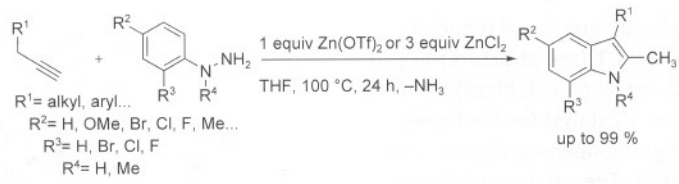
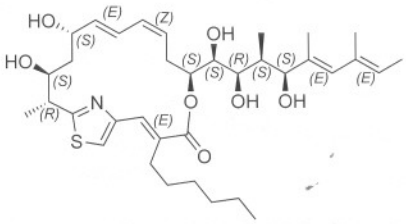


Indole click chemistry: The quest for better catalysts for the intermolecular hydrohydrazination to indoles leads to zinc salts. A simple one-pot synthesis forms indoles from arylhydrazines and terminal alkynes. The pharmacologically relevant indole building blocks are selectively formed in the presence of zinc triflate ($Zn(OTf)_2$) or $ZnCl_2$ (see scheme).

Chemistry and biology meet in the structure elucidation of the antibiotics thuggacins A–C. The absolute configuration of all stereogenic centers in the thuggacins was confirmed through a combination of chemical derivatization, NMR analysis, molecular modeling, and bioinformatic analysis of the thuggacin biosynthetic genes.



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