

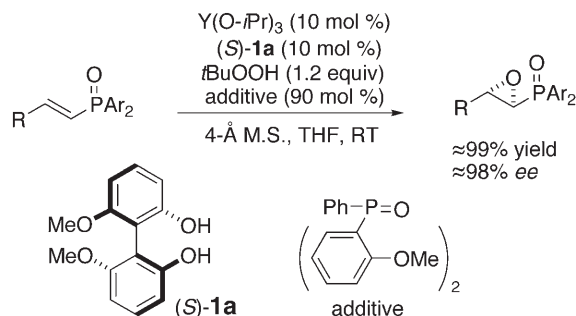
## Epoxidation

K. Hara, S.-Y. Park, N. Yamagiwa,  
S. Matsunaga,\* M. Shibasaki\*

**Catalytic Asymmetric Epoxidation of  $\alpha,\beta$ -Unsaturated Phosphane Oxides with a  $Y(O-iPr)_3$ /Biphenyldiol Complex**

*Chem. Asian J.*

DOI: 10.1002/asia.200800035



**Essential extras:** A combination of  $Y(O-iPr)_3$ , biphenyldiol ligand **1a**, and an achiral phosphorus additive enables the catalytic asymmetric epoxidation of  $\alpha,\beta$ -unsaturated phosphane oxides

to give optically active  $\alpha,\beta$ -epoxy phosphane oxides. The reaction proceeds smoothly to afford the products in good yield and with good enantioselectivity. M.S. = molecular sieves.

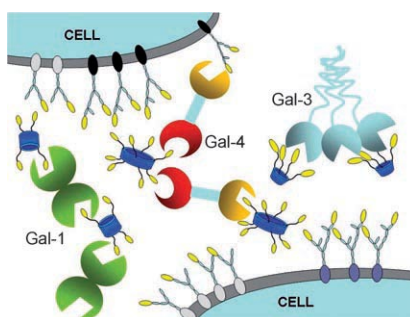
## Lectins

S. André, F. Sansone, H. Kaltner,  
A. Casnati, J. Kopitz, H.-J. Gabius,\*  
R. Ungaro\*

**Calix[n]arene-Based Glycoclusters: Bioactivity of Thiourea-Linked Galactose/Lactose Moieties as Inhibitors of Binding of Medically Relevant Lectins to a Glycoprotein and Cell-Surface Glycoconjugates and Selectivity among Human Adhesion/Growth-Regulatory Galectins**

*ChemBioChem*

DOI: 10.1002/cbic.200800035



**Glycocalixarenes hit on lectins with medical relevance:** A set of 14 calix-[n]arenes adorned with variable numbers of galactose or lactose units has been synthesized, and their interactions with lectins of clinical interest (either biohazard or factor in tumor progression) were studied. A preference for lactose over galactose epitopes, glycoside cluster effects, and a dependence of selective lectin inhibition on shape and valency of the glycoclusters are revealed.

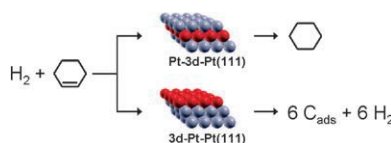
## Catalysts

M. P. Humbert, L. E. Murillo,  
J. G. Chen\*

**Rational Design of Platinum-Based Bimetallic Catalysts with Enhanced Hydrogenation Activity**

*ChemPhysChem*

DOI: 10.1002/cphc.200800139



**Volcanoes abound:** The bond strength of adsorbed reactants determines the hydrogenation activity of Pt-based bimetallic catalysts (see reaction). Weak bonding limits the ability of the molecules to react and strong bonding promotes undesired dehydrogenation and decomposition reactions. A volcano-type relationship between activity and adsorbate binding energy is thus observed for the hydrogenation of  $C=C$  and  $C=O$ .

## Nitrogen-Rich Chemistry

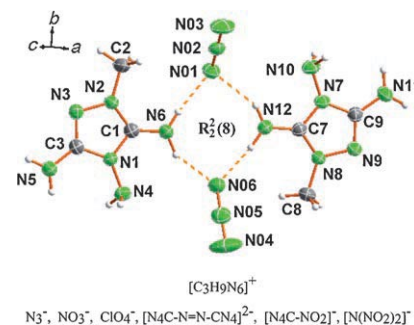
C. Darwich, T. M. Klapötke,\*  
C. M. Sabaté

**1,2,4-Triazolium-Cation-Based Energetic Salts**

*Chem. Eur. J.*

DOI: 10.1002/chem.200800340

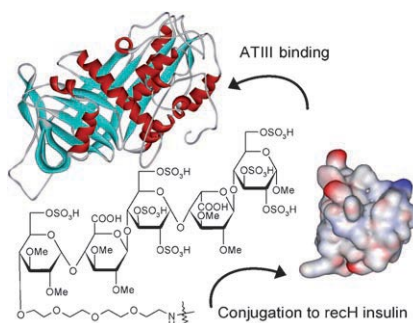
**Things that go bang:** Salts based on the novel methylguanazinium cation with classical energetic anions were synthesised and fully characterised (an example is illustrated here). All compounds have low sensitivities toward classical stimuli, good thermal stabilities (DSC) and high (calculated) performances yielding a new family of heterocycle-based compounds with prospective use as high-explosives and/or propellants.



# ... ON OUR SISTER JOURNALS

## Glycoconjugates

**CarboCarrier™**: Site-specific conjugation of insulin to a synthetic antithrombin III (ATIII)-binding pentasaccharide (PS) improves the protein's half-life and extends the duration of action. The half-life can be adjusted by changing the PS affinity for ATIII.

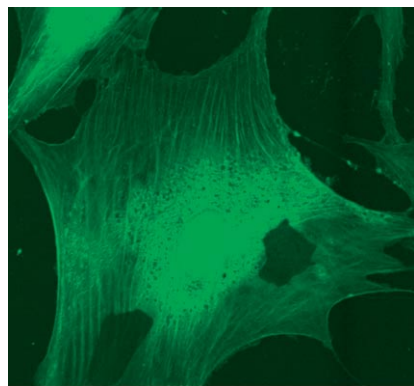


M. de Kort,\* B. Gianotten,  
J. A. J. Wisse, E. S. Bos,  
M. H. M. Eppink, E. Mattaar,  
G. M. T. Vogel, W. H. A. Dokter,  
M. Honing, S. Vonsovic, M.-J. Smit,  
J. C. H. M. Wijkman,  
C. A. A. van Boeckel

### Conjugation of ATIII-Binding Pentasaccharides to Extend the Half-Life of Proteins: Long-Acting Insulin

*ChemMedChem*  
DOI: 10.1002/cmdc.200800053

## Artificial Life



**From little to large**: Dimensional constraints are critical for the gathering, processing, and transmission of chemical-based information with the consequence that nanoscale miniaturization is fundamental to the emergence and sustainability of cellular life. The deep significance of this relationship is analyzed in this Review.

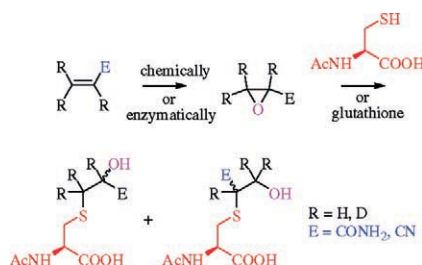
S. Mann\*

### Life as a Nanoscale Phenomenon

*Angew. Chem. Int. Ed.*  
DOI: 10.1002/anie.200705538

## Metabolism and Toxins

Practical syntheses of all four oxidative metabolites of acrylamide and acrylonitrile in their unlabelled and deuterium-labelled forms make it possible to clarify the metabolism of and quantify human exposure to these toxic electrophiles. An approach to compounds with the rare structural fragment  $R^1OCH_2CH(SR^2)CN$  [ $R^1$  = protecting group or H,  $R^2$  = (functionally substituted) alkyl or aryl group] has been developed.

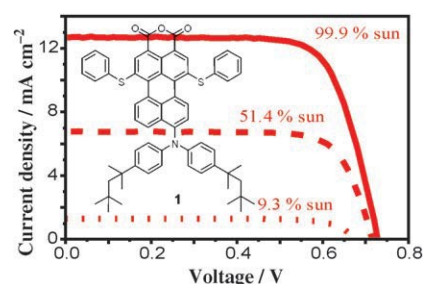


V. N. Belov, S. M. Korneev, J. Angerer,  
A. de Meijere\*

### Syntheses of D-Labelled Oxidative Metabolites of Acrylamide and Acrylonitrile for the Quantification of Their Toxicities in Humans

*Eur. J. Org. Chem.*  
DOI: 10.1002/ejoc.200800291

## Dye-Sensitized Solar Cells



**Sunny side up**: 1,6-Dithiophenol-substituted perylene organic sensitizer **1** was synthesized, and its photovoltaic properties in dye-sensitized solar cells were assessed. When anchored onto  $TiO_2$  film, the dye exhibits an unprecedented incident monochromatic photon-to-current conversion efficiency of 87 % and yields a power conversion efficiency of 6.8 % under standard AM 1.5 solar conditions.

C. Li, J.-H. Yum, S.-J. Moon,  
A. Herrmann, F. Eickemeyer,  
N. G. Pschirer, P. Erk, J. Schöneboom,  
K. Müllen, M. Grätzel,  
M. K. Nazeeruddin\*

### An Improved Perylene Sensitizer for Solar Cell Applications

*ChemSusChem*  
DOI: 10.1002/cssc.200800068