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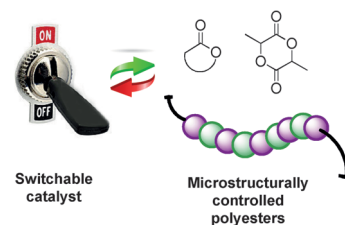


Ring-Opening Polymerization

S. M. Guillaume, E. Kirillov, Y. Sarazin, J.-F. Carpentier*

Beyond Stereoselectivity, Switchable Catalysis: Some of the Last Frontier Challenges in Ring-Opening Polymerization of Cyclic Esters

Searching for the switches: Metal-based catalysts and initiators have long been integral to the ring-opening polymerization (ROP) of cyclic esters. However, several challenges remain. This review surveys advances in the development of new metal-based catalysts for the isoselective ROP, as well as that of ROP catalysts that can be switched between two catalytic states by external stimuli.



Chem. Eur. J.
DOI: 10.1002/chem.201500613

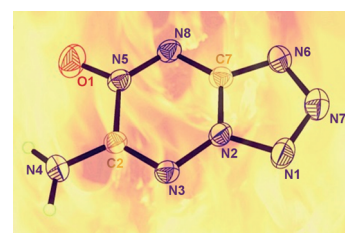


Energetic Materials

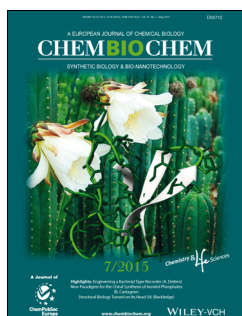
H. Wei, J. Zhang, J. M. Shreeve*

Synthesis, Characterization, and Energetic Properties of 6-Amino-tetrazolo[1,5-b]-1,2,4,5-tetrazine-7-N-oxide: A Nitrogen-Rich Material with High Density

I feel so energetic: A nitrogen-rich compound, 6-amino-tetrazolo[1,5-b]-1,2,4,5-tetrazine-7-N-oxide, that has good thermal stability, with high density and high heat of formation, has been designed and synthesized. The N-oxide creates a good balance of high nitrogen content and high density.



Chem. Asian J.
DOI: 10.1002/asia.201500086

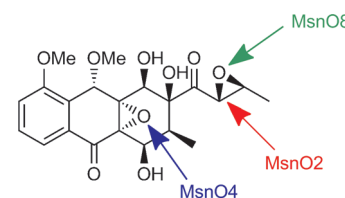


Biosynthesis

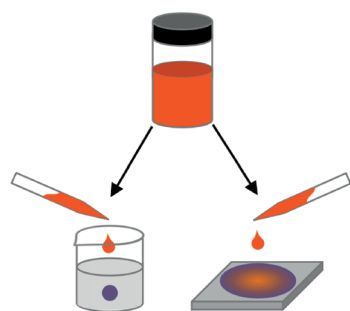
S. Maier, T. Heitzler, K. Asmus, E. Brötz, U. Hardter, K. Hesselbach, T. Paululat, A. Bechthold*

Functional Characterization of Different ORFs Including Luciferase-Like Monooxygenase Genes from the Mensacarcin Gene Cluster

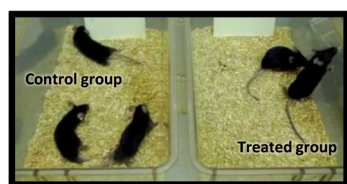
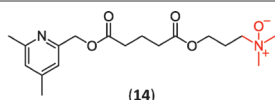
MsnO2, MsnO4, and MsnO8: We elucidated the components of the *Streptomyces bottropensis* mensacarcin biosynthesis gene cluster by selective deletion and complementation in a heterologous expression system. Three luciferase-like monooxygenases are involved in later steps of mensacarcin biosynthesis.



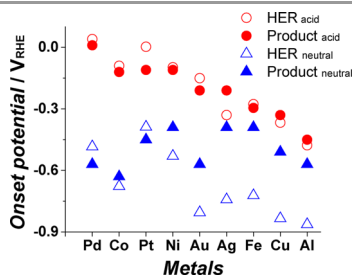
ChemBioChem
DOI: 10.1002/cbic.201500048



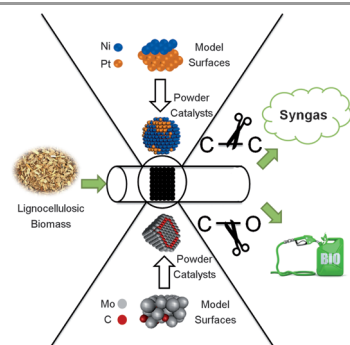
ChemPhysChem
DOI: 10.1002/cphc.201402758



ChemMedChem
DOI: 10.1002/cmdc.201500045



ChemSusChem
DOI: 10.1002/cssc.201500176



ChemCatChem
DOI: 10.1002/cctc.201403067

Solar Cells

R. Dattani, M. T. F. Telling, C. G. Lopez, S. H. Krishnadasan, J. H. Bannock, A. E. Terry, J. C. de Mello, J. T. Cabral, A. J. Nedoma*

Rapid Precipitation: An Alternative to Solvent Casting for Organic Solar Cells

A drop in the bucket: Rapid precipitation shows promise for the processing of organic solar cells and introduces new challenges. Compared with drop casting, rapid precipitation allows for faster processing, finer phase separation, and nearly doubled polymer crystallinity.

Drug Discovery

T. Getter, I. Zaks, Y. Barhum, T. Ben-Zur, S. Bösel, S. Gregoire, O. Viskind, T. Shani, H. Gottlieb, O. Green, M. Shubely, H. Senderowitz, A. Israelson, I. Kwon, S. Petri, D. Offen, A. Gruzman*

A Chemical Chaperone-Based Drug Candidate is Effective in a Mouse Model of Amyotrophic Lateral Sclerosis (ALS)

Low concentration efficacy: Compound **14** demonstrated biological effects in ALS mice, showing the prevention of body mass loss and improvements in neurological function. In vitro studies revealed that this lead compound significantly decreases the formation of misfolded mutated superoxide dismutase 1 (SOD1) and prevents ER-stress-induced apoptosis. In addition, **14** decreased the levels of known ER stress markers and decreased the formation of misfolded mutant SOD1 aggregates.

Biomass conversion

Y. Kwon, Y. Y. Birdja, S. Raoufmoghaddam, M. T. M. Koper*

Electrocatalytic Hydrogenation of 5-Hydroxymethylfurfural in Acidic Solution

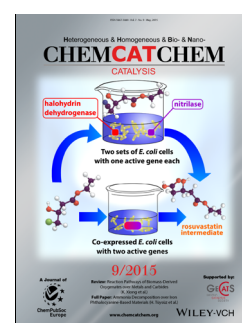
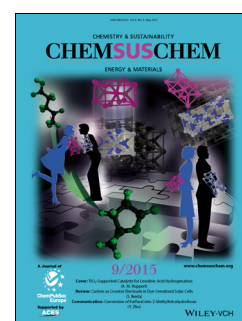
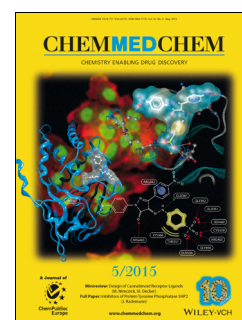
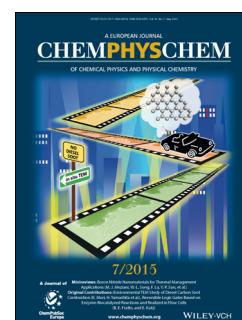
HMF hydrogenation: Electrocatalytic hydrogenation of 5-hydroxymethylfurfural (HMF) is studied on solid metal electrodes in acidic solution (0.5 M H₂SO₄). The pH of the solution plays an important role in the hydrogenation of HMF: acidic conditions lower the activation energy for HMF hydrogenation and hydrogenate the furan ring further, to tetrahydrofuran.

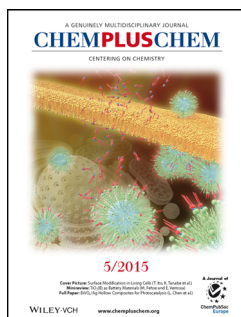
Biomass conversion

K. Xiong, W. Yu, D. G. Vlachos,* J. G. Chen*

Reaction Pathways of Biomass-Derived Oxygenates over Metals and Carbides: From Model Surfaces to Supported Catalysts

Controlling bond scission: The conversion of lignocellulosic biomass-derived oxygenates into value-added fuels and chemicals requires the control of bond-scission sequences. In this review, the application of metal (both mono- and bimetallic) and metal carbide catalysts is emphasized for the selective C–C and C–O bond-scission reactions. Furthermore, the importance of combining density functional theory calculations, microkinetic modelling, ultrahigh vacuum experimental studies over single-crystal model surfaces, and reactor evaluations on the corresponding powder catalysts is illustrated.



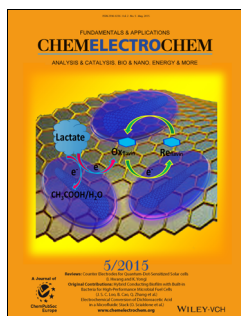
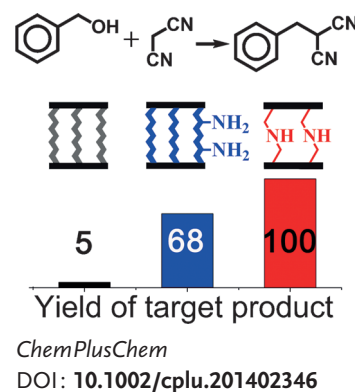


Organic–Inorganic Materials

M. V. Opanasenko,* E. Montanari, M. V. Shamzhy

Fabrication of Hybrid Organic–Inorganic Materials with Tunable Porosity for Catalytic Application

Excellent textural properties: Organic–inorganic materials functionalized with amino groups have been synthesized by using a two-dimensional zeolitic precursor, IPC-1P. The obtained hybrids possess excellent textural properties and catalytic activity in the Knoevenagel condensation of benzaldehyde with malononitrile relative to those of non-functionalized or grafted materials (see figure).

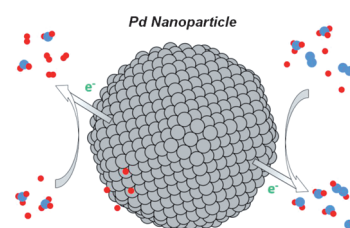


Nanoparticles

W. Ju, T. Brülle, M. Favaro, L. Perini, C. Durante, O. Schneider,* U. Stimming

Palladium Nanoparticles Supported on Highly Oriented Pyrolytic Graphite: Preparation, Reactivity and Stability

Size matters: Size significantly influences the electrochemical properties of Pd nanoparticles (NPs). Extremely small NPs are used as electrocatalysts to sustain a high material dispersion. However, reducing the size of Pd NPs makes it more difficult to understand the catalytic activity of Pd NPs in the HER, due to their size-dependent hydrogen absorption behaviour. The Pd-NP-catalysed ORR is adversely influenced by a reduction in particle size, because the strong Pd–O bonding energy blocks the release of oxygen molecules from the Pd surface. With a change in particle size, the degeneration of the catalyst follows different mechanisms.



ChemElectroChem
DOI: 10.1002/celc.201402379

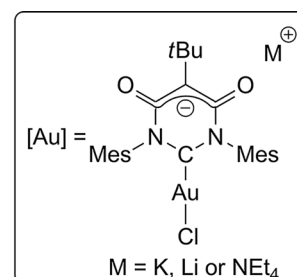


Gold–NHC Catalysts

S. Bastin,* C. Barthes, N. Lugan, G. Lavigne, V. César*

Anionic N-Heterocyclic Carbene Complexes of Gold(I) as Precatalysts for Silver-Free Cycloisomerization of Enynes

The anionic *malon*NHC–gold(I) complexes, synthesized as their Li^+ , K^+ , and Et_4N^+ salts, were fully characterized and used as precatalysts in the silver-free Au-catalyzed cycloisomerization reaction of 1,6-enynes. It was revealed that the nature of the counteranion has a strong influence on the catalyst efficiency. The potassium salt appeared to be the best catalyst affording yields of up to 99%.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201500168

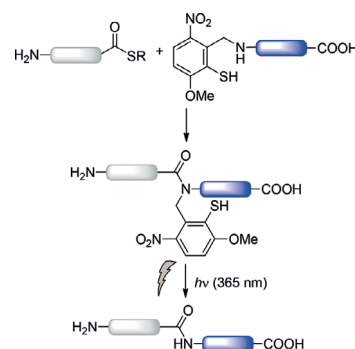


Auxiliary-Mediated Ligation

C. Nadler, A. Nadler, C. Hansen, U. Diederichsen*

A Photocleavable Auxiliary for Extended Native Chemical Ligation

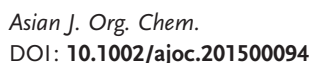
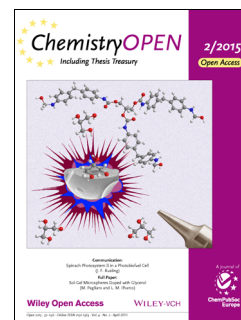
A UV-labile auxiliary for cysteine-free peptide ligation reactions was developed. This auxiliary, which is easily prepared, can be readily attached to a variety of N-terminal amino acids to facilitate ligation reactions at various junctions, and its cleavage efficiently proceeds through a mild photolysis reaction. This new auxiliary provides an excellent alternative to existing ligation auxiliaries.



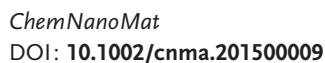
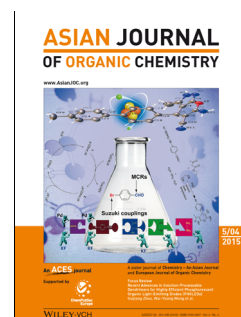
Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201500033



The power of gold! A new thiolated dissymmetrical porphyrin was synthesized and consequently immobilized onto gold nanoparticles using the Brust–Schiffrin method. Thiolated polyethylene glycol was added to obtain water-soluble nanoparticles. The nanoparticles could be internalized by cells and were nontoxic. Tests on the ability of the functionalized gold nanoparticles to induce singlet oxygen production point to a promising nanosystem for photodynamic therapy.



What's Nu? (–)-Deoxynupharidine has been synthesised via an intermediate that can also be used for other Nuphar alkaloids. A highly diastereoselective silver catalysed cyclisation of an allenic hydroxylamine sets the stereochemistry in this synthesis.



Hyperbranched PEI-capped fluorescent carbon dots (CDs) have been prepared by a facile and one-step hydrothermal route. The resultant CDs show stable and strong blue fluorescence. More interestingly, nanocomposites of PEI-coated CDs display pH- and concentration-dependent fluorescence and can be used as an excellent fluorescent probe for cellular imaging.



In an interview, David Spichiger, Executive Director of the Swiss Chemical Society (SCS), talks about key activities, such as the society's scientific journals and events, how the SCS serves both new members and senior scientists, and how it will tackle future challenges.

