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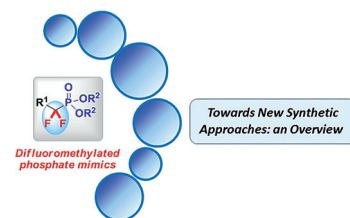


Synthetic Methods

M. V. Ivanova, A. Bayle, T. Besset, X. Pannecoucke, T. Poisson*

New Prospects toward the Synthesis of Difluoromethylated Phosphate Mimics

On to pastures new: The difluoromethyl phosphonate motif plays a crucial role in the development of bioactive molecules. Recently there has been renewed interest in enlarging the panel of reactions to access these difluoromethylated phosphonate-containing molecules. This Concept article charts the recent progress made in this area.



Chem. Eur. J.
DOI: 10.1002/chem.201601310

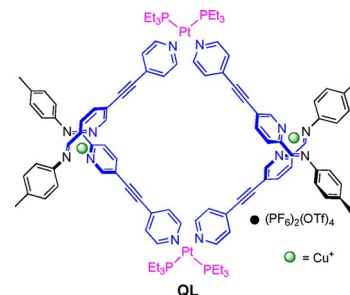


Multicomponent Self-Assembly

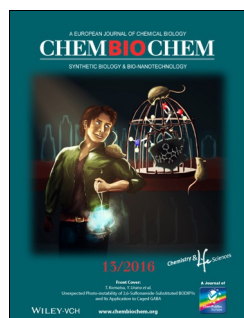
M. L. Saha,* Z. Zhou, P. J. Stang*

A Four-Component Heterometallic Cu-Pt Quadrilateral via Self-Sorting

Self-sorting things out: This work demonstrates a novel multicomponent self-assembly technique that combines the subcomponent self-assembly, the platinum (II)-pyridine coordination-driven self-assembly and integrative self-sorting in a one-pot process. The robustness of this approach was demonstrated by quantitatively preparing the self-assembled four-component heterometallic Cu^I-Pt^{II} quadrilateral QL.



Chem. Asian J.
DOI: 10.1002/asia.201600399

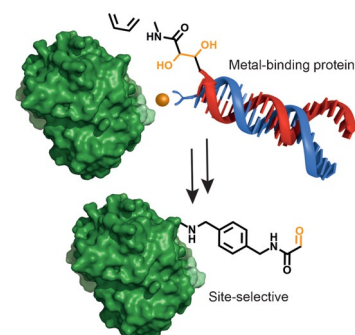


Protein Labeling

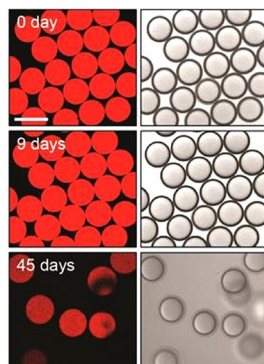
A. L. B. Kodal, C. B. Rosen, M. R. Mortensen, T. Tørring, K. V. Gothelf*

DNA-Templated Introduction of an Aldehyde Handle in Proteins

Site-selective labeling of metal-binding proteins is achieved by metal-coordination and DNA-templated reductive amination of a DNA-tethered aldehyde with lysine at the surface of the protein, followed by oxidative cleavage of a diol spacer in order to remove the DNA and form the aldehyde handle at the protein.



ChemBioChem
DOI: 10.1002/cbic.201600254



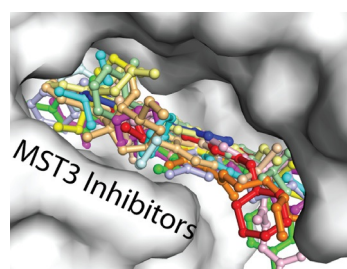
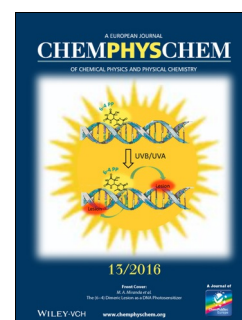
ChemPhysChem
DOI: 10.1002/cphc.201600142

Controlled Release

C.-X. Zhao, D. Chen, Y. Hui, D. A. Weitz, A. P. J. Middelberg*

Stable Ultrathin-Shell Double Emulsions for Controlled Release

W/O/W! The formation of biocompatible, water-in-oil-in-water (W/O/W) double emulsions with an ultrathin layer of fish oil is reported. In addition, their application for the encapsulation and controlled release of small hydrophilic molecules is demonstrated.



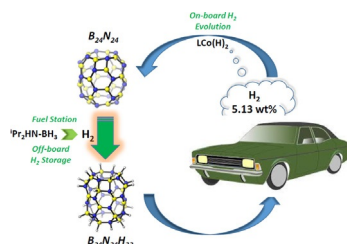
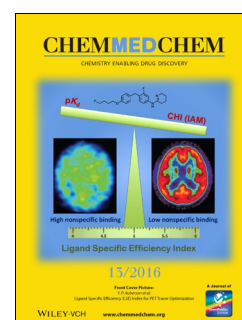
ChemMedChem
DOI: 10.1002/cmdc.201600115

Anticancer Agents

S. H. Olesen, J.-Y. Zhu, M. P. Martin, E. Schönburnn*

Discovery of Diverse Small-Molecule Inhibitors of Mammalian Sterile20-like Kinase 3 (MST3)

The orphan kinase MST3 was screened against a kinase inhibitor library using differential scanning fluorimetry, and 14 hit compounds were confirmed as MST3 inhibitors by enzymatic activity assay and X-ray crystallography. The structure–activity relationships explain the differential inhibitory activity of these compounds, the information of which may aid in the rational design of MST3-selective inhibitors as potential therapeutics and to interrogate the function of this enzyme in diseased cells.



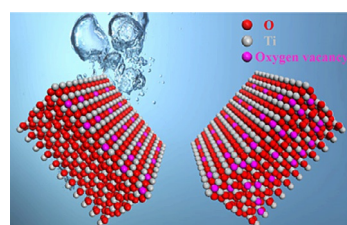
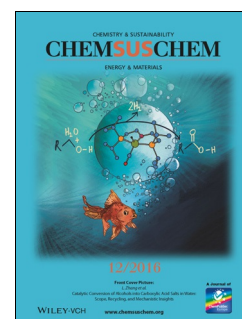
ChemSusChem
DOI: 10.1002/cssc.201600213

Hydrogen Storage

G. Ganguly, T. Malakar, A. Paul*

In Pursuit of Sustainable Hydrogen Storage with Boron-Nitride Fullerene as the Storage Medium

H₂ on repeat: DFT studies reveal that hydrogenated B₂₄N₂₄ can serve as a plausible hydrogen storage material with the promise of fast regeneration from the dehydrogenated mass. The kinetic barrier of the hydrogenation reaction is low, and the associated process is predicted to be thermodynamically downhill. A probable dehydrogenation mechanism for the hydrogenated B₂₄N₂₄ is also proposed.



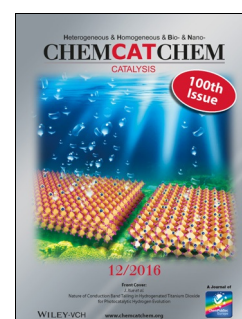
ChemCatChem
DOI: 10.1002/cctc.201600237

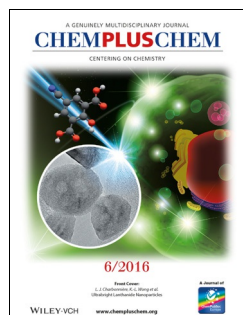
Photocatalysis

J. Xue, X. Zhu, Y. Zhang, W. Wang, W. Xie, J. Zhou, J. Bao,* Y. Luo, X. Gao, Y. Wang, L.-y. Jang, S. Sun,* C. Gao

Nature of Conduction Band Tailing in Hydrogenated Titanium Dioxide for Photocatalytic Hydrogen Evolution

Do the evolution: Enhancing the responsive ability of H-TiO₂ under visible-light irradiation through the introduction of an excess amount of oxygen vacancies may have a negative effect on photocatalytic H₂ evolution. Herein, we control the degree of hydrogenation to restrict tailing of the conduction band, and this results in the most favorable disordered structure for photocatalytic H₂ evolution.



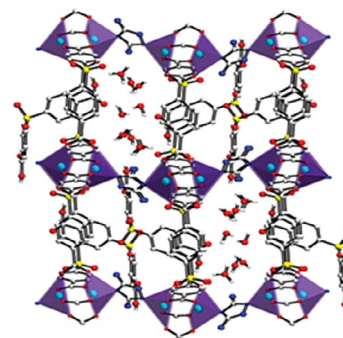


Metal–Organic Frameworks

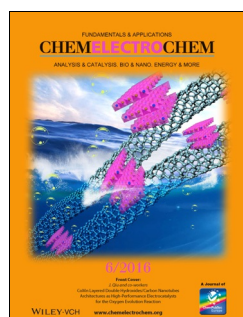
S. Bhattacharya, S. Pal, S. Natarajan*

Switchable Room-Temperature Ferroelectric Behavior, Selective Sorption and Solvent-Exchange Studies of $[\text{H}_3\text{O}][\text{Co}_2(\text{dat})(\text{sdba})_2]\cdot\text{H}_2\text{sdba}\cdot 5\text{H}_2\text{O}$

Complex behavior: The compound $[\text{H}_3\text{O}][\text{Co}_2(\text{dat})(\text{sdba})_2]\cdot\text{H}_2\text{sdba}\cdot 5\text{H}_2\text{O}$ (dat = 3,5-diamino-1,2,4-triazole; H_2sdba = 4,4'-sulfonyldibenzoic acid) is ferroelectric at room temperature, exhibits polarization switching behavior upon dehydration and subsequent rehydration, and undergoes a solvent-mediated single-crystal-to-single-crystal transformation. Gas sorption studies on the dehydrated compound indicate the selective adsorption of CO_2 over CH_4 at 195 K.



ChemPlusChem
DOI: 10.1002/cplu.201500564

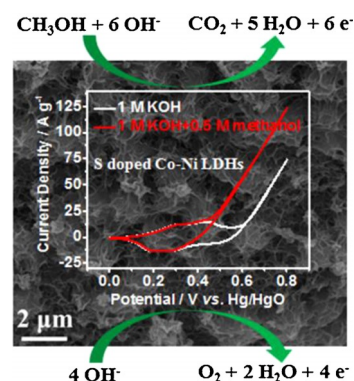


Electrocatalysis

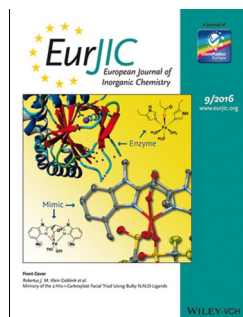
L. Qian,* W. Chen, M. Liu, Q. Jia, D. Xiao

One-Step Electrodeposition of S-Doped Cobalt–Nickel Layered Double Hydroxides on Conductive Substrates and their Electrocatalytic Activity in Alkaline Media

Double or nothing: S-doped Co–Ni layered double hydroxides with different morphologies are directly synthesized on conductive substrates through one-step cyclic voltammetry electrodeposition. These materials can be used for electrocatalytic methanol oxidation and the oxygen evolution reaction in alkaline media.



ChemElectroChem
DOI: 10.1002/celec.201600022

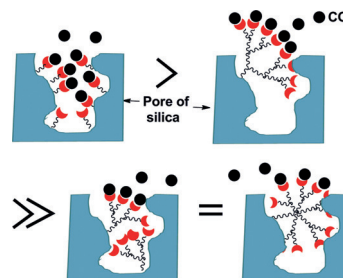


Dendrimer Composites

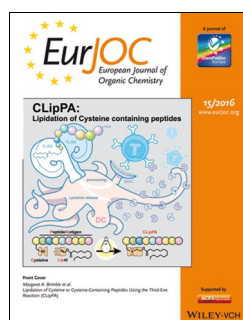
D. Riegert, L. Bareille, R. Laurent, J.-P. Majoral, A.-M. Caminade,* A. Chaumonnot*

Silica Functionalized by Bifunctional Dendrimers: Hybrid Nanomaterials for Trapping CO_2

Several types of bifunctional dendrimeric structures have been grafted to several types of nanoporous silica to afford various hybrid nanomaterials. Some of them have been used to trap CO_2 , with various efficiencies, depending on the size and shape of the dendrimeric structures and the porosity of the silicas.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201600426

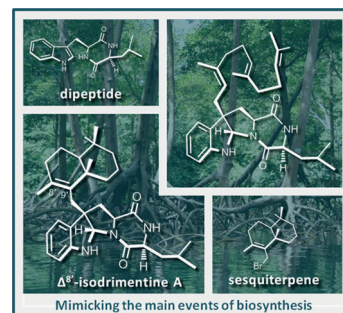


Bio-Inspired Synthesis

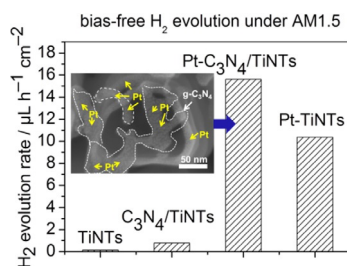
A. Skiredj, M. A. Beniddir, L. Evanno,* E. Poupon*

Mimicking the Main Events of the Biosynthesis of Drimentines: Synthesis of Δ^8 -Isodrimentine A and Related Compounds

A straightforward assembly of Δ^8 -isodrimentine A by a bio-inspired alkylation of a tryptophan-containing cyclodipeptide is described. The two fragments were prepared by peptidic couplings and from (+)-sclareolide. A fully biomimetic approach was also evaluated with the synthesis of a farnesyl-substituted pyrroloindoline–diketopiperazine, corresponding to a biosynthetic precursor of drimentine A.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201600444



ChemistryOpen

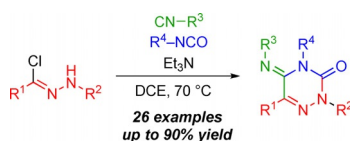
DOI: 10.1002/open.201500219

Photocatalysis

Z.-D. Gao, Y.-F. Qu, X. Zhou, L. Wang, Y.-Y. Song,* P. Schmuki*

Pt-Decorated g-C₃N₄/TiO₂ Nanotube Arrays with Enhanced Visible-Light Photocatalytic Activity for H₂ Evolution

Dressing up TiNTs! TiO₂ nanotube layers (TiNTs) were decorated with graphitic-phase C₃N₄ (g-C₃N₄) via a facile chemical vapor deposition (CVD) approach. In comparison with classical TiO₂ nanotubes, the g-C₃N₄/TiNTs show an onset of the photocurrent at 2.4 eV with a considerably high photocurrent magnitude in the visible range. After further decoration with Pt, the platform exhibited a strong enhancement for photoelectrochemical and bias-free H₂ evolution under AM1.5.



Asian J. Org. Chem.

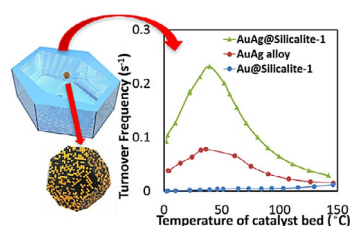
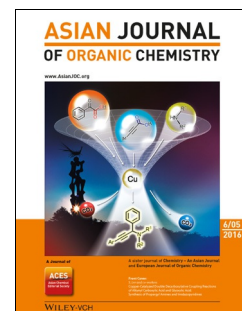
DOI: 10.1002/ajoc.201600191

Multicomponent Reactions

T. Soeta,* S. Takashita, Y. Sakata, Y. Ukaji*

Ugi-type Multicomponent Reaction of Nitrile Imines, Isocyanides, and Isocyanates: Effective Synthesis of 1,2,4-Triazinedione Derivatives

A triple look: A Ugi-type multicomponent reaction (MCR), in which a combination of a nitrile imine, an isocyanide, and an isocyanate reacted to give the corresponding 1,2,4-triazinedione derivatives in good-to-high yields has been developed. This reaction is one of the few examples of isocyanide-based MCRs using an isocyanate in place of a carboxylic acid. A wide range of nitrile imines, isocyanides, and isocyanates were found to be applicable to the reaction.



ChemNanoMat

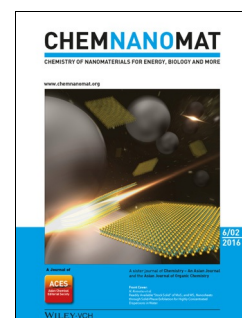
DOI: 10.1002/cnma.201600058

Nanoreactors

S. Li, A. Tuel, J.-L. Rousset, F. Morfin, M. Aouine, L. Burel, F. Meunier, D. Farrusseng*

Hollow Zeolite Single-Crystals Encapsulated Alloy Nanoparticles with Controlled Size and Composition

Box it up: A generic process for synthesizing nanoalloys of controlled size (2–10 nm) and composition in zeolite nanoboxes is described. The nanoboxes act both as nanoreactors where the bimetallic particles are formed and as protective ultra-microporous shells, which prevent sintering even under harsh conditions. The simultaneous presence of Ag and Au at the surface of Au₁₆₁Ag₂₂ NPs has been demonstrated through the catalytic activity for CO oxidation near room temperature.



ChemViews magazine

DOI: 10.1002/chemv.201600016

Chemistry Startups

V. Köster, T. Daubenfeld

Chemistry Drives Innovation

Professor Thorsten Daubenfeld, Fresenius University of Applied Sciences in Idstein, Germany, talks about the state of chemical startups in Germany, their importance for innovation, and why chemists should consider learning business fundamentals in addition to science.

