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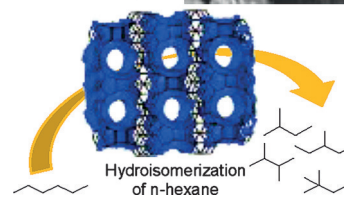
Heterogeneous Catalysis

J. E. Schmidt, C.-Y. Chen, S. K. Brand, S. I. Zones, M. E. Davis*

Facile Synthesis, Characterization, and Catalytic Behavior of a Large-Pore Zeolite with the IWV Framework

Microporous materials: Synthesis of aluminosilicate IWV under industrially relevant conditions has been demonstrated, and the material can be produced in both fluoride and hydroxide media across a wide composition range. The zeolite demonstrates catalytic activity in the hydroisomerization of *n*-hexane (see figure).

Easily produced aluminosilicate IWV made in hydroxide media demonstrates catalytic activity



Chem. Eur. J.

DOI: 10.1002/chem.201504717

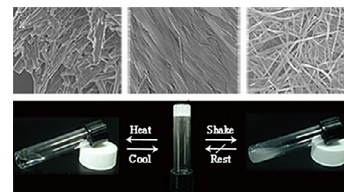


Ionogels

X. Wang, Q. Yang, Y. Cao, J. Zhou, H. Hao, Y. Liang, J. Hao*

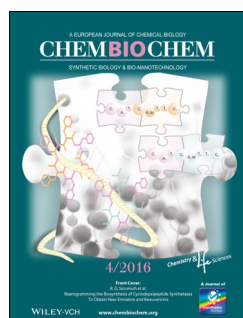
Ionogels of a Sugar Surfactant in Ionic Liquids

Sweetened gels: Green and environmentally friendly ionogels are obtained through the self-assembly of a sugar surfactant in imidazolium-based ionic liquids (see figure). Microstructures from ribbons to lamellar structures are induced by temperature. The relationship between the rheological and tribological properties are described.



Chem. Asian J.

DOI: 10.1002/asia.201501198

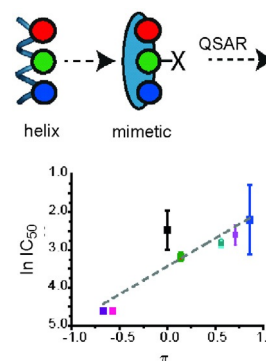


Protein-Protein Interactions

V. Azzarito, P. Rowell, A. Barnard, T. A. Edwards, A. Macdonald, S. L. Warriner,* A. J. Wilson*

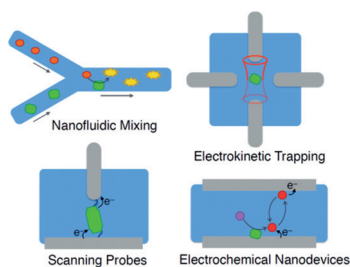
Probing Protein Surfaces: QSAR Analysis with Helix Mimetics

Rationalising behaviour: Using a helix mimetic based on an oligoamide scaffold, we have exploited a modular synthesis to access compounds that can readily be used to understand the noncovalent determinants of *h*DM2 recognition by cell-active p53/*h*DM2 inhibitors.



ChemBioChem

DOI: 10.1002/cbic.201500504



ChemPhysChem

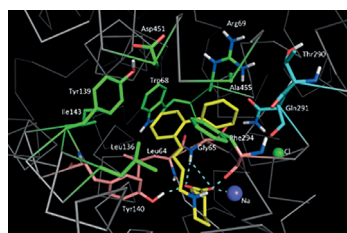
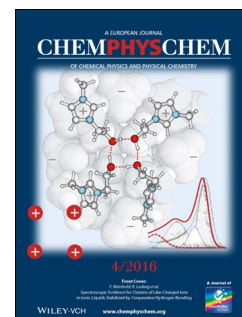
DOI: 10.1002/cphc.201500686

Single Molecules

K. Mathwig, Q. Chi, S. G. Lemay, L. Rassaei*

Handling and Sensing of Single Enzyme Molecules: From Fluorescence Detection towards Nanoscale Electrical Measurements

Hard to handle: Some of the major breakthroughs that have led to significant advances in classical single-molecule enzyme studies are first summarized. In addition, several recent developments in micro- and nanodevices are highlighted, which allow the study and handling of few or even single enzyme molecules in a confined reaction space



ChemMedChem

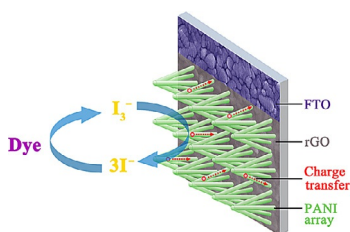
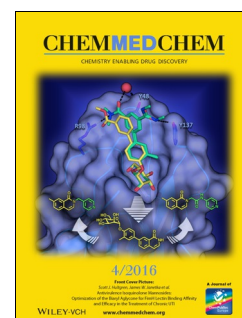
DOI: 10.1002/cmdc.201500490

Medicinal Chemistry

M. Petrera, T. Wein, L. Allmendinger, M. Sindelar, J. Pabel, G. Höfner, K. T. Wanner*

Development of Highly Potent GAT1 Inhibitors: Synthesis of Nipecotic Acid Derivatives by Suzuki–Miyaura Cross-Coupling Reactions

Exploring the gap: Guided by molecular modeling studies, a series of nipecotic acid derivatives with different 2-biphenyl moieties on an *N*-butenyl linker were synthesized as potential GAT1 inhibitors. A 2',4'-dichlorobiphenyl-2-yl derivative was found to be highly potent in binding and uptake assays and to display high subtype selectivity for GAT1.



ChemSusChem

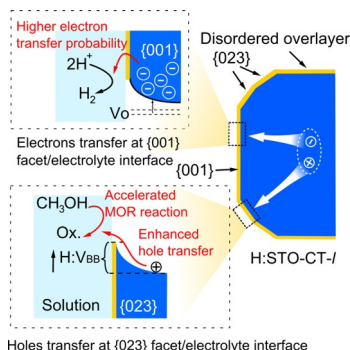
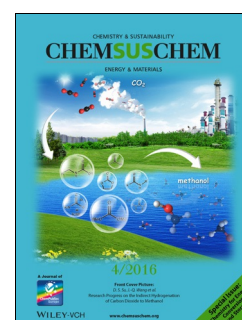
DOI: 10.1002/cssc.201501584

Solar Cells

Z. He, J. Liu, S. Y. Khoo, T. T. Y. Tan*

Electropolymerization of Uniform Polyaniline Nanorod Arrays on Conducting Oxides as Counter Electrodes in Dye-Sensitized Solar Cells

PANI for your thoughts: A rapid and template-free method to grow highly ordered polyaniline (PANI) nanorod arrays on conducting oxide substrates is reported. The substrate, FTO, is modified with a thin layer of reduced graphene oxide, before growth of the PANI nanorods by in situ, low-potential electropolymerization. When employed as electrodes in dye-sensitized solar cells, the PANI arrays offer high electrocatalytic activity, chemical stability, and enhanced performance compared to platinum-based electrodes.



Holes transfer at {023} facet/electrolyte interface

ChemCatChem

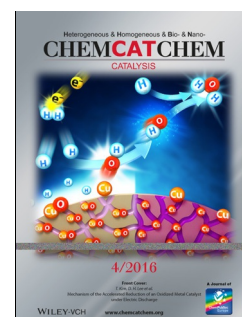
DOI: 10.1002/cctc.201501162

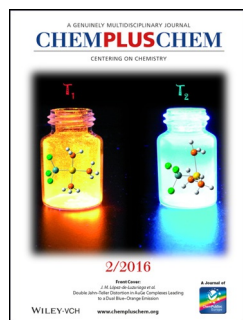
Electrocatalysis

B. Wang, S. Shen,* L. Guo

Surface Reconstruction of Facet-Functionalized SrTiO₃ Nanocrystals for Photocatalytic Hydrogen Evolution

Facet-rich coating: Surface-reconstructed SrTiO₃ nanocrystals with disordered overlayers are created by a thermal hydrogenation process. The nanocrystals enclosed with {023} and {001} facets in an appropriate ratio show the highest photocatalytic activity for hydrogen evolution. MOR = methanol oxidation reaction; V = vacancy.



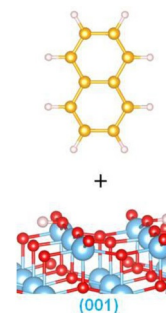


Density Functional Calculations

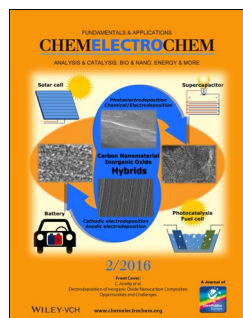
H.-Y. T. Chen, S. Livraghi, E. Giamello, G. Pacchioni*

Mechanism of the Cyclo-Oligomerisation of C_2H_2 on Anatase TiO_2 (101) and (001) Surfaces and Their Reduction: An Electron Paramagnetic Resonance and Density Functional Theory Study

On the surface of things: Acetylene oligomerisation occurs on the surface of anatase TiO_2 leading to the formation of polycyclic aromatic hydrocarbons and a reduced titania surface. The mechanism of the reaction has been elucidated by EPR measurements and DFT calculations (see figure).



ChemPlusChem
DOI: 10.1002/cplu.201500383

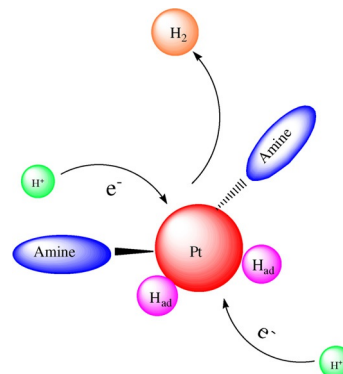


Water Splitting

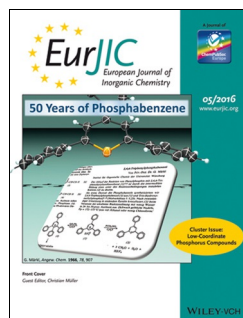
T. Li, X. Wang, W. Yuan,* C. M. Li

Unique Co-Catalytic Behavior of Protic Ionic Liquids as Multifunctional Electrolytes for Water Splitting

DEAFening: For the first time, a protic ionic liquid, diethylammonium format, is used as a multifunctional electrolyte in a water-splitting cell, demonstrating a unique role as co-catalyst.



ChemElectroChem
DOI: 10.1002/celc.201500458

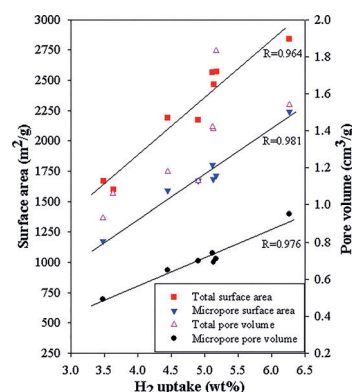


Hydrogen-Storage Materials

Z. Yang, W. Xiong, J. Wang, Y. Zhu, Y. Xia*

A Systematic Study on the Preparation and Hydrogen Storage of Zeolite 13X-Templated Microporous Carbons

A systematic study on CVD-based strategies for the nanocasting of porous carbon materials with zeolite 13X as template is presented. The resulting carbon materials exhibit hydrogen-uptake capacities of up to 6.3 wt.-%. Linear relationships between the uptake capacity and the total surface area, the micropore volume, and the micropore surface area were found.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201501180

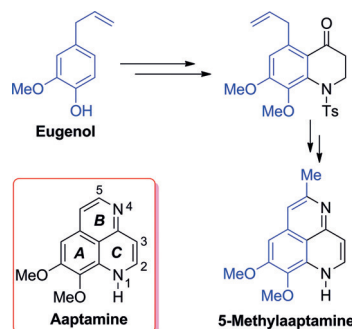


Natural Product Synthesis

D. A. Heredia, E. L. Larghi,* T. S. Kaufman*

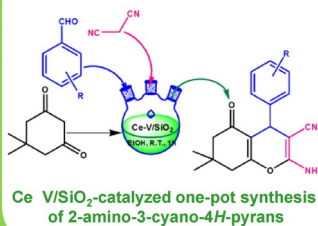
A Straightforward Synthesis of 5-Methylaaptamine from Eugenol, Employing a 6π -Electrocyclization Reaction of a 1-Azatriene

5-Methylaaptamine, an analogue of naturally occurring aaptamine, was synthesized from eugenol by using an $A \rightarrow AC \rightarrow AC-B$ ring-construction strategy. The synthetic approach involved the preparation of a 2,3-dihydro-1H-quinolin-4-one system through an aza-Michael/sulfonamidation/Friedel-Crafts cyclization sequence. A 6π -electrocyclization reaction was used to obtain the final B ring.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201501566

Green chemistry



ChemistryOpen

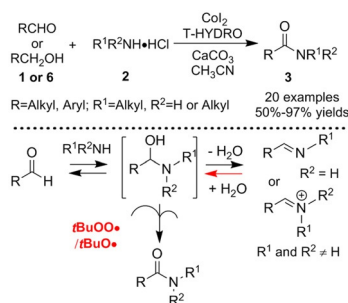
DOI: 10.1002/open.201500159

Green Synthesis

S. N. Maddila, S. Maddila, W. E. van Zyl, S. B. Jonnalagadda*

Ceria–Vanadia/Silica-Catalyzed Cascade for C–C and C–O Bond Activation: Green One-Pot Synthesis of 2-Amino-3-cyano-4H-pyrans

One-pot wonder: We designed a ceria–vanadia/silica (Ce–V/SiO₂) heterogeneous catalyst and used it for the green synthesis of 2-amino-3-cyano-4H-pyran derivatives, typically used in pharmaceuticals. The efficient reaction was a multicomponent one-pot condensation of 5,5-dimethylcyclohexane-1,3-dione, aromatic aldehyde, and malononitrile in ethanol, with yields up to 95%. The catalyst is economical, recyclable, and reusable for over five runs while preserving its high activity.



Asian J. Org. Chem.

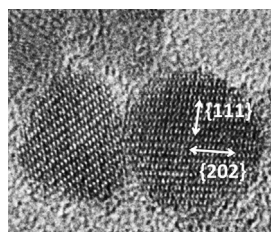
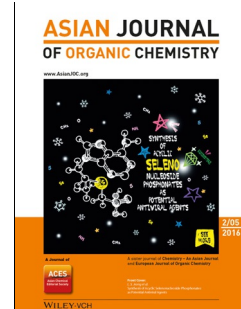
DOI: 10.1002/ajoc.201500514

Amide Synthesis

Y.-F. Guo, T.-L. Ren, B.-H. Xu,* Y.-F. Wang, S.-J. Zhang*

Cobalt-Catalyzed Dehydrogenative Coupling of Alcohols/Aldehydes and Amines: An Important Role for Imine Hydration

A good hyd-ing: A protocol for Co^{II}/I[−]/tert-butyl hydroperoxide-catalyzed oxidative cross-coupling of alcohols or aldehydes with amines has been developed. tBuO•/tBuOO• rather than IO[−]/IO₂[−]/IO₃[−] is the active hydrogen-abstraction species in this catalytic process. Investigation into the reaction mechanism also revealed the potential transiency of a hemiaminal and the important role of its regeneration by imine hydration.



ChemNanoMat

DOI: 10.1002/cnma.201500181

Biomaterialization

Y. Maeda, Z. Wei, Y. Ikezoe, E. Tam, H. Matsui*

Biomimetic Crystallization of MnFe₂O₄ Mediated by Peptide-Catalyzed Esterification at Low Temperature

A catalytic peptide, discovered through hydrogel-based phage display, could generate MnFe₂O₄ nanocrystals exhibiting superparamagnetism at 4 °C in a methanol–benzyl alcohol mixture.



ChemViews magazine

DOI: 10.1002/chemv.201500106

Biomass Production

F. Derwenskus, C. Holdmann

Microalgae – Underestimated All-Rounders

Microalgae have substantially higher biomass productivity than terrestrial plants. These diverse species have potential for a whole range of applications, including synthesizing food ingredients and recycling inorganic waste. The optimization of algae-based processes is a very promising area of research.

