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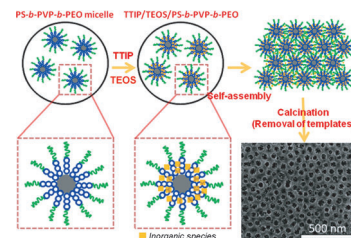


Self-Assembly

Y. Li, B. P. Bastakoti,* M. Imura, S. M. Hwang, Z. Sun, J. H. Kim, S. X. Dou, Y. Yamauchi*

Synthesis of Mesoporous $\text{TiO}_2/\text{SiO}_2$ Hybrid Films as Efficient Photocatalyst by Polymeric Micelle Assembly

Photoactive hybrids: Thermally stable mesoporous $\text{TiO}_2/\text{SiO}_2$ hybrid films with pore size of 50 nm have been synthesized by adopting the polymeric micelle-assembly method. A triblock copolymer, poly(styrene-*b*-2-vinyl pyridine-*b*-ethylene oxide), which serves as a template for the mesopores, was utilized to form polymeric micelles (see figure).



Chem. Eur. J.
DOI: 10.1002/chem.201304689

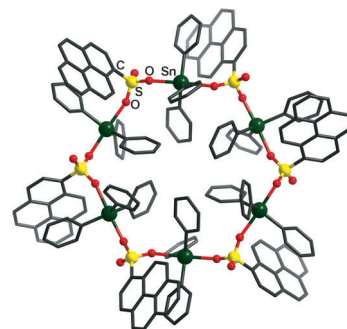


Supramolecular Chemistry

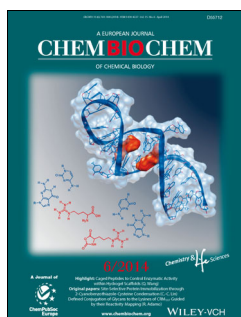
S. Kundu, R. K. Metre, R. Yadav, P. Sen, V. Chandrasekhar*

Multi-Pyrene Assemblies Supported on Stannoxane Frameworks: Synthesis, Structure and Photophysical Studies

Ring-tin-tin: The reactions of pyrene sulfonic acid (PySO_3H) or $\text{C}_{16}\text{H}_9\text{CHNC}_6\text{H}_3(\text{COOH})_2$ (LH_2) with various organotin precursors afforded pyrene-containing organostannoxanes (see figure), such as $[\text{Ph}_3\text{SnPySO}_3]_6$ (1), $[\{(\text{Me}_2\text{Sn})_2(\mu_3\text{-O})(\mu\text{-OH})\text{PySO}_3\}_2\{(\text{Me}_2\text{Sn})_2(\mu_3\text{-O})(\mu\text{-OH})\text{H}_2\text{O}\}_2\cdot 2\text{PySO}_3]$ (2), $[\{t\text{Bu}_2\text{Sn}(\text{OH})\text{PySO}_3\}_2]$ (3), $[\{(n\text{BuSn})_{12}(\text{O})_{14}(\text{OH})_6\{\text{PySO}_3\}_2]$ (4), and $[\{(n\text{Bu}_2\text{Sn})\text{L}\}_3\cdot \text{C}_6\text{H}_5\text{CH}_3]$ (5) which show interesting photophysical properties.



Chem. Asian J.
DOI: 10.1002/asia.201400054

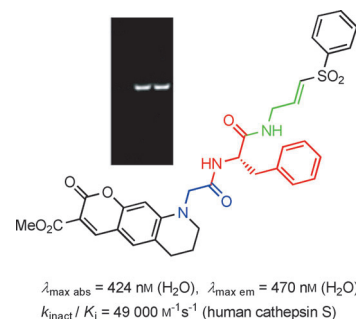


Fluorescent Probes

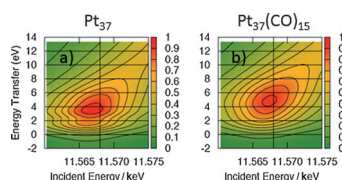
M. D. Mertens, J. Schmitz, M. Horn, N. Furtmann, J. Bajorath, M. Mareš, M. Gütschow*

A Coumarin-Labeled Vinyl Sulfone as Tripeptidomimetic Activity-Based Probe for Cysteine Cathepsins

Tricycle light: A tripeptidomimetic, vinyl sulfone-type activity-based probe containing a rigid coumarin moiety fluorophore was prepared by convergent synthesis. The probe was evaluated as an inactivator of human cathepsins and, as exemplified with cathepsin S, it proved to be suitable for imaging in SDS-PAGE.



ChemBioChem
DOI: 10.1002/cbic.201300806



Surface Science

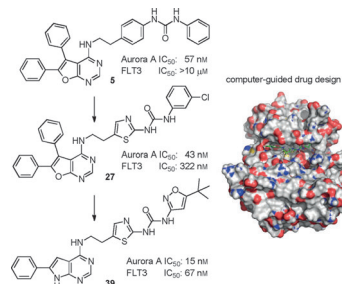
M. W. Small, J. J. Kas, K. O. Kvashnina, J. J. Rehr,* R. G. Nuzzo,*
M. Tromp,* A. I. Frenkel*

Effects of Adsorbate Coverage and Bond-Length Disorder on the d-Band Center of Carbon-Supported Pt Catalysts

Don't let disorder bother you: Using resonant inelastic X-ray scattering (RIXS) measurements the changes in the d-band center of carbon-supported Pt nanocatalysts are imaged in response to variable temperatures and gas atmospheres. Theoretical analysis of RIXS data reveals that the d-band-center shift toward the Fermi level at elevated temperatures is dominated by the decrease in adsorbate coverage, whereas the increase of bond-length disorder plays no significant role.

ChemPhysChem

DOI: 10.1002/cphc.201400055



ChemMedChem

DOI: 10.1002/cmdc.201300571

Drug Design

Y. Chang Hsu, Y.-Y. Ke, H.-Y. Shiao,* C.-C. Lee, W.-H. Lin, C.-H. Chen,
K.-J. Yen, J. T.-A. Hsu, C. Chang, H.-P. Hsieh*

Facile Identification of Dual FLT3–Aurora A Inhibitors: A Computer-Guided Drug Design Approach

In silico selection: We selected an Aurora hit compound as a starting point, followed by two consecutive computer-guided strategies to rapidly and efficiently modify the side chain and core. These efforts resulted in the identification of a potential FLT3–Aurora A inhibitor for further development to treat acute myeloid leukemia (AML).

Switchable ionic liquids (SILs)



Mild treatment of moist wood

Biomass Processing

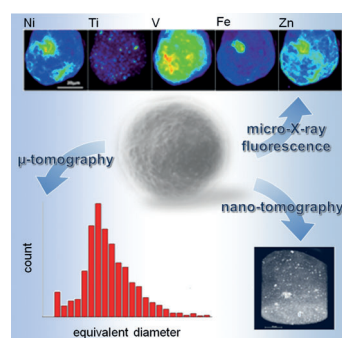
I. Anugwom, V. Eta, P. Virtanen, P. Mäki-Arvela, M. Hedenström,
M. Hummel, H. Sixta, J.-P. Mikkola*

Switchable Ionic Liquids as Delignification Solvents for Lignocellulosic Materials

Making the switch: A feasible fractionation method of birch chips (*B. pendula*) is developed by using a switchable ionic liquid (SIL) derived from an alkanol amine (monoethanol amine, MEA) and an organic super base (1,8-diazabicyclo-[5.4.0]-undec-7-ene, DBU) with two different trigger acid gases (CO_2 and SO_2) is studied. After SIL treatment, the dissolved fractions are selectively separated by a step-wise method using an antisolvent to induce precipitation. The SIL was recycled after concentration and evaporation of anti-solvent.

ChemSusChem

DOI: 10.1002/cssc.201300773



Catalytic Cracking

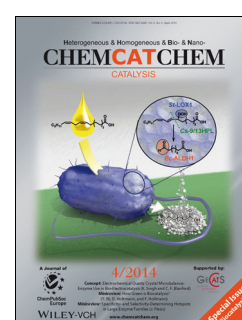
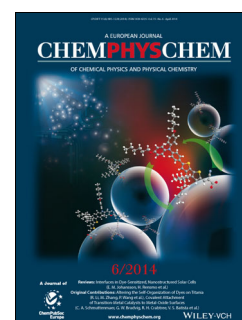
S. R. Bare,* M. E. Charochak, S. D. Kelly, B. Lai, J. Wang,
Y.-c. K. Chen-Wiegar

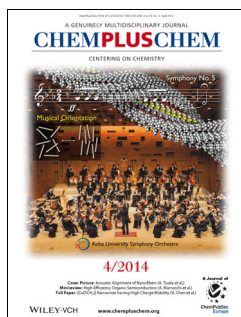
Characterization of a Fluidized Catalytic Cracking Catalyst on Ensemble and Individual Particle Level by X-ray Micro- and Nanotomography, Micro-X-ray Fluorescence, and Micro-X-ray Diffraction

Mini techniques, bigger picture: A combination of advanced characterization techniques, synchrotron X-ray micro- and nanotomography, micro-X-ray fluorescence, and micro-XRD, are used to characterize a commercial spent equilibrium fluid catalytic cracking catalyst at both the ensemble and individual particle level.

ChemCatChem

DOI: 10.1002/cctc.201300974



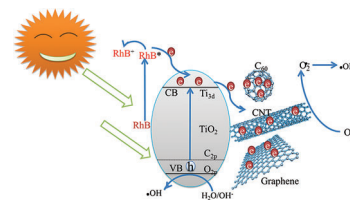


Photocatalysis

Q. Li, J. Bian, L. Zhang, R. Zhang, G. Wang, D. H. L. Ng*

Synthesis of Carbon Materials–TiO₂ Hybrid Nanostructures and Their Visible-Light Photo-catalytic Activity

Closing the gap: The incorporation of carbon materials onto TiO₂ leads to a superior adsorption ability for dye, narrower band gaps, and accelerated separation of electron–hole pairs; these factors enhance the photocatalytic activity of the composites (see picture; RhB = rhodamine B, CB = conduction band, VB = valence band).



ChemPlusChem
DOI: 10.1002/cplu.201300380

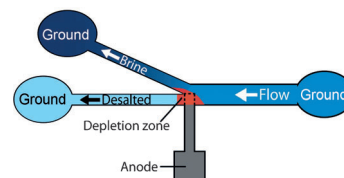


Electrochemical Desalination

K. N. Knust, D. Hlushkou, U. Tallarek,* R. M. Crooks*

Electrochemical Desalination for a Sustainable Water Future

From seawater to a table near you: Electrochemically mediated desalination is presented within the context of existing thermal, membrane, and electrochemical desalination techniques, while explaining many of the underlying concepts guiding the development of desalination technologies.



ChemElectroChem
DOI: 10.1002/celec.201300236

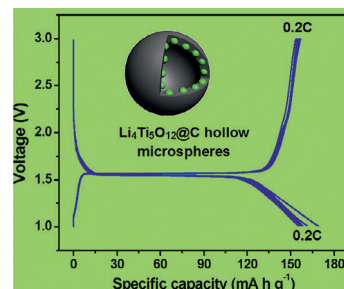


Anode Materials

J. Liu,* W. Liu, S. Ji,* Y. Wan, H. Yin, Y. Zhou

Facile Synthesis of Carbon-Encapsulated Li₄Ti₅O₁₂@C Hollow Microspheres as Superior Anode Materials for Li-Ion Batteries

A solution-phase self-assembly and solid-phase carbonization route for the synthesis of uniform hollow carbon microspheres embedded with Li₄Ti₅O₁₂ nanoparticles has been developed. The micro-sized spherical Li₄Ti₅O₁₂@C hollow composites have conductive carbon shells, which endow them with high specific capacity, rate capability, electrode density, and cycle stability.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201301558

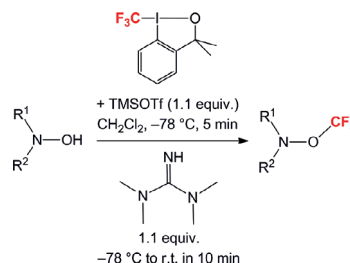


Trifluoromethylation

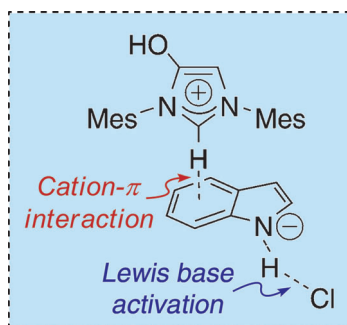
V. Matoušek, E. Pietrasiak, L. Sigrist, B. Czarniecki, A. Togni*

O-Trifluoromethylation of *N,N*-Disubstituted Hydroxylamines with Hypervalent Iodine Reagents

Electrophilic trifluoromethylation of dialkyl hydroxylamines with hypervalent iodine(III) reagents gives access to compounds containing the virtually unexplored NOCF₃ functional group. Aspects concerning synthesis, properties, and reaction mechanism are presented. The transformation is also applicable to hydroxylamines derived from common drugs and shows a broad functional group tolerance.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201402225



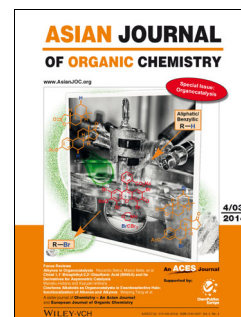
Asian J. Org. Chem.
DOI: 10.1002/ajoc.201400026

Imidazolium Catalysis

T. Narumi, S. Tsuzuki, H. Tamamura*

Imidazolium Salt-Catalyzed Friedel–Crafts-Type Conjugate Addition of Indoles: Analysis of Indole/Imidazolium Complex by High Level ab Initio Calculations

Salt is good for you: An imidazolium salt-catalyzed, Friedel–Crafts-type conjugate addition of indoles that requires no base, solvent, or N-heterocyclic carbene has been developed. The key is the unique activation of indoles by the cation– π interaction of indole/imidazolium complexes assisted by chloride anions derived from imidazolium salts. Ab initio calculations support the presence of a cation– π interaction in the indole/imidazolium complex.



ChemViews magazine
DOI: 10.1002/chemv.201400025

Pharmaceutical Industry

J. LaMattina

Challenges Facing the Pharmaceutical Industry

Getting a new drug on to the market has become increasingly difficult as the emphasis on proving the long-term benefits and safety of new drugs has increased, resulting in new hurdles in clinical development. In this webinar, John LaMattina, former President, Pfizer Global R&D, discusses these challenges and also tackles the reasons behind the public's mistrust of the pharmaceutical industry.

