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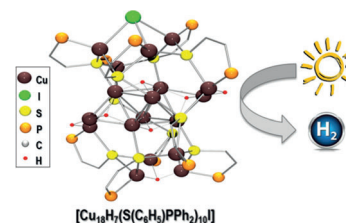


Copper Nanoclusters

M. A. Huertos, I. Cano, N. A. G. Bandeira, J. Benet-Buchholz, C. Bo, P. W. N. M. van Leeuwen*

Phosphinothiolates as Ligands for Polyhydrido Copper Nanoclusters

Post scriptum: Copper hydride nanoclusters have been prepared by reduction of a copper(I) phosphinothiol complex; they release H₂ by visible light irradiation. A Cu₁₈ cluster was isolated by crystallization, showing an unprecedented geometry that was evaluated by X-ray diffraction.



Chem. Eur. J.
DOI: 10.1002/chem.201404763

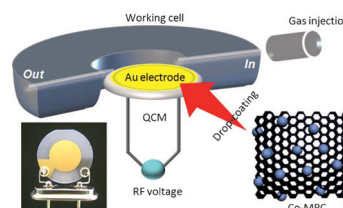


Mesoporous Materials

J. Tang, N. L. Torad, R. R. Salunkhe, J.-H. Yoon, M. S. Al Hossain, S. X. Dou, J. H. Kim, T. Kimura, Y. Yamauchi*

Towards Vaporized Molecular Discrimination: A Quartz Crystal Microbalance (QCM) Sensor System Using Cobalt-Containing Mesoporous Graphitic Carbon

Picking up changes: Sensitive and selective detection of aromatic substances by using mesoporous carbon (MPC)-based materials, combined with a quartz crystal microbalance sensor system, is described (see picture; RF = radiofrequency). By increasing the degree of graphitization in the carbon-based pore walls, the MPCs show greater adsorption uptake and faster sensor response towards toxic benzene and toluene vapors.



Chem. Asian J.
DOI: 10.1002/asia.201402629



Antibiotic Resistance

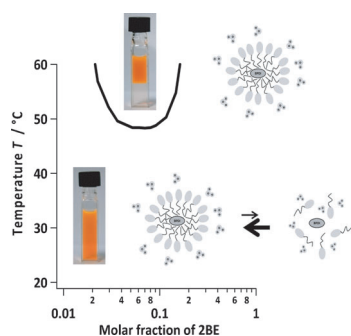
P. W. Thomas, M. Cammarata, J. S. Brodbelt, W. Fast*

Covalent Inhibition of New Delhi Metallo-β-Lactamase-1 (NDM-1) by Cefaclor

Finding a handhold: Due to mechanistic differences, using inactivators of serine-β-lactamases to inhibit metallo-β-lactamases is like trying to shake hands with an empty glove. Here, the drug cefaclor was shown to covalently inactivate New Delhi metallo-β-lactamase-1 (NDM-1), identifying Lys211 as a “handhold” for covalent inhibitor design.



ChemBioChem
DOI: 10.1002/cbic.201402268



ChemPhysChem

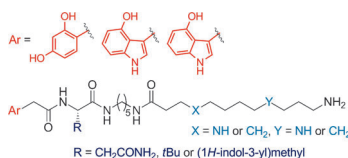
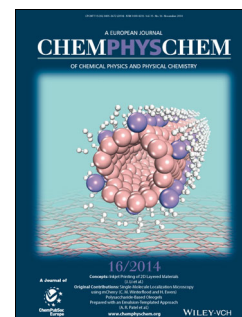
DOI: 10.1002/cphc.201402308

Fluorescence Spectroscopy

S. Toyouchi, S. Kajimoto, D. Barzan, A. Kiel, J. Enderlein, H. Fukumura,* D.-P. Herten*

Observation of Unusual Molecular Diffusion Behaviour below the Lower Critical Solution Temperature of Water/2-Butoxyethanol Mixtures by using Fluorescence Correlation Spectroscopy

Dying to misbehave: Data from fluorescence correlation spectroscopy measurements indicate that transient solution structures affecting the diffusion and potentially the reactivity of solvents may occur even at temperatures far below the lower critical solution temperature.



ChemMedChem

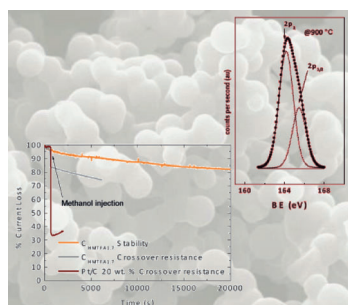
DOI: 10.1002/cmdc.201402278

Natural Products

X.-F. Xiong, M. H. Poulsen, R. A. Hussein, N. G. Nørager, K. Strømgaard*

Structure–Activity Relationship Study of Spider Polyamine Toxins as Inhibitors of Ionotropic Glutamate Receptors

Selectivity woven in: Polyamine spider toxins from the orb-weaver spider *Nephila clavata* (Joro spider) were used as templates for a structure–activity relationship study. Compounds were evaluated at AMPA and NMDA subtypes of glutamate receptors, providing novel compounds with selectivity for AMPA receptors.



ChemSusChem

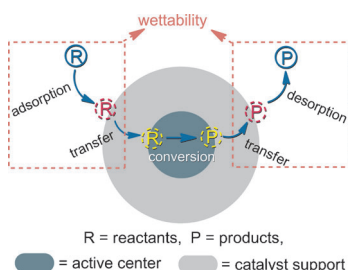
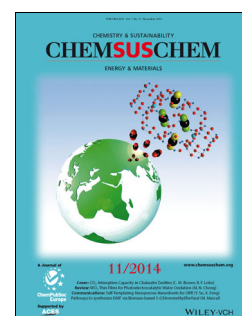
DOI: 10.1002/cssc.201402753

Electrocatalysis

N. López-Salas, F. del Monte,* A. Tamayo, J. L. G. Fierro, A. L. De Lacey, M. L. Ferrer, M. C. Gutiérrez*

Sulfur-Doped Carbons Prepared from Eutectic Mixtures Containing Hydroxymethylthiophene as Metal-Free Oxygen Reduction Catalysts

Performance-enhancing treatment: A template-free approach based on the use of eutectic mixtures composed of 2-hydroxymethylthiophene and furfuryl alcohol has been designed for the preparation of hierarchical sulfur-doped carbons (see picture) in monolithic form. The performance of these carbons in the oxygen reduction reaction is described.



ChemCatChem

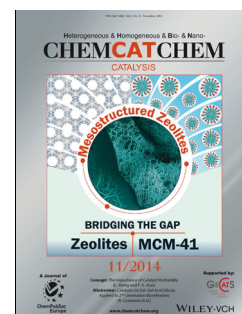
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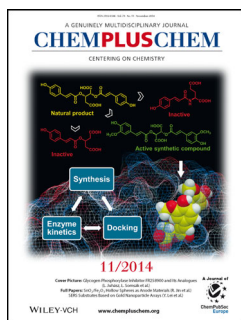
Wettability

L. Wang, F.-S. Xiao*

The Importance of Catalyst Wettability

When just getting wet is not enough: Preparation of highly efficient heterogeneous catalysts is mainly devoted to designing catalytic sites, and the catalyst wettability has been overlooked for a long time. Here, it is shown that the catalyst wettability is also an important factor for improving catalytic activity, product selectivity, and catalyst stability. The catalyst wettability should be considerable for designing and developing novel heterogeneous catalysts in the future.



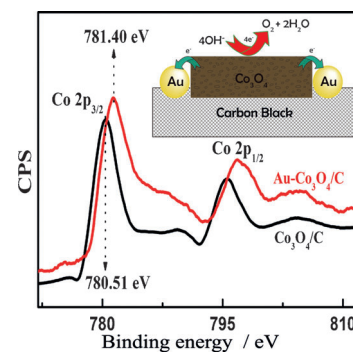


Electrocatalysis

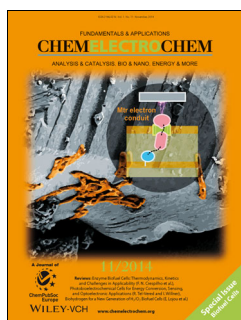
Z.-y. Li, K.-h. Ye, Q.-s. Zhong, C.-j. Zhang, S.-t. Shi, C.-w. Xu*

Au–Co₃O₄/C as an Efficient Electrocatalyst for the Oxygen Evolution Reaction

What a bind! The electron binding energy of Co 2p shows a positive shift of about 0.89 eV after loading with Au (see figure). Such a big shift in binding energy promotes the formation of Co^{IV} and increases the population of active centers on the catalyst surface. Gold, a highly electronegative metal, acts as an electron adsorbate, which facilitates the deprotonation of the OOH species by an electron inductive effect.



ChemPlusChem
DOI: 10.1002/cplu.201402136

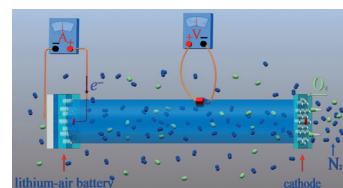


Batteries

W. He,* X. Wang, L. Ye, Y. Pan, Y. Song, A. Liu, W. Wang, H. Zhang, H. Qi, M. Zhou, Z. Wang, K. H. L. Zhang, J. H. Dickerson

Out-of-Cell Oxygen Diffusivity Evaluation in Lithium–Air Batteries

Hopping in and out of the tube: An out-of-cell electrochemical device is proposed for the direct measurement of cathode diffusivity in the lithium–air battery. Battery performance is also investigated through equation derivation and quantitative analysis.



ChemElectroChem
DOI: 10.1002/celc.201402221

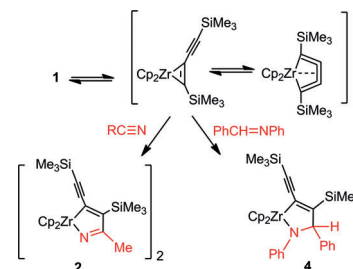


Metallacycles

V. V. Burlakov, L. Becker, V. S. Bogdanov, M. V. Andreev, P. Arndt, A. Spannenberg, W. Baumann, U. Rosenthal*

Reactivity of a Seven-Membered Zirconacyclocumulene towards CN Multiple Bonds – Formation of Metallaheterocycles by Insertion of C≡N and C=N Groups

Reactions of RC≡N (R = Me, Ph) and PhCH=NPh with the seven-membered zirconacyclocumulene [Cp₂Zr{η⁴-Me₃SiC₄(SiMe₃)–C(C₂SiMe₃)=CSiMe₃}] (**1**) give five-membered cycles by insertion of CN bonds. For the nitrile with R = Me, stabilization by dimerization occurs to yield **2**, whereas for R = Ph with a second nitrile, pyrimidines are formed. Compound **4** reversibly inserts CO₂.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201402618

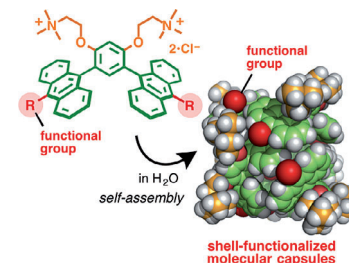


Micelles

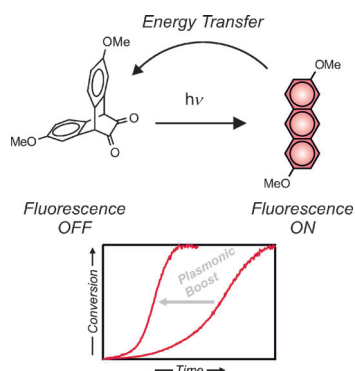
K. Kondo, A. Suzuki, M. Akita, M. Yoshizawa*

Micellar Polyaromatic Capsules: Enhanced Emissive Properties through Shell-Functionalization

Functionalization of the polyaromatic shell of a micelle-like molecular capsule was accomplished by simple functionalization of the amphiphilic subunits. The shell-functionalization drastically enhances the host and host–guest emissive properties.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201403136



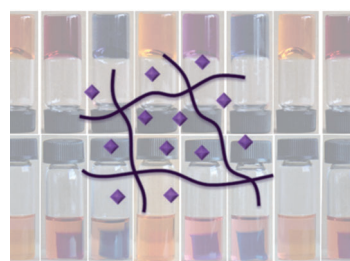
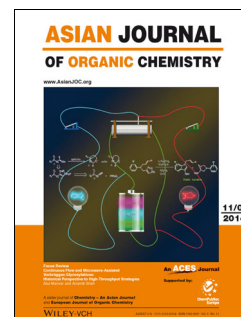
Asian J. Org. Chem.
DOI: 10.1002/ajoc.201402211

Photochemical Autocatalysis

E. R. Thapaliya, B. Captain, F. M. Raymo*

Plasmonic Acceleration of a Photochemical Replicator

Waste not, want not! Energy transfer from a fluorescent photochemical product to the corresponding non-emissive reactant imposes kinetic amplification on the overall transformation. In proximity to metallic nanostructures, plasmonic effects enhance the efficiency of energy transfer to accelerate dramatically the autocatalytic loop of this photochemical replicator.



ChemViews magazine
DOI: 10.1002/chemv.201400100

Supramolecular Chemistry

D. Bradley

Swell Gels

Responsive gels that swell and contract depending on the environment in which they find themselves have interesting applications, including targeted drug delivery. In *ChemViews Magazine*, David Bradley looks at the research of Minghua Liu, who has developed a supramolecular metallo-hydrogel that could be used as a two-step drug-delivery vehicle.

