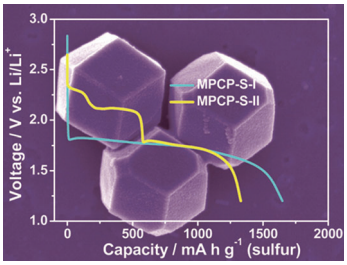
Lithium–Sulfur Batteries

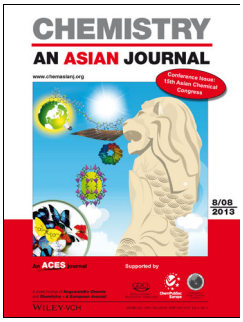
H. B. Wu, S. Wei, L. Zhang, R. Xu,* H. H. Hng, X. W. Lou*

Embedding Sulfur in MOF-Derived Microporous Carbon Polyhedrons for Lithium–Sulfur Batteries

Microporous carbon polyhedrons (MPCPs) are derived from unique MOF polyhedrons, and used as a model microporous carbon host to incorporate sulfur for Li–S batteries. Systematic investigations have been carried out to reveal the effects of several important parameters, such as the sulfur loading temperature, sulfur content, and the electrolyte. The MPCPs/sulfur composite with sulfur exclusively embedded in micropores exhibit stable cycling performance with high Coulombic efficiency in both DOL/DME and EC/DEC electrolytes.



Chem. Eur. J.
DOI: **10.1002/chem.201301689**

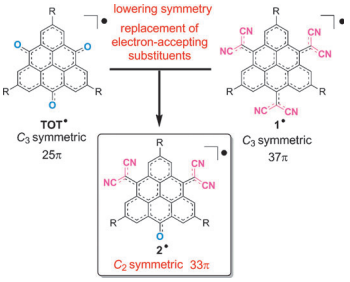


Polycylces

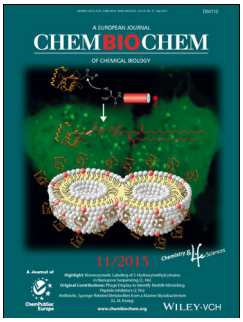
A. Ueda, H. Wasa, S. Nishida, Y. Kanzaki, K. Sato, T. Takui,* Y. Morita*

A Dicyanomethylene-Substituted Triangulene: Effects of Molecular-Symmetry Reduction and Electron-Accepting Substituents on a Fused Polycyclic Neutral π-Radical System

Love triangle: A triangulene-based C_2-symmetric 33 π-conjugated stable neutral π-radical (**2**$^{\bullet}$, see figure) has been designed, synthesized and characterized. A comparison of the structure and properties of **2**$^{\bullet}$ with those of its C_3-symmetric analogues **1**$^{\bullet}$ and **TOT**$^{\bullet}$ revealed the effects of molecular-symmetry reduction and electron-accepting substituents on this highly delocalized fused polycyclic neutral π-radical system.



Chem. Asian J.
DOI: **10.1002/asia.201300471**

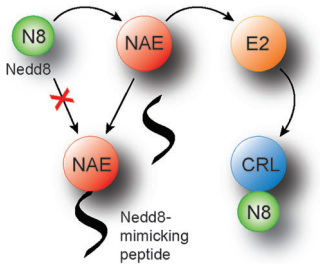


Phage Display

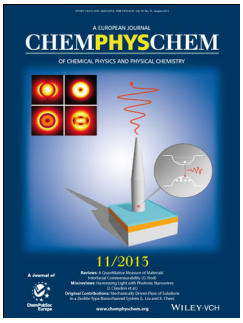
B. Zhao, K. Zhang, E. B. Villhauer, K. Bhuripanyo, H. Kiyokawa, H. Schindelin, J. Yin*

Phage Display to Identify Nedd8-Mimicking Peptides as Inhibitors of the Nedd8 Transfer Cascade

Trojan horse inhibitor of protein neddylation: The ubiquitin-like protein Nedd8 goes through an enzymatic cascade to modify key cellular proteins, such as cullin-RING ubiquitin ligase (CRL). Phage selection identified short peptides that function as a Trojan horse to covalently react with NAE and thus block Nedd8 transfer through the cascade.



ChemBioChem
DOI: **10.1002/cbic.201300234**

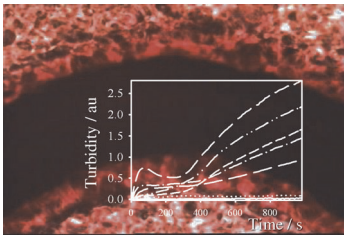


Protein Polymerization

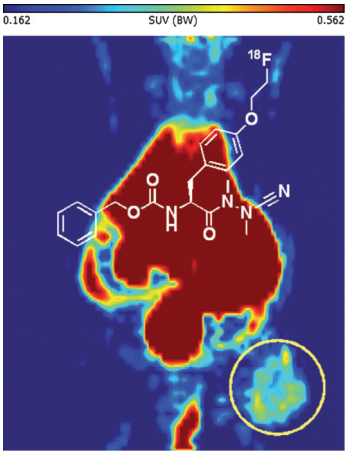
Z. Iqbal, M. Li, R. McKendry, M. Horton, D. J. Caruana*

Investigation of Sickle-Cell Haemoglobin Polymerisation under Electrochemical Control

Electrochemical protein polymerisation: Sickle-cell haemoglobin has a tendency to form stiff protein fibres at low oxygen partial pressures. Here we use an electrochemical cell to deplete oxygen in a small-volume cell and monitor the polymerisation under different chemical and physical conditions.



ChemPhysChem
DOI: **10.1002/cphc.201300203**

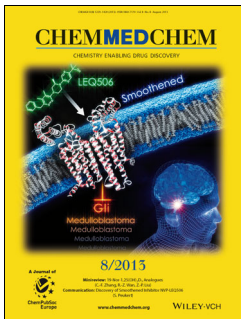


Imaging Agents

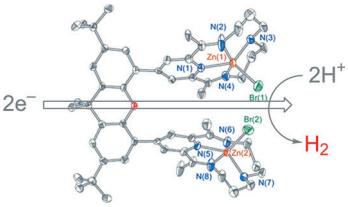
R. Löser,* R. Bergmann, M. Frizler, B. Mosch, L. Dombrowski, M. Kuchar, J. Steinbach, M. Gütschow, J. Pietzsch

Synthesis and Radiopharmacological Characterisation of a Fluorine-18-Labelled Azadipeptide Nitrile as a Potential PET Tracer for in vivo Imaging of Cysteine Cathepsins

Visualising cathepsins in tumours: Cysteine cathepsins are key players in tumour pathology. An azadipeptide nitrile with high affinity for cathepsins L, S, B, and K was labelled with fluorine-18 and investigated for its pharmacokinetic properties. PET imaging studies with tumour-bearing mice indicate the tumour accumulation of the probe and the potential of tumour targeting for this inhibitor class.



ChemMedChem
DOI: **10.1002/cmdc.201300135**

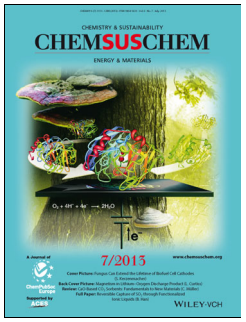


Water Splitting

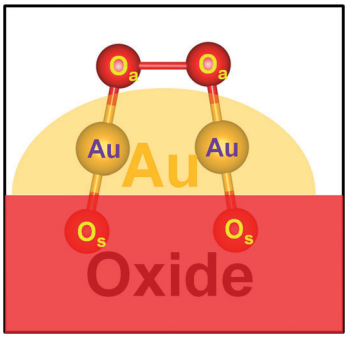
C. H. Lee, D. Villágran, T. R. Cook, J. C. Peters, D. G. Nocera*

Pacman and Hangman Metal Tetraazamacrocycles

Man the gallows! Metal complexes of derivatized tetraazamacrocyclic ligands (see picture) are synthesized by metal-templated condensation between 3,3′-diaminodipropylamine and 4-substituted diacetylpyridine derivatives, which are prepared by palladium-catalyzed cross-coupling reactions. An electrochemical study on a Hangman complex prepared this way provides a cautionary note that residual amounts of palladium can support H_2 generation.



ChemSusChem
DOI: **10.1002/cssc.201300068**

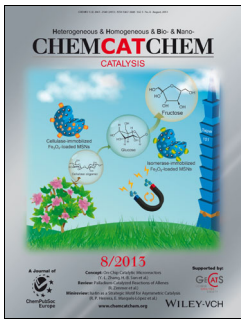


Oxygen Activation

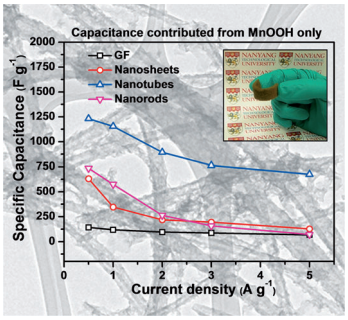
K. Sun,* M. Kohyama, S. Tanaka, S. Takeda

Direct O_2 Activation on Gold/Metal Oxide Catalysts through a Unique Double Linear O–Au–O Structure

Two straight molecules: Direct O_2 dissociation on gold was analyzed by Hückel theory and a unique double linear O–Au–O structure was proposed to activate the O_2. DFT calculations reveal that the sites with the double linear O–Au–O structure have high reactivity, with O_2 dissociation barriers as low as 0.12 eV and 0.17 eV for Au/TiO_2 and Au/CeO_2 systems, respectively.



ChemCatChem
DOI: **10.1002/cctc.201300134**

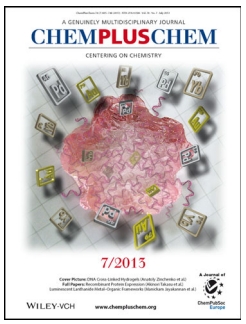


Supercapacitors

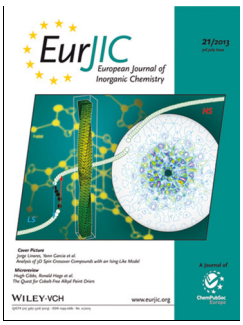
H. T. Tan, X. Rui, W. Shi, C. Xu, H. Yu, H. E. Hoster, Q. Yan*

Controlled Synthesis of Manganese Oxyhydroxide Nanotubes: Implications for High-Efficiency Supercapacitors

Nothing on the inside: The unique structural properties of MnOOH nanotubes endow them with excellent electrochemical characteristics in terms of the specific capacitance, energy, and power densities (see figure). Furthermore, hybridizing graphite felt (GF) with MnOOH species using the binder-free concept enables them to be used as flexible supercapacitor electrodes.



ChemPlusChem
DOI: **10.1002/cplu.201300095**

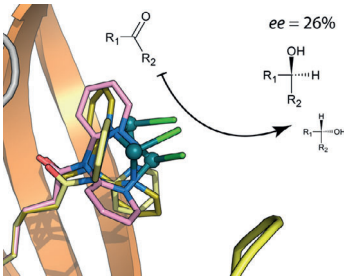


Artificial Metalloenzymes

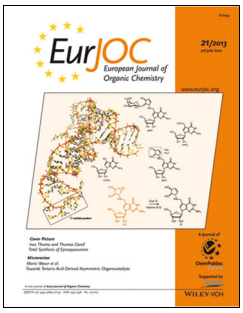
M. V. Cherrier, S. Engilberge, P. Amara, A. Chevalley, M. Salmain, J. C. Fontecilla-Camps*

Structural Basis for Enantioselectivity in the Transfer Hydrogenation of a Ketone Catalyzed by an Artificial Metalloenzyme

A metalloenzyme consisting of a Rh-based catalytic head and a fatty acid derived tail bound to β-lactoglobulin catalyzes the asymmetric transfer hydrogenation of a ketone with an enantiomeric excess (*ee*). Calculations based on the crystal structure reported here show that the complex head can adopt discrete orientations, which may explain the *ee*.



Eur. J. Inorg. Chem.
DOI: **10.1002/ejic.201300592**

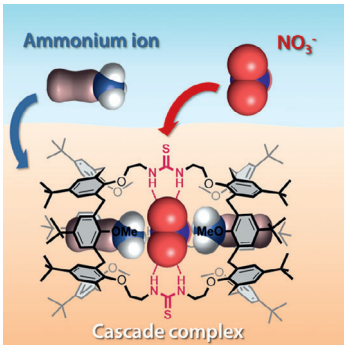


Host–Guest Chemistry

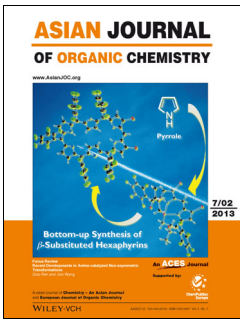
S. Moerkerke, S. Le Gac, F. Topić, K. Rissanen, I. Jabin*

Selective Extraction and Efficient Binding in a Protic Solvent of Contact Ion Triplets by Using a Thiourea-Based Bis-Calix[6]arene Receptor

A tubular D_{3h}-symmetric bis-calix[6]arene displaying three convergent thiourea groups has been efficiently synthesized. In comparison with the parent amido- and urea-based receptors, this new calix[6]tube exhibits strong and unique binding properties towards contact ion triplets in a protic environment. In particular, the selective extraction of ammonium nitrates from water has been evidenced.



Eur. J. Org. Chem.
DOI: **10.1002/ejoc.201300639**

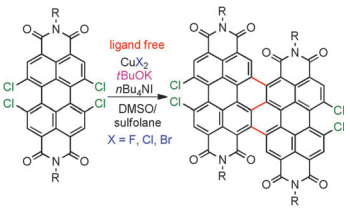


Perylene Bisimides

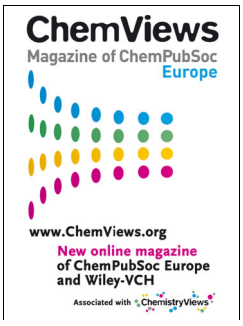
X. Lu, H. Dong,* P. He, X. Zhang, J. Liu, Q. Meng, L. Jiang, Z. Wang, Y. Zhen,* W. Hu*

A Ligand-free Copper-promoted Dimerization of Perylene Bisimide by Aromatic C–C Homocoupling and C–H Activation

Dimer-mite: A ligandless, copper-mediated dimerization of tetrachlorinated perylene bisimide towards fully conjugated, triply linked tetrachlorinated di(perylene bisimides) through C–C homocoupling and C–H activation has been developed. This method provides an efficient and economical protocol for the construction of condensed ring systems of perylene bisimides.



Asian J. Org. Chem.
DOI: **10.1002/ajoc.201300109**



Functional Materials

H. Shinokubo

What's Cooking in Chemistry: Hiroshi Shinokubo

Professor Hiroshi Shinokubo works on organic synthesis, organometallic chemistry, porphyrin related molecules, and functional materials at the Department of Engineering, Nagoya University, Japan. In a recent Author Profile in *Angewandte Chemie*, he revealed that he probably would be a chef if he were not a chemist. *ChemViews magazine* finds out what he likes to cook in the lab and on the stove.

ChemViews magazine
DOI: **10.1002/chemv.201300062**