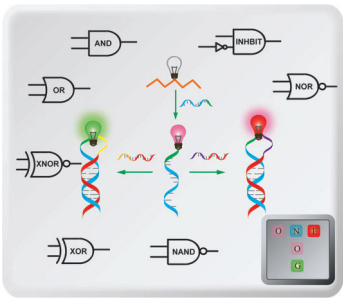
Logic Gates

Z. Huang, Y. Tao, F. Pu, J. Ren,* X. Qu*

Versatile Logic Devices Based on Programmable DNA-Regulated Silver-Nanocluster Signal Transducers

The DNA after tomorrow: A DNA-encoding strategy for regulating the fluorescence behavior of silver nanoclusters (AgNCs) was developed. The AgNCs were used as signal transducers to construct versatile molecular logic gates and a molecular keypad that was capable of constructing crossword puzzles, whilst simultaneously addressing the concerns of simple and universal design, as well as biocompatible operation.



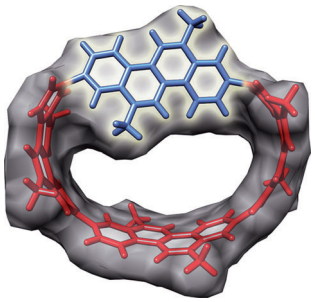
Chem. Eur. J.
DOI: **10.1002/chem.201103859**

Macrocycles

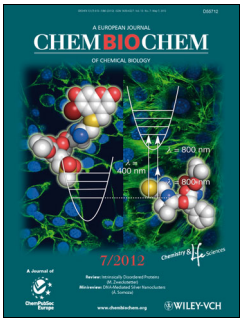
S. Hitosugi, W. Nakanishi, H. Isobe*

Atropisomerism in a Belt-Persistent Nanohoop Molecule: Rotational Restriction Forced by Macrocyclic Ring Strain

Enough strain! Strain in a macrocyclic ring hinders the rotation of an arylene panel in a nanohoop molecule containing four chrysenylene units (see picture). Unlike conventional rotational restrictions in biaryl systems, the new atropisomerism does not require any steric hinderance from the substituents. The study of atropisomerism also provides the first experimental insights into the relative stability of nanohoop structures.



Chem. Asian J.
DOI: **10.1002/asia.201200187**

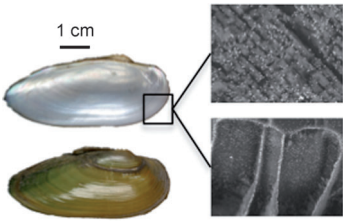


Biomineralization

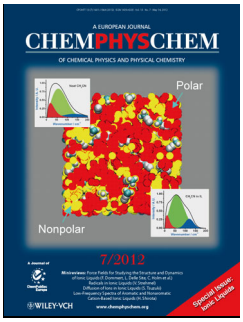
P. Ramos-Silva,* S. Benhamada, N. Le Roy, B. Marie, N. Guichard, I. Zanella-Cléon, L. Plasseraud, M. Corneillat, G. Alcaraz, J. Kaandorp, F. Marin*

Novel Molluskan Biomineralization Proteins Retrieved from Proteomics: A Case Study with Upsalin

Upsalin, a novel mineral-associated protein: We report the characterization of Upsalin, a new biomineralization protein from the freshwater mussel *Unio pictorum*. Through a combination of molecular biology, biochemistry, and proteomics, we were able to identify the full transcript and to purify a protein fraction containing Upsalin from shell extracts. Expression patterns were analyzed and its presence in the shell was confirmed by immunogold localization.



ChemBioChem
DOI: **10.1002/cbic.201100708**

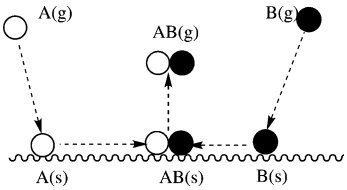


Computational Catalysis

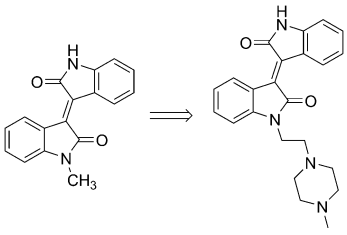
I. Y. Zhang, X. Xu*

Gas-Phase Thermodynamics as a Validation of Computational Catalysis on Surfaces: A Case Study of Fischer–Tropsch Synthesis

Combination of errors: A set of gas-phase reactions relevant to the Fischer–Tropsch synthesis has been constructed as a case study to relate gas-phase reactions and the corresponding surface reactions through the Born–Haber cycle (see picture). Calculations were performed with different functionals to assess their suitability.



ChemPhysChem
DOI: **10.1002/cphc.201100909**



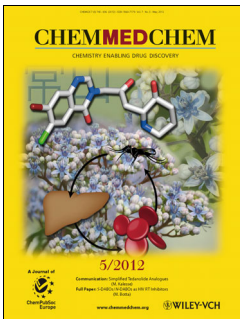
ChemMedChem
DOI: **10.1002/cmdc.201200018**

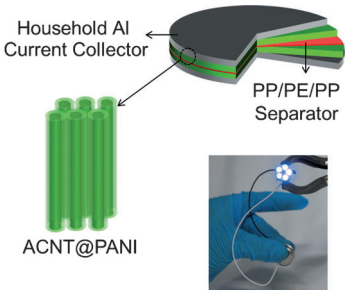
Antitumor Agents

X. K. Wee, T. Yang, M. L. Go*

Exploring the Anticancer Activity of Functionalized Isoindigos: Synthesis, Drug-like Potential, Mode of Action and Effect on Tumor-Induced Xenografts

Modification of meisoindigo, an antileukemic drug, by replacing *N*-methyl with a solubilizing piperazinylethyl side chain significantly enhanced aqueous solubility, improved antiproliferative activity on cancer cell lines and gave rise to in vivo activity on tumor-induced xenografts in mice.





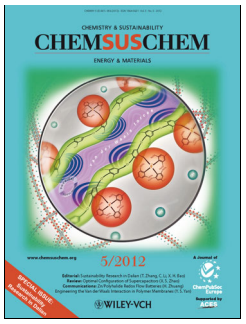
ChemSusChem
DOI: **10.1002/cssc.201100553**

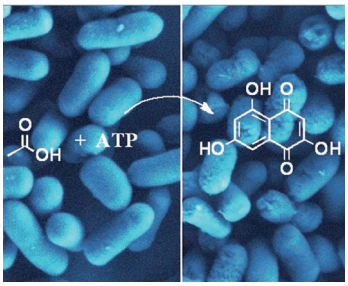
Supercapacitors

F. Huang, F. Lou, D. Chen*

Exploring Aligned-Carbon-Nanotubes@Polyaniline Arrays on Household Al as Supercapacitors

Household—the basis for everything: Supercapacitors are designed and constructed with three-dimensional aligned carbon nanotubes coated by polyaniline (ACNT@PANI) on flexible and cost-effective household Al foils, in both aqueous and organic electrolytes (see figure). The regular pores of the arrays and the thin PANI film facilitated ion diffusion and charge transfer to improve the rate performance.





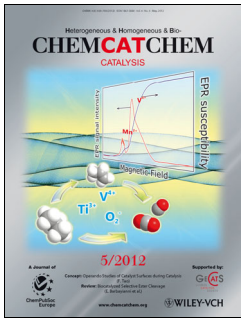
ChemCatChem
DOI: **10.1002/cctc.201100351**

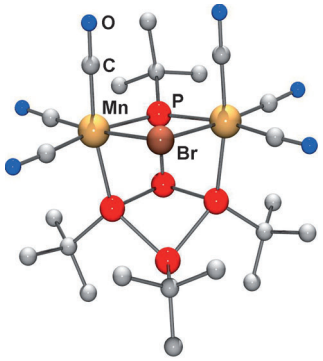
Biocatalysis

S. Krauser, P. Kiefer, E. Heinzle*

Multienzyme Whole-Cell In Situ Biocatalysis for the Production of Flaviolin in Permeabilized Cells of *Escherichia coli*

Serial conversion: Biocatalysis is applied to secondary metabolite synthesis through a new strategy. A one-pot multienzyme cascade reaction is performed with tailored permeabilized whole *Escherichia coli* cells in a well-defined environment. Acetate (C_2) is converted to flaviolin (C_{10}) through three serial biocatalytic conversion steps under the consumption of adenosine 5'-triphosphate (ATP).





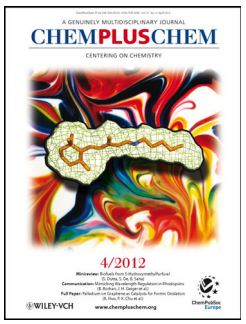
ChemPlusChem
DOI: **10.1002/cplu.201200013**

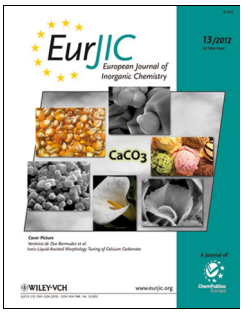
P Ligands

A. Kircali, R. Frank, S. Gómez-Ruiz, B. Kirchner, E. Hey-Hawkins*

Synthesis and Thermolysis of the Phosphorus-Rich Manganese(I) Complex $[Mn_2(\mu\text{-Br})\{cyclo\text{-}(P_4tBu_3)PtBu\}(CO)_6]$: From Complexes to Metal Phosphides

A complex matter: $Na[cyclo\text{-}(P_5tBu_4)]$ reacts with two equivalents of $[MnBr(CO)_5]$ to give the phosphorus-rich manganese(I) complex $[Mn_2(\mu\text{-Br})\{cyclo\text{-}(P_4tBu_3)PtBu\}(CO)_6]$ (see structure) containing a $[\{cyclo\text{-}(P_4tBu_3)\}PtBu]^-$ ligand. The rearrangement of $[cyclo\text{-}(P_5tBu_4)]^-$ to $[cyclo\text{-}(P_4tBu_3)PtBu]^-$ was rationalized by theoretical studies. Thermolysis of **2** up to 1000 °C gives Mn_2P.



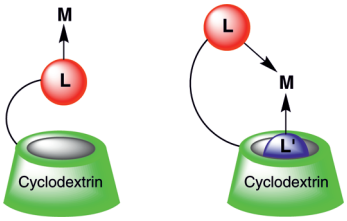


Functionalized Cyclodextrins

F. Hapiot,* H. Bricout, S. Tilloy, E. Monflier

Functionalized Cyclodextrins as First and Second Coordination Sphere Ligands for Aqueous Organometallic Catalysis

The scope and limitations of the use of functionalized cyclodextrins as first- and second-sphere ligands in aqueous catalysis are discussed with emphasis on the role of the reaction solvent and the interaction between the functional group and the cyclodextrin cavity.



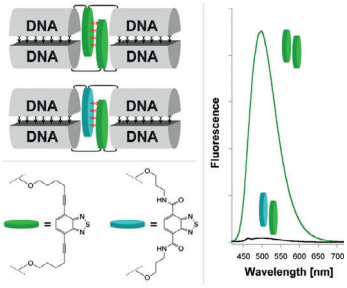
Eur. J. Inorg. Chem.
DOI: **10.1002/ejic.201101316**

Modified DNA

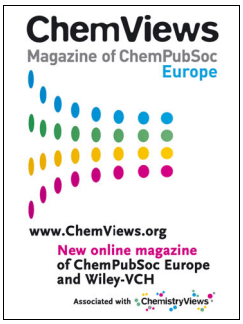
F. Garo, R. Häner*

2,1,3-Benzothiadiazole-Modified DNA

Two different types of 2,1,3-benzothiadiazole (BTD) derivatives were introduced into DNA. Depending on the electronic properties of the BTD units, the DNA hybrids exhibit significantly different spectroscopic profiles. Fluorescence quenching by the individual nucleobases correlates with the respective oxidation potentials.



Eur. J. Org. Chem.
DOI: **10.1002/ejoc.201200231**

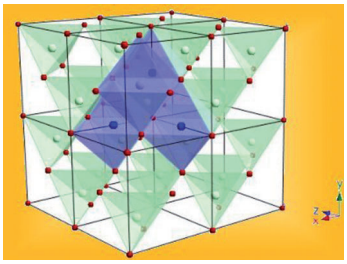


Quantum Dots

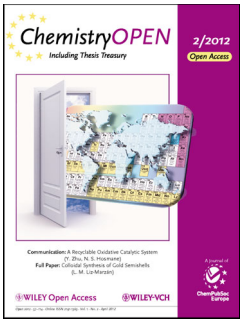
David Bradley

On the Dot

A new class of quantum dot that includes a stable spinel, $ZnCr_2Se_4$, within the nanoscopic semiconductor structure has opened up the possibility for the coupling of magnetic behavior to size-dependent optical properties for the first time.



ChemViews magazine
DOI: **10.1002/chemv.201200037**

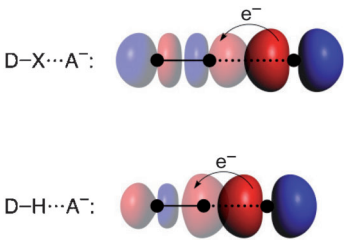


Density Functional Theory

L. P. Wolters, F. M. Bickelhaupt*

Halogen Bonding versus Hydrogen Bonding: A Molecular Orbital Perspective

More than just attraction! Halogen bonds in $DX\cdots A^-$ are similar in nature to hydrogen bonds in $DH\cdots A^-$ (D, X, A = F, Cl, Br, I) but the former have an even more pronounced covalent component (HOMO–LUMO orbital interaction; see figure) than the latter, as follows from detailed bonding analyses.



ChemistryOpen
DOI: **10.1002/open.201100015**