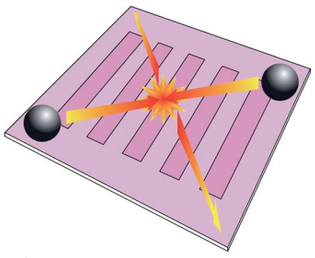
Photoelectrochemistry

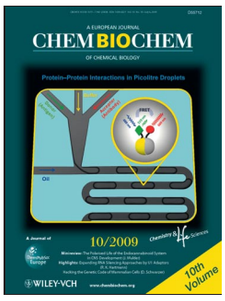
N. V. Rees, R. G. Compton*

A Photoelectrochemical Method for Determining the Kinematics of Moving Particles Using an Array of Individually Addressable Electrodes

Collision course: Photoelectrochemistry is used to detect and monitor the trajectory of moving spheres, using an array of individually addressable electrodes. The motion of a sphere is detected by the "dark" transients recorded as the shadow cast by the moving sphere passes over each electrode. The method can be used to determine the size and velocity of a single ball, or simultaneously track two spheres in collision.



Chem. Asian J.
DOI: **10.1002/asia.200900126**

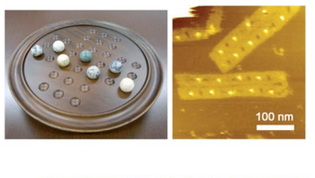


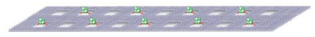
Nanoarrays

A. Kuzuya,* M. Kimura, K. Numajiri, N. Koshi, T. Ohnishi, F. Okada, M. Komiyama*

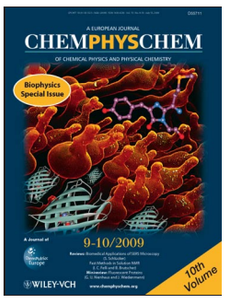
Precisely Programmed and Robust 2D Streptavidin Nanoarrays by Using Periodical Nanometer-Scale Wells Embedded in DNA Origami Assembly

A new punched DNA origami assembly with periodic, nanometer-scale wells has been successfully designed and constructed. Punched origami assemblies allow for the arrangement of fully distinguishable nanometer-scale wells in two dimensions. Through modification of the wells with two biotins, exactly one streptavidin (SA) tetramer can be captured in any predetermined well in the complex.





ChemBioChem
DOI: **10.1002/cbic.200900229**

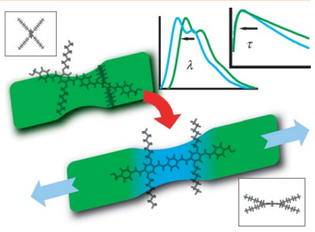


Fluorophores

S. Marawske, D. Dörr, D. Schmitz, A. Koslowski, Y. Lu, H. Ritter,* W. Thiel,* C. A. M. Seidel,* R. Kühnemuth*

Fluorophores as Optical Sensors for Local Forces

Optical force sensor: To explore the use of fluorophores as optical sensors for local mechanical forces, a custom-tailored chromophore is synthesized and aligned in a flexible polyvinyl chloride matrix by stretching (see picture). Applying tensile stress causes a decrease in the fluorescence lifetime by 2.5% and a blue-shift of the fluorescence spectrum of 1.2 nm, consistent with the predictions from semiempirical calculations.



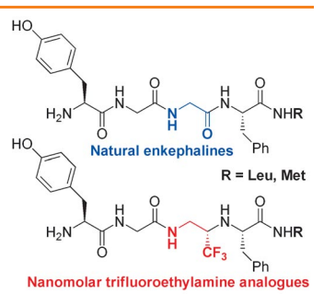
ChemPhysChem
DOI: **10.1002/cphc.200900240**

Peptidomimetics

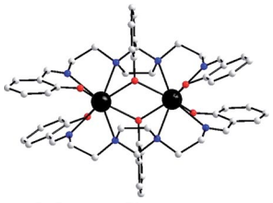
R. Sinisi, A. Ghilardi, S. Ruiu, P. Lazzari, L. Malpezzi, M. Sani, L. Pani, M. Zanda*

Synthesis and in vitro Evaluation of Trifluoroethylamine Analogues of Enkephalins

No gain with pain. At least when it comes to analgesics! Here we show that enkephalin analogues with the Gly3–Phe4 peptide bond replaced by a stereochemically defined trifluoroethylamine function display binding affinities in the nanomolar range for the μ- and δ-opioid receptors, only 30- to 80-fold lower than those of the natural compounds, whereas the Gly2–Gly3 trifluoroethylamine analogues have lower affinity.



ChemMedChem
DOI: **10.1002/cmdc.200900158**



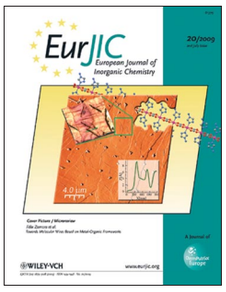
Eur. J. Inorg. Chem.
DOI: **10.1002/ejic.200900251**

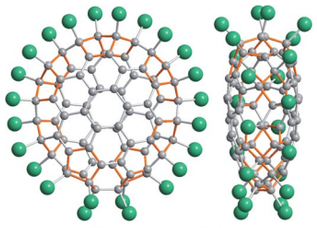
Photophysical Properties

J. Chakraborty, S. Thakurta, G. Pilet, R. F. Ziessel, L. J. Charbonnière, S. Mitra*

Syntheses, Crystal Structures and Photophysical Properties of Two Doubly μ-Phenoxo-Bridged Ln^{III} (Ln = Pr, Nd) Homodinuclear Schiff Base Complexes

Two new doubly μ-phenoxo-bridged homodinuclear Pr^{III} and Nd^{III} complexes have been synthesized by using a heptadentate Schiff base ligand. In the complexes each Ln^{III} center adopts a distorted square antiprism geometry. Detailed photophysical investigations of the precursor ligand and interesting solid-state photoluminescence properties of the Ln complexes in the NIR region have been reported.





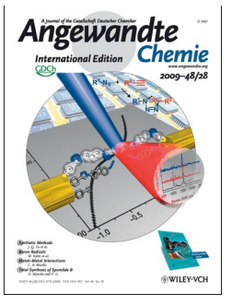
Angew. Chem. Int. Ed.
DOI: **10.1002/anie.200902253**

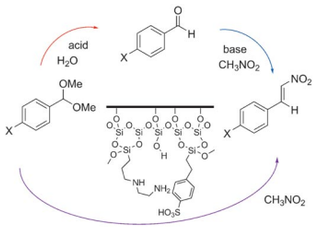
Halogenated Fullerenes

I. N. Ioffe, A. A. Goryunkov, N. B. Tamm, L. N. Sidorov, E. Kemnitz,* S. I. Troyanov*

Fusing Pentagons in a Fullerene Cage by Chlorination: IPR D_2-C_{76} Rearranges into non-IPR $C_{76}Cl_{24}$

Spectacular skeletal rearrangement of the C_{76} fullerene cage was observed as a result of chlorination of D_2-C_{76} to give $C_{76}Cl_{24}$ (see structure; gray C, green Cl, orange bonds highlight the pentagons), which features a significantly flattened carbon cage that violates the isolated pentagon rule. This transformation is likely to include seven single Stone–Wales rearrangements, which are considerably facilitated by chlorination of fullerene cage.





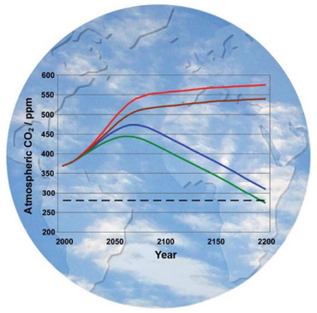
Chem. Eur. J.
DOI: **10.1002/chem.200900851**

Nanocatalysis

S. Shylesh, A. Wagner, A. Seifert, S. Ernst, W. R. Thiel*

Cooperative Acid–Base Effects with Functionalized Mesoporous Silica Nanoparticles: Applications in Carbon–Carbon Bond-Formation Reactions

Work together: Acid–base bifunctional mesoporous silica materials were prepared by co-condensation of tetraethoxysilane and silanes possessing amino and sulfonic acid groups. The samples showed increased catalytic activity for various one-step reaction cascades compared with the homogeneous catalysts. An acid–base cooperative activation mechanism is proposed (see scheme).



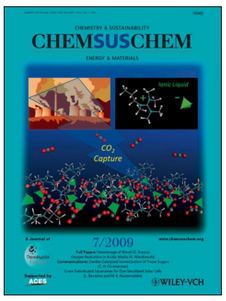
ChemSusChem
DOI: **10.1002/cssc.200900102**

Wood Geostorage

G. Kreysa*

Sustainable Management of the Global Carbon Cycle Through Geostorage of Wood

Carbon tree-ties: Combustion of fossil energy sources has caused the carbon inventory of the atmosphere to increase, and it will continue to increase. Natural photosynthesis can efficiently fixate carbon dioxide from air. Subsequent geostorage of the resulting biomass in an oxidation-proof environment would remove the carbon from the carbon cycle.



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