



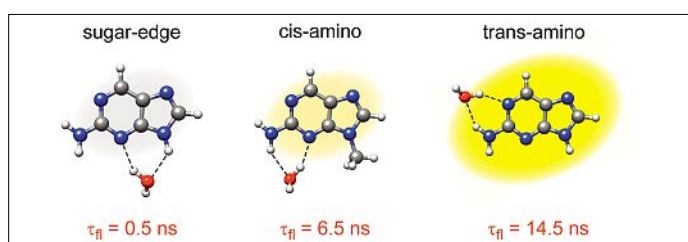
Swiss Science Concentrates

A CHIMIA Column

Short Abstracts of Interesting Recent Publications of Swiss Origin

Switching on the Fluorescence of 2-Aminopurine by Site-selective Microhydration

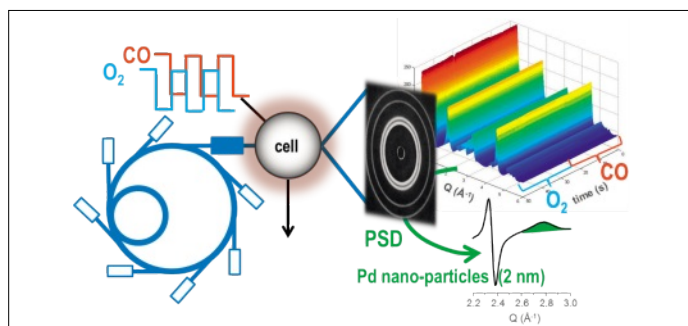
S. Lobsiger, S. Blaser, R. K. Sinha, H.-M. Frey, and S. Leutwyler*, *Nature Chem.* **2014**, *6*, 989. University of Bern
2-Aminopurine (2AP) is widely used as a site-specific fluorescent probe of DNA and RNA base-flipping and -folding. The group of S. Leutwyler showed that 2AP is not intrinsically strongly fluorescent, contrary to widespread belief. Gas-phase, jet-cooled 2AP and 9-methyl-2AP have very short fluorescence lifetimes (156 ps and 210 ps, respectively) rendering them essentially non-fluorescent. However, the lifetime of 2AP increases dramatically when it is part of a hydrate cluster, $2AP \cdot (H_2O)_n$, where $n = 1-3$. Selective microhydration of 2AP at its sugar-edge, *cis*-amino or *trans*-amino sites increases the fluorescence lifetime by up to 100-fold.



Revealing the Dynamic Structure of Complex Solid Catalysts using Modulated Excitation X-ray Diffraction

D. Ferri*, M. A. Newton*, M. Di Michiel*, G.L. Chiarello, S. Yoon, Y. Lu, and J. Andrieux, *Angew. Chem Int. Ed.* **2014**, *53*, 8890. Paul Scherrer Institut, Villigen

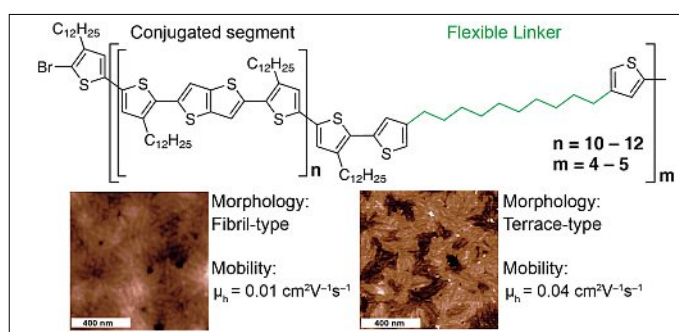
X-ray diffraction is a valuable tool to unravel the structure of solid catalysts under operation conditions. However, it is typically limited in the case of finely dispersed systems. A modulation excitation approach coupled to phase sensitive detection has been used to capture small Pd nano-particles of *ca.* 1–2 nm (2 wt%) supported on ceria-zirconia under an oscillating CO-O₂ feed. By eliminating the contribution of the static response of the ceria-zirconia bulk, this approach evidences very subtle changes that are associated with the Pd(111) reflection and the Ce³⁺/Ce⁴⁺ pair. The redox kinetics of the full material can, thus, be described in greater detail.



Controlling Conjugated Polymer Morphology and Charge Carrier Transport with a Flexible-linker Approach

A. Gasperini, S. Bivaud, and K. Sivula*, *Chem. Sci.* **2014**, *5*, 4992. EPFL Lausanne

The prototype of a new class of polymer semiconductors was presented by K. Sivula and coworkers. The conjugation segment length and the length of the entire polymer chain were separately controlled by using a double Stille-coupling polymerization. Polymers of the same molecular weight were shown to exhibit distinct thin-film morphologies and resulted in an improvement of the charge carrier mobility from fibril-type to terrace morphologies. The results indicate that employing linkers is a promising route to advance morphology control in semiconducting polymer based devices.



Inducing Axial Chirality in a 'Geländer' Oligomer by Length Mismatch of the Oligomer Strands

M. Rickhaus, L.M. Bannwart, M. Neuburger, H. Gsellinger, K. Zimmermann, D. Häussinger, and M. Mayor*, *Angew. Chem Int. Ed.* **2014**, *53*, 14587. University of Basel and Karlsruhe Institute of Technology

A new concept how to introduce axial chirality was presented by the group of M. Mayor. Their Geländer-type oligomer interlinks three terphenyl rings with an oligo(benzyl ether) as a single bridge. The induced length mismatch of the oligomers is compensated by twisting the longer strand around the shorter resulting in a continuous twist of the entire structure. As a result, the molecule exists exclusively in the form of two stereoisomers, a pair of enantiomers – for the first time such a system cannot adopt an achiral *meso* form. A high racemization barrier allowed the chiral separation of both enantiomers, which undergo subsequent uniform interconversion over the course of several hours.

