

- ▶ Thursday, October 22, 2009
- ▶ 4:00 P.M.
- ▶ 366 Colburn Laboratory

Dr. Hubert Koller

Institut für Physikalische Chemie

Dr. Koller received his B.S. degree in chemistry from the University of Konstanz, Germany, in 1989. He received his doctoral degree from the University of Stuttgart in 1994. From 1994 to 1995, Dr. Koller was a postdoc at California Institute of Technology after which he spent a year as a postdoc at the University of Eindhoven. Since 1996, Dr. Koller has been the head of an independent research group at the University of Münster.

His research focuses on zeolites as catalysts and functional materials, interactions at interfaces, nanostructured materials, sol-gel processes, self-assembly, pore design, drug carrier systems, micro- and nano-particles, and solid-state NMR spectroscopy.

“Sol-Gel Encapsulation For Drug Release and Catalytic Materials: Weak Bonds With Strong Impact ”

Sol-gel encapsulation of molecules, molecular aggregates and metal nanoparticles is investigated systematically in order to explore their pore generating properties. The different systems have potential applications in oral drug delivery or heterogeneous catalysis. Special emphasis is placed on the influence of non-covalent interactions between the guests and the sol-gel surfaces. Ionic and hydrophobic interactions have been identified as important driving forces for pore generation and release kinetics of a variety of drug molecules. Stabilizing agents containing aromatic groups have been used for the encapsulation of noble metal nanoparticles in sol-gel matrices. These aromatic groups lead to an improved dispersion of the particles in a hybrid gel which also contains aromatic groups. Catalytic tests with CO oxidation show that Au and Ag particles are catalytically active in these materials.