

# Frontiers in Catalysis Science and Engineering Lecture Series

Physical Sciences Division



**Prof. Dr. Christof Woell**

Karlsruhe Institute of Technology (KIT)

## Chemical Reactions at Isolated Sites inside Metal Organic Frameworks

Friday, August 30 @ 10:00 am | EMSL Auditorium

Isolated, coordinatively unsaturated metal sites (CUS) within metal-organic framework (MOF) materials feature interesting chemical properties and offer applications as single-site catalysts. In this talk, we will discuss selected examples providing fundamental insight into chemical reactions occurring inside MOFs. In addition to the common form, powders, we discuss the potential of MOF thin films (SURMOFs). The combined spectroscopic and modeling approach applied to selected systems demonstrated that the catalytic activity of MOFs can be precisely tuned. A particular interesting case is the so-called defect-engineering, where structural imperfections are created in a controlled fashion. The chemical properties of MOF materials can be further modified by integration and decoration of linkers or loading with guest species, such as metal or metal-oxide nanoparticles or nanoclusters. A particularly interesting aspect of layer-by-layer approaches for the fabrication of MOF thin films is the prospect to realize tandem catalysts.

**Host:** Zdenek Dohnalek | 1-6150

**Admin:** Diane Stephens | 1-6147