The 201st iCeMS SEMINAR

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16:00-17:30

Metal-Organic Frameworks with Ultrahigh Porosity, Switchability and Functionality

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Venue: Room A2-306
Katsura Campus, Kyoto University

Metal-Organic Frameworks (MOFs) are an exciting class of materials due to their high porosity and modular construction. The integration of chiral or optically active functional groups gives access to enantioselective catalysts, adsorbents or sensing materials through changes of optical properties. A fascinating phenomenon of some MOFs is flexibility in the solid state. Some porous solids were discovered showing step-wise huge volume changes (more than 240 % in case of DUT-8, DUT = Dresden University of Technology) during gas uptake. Recently also the highly porous cubic DUT-49 (S_g > 5000 m^2/g) was found to show pronounced structural changes during methane adsorption at low temperatures resulting in anomalous Negative Gas Adsorption (NGA) behavior. Robust frameworks with high chemical stability were synthesized based on zirconium clusters (DUT-67). Zirconium MOFs are also a promising basis for optical sensor integration. MOF mineralization in the presence of biological (marine) sponges gives access to hierarchical materials suitable for filter applications.

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