

Master Position

on

Atmospheric water harvesting: influence of defect sites in metal-organic frameworks on water uptake

Project:

Climate warming induced draughts are an increasing problem worldwide, threatening especially poor countries. Metal-organic frameworks (MOFs) are the most promising class of materials for harvesting large quantities of water from humid air.^[1,2] While the amount of atmospheric water harvesting (AWH) MOFs is rapidly increasing over the last decade, the technical development of analysis platforms capable of in situ studying their performance is just starting. We developed a system based on (nonlinear) laser micro- and spectroscopy,^[3] that is capable of live monitoring the effect of heterogeneity on the AWH performance on the single crystal level.

Qualification:

We are searching for candidates with:

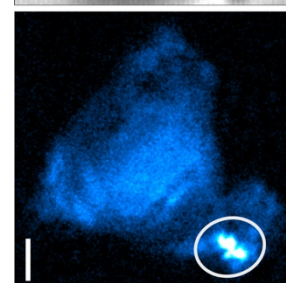
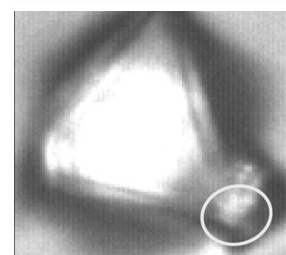
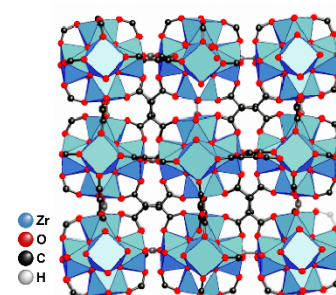
- Background in inorganic / physical chemistry or physics
- Interest in optical spectroscopy techniques and imaging
- Prior experience in programming (Matlab / LabView) is an asset

Our offer:

We offer a multi-disciplinary and collaborative environment for working with advanced imaging and spectroscopy on the next generation of AWH MOFs. This is your opportunity to join our team in developing an automated gas exchange system to evaluate the in-situ sorption performance of novel AWH materials.

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Top to bottom:

Crystal structure, bright-field and CARS image of MOF-801 crystal.

Circle is indicating enhanced uptake on defect site.

Literature:

1. Xu et al, *ACS Cent.Sci* 2020
2. Hanikel et. al, *Science* 2021
3. Fuchs et. al, *Adv. Mat.*, 2021