



Synthesis of Metal-organic frameworks

Motivation and challenge

Metal-organic frameworks is a class of porous, crystalline materials, and are composed of discrete inorganic and organic building units in a 3-dimensional lattice. In this rapidly growing field, new structures are discovered regularly, and there is a need to understand more about the synthesis conditions.

Objectives and scope

The student will investigate the effect of different synthesis parameters of some Zr-based frameworks, in order to prepare compounds with high purity and yields. This will involve significant synthesis work.

The tools used to analyze the compounds are powder X-ray diffraction for phase identification, NMR to investigate the organic composition, and adsorption measurements to quantify the porosity.

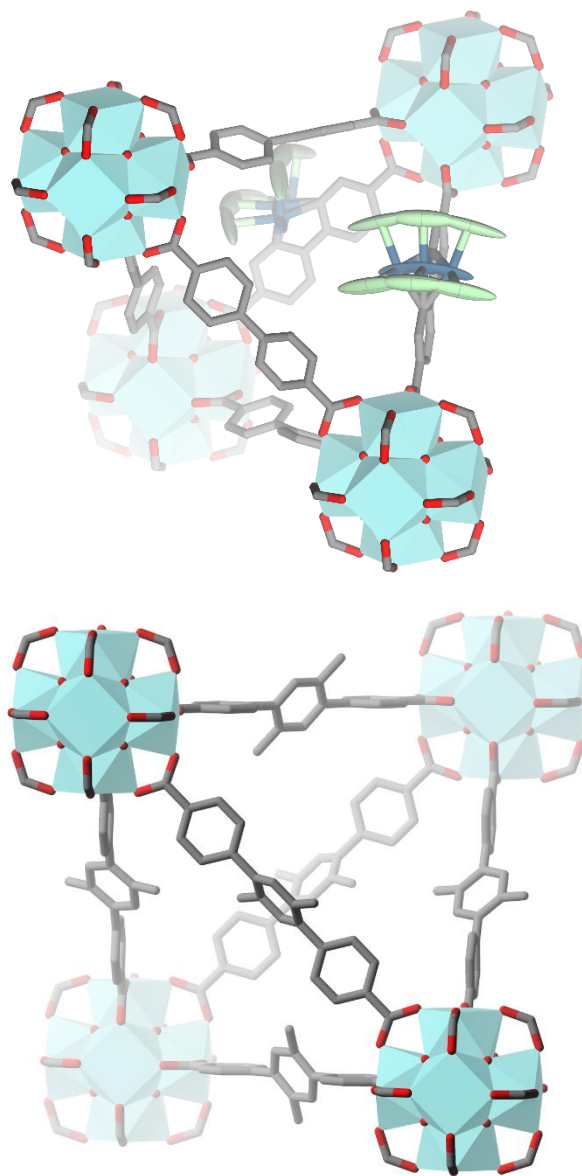
Visits to large research facilities (synchrotrons like ESRF or MAX IV) and relevant international conferences will be possible.

Skills to be developed

- Chemical synthesis
- Solid-liquid separation
- PXRD
- NMR
- Adsorption measurements
- Systematic investigation

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Structures of two Zr based metal-organic frameworks