

Metal-Organic Frameworks & Postsynthetic Modifications

Metal-Organic Frameworks (MOFs)

 MOFs are a classification of crystalline solids composed of metal clusters connected by organic linkers.

 MOFs are used in catalysis, gas sorption, gas separation and other purposes due to their incredibly high surface areas, chemical and thermal stabilities.

Presynthetic and postsynthetic modification can both be used to functionalize the materials, in this case the organic linkers, which allows for fine tuning of their properties.

Postsynthetic Modification (PSM)

PSM uses the MOFs characteristic of large pore size as a means to carry out reactions on the already formed MOF, after the synthesis is complete.

There are several different methods of PSM, but our experiments rely solely on PSM of functional groups on the organic linking component .



Abstract

 One limit on the functional applications of particular MOFs are their instability in water and other common solvents.

The goal of our research is to create more stable, and therefore, more viable and functional MOFs by linking organic components on opposite side of the unit cell, providing secondary support to the lattice.

Pre-Crosslinking ,the method we developed to presynthetically incorporate the linkers will be refered to as PCL.

Pre-Crosslinked MOF creation using linked BDC ligands

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