The Use of Homochiral Metal-Organic Frameworks in Catalysis

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Background:

Metal-Organic Frameworks (MOFs) are crystalline, hybrid porous solids with infinite network structures that are built from inorganic connecting points with organic bridging ligands. There are infinite combinations of metals and ligands. There is great interest in the use of homochiral MOFs in asymmetric catalysis.

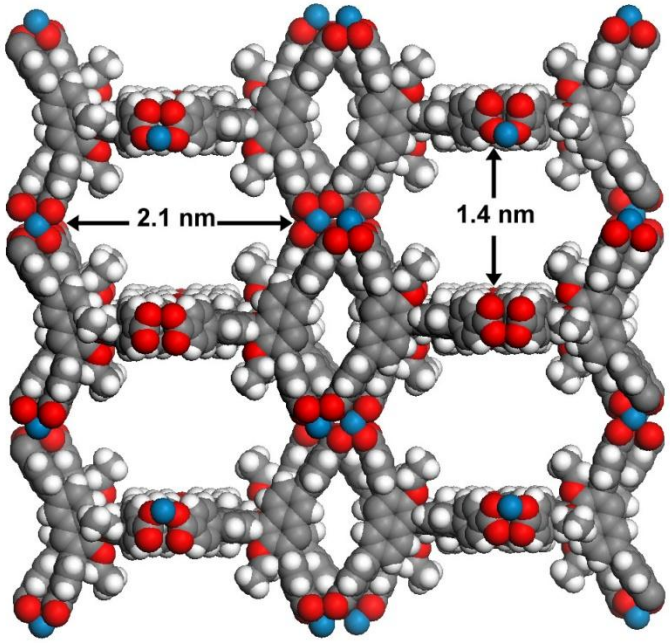
Goals:

- To synthesize homochiral MOFs with incorporated functionality
- To characterize MOFs in relation to porosity and stability
- To test the created MOFs with regards to catalytic ability

One of the organic ligands that I synthesized and used to create both copper and zinc MOFs

Results

- I was able to synthesize many different organic ligands and grow crystalline, homochiral MOFs
- I was able to classify these MOFs with regards to pore size and crystal structure
- I used Thermogravimetric Analysis (TGA), analyzed dye uptake using UV-VIS spectrometers, proton NMR and X-ray diffraction
- Now that these crystals are characterized I can begin testing their catalytic abilities



A space-filling model of the MOF made with copper and the previously shown ligand