

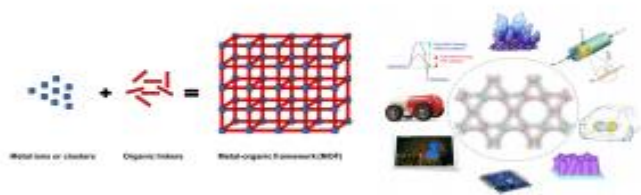
Incorporation of Amino Acids into Metal Organic Frameworks



Thomas E. Ericson, Babak Tahmouresilerd, Anthony F. Cozzolino
Department of Chemistry and Biochemistry, Texas Tech University, Lubbock, TX 79409

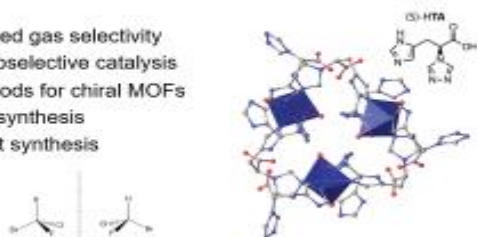


What is a Metal Organic Framework



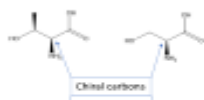
Chiral MOF

- Improved gas selectivity
- Enantioselective catalysis
- 2 Methods for chiral MOFs
- Direct synthesis
- Indirect synthesis



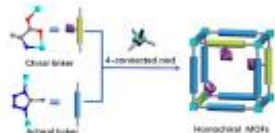
Amino Acids

- Source of chiral carbons
- Easily Accessible
- Cheap

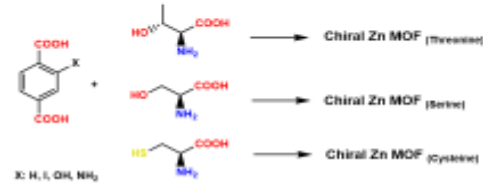
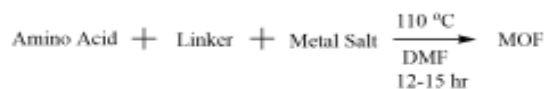


BioMOF

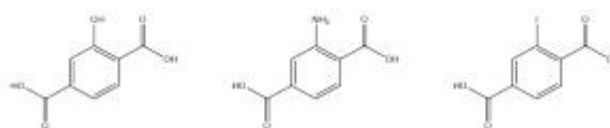
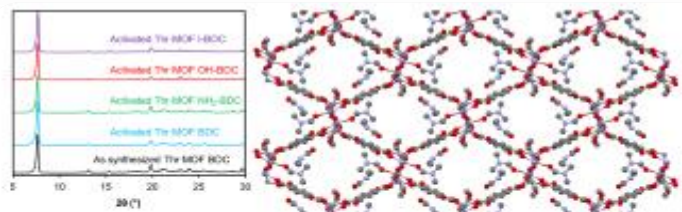
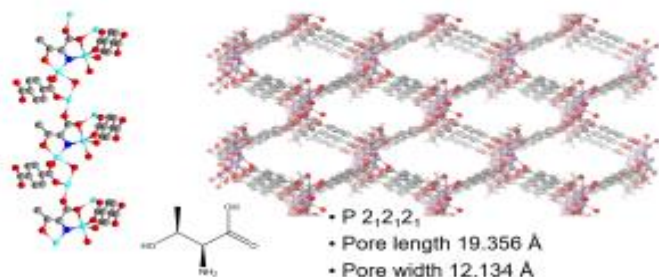
- BioMOFs constructed with amino acids generally utilize a mixed linker method
- BioMOFs can have use in new applications such as biology, and medicine



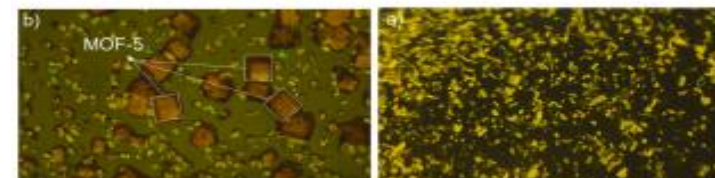
General Synthesis



Threonine MOF



Problems



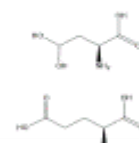
- Need to know the chemical formula
- There are 2 Zn for every 1 terephthalic acid and 1 amino acid
- +4 charge, 3 carboxylates and the amine is 3-coordinate, planar and bound to two Zn²⁺ implying RN²⁻

Bondwell pKa Values	
Alcohol	29.8
Amines	43-44
Carboxylic acid	12.6

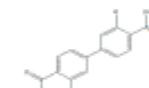


Different Variables

Amino Acid



Linker



Metal Salts

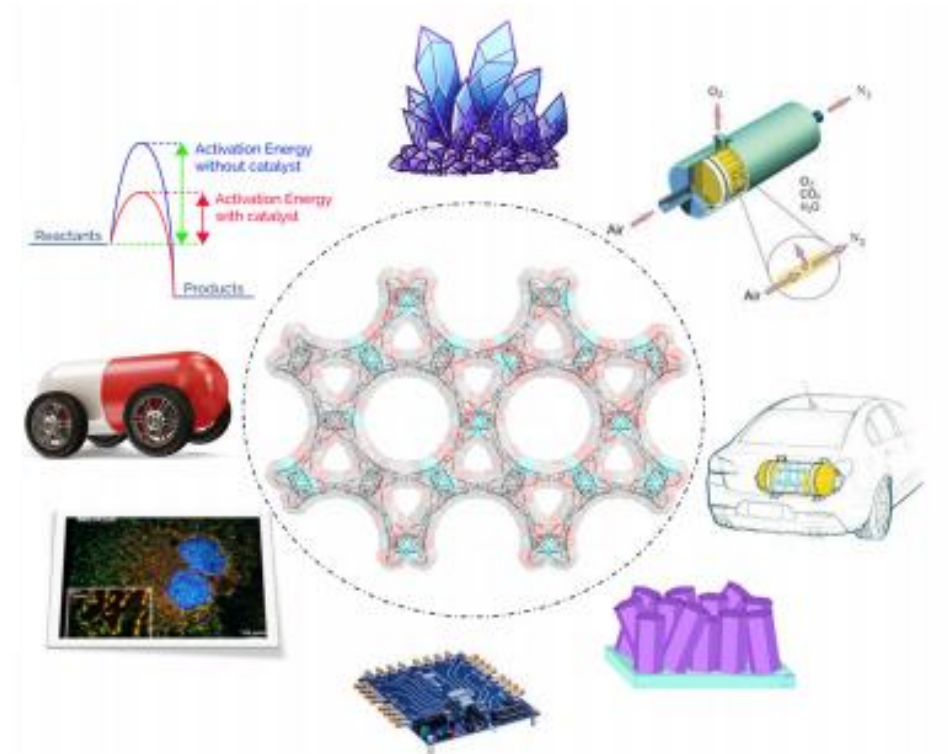
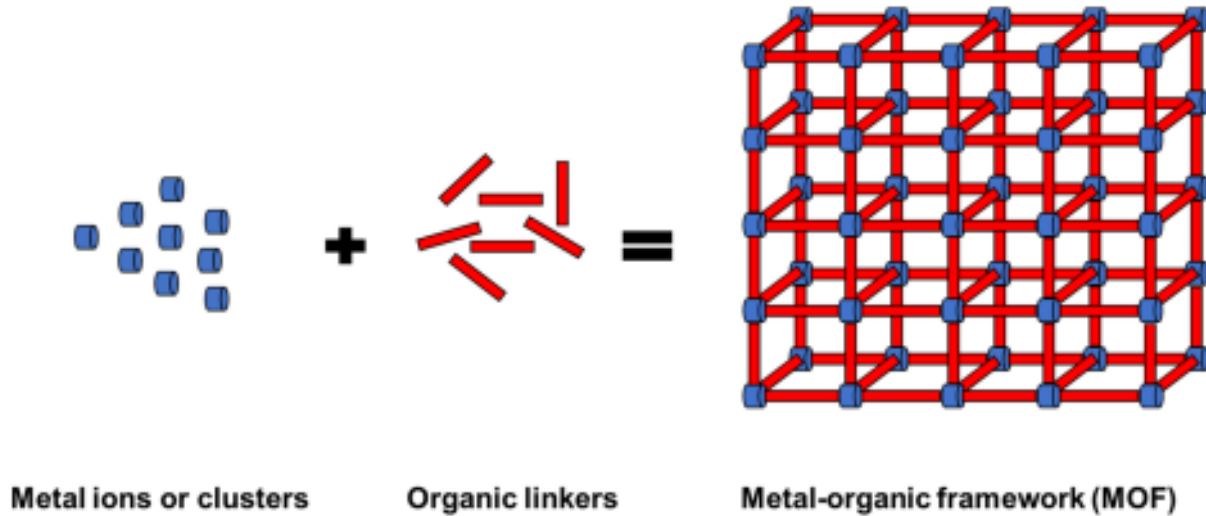
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- Fe, Cu, Ni

Acknowledgements



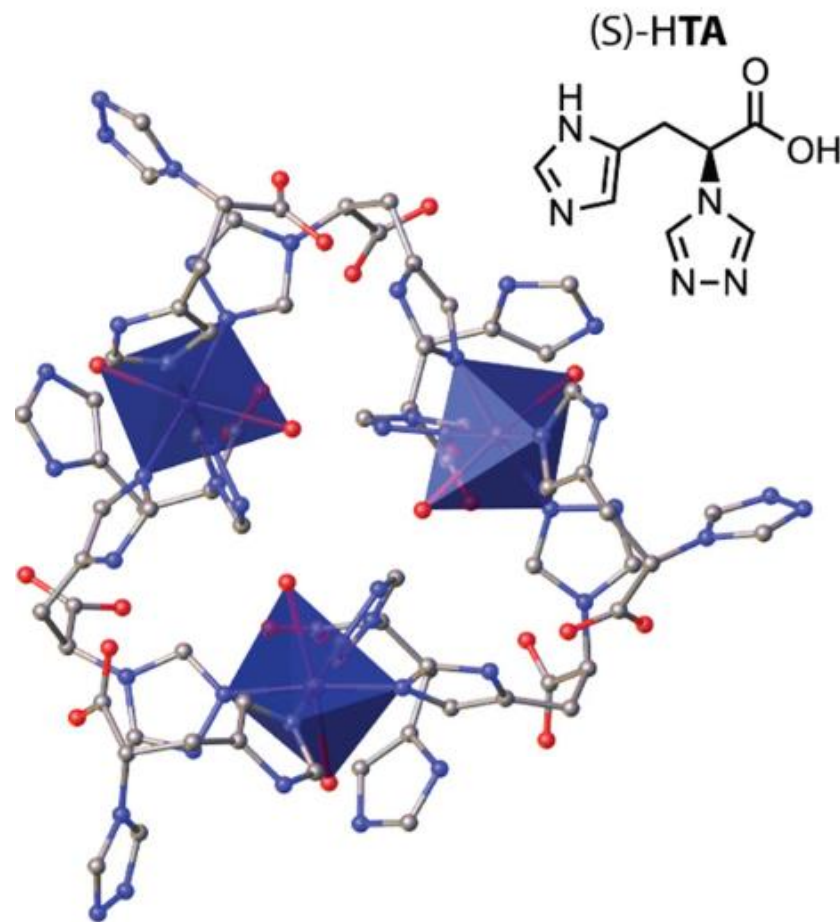
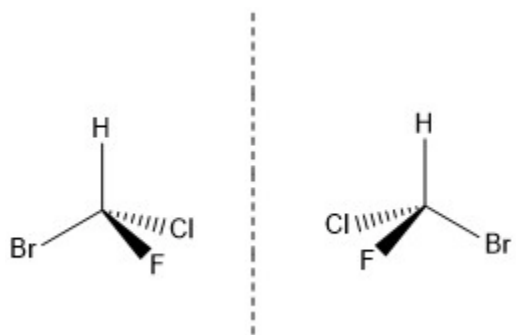
Dr. Anthony F. Cozzolino
Dr. Babak Tahmouresilerd
Dr. Daniel K. Ummeh

What is a Metal Organic Framework



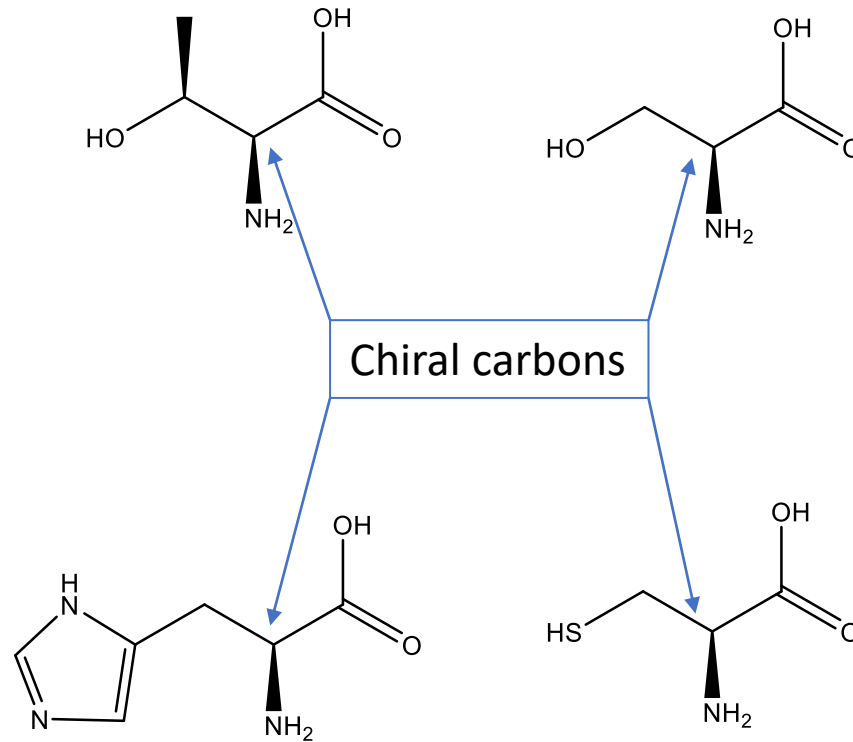
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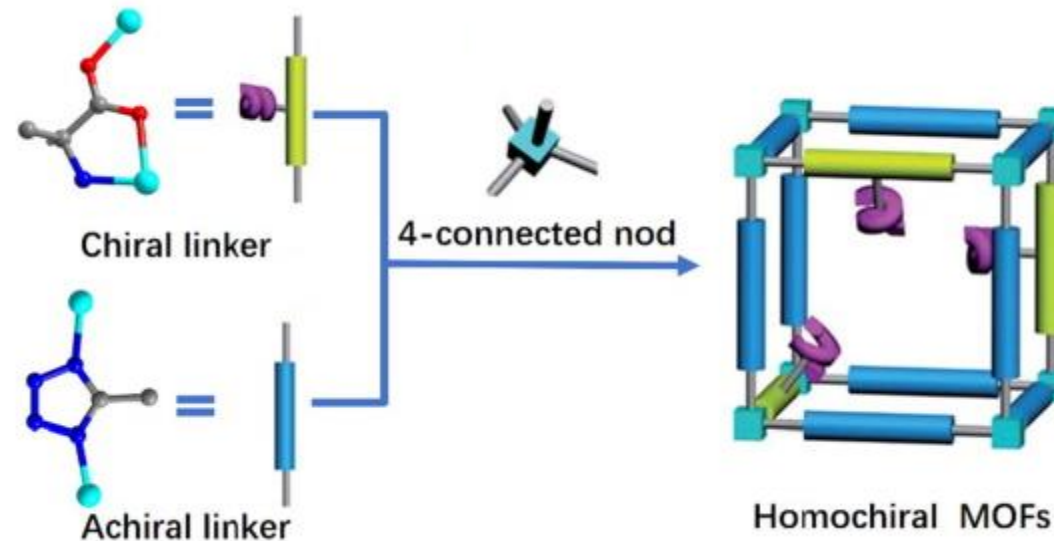
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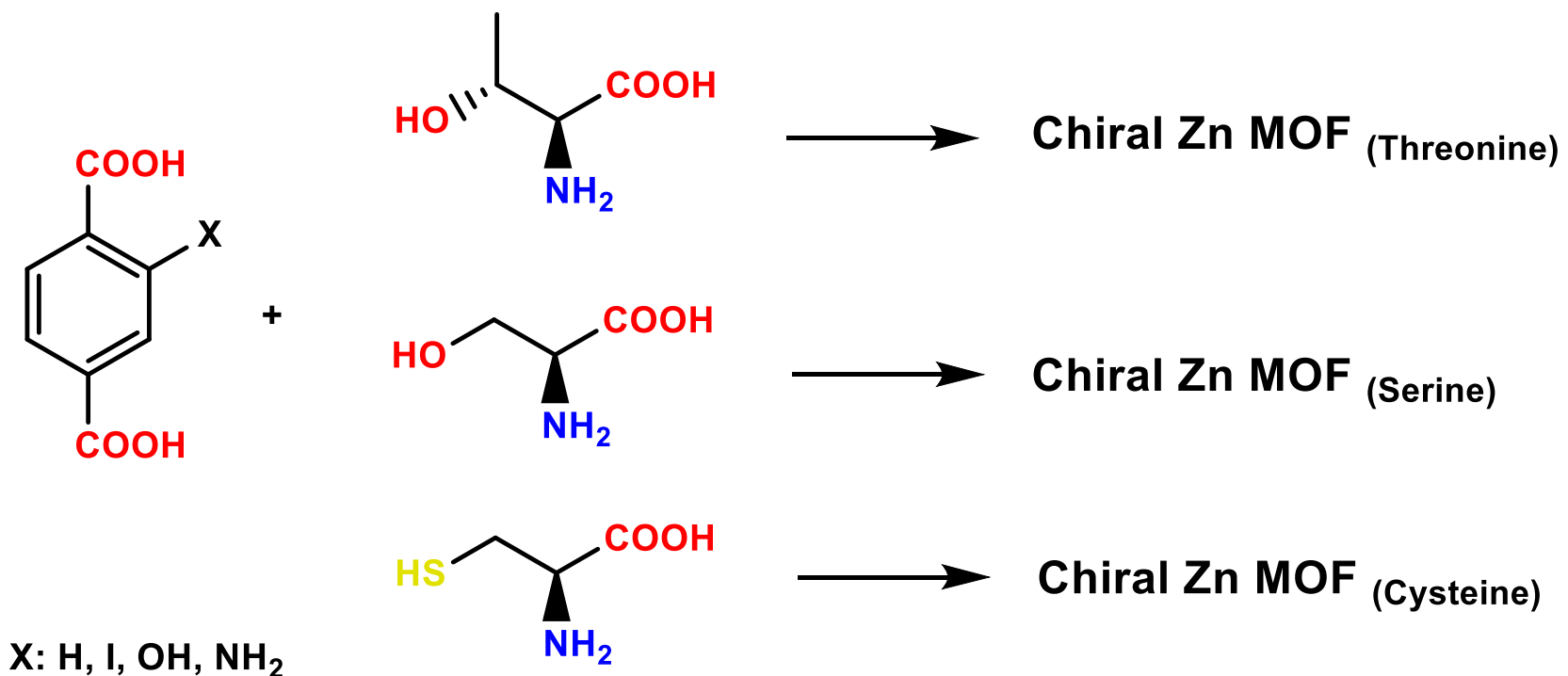
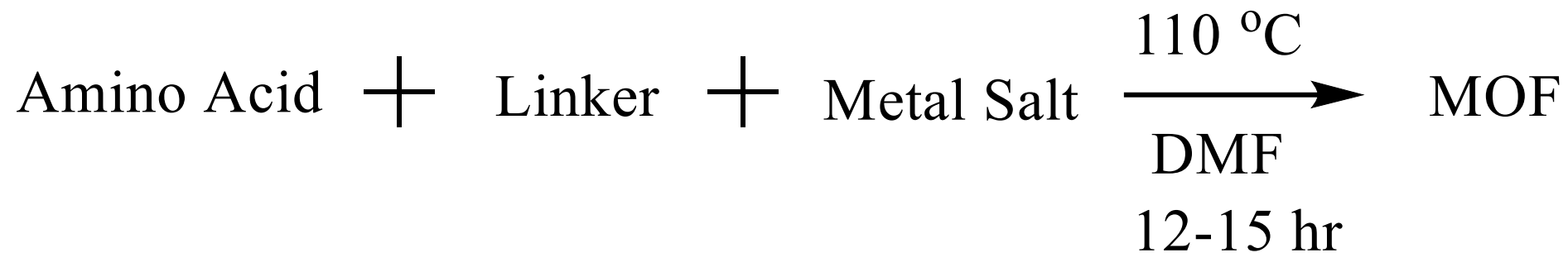


BioMOF

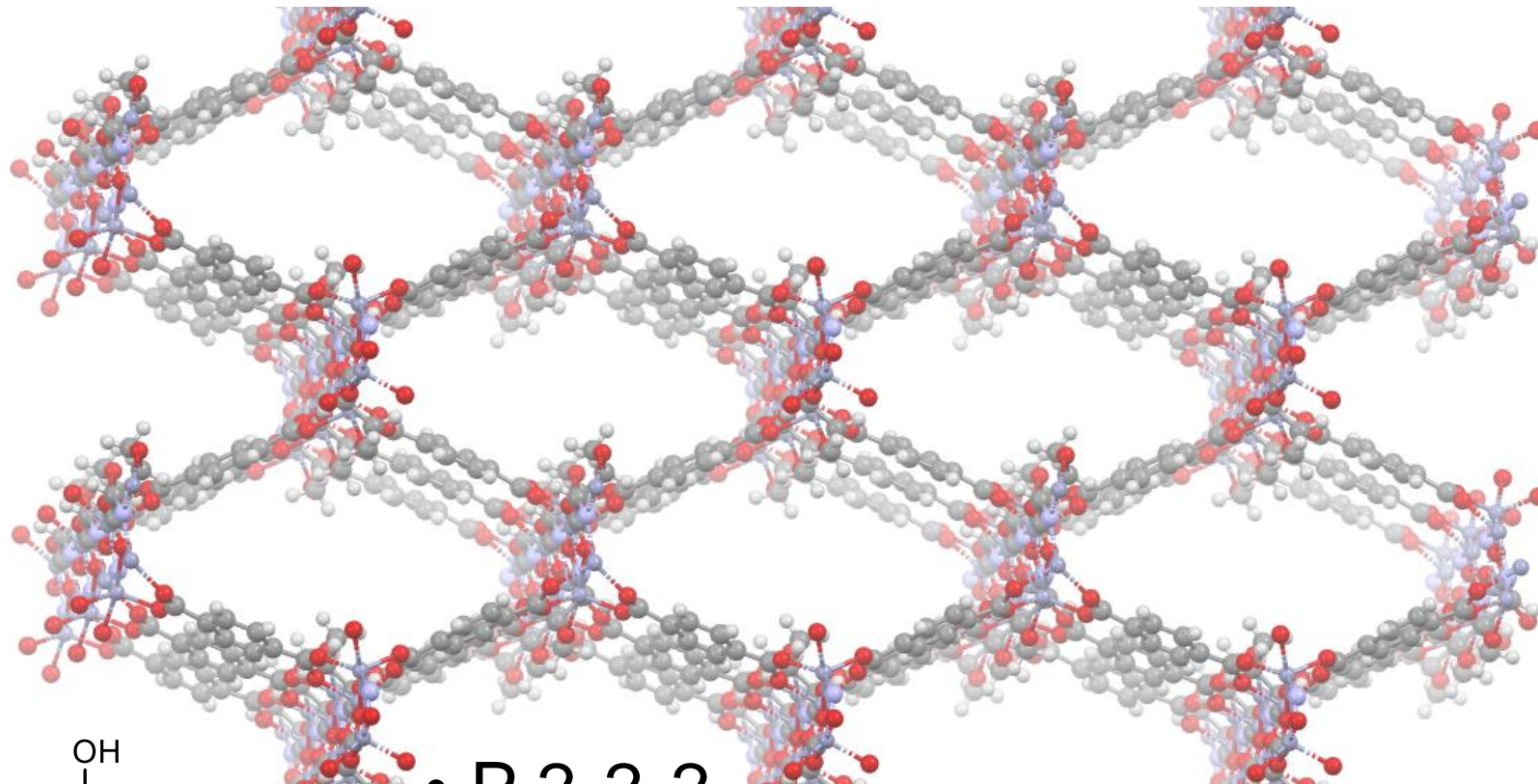
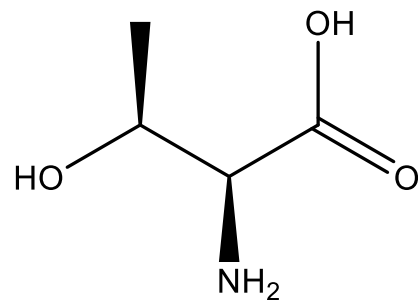
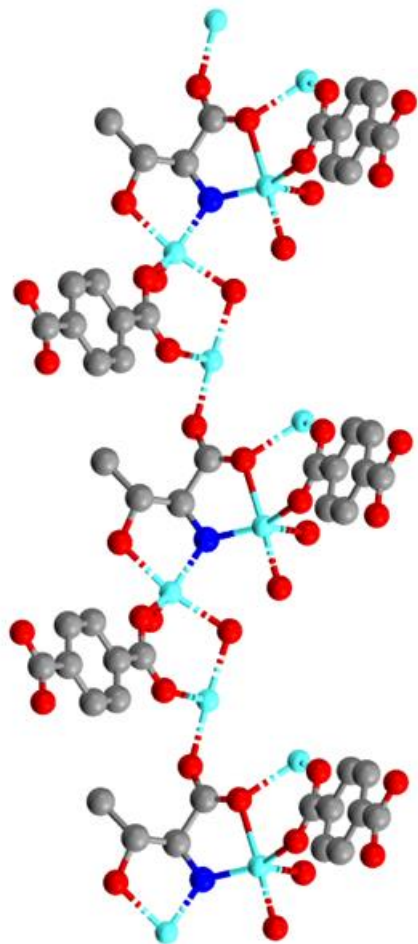
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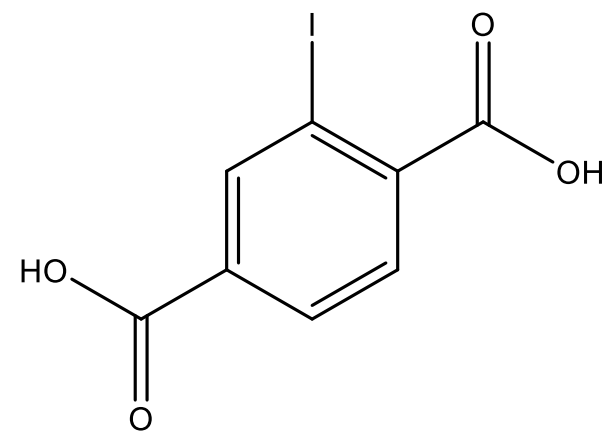
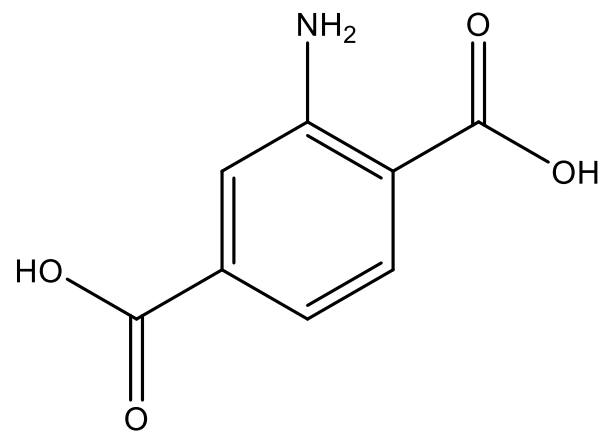
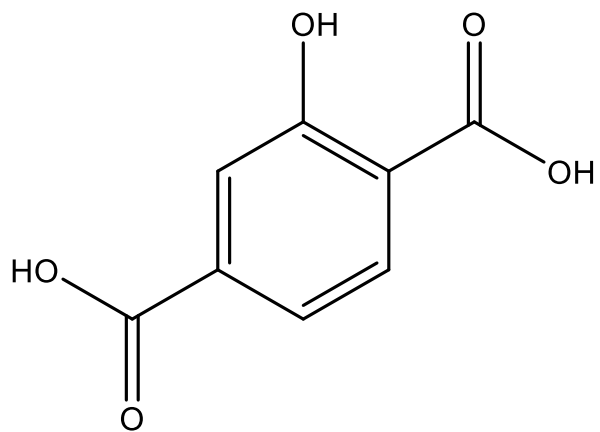
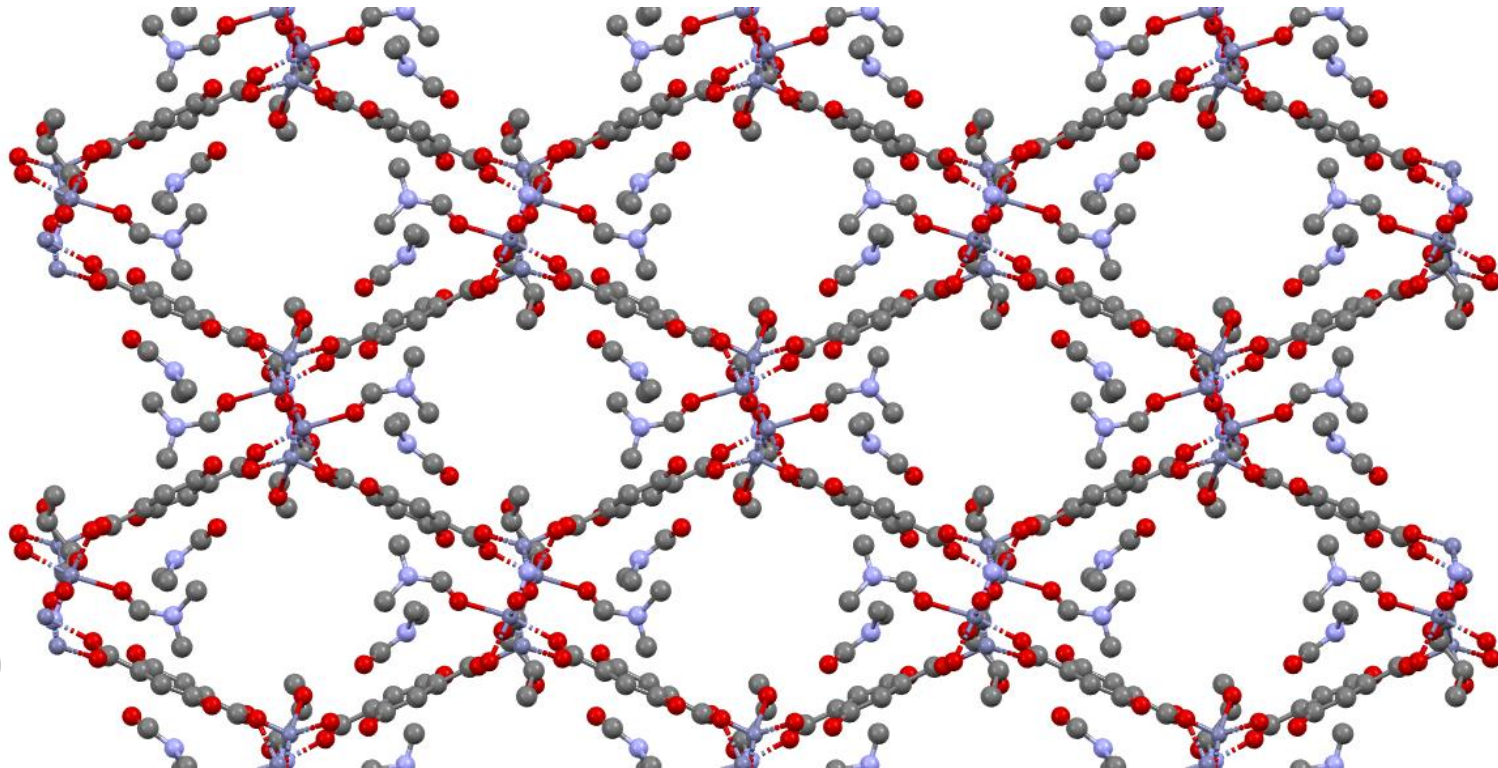
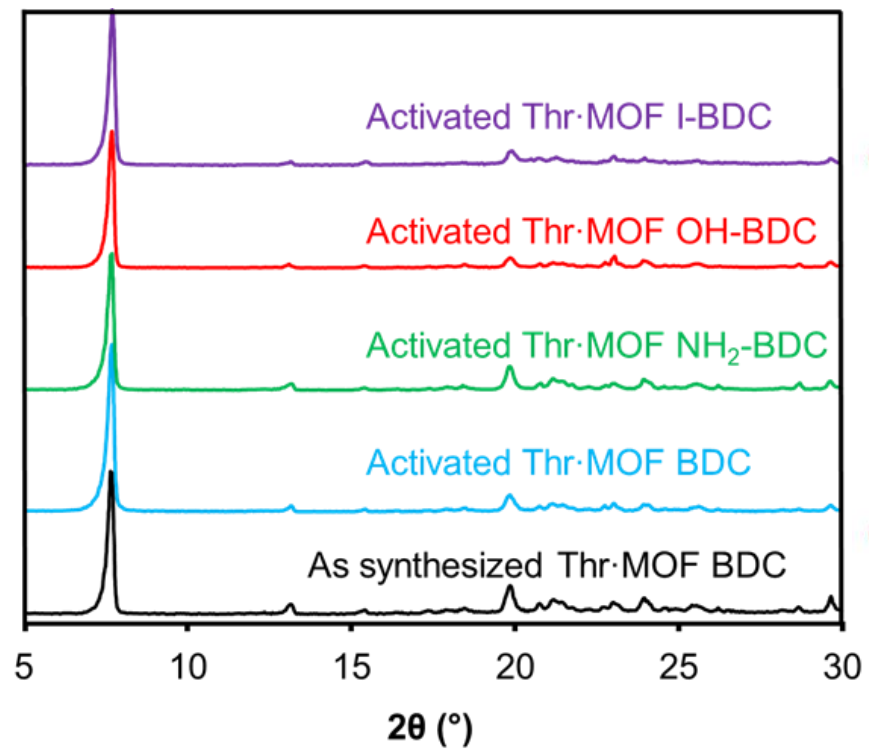
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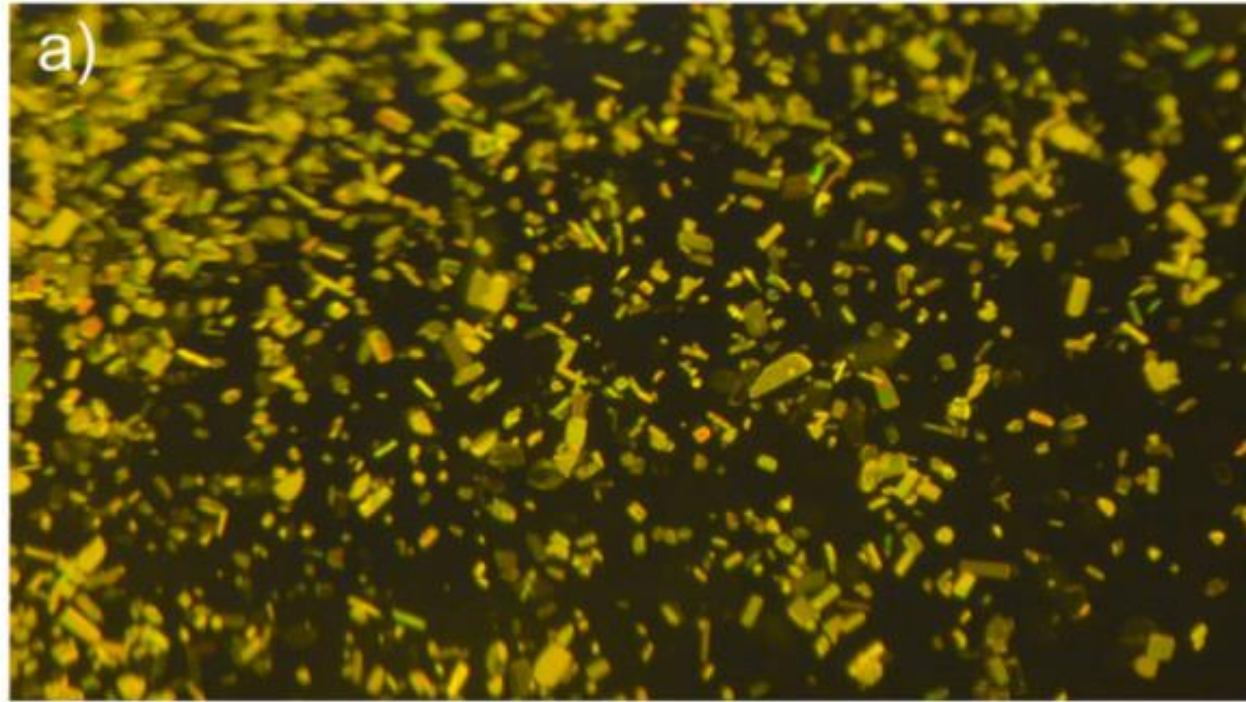
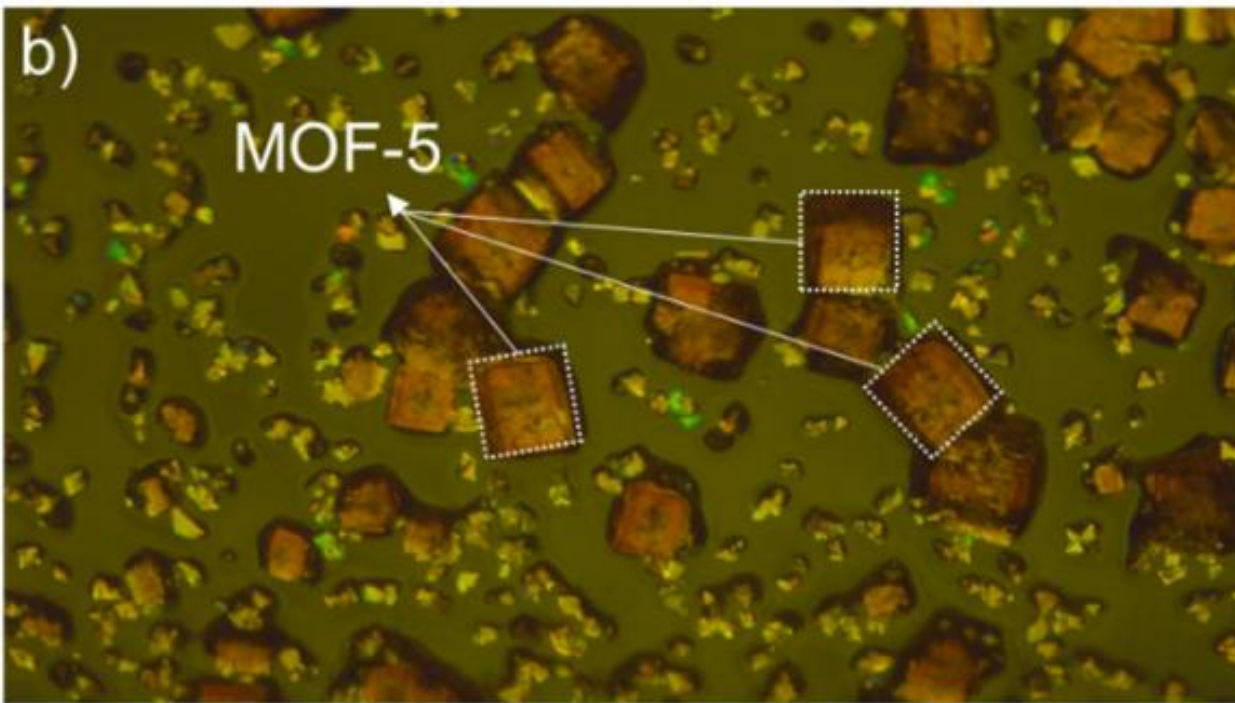
Threonine MOF



- P $2_12_12_1$
- Pore length 19.356 Å
- Pore width 12.134 Å

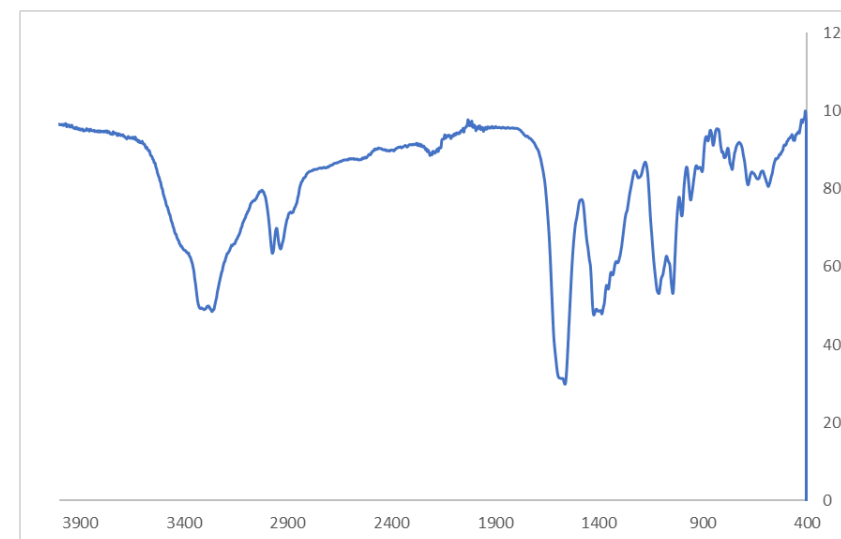


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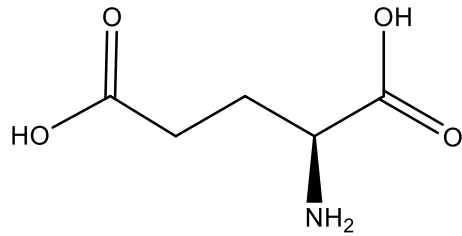
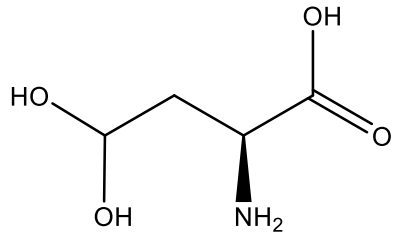
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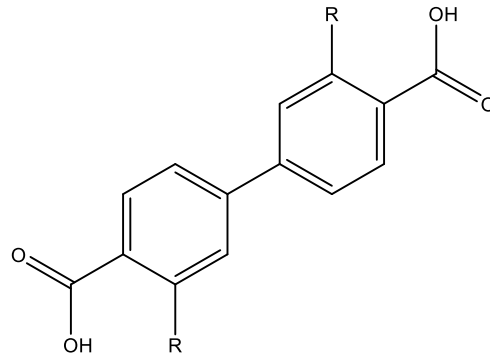


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