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Objective
The main objective of this research is to demonstrate that an MOF material with two different channels can be functionalized with two incompatible chemical groups resulting in the groups self-sorting into different channels.

Background Info
- Metal-organic framework (MOF) materials are formed from a reaction between an organic linker with multiple binding sites and a metal node, creating a porous 3D grid-like structure.

- MOF materials can be utilized in catalysis, gas storage, and filtration.
- MOF crystal structures affect their functionality, so structure manipulation is key for certain applications.
- Post-synthetic modification (PSM) is a process where an assembled MOF is chemically altered while keeping the crystal structure intact.
- In this project two PSMs are going to be performed onto a synthesized MOF to get hydrophobic and hydrophilic properties.

Reactions

Data/Results

Conclusions
- The first PSM of KSU-1 successfully modified the amine group to an amide group.
- The mono-functionalized KSU-1 retained its solvent absorption capabilities.
- Mono-functionalized KSU-1 retained crystallinity.

Future Research
- In future studies, the second PSM will be done on KSU-1 along with spectroscopy to characterize it.
- Bi-functionalized KSU-1 will be tested with various polar and non-polar solvents to observe hydrophobic and hydrophilic qualities.
- Spectroscopy is needed to help identify where the PSMs are occurring.

References

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