

Synthesis and Structure of Metal-Organic Frameworks

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Metal Organic Frameworks (MOFs) consist of metal ions or clusters connected by organic linkers. These compounds, when formed, contain empty cavities within it. There is a growing interest in these compounds due to their possible applications in gas storage, purification, and chemical sensing. However, the ability to synthesize MOFs from nontoxic, biorenewable starting materials may benefit the environment and save money on production costs. Also, they may have possible pharmaceutical and food science applications like drug delivery.

Possible MOFs will be synthesized using benign natural starting materials; combining salts of various metals (Ca^{2+} , Fe^{2+} , Zn^{2+} , Co^{2+} , Ni^{2+}) with cyclic polysaccharides through simple one pot reactions and reflux reactions, respectively. Aqueous solutions of the combined starting materials will be allowed to crystallize by vapor diffusion with methanol in order to produce crystals. The products formed will be analyzed using single crystal or powder x-ray diffraction and ^1H NMR spectroscopy.