

# Chemical Engineering Master's Defense

## Synthesis and Characterization of Boronic-acid-Containing Metal Organic Frameworks

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### abstract

We report the synthesis of novel boronic acid-containing metal-organic frameworks (MOFs), which was synthesized via solvothermal synthesis of cobalt nitride with 3,5-Dicarboxyphenylboronic acid (3,5-DCPBC). Powder X-ray diffraction and BET surface area analysis have been used to verify the successful synthesis of this microporous material.

We have also made the attempts of using zinc nitride and copper nitride as metal sources to synthesize the boronic acid-containing MOFs. However, the attempts were not successful. The possible reason is the existence of copper and zinc ions catalyzed the decomposition of 3,5-Dicarboxyphenylboronic acid, forming isophthalic acid. The ended product has been proved to be isophthalic acid crystals by the single crystal X-ray diffraction. The effects of solvents, reaction temperature, and added bases were investigated. The addition of triethylamine has been shown to tremendously improve the sample crystallinity by facilitating ligand deprotonation.



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