CHEMISTRY DEPARTMENT SEMINAR

Student Seminar Talk

Mechanochemistry of metal-organic frameworks: the afforded degrees of control and a general synthetic approach

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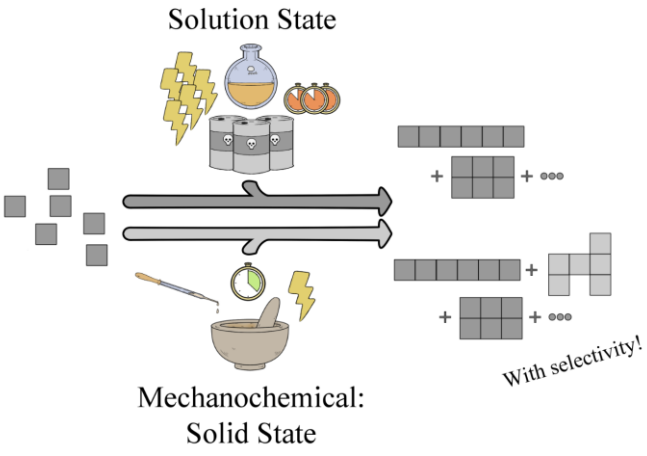
Metal-organic frameworks (MOFs) are crystalline porous coordination polymers consisting of networks of coordinative bonded metal cations and organic ligands. They have a diversity of potential applications due to their varieties of pore sizes and shapes, high surface areas, and customizable chemical properties. However, they are conventionally synthesized through solution-state approaches that generate excess solvent waste, require large energy inputs, and are not scale-up friendly, which limits their widespread use. Because of the expense of the solution-state approach, the mechanochemical synthesis of MOFs, in which mechanical force is used to drive the formation of the extended network in the solid-state, is gaining increased attention as an alternative synthetic method.

Herein, we prepared a variety of MOF materials through ball-milling, namely a family of chemically stable group 4 and group 13 metals-based MOFs and a series of catechol-derived linkers-based MOFs. The solid-state nature of the mechanochemical method requires far less solvent than a solvothermal approach and can be completed in much less time to produce materials with high yields, which makes it attractive as a greener synthetic route.



April 14th @ 2.00 p.m. – Lopez 106

Meeting ID: 955 4454 2732 https://zoom.us/j/95544542732