

MS31-P14 | THERMO- / MECHANO- MECHANICALLY RESPONSIVE COCRYSTALS DURING SINGLE-CRYSTAL-TO-SINGLE-CRYSTAL PHASE TRANSITIONS

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Molecular cocrystals, especially charge-transfer co-crystals, have been found to exhibit distinct optical, electrical and magnetic properties, but they can also show mechanically responsive behaviors under a thermo-, mechano-, or photo- stimulation [1]. However, in this field, understanding structure-property relationships are still lacking. Thus, we utilized a series of *in situ* techniques (i.e., optical microscope, XRD, AFM and TEM) to observe the thermo- / mechano- responsive behaviors and single-crystal-to-single-crystal phase transitions in cocrystals and coordination polymers. Some interesting phenomena were found during these experiments, including mechano-mechanically responsive oriented single-crystal-to-single-crystal phase transitions in 8-hydroxyquinoline-Based cocrystals (CuQ₂-TCNQ, and PdQ₂-TCNQ) [2]; self-healing behavior in thermo-mechanically responsive coronene-TCNB cocrystals [3]; and nanoparticles-mediated migration and oriented attachment during a crystallization process in [Ni(quinolone-8-thiolate)₂] ([Ni(qt)₂]) [4] The results indicated that molecular cocrystal is an excellent research platform for studying the mechanically responsive crystalline material.

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[2] a) G. Liu, et.al., J. Am. Chem. Soc. 2014, 136, 590-593, b) G. Liu, et.al., Chem. Asian J. 2016, 11, 1682-1687.

[3] G. Liu, et.al., 2017, Angew. Chem., Int. Ed. 56, 198-202.

[4] G. Liu, et.al., J. Am. Chem. Soc. 2015, 137, 4972-4975.