**Synthesis and Characterization of MOFs and Zeolites for Energy Applications**

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Abstract:

The Zhang Group (Diffusion and Reaction Engineering with Advanced Materials, DREAM Team) studies the synthesis and characterization of microporous materials (zeolites and MOFs) and their energy-related applications. In this talk, I will introduce the morphology control of pillared MOFs M2(bdc)2(dabco) (M = Cu, Zn, Ni, and Co) and their bimetallic intergrowth. The MOFs are used for adsorptive separation of inorganic gases (carbon capture, naturel gas sweetening), hydrocarbons (natural gas liquids removal), and dyes from organic solvents. In addition to MOFs, I will also introduce ETS-10, a titanoslicate that can adsorb high-valent metal ions. We have shown that ETS-10 can be used for adsorptive separation of divalent and trivalent metal ions. Among the metal-exchanged ETS-10, Ni-exchanged ETS-10 can also be used for ethylene oligomerization, which shows high activity and selectivity comparing to current microporous catalysts for oligomerization.