

Metal-Organic Architectures for Catalysis & Functional Materials

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Abstract. This presentation will highlight our recent research on the design and applications of a wide diversity of functional metal-organic architectures, including metal-organic frameworks (MOFs), coordination polymers (CPs), and multinuclear metal complexes. The following topics will be discussed. (1) Aqueous medium self-assembly generation and structural diversity of Cu(II) CPs driven by aminoalcoholate and carboxylate ligands. Application of these compounds as efficient catalysts in mild oxidative C–H functionalization of alkanes and other substrates. (2) Crystal engineering of MOFs & CPs assembled from multifunctional polycarboxylic acids with biphenyl or phenyl-pyridine cores and various metal nodes (Fe, Co, Cu, Mn, Ni, Zn, Cd, Ln). Examples of their applications as heterogeneous catalysts, selective sensors, adsorbents, or luminescent probes. (3) Design of bioactive Ag, Cu, and Zn-based metal-organic architectures toward applications as topical antimicrobial agents.