TRIGONAL PRISMATIC CLUSTERS AS VERSATILE MOLECULAR BUILDING BLOCKS FOR THE STEPWISE CONSTRUCTION OF CATIONIC METAL-ORGANIC MATERIALS. Alexander Schoedel, Lukasz Wojtas, Mohamed Eddaoudi, Michael J. Zaworotko, Department of Chemistry, University of South Florida, 4202 E. Fowler Ave IDR 211, Tampa, FL 33620.

In the past decade metal-organic materials (MOMs) assembled from metal-based building blocks and organic linkers have attracted much scientific interest due to their large pore dimensions and their enormous structural diversity. The unique features of these crystalline materials, in comparison to other porous materials (e.g. zeolites), include tailoring of pore dimensions as well as implementation of functionality for specifically targeted properties. However, precise control over the assembly process still remains a challenge for crystal engineering. Herein we will present a stepwise process for the construction of cationic MOMs based on preformed carboxylate based centers connected by metal-pyridine bonds leading to predictable network structures. Examples of microporous and mesoporous structures will be discussed in this context. The large solvent accessible channels in these structures enable subsequent anion exchange processes which might be useful in terms of both postsynthetic framework modification and fine-tuning of carbon dioxide adsorption properties.