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Designing Proton Conducting Metal Organic Frameworks

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Metal organic frameworks (MOFs) or porous coordination polymers (PCPs) represent a tunable molecular scaffolding that can be adjusted for a breadth of applications. This presentation will concern our efforts towards tailoring MOFs towards making new proton conductors ultimately for fuel cells. A major hurdle in these technologies is an electrolyte capable of conducting protons above 100˚C. Higher operating temperatures will enhance electrode kinetics and decrease electrode poisoning among several critical operational benefits. In contrast to the macromolecular approaches typically employed towards these electrolytes, we have used a MOF strategy to generate crystalline networks with acidic pores. These MOFs present options to address higher temperature conduction,1 conduction over 10-2 Scm-1,2 and water stability.3 The emphasis in the talk will concern routes to designing these systems and subsequent challenges in their characterization.

[1] *J. A. Hurd et al. Nature Chem. 2009, 1, 705.,* ***[2]*** *S. Kim et al., J. Am. Chem. Soc. 2013, 135, 963.,* ***[3]*** *J. M. Taylor et al., J. Am. Chem. Soc. 2013, 135, 1193.*

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