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Applications of neutron scattering to understanding structure and gas storage properties of metal-organic frameworks and related materials

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The development of nanostructured materials with predictable and controllable connectivity and functionalities has sparked a multitude of research directions. We have been studying emerging metal-organic framework (MOFs) systems and their adsorption properties for methane storage, carbon capture, gas separations and hydrogen storage. Neutron methods including powder diffraction, vibrational and rotational spectroscopy, and quasi-elastic scattering, are invaluable to advancing our understanding the performance (or lack of performance) of novel storage and adsorption systems. This will be illustrated by discussing several examples taken from our recent research involving both MOFs other microporous materials.