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**Strategies for increasing hydrogen storage capacity and adsorption energy in MOFs**

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Storage of hydrogen in its molecular form is difficult and expensive because it requires employing either extremely high pressures as a gas or very low temperatures as a liquid. Worldwide effort is focused on storage of hydrogen with sufficient efficiency to allow its use in stationary and mobile fueling applications. DOE has set performance targets for on-board automobile storage systems to have densities of 60 mg H<sub>2</sub>/g (gravimetric) and 45 g H<sub>2</sub>/L (volumetric) for year 2010. These are system goals. Metal-organic frameworks (MOFs) have recently been identified as promising adsorbents (physisorption) for H<sub>2</sub> storage, although little data are available for their adsorption behavior at saturation: a critical parameter for gauging the practicality of any material. This presentation will report adsorption data collected for seven MOF materials at 77 K which leads to saturation at pressures between 25 and 80 bar with uptakes from 2% to 7.5%. Strategies for increasing the adsorption energy of hydrogen in MOFs will also be presented.