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Make America Green Again: Fueling a Cleaner Future with Adsorbed Hydrogen Storage Tanks ANDREW GILLESPIE, MATTHEW PROSNIEWSKI, ERNEST KNIGHT, PETER PFEIFER, Univ of Missouri - Columbia — Compressed hydrogen requires extremely high pressures or low temperatures in order to compete with the energy density of conventional fossil fuels. Adsorbent materials provide a means to increase the energy density of the gas up to 3 times that of compressed gas at the same temperature and pressure. Absorbent types are often compared based on their pore structures, surface areas, and heats of adsorption because each of these quantities directly impact storage capacity. In this talk, we compare the deliverable storage capacities of various adsorbent types and discuss the impact that high binding energies have on material performance and delivery. Carbonaceous materials were found to reversibly deliver 2-3 times the amount of hydrogen compared to compressed gas at cryogenic temperatures.

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