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A combined pressure-temperature synthesis approach towards novel hydrogen storage materials[1] RAJA CHELLAPPA, MADDURY SOMAYAZULU, VIKTOR STRUZHKIN, RUSSELL HEMLEY, Carnegie Institution of Washington — There is a growing need to explore synthesis of novel hydrogen storage materials with very high hydrogen content ($>$ 30 wt.%) as well as tuning materials in order to facilitate reversible hydrogen desorption and absorption. A combined pressure-temperature ($P-T$) approach holds considerable promise towards achieving these objectives. In this talk, we will present results from our on-going efforts to synthesize hydrogen clathrates with very high hydrogen content that can be recovered at moderate $P-T$ conditions based on simple molecular systems including clathrates and van der Waals compounds, specifically H_2O, CH_4, NH_3, and boron containing systems. The use of suitable additives to enhance stability will also be explored. Results will also be presented from the direct $P-T$ synthesis of metastable light metal (Li, Mg, B- based) complex hydrides.

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