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Structural Studies of Group IV Binary Hydrides at Extreme Pressures[1] PATRICIA KALITA, Department of Physics and Astronomy, University of Nevada Las Vegas, NV, ANDREW CORNELIUS, Department of Physics and Astronomy, University of Nevada Las Vegas, NV, USA, KRISTINA LIPINSKA, Harry Reid Center of Environmental Studies and Dept. of Chemistry, University of Nevada Las Vegas, NV, USA, STANISLAV SINOGEIKIN, OLGA SHEBANOVA, WENGE YANG, Carnegie Institution of Washington, Washington DC, USA, ROMEO DE COSS, RAMIRO QIJANO, Dept. De Fisica Applicada, Centro de Investigation y de Estudios Avanzados del IPN, Unidad Merida, Mexico — Although binary hydrides such as TiH_2 are not ideal candidates for storing hydrogen, they can act as active species to catalyze the reversible dehydrogenation of other hydrides and of carbon nanotubes. The equation of state of TiH_2, ZrH_2 and HfH_2 was obtained using synchrotron x-ray diffraction and diamond anvil cells, with structural studies carried out *in situ* on compression up to ∼50 GPa, under quasi-hydrostatic conditions. We discuss pressure-induced structural transformations and the experimental bulk modulus for TiH_2, ZrH_2 and HfH_2, accompanied by corresponding first principle calculations.

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