

Abstract Submitted
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Xe(H₂)₇ - A hydrogen-rich van der Waal compound stable to multimegabar pressures MADDURY SOMAYAZULU, Carnegie Institution of Washington, PRZEMYSŁAW DERA, GSECARS, University of Chicago, STEPHEN GRAMSCH, RUSSELL HEMLEY, Carnegie Institution of Washington — We have recently reported the occurrence and stability of a sequence of hydrogen-rich compounds of Xe and H₂ [1]. The first solid phase that forms at 4 GPa changes stoichiometry at discrete pressures culminating in a solid whose stoichiometry is determined to be Xe(H₂)₇. The Raman and IR spectra of this solid display remarkable complexity that can be explained in terms of a tripled hydrogen lattice. We report the details of this spectroscopy that have been measured to a maximum pressure of 255 GPa. Single crystal diffraction data of very high quality was collected at the HPCAT beamline 16-BM-D at the APS. The low pressure data was used to identify not only the structural details but also evaluate the changes in the electron density of xenon indicative of interaction between the xenon dimers and the surrounding hydrogen molecules. Acknowledgements: This work was supported by DOE-BES (DE-FG02-06ER46280), NSF-DMR (DMR-0805056) and DOE-NNSA(CDAC). A.P.S. is supported by DOE-BES under contract DE-AC02-06CH11357.

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