

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Synthesis of a new vdW compound (Xe)(Cl₂) and ionic XeCl₂ under pressure¹ MADDURY SOMAYAZULU, CHANGYONG PARK, YUE MENG, STEPHEN GRAMSCH, Carnegie Institution of Washington, RUSSELL HEMLEY, George Washington University — A number of xenon compounds have been synthesized at high pressure-high temperature conditions recently. Most of them have been shown to be molecular, van der Waals compounds. Recently, it has been shown that in the case of Xe-O system, pressure induces changes in the xenon valence state thereby confirming the hypothesis that pressure induces hyper-valency in xenon compounds. Indeed, this causes XeF₂ to transition to XeF₄, XeF₆ and ultimately to XeF₈. In the Xe-Cl₂ system, we observe the formation of a vdW compound that can be transformed to a non-molecular compound at higher pressures and under laser heating. Using a combination of XANES and XRD at 16-BM-D of HPCAT, we have experimental evidence of valence changes that manifest in huge Raman intensities in the vdW compound.

¹This work was supported by CDAC (DE-NA-00006). HPCAT is supported by DOE-NNSA, DOE-BES and NSF

Maddury Somayazulu
Carnegie Institution of Washington

Date submitted: 10 Nov 2016

Electronic form version 1.4