

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Repulsive interactions of deuterium and nitrogen under high pressures** MINSEOB KIM, Institute for Shock Physics, Washington State University, CHOONG-SHIK YOO, Institute for Shock Physics and Dept of Chemistry, Washington State University — High-pressure studies of simple diatomic mixtures are fundamental to understanding the nature of intermolecular interactions and, thereby, their physical and chemical transformations. In this paper, we present the Raman and x-ray studies of  $D_2:N_2$  mixtures to 70 GPa. Our results indicate that the evolution of Raman spectra of  $D_2$  under pressure is apparently coupled to the structural phase transitions in the host  $N_2$  lattice and their crystal structures. A large blue-shift of  $D_2$  vibron in  $N_2$  lattice at high pressures indicates a highly repulsive nature of intermolecular interactions between the host  $N_2$  and guest  $D_2$  molecules. We will discuss about the origin of such repulsive interaction in terms of the crystal structure of the mixture at high pressures.

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Date submitted: 20 Nov 2009

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