Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Anomalous bond length behavior and a new solid phase of bromine under pressure MIN WU, Zhejiang University of Technology, JOHN TSE, YUANMING PAN, University of Saskatchewan — The behavior of diatomic molecular solids under pressure have attracted great interests and been extensively studied. Under ambient pressure, the structure of bromine is known to be a molecular phase (phase I). With increasing pressure, it transforms into an incommensurate phase (phase V) before eventually to a monoatomic phase (phase II). However, between phases I and V, the interatomic distance was found to first increase with pressure and then decrease abruptly. This anomalous bond length behavior is accompanied by the splitting of the Raman bands. These phenomena have not been resolved. Here we suggest a new solid phase that explains the Raman spectra. Furthermore, the anomalous bond length behavior is found to be the result of subtle second neighbor intermolecular interactions and is an intrinsic property of bromine in molecular phases.

Min Wu
Zhejiang University of Technology

Date submitted: 08 Nov 2015 Electronic form version 1.4