Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

**EOS development and numerical modeling of CL-20 compaction**
AARON BRUNDAGE, MARCIA COOPER, Sandia National Laboratories — The response of low-density pressings (62-70% theoretical maximum density) of CL-20 (Hexanitrohexaazaisowurtzitane) to shock impact has been investigated with numerical simulation using BN (Baer-Nunziato) multiphase modeling. Validation data for the modeling was acquired from wave profiles measured with VISAR from low-velocity impact gas-gun experiments. Previously unreported equation of state (EOS) data for CL-20 was determined to support the numerical modeling. A configurational stress relationship, which was needed for the multiphase modeling, was determined from the dynamic loading data. Additionally, a Mie-Gruniesen equation of state for crystalline CL-20 was constructed from previously reported diamond anvil cell (DAC) isothermal compression experiments. The predictions of the observed elastic wave precursors and compaction wave profiles were in good agreement with the data over the range of impact velocities reported herein. A multiphase model is needed to describe the deflagration-to-detonation transition (DDT) in porous CL-20 samples initiated by dynamic compaction.

Aaron Brundage
Sandia National Laboratories

Date submitted: 12 Feb 2009 Electronic form version 1.4