

Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

A Binary Eutectic Mixture of TNAZ and R-Salt Explosives

MARY SANDSTROM, VIRGINIA MANNER, STEVEN PEMBERTON, JOSEPH LLOYD, BRYCE TAPPAN, Los Alamos National Laboratory — TNAZ is a high performing explosive that is melt castable. However, the casting process can be problematic since TNAZ has a high vapor pressure exacerbated by a fairly high melting temperature. In order to mitigate the ill effects of its high vapor pressure, including a lower melting explosive was explored by making a series of mixtures of TNAZ and R-Salt. Initially, a eutectic temperature and composition was theoretically determined. Then a phase diagram was constructed from a series and mixtures by differential scanning calorimetry (DSC). The vapor pressure of the eutectic composition was determined by thermogravimetric analysis (TGA). Cylinder testing of the eutectic composition was carried out in copper tubes, 5" long with 1/2 "inner diameter and 1/16" thick walls. The detonation velocity was measured using wire switches along the cylinder length and the expanding wall velocity was measured using PDV gauges. A rough evaluation of JWL equation-of-state parameters has been carried out. A more detailed evaluation is in progress.

Mary Sandstrom
Los Alamos National Laboratory

Date submitted: 22 Feb 2011

Electronic form version 1.4