Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Deflagration rates of secondary explosives under static MPa - GPa pressure[1] JOSEPH ZAUG, LLNL, CHRISTOPHER YOUNG, GEA Barr-Rosin Ltd., 48 Bell St., Maidenhead, SL6 1BR, UK, ELIZABETH GLASCOE, JON MAIENSCHEIN, LLNL, ELAINE HART, Stanford University, Civil and Environmental Engineering Department, Palo Alto, California 94305, GREGORY LONG, Sandia National Laboratories, New Mexico, PO Box 5800, Albuquerque, NM 87185-1454, COLLIN BLACK, GREGORY SYKORA, JEFFREY WARDELL, LLNL — We discuss our measurements of the chemical reaction propagation rate (RPR) as a function of pressure using diamond anvil cell (DAC) and strand burner technologies. Materials investigated include HMX and RDX crystalline powders, LX-04 (85% HMX and 15% Viton A), and Comp B (63% RDX, 36% TNT, 1% wax). The anomalous correspondence between crystal structure, including in some instances isostructural phase transitions, on pressure dependant RPRs of TATB, HMX, Nitromethane, and Viton are elucidated using micro -IR and -Raman spectroscopies. The contrast between DAC GPa and strand burner MPa regime measurements yields insight into explosive material burn phenomena. Here we highlight pressure dependent physicochemical mechanisms that appear to affect the deflagration rate of precompressed energetic materials.

[1]Work performed for U.S. Department of Energy by LLNL, Contract DE-AC52-07NA27344.

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Date submitted: 20 Feb 2009 Electronic form version 1.4