

Abstract Submitted  
for the SHOCK11 Meeting of  
The American Physical Society

**Ultrafast Shock Interrogation of Hydrogen Peroxide/Water Mixtures: Thermochemical Predictions of Shock Condition Chemistry<sup>1</sup>**

JOSEPH ZAUG, MICHAEL ARMSTRONG, SORIN BASTEA, I.-F. WILLIAM KUO, JONATHAN CROWHURST, MICHAELA KASHGARIAN, LLNL — Hydrogen peroxide is a powerful oxidizer and its concentrated aqueous solutions exhibit very high reactivity, even sustaining detonation under strong enough confinement. Due to its simple composition and basic expected decomposition kinetics hydrogen peroxide is very suitable for studying the interplay of high pressures, temperatures and reactivity and their effect on the equation of state, particularly at the boundary between detonating and non-detonating behavior. To this end we have performed picosecond time resolved shock measurements on solutions of hydrogen peroxide of concentrations from 30 to 90 percent, and analyzed the results in terms of common assumptions of chemical equilibrium in reactive fluid mixtures. Experimental shock states were achieved up to a maximum pressure of 20 GPa with corresponding shock velocities of 6-7 km/sec.

<sup>1</sup>This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract No. DE-AC52-07NA27344. We acknowledge the LLNL Laboratory Directed Research and Development office for support.

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Date submitted: 18 Feb 2011

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