

Abstract Submitted
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Investigation of Shock-Induced Reaction in a Ni+Al Powder Mixture D.E. EAKINS¹, N.N. THADHANI, Georgia Institute of Technology — We will present initial results on the study of the effect of powder microstructure on the reaction response of nickel and aluminum mixtures. The shock-compression and reaction response of equi-volumetric micron-scale ($\sim 50\text{-}60\%$ dense) nickel and aluminum powder mixtures is investigated in the range of the crush-up pressure ($P = 0.5\text{ GPa}$) and up to 10 GPa . Time resolved stress measurements (using PVDF gauges) coupled with VISAR data is used to determine the shock states. Evidence of reaction or lack thereof is inferred by comparing the measured states with calculated Hugoniot state of reaction products based on the ballotechnic model proposed by Bennett and Horie, (*Shock Waves* 4:127-136). Post-impact microstructural analysis of recovered material and comparison of calculated and measured product states is used to establish the criterion for reaction occurring in the shock or post-shock states. Funding for this research was provided by AFOSR/MURI Grant No. F49620-02-1-0382.

¹presenter

Daniel Eakins
Georgia Institute of Technology

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