

Abstract Submitted
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A simple hydride model for cerium ejecta particles¹ JONATHAN D. REGELE, JOHN D. SCHWARZKOPF, WILLIAM T. BUTTLER, ALAN K. HARRISON, Los Alamos National Laboratory — Cerium ejecta particles created by shock driven Richtmyer-Meshkov instabilities are known to hydride inside of deuterium gas and release exothermic energy in the form of heat and increased particle temperature. Cerium dihydride, which is the reaction product specie, is solid under the experimental conditions considered. A model is developed to describe the hydriding process by combining the lumped-capacitance thermal conduction model, Ranz-Marshall heat transfer correlation, and a diffusion-controlled reaction. Comparisons with experimental data are used to determine model accuracy and to discover what additional physics should be considered in the model.

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