Title:	Modelling of Initiation Behavior as a Function of Some Mechanical Properties for HMX-Based Explosives
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Abstract

Hydrocode calculations are used to simulate initiation in single- and double-shock experiments on several HMX-based explosives. Variations in the reactive behavior of these materials reflects the differences between binders in the material, providing information regarding the sensitivity of the explosive to the mechanical properties of the constituents. Materials considered are EDC-37, with a soft binder, PBX-9501, with a relatively malleable binder, and PBX-9404, with a stiff binder. Bulk reactive behavior of these materials is dominated by the HMX component and should be comparable, while the mechanical response varies. The reactive flow model is temperature-dependent, based on a modified Arrhenius rate. Some unreacted material is allowed to react at a rate given by the state of the hotspot rather than the bulk state of the unreacted explosive, according to a length scale reflecting the hotspot size, and a time scale for thermal equilibration. The Arrhenius barrier for HMX is assumed to be the same for all compositions considered. The initiation data for different HMX-based explosives are modelled by choosing plausible parameters to describe the reactive and dissipative properties of the binder, and hence the behavior of the hotspots in each formulation.