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Modeling Thermal Ignition in PBX 9502 BRYAN HENSON, LAURA SMILOWITZ, JERRY ROMERO, DAVID OSCHWALD, Los Alamos National Laboratory — We present a model of 2,4,6 trinitro-1,3,5-benzenetriamine (TATB) thermal ignition in the plastic bonded formulation PBX 9502 that is constrained by a global chemistry and parameterized almost entirely by independent and more elemental measurements of rate. We model solid decomposition using a cyclic mechanism coupling thermodynamic states of TATB that we have shown to be effective in models of thermal ignition for octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) based plastic bonded explosives. We have shown that elements of these models are broadly applicable to the class of secondary solid organic explosives, and this model of TATB thermal ignition further indicates the similarity of mechanisms underlying thermal decomposition and ignition in this class of explosive.

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