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### **Mechanisms of Shock-Induced Reactions in High Explosives**

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Understanding the mechanism by which shock waves initiate chemical reactions in explosives is key to understanding their unique and defining property: the ability to undergo rapid explosive decomposition in response to mechanical stimulus. Although shock-induced reactions in explosives have been studied experimentally and computationally for decades, the nature of even the first chemical reactions that occur in response to shock remain elusive. To predictively understand how explosives respond to shock, the detailed sequence of events that occurs - mechanical deformation, energy transfer, bond breakage, and first chemical reactions - must be understood at the quantum-mechanical level. This paper reviews recent and ongoing experimental and theoretical work in this important area of explosive science.