

Abstract Submitted
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Effects of Electric Fields on the Chemical Reaction Rates of Detonating Solid Explosives CRAIG TARVER, Lawrence Livermore National Laboratory — The presence of a strong electric field has been demonstrated to effect the shock initiation and detonation wave propagation of solid high explosives. Several mechanisms have been proposed to explain the observed increased shock sensitivity, increased detonation velocity, and decreased failure diameter of certain explosives. One chemical mechanism is thought to be the excitation of some of the explosive molecules to higher energy electronic states, which rapidly decay to the ground electronic state while vibrationally exciting the molecules. This process increases the overall reaction rate of the explosive and produces a shorter duration reaction zone. The shorter reaction time results in a more rapid transition to detonation, a decreased failure diameter, and an increased detonation velocity for a specific charge diameter. This work was performed under the auspices of the U. S. Department of Energy by the Lawrence Livermore National Laboratory under Contract No. DE-AC52-07NA27344.

Craig Tarver
Lawrence Livermore National Laboratory

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