

Abstract Submitted
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Prompt Reaction of Aluminum in Detonating Explosives

HAROLD SANDUSKY, RICHARD GRANHOLM, NAVSEA Indian Head Div. — The potential of aluminum reaction to boost detonation energy has been studied for decades, most recently spurred by the availability of nanometer-sized particles. A review of the literature provides perspective for a recent study with the small-scale shock reactivity test. In this test, <1/2-g samples in confinement are shock loaded on one end, and the output at the other end dents a soft witness block. One test series had 0.3 g of HMX mixed with various forms of aluminum added in amounts of up to 25% of the total sample mass, with the deepest dent for H-5 aluminum occurring at 15%. Test results on ammonium perchlorate mixed with H-5 aluminum were consistent with the peak in detonation velocity reported in *Combustion and Flame* by Price in 1973 on similar mixtures. One outcome of this study is a new interpretation for the participation of aluminum in large scale gap tests on plastic-bonded explosives, which was discussed by Bernecker at this meeting in 1987.

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