

## Title: Nanothermites as Replacements for Small Arms Primers

Primers act as the sensitive initiating material in the firing of large- and small-calibre weapons. Most formulations contain a large proportion of the explosive lead styphanate. This material exits the barrel as PbO which is readily inhaled or deposited in the environment. Moreover, current firing systems and primers do not lend themselves to the incorporation of modern technology. Although simple to produce and readily integrated into low-power laser ignition systems, nanothermites display an unpredictable sensitivity to friction and electrostatic discharge. Mitigation of these problems requires a detailed understanding of structure/activity relationships. The present work examines the role of the passivation of aluminum fuel, the use of metal oxidant mixtures, additives and sedimentation effects to explore the relationship between composition and sensitivity.