

Quantitative Characterization of Internal Defects in RDX

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Cyclotrimethylenetrinitramine(RDX) is an explosive compound which is used in the mining and oil drilling industry and for military applications. A good product performance is achieved by making a high solid load explosive with a low sensitivity to minimize an unintentional of the explosive. The sensitivity is affected by crystal properties such as size, shape and defects, on which the solvent used in the crystallization process has a large influence. To reduce defects in RDX crystal, optimum crystallization conditions were studied in the various solvents. The use of explosive crystals free of solvent inclusions leads to decrease the shock sensitivity of cast explosive formulations. The purpose of this paper is to provide accurate quantitative tools for internal crystal defects measurements. Qualitative observations of internal crystal defects can be performed by optical microscopy with matching refractive index. The methods record the mass of the solvent of recrystallization by using GC and are based on accurate measurements of the crystal apparent density.