HIGH PRESSURE MATRIX ISOLATION STUDY OF THE DEFLAGRATION OF HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE

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The pressure dependence of laser induced decomposition of RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine) and RDX-d6 has been studied using a high pressure matrix isolation technique. RDX samples were loaded in Merrill-Bassett anvil cells and cooled to a minimum of 23 K at the desired starting pressure. Individual samples were each exposed to a single 8 ns pulse of 532 nm light from a Nd:YAG laser. Thermal transport from the decomposing RDX and RDX-d6 into the anvils arrested the decomposition, trapping intermediates and products formed under high pressure-high heating rate conditions. A two dimensional finite elements model was employed to estimate the quenching rates and heat flow within the samples. The technique was utilized to study single crystals, pressed powders, and solutions to determine the effect of mechanical stress on the sensitivity towards laser initiation. The threshold energy for reaction initiation and product distribution is given as a function of pressure.