

Initiation of detonation in tetranitromethane and its mixtures with acetone by shock waves

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The initiation of detonation in a liquid explosive tetranitromethane (TNM) and its mixtures with acetone was investigated at a pressure of 10 GPa. The initiating pulse formed by the explosion of a low-density trinitrotoluene charge was injected into the sample through Teflon screen. Two methods of registration were used simultaneously in the experiments. Measurements of the glow intensity was carried out using photomultipliers with optical fiber. Determination of the onset of conductivity on the boundary Teflon-sample was fulfilled using electrical contact sensor. A higher time resolution (several ns) was achieved in comparison with earlier studies of TNM carried out using high speed camera in the slot scan mode (100 ns). This approach allowed to analyze in detail the intensity of the observed glow and to obtain the induction periods for mixtures with stoichiometry concentration of acetone. It was shown that the front of the shock wave is transparent and the reaction initiates directly on the boundary with Teflon screen.

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