IGNITION OF LEAD STYPHNATE AND AZIDE BY CONTINUOUS LASER RADIATION IN NEAR INFRARED RANGE

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Abstract: The process of ignition of the initiating explosives — lead azide and lead styphnate and their mixtures with 0.5% nanoaluminum — using laser with continuous pumping and fiber delivery of radiation with a wavelength of 0.98 μm has been investigated. The ignition delay of these materials at different laser radiation power, from 0.1 to 10 W, was measured. It is found that the ignition delay time is inversely proportional to the power of laser radiation with an exponent of 5 to 10 for pure substances. Mixtures with 0.5% nanoaluminum are heated to the ignition by the order of magnitude faster. For such mixtures, the ignition delay time is inversely proportional to the power of laser radiation with an exponent of 1.9 to 2.3.

Keywords: ignition; laser initiation; initiating explosives; laser radiation; detonation

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