

Abstract Submitted
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Non-classical

detonation regimes of the mixtures of tetranitromethane/methanol and tetranitromethane/nitrobenzene.¹ VALENTINA MOCHALOVA, ALEXANDER UTKIN, Institute of Problems of Chemical Physics RAS, Tomsk State University — The experimental study of the liquid explosive tetranitromethane and its mixtures with not detonating liquids (methanol and nitrobenzene) is presented in this work. By the using of a laser interferometer VISAR the stability of detonation waves in that mixtures, depending on the diluent concentration, was investigated. It is shown that the detonation front of these mixtures is stable up to 40% of diluent. Also the dependence of the detonation velocity of tetranitromethane/diluent on the diluent concentration and the limit concentration of the diluent, above which the detonation of the mixture was impossible, were found for each mixture. The compounds of the mixtures, in the reaction zone of which the distribution of parameters didn't correspond to the classical detonation theory, were found. An increase of the pressure and particle velocity behind a shock jump in the mixtures of tetranitromethane/methanol and tetranitromethane/nitrobenzene and the possibility of the existence of a steady-state detonation wave without a Von Neumann spike are interpreted within the framework of models that take into account the possibility of chemical reactions directly in the shock wave front.

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