

Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Shockwave initiation of mixture liquid HE ALEXEY MEN'SHIKH, A.V. FEDOROV, A.L. MIKHAYLOV, D.V. NAZAROV, S.A. FENYUSHIN, V.A. DAVYDOV, RFNC-VNIIEF, 607190, Sarov, Russia — The authors performed studies of initiation of mixture liquid HE (of the “oxidizer-fuel” type) consisting of tetranitromethane with nitrobenzene (TNM/NB) having mass ratio of 74/26 by planar and spherically diverging shock waves with amplitudes of 10-25 GPa. Laser interferometry method was used to record profile of particle velocity at the HE-window interface. At initiation of HE detonation having thickness of 2-50 mm, the pulsing regime was recorded, maximum pressure of which reached 50 GPa in some parts of the front. Thickness of the layer of pulsing detonation wave was ~ 150 mm. We recorded dispersion of particle velocity of wave. Different profiles and amplitudes of wave were recorded in one test at different interference lines. At HE thickness of 50 mm, in a series of tests, we recorded normal detonation wave with value of Neumann spike of 35 GPa, value of detonation pressure of 21 GPa. Pulsing detonation regime was also recorded at initiation of the other mixture liquid HE TNM/NB, where NB percentage was from 20 to 50%. The paper presents hypotheses for explanation of the mechanism of detonation initiation in studied HE.

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Date submitted: 05 Apr 2005

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