

Abstract Submitted
for the SHOCK19 Meeting of
The American Physical Society

Studying the dynamic properties of cyanoacrylate adhesive in plate impact experiments REFAEL HEVRONI, Negev Nuclear Research Center, NATAN KARAEV, ELI GUDINETSKY, Israeli Atomic Energy Commission, VITALY PARIS, ARNON YOSEF-HAI, Negev Nuclear Research Center — Cyanoacrylate adhesive are commonly used in plate impact experiments as binding for targets to optical windows and binding of multi-layered impactors. Thus, knowledge of the equation of state of cyanoacrylate adhesives improves the accuracy of the analysis of dynamic experiments. In this work, plate impact experiments were performed on transparent cyanoacrylate cast windows. The principle Hugoniot and the sound velocity were measured on shock-loaded cyanoacrylate Windows up to 7 GPa. A VISAR was used to monitor particle velocity of the impactor-window interface. In optical shock-loaded windows, the dynamic optical correction is typically reversed when the shock-wave reflects from the window's free surface, expressed by a sharp change in the measured particle velocity. This phenomenon was used estimate the shock-wave travel time, the arrival time of the rarefaction wave propagates from the window's free surface to the impactor-window interface observed as a continuous increase of the impactor-window interface velocity. This phenomenon was used to estimate the rarefaction wave travel time, and thus to calculate the sound velocity. From the experimental data a Mie-Gruneisen type equation of state for cyanoacrylate was proposed.

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Date submitted: 02 Mar 2019

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