Abstract Submitted for the SHOCK05 Meeting of The American Physical Society

Tension of ethyl alcohol and hexadecane by shock waves<sup>1</sup> ALEXANDER UTKIN, VASILIY SOSIKOV, VLADIMIR FORTOV, Institute of Problems of Chemical Physics RAS — The influences of strain rate and initial temperature on the negative pressure in ethyl alcohol, and hexadecane under shock waves have been investigated. The method of spall strength measurements was applied and wave profiles were registered by laser interferometer VISAR. At initial temperature 298 K spall strength of ethyl alcohol was found. Unlike other liquids the process of destruction in methyl alcohol is double staged. At the first stage formation of cavities starts and there is a kinked at free velocity profile was observed. At the second stage the cavity grow rate increases and the spall pulse occurs. The dependence of negative pressure from the strain rate was instigated. The value of the negative pressure correspondent to the kinked at free velocity profile was practically constant and equal to 14MPa. The maximal strength value may be much higher and equal to about 50MPa. The Influence of temperature near melting point on negative pressure in hexadecane has been investigated. Theory of homogeneous bubble nucleation was used to explain the experimental results.

<sup>1</sup>The work was supported by Russian Science Support Foundation.

Vladimir Fortov Institute of Problems of Chemical Physics

Date submitted: 28 Mar 2005

Electronic form version 1.4