

Abstract Submitted  
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**Spall strength of sapphire** ANDREY SAVINYKH, Institute of Problems of Chemical Physics RAS, Chernogolovka, 142432 Russia, GENNADY KANEL, Joint Institute for High Temperatures of RAS, Moscow, 125412 Russia, SERGEY RAZORENOV, Institute of Problems of Chemical Physics RAS, Chernogolovka, 142432 Russia — The spall strength of c-cut sapphire has been measured as a function of the load duration and peak stress. In experiments, the VISAR particle velocity histories at the interface between the sapphire samples and a water window were recorded. The peak shock stress varied from 17.3 GPa up to 21.4 GPa that is below the Hugoniot elastic limit but close to it, the load duration varied from 100-150 ns to 250-300 ns. Within this range measured values of the spall strength varies from 4.2 to 10.6 GPa. Results of measurements demonstrate much higher sensitivity of the spall strength to the strain rate than that for metals and a trend to its decrease with the increasing peak stress. Development of any inelastic deformation leads to complete loss of the resistance to tension in the domain of a sapphire sample where these processes occurred. The complex of experimental observations leads to conclusion that the damage nuclei may appear in sapphire under both uniaxial compression and following tension and the expectation time decreases with increasing both compressive and tensile stresses.

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