Shock-wave processes in palladium upon irradiation with a picosecond laser pulse

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In the present work, we study the processes that occur in palladium target after irradiation with an intense picosecond laser pulse. The experiments were carried out using a Kamerton-T facility based on a neodymium glass laser. The radiation wavelength in the second harmonic is 0.527 μm. The duration (full width at half maximum) of the pulse was 70 ps. The pulse energy was 1.164 J. This pulse was focused on the surface of the palladium target into a spot 0.414 mm in diameter; target thickness was 90 μm. Taking into account the measured dependence of the radiation intensity on time, the maximum intensity is estimated to be 11.08 TW/cm^2. Under the action of such a pulse, a spall occurs in the target at a distance of 12 μm from the rear surface of the target. The spall plate diameter was 0.460 mm. The dynamics of compression and unloading waves in the spall plane is modeled using the equation of state of palladium constructed for a wide range of densities, pressures, and specific internal energies.