

Strong Shock Waves And Extreme States Of Matter

M.A.Mochalov¹, R.I.Il'kaev¹, V.E.Fortov², A.L.Mikhaylov¹

¹ RFNC-VNIIEF, Sarov, Russia

² RAS, Moscow, Russia

We have presented obtained in RFNC-VNIIEF results of investigation of properties of fluid inert gases, gaseous deuterium and helium at single, double and quasi-isentropic shock compression. To generate strongly compressed high-temperature states in the mediums under investigation special experimental devices of plane, cylindrical, hemispherical and spherical types of symmetry have been developed. On the basis of created laboratory technics and experimental methods a complex of experimental data for investigated mediums at extreme conditions has been created. The investigations have been carried out at pressures up to $P \gg 5000$ GPa, densities up to $\rho \gg 20$ g/cm³, temperatures up to $T \gg 56000$ K and conductivities up to $G \gg 10^5$ (Ohm·m)⁻¹. Obtained experimental data have been used for testing the model equations of state of investigated mediums at the range of extremely high densities and pressures.