

Abstract Submitted
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Equation of State of Shock Compressed Gases at Megabar Pressure Range VICTOR GRYAZNOV, Institute of Problems of Chemical Physics RAS, IGOR IOSILEVSKIY, VLADIMIR FORTOV, Joint Institute for High Temperatures RAS — The model for equation of state of warm dense matter is developed in frames of “chemical picture.” Shock compressed gas is considered as a multi-component strongly interacted mixture of atoms, molecules, ions and electrons. Coulomb interaction of charged particles, short-range repulsion and attraction of heavy particles so as partial degeneracy of free electrons are taken into account. Contribution of repulsion of atoms and molecules to thermodynamic functions is considered in frames of extended soft-sphere model and corresponds to non-empirical atom-atomic approximation. The modified pseudopotential model is used for description of interaction of charged particles. The results of calculation of principal Hugoniot of hydrogen, deuterium and nitrogen together with calculation of thermodynamics for reshock states and third-shock reverberation are presented. The calculation results are compared with gas-gun, explosive, magnetically launched flyer-plate and laser experiments so as with the results of the first principle modeling.

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