CONSTRUCTION OF THE EQUATION OF STATE FOR SILICA AT HIGH ENERGY DENSITIES

Khishchenko K. V.

JIHT RAS, Moscow, Russia
konst@ihed.ras.ru

The problem of describing the thermodynamic properties of matter in a non-ideal plasma state is of interest due to the fact that such states are achieved in processes involving the interaction of intense energy fluxes with condensed matter. To solve problems of numerical modeling of the hydrodynamics of such processes, the equation of state is necessary to close the system of equations of motion of the medium. This work is devoted to the construction of the equation of state for silica at high energy densities. The calculations are based on the functional dependence of pressure upon specific volume and specific internal energy. To choose the values of the constants in this dependence, data from shock-wave experiments with silicon dioxide samples of different initial densities are used. The constructed equation of state is in good agreement with these data over a wide range of thermodynamic parameters. This equation of state can be effectively used at simulation of processes in matter at high energy densities.