Equation of state for aluminum oxide and mixtures on its basis at high pressures and temperatures in shock waves

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In this work, equations of state for aluminum oxide (alumina) and a number of substances included in mixtures with it are constructed on the basis of a thermodynamic model [1], which makes it possible to describe data from shock compression experiments over a wide range of pressures and temperatures. The equations of state for alumina-based mixtures are constructed under the assumption of establishing thermal and mechanical equilibrium between the components [1]. The calculated shock (Hugoniot) adiabats for mixtures based upon aluminum oxide as well as for their components are compared with experimental data over the entire studied range of densities and pressures. The obtained good agreement between the adiabats and the data confirms the reliability of the presented equations of state, which makes them suitable for numerical modeling of dynamic processes at high pressures and temperatures.
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