NUMERICAL MODELING OF THERMODYNAMIC PARAMETERS FOR MIXTURES WITH A SMALL PARAMETRIC EQUATION OF STATE OF THEIR COMPONENTS

Maevskii K.K.

LIH SB RAS, Novosibirsk, Russia
konstantin@hydro.nsc.ru

The results of numerical experiments on modeling of shock-wave loading of porous and solid heterogeneous mixtures, including tungsten as a component, are presented. The model is based on the assumption that all components of the mixture, including gas, under shock-wave loading are in thermodynamic equilibrium (model TEC - thermodynamic equilibrium components). Condensed components are described by a small parametric equation of state of Mie–Grüneisen type [1, 2].

Interest in the investigating of the compressibility of powder mixtures with tungsten as a component is associated with the possibility of creating materials with the desired properties, and the properties of tungsten. The equation of state used for components contains only one free parameter, which allows one to describe the data obtained on the basis of experiments at maximum compressions. The parameters of the model, which allows one to describe reliably thermodynamic parameters of shock-wave loading of pure materials, are used for modeling mixtures, including tungsten as a component. It is shown that this model allows us to describe reliably shock-wave loading of mixtures of different compositions [3].

---

1. Kinelovskii S.A. and Maevskii K.K. Model of the behavior of aluminum and aluminum based mixtures under shock wave loading // High Temperature 2014. V. 52. P. 821.
2. Kinelovskii S.A. and Maevskii K.K. Modeling shock loading of multicomponent materials including bismuth // High Temperature 2016. V. 54. P. 675.
3. Maevskii K.K and S.A. Kinelovskii Thermodynamic parameters of mixtures with epoxy as a component under shock wave loading // Journal of Physics: Conf. Series 2018. V. 946. P. 012113.