

Bushman equations of state: Thirty years after

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This work is devoted to a review of the results of Alexei Bushman obtained in his studies of the problem of constructing equations of state for matter at high energy densities. Variants of equation-of-state models in the form of a function of internal energy upon specific volume and pressure as well as a function of free energy upon specific volume and temperature are considered. A description is given of methods for taking into account phase transformations (melting, evaporation) at high temperatures and pressures. Examples are presented of constructing equations of state for metals (aluminum, copper, lead, bismuth and others) and polymeric materials (polymethylmethacrylate, polytetrafluoroethylene and others) in a wide range of changes in thermodynamic parameters. The directions of development of these studies over the thirty years that have passed since the death of Alexei Bushman on December 6, 1993 are discussed.