Abstract

A procedure is described for developing simple approximate equations of state of liquids from Hugoniot P-V relations determined in shock wave measurements. This is applied to a number of liquids and a table of coefficients is given.

The formalism of irreversible thermodynamics is applied to time-dependent phase transitions in iron and an approximate set of constitutive relations is obtained in a form suitable for numerical integration with the equations of continuum dynamics. These are applied in an approximate form to study the development of the two-wave structure in iron caused by the α-ε phase transition.

Finite strain theory is applied to the analysis of shock wave data for quartz, and the results supply enough information to estimate some of the fourth-order elastic constants.