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Multi–Phase Equations of State for Copper, Silver and Gold I.V. LOMONOSOV, IPCP RAS — Results of theoretical calculations and experimental measurements of the equation of state (EOS)are discussed and applied to Cu, Ag and Au. A multi-phase EOS model is presented, accounting for solid, liquid, gas, and plasma states, as well as two–phase regions of melting and evaporation. The thermodynamic properties and phase diagrams are calculated with the use of this model. Theoretical calculations of thermodynamic properties of the solid, liquid, and plasma phases, and of the critical point, are compared with results of static and dynamic experiments. The analysis deals with thermodynamic properties of solid metal at T = 0 and 298 K from theories, static compression experiments in diamond anvil cells, and the information obtained in isentropic–compression and shock–wave experiments. Thermodynamic data in the liquid state, resulting from traditional thermophysical measurements, "exploding wire" experiments, and evaluations of the critical point are presented. Numerous shock–wave experiments have been done to measure shock adiabats of crystal and porous samples, release isentropes, and sound speed in shocked metal. These data are analyzed in a self–consistent manner together with all other available data at high pressure. The present EOS describes with high accuracy and reliability the complete set of available information.

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