STUDY OF THE NEAR-CRITICAL POINT STATES OF LIQUID - VAPOR PHASE TRANSITION OF METALS UNDER ISENTROPIC EXPANSION OF SHOCK-WAVE COMPRESSED POROUS SAMPLES.

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Thermodynamic parameters of critical point of liquid - vapor phase transition are determining at creation of wide-rang semi-empirical equations of states describing behavior of rarefied matter. For many metals the high-temperature part of a curve of boiling is in plasma area that essentially complicates the theoretical description of these states. Strong variations of electron subsystem at the near-critical point region do not allow to estimate thermodynamic parameters of the critical point only theoretically.

In the work experimental studies of near-critical point states of metals (Mo, W, Ni, and Cu) under isentropic expansion of shock-wave compressed porous samples in transparence helium environment were carried out. In these experiments temperature and velocity of expending metal by means of fast optical pyrometer were registered.

The very high porous metal temperature during expansion in **two-phase** region have been registered in our experiments, one essentially higher both temperature of liquid metal, and temperature helium barrier [1].

In **one-phase** region under expansion at the initial moment the jump of the temperature is observed, but the high temperature fast falls down up to temperature of metal surface.

Thus, registration of temperature profile of shock-compressed porous metal under expansion allows to determine, where there is metal expansion in two or one-phase region, that is to register border of tow-phase region and to estimate parameters of critical point (temperature and pressure).

1. Emelyanov A .N., Pyalling A. A. and Ternovoi V. Ya, Int. J. Thermophysics, 2005, v. 26, No. 6, pp.1985-1995.