

INVESTIGATION OF NEAR CRITICAL POINT STATES OF TANTALUM, LITHIUM AND SODIUM BY PULSE HEATING UNDER LAUNCHING

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The near critical point states of the liquid-vapor phase transition of tantalum, lithium and sodium were investigated. The heating of tantalum foil samples in 1-D geometry was carried out by multiple-shocked helium from back side of the tantalum foil and heating of lithium and sodium - by shocked helium from the front side under dynamically created isobaric conditions. The temperature of sample was measured by fast 8-channel optical pyrometer. The pressure was obtained from measured shock velocity in helium using base length technique. Generated states of metal under investigation during pulse heating near free surface were analyzed. State with highest temperature before the starting of plasma formation at pressures below pressure of critical point of liquid – gas transition is due to state on spinode line. Intersection of interpolating line of such states in pressure range below critical point with such line in pressure range above critical point allows evaluate metal critical point temperature. Three sets of experiments with various history of heating were carried out, allowed to evaluate the critical point location of the studied metals in P-T plane.