The thermophysical properties of low-temperature tin plasma

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The thermophysical properties (thermodynamics and the electronic transport coefficients) are significant in various areas of area physics, including the region of the low-temperature plasma (LTP) of metals. The latter is located approximately at the temperatures 10 kK$\leq T \leq$ 100 kK and the densities $\rho \leq \rho_c$, where ρ_c is the critical densities. Presently, there are many investigations both in the calculations and in the experiments of the considered properties in LTP for various substances, including metals [1]. However, the data for many metals in LTP are still divergent even within the most exact *ab initio* simulations [1]. Moreover, there are some metals, including tin, for which corresponding data are absent in LTP. Tin has low melting temperature T_m= 505.08 K. Thus, its thermophysical properties in liquid state had been already measured with good accuracy 50 years ago [2]. The same concerns the high pressure phase diagram (but at T $\leq$ 3 kK) [3]. But at temperature increase there much less data. In particular there are the shock wave measurements data near the normal density (ρ_0=2.829 g/cm^3) [4]. However, in LTP there are no appropriate data, excluding for only semi-empirical models [5,6]. So it is necessarily to fill this gap.Previously we have developed a model to calculate the properties under study for different metals in LTP state. It was successfully applied to various substances, see [7] and references therein. Now we have applied it to tin.

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