EXPERIMENTAL DEPENDENCE OF THE DENSITY OF LOCAL ENTROPY RATE OF PRODUCTION OF CHANGE OF THE TEMPERATURE IN TIME

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The paper reports on the analysis of experimental thermograms $T(\tau)$ of the tungsten solid-phase samples obtained in the process of instant cooling of a spherical by the method of electrostatic levitation, or heating the thin plate by a direct current in a circuit with the unloaded battery or heating the thin plate by a laser stream of radiation. The range of change of the temperature in time $dT/d\tau$ makes $10 \div 9 \cdot 10^7$ K/s in various experiments. The comparative analysis is lead - the density of a heat flux q shares on product of speed of change of a heat flux $dq/d\tau$ and relaxation time $\tau_q = 10^{-12} - 10^{-10}$ s. The analysis has shown that in all experiments the Fourier's law of heat conductivity which corresponds to a linear mode of thermodynamics is realized. Density of local entropy rate of production p counted under the known formula which is deduced in the assumption of constant value of an isobaric thermal capacity of substance. The assumption, that a thermal capacity is a constant, is executed as a result of small values of change of temperature which gets out at processing thermogram. Check of an opportunity of application of the specified formula for calculation of the density of local entropy rate of production is based on performance of the extremum principle for dependence $p = f(\tau)$ when the condition of system aspired to an equilibrium. It is shown, that in four various experiments the density of local entropy rate of production has uniform linear dependence from speed of change of temperature. The given result allows to assume, that linear dependence $p = f(dT/d\tau)$ can be considered as universal dependence for a linear mode of thermodynamics.