DETERMINATION OF THE TEMPERATURE OF SPONTANEOUS BOILING-UP OF WATER IN EMULSIONS ON A MICRO-DIMENSIONAL HEATER

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Visualization of fast–flowing processes of heating, convection and boiling under conditions of pulsed isothermal action Tst(t–t1) – T0 = const, where t1 is the duration of temperature increase of a micro-dimensional wire heater from the initial value T0 to the experimentally set value Tst. The objects of the isothermal exposure study were water, aqueous emulsions of rapeseed oil ether and their mixtures. The subject of the study was the temperature-time range of the instantaneous heat transfer coefficient (MCT) from a miniature heater undisturbed by boiling into the above-listed samples with an initial temperature of T0 with a step-by-step change in the Tst value. It is shown that at atmospheric pressure with the duration of thermal stabilization t = 1 s in the case of deionized water, the temperature range Tst(t) – T0 undisturbed by boiling corresponds to the degree of overheating relative to the liquid–vapor equilibrium temperature Ts in 70-80 K. Water droplets in vegetable oil emulsions reduce the values of overheating of the starting oil at t = 100 ms by 50-200 K in the range of 0.1 – 10 wt.The investigation has been conducted at the expense of a grant of the Russian Science Foundation (project No. 23-69-10006), https://rscf.ru/project/23-69-10006