

# 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  $T_{st}(t-t_1) - T_0 = \text{const}$ , where  $t_1$  is the duration of temperature increase of a micro-dimensional wire heater from the initial value  $T_0$  to the experimentally set value  $T_{st}$ . 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  $T_0$  with a step-by-step change in the  $T_{st}$  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  $T_{st}(t) - T_0$  undisturbed by boiling corresponds to the degree of overheating relative to the liquid-vapor equilibrium temperature  $T_s$  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>