

# Critical and transport properties of composite fuels

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Composite fuels based on industrial waste, household waste, biomass, plant materials and water are an affordable alternative to traditional energy resources. The object of the study is samples of n-decane, n-dodecane and kerosene surrogate SU4, relevant for the development of new fuel technology, as well as model liquids.

The goal of the work was to determine the degree of overheating of samples at different values of their average heating rate (1–5) K/ $\mu$ s. The method of pulsed method was used to control the heat generation power on a miniature heater-probe.

A new array of experimental data has been obtained on the achievable overheating of liquids relevant for the development of new fuel technology, on unsteady heat transfer by these liquids, including in the region of overheated liquid–vapor states relative to the equilibrium temperature. It serves as the basis for setting the problem of studying the boiling of inhomogeneous systems that relax according to several characteristics, and elucidating the factors limiting the degree of overheating in experiments on the microexplosion of composite water-in-fuel droplets. 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>).