

EFFECT OF MOISTURE ON HEAT TRANSFER IN LIQUID HYDROCARBONS UNDER IMPULSE HEATING OF A WIRE

Lukyanov K. V., Kotov A. N., Starostin A. A., Skripov P. V.*

ITP UB RAS, Ekaterinburg, Russia

**r.t.f@bk.ru*

Rapid local heating can be observed in friction units with oil lubrication, in cycles of cooking and burning of fuel in engines and reactive plants and other process units. As a rule, in real processes, liquid hydrocarbons may contain impurities of moisture. To study the effect of moisture in saturated hydrocarbons, the technique of powerful local heating of a wire probe was used. The main task was to elucidate the influence of the moisture impurity on the intensity of non-stationary heat transfer when the probe was heated above the normal boiling point of the components. Experiments were carried out on samples of hexane, decane, hexadecane with a moisture content of 5 to 35 ppm. Moisture additives were introduced from the vapor phase through the free surface of the liquid and controlled by the Karl Fischer method. It turned out that under conditions of pulsed heating, small impurities of moisture can exert a considerable influence not only on the boiling point of hydrocarbons, but also on the heat transfer intensity of these substances in a state of superheating, near the temperature of spontaneous boiling-up. The work was supported by the Russian Foundation for Basic Research, project No. 16-08-00381-a.

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