MANOMETRICAL INVESTIGATION OF THE SATURATED VAPOR PRESSURE AND CRITICAL TEMPERATURES OF HYDROCARBON COMPOUNDS

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At present, there are no experimental data on the thermophysical properties of some hydrocarbon compounds of promising aviation fuels. The present work is devoted to the investigation of thermophysical properties and critical temperatures of hydrocarbon compounds by the manometric method, as well as to an assessment of the fulfillment of Raoult's law for mixtures of hydrocarbon compounds. Promising components of aviation fuels: aliphatic cyclic hydrocarbons with high density, volumetric heat of combustion and high boiling temperature were studied in the research. The experimental manometric installation includes the thermostat, the pressure regulation system, the test chamber, and allows to determine the pressure of the test sample from 0 to 45 atm at temperatures from 15 textdegree C to 500 textdegree C [1]. Investigation of the saturated vapor pressure of the samples was carried out by measuring the equilibrium pressure during their isochoric heating. The vapor pressure of samples was not changed during the test chamber was held at a given temperature for 2 hours, i.e. the reaction of thermal decomposition with evolution of gases was not observed during vapor determination. It is established that the saturated vapor pressures of the samples studied in the interval 100-400 textdegree C are subject to Clapeyron-Clazius law. The dependence of the vapor pressure on temperature, enthalpy and evaporation entropy, boiling point and critical temperatures was determined for the hydrocarbon compounds.

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1. V.V. Dubikhin, V.G. Matveev, G.M. Nasin. Thermal decomposition of 2,4,6-trinitrotoluene in melt and solutions // Izvestiya Akademii Nauk.