

Experimental Study of the Thermophysical Properties of the Binary System Hydrocarbon -Water (N-Heptane – Water)

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The study of binary systems of a hydrocarbon and water provoke interest both from a theoretical point of view (in the thermodynamic behavior of complex systems) and for practical use of the results (a natural hydrocarbon system, oils are often mixed with water). The temperature dependence of the thermophysical properties (the heat capacity at constant volume C_v and PVT properties) of a complex of binary system $[(1-x) C_7H_{14} + xH_2O]$ has been experimentally studied by the well known method with a high temperature adiabatic calorimeter – piezometer. The studied samples of $\{(1-x) C_7H_{16} + xH_2O\}$ were prepared from synthetic n-heptane, marked “reference” and doubly distilled water.

Measurements of the heat capacity have been carried out along isochores for several constant compositions of the mixture with different content of the polar component in n-heptane. The measurements have been carried out in the interval of temperature 373 to 550 K and with pressure up to 10 MPa, including the region of phase transitions for liquid-liquid and liquid-vapour separation and the region of the upper critical end point.

The peculiar behavior of the thermophysical properties of these systems is determined for the studied temperature range and concentration range of the polar component in the mixture.

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