ISOCHORIC HEAT CAPACITY AND PHASE EQUILIBRIUM LINES IN THE BINARY SYSTEM N-HEXANE + WATER IN THE CONCENTRATION RANGE 0-0.2566 M.F. H_2O

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Experimental investigation of the Cv, V, T properties in the n-hexane + water system with the different compositions (x) 0.1195; 0.1662; 0.1998; 0.2566 molar fraction (m.f.) H_2O in the temperature range 312 - 503K and pressures up to 6 MPa, were made with the high-temperature adiabatic calorimeter designed by Kh.I. Amirkhanov [1].

For our investigations we used adiabatic calorimeter with the volume 432.611 cm^3 at temperature T = 298.15 K and atmosphere pressure 0.1 MPa.

For each measured isochore, two jumps of the isochoric heat capacity were observed. A sharp jump of isochoric heat capacity at the intersection of the boundaries of the three and two-phase regions is associated with the phase transitions liquid-liquid-gas in liquid-gas in the binary mixture n-hexane + water, the phase transition associated with the dissolution of the components (liquid-liquid), more smooth and occurs in a certain temperature range.

According to the measurements of the heat capacity Cv, phase equilibrium curves liquid-liquid-gas, liquid-liquid and liquid-gas are plotted as a function of density and composition. The form of the phase equilibrium curve of liquid (less volatile component) - gas (more volatile component) for the composition of 0.2566 mole fractions of H2O has a parabolic shape and differs from all compositions. For this concentration, the liquid-liquid phase and liquid-gas phase curves intersect at one point - the critical point of the three-phase equilibrium or the upper critical end point (UCEP).

Using the experimental data on the critical line for the mixture and the vapor pressure of the pure solvent (n-hexane), the Krichevsky parameter was calculated. Based on the Krichevsky parameter, the thermodynamic and structural properties of the dilute n-hexane + water mixture near the critical point of n-hexane were also calculated.

1. Amirkhanov Kh.I., Alibekov B.G., Vikhrov D.I., Mirskaya V.A. Isochoric heat capacity and other caloric properties of methane hydrocarbons. Makhachkala: Dagestan book publishing, 1981.