

The Phase Equilibria Curves of Hydrocarbon + Water Binary Mixtures

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Study of phase behavior in systems consisting of hydrocarbon + water are important for theoretical use, as they give information on interactions between polar and nonpolar molecules. The results of such examination are also important for practical use, as natural hydrocarbon mixtures as a rule are in contact with water.

The phase equilibria of n-heptane + water binary mixtures were studied for four compositions (mole fraction) of water (0.1470, 0.2951, 0.4200, 0.5923). Temperature dependence of density was determined at temperatures 433 K - 563 K for these mixtures. The liquid-liquid and liquid-vapor phase equilibria curves were determined from the temperatures corresponding to phase transitions in mixtures along the isochors. Apparatus and measuring method for the present study were the same as those previously described (improved high temperature adiabatic calorimeter of constant volume). The measurements are carried along isochors at fixed concentrations.

Particular attention is given to the phase equilibria curves of mixtures containing polar (water) and non polar (hydrocarbon) components. The dynamic changes of the phase equilibria curves are investigated depending on concentration of a polar component in the mixtures.

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