Phase transitions and volumetric properties of an n-hexane–water system

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Using a constant-volume piezometer and the compression technique by reference to the isochors, authors got the p–T-dependence values for a splitting equimolar n-hexane–water system being in the binary-phase and the triple-phase areas of the parameters of state in the $T = 373.15$–673.15 K, $p = 0.25$–56 MPa and $\rho = 55$–554 kg/m^3 rangers of temperature, pressure and density relatively. According to the hinge and salient points of the isochors at a phase p–T-plot they determined parameters of the LLV $\leftrightarrow$ LL and LLV $\leftrightarrow$ LV phase transitions (L means liquid, V—vapor). The $p(T)$ dependence along a curve of LLV $\leftrightarrow$ LL and LLV $\leftrightarrow$ LV coexistence is described by a polynomial equation. Average relative deviation of the calculated p values versus the experimental data amounts to 0.1%. According to the 523.15–648.15 K isotherms authors got the p–V_m–T-dependencies (V_m is the molar volume) for a vapor phase and a supercritical fluid of the named system in the $p = 2.00$–40.42 MPa and $\rho = 13.98$–516.33 kg/m^3 ranges depending on water concentrations: $V_m(p, x)_T = \sum_{i=0}^{n} a_{ij} p^i x^j$, where the a_{ij} coefficients were determined using the least square method. Relative deviation of the calculated V_m values versus the experimental data amounts to 0.7–1.7%.