

The Universal Triangle of Liquid - Gas States

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We demonstrate for the first time that: (a) the straight line of unit compressibility factor (Zeno line) tends asymptotically to the liquid branch of binodal at low temperatures, (b) the straight line with a half density has to be close to the average of vapor –liquid densities along the binodal curve (rectilinear diameter), and (c) the phase coexistence curves are inscribed into the right triangle in the density-temperature plane, which is formed by the Zeno line and by the segments, which this line cuts off on the axes. These statements are confirmed for model systems and for a wide group of real substances (for the first time including metals: Hg, Cs, Cu). Critical parameters of all substances under study are located in the vicinity of the triangle median, drawn to the density axis, with dispersion of the order of two in reduced units.