The Triangle of Liquid-Gas States

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We have demonstrated for the first time that (a) the straight line of the unit compressibility factor (the Zeno line) tends asymptotically to the liquid branch of the binodal at low temperatures; (b) the straight line with a half-density has to be close to the average of the vapor–liquid densities along the binodal curve (rectilinear diameter); and (c) the phase coexistence curves are inscribed into a 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 order of two in reduced units.