

Revisiting the Diameter of the SF₆ Liquid-Vapor Coexistence Curve

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Among all simple fluids, a striking difference of SF₆ data showing a strong deviation from the rectilinear diameter of the coexisting curve is puzzling. To elucidate the problem, we used a simple optical method allowing high-resolution measurements of the liquid-vapor meniscus position of SF₆ as a function of temperature from far (10 K) to extremely close (1 mK) to the critical temperature. The observed meniscus positions are analyzed using the most recent theoretical approaches to predict consequences of the complete scaling and the law of the rectilinear diameter. It results that the meniscus position shows a well-defined temperature dependence crossing the volumetric median plane of a highly symmetrical cell, probing unambiguously the absence of the expected deviation in the rectilinear density diameter approaching the SF₆ critical point.