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Derivation of the formula of Timmermance-Filippov from the generalized Putilov's equation of state

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Abstract

The formula of Timmermance-Filippov – the equality of critical factor of compressibility of gas-liquid phase transition to the ratio of densities of substance at the critical point and at the zero temperature and pressure – is derived from the generalized Putilov's equation of state. It is shown that the formula is valid for arbitrary temperature dependences of the parameters of the generalized Putilov's equation of state. The formulas are found to define critical parameters using cold pressure and its first and second volume derivatives.