A Method for Estimating Critical Pressures

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A new method for estimating the critical pressure of non-associative fluids is proposed. It is based on the extrapolation of the function approximating the pressure as a function of the temperature in the region of standard conditions to the critical temperature. The approximate equation consists of the logarithm of pressure as a sum of constant term and functions of the first and the forth power of the inverse reduce temperature. Such a combination of the powers of a temperature is connected with the Haggenmacher representation of the difference between specific volumes saturated liquid and saturated vapor. The analysis of usage of various powers of inverse temperature shows that the forth power in the third term provides the clear minimum for the estimation's error.

The proposed algorithm is applied to 40 substances of various types such as n-alkanes, halogensubstituted hydrocarbons, alkylbenzenes etc. Comparison with the known experimental data affirms the exactness of this approach.