

Applied Equation of the Critical State

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Researchers, engineers, young specialists and students investigating liquids and gases near the critical state, are in need of concise material on equations of state. Such material can be used also for analysis and treatment of experimental results in critical region. The aim of this work is to fill the indicated gap.

The peculiarity of critical phenomena is because of the fact that the strong increase of susceptibility means that small perturbations cause large responses. Because of that, a change of parameters may lead to anomalous qualitative changes in the studied system.

We analyzed works dealing with critical states and picked out practically important thermodynamic equations of the critical state.

The following states, properties and features of critical states were analyzed and investigated; gaseous and critical state; Van-der-Waals equation of state; equations for pseudocritical properties; cubic equations of state; Redlich-Kwong equation of state; Koawa equation of state; Peng-Robinson equation of state; Bertloo equation of state; Diterichi equation of state; various types of equations of state; equations of potential functions; features and conditions of critical states; types of calculation methods; critical parameters and correlations; Lee-Kesler equation; equation of density of liquids.