

Thematic direction: About some consequences from the virial equation of state. Part 2.

Definition of the critical parameters from second and third virial coefficients

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Abstract

It is shown that the virial equation of state gives the relations between temperature, pressure, volume and second and third virial coefficients at the critical point of liquid-gas phase transition of one-component substance. It is shown that the critical values of pressure, temperature and volume can be defined with good accuracy using relations. The relation between temperature, pressure and second virial coefficient at the critical point is found that gives the values of critical pressure for 17 various substances with accuracy equal to 5%. The values of critical temperature for 17 various substances with accuracy equal to 4% can be obtained using the relation between second and third virial coefficients at the critical point if the experimental (or simulated) temperature dependences of second and third virial coefficients are known. The relations obtained can be used to determine the critical parameters of substances.