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## The calculation of multicomponent mixture phase diagram, using the equations of state of the van der Waals type

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Hydrocarbon mixtures filtration process simulation development has resulted in use of cubic equations of state of the van der Waals type to describe the thermodynamic properties of natural fluids under real thermobaric conditions [1]. Two- and three-component hydrocarbon systems allow to simulate the fluids of different types of reservoirs qualitatively, what makes it possible to carry out the experimental study of their filtration features. Exploitation of gas-condensate reservoirs shows the possibility of existence of various two-phase filtration regimes, including self-oscillatory one, which occurs under certain values of mixture composition, temperature and pressure drop [2]. Plotting of the phase diagram of the model mixture is required to determine these values. A software package to calculate the vapor-liquid equilibrium of multicomponent systems using cubic equation of state of the van der Waals type has been created. Phase diagrams of gas-condensate model mixtures have been calculated.

1. Brusilovsky A. I. Phase transitions in the development of oil and gas reservoirs // Moscow: “Graal”, 2002, p. 575.
2. Kachalov V.V., Maikov I.L., Molchanov D.A., Torchinsky V.M. Gas condensate reservoirs as the oscillating system of oscillator type // Gas Science Chronicle, №2(18), 2014, p. 106–112.

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