Scaling models for describing the thermodynamic properties of liquid and gaseous carbon dioxide in the region of liquid–vapor phase equilibrium

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The study of the properties of substances near the region of liquid–vapor phase equilibrium is of interest to modern science, as it allows one to expand theoretical understanding of the thermodynamics of materials undergoing phase transitions. The obtained information about the numerical values of thermodynamic quantities is used to solve applied problems, as well as in mathematical modeling of physical processes near the saturation line.

This work is devoted to the theoretical description of the thermodynamic properties of carbon dioxide in the region of liquid–vapor phase equilibrium. Various scaling models are considered, based on which the temperature and density of liquid and gaseous carbon dioxide on the binodal are calculated. The obtained model dependences are compared with available experimental data. Based on this, a conclusion is made about the possibilities of using the considered models in hydrodynamic modeling of physical processes in carbon dioxide near the region of liquid–vapor phase equilibrium.

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