Determining the viscosity of the mixture working fluid of high-temperature steam turbine

© A.A. Zhinov, P.A. Milov

Kaluga Branch of Bauman Moscow State Technical University, Kaluga, 248000, Russia

This article examines and compares different methods of determining the viscosity of non-ideal H_2O and CO_2 gas mixtures. The calculations for each method established the insignificant differences between them. The impact of the mixture temperature on its viscosity is significantly more important than choosing the method which affects the result in the considered range of concentrations.

Keywords: viscosity, working fluid, high-temperature turbine, gas mixture, determination of properties.

REFERENCES

- [1] Graham T. On the Motion of Gases. Phil. Trans., vol. 136, 1846, pp. 573-631.
- [2] Wilke C. Viscosity Equation for Gas Mixtures. *J. Chem. Phys.*, vol. 18, 1950, pp. 517–519.
- [3] Herning E., Zipperer L. Calculation of the Viscosity of Technical Gas Mixtures from the Viscosity of the Individual Gases. *Gas und Wasserfach*, vol. 79, 1936, pp. 69–73.
- [4] Davidson T.A. A simple and accurate method for calculating viscosity of gaseous mixtures. Report of investigations, Bureau of Mines, 1993.

Zhinov A.A. (b. 1965) graduated from Kaluga branch of Bauman Moscow Higher Technical School in 1988. Ph.D., Assoc. Professor, head of the Heat Engines and Thermal Physics Department at Kaluga Branch of Bauman Moscow State Technical University. Research interests include turbine construction, heat engineering, fluid mechanics, and mathematical simulation. e-mail: jin@bmstu-kaluga.ru

Milov P.A. (b. 1991) is a student at Kaluga branch of Bauman Moscow State Technical University. Areas of activities and interest include steam turbines, heat engineering, fluid mechanics, mathematical simulation. e-mail: luridpale@mail.ru