

**PROPERTIES OF THERMODYNAMIC SYSTEMS
PARTICIPATING IN THE PROCESS OF OBTAINING
BIODIESEL FUEL IN SUB- AND SUPERCRITICAL FLUID
CONDITIONS**

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The catalytic transesterification of vegetable oils in the environment of supercritical alcohols becomes one of the promising ways of producing biodiesel fuel [1]. The technological processes taking place in the biodiesel production facilities assume a quantitative analysis of the thermal effects of the transesterification process of vegetable oils in the environment of supercritical alcohols. Along with this, for modeling and optimization of technological processes of production of biodiesel fuel in the course of the transesterification reaction carried out under sub- and supercritical conditions, it is necessary to locate the thermodynamic properties of the initial components (especially at pre- and supercritical states of the reacting alcohol component) and reaction products. The thermophysical properties of the main components of the transesterification reaction and reaction products are presented in sufficient detail in the domestic and foreign literature. At the same time, there are no data on the properties of the mixtures of the reaction components and the thermal effects of the transesterification reaction. Extensive studies of thermodynamic properties, carried out at the Department of Theoretical Foundations of Heat Engineering, FSEI HE KNRTU [2-4], allowed to cover the whole chain of the process of obtaining biodiesel fuel in sub- and supercritical fluid conditions (preparation, mixing, reaction and separation). On the basis of this material, it became possible to proceed to the modeling and optimization of the technological process and to go to the design of an industrial biodiesel fuel plant. 1. Gumerov F. M., and others. Supercritical fluids: Theory and practice. 2006. V. 1. Nom.1. P.66-76. 2. Usmanov RA, Gabitov RR, Biktashev Sh.A. Supercritical fluids: Theory and practice. 2011. V.6. Nom.3, P.45-61. 3. Usmanov R. A., Gumerov F. M., Gabitov F. R., Zaripov Z. I., Scshamsetdinov F. N., Abdulgatov I. M. : Liquid Fuels: Types, Properties and Production. Nova Science Publisher, Inc., New York, 2012, Chapter 3, P. 99-146. 4. Gumerov F.M. Biodiesel fuel. Transesterification in supercritical fluid conditions. Monograph.Kazan.Publishing house. Ltd Innovation - publishing house Butlerov Heritage. 2017. 360p.