# MODELING OF FLAMELESS COMBUSTION OF LARGE DROPLETS OF NORMAL AND IZOMERIZED HYDROCARBONS IN MICROGRAVITY CONDITIONS

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**Abstract:** Comparative calculations of combustion of large (2.8 mm) droplets of four liquid octanes — $n$-octane, 2-methylheptane, 2,2-dimethylhexane, and 2,2,4-trimethyl pentane — are performed for microgravity conditions. The temperature histories obtained for droplet combustion were shown to be qualitatively similar to those obtained for self-ignition of homogeneous fuel–air mixtures: the oxidation and combustion rates of fuel droplets also decrease with the degree of branching in the molecule structure in the line from $n$-octane to reference iso-octane (2,2,4-trimethylpentane). This theoretical conclusion corresponds well with the results of space experiment "Zarevo" with droplets of pure $n$-dodecane and iso-dodecane as well as with droplets of $n$-dodecane/iso-dodecane solutions of different composition.

**Keywords:** alkanes; iso-octanes; detailed kinetic mechanism; multistage self-ignition; radiation quenching of droplet flame; flameless combustion of droplet

## Acknowledgments

This work was partly implemented within the project of the Russian Science Foundation (grant 14-13-00082P) and within the space experiment "Zarevo."

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*Received October 23, 2017*

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