

||||| 特集：航空機を利用した微小重力実験 |||||
(解説)

航空機による微小重力環境を利用した高圧液滴燃焼実験

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High-Pressure Droplet-Combustion Experiments in Microgravity Environment on board of Aircraft

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Abstract

The present report briefly introduces recent parabolic flight experiments on high-pressure droplet combustion. Dependence of burning characteristics of single fuel droplets both on ambient pressure and on gravitational acceleration was examined. Ignition delay of 1-octadecanol droplets had a minimum at an ambient pressure near to the critical pressure of the fuel. The ignition delay was not affected by residual reduced gravity. Burning rate constant of methanol droplets increased monotonically with increasing ambient pressure. Residual gravitational acceleration of the order of 10^{-2} G induced an appreciable influence on the burning rate constant. Variation of burning rate constant as $Gr^{1/4}$ was confirmed experimentally by varying gravitational acceleration and ambient pressure.