Combustion Analysis of Suspended Sodium Droplet

Authors : T. Watanabe

Abstract : Combustion analysis of suspended sodium droplet is performed by solving numerically the Navier-Stokes equations and the energy conservation equations. The combustion model consists of the pre-ignition and post-ignition models. The reaction rate for the pre-ignition model is based on the chemical kinetics, while that for the post-ignition model is based on the mass transfer rate of oxygen. The calculated droplet temperature is shown to be in good agreement with the existing experimental data. The temperature field in and around the droplet is obtained as well as the droplet shape variation, and the present numerical model is confirmed to be effective for the combustion analysis.

Keywords : analysis, combustion, droplet, sodium
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