Further Analysis of Structure and Stabilization Mechanism of a Standoff Microjet Methane Diffusion Flame

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Abstract

The structure and stabilization mechanism of a standoff microjet methane diffusion flame are investigated numerically using multi-component transport model coupled with GRIMech 3.0 chemical kinetic mechanisms. Results indicate that the HO2 reactions at relatively low temperatures play an important role in forming the hot zone near the tube wall. The heat release of the hot zone then provides heat for sustaining and enhancing further H2-O2 chain reactions and CH3 formation and oxidation, which results in the formation of the reaction kernel responsible for flame stabilization. Comparison of the present results with those reported for the 0g flame is also made to investigate the similarities and differences between both flames.

Keyword：Structure and Stabilization Mechanism; Microjet Methane Diffusion Flame