

Further analysis of chemical kinetic structure of a standoff microjet
methane diffusion flame near extinction

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Abstract

Numerical results of a standoff microjet methane diffusion flame are further analysed to elucidate the characteristic chemical structure of the flame near the extinction limit. Computed results indicate that the standoff behaviour of the microjet diffusion flame is a consequence of flame quenching on the tube wall, followed by the sequence of accelerating fuel pyrolysis by heat conduction through the tube wall, producing intermediate radicals, initiating further reaction on the H₂O₂ path near the tube wall, creating a hot zone in the quenching gap region, and finally forming a reaction kernel to hold the flame.

Keyword : Chemical kinetic structure; Microjet flame