Structure of Microjet Methane Diffusion Flames

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Abstract

The flame shape, flame length, and quenching limit of microjet methane diffusion flames operated at fuel exit velocity ranging from just above quenching to below blowoff for tube diameters varying from 186 to 778 m are investigated. Comparisons of the measured flame heights, flame shapes, and quenching velocities with theoretical predictions indicate that a simple jet flame model can not properly predict the characteristics of microjet methane flames. However, with modification of the model, the predictions are in good agreement with the measured data. Comparisons of predicted quenching velocity with measured results indicate that quenching occurs when the flame length equals the standoff distance. It is also found that the quenching curve follows Re X d = const.

Keyword：Microjet flame; Falme structure