Measurement of Local Equivalence ratio in Partially Premixed Swirling Methane Flame Using Local Chemiluminescence

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Abstract

Spatially resolved measurements of flame emission spectra using two Cassegrain mirrors and two spectrometers are performed and used to obtain the correlation of the intensity ratio of OH*/CH* and C2*/OH* to the equivalence ratio in laminar flames over an equivalence ratio range of 0.8-1.4. The calibration curves are then applied to measure the local equivalence ratio in a partially premixed swirling flame. Experimental results indicate that this non-laser based chemiluminescence technique can only be applied to determine the local flame stoichiometry in the reaction zone of partially premixed swirling methane flames.

Keyword：Chemiluminescence measurement; Local equivalence ratio; Partially premixed flames