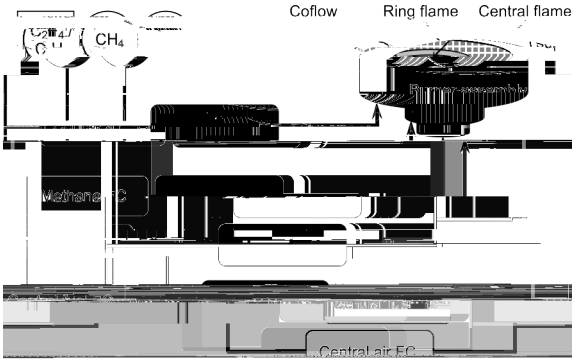
ISF2 Target Flame 2:

Laminar Premixed Pressurized



Apparatus

The central, sooting flame (ethylene/air) was stabilized above a water-cooled sintered bronze matrix. This flame is surrounded by a non-sooting "shielding flame" of methane/air (varying ϕ). The flames were surrounded by an air coflow. The diameters of the central matrix, shielding matrix, and coflow duct were 41.3 mm, 61.3 mm, and 150 mm, respectively.

Measurements

Quantitative soot volume fraction measurements were obtained using laser-induced incandescence coupled with a quasi-simultaneous absorption measurement for calibration. The ments in sooting and non-sooting environments.

Conditions

Pressure: 3 bar

ϕ =2.3 (C/O=0.766) – Fuel: 13.82 % - O

$_2$: 18.10 % - N_2: 68.08 % - 12.381 nlm (ref. 0°C, 1013.25 mbar)

=2.05 (C/O=0.683) – Fuel: 12.54 % - O

$_2$: 18.37 % - N_2: 69.09 % - 15.219 nlm (ref. 0°C, 1013.25 mbar)

o Temperature profile o Soot volume fraction

ϕ =2.4 (C/O=0.8) – Fuel: 14.37 % - O_2: 17.98 % - N_2: 67.65 % - 15.263 nlm (ref. 0°C, 1013.25 mbar)

o Temperature profile o Soot volume fraction

Notes

The shielding flame acts as a pilot flame and reduces heat losses by conduction and radiation.

The cold gas velocities listed in the references are at 273K.

This set of flames links to the session "laminar flames" listing atmospheric flames

References

M.S. Tsurikov, K.P. Geigle, V. Krüger, Y. Schneider-Kühnle, W. Stricker, R. Lückerath, R. Hadef, M. Aigner, Comb. Sci. Technol. 177 (2005) 1835-1862.