NUMERICAL SIMULATION OF NON-PREMIRED SWIRLING FLAMES

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Abstract

Low swirling injectors do not promote the fluid to turn over near the centre of the chamber, resulting larger mixing and reaction zones with weak gradients of temperature and species' mass fractions. Whereas, high swirl burners promote the formation of an inner recirculation zone with hot products of reaction. The lead stagnation point of the IRZ plays an important role fixing the location of the flame front in swirling burners. At constant stoichiometry, high swirl burners promote thinner flame fronts, higher equilibrium temperature and higher nitrogen monoxide emissions than those of low swirl burners. These aspects offer a chance of using lean mixtures with the corresponding reduction of methane consume and NOx emissions.

REFERENCES:
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