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ON THE NOx EMISSION LEVELS OF AN ASYMMETRIC VORTEX FLAME COMBUSTOR

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Abstract

The vortex flame concept of combustion has been well known to produce low levels of NOx. This feature qualifies it to be used in industrial processes and in power generation to comply with the environmental regulations concerning nitrogen oxide emissions. An asymmetric vortex flame combustor has been recently proposed by the authors. The present article reports the levels of NOx emissions of such combustor for the first time. An experimental platform designed and developed to examine the NOx levels of the exhaust gases for a range of equivalence ratios and Reynolds number. The results show that the NOx levels are affected by the variation of the equivalence ratio more significantly than it is affected by the Reynolds number. The trend of NOx levels are close to the substantially reduced levels predicted in previous researches. Statistical regression was used to formulate an empirical correlation to allow prediction of the NOx emissions as a function of the equivalence ratio and Reynolds number.

Key words: exhaust gas analysis, NOx, pollutant emissions, vortex flame

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