

Abstract

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On the NO_x Emission Levels of an Asymmetric Vortex Flame Combustor

The vortex flame concept of combustion has been well known to produce low levels of NO_x. This feature qualifies it to be used in industrial processes & 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 NO_x emissions of such combustor for the first time. An experimental platform designed & developed to examine the NO_x levels of the exhaust gases for a range of equivalence ratios & Reynolds number. The results show that the NO_x levels are affected by the variation of the equivalence ratio more significantly than it is affected by the Reynolds number. The trend of NO_x 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 NO_x emissions as a function of the equivalence ratio & Reynolds number.