

A Numerical Study on the Influence of CO₂ Dilution on Combustion Characteristics of a Turbulent Diffusion Flame

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Abstract : The objective of the present study is to numerically investigate the effect of CO₂ replacement of N₂ in air stream on the flame characteristics of the CH₄ turbulent diffusion flame. The Open source Field Operation and Manipulation (OpenFOAM) has been used as the computational tool. In this regard, laminar flamelet and modified k- ϵ models have been utilized as combustion and turbulence models, respectively. Results reveal that the presence of CO₂ in air stream changes the flame shape and maximum flame temperature. Also, CO₂ dilution causes an increment in CO mass fraction.

Keywords : CH₄ diffusion flame, CO₂ dilution, OpenFOAM, turbulent flame

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