



Combustion Characteristics of C₃H₈/C₄H₁₀ Flames affected by Air Flow Bluff Body on Non-Premixed Slot Burner

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Abstract. This study is to investigate the C₃H₈/C₄H₁₀ combustion flames with variation of air flow bluff body on non-premixed slot burner. The C₃H₈ and C₄H₁₀ were applied in this study as the main composition of liquefied petroleum gas (LPG). In order to apply C₃H₈ and C₄H₁₀ combustion with safety, the IDF slot burner with two fuel exit and one air exit were selected to investigate with non-premixed combustion. This study focused on the effects of air flow bluff body shape (cylinder, spiral and droplet shape) with variation of equivalence ratios and firing rates for combustion characteristics such as flame structure, flame temperature and emission. The results showed that the highest premixed flame ratio and the lowest CO were obtained from spiral shape of air flow bluff body. Moreover, the flame characteristics of spiral shape were wider compared to the cylinder and droplet shapes of air flow bluff body. This study could be applicable to smartly design for LPG combustion on non-premixed burner.

Keywords: Slot burner; Air flow bluff body; C₃H₈/C₄H₁₀; Spiral shape; Cylinder shape; Droplet shape; Non-premixed combustion.