

An Experimental Study on the Measurement of Fuel to Air Ratio Using Flame Chemiluminescence

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Abstract : This study is aiming at establishing the relationship between the optical signal of flame and an equivalent ratio of flame. In this experiment, flame optical signal in a furnace is measured using photodiode. The combustion system which is composed of metal fiber burner and vertical furnace and flame chemiluminescence is measured at various experimental conditions. In this study, the flame chemiluminescence of laminar premixed flame is measured by using commercially available photodiode. It is experimentally investigated the relationship between equivalent ratio and photodiode signal. In addition, The strategy of combustion control method is proposed by using the optical signal and fuel pressure. The results showed that certain relationship between optical data of photodiode and equivalence ratio exists and this leads to the successful application of this system for instantaneous measurement of equivalence ratio of the combustion system.

Keywords : flame chemiluminescence, photo diode, equivalence ratio, combustion control

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