

당량비 변동과 와동이 덤프연소기내의 연소 불안정성에 미치는 영향

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Effect of Equivalence Ratio Fluctuations and Vortex Structure on the Instability of Turbulent Combustion in a Dump Combustor

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Key Words: Combustion Instability(연소불안정성), Equivalence Ratio Fluctuation(당량비변동)

Abstract : The combustion instability of turbulent flames, together with the emission of combustion products, is the most important problem of the gas turbine combustor. Thus improved understanding of mechanisms of combustion instability is necessary for the design and operation of gas turbine combustors. In this study, we investigated the cause of the combustion instability in a rearward-step dump combustor with respect to the fuel flow modulation choked fuel flow, unchoked fuel flow and fully premixed mixture flow. We observed various types of combustion instabilities with respect to the variation of equivalence ratio, fuel flow conditions and fuel injection location. We found that the pressure fluctuation of turbulent combustion in a dump combustor is highly related to the vortex structure and the equivalence ratio fluctuations due to fuel flow modulation and unmixedness of the fuel and air.

평활관 내 R32/290 등온비등 혼합냉매의 증발열전달 특성에 관한 실험적 연구

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Experimental Studies on the Evaporative Heat Transfer of R32/290 Azeotropic Mixture in a Horizontal Smooth Tube

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Key Words: heat transfer coefficients(열전달계수), evaporation(증발), azeotropic mixtures(등온비등 혼합냉매), smooth tube(평활관), pressure drop(압력강하)

Abstract : Due to environmental problems caused by CFC, HCFC or HFC refrigerants, new alternative refrigerants has gained a great attention. This paper presents the measured heat transfer coefficients and pressure drop during evaporation process of R32/290 azeotropic mixture in a horizontal smooth tube. A smooth tube with outer diameter of 5 mm and length of 5 m was selected as test section. The tests were conducted at mass fluxes from 497 to 994 kg/m²s, heat fluxes from 12 to 20 kW/m² and outlet temperature from -5 to 5°C. The differences of heat transfer characteristics among pure R32, R290 and R32/290 azeotropic mixture were analysed.