Combustion characteristics of radiant tube burner applying perforated combustion tube for the recirculation of combustion gas

조길원*
포항산업과학연구원
(kwcho@rist.re.kr*)

This study has been carried out to develop a low NOx radiant tube burner enabling high performance combustion. Full-scale combustion experiments have been performed using an experimental furnace equipped with a W-shaped radiant tube. Temperature distribution on the radiant tube and NOx emission were measured as key performance indices in the experiments. Three types of combustion tube incorporating air staging and biased nozzle were examined with varying primary air fraction and internal recirculation ratio.
Temperature uniformity and low NOx performance were greatly enhanced by applying internal recirculation of combustion gas. It was shown that a combustion tube having radial openings to mix the combustion gas and the secondary air to a certain extent could suppress the NOx emission. With the developed burner, NOx emission of less than 120 ppm, more than 20% reduction compared with conventional low NOx burners, has been accomplished at the furnace temperature of 950℃ using coke oven gas as fuel.