

Development of a dual fuel burner for firing COG and BNG

조길원*, 조한창
포항산업과학연구원
(kwcho@rist.re.kr*)

This study has been carried out to develop a new burner capable of firing COG (coke oven gas) and BNG (mixture of blast furnace gas and natural gas) exclusively. Full-scale combustion tests have been performed for various types of burners using appropriate experimental apparatus. Injecting fuel into radial direction resulted in the improvement of flame stability in case of BNG combustion, however, caused overheating of burner tile in case of COG combustion due to the large difference in flame speed. A multi-hole fuel nozzle, alternately arranged with large and small holes, showed acceptable flame stability. A burner tile designed to supply combustion air in three stages, characterized with split injection of the secondary air, showed to meet the requirements of COG-BNG burner. Optimization tests were carried out to determine the air fractions as 15%, 35% and 50% for the primary, sub-secondary and main-secondary air, respectively. The developed burner showed good flame stability and uniform temperature distribution in the furnace. No emission of carbon monoxide was observed at the air ratio of 1.1. NO_x emission of less than 110 ppm for COG combustion was accomplished at the furnace temperature of 1,300°C.