

브라운가스의 특성에 대한 실험적 연구
김창희, 오규형*, 강경수, 박주식, 배기광, 김종원
한국에너지기술연구원, *호서대학교

Experimental Study on the Characteristics of Brown Gas

Chang-Hee Kim, Kyu-Hyung Oh*, Kyung-Soo Kang, Chu-Sik Park,

Ki-Kwang Bae, and Jong-Won Kim

Korea Institute of Energy Research, *Hoseo University

Abstract

The characteristics of Brown gas was experimentally studied in view of efficiency and flame propagation. For this study, the Brown gas stack with 7 cells was manufactured following the Brown gas related patents and reports. All measuring equipments were re-tested and calibrated by Korea Laboratory Accreditation Scheme (KOLAS) certified laboratories. Since the amount of produced gas is most crucial in determining the efficiency, we adopted two gas collecting methods such as bottle trap method and wet gas meter method. The energy efficiency of our own fabricated stack was measured to be 75 %, which is comparable to general alkaline water electrolysis efficiency. In order to analyze the flame propagation characteristics of Brown gas, we measured the flame propagation pressure, velocity, and shape by using strain type pressure sensor, optical sensor, and high speed camera in conjunction with Schlieren system, respectively. From the experimental results, it was found that the flame propagation behavior of Brown gas was almost the same as that of hydrogen and oxygen mixture gas in 2:1 molar ratio. Moreover, from the high speed camera analysis, we concluded that the Brown gas flame exhibits explosion behavior as does mixture gas ($H_2:O_2=2:1$).

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