

A study on the methanol steam reforming in micro-channels reactor

정현도*, 김권일, 김동식, 전봉주¹
한국에너지기술연구원; ¹충북대학교 공업화학과
(hdjung@kier.re.kr*)

Hydrogen production from methanol by steam reforming has been studied on a series of Cu/Zn based catalysts in a micro-channels reactor. Effects of catalysts preparation method, composition and undercoating buffer layer in micro channels wall for the adhesion between catalysts powder and the substrate structure have been studied. The catalyst containing 18.75 mole% ZrO_2 in Cu/ZnO/ ZrO_2 / Al_2O_3 catalyst was investigated activity with methanol conversion of 92% and outlet CO concentration of 0.108 mol% at 260°C reaction temperature. A micro-channels sheet had four holes for flow path and 34 parallel channels of a rectangular shape on it and the micro channels were 300 μm wide, 200 μm in deep and 20 mm long. Undercoating alumina as a buffer layer in micro channels wall have been improved conversion of methanol in micro-channels reactor compared to non-buffer layer in micro channels wall. It is shown that alumina as a buffer layer in micro channels wall has been improved adhesion between catalyst powder and channels wall so catalyst on the micro channels wall exhibited higher activity performance and stability as compared to non-buffer layer in micro channels wall.