

## Steam reforming and oxidative steam reforming of methanol over CuO–CeO<sub>2</sub> catalysts

P.P.C. Udani, P.V.D.S. Gunawardana, 김동현\*

경북대학교 화학공학과

(dhkim@knu.ac.kr\*)

Steam reforming (SRM) and oxidative steam reforming of methanol (OSRM) were carried out over a series of co-precipitated CuO–CeO<sub>2</sub> catalysts with varying copper/ceria atomic ratio in the range of 30–80 at.% Cu (=100\*Cu/(Cu+Ce)). The effects of copper content, reaction temperature and O<sub>2</sub> addition on catalytic activity were investigated. All the catalysts were characterized by using H<sub>2</sub>-TPR and N<sub>2</sub> physisorption. It was found that BET surface areas of CuO–CeO<sub>2</sub> catalysts decreased with increasing copper content and H<sub>2</sub>-TPR results showed that both peak area and the temperature of the peak maximum increased considerably with increasing copper content. The activity of CuO–CeO<sub>2</sub> catalysts for the steam reforming and oxidative steam reforming of methanol increased with the copper content. Among the catalysts studied, 70 at.% CuO–CeO<sub>2</sub> catalyst showed the highest activity in the temperature range of 150–300 °C for both SRM and OSRM. It was observed that the reaction rate of SRM increased considerably with the addition of O<sub>2</sub> into the feed stream.