Performance of Ce-promoted Ni/Al_2O_3 Catalysts for the Combined Steam and Carbon Dioxide Reforming of Methane

구기영, 노현석[1], 서동주, 정운호, 서용석, 윤왕래*, 박승빈[2]
한국에너지기술연구원; [1]연세대학교; [2]KAIST
(wlyoon@kier.re.kr*)

Supported Ni catalysts were promoted with cerium oxide for the combined steam and carbon dioxide reforming of methane (CSCRM). Cerium oxide has a dominant ability to supply the active oxygen species which suppresses coke formation by oxidizing surface carbon on the catalyst. Ce-promoted Ni/Al_2O_3 catalysts with various Ce content have been prepared by using co-impregnation method and characterized by XRD, BET and H_2-TPR. The reaction was performed with the ratio of $(H_2O+CO_2)/CH_4$ of 1.2 from 750 °C to 650 °C. Coke formation in used catalysts was examined by SEM. It has been found that catalytic activity and stability depends on the Ce content over Ni/Al_2O_3 catalyst and the optimum Ce content is 6wt%, resulting from the highest activity as well as high coke resistance.