

Hydrogen production by steam reforming of methane over Ni/ceria-zirconia : Effect of Ce/Zr content.

김상윤, Nguyen Phu Huy, 왕명연, Lien Do-Thi, 신은우[†]

울산대학교

(ewshin@ulsan.ac.kr[†])

Steam reforming of methane (SRM) is the most common and mature method for hydrogen production. Ni/ceria-zirconia (CZ) catalysts have been studied for this reaction due to the nature to make mobile oxygen species and high reducibility of Ce-ZrO₂. In addition, the interaction between the support and the nickel also has a significant impact on the activity and selectivity. In order to further understand the roles of mixed-oxide supports in the SRM, Ni/CZ catalysts with different Ce/Zr composition of support were investigated. A series of Ce-rich and Zr-rich CZ support were prepared by the citrate complex method by adjusting the Ce/Zr ratio in a range of 0.067–15. The characterizations such as surface area, reduction temperature and basicity of prepared catalysts were analyzed by BET, XRD, TPR and TPD-H₂. Among the catalysts with various CZ support loading values, Ce-rich catalyst (Ce/Zr=15) exhibited the highest TPR and TPD values.