

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

김상윤, 왕명연, Dao Duc Quang<sup>1</sup>, Nguyen Phu Huy<sup>2</sup>, 신은우<sup>†</sup>

울산대학교; <sup>1</sup>University of Ulsan; <sup>2</sup>University of ulsan

(ewshin@ulsan.ac.kr<sup>†</sup>)

Increase of worldwide demand on renewable energy and environmental concern are the major issues of today. Hydrogen is a one of very promising alternative energy with the highest energy density. Ethanol steam reforming(ESR) is the most renewable method for hydrogen production with CO<sub>2</sub> neutral. Ni/ceria-zirconia (CZ) catalysts have been studied for this reaction due to the nature to make mobile oxygen species and high reducibility of CZ. 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 ESR, Ni/CZ catalysts with different Ce/Zr composition of support were investigated and compared with the supports. Each 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 and 15. The characterizations such as surface area, reduction temperature and basicity of prepared catalysts were analyzed by BET, Raman, XRD, TPR and XPS. Among the catalysts, Ce-rich catalyst exhibited high oxygen mobility according to high oxygen vacancies and it influence to highest production of hydrogen.