

## Study on the catalytic performance of propane steam reforming with $\text{La}_{1-x}\text{Sr}_x\text{Cr}_{1-y}\text{M}_y\text{O}_{3-\delta}$ (M = Ni, Fe)

손정민\*, 김재로<sup>1</sup>

전북대학교; <sup>1</sup>회성축매

(jmsohn@chonbuk.ac.kr\*)

$\text{La}_{1-x}\text{Sr}_x\text{Cr}_{1-y}\text{M}_y\text{O}_{3-\delta}$  (M = Ni, Fe) catalysts were synthesized by the sol-gel method. The catalysts were characterized by XRD, SEM, BET and TEM. The performance of catalytic activity in steam reforming of propane at temperature range 600 ~ 800°C was investigated. The conductivity was measured by the four terminal d.c method in air, 5% H<sub>2</sub>/N<sub>2</sub> and 5% C<sub>3</sub>H<sub>8</sub>/N<sub>2</sub>.

The reaction results were obtained using  $\text{La}_{1-x}\text{Sr}_x\text{Cr}_{1-y}\text{M}_y\text{O}_{3-\delta}$  (M = Ni, Fe) catalysts under S/C=1.7 and S/C=1 reaction conditions, respectively. In both cases, propane conversion increased with an increase in the amount of added Sr until x=0.3 in the A-site and Ni and Fe until y=0.5 in the B-site. A similar trend was observed for hydrogen yield. Consequently,  $\text{La}_{0.7}\text{Sr}_{0.3}\text{Cr}_{0.5}\text{Ni}_{0.5}\text{O}_3$  catalyst exhibited the best performance under Ni-substitution of which propane conversion was 100 % and hydrogen yield was 95.9 % at 800°C in the S/C=1.7 condition. The  $\text{La}_{0.7}\text{Sr}_{0.3}\text{Cr}_{0.5}\text{Fe}_{0.5}\text{O}_3$  catalyst exhibited the best performance under Fe-substitution of which propane conversion was 99.6 % and hydrogen yield was 81.8 % at 800°C in the S/C=1.7 condition.