

### Studies on Steam CO<sub>2</sub> Reforming of Methane over High surface perovskite catalysts for GTL-FPSO application

양은혜<sup>1,2</sup>, 박미경<sup>2</sup>, 이윤주<sup>2</sup>, 김상우<sup>2</sup>, 안병성<sup>2</sup>, 문동주<sup>2,\*</sup>

<sup>1</sup>UST; <sup>2</sup>KIST

(djmoon@kist.re.kr\*)

Steam CO<sub>2</sub> reforming of methane (SCR) is a promising way to produce synthesis gas which can be a feedstock for GTL-FPSO process. Perovskite(LaFeO<sub>3</sub>) support with high surface area were prepared by modified hard template EDTA method and Ni was impregnated on the perovskite. The prepared perovskite type catalysts were characterized by various techniques such as N<sub>2</sub> physisorption, CO chemisorption, TPR, XRD, SEM, TEM-EDS and TG analysis. Commercial simulation package was used to estimate the optimum experimental conditions for SCR of methane. The simulation results were compared with the experimental results under the tested conditions.

It was found that the perovskite was prepared by modified hard template EDTA method showed higher catalytic stability and less sintering than that of prepared by pechini method in the SCR of CH<sub>4</sub> at the reaction conditions of 850C, 21 bar and molar ratio of CH<sub>4</sub>:C<sub>2</sub>O:H<sub>2</sub>O = 1 : 0.7 : 1.55. It was found that higher surface area led to well dispersion of Ni particles and it enhanced the catalytic performance.