

### Partial oxidation of n-butane over ceria-promoted nickel-calcium hydroxyapatite catalysts

이상엽, 김기훈, 윤기준\*  
성균관대학교  
(kijyoon@skku.edu\*)

Strong research efforts have been devoted in the past two decades to development of efficient processes for producing hydrogen by the partial oxidation of hydrocarbons. For this purpose, numerous studies on the natural gas(or methane) conversion have been reported. However, studies on partial oxidation of butane are very few although butane is a readily available hydrocarbon in LPG and is expected to exhibit higher reactivity. In this work, Ni-calcium hydroxyapatite, which has recently been reported to show high performance in partial oxidation of methane, was tested for partial oxidation of n-butane. In addition, to improve the performance, a promoter, ceria, was added and the effect was studied. These catalysts were tested in a range from 823 to 1023K. Partial oxidation of n-butane yielded various by-products such as methane, ethylene, ethane, propylene and 1-butene below 973 or 923K. When ceria was added, the by-products were decreased and the hydrogen yield was increased. It is observed that ceria played a role that enhances the activity and changes the selectivity.