



# Academic Lecture



State Key Laboratory  
of Chemical Resource Engineering

## Applications of Ordered Mesoporous Metal Oxides for Efficient Syngas Conversion

**报告人:** Prof. Jong Wook Bae (Sungkyunkwan University)

**时间:** 2019-10-22 (周二) 上午 9:00-10:00

**地点:** 化学工程楼A203会议室



### 报告简介:

The ordered mesoporous bimetal oxides such as  $\text{Co}_3\text{O}_4\text{-Al}_2\text{O}_3$  (or  $\text{Co}_3\text{O}_4\text{-ZrO}_2$ ) and bifunctional ZnO-modified  $\text{CuO-Al}_2\text{O}_3$ , prepared by nanocasting methods by using a hard template of mesoporous KIT-6 [1-3], were investigated for  $\text{CO}_x$  hydrogenation to clean fuels such as hydrocarbons and dimethyl ether (DME). The enhanced structural stability and catalytic activity for typical hydrogenations such as Fischer-Tropsch synthesis (FTS) reaction and direct DME synthesis by  $\text{CO}_x$  hydrogenation were mainly attributed to the largely exposed active surface areas. The highly ordered mesoporous structures were robustly preserved even after the reductive  $\text{CO}_x$  hydrogenation conditions without significant structural collapses and aggregations of active metal crystallites through the formations of strongly interacted metal particles [4,5]. Those stable preservations of the original mesoporous structures were mainly responsible for the enhanced catalytic stability due to the newly formed and strongly interacted spinel-type solid solutions.

### References:

- [1] A.Y. Khodakov, W. Chu, P. Fongarland, *Chem. Rev.* 107 (2007) 1692
- [2] C.I. Ahn, H.M. Koo, J.M. Jo, H.S. Roh, J.B. Lee, Y.J. Lee, E.J. Jang, J.W. Bae, *Appl. Catal. B* 180 (2016) 139.
- [3] J.M. Cho, S.R. Lee, J. Sun, N. Tsubaki, E.J. Jang, J.W. Bae, *ACS Catal.* 7 (2017) 5955.
- [4] H. Ham, S. Baek, C.H. Shin, J.W. Bae, *ACS Catal.* 9 (2019) 679.
- [5] S. Kasipandi, J.W. Bae, *Adv. Mater.* (2019) 1803390.

### 报告人简介:

Prof. Jong Wook Bae got a Ph.D. degree in Chemical Engineering Department of POSTECH, South Korea. He is now working as an associate Professor in School of Chemical Engineering of Sungkyunkwan University (SKKU) from 2011. Before joining the SKKU, he worked in LG Chem. and Korean Research Institute of Chemical Technology (KRICT), South Korea. His recent research topics are syngas conversions to value-added chemicals such as hydrocarbons (Fischer-Tropsch synthesis), dimethyl ether, acetates and aromatics by  $\text{CO}_x$  hydrogenation reaction using the ordered mesoporous metal oxides and bifunctional heterogeneous catalysts. He published more than 140 SCI(E) papers such as *ACS Catalysis*, *Advanced Materials*, *Applied Catalysis B* and so on from 2011.

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