

# **One-pot synthesis of copper-containing mesoporous silica nanoparticles for selective propene oxidation to acrolein**

**Nien-Chu Lai, Chun-Hsia Liu, Chia-Min Yang\***

Department of Chemistry, National Tsing Hua University, Hsinchu 30013, Taiwan

\*Email: cmyang@mx.nthu.edu.tw

NSC Project No. : NSC101-2628-M-007-001-MY2

Supported copper catalysts have been widely used as redox catalysts. One of the important reactions that could be catalyzed by copper is selective propene oxidation with molecular oxygen to propylene oxide or acrolein, both of which are valuable intermediates in chemical industry. Catalysts with small copper particles are often prepared by methods such as deposition-precipitation and microemulsion on silica or other supports, but it remains challenging to prevent possible agglomeration/sintering of copper species. In this report, we prepared copper-containing MCM-41-type mesoporous silica nanoparticles (Cu-MSN) by pH-jump method. The surfactant molecules were removed by solvent extraction and/or calcination, and the resulting catalysts contained highly dispersed copper species on silica. The catalysts exhibited excellent catalytic activities for selective propene oxidation and, compared to the best silica-supported copper catalyst ever reported, they showed high propene conversion and high acrolein yield at relatively low temperatures of 180-260 °C.

Keywords: mesoporous material, copper catalyst, selective propene oxidation

報告型式：☐口頭    ☒海報    ☐皆可

是否參加學生壁報論文競賽：☐是    ☒否

(註：參加口頭報告者亦可參加學生壁報論文競賽，但須準備海報、全文及簡報等相關資料，依學生壁報論文競賽獎評選辦法中所規定之方式辦理。)