# Structural effects of mesoporous silica on the heterogeneous enantioselective hydrogenation

김정명, 송병주, 윤용주†
포항공과대학교
(yjyun@postech.ac.kr†)

Enantioselective catalysis is an important chemical process in pharmaceutical, agrochemical and cosmetic industries. Heterogeneous enantioselective catalysis is a promising route for the production of enantiopure compounds because of many advantages such as product separation and regeneration over homogeneous catalysis. In this study we investigated the structural effect of silica supports on the asymmetric hydrogenation of ethyl pyruvate on cinchonidine modified $Pt/SiO_2$ catalysts. We used MCM-41, SBA-15 and MCF-17 as model supports. $Pt/SiO_2$ catalysts were prepared via a facile impregnation method. These were characterized by SAXS, XRD, TEM, $N_2$ physisorption and CO chemisorption techniques. The experiments were carried out in a glass reactor under 1 bar hydrogen pressure at room temperature. Under optimized reaction condition, $Pt/SiO_2$ resulted in 70~80% of enantiomeric excesses with preference of (R)-ethyl lactate. As the channel of the mesoporous silica becomes narrower, turnover frequency and enantiomeric excess increase. The experimental data shows that structure of mesoporous silica supports play vital roles in determining the enantioselectivity.