The influence of pore structure of silica supports on heterogeneous enantioselective hydrogenation of ethyl-2-oxo-4-phenylbutyrate

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Supported Pt catalysts, chirally modified with cinchonidine, are highly effective in heterogeneous enantioselective hydrogenation of α-ketoesters. In the liquid-phase catalysis, the diffusion of chiral modifiers and reactants in internal pores of catalysts can affect the catalytic performance. Here, we have investigated the structural effects of mesoporous silica supports on enantioselective hydrogenation of ethyl-2-oxo-4-phenylbutyrate. Different mesoporous silicas such as SBA-15, KIT-6 and MCF were used as supports for Pt catalysts. The supported Pt catalysts were modified with cinchonidine. They exhibited higher *ee* in the order of Pt/MCF > Pt/SBA-15 > Pt/KIT-6. The silica support allowing easy diffusion of reaction components showed higher *ee* and remained the enantioselectivity even at low Pt loading. Enantioselectivity increased with increasing cinchonidine concentration at low concentration region but maximum *ee* was determined by pore structure of the Pt catalysts. These results indicate that the pore structure of silica supports plays a vital role in controlling enantioselectivity.