

Heterogeneous enantioselective hydrogenation over chirally modified Pt/SiO₂

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Homochirality of life on Earth has significant implications in the production of pharmaceutical compounds. Development of effective catalysts for the production of enantiomerically pure compounds could have a huge impact on pharmaceutical industry. Heterogeneous enantioselective catalysts provide significant advantages in applications such as easy separation from products and high reusability. Here, we present catalytic performance of cinchonidine-modified Pt/SiO₂ catalysts for enantioselective hydrogenation of ethyl pyruvate. They were prepared via a facile impregnation of Pt on MCM-41, SBA-15, KIT-6 and MCF. Under 1 bar of hydrogen pressure, the prepared 1 wt% Pt/SiO₂ catalysts show 80~90% of enantiomeric excesses with preference of (R)-ethyl lactate. These are comparable or higher than that obtained from 5 wt% Pt/Al₂O₃, one of the most efficient catalysts for asymmetric hydrogenation of ethyl pyruvate. Moreover, the Pt/SiO₂ catalysts exhibit no significant loss in activity and enantioselectivity for repeated cycles of reaction. These results reveal that Pt/SiO₂ catalysts are promising for enantioselective hydrogenation.