Chemoselective Reduction of \(\alpha,\beta\)-Unsaturated Aldehydes with AuNPore

Significance: Nanoporous gold (AuNPore) catalyzed the 1,2-reduction of \(\alpha,\beta\)-unsaturated aldehydes 1 with triethylsilane. The reduction was carried out in the presence of water and triethylamine to give the corresponding allyl alcohols 2 in 42–78% yield with 82:18 to 100:0 \((2/3)\) chemoselectivity.

Comment: Previously, the authors reported the AuNPore-catalyzed chemoselective reduction of imines with dimethylphenylsilane \((\text{Org. Lett.} \ 2014, \ 16, \ 2558)\). In the reduction of cinnamyl aldehyde, the catalytic activity of AuNPore was superior to that of \(\text{Au}_{20}\text{Ag}_{70}\) alloy, homogeneous \(\text{AuCl(Ph}_3\text{P)}/\text{Bu}_3\text{P}\), and \(\text{AuCl/IPr-HCl}\). ICP-MS analysis showed that no gold content was leached from the catalyst during the reaction.