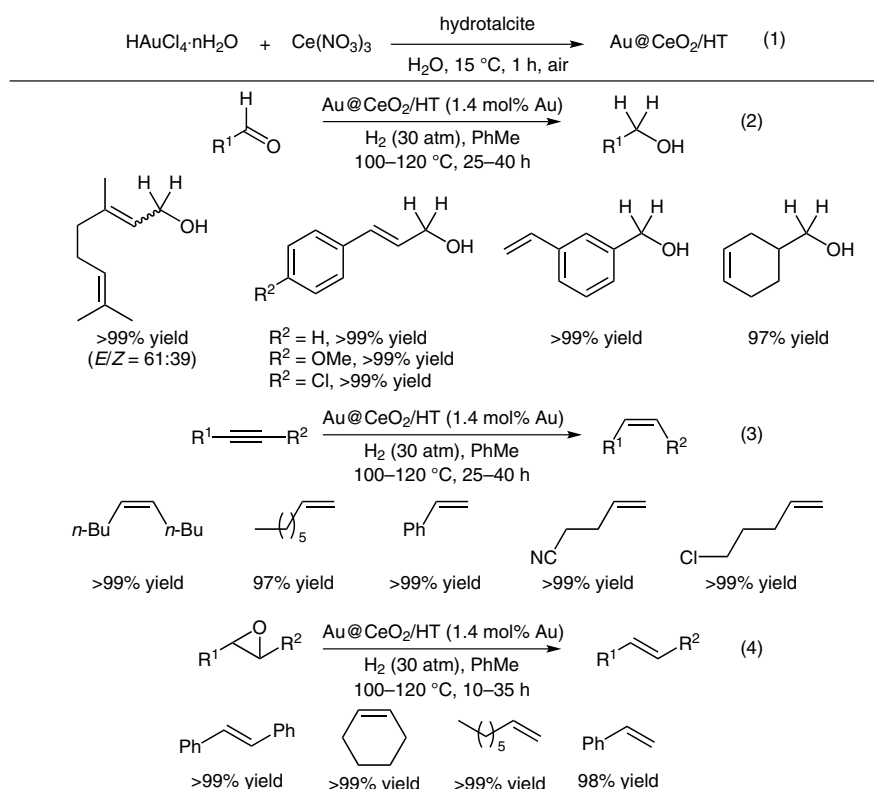


Hydrogenations with Hydrotalcite-Supported Gold–Ceria Nanocomposites



Significance: Cerium oxide coated gold nanoparticles supported on hydrotalcite (Au@CeO/HT) were prepared by mixing HAuCl₄·nH₂O, Ce(NO₃)₃, and hydrotalcite in water (eq. 1). Au@CeO/HT catalyzed the hydrogenation of aldehydes or alkynes under hydrogen to give the corresponding alcohols and alkenes, respectively (eqs. 2 and 3). Au@CeO/HT also promoted the deoxygenation of epoxides to afford the corresponding alkenes (eq. 4).

Comment: Au@CeO/HT were characterized by means of TEM, HAADF-STEM, and EDX analyses. In the hydrogenation of citral, the catalyst was recovered by simple filtration and reused without loss of its catalytic activity (reuse: >99% yield). ICP-AES analysis showed no leaching of gold from the catalyst during the reaction. TEM analysis of the recovered catalyst revealed that the structure of the catalyst was unchanged after the reaction.