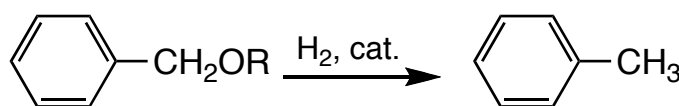
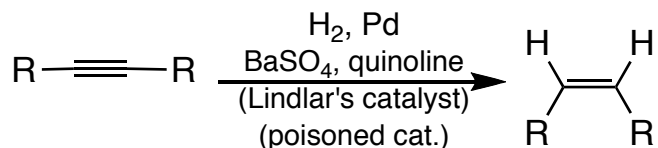
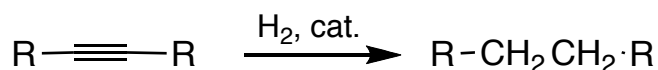
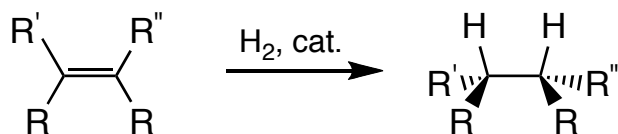


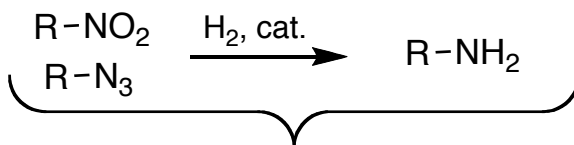
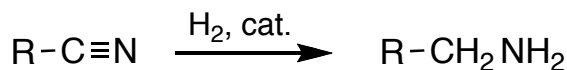
CHM 422 Organic Synthesis, Dr. Laurie S. Starkey

Common Reduction Reactions

catalytic* hydrogenation



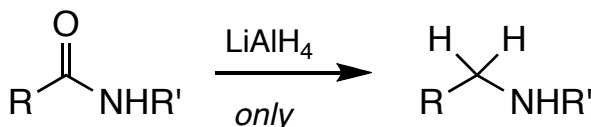
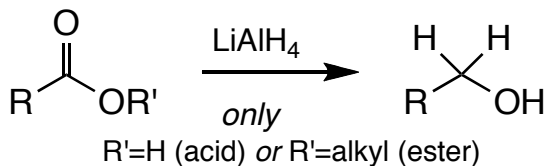
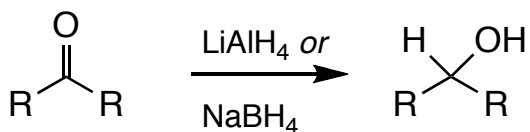
*catalyst = Pd, Pt, Ni or
Ru or Rh organometallic reagents
such as RhCl[PPh₃]₃



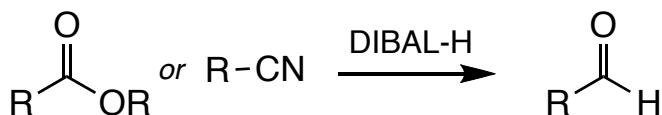
useful reactions for the synthesis of amines

Since the benzylic position is easily reduced, the benzyl group (PhCH₂-) is commonly used to protect alcohols.

hydride reagents

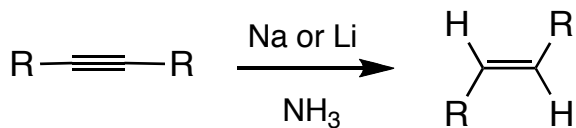


Note: Lithium aluminum hydride (LAH) reductions are always followed by an aqueous workup (H₃O⁺). NaBH₄ is less reactive and can be used with protic solvents (ROH).

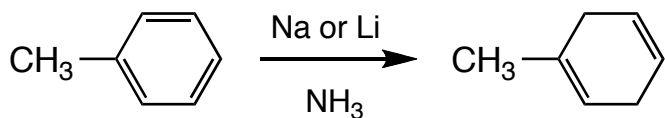


DIBAL-H, diisobutylaluminum hydride, reduces esters and nitriles to aldehydes

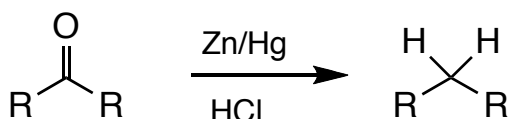
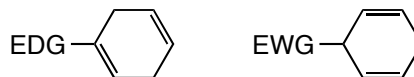
metal reagents



Dissolving metal reduction gives *trans* alkene product.



Birch reduction gives 1,4-diene products.



Clemmensen or Wolff-Kishner (NH₂NH₂, KOH) reduction converts a carbonyl to a methylene. Conversion can also be done by reduction of the dithiane (HSCH₂CH₂CH₂SH; Raney Ni).