Electronic Effect of Ruthenium Nanoparticles on Efficient Reductive Amination of Carbonyl Compounds

Reductive Amination of Carbonyl Compounds on Nb2O5-Supported Ruthenium

**Significance:** Nb2O5-supported ruthenium nanoparticles (Ru/Nb2O5) were prepared by mixing Nb2O5 with an aqueous solution of Ru(NO)(NO3)3, followed by treatment under flowing H2/argon at 673 K (eq. 1). Ru/Nb2O5 promoted the reductive amination of carbonyl compounds 1 with NH3 and H2 to give the corresponding primary amines 3 in ≥98% yield (eq. 2).

**Comment:** Ru/Nb2O5 prevented the formation of secondary amines and undesired hydrogenated byproducts. Ru/Nb2O5 was characterized by means of SEM, STEM, XPS, TPR, XRD and FT-IR analyses. Ru/Nb2O5 was recovered and reused three times without loss of its catalytic activity (2f; first reuse: 99% yield; second reuse: 93%; third reuse: 94%).