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Electronic Effect of Ruthenium Nanoparticles on Efficient Reductive Amination of Carbonyl Compounds
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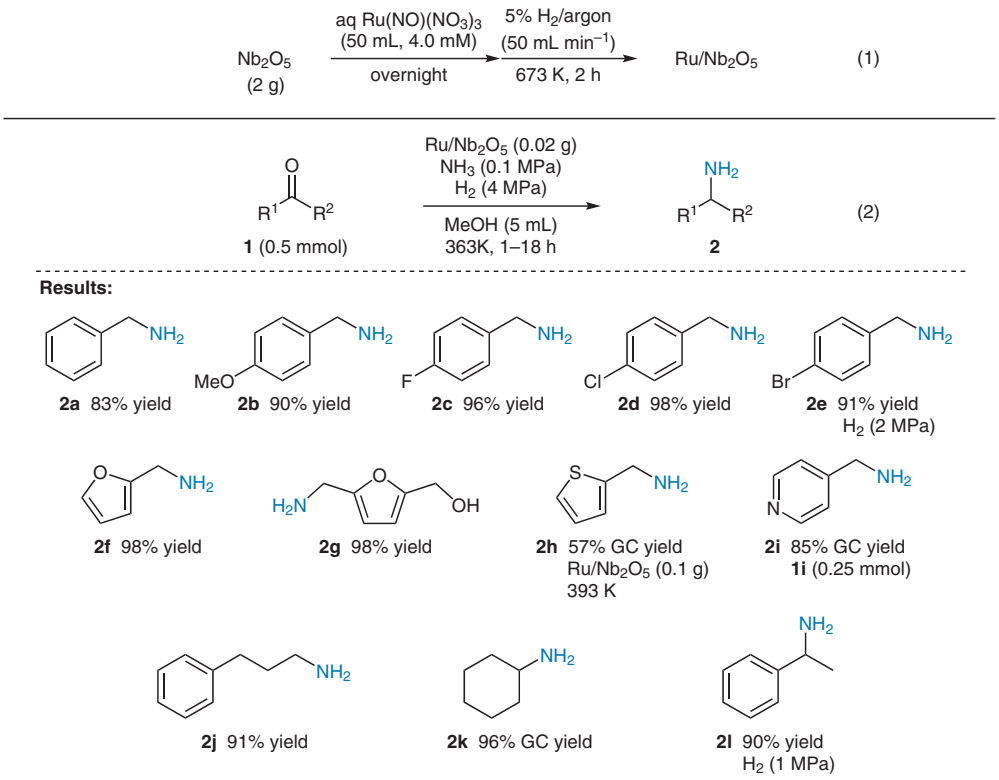
Reductive Amination of Carbonyl Compounds on Nb_2O_5-Supported Ruthenium



Significance: Nb_2O_5-supported ruthenium nanoparticles (Ru/Nb_2O_5) were prepared by mixing Nb_2O_5 with an aqueous solution of $Ru(NO)(NO_3)_3$, followed by treatment under flowing H_2/argon at 673 K (eq. 1). Ru/Nb_2O_5 promoted the reductive amination of carbonyl compounds **1** with NH_3 and H_2 to give the corresponding primary amines **3** in ≤98% yield (eq. 2).

Comment: Ru/Nb_2O_5 prevented the formation of secondary amines and undesired hydrogenated byproducts. Ru/Nb_2O_5 was characterized by means of SEM, STEM, XPS, TPR, XRD and FT-IR analyses. Ru/Nb_2O_5 was recovered and reused three times without loss of its catalytic activity (**2f**; first reuse: 99% yield; second reuse: 93%; third reuse: 94%).

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Category
Polymer-Supported Synthesis

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niobium catalysis
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carbonyl compounds
reduction
amination