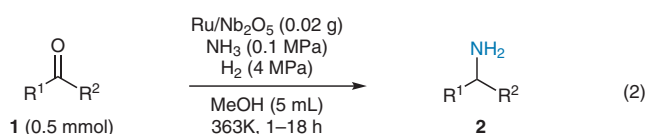
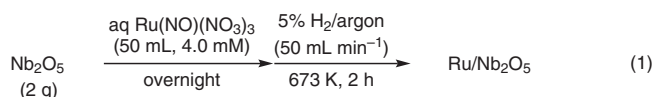


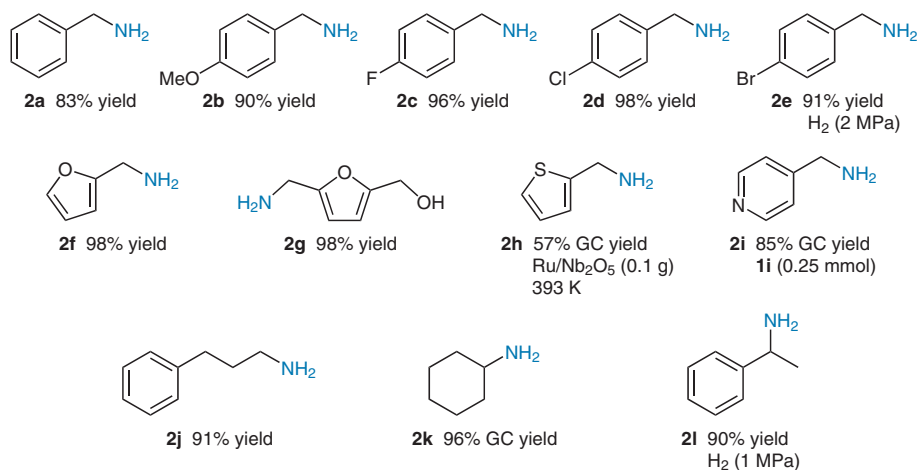
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Electronic Effect of Ruthenium Nanoparticles on Efficient Reductive Amination of Carbonyl Compounds
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Reductive Amination of Carbonyl Compounds on Nb₂O₅-Supported Ruthenium



Results:



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%).

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