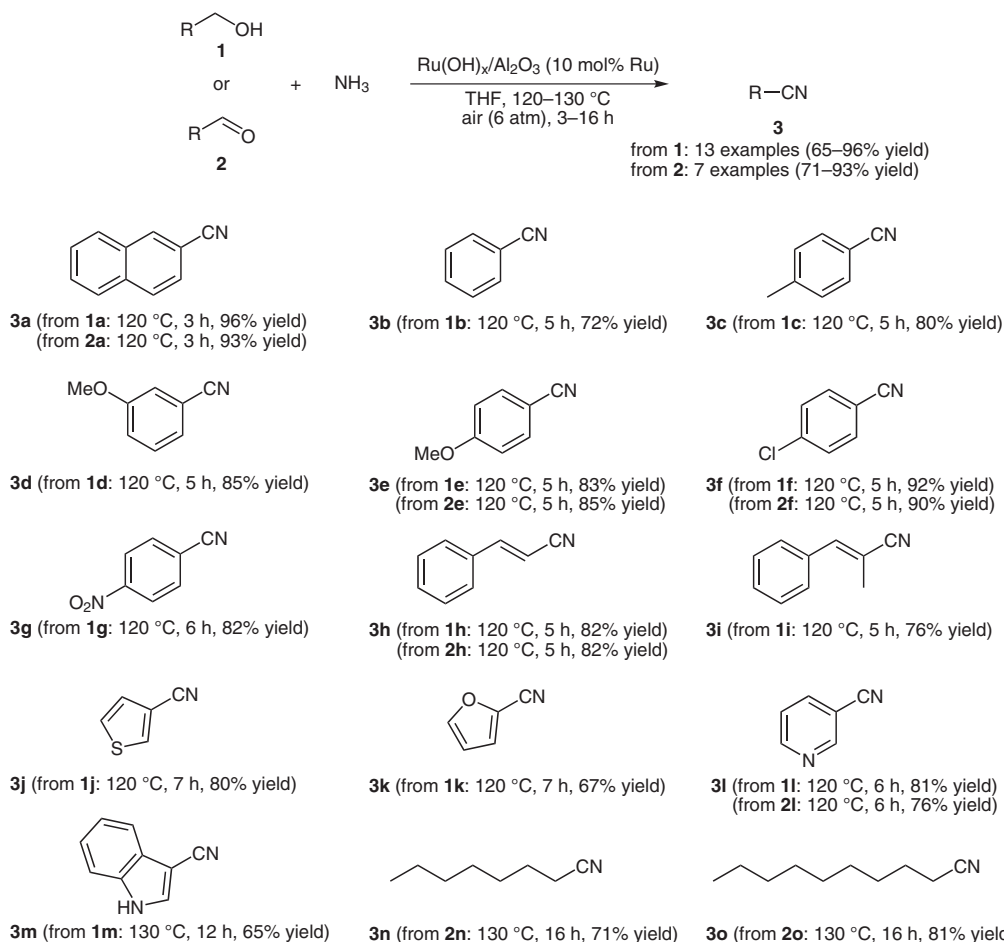


Synthesis of Nitriles from Primary Alcohols and NH_3 with $\text{Ru}(\text{OH})_x/\text{Al}_2\text{O}_3$



Significance: An Al_2O_3 -supported ruthenium hydroxide catalyst ($\text{Ru}(\text{OH})_x/\text{Al}_2\text{O}_3$) promoted the reaction of primary alcohols **1** or aldehydes **2** with ammonia to give the corresponding nitriles **3** in 65–96% yield (from **1**, 13 examples; from **2**, 7 examples). No leaching of ruthenium was observed by ICP-AES analysis after the reaction.

Comment: The authors have previously reported the preparation and characterization of $\text{Ru}(\text{OH})_x/\text{Al}_2\text{O}_3$ and its application to the aerobic oxidative dehydrogenation of alcohols (*Angew. Chem. Int. Ed.* **2002**, *41*, 4538; *Chem. Eur. J.* **2003**, *9*, 4353). The catalytic activity of $\text{Ru}(\text{OH})_x/\text{Al}_2\text{O}_3$ was superior to that of the other supported catalysts for the formation of **3a** from **1a** [$\text{Au}(\text{OH})_x/\text{Al}_2\text{O}_3$: 10%, $\text{Pd}(\text{OH})_x/\text{Al}_2\text{O}_3$: <1%, $\text{Pt}(\text{OH})_x/\text{Al}_2\text{O}_3$: <1%, $\text{Rh}(\text{OH})_x/\text{Al}_2\text{O}_3$: <1%, Ru/C: 22%, RuHAP: 4%].