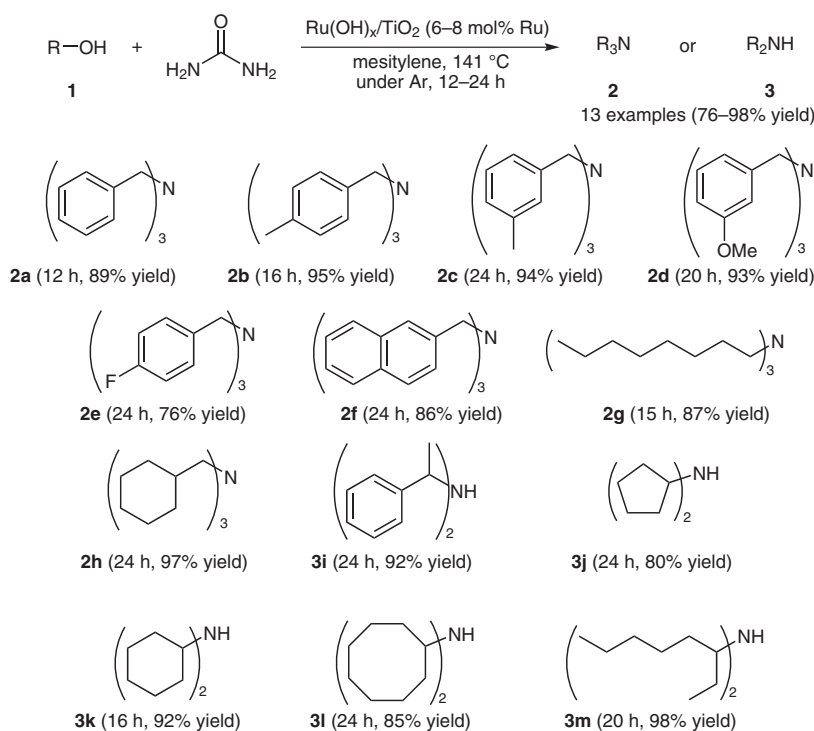


Synthesis of Amines from Alcohols and Urea with $\text{Ru}(\text{OH})_x/\text{TiO}_2$



Significance: TiO_2 -supported ruthenium hydroxide ($\text{Ru}(\text{OH})_x/\text{TiO}_2$) catalyzed the reaction of alcohols **1** with urea in mesitylene under Ar atmosphere to give the corresponding tertiary amines **2** or secondary amines **3** in 76–98% yield (13 examples). The catalyst was recovered by simple filtration and reused without significant loss of catalytic performance for formation of **3k** (reuse: 90% yield). No leaching of ruthenium was observed by ICP-AES analysis after the reaction.

Comment: The authors have previously reported the preparation of $\text{Ru}(\text{OH})_x/\text{TiO}_2$ and its application to the hydrogen transfer reactions (*Chem. Eur. J.* 2008, 14, 11480). The catalytic activity of $\text{Ru}(\text{OH})_x/\text{TiO}_2$ was superior to that of the other supported ruthenium catalysts for the formation of **2a** [$\text{Ru}(\text{OH})_x/\text{Al}_2\text{O}_3$: 47% yield, $\text{RuCl}_x/\text{TiO}_2$: 0% yield, RuHAP: 0% yield, Ru/C: 18% yield].