Diborane, B₂H₆

The reducing characteristics of diborane (disassociated to BH₃ in ether or THF solution) were first introduced as addition reactions to alkenes and alkynes. This remains a primary application of this reagent, but it also effects rapid and complete reduction of carboxylic acids, amides and nitriles. Other than LAH, this reagent provides one of the best methods for reducing carboxylic acids to 1º-alcohols.

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\begin{align*}
\text{(1)} & \quad \text{R–CO}_2\text{H} + \text{BH}_3 & \xrightarrow{\text{ether soln.}} & \text{[RCH}_2\text{O–B]} & \xrightarrow{\text{H}_2\text{O}_2} & \text{RCH}_2\text{–OH} \\
\text{(2)} & \quad \text{R–C≡N} + \text{BH}_3 & \xrightarrow{\text{ether soln.}} & \text{RCH}_2\text{–N–B} & \xrightarrow{\text{H}_2\text{O}} & \text{RCH}_2\text{–NH}_2
\end{align*}
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