Asymmetric Reduction of α-Amino Ketones Catalyzed by Lewis Acids

**Significance:** The authors developed a metal-catalyzed asymmetric reduction of α-amino ketones using KBH₄ as hydride source. Under mild conditions, desired amino alcohols are obtained with high enantioselectivities.

**Comment:** β-Amino alcohols are important structural motifs in natural or pharmaceutical compounds. The authors also presented a gram-scale version of this reaction and its possible transition state.

**Equation:**

\[
\text{R}^1\text{H} + \text{KBH}_4\text{aq} (0.6 \text{ equiv}) + \text{ligand} (8 \text{ mol\%}) + \text{Ni(OTf)}_2 (8 \text{ mol\%}) \\
\text{THF–CH}_2\text{Cl}_2 \ \text{–20 to 0 °C, 24 h}
\]

**Selected examples:**

- **98% yield 88% ee** (with 12 mol% of catalyst)
- **95% yield 92% ee**
- **92% yield 96% ee**
- **90% yield 97% ee**
- **80% yield 85% ee**

**Possible transition state:**

**Key words**

- amino ketones
- reduction
- nickel
- scandium