Cyclization of 1-(Trifluoromethyl)-4-alkyn-1-ones with Arylboronic Acids

**Significance:** Lautens and co-workers report a rhodium-catalyzed cyclization of 1-(trifluoromethyl)-4-alkyn-1-ones with variously substituted arylboronic acids to obtain (trifluoromethyl)cyclobutanols bearing an exocyclic double bond.

**Comment:** The reactivity of the newly formed exocyclic double bond was explored by subjecting a (trifluoromethyl)cyclobutanol to an epoxidation reaction using MCPBA and an ozonolysis.

**Equation:**

\[
[\text{Rh} \text{(cyclooctene)Cl}_2] (2.5 \text{ mol\%}), \text{ligand L} (5.0 \text{ mol\%}), \text{Et}_3\text{N} (1.5 \text{ equiv}) \rightarrow \text{R}^1 \text{CF}_3 \text{OH} \text{Et} \text{R}^2 \text{Et} \text{B(OH)}_2 \text{R}^1 \rightarrow \text{R}^1 \text{CF}_3 \text{OH} \text{Et} \text{R}^2 \text{Et} \text{B(OH)}_2 \text{R}^1
\]

**Selected examples:**

- \( \text{R}^1 = \text{Me}, \text{Et}, \text{Bn} \)
- \( \text{R}^2 = \text{H}, \text{Me}, \text{OH}, \text{OMe}, \text{CO}_2\text{Me}, \text{F}, \text{Cl}, \text{Br}, \text{Ac}, \text{CH}_2\text{OH}, \text{NHBOc}, \text{CHO} \)
- \( \text{coe} = \text{cyclooctene} \)

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**Yields and ee:**

- 41% yield, 50% ee
- 56% yield, 90% ee
- 53% yield, 92% ee
- 83% yield, 95% ee
- 42% yield, 89% ee
- 83% yield, 93% ee
- 52% yield, 93% ee
- 56% yield, 96% ee
- 65% yield, 95% ee
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**Keywords:**
- Boronic acids
- Cyclization
- Rhodium