Enantioselective Rhodium-Catalyzed Synthesis of Axially Chiral Biaryls

Significance: Several bioactive molecules contain an axially chiral biaryl subunit. Although several methods exist for their synthesis, the use of direct C–H functionalization is less well studied. The authors present a rhodium-catalyzed dehydrogenative Heck coupling to produce axially chiral biaryls using the Cramer complex.

Comment: The substrate scope showed variability in the aza biaryl starting material and the olefin coupling partner. The products were shown to be competent in rhodium-catalyzed 1,4-additions to cyclohexenone with phenylboronic acid, producing the adduct in up to 77% yield and with 68% ee.

Selected examples:

- Rh catalyst (5 mol%), (BzO)₂ (5 mol%), Cu(OAc)₂ (20 mol%), Ag₂CO₃ (1 equiv)
- MeOH (0.2 M), 80 °C, 24 h
- up to 84% ee
- up to 97% yield
- 23 examples