Cobalt-Catalyzed Hydroboration of Alkynes

Significance: Chirik and co-workers report a bis(imino)pyridine cobalt-catalyzed hydroboration of terminal alkynes using HBpin to afford various vinylboronate esters with high Z-selectivity.

Comment: Selective insertion of an alkynylboronate ester into a Co–H bond via syn-hydrometallation generates a pro-(Z) cobalt alkynyl intermediate to yield the corresponding (Z)-vinylboronate ester.

Proposed mechanism:

Selected examples:

- 76% yield, Z/E = 92:8
- 72% yield, Z/E = 98:2
- 79% yield, Z/E = 97:3
- 59% yield, Z/E = 92:8
- 50% yield, Z/E = 97:3
- 56% yield, Z/E = 56:44
- 76% yield, Z/E = 95:5
- 69% yield, Z/E > 98:2