Asymmetric C–H Functionalization Using Chiral CpXCo(III) Catalysis

Significance: This work is an important advance in catalytic C–H functionalizations for the following reasons: (1) it is the first example of asymmetric C–H functionalization using a chiral CpX-ligand-bound Co(III) complex; (2) it outperforms competing rhodium-catalyzed methods; (3) reactions with alkyl alkenes give regioisomeric products opposite to those with rhodium complexes.

Comment: The authors systematically studied the effect of various substituents on the CpX ligand in the C–H functionalization of chlorobenzamides, a benchmark for chiral CpRh(III) catalysis. The presence of the tert-butyl group greatly influences the approach of the olefin, whereas the naphthyl backbone acts to orient and align the metallocene.