

Thesis Abstract

The thesis entitled “Weakly Coordinating Ketone-Directed C–H Alkylation, Alkenylation, and Annulative π -Extension by C–H Bond Activation” has been divided into five chapters.

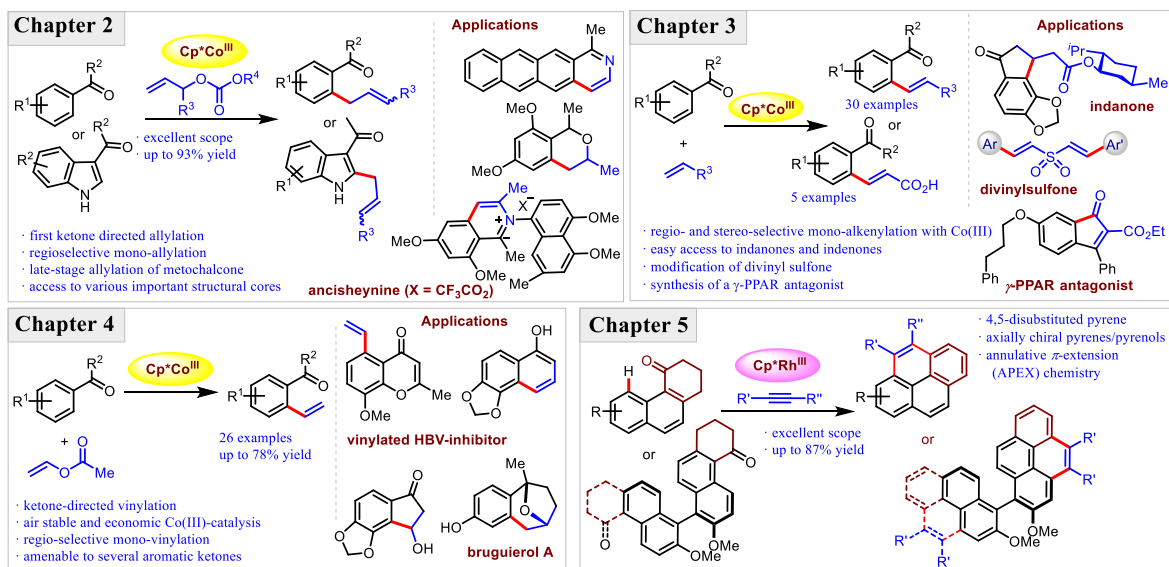
Chapter 1 describes the overview of transition metal-catalyzed C–C bond formation reaction by weakly coordinating, ketone-directed C–H functionalization.

Chapter 2 presents ketone-directed regioselective, monoallylation of a wide range of aromatic ketones, chalcones and protecting group-free indoles using Cp*Co(III)-catalyzed C–H bond activation.

Chapter 3 demonstrates the alkenylation of (*het*)aromatic ketones with alkenes or Heck-type coupling using a Cp*Co(III) catalyst. Two-step synthesis of a γ -PPAR antagonist, synthesis of indanone, and modification of divinylsulfone are also reported.

Chapter 4 describes 3d-transition metal, cobalt(III)-catalyzed, ketone-directed C–H vinylation of aromatic ketones and enones with economical vinyl acetate.

Chapter 5 deals with syntheses of 4,5-functionalized pyrenes, axially-chiral naphthylpyrene, and 1,1'-bipyrene derivatives by Rh(III)-catalyzed C–H functionalization. The one-pot syntheses involve C–H activation, alkyne-insertion, intramolecular nucleophilic attack at the ketone, dehydration, and aromatization as important steps.



Keywords: Catalytic C–H Functionalization, Weak Coordination, Ketone-Directed, Allylation, Alkenylation, Vinylation, Annulative π -Extension, Cobalt, Rhodium.