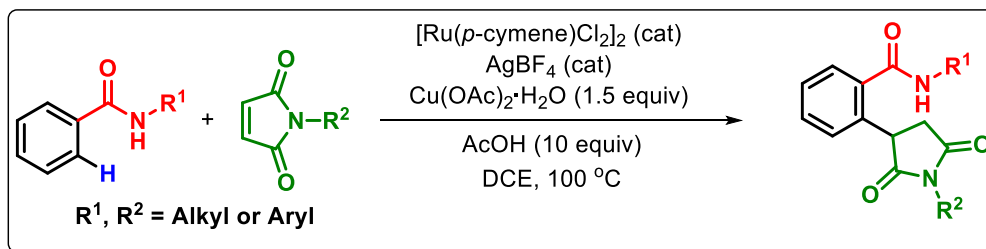


SYNOPSIS

Transition metal catalyzed functionalization of C-H bond to C-C bond is advantageous and atom economical. The use of directing groups is intended to overcome the challenges associated with the C-H activation such as low reactivity of C-H bond and the issue of site selectivity. Amides are well known as directing groups and found to couple with a variety of coupling partners. In this thesis, maleimide has been used as a selective coupling partner to generate conjugate addition products exclusively. The typical Heck-type oxidative coupling that occurs, when alkenes are used, is avoided by choosing maleimide as an alkene, which cannot undergo β -hydride elimination, due to the unavailability of *syn*-periplanar β -hydrogen atom. The amide nitrogen which is notorious to undergo tandem reactions to generate spirocyclic or annulation products under cross-coupling conditions remains innocent under the reaction conditions. Along with the substrate scope, a robustness screen has been performed to analyze the performance of amide as a directing group in the presence of other directing groups, and also for examining the tolerance of the reaction conditions for other frequently encountered functional groups. The following Scheme represents the typical reaction and conditions used for the reaction.



Coupling of maleimides in the presence of amide as a directing group