Abstract

Thesis topic: **Transition Metal Catalyzed Direct, Regioselective Functionalizations and Construction of 2-Pyridone Based Scaffolds**

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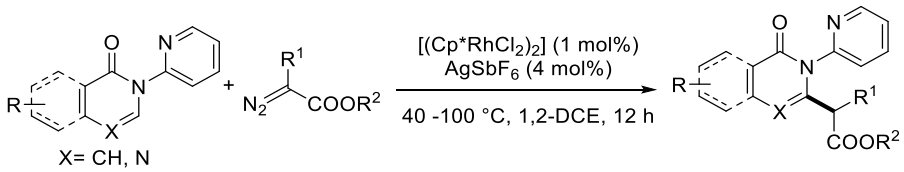
Keywords: (1) 2-Pyridone, (2) C-H functionalization, (3) regio-selective, (4) transition-metal catalysts, (5) carbenoid, (6) nitrenoid, (7) synthetic methodology.

The thesis entitled "**Transition Metal Catalyzed Direct, Regioselective Functionalizations and Construction of 2-Pyridone Based Scaffolds**" describes the development of new step-economical strategies for site-selective functionalization and construction of 2-pyridone related scaffolds.

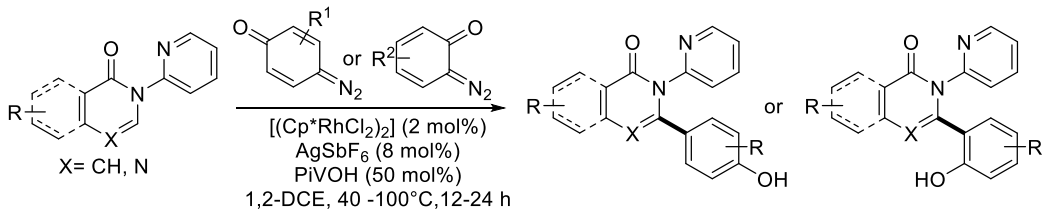
Chapter 1 describes the importance of 2-pyridone scaffolds and recent advances in the direct functionalizations of this scaffold.

Chapter 2 illustrates the regio-selective functionalizations of 2-pyridones and related heterocycles using metal-carbenoid/nitrenoid based on migratory insertion. It contains 4 parts. **Chapter 2, part A** illustrates rhodium(III)-catalyzed C6-alkylation of 2-pyridone and other related heterocycles using diazo malonates as the alkylating agent under mild conditions (Scheme 1).



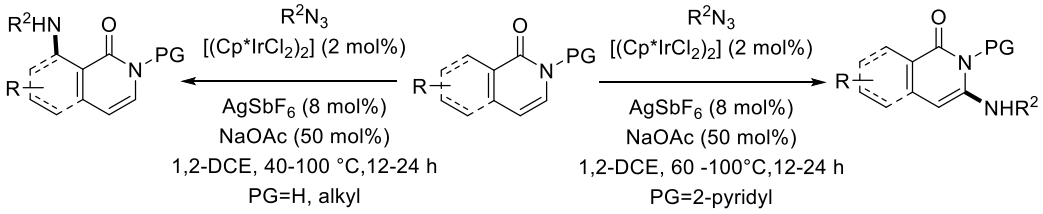
Scheme 1: Rh(III)-catalyzed C6-alkylation of 2-pyridones.

Chapter 2, part B describes rhodium(III)-catalyzed C6-arylation of 2-pyridone and other related heterocycles using diazoquinones as the arylating agent under mild conditions (Scheme 2). This protocol gives direct access to heteroarylated phenols.



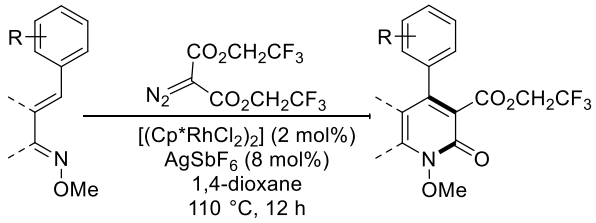
Scheme 2: Rh(III)-catalyzed C6-arylation of 2-pyridones.

Chapter 2, part C defines iridium(III)-catalyzed regio-selective amidation of 2-pyridones and isoquinolones and its application in the synthesis of the precursor of a pharmaceutically important compound (Scheme 3).



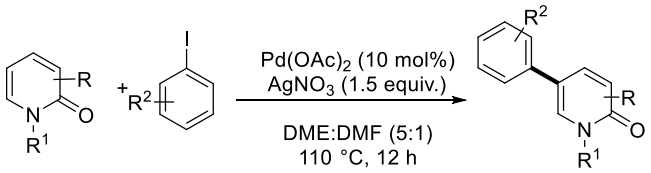
Scheme 3: Ir(III)-catalyzed region-selective amidation of isoquinolones and 2-pyridones

Chapter 2, part D represents Rh(III)-catalyzed cascade cyclization of α, β–unsaturated oxime with a highly electron deficient diazo malonates to furnish C4-arylated highly substituted 2-pyridone derivatives (Scheme 4).



Scheme 4: Rh(III)-catalyzed synthesis of 2-pyridone derivatives

Chapter 3 depicts Pd(II)-catalyzed site-selective C5-arylation of 2-pyridones. The developed protocol had been used as a key step in the synthesis of a pharmaceutically important compound (Scheme 5).



Scheme 5: Pd(II)-catalyzed direct C5-arylation using aryl iodides of 2-pyridones

Overall Contribution and Remarks