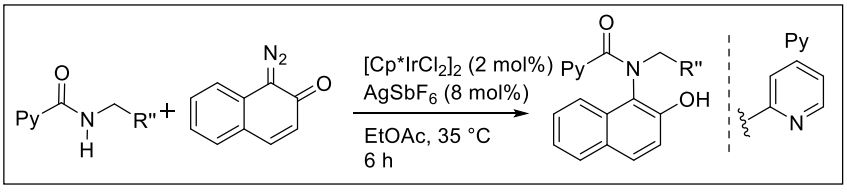
Transition Metal Catalysed *N*, *O*-Arylations using Diazoquinones and Synthesis of *N*-Naphthylated 2-Pyridones using Internal Alkynes

Keywords: (1) Diazoquinones (2) Quinoid-carbene (3) Transition metal catalysis (4) Migratory insertion (5) Oxidative annulation (6) 2-Pyridone (7) Internal alkynes

The thesis titled **"Transition Metal Catalysed *N*, *O*-Arylations using Diazoquinones and Synthesis of *N*-Naphthylated 2-Pyridone using Internal Alkynes"** comprehensively describes innovative strategies for several chemical processes. Firstly, it explores transition-metal catalysed *N*-arylations of electron-deficient aliphatic amides, detailing the methodologies and conditions that facilitate these reactions. Secondly, it delves into O-arylations of epoxides using diazoquinones, highlighting the reactivity and mechanism involved in these transformations. Additionally, the thesis represents the complementary approaches for the synthesis of *N*-naphthylated 2-pyridones using internal alkynes. These processes employ step-economic pathways, emphasizing efficiency and practicality in synthetic chemistry.

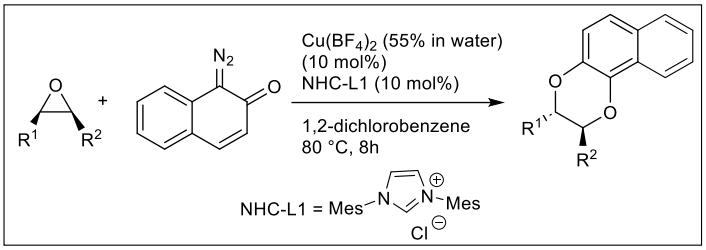
Chapter 1 provides an introductory overview of diazonaphthoquinones, explaining their reactivity in the presence of transition-metal catalysts towards *N*-arylation and *O*-arylation. It also discusses strategies for double C–H bond annulations of *N*-containing heterocycles using internal alkynes as coupling partners for the construction of nitrogen-containing polyaromatic hydrocarbons (*N*-PAHs).

Chapter 2 illustrates Ir(III)-catalysed intermolecular mild *N*-arylation of aliphatic amides using quinoid carbene *via* migratory-insertion based approach (Scheme 1).



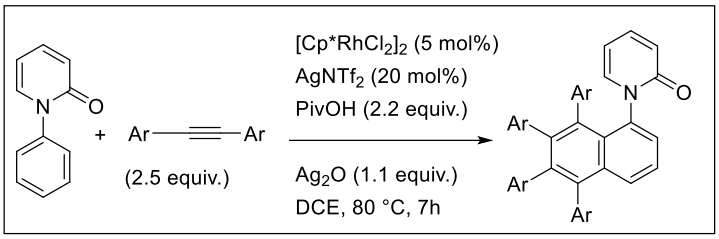
Scheme 1: Ir(III)-catalysed *N*-arylation of primary aliphatic amides using quinoid carbene

Chapter 3 describes Cu(II)-NHC catalysed insertion of quinoid carbene into epoxides for the straightforward synthesis of dihydronaphthodioxine *via* intramolecular S_N2- type substitution with inversion (Scheme 2).



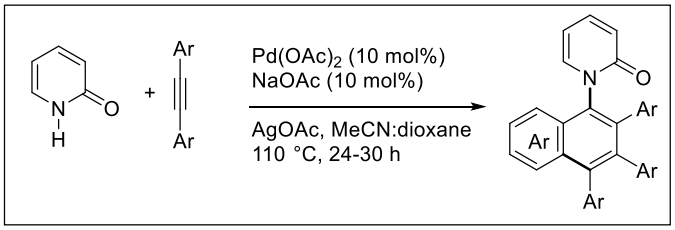
Scheme 2: Cu(II)-NHC catalysed straightforward synthesis of dihydronaphthodioxine using quinoid carbene

Chapter 4 illustrate Rh(III)-catalysed weakly coordinating 2-pyridone directed *N*-naphthylation of *N*-phenyl 2-pyridone using internal alkynes (Scheme 3).



Scheme 3: Rh(III)-catalysed *N*-naphthylation of *N*-phenyl 2-pyridone using internal alkyne

Chapter 5 illustrate a complementary method for the Pd(II)-Catalysed oxidative naphthylation of unmasked 2-Pyridone through N-H/C-H bond activation using diarylalkynes as uncommon arylating agents (Scheme 4).



Scheme 4: Pd(II)-catalysed *N*-naphthylation of 2-pyridone using internal alkynes