

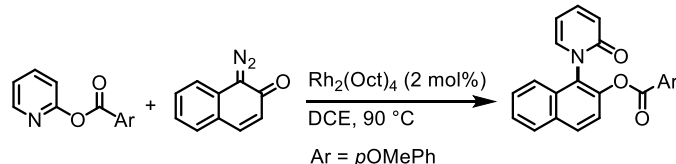
**THESIS ABSTRACT : SUBARNA PAN (19CY91F11)**
**Transition-Metal Catalyzed Diazonaphthoquinone Insertion: Unified Routes to Heterobiaryls, Extended Imidazolium Systems, and Sulfur Ylide Rearrangement**

**Keywords:** (1) Quinoid carbene (2) Transition metal catalysis (3) C-H functionalization (4) Step-economic synthesis (5) Heterobiaryls (6) Conjugate  $\pi$ -system

The thesis entitled “**Transition-Metal Catalyzed Diazonaphthoquinone Insertion: Unified Routes to Heterobiaryls, Extended Imidazolium Systems, and Sulfur Ylide Rearrangement**” describes the strategies for the arylation of carbon and heteroatoms.

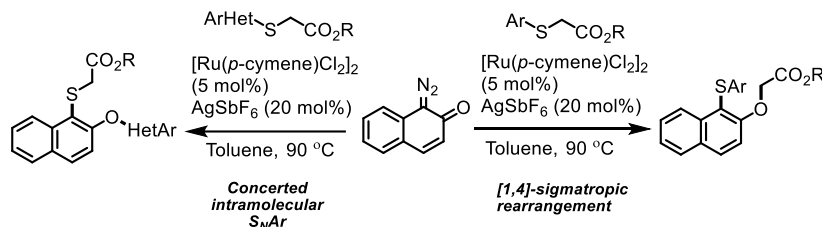
**Chapter 1** offers an introductory overview of metal-quinoid-carbene (metal-QC) and arylation strategies using metal-QC as an emerging alternative to conventional protocols.

**Chapter 2** illustrates Rh(II)-catalyzed synthesis of *N*-aryl pyridones using diazonaphthoquinones *via* 1,6 benzoyl migratory rearrangement (Scheme 1).



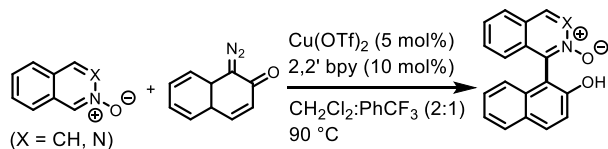
**Scheme 1: Rh(II)-catalyzed synthesis of *N*-aryl 2-pyridones**

**Chapter 3** describes Ru(II)-catalyzed [1,4]-sigmatropic rearrangement and intramolecular concerted  $S_{\text{N}}\text{Ar}$  of aryl and heteroaryl-thio derivatives using diazonaphthoquinones (Scheme 2).



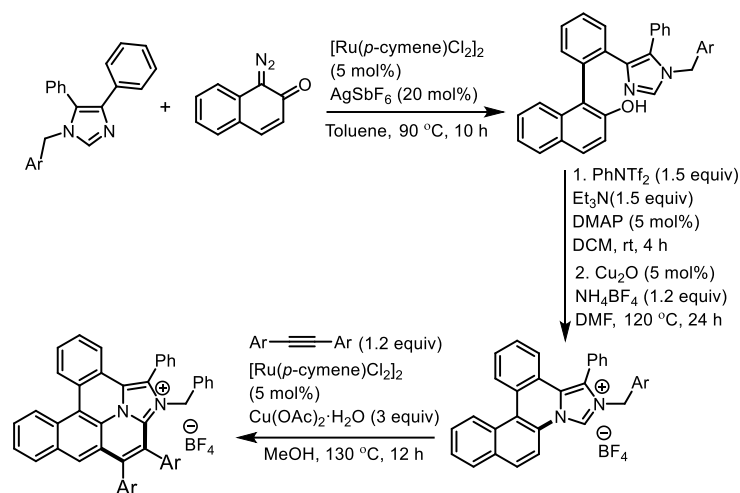
**Scheme 2: Ru(II)-Catalyzed [1,4]-Sigmatropic Rearrangement and Intramolecular  $S_{\text{N}}\text{Ar}$**

**Chapter 4** describes Cu(II)-catalyzed construction of heterobiaryls using 1-diazonaphthoquinones: a general strategy for the synthesis of quinox and related P,N ligands (Scheme 3).



**Scheme 3: Cu(II)-catalyzed construction of heterobiaryls using 1-diazonaphthoquinones**

**Chapter 5** illustrates A combined catalytic approach to imidazolium-based  $\pi$ -frameworks *via* successive C( $sp^2$ )-H insertion of quinoid carbene, *N*-quaternization, and annulative alkyne insertion (Scheme 4).



**Scheme 4: synthesis of  $\pi$ -extended imidazolium framework**