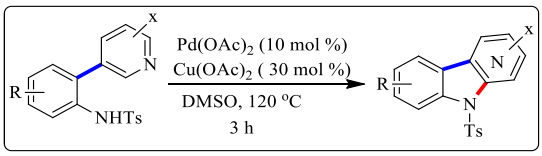
ABSTRACT

Palladium and/or Copper Mediated Methods for the Synthesis of Nitrogen and Oxygen Heterocycles

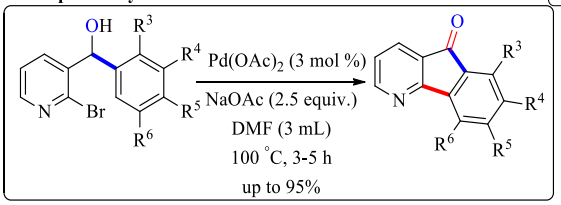
Heterocycle comprises a vast majority of bioactive natural products and drug molecules. Their efficient and shorter synthesis is indeed the major challenge in synthetic organic chemistry. Use of transition metals leaving behind the classical methods remained the main focus of research in organic synthesis for past few decades. In this dissertation we have developed some strategies towards the synthesis of some nitrogen and oxygen hetrocycles *via* Pd and Cu catalysis.

My dissertation entitled as *"Palladium and/or Copper Mediated Methods for the Synthesis of Nitrogen and Oxygen Heterocycles"* has been divided into five chapters. In **Chapter 1** we have described a method for the synthesis of three isomer *α, β, γ*-Carbolines *via* Pd-catalyzed C-H activation. Synthesis of azafluorenone and their derivatives by Pd-catalyzed oxidative Heck cyclization has been discussed in **Chapter 2**. A one pot synthesis of phenanthridines and their higher analogs benzo[*i*] and benzo[*k*] derivatives *via* Pd (0) catalyzed Suzuki coupling followed by condensation has been reported in **Chapter 3**. The Pd-free Sonogashira coupling strategy for the synthesis of isoquinolines, pyridines and phthalides has been developed in **Chapter 4** and **Chapter 5** respectively.

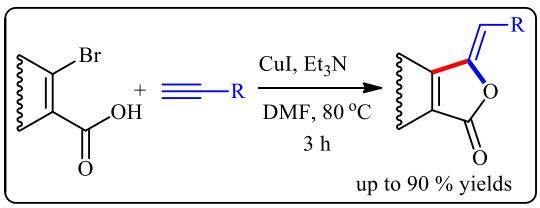
Chapter 1: Synthesis of Carbolines



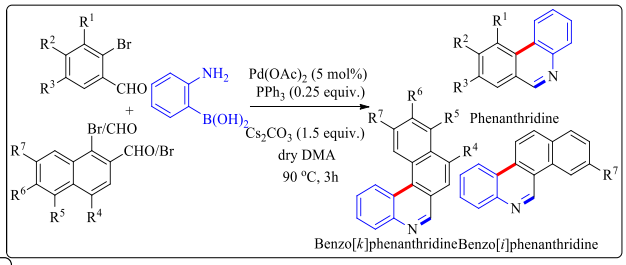
Chapter 2: Synthesis of Azafluorenone



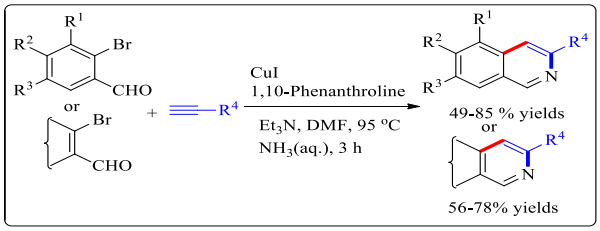
Chapter 5: Synthesis of phthalides



Chapter 3: Synthesis of phenanthridine and its higher analogs



Chapter 4: Synthesis of Isoquinoline and pyridines



Keywords: Pd-catalyst, Cu-catalyst, carbolines, azafluorenones, phenanthridines, isoquinolines, phthalides.