

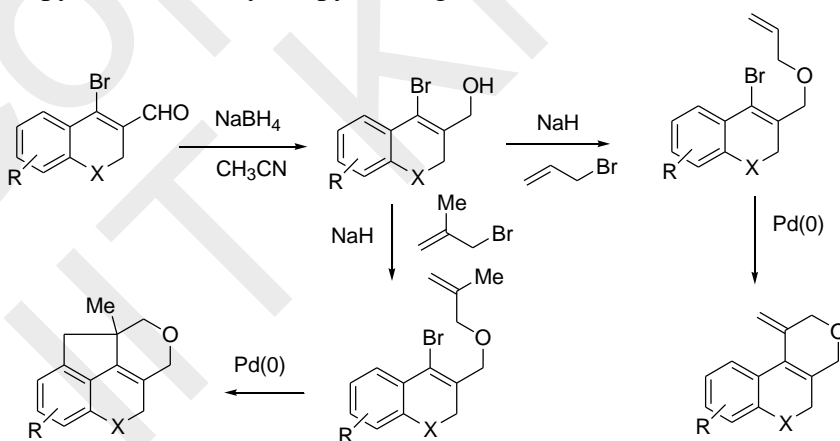
## ABSTRACT

Use of transition metal compounds or complexes as catalysts or reagents in organic synthesis is an exciting field in research and numerous novel reactions which are impossible to achieve by conventional synthetic methods have already been discovered. Total syntheses of many complex molecules have been achieved efficiently in shorter steps, which was unbelievable ten years ago. So the applications of transition metal-catalysts and reagents to organic synthesis are still being actively investigated. Substituted pyran and furan represent a common structural component of naturally occurring and biologically active molecules. During the investigation we tried to synthesize some of the pyran, furan and alkyl phenanthrene derivatives starting from  $\beta$ -bromovinylaldehydes by using palladium and copper-catalyst.

The dissertation entitled "Synthesis of heterocyclic and carbocyclic compounds by palladium and copper-catalyzed reactions" has been organized in three chapters.

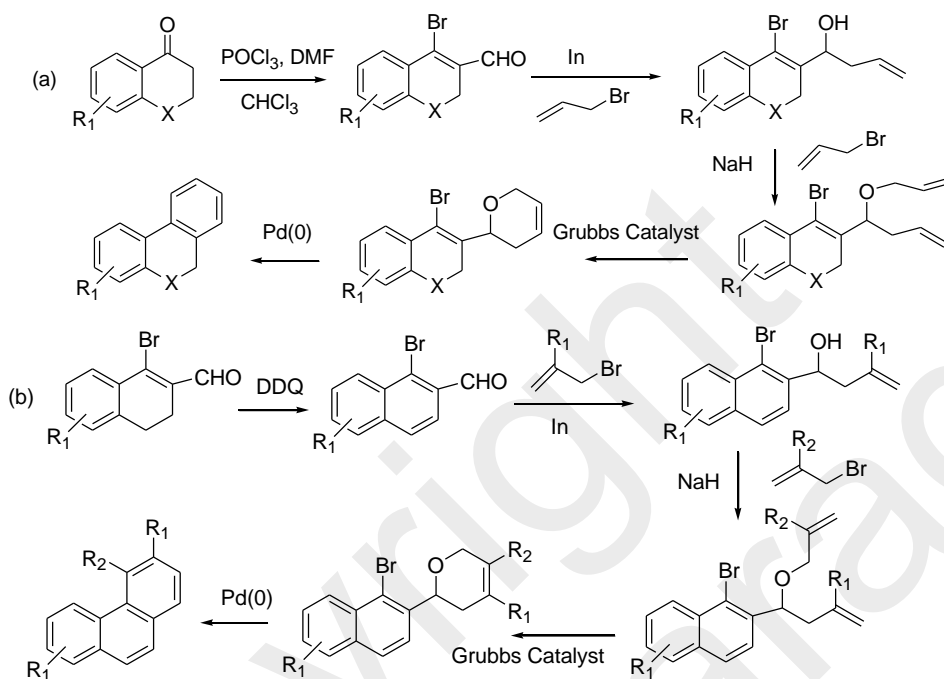
### Chapter 1: Substrate dependent intramolecular palladium-catalyzed cyclization and subsequent $\beta$ -H elimination or C-H activation: a general method for the synthesis of fused pyran rings

This chapter describes a novel palladium catalyzed intramolecular Heck reaction to afford exocyclic pyran and tetracyclic pyran rings.



## Chapter 2: Synthesis of 9, 10-dihydrophenanthrene, alkyl phenanthrene and its analogues by palladium-catalyzed 6 $\pi$ electrocyclic reaction

In this chapter we have developed substituted phenanthrenes, 9,10-dihydrophenanthrene and alkyl phenanthrene by novel palladium-catalyzed electrocyclic reactions.



## Chepter 3: Synthesis of furan and naphthofuran by copper catalyzed reaction from 3-(1-alkenyl)-2-alkene-1-al

In this chapter a novel, convenient, one-pot synthetic approach towards substituted furan and naphthofuran derivatives by copper-catalyzed reactions from 3-(1-alkenyl)-2-alkene-1-al has been developed.

