1 Introduction

This dissertation is focused on the development of new methodology for the synthesis steroid derivatives. Steroids, due to their biological activity, still represent a favourite target of total syntheses. Many approaches for their preparation, based on transition metal-mediated or catalyzed reactions, have been developed.

From the synthetic point of view, it would be ideal or at least highly desirable and interesting to develop a methodology based on the repetitive use of one reagent. Fortunately, such a strategy has not been published yet. To bring this methodology to life, it is crucial to use a suitable reagent that can selectively react with a wide variety of functional groups. In this regard, zirconocene derivatives seem to be potentially applicable as they display a broad reactivity. Hence, the main objective of this work is to elucidate the viability of their sequential use in the synthesis of complex natural compounds.

2. Aim of the Work

The aim of this work is to develop a new synthetic methodology for the preparation of polycyclic isoprenoids. This methodology should be based on the sequential repetitive use of one reagent and should enable modular and flexible access to a wide variety of compounds. The appropriate reagent should function as a universal tool. Bearing the broad reactivity of such a tool in mind, dibutylzirconocene (Negishi reagent) might be the right candidate to serve this purpose.

The goal is to i) test the proposed methodology on a model target compound, ii) apply this methodology in the synthesis of various estratrienes, iii) use this synthetic approach for the total synthesis of estrone and iv) develop a catalytic and enantioselective version of the proposed methodology..