

CHAPTER I

INTRODUCTION



The most characteristic feature of cyclodextrin is the ability to form host-guest complex with a variety of molecules, organic, inorganic and metal ions. There are few reports about the inclusion of organometallic complexes by cyclodextrin. Ferrocene and ferrocenyl derivatives, organometallic complexes, can be included in the cavity of cyclodextrin because of the hydrophobic attraction. Molecular dimensions of ferrocene and ferrocenyl derivatives are approached to the cavity of β -cyclodextrin so the preparation of inclusion compounds with β -cyclodextrin is interesting.

The synthesis of enantiomerically pure molecule is of great interest in organic chemistry. As such, the access to chiral alcohol was received special attention. An efficient method to prepare optically active secondary alcohol consists in carrying out the asymmetric alkylation of aldehyde with organometallic catalyst. Several aldehydes have been alkylated according to this procedure with high enantioselectivity, benzaldehyde has been most extensively studied. Considerable attention has also focused on the improvement of the chiral catalyst properties having different structures and functionalities. In this respect, organometallic complexes have been used as efficient catalysts for the enantioselective alkylation of aldehyde. Organometallic complex with nitrogen functionality such as β -amino alcohol, is one of the most attractive classes of compounds because of good nucleophilic property to react with benzaldehyde.

In this research, ferrocenyl derivatives, especially ferrocenylamine, included in cyclodextrin will be synthesized and tested for their catalytic activity.

In summary, this thesis is divided into four sections, preparations of ferrocenyl derivatives, preparations of inclusion compounds with β -cyclodextrin, catalytic activity in alkylation of benzaldehyde with diethylzinc and enantioselectivity of chiral product. In the first section, ferrocenylamine derivatives and other ferrocenyl derivatives were prepared and characterized. In the second section, inclusion compounds of these derivatives with β -cyclodextrin were formed and characterized by various techniques. Alkylation of benzaldehyde with diethylzinc catalyzed by ferrocenyl derivatives and inclusion compounds was studied and reported in section 3. The determination of % enantiomeric excess of product by various methods was presented in section 4.



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