NOVEL APPLICATIONS OF *CINCHONA* ALKALOIDS DERIVATIVES AS ENANTIOSELECTIVE REACTIONS CATALYSTS

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ABSTRACT

Stereocontrolled Organic Synthesis is one of the areas within Organic Chemistry, important especially from the chemical and pharmaceutical industries point of view. Enantioselective reactions are widely based on use of chiral catalysts, among which organic compounds, called organocatalysts, exhibit particular potential. To this group belong derivatives of natural compounds, especially of *Cinchona* alkaloids, which attract constant interest in the research, providing high enantioselectivities in a wide variety of reactions.

The aim of my research was: to obtain broadened library of quaternary ammonium salt derivatives of chosen alkaloids, then testing enantioselectivity of these catalysts in alkylations of Schiff base and β-ketoesters, and halogenations of said β-ketoesters.

As a result of my work, I have made a choice of catalyst side groups which had the greatest potential of providing me with high enantioselectivities in a wide variety of reactions. I have developed a plan of synthesis for designed catalysts, belonging to six groups based on six different alkaloids. Then, I have obtained proposed catalysts with satisfactory yields. Those catalysts underwent tests in the reactions of glycine imine ester benzylation, benzylations of ester derivatives of indan-1-one, as well as chlorinations and brominations of indanone and tetralone derivatives.

The results of my research on chlorinations and alkylations of β-ketoesters had brought a significant advancement into novel asymmetric synthesis catalyzed by natural compounds derivatives, confirmation of which are two scientific articles, published in a worldwide reach journals. At the same time, observations that I have made, enable better understanding of mechanisms of enantioselective reactions, catalyzed by *Cinchona* alkaloid derivatives.