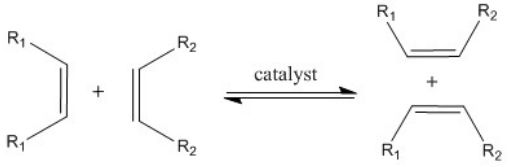
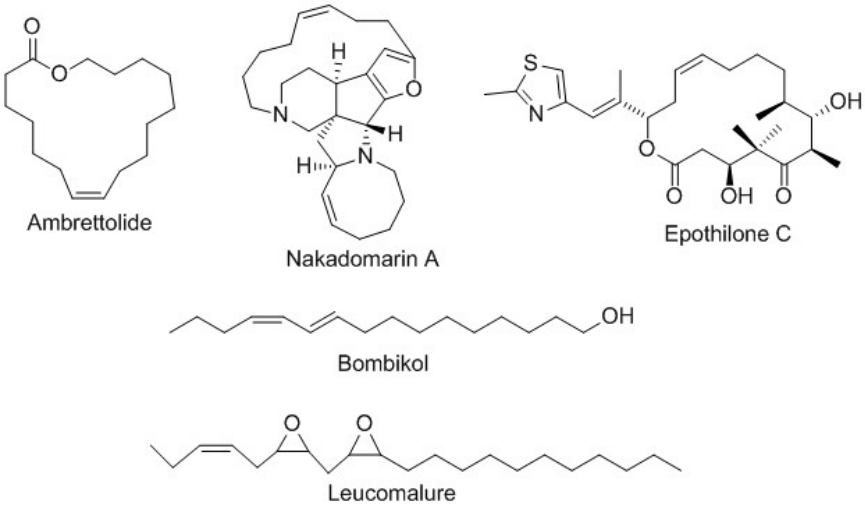
NEW OLEFIN METATHESIS CATALYSTS CONTAINING THE NITRO GROUP ON THE *N*-HETEROCYCLIC LIGAND

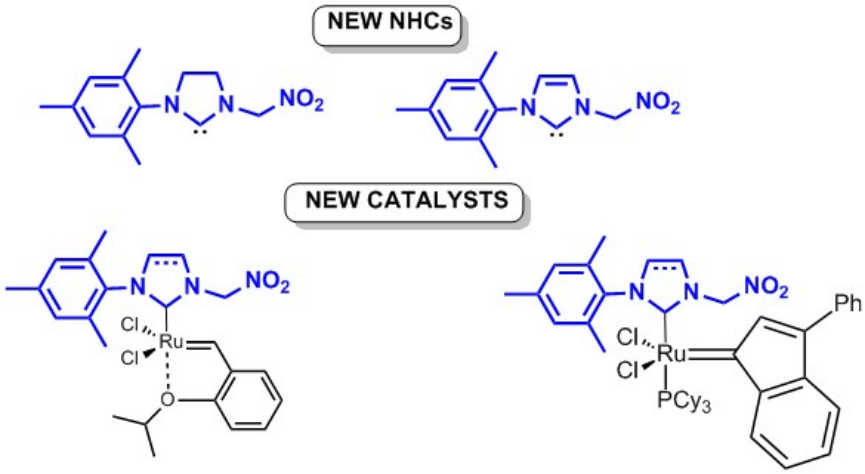
An olefin metathesis reaction is a particularly useful method in organic chemistry. With it, you can obtain compounds "tailor-made", exactly as planned. Very often, the mechanism of this reaction is compared to dance, in which participate substrates having a C-C double bond and a catalyst. It is the main guide in the dance, so that the exchange partners on the dance floor or in the reaction flask - replacement of molecular fragments at the C = C bonds in substrates. The importance of this reaction may indicate first of all the fact that in 2005, R. H. Grubbs, R. Schrock and Y. Chauvin received the Nobel Prize for their contribution to the development of a mechanism and obtaining well-defined olefin metathesis catalysts.



Despite years of methodology improvement for this reaction and the development of new catalysts, to date chemists have not managed to overcome all the difficulties encountered. The basic problem is the phenomenon of geometric isomerism occurring in the unsaturated reaction products (alkenes). *E* (*trans*) and *Z* (*cis*) isomers proved hard to separate which complicates the synthesis of many biologically active compounds (including anticancer drugs, pheromones) that exhibit the proper biological activity only for a specific isomer.



The aim of the project is the synthesis of new olefin metathesis catalysts that would allow receiving predominantly only one of the isomers. We expected that planned complexes will be stable in air and to moisture, easy to clean under standard conditions.



Four proposed catalysts will contain a nitro group in its molecule. We hope that the proposed construction will affect the stereochemistry of the formed C = C bond, give predominantly *Z* configurated products. The first stage of the project will be the synthesis of the salts, that are necessary to generate the N-heterocyclic carbenes. In the next step the catalysts will be modifiedand checked for their activity in model olefin metathesis reactions. In addition, the calculation will be carried out (DFT), aimed at obtaining full information on the new catalysts and the impact of their structures on the obtained product stereochemistry.