

Title: **Asymmetric catalysis by using tripodal pseudopeptidic cages.**

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Date: June 2019

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The main goal of this project is the synthesis of a supramolecular pseudopeptidic cage that is able to recognize chloride ions (Figure 1). This recognition will later be proved for asymmetric catalysis on different substrates. Three L-amino acids (phenylalanine) provide it the chiral centres that should allow the cage to act as an asymmetric catalyst. The interest in this kind of catalysis lies in getting enantiomerically enriched compounds, which have high synthetic interest and high value, even though the reagents have affordable prizes.

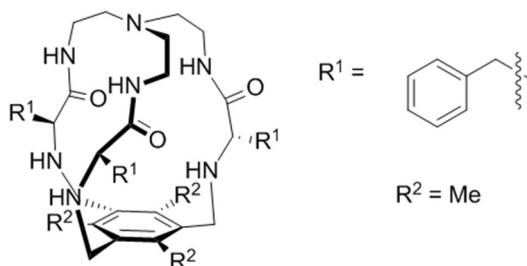


Figure 1. Supramolecular pseudopeptidic cage developed in the group.

In order to get the desired cage (which will be called [1+1] because it is formed by one aromatic electrophile and one tripodal amine) it is needed to use the template effect with the chloride. Thanks to that, the third step of its synthesis (a S_N2 reaction between a triple benzyl bromide and a free triamine) will be promoted in a fully intramolecular way, yielding the desired cage.

Finally, the cage has been characterized by $^1\text{H-NMR}$, $^1\text{H-}^1\text{H}$ (COSY), $^{13}\text{C-}^1\text{H}$ (HSQC) and by ESI-MS, too. Thanks to these techniques it is possible to identify each proton and with whom it interacts.

In the period available, different substrates were tested to try the asymmetric reactions catalysed with the supramolecular cage. Finally, two reactions were studied: a β -chlorohydrine cyclization to yield epoxides, and a β -chloroacid cyclization to yield β -lactones.

Keywords: supramolecular synthesis, asymmetric catalysis, molecular recognition, pseudopeptides, cages.