



YRICCCE II

II. Young Researchers' International Conference on Chemistry and Chemical Engineering

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Hotel Bara



Program and Book of Abstracts

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SYNTHESIS OF A BINAPHTHALENE DERIVATIVE OF HYDROQUININE AND ITS APPLICATION IN MICHAEL ADDITION

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The use of binaphthalene^[1], squaramide^[2,3,4] and cinchona^[3] moieties as functionalities of chiral bifunctional organocatalysts is well established in asymmetric catalysis. The bifunctional cinchona-based organocatalysts containing hydrogen bond donor moieties have been found useful in asymmetric *Michael* addition, in *Morita–Baylis–Hillman* reaction and in *Henry* reaction. Our aim was the first synthesis of an organocatalyst that contain all the three moieties mentioned above.

Multistereogenic binaphthyl-cinchona derivatives (for example see **4** on Figure 1.) were synthesized and successfully applied in *Michael* addition 1,3-dioxo compounds to β -nitrostyrene. High yields (up to 83%) and enantiomeric excesses (up to 97%) were achieved in different solvents. The applied hydrogen-bond organocatalysts were synthesized^[5-7] using commercially available, and cheap starting materials such as (*R*)-binaphthol (**1**), quinine (**2**) and dimethyl squarate (**3**) that gave the squaramide unit which is frequently used as building blocks of H-bond organocatalysts.^[2]

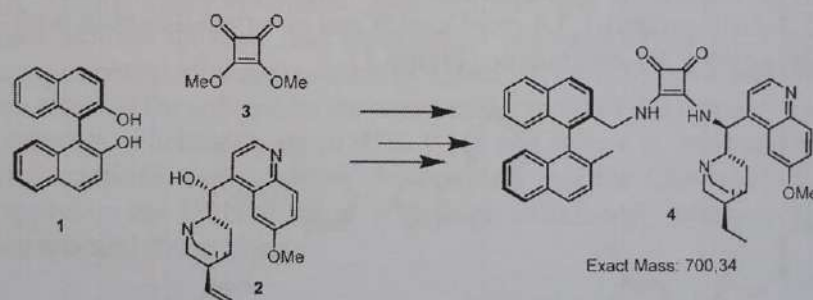


Figure 1. Synthesis of new organocatalyst with central and axial chirality

The feasibility of the application of these catalysts can be potentially expanded by using OSN (Organic Solvent Nanofiltration) technique. This method is widely used for separation of molecules based on the differences between those molecule's sizes. With the help of the OSN technique, the applied organocatalysts can be recyclable, due to its high molecular weight.

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