Chromatography-free Lipase-Catalyzed Kinetic Resolution of Secondary Alcohols Using Vinyl 3-(dimethylamino)propanoate as an Acyl Group Donor

B. Zdun, P. Borowiecki

Warsaw University of Technology, Faculty of Chemistry, Noakowskiego 3, 00-664, Warsaw, Poland
beata.zdun.dokt@pw.edu.pl

Enzymatic kinetic resolution is one of the most popular tools for the synthesis of optically active compounds, which mostly stems from the enormous biocatalytic potential of hydrolases, especially lipases [1]. Unfortunately, the use of EKR is associated with unpleasant technological consequences, including low process efficiency and the requirement to purify the products using preparative column chromatography. The second-mentioned obstacles related to the purification step generate the high costs of the particular process and also significant amounts of environmentally harmful waste, including volatile and toxic organic solvents as well as cancerogenic silica gel. In recent years, much effort has been made to circumvent this limitation and obtain high-yield optically pure compounds without chromatographic purification [2].

Herein, we report the development of a convenient and practical method for the chromatography-free enzymatic kinetic resolution of secondary alcohols (**Figure 1)**. The employed vinyl 3-(dimethylamino)propanoate as an acyl group donor enabled highly enantioselective (E>200) lipase-catalyzed resolution of racemic alcohols with up to 98% ee. Moreover, the KR products are easily separated via a liquid-liquid extraction work-up using a 1M HCl aqueous solution.

The developed method can be applied to the industrial synthesis of chiral secondary alcohols where the other techniques fail in the separation work-up.

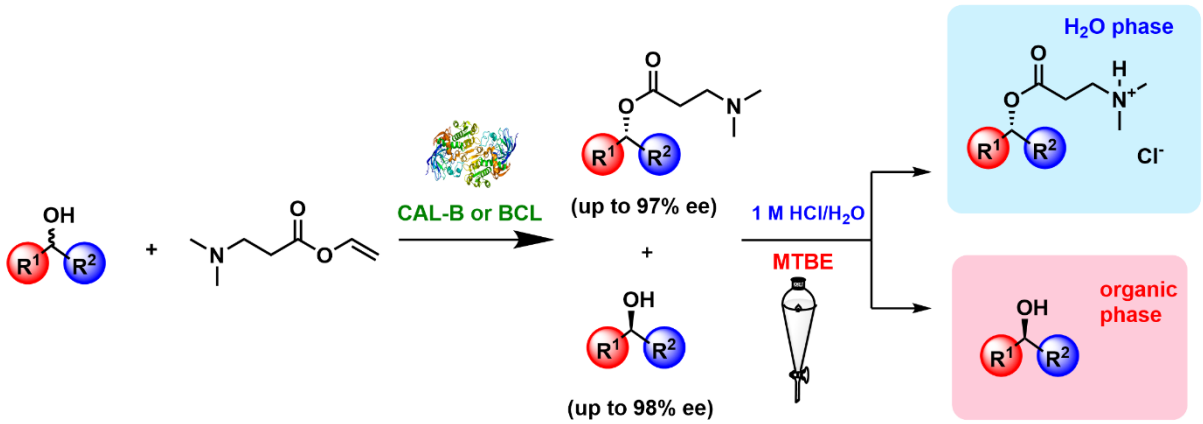

Figure 1. Chromatography-free lipase-catalyzed kinetic resolution of racemic alcohols.

References

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[2] M. Ahmed, T. Kelly, A. Ghanem, *Tetrahedron,68 (2012), 6781-6802,* DOI: 10.1016/j.tet.2012.05.049

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