Deracemization of Alcohols and Amines via Chemoenzymatic Dynamic Kinetic Resolution

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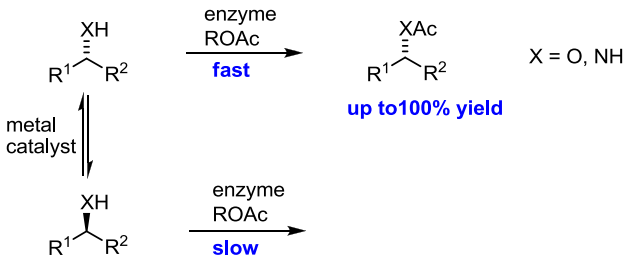
The combination of an enzymatic resolution and a metal-catalyzed racemization has been developed into an efficient methodology for dynamic kinetic resolution (DKR) of alcohols and amines (Scheme 1). In 1997 we reported on an efficient method for the dynamic kinetic resolution of sec-alcohols using a lipase and a ruthenium catalyst.[1] Since then a large number of metalloenzymatic systems for DKR have been reported.[2] Recent extensions of the metal racemization catalyst have included 1st row iron complexes.[3]



Scheme 1. Metal- and enzyme-catalyzed DKR.

The DKR reactions have been applied to the enantioselective synthesis of various biologically active compounds where the asymmetric transformation of Scheme 1 has been used as a key step.

Recently we have developed hybrid catalysts for the DKR of amines (Fig. 1). These hybrid catalyst mimic metalloenzymes and were used for dynamic kinetic resolution of primary amines in high yield and excellent enantioselectivity.[4]

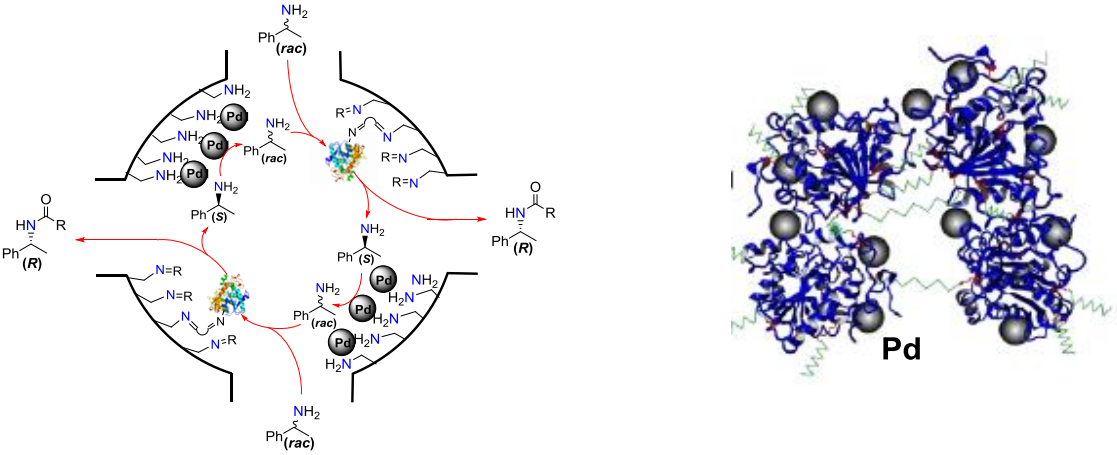


Figure 1. Hybrid DKR catalysts

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