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Catalytic Dynamic Kinetic Resolutions with N-Heterocyclic Carbenes: Asymmetric Synthesis of Highly Substituted β-Lactones


**NHC-Catalyzed Dynamic Kinetic Resolutions**

![Chemical Structures](image)

**Significance:** The Scheidt group reports a NHC-catalyzed dynamic kinetic resolution (DKR) reaction of racemic α-substituted β-keto esters. Under the reaction conditions to generate NHC catalyst from precursor 1, the substrate simultaneously epimerized for the desired DKR process. Functionalized β-lactones and cyclopentenes were obtained with good yields and high stereoselectivities. The utility of the enantioenriched β-lactone was demonstrated by further functionalization to various synthetically useful synthons.

**Comment:** DKR and DYKAT (dynamic kinetic asymmetric transformation) are powerful tools to convert a racemic mixture into a single enantiopure product in 100% theoretical yield (see Review below). High stereoselectivities in the formation of the desired products were achieved by choosing a proper combination of a NHC catalyst precursor and a base for the selective aldol/acylation reaction (B) along with an efficient racemization of intermediate A.

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