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A MECHANISTICAL STUDY OF LEWIS BASE CATALYZED CYANOHYDRIN SYTHESIS

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Enantiopure cyanohydrins are valuable building blocks in organic and medicinal chemistry [1]. Both functional groups of cyanohydrins (nitrile and hydroxy group) can be easily modified giving access to a variety of valuable organic compounds such as α-amino acids, α-hydroxy acids and aziridines.
Herein we present chiral Lewis base-catalyzed synthesis of enantioenriched cyanohydrins (enantioselectivity up to 65:35 er) from aliphatic and aromatic aldehydes. In order to understand and improve the stereoselectivity, the mechanism of the reaction was investigated. Two potential reaction paths were identified and explored - first through the formation of a cyanohydrin anion and second through the formation of a hemiaminal intermediate.

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