

Applications of Dainshefsky's Dienes in the Asymmetric synthesis of Aza-Diels-Alder Reaction

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Abstract

Asymmetric hetero-Diels-Alder (AHDA) reactions provide a multitude of opportunities for the highly efficient, regio- and stereoselective construction of various heterocycles in enantiomerically pure form. The asymmetric aza-Diels-Alder (A-aza-DA) reaction using diversely hetero-dienophiles and hetero-dienes have been increasingly developed as a valuable method for the synthesis of functionalized nitrogen ring systems. The purpose of this review is to give a detailed discussion of the A-aza-DA reaction particularly, the stereoselective reactions of imines as dienophiles with Dainshefsky dienes to obtain optically pure aza-Diels-Alder products. The development of stereoselective variants of the reaction make use of imines as the dienophile and Dainshefsky dienes is at the forefront of these studies. This review updates the A-aza-DA reactions covering the literature from 1972 till date.

Keywords: Asymmetric synthesis; Chiral Amines; Chiral Lewis acids; Dainshefsky's Dienes; Imines; aza-Diels-Alder reaction.