

Public Abstract

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Title:DEANTIAROMATIZATION AS A DRIVING FORCE IN AN ELECTROCYCLIZATION OF CYCLOPENTADIENONE AND THE TOTAL SYNTHESIS OF 1-*epi*-seco -PSEUDOPTEROXAZOLE

Deantiaromatization has been successfully demonstrated as a driving force in an electrocyclization of cyclopentadienones. The reaction was found to be general for a number of substrates and provides a unique way to access tricyclic ring systems with high stereoselectivity. Some evidence was uncovered to show that the process is indeed an 8i€ conrotatory electrocyclic ring closure.

During the exploration of substituent effects in the electrocyclization, a novel coupling reaction of an organolithium with primary halides was discovered. The experimental data suggested the engagement of the silicon atom and the important role of terminal alkene in the coupling reaction. However, the application of thiw methodology to other silane systems was successful.

The total synthesis of 1-*epi*-seco-pseudopteroxazole was accomplished in 17 steps, featuring the Buchwald-Hartwig coupling, a stereoselective intramolecular Michael reaction, a Heck coupling and asymmetric reduction of trisubstituted alkene.

In the course of reductive cleavage of the C-I bond to access key intermediate 358, a novel dephenylation of Harmata benzothiazines was discovered to provide chiral cyclic sulfinamides with complete stereocontrol. Preliminary mechanistic studies were carried out and a plausible mechanism was proposed based on our experimental results.