BIOMIMETIC ASYMMETRIC SYNTHESIS OF 3-SUBSTITUTED DIHYDROISOCARBOSTYRIL DERIVATIVES

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Novel asymmetric C-C bond formation into heterocyclic nuclei is reported.

Recently, we reported asymmetric synthesis of optically active 2-oxo-5-pyrrolidineacetic acid by Wittig-Horner reaction of 5-hydroxypyrrolidone derivatives [Tet. Lett., 93 (1977)]. The present paper describes the successful exploitation of this process to a biomimetic asymmetric synthesis of hitherto unknown (R)-(-)-3-carboxymethyl-3,4-dihydroisocarbostyril, the absolute configuration of which was determined by the chemical correlation.

Chiroptical properties of the optically active 3-substituted dihydroisocarbostyril derivatives and a tricyclic compound, 1,2,3,10a-tetrahydropyrrolo-[1,2-b]isoquinolin-5(10H)-one, were studied.

Further, the above asymmetric C-C bond formation was performed in two-phase system catalysed by onium salts at room temperature yielding (R)-(-)-3-carboxymethyl-3,4-dihydroisocarbostyril (51% e.e.). The scope, limitations, and specific advantages of this new phase-transfer catalysed asymmetric synthesis are detailed.