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An efficient and convenient synthesis of 1,2,3-trisubstituted pyrroles via iodocyclization from ethyl acetoacetate

Pengfei Xu, Kunzhu Huang, Zhiguo Liu, Ming Zhou, Wenbin Zeng*

School of Pharmaceutical Sciences, Central South University

172 Tongzipo Road, Changsha 410013, China.

** Author of correspondence: Prof. Wenbin Zeng, School of Pharmaceutical Sciences, Central South University, Changsha 410013, China. Tel/Fax: (86)731-8265-0459; Email: wbzeng@hotmail.com.*

Abstract

A novel and efficient methodology for the synthesis of 1,2,3-trisubstituted pyrroles by one-pot two-step reaction has been developed. The iodocyclization of series of β-enamino esters followed by dehyroiodination, led to the formation of corresponding pyrroles. This approach provides an easy access to a wide range of 1,2,3-trisubstituted pyrroles.

Keywords: Pyrroles; One-pot synthesis; Iodocyclization; Tandem reaction

Substituted pyrroles represent an important class of organic compounds which have found in many bioactive molecules and natural products.[1-2] They have also been widely applied in medicinal and material science.[3] In view of their characteristic properties, a variety of methods for synthesis of substituted pyrroles have been developed. Paula and co-workers reported the efficient synthesis of 2,3,5-substituted pyrrole derivatives by treatment of 2,3-dihydrofuran derivatives with trifluoroacetic acid.[4] Recently, Lingaiah and co-workers developed a novel method to construct tetrasubstituted pyrrole ring utilize polyethylene glycol as reaction medium.[5] Abu and co-workers employed a four-component reaction catalyzed by nickel (II) chloride hexahydrate to construct the tetra-substituted pyrroles.[6] However, efficient and convenient methodologies for the synthesis of 1,2,3-trisubstituted pyrroles are not numerous in literature.[7-8] In another arena of iodine chemistry, the nontoxic, inexpensive and readily available iodine has emerged as a very attractive reagent for