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New highlights of the syntheses of pyrrolo[1,2-*a*]quinoxalin-4-ones

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Abstract

The one-pot three-component reactions of 1-substituted benzimidazoles with ethyl bromoacetate and electron-deficient alkynes, in 1,2-epoxybutane, gave a variety of pyrrolo[1,2-*a*]quinoxalin-4-ones and pyrrolo[1,2-*a*]benzimidazoles. The influence of experimental conditions on the course of reaction was investigated. A novel synthetic pathway starting from benzimidazoles unsubstituted at the five membered ring, alkyl bromoacetates and non-symmetrical electron-deficient alkynes in the molar ratio of 1:2:1, in 1,2-epoxybutane at reflux temperature, led directly to pyrrolo[1,2-*a*]quinoxalin-4-ones in fair yield by an one-pot three-component reaction.

Introduction

The pyrrolo[1,2-*a*]quinoxaline system has significant biological activities and is a subject fo constant interest. This skeleton is a constituent of several bioactive heterocyclic compounds that demonstrate interesting activity against *Mycobacterium tuberculosis* [1], anti-HIV [2], anticancer [3], and it modulates the estrogen receptor activity [4].

Synthetic methods towards pyrrolo[1,2-*a*]quinoxaline derivatives based on pyrroles [5], or quinoxalines [6] have been recently reviewed. Among other synthetic routes, the 1,3-dipolar cycloaddition of heterocyclic *N*-ylides with various activated alkynes or alkenes is an important method for constructing fused heterocyclic systems such as pyrrolo[1,2-