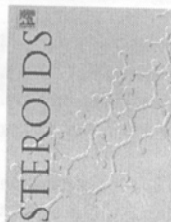




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Convenient preparation of A-ring fused pyridines from steroidal enamides

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ABSTRACT

A facile strategy for the preparation of A-ring fused pyridosteroids has been accomplished in high yields by the reaction of Vilsmeier reagent (chloromethyleneiminium salt) with steroidal A-ring enamides (2- and 3-ene) under thermal conditions. The structure of 6'-chloro-5 α -cholest [3,2-b]pyridine was determined by X-ray analysis.

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Formylation

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Pyridosteroid

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1. Introduction

The heterosteroids are of great pharmaceutical importance because of inherent biological activities [1–4]. Enormous efforts have been made to synthesize A-ring fused heterosteroids with pyrazole, isoxazole, oxazole, pyridine, pyrrole and pyrimidine moieties [5–12]. Among these heterosteroids, the synthesis of pyridine fused A-ring steroids draws renewed interests [13] in view of the widespread occurrence and biological activity of pyridines in natural products and pharmaceuticals [14]. On the other hand, enamides are synthetically important functionalities that constitute important building blocks of many biologically active compounds [15,16]. However, steroidal enamides are less intensively studied in comparison to aliphatic or cyclic enamides [17]. Barton and coworkers have reported a simple synthesis of steroidal A-ring enamides from 3-ketoximes [18]. Morzycki et al. studied some electrophilic nitration reactions at the C-2 position of A-

ring steroidal enamides [19]. In continuation of our interests on A- and D-ring fused azasteroids [20,21], we report herein a convenient strategy for the preparation of A-ring annelated pyridosteroids from the Vilsmeier reaction of enamides in high yields.

2. Experimental

All reactions of steroidal enamides using Vilsmeier reagent were carried out under anaerobic condition and monitored on Merck aluminium thin layer chromatography (TLC, UV_{254nm}) plates. Column chromatography was carried out on silica gel (60–120 mesh, Merck chemicals). Melting points were determined in open capillary tubes on a Buchi B-540 apparatus and are uncorrected. IR spectra were recorded on a PerkinElmer FT-IR spectrometer using KBr pellets or on a thin film using chloroform. All the ¹H and ¹³C NMR spectra were recorded on

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