Tricyclic Heteroaromatic Ring Systems III. Synthesis of 1H,6H-Dipyrazolo[3,4-b:3',4'-d]pyridin-3-ones

Short Communication

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The reaction of hydrazines with substituted ethyl 4-chloro-1H-pyrazolo[3,4-b]pyridine-3-carboxylates leads to the formation of 1H,6H-dipyrazolo[3,4-b:3',4'-d]pyridin-3-ones.

(Keywords: Pyrazolo[3,4-b]pyridines; Ring closures)

Introduction

Whereas the linear dipyrazolo[3,4-b:3',4'-e]pyridine ring system (1) has been known for some time, the corresponding angular dipyrazolo[3,4-b:3',4'-d]pyridine ring system (2) has only recently been reported and some of its derivatives shown to act as tranquilizing and antiinflammatory agents. During our studies on pyrazolo-[3,4-b]pyridines we obtained a number of compounds which were transformed into derivatives of 2.

Results and Discussion

The pyrazolo[3,4-b]pyridines (3-6) used in this work were obtained by “chloro-cyclization” of the corresponding ethyl α-carbethoxy-β-(pyrazol-5-ylamino)acrylates which in turn were obtained from the reaction of 5-aminopyrazoles with diethyl ethoxymethylene malonate.
The reaction of 3-6 with hydrazine and methylhydrazine leads to the desired tricyclic compounds 7-15. From the reaction of 6 with phenylhydrazine an open chain derivative was formed which on treatment with acetic acid ringclosed to 16 with the phenyl ring on N-2. The isomeric compound 17 having the phenyl ring on N-1 was obtained indirectly. The chloroester (6) was hydrolyzed to the corresponding acid