DIPYRAZOLO[4'',3'':5,6][4',3'-e]PYRIDO[3,2-c]PYRIDAZINE - A NEW HETEROAROMATIC TETRACYCLIC SYSTEM

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ABSTRACT: An intramolecular diazo-coupling reaction of an aminopyrazolylpyrazolo[3,4-*b*]pyridine was employed to give the title ring system. (keywords: Pyrazolo[3,4-*b*]pyridines; Diazo-coupling; Friedlander reaction).

INTRODUCTION

Synthesis and study of the pyrazolo[3,4-*b*]pyridines have been of interest for their potential biological and pharmacological activities properties¹⁻⁷. Antiviral activity⁸ has also been investigated for several compounds of this system.

During our investigation on the chemistry of pyrazolo[3,4-*b*]pyridine ring systems, we were able to prepared their derivatives which enabled us to build-up some new tri and tetracyclic heteroaromatic system based on pyrazolo[3,4-*b*]pyridine^{9,10}.

RESULTS AND DISCUSSION

During our synthetic programme of pyrazolo[3,4-*b*]pyridines employing diverse reaction pathways^{1,7,8,9,10}, we had isolated 1,3,4-trimethyl-6-(5'-amino-1',3'-dimethylpyrazol-4'-yl)pyrazolo[3,4-*b*]pyridine (II) from an attempted acylation of 5-amino-1,3-dimethylpyrazole with acetic anhydride¹¹. The intermediate I has potential for preparation of diverse derivatives through manipulation of the amino group.

We would now like to report the synthesis of a new tetracyclic system which was obtained from a diazotation of (I). The product it was isolated a yellow precipitate characterized as a derivative of the title ring system a 1,3,6,7,9-pentamethyldipyrazolo[4'',3'':5,6][4',3'-e]pyrido[3,4-c]pyridazine (III) (scheme 1).

Scheme: 1

EXPERIMENTAL.

The ^1H nuclear magnetic resonance spectra were obtained on a Varian model Unity Plus spectrometer operating at 300 MHz and Bruker AM-500 spectrometer (TMS as internal standard). Fourier transform infrared (FT IR) absorption spectra were recorded on a Perkin-Elmer mode 727 spectrophotometer. The solid samples were measured as potassium bromide pellets. Elemental analysis were determined on a Perkin-Elmer 240 and are in full agreement with the calculated values. Melting points (m.p) were determined with a Fisher-Johns apparatus and are uncorrected. The product 1,3,4-trimethyl-6-(5'-amino-1',3'-dimethylpyrazol-4'-yl)pyrazolo[3,4-b]pyridine (II), was prepared according to literature method¹¹.

1,3,6,7,9-pentamethyl-dypirzolo[4'',3'':5,6][4',3'-e]pyrido[3,4-c]pyridazine (II)

0.0014 mol de I dissolved in 10mL of hydrochloric acid was diazotized at 0-5°C by a solution of 0.0087 mol of sodium nitrite in 6mL of water for an hour and then at room temperature (25-28°C) for further two hours period. There results a yellow precipitate which was filtered and dried to give product characterized as a derivative of the title ring system a 1,3,6,7,9-pentamethyldypirzolo[4'',3'':5,6][4',3'-e]pyrido[3,4-c]pyridazine (III). purified by colum chromatografy on silica gel (chloroform as eluting solvent) followed by crystallization from benzene, mp. 179-80°C, yield 0,4g; 77%.

Elemental analysis: $\text{C}_{14}\text{H}_{15}\text{N}_7$ requeries: C, 59.77; H, 5.37; N, 34.85% found: C, 60.01; H, 5.57; N, 34.81%.

^1H NMR (CDCl_3) δ (ppm): 2.84(s); 2.98(s); 3.44(s); 4.08(s); 4.;42(s); (15H-5CH₃);

^{13}C NMR (CDCl_3): 14.25(CH_3 -1), 33.05(CH_3 -2), 34.56(CH_3 -7), 13.78(CH_3 -9), 15.72(CH_3 -10);
IR (KBr): absence of NH_2 absorption bands.
EIMS m/z (%): 281 M^+ /(100); 266(37); 252(11); 238(41); 225(5); 212(13); 197(22); 182(6); 170(7); 156(5); 141(55); 129(6); 115(10); 102(6); 91(11); 88(6); 76(7); 75(7); 64(10); 5(7); 48(51).

CONCLUSIONS

The new ring system III is formed by an intramolecular diazo-coupling forming a pyridazine ring. Such cyclization have also been reported in similar reaction¹².

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