

A NOVEL SYNTHESIS OF SOME ANNELATED PYRIMIDINES : REACTION OF
6-HYDROXYLAMINO-1,3-DIMETHYLPYRIMIDINE-2,4-DIONE WITH IMINES
AND α -CHLOROIMINES

Dipak PRAJAPATI, Sivaprasad ATTALURI, Jagir S. SANDHU* and
Jogendra Nath BARUAH

Regional Research Laboratory, Jorhat 785 006, India

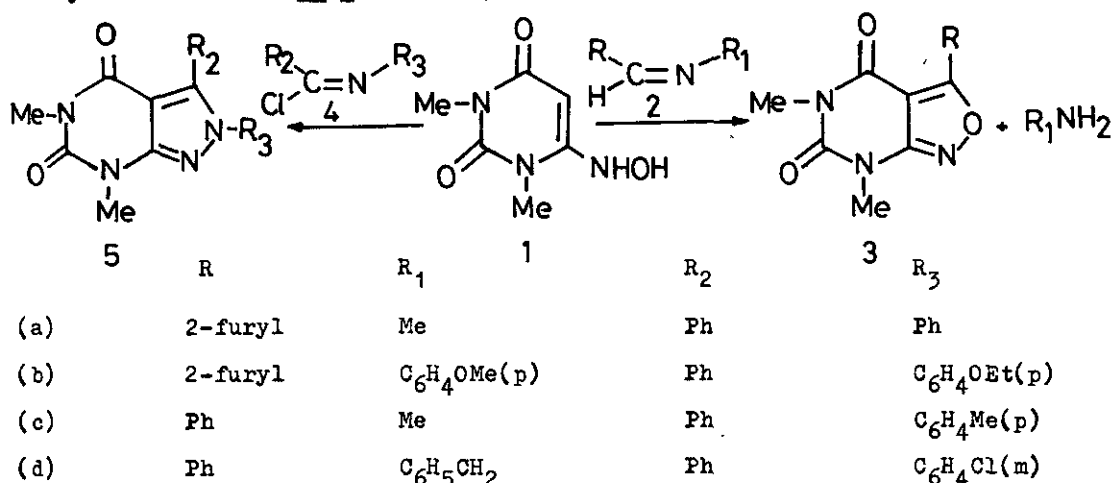
Abstract - Reaction of imines and α -chloroimines with
6-hydroxylamino-1,3-dimethylpyrimidine-2,4-dione gives
isoxazolo[3,4-d] and pyrazolo[3,4-d]pyrimidines
respectively in good yields.

The purine and pyrimidine nuclei are present in nucleic acids, nucleotides and several other naturally occurring biologically active substances. Because of this purine and pyrimidine derivatives occupy a unique position of significance and there has been tremendous effort to synthesize novel heterocycles having an annelated pyrimidine nucleus^{1,2,3}. Several approaches have been reported to construct heterocycles on C-5, C-6 double bond of substituted uracils⁴. In this communication we describe a novel and facile method of synthesizing isoxazolo[3,4-d] and pyrazolo[3,4-d]pyrimidines.

6-Hydroxylamino-1,3-dimethylpyrimidine-2,4-dione **1**⁵ (1.71 g, 0.01 mol) and imine **2a** (1.09 g, 0.01 mol) on stirring at room temperature for 3 h in absolute alcohol (15-20 ml), on concentration of the reaction mixture gave a solid **3a** crystallizable from alcohol, mp 205°C in 63% yield. ¹H-NMR (CDCl₃) δ : 3.10 (3H,s), 3.25 (3H,s), 6.45 (1H,q,furan H₄), 7.50 (1H,d,furan H₃), 7.95 (2H,d,furan H₅). The mass spectrum of **3a** showed molecular ion at m/e 247. When **2b** was used the same compound **3a** was obtained which clearly proved the elimination of amine part and was further confirmed by isolating the amine from the mother liquors (tlc). Use of **2c-d** gave **3c** in 70% yield⁶.

In contrast when α -chloroimines were used the imine nitrogen was involved in the pyrazolo ring formation. When equimolar quantities of **1** and α -chloroimine **4a** in the presence of dry triethylamine were refluxed in dry benzene for 2 h, a crystalline solid was obtained. This material on purification and crystalli-

zation gave 5a, mp 208°C, in 70% yield. $^1\text{H-NMR}$ (TFA) δ : 2.75 (3H,s), 2.98 (3H,s), 6.8-7.2 (10H,m). The mass spectrum of 5a showed molecular ion at m/e 332. Similarly were obtained 5b-d in good yields.



Regarding the reaction mechanism involved in these transformations, the reaction appears to be triggered by the attack of electron rich C-5 position onto the imine carbon followed by cyclisation. However, further work is in progress to understand the mechanism as well as the scope of the reaction.

REFERENCES AND NOTES

1. B. R. Baker, 'Design of Active-Site-Directed Irreversible Enzyme Inhibitors', Wiley, New York (1967).
2. R. K. Robins, 'Heterocyclic Compounds', Edited by R. C. Elderfield, Vol. 8, New York (1967).
3. T. Sasaki, K. Minamoto, T. Suzuki and S. Yamashita, *Tetrahedron*, **36**, 865 (1980) and references cited therein.
4. T. K. Bradshaw and D. W. Hutchison, *Chem. Soc. Rev.*, **6**, 43 (1977) and references cited therein.
5. W. Pfeleiderer and H. Ferch, *Ann. Chem.*, **615**, 52 (1958).
6. (a) We do not believe 2a-d can undergo simple hydrolytic cleavage because on stirring 2 alone in alcohol under identical conditions no such cleavage could be detected. (b) All the new compounds reported gave satisfactory spectral as well as analytical data.

Received, 23rd December, 1983