Synthesis of 1-Pyridino, 1-[4(1-Substituted) -2, 4-Dithiobiureto] Phenyldimethylpropanamine

R. S. SHEKAR[A] , P.R.KALE[B], M.V.LUNGE[B] , A.K.GHORMADE[B]

[A] - Department of Chemistry, Mahatma Fule Arts Commerce & Sitaramji Chaudhari Mahavidyalaya Warud shekar.rupesh@gmail.com
[B] - Department of Chemistry, S.R.R.Lahoti Science College Morshi.

Abstract:

Heteroacyclic and Heterocyclic containing drugs showed remarkable and noticeable drug absorption, transmission and drug effects; hence they created their own identity and importance in pharmaceutical, medicinal, agricultural and drug sciences. Thioamido, pyridino, thiobiureto and alkylamino heterocyclic compounds showed various significances and applications in industrial, pharmaceutical, medicinal and drug chemistry. Considering all these facts into consideration it was thought interesting to synthesize 1-pyridino,1-[4(1-substituted)-2, 4-dithiobiureto]phenyl-dimethylpropanamine by interacting 1-pyridino,1-(4-thiocarbamido)phenyl-dimethylpropanamine with various isothiocyanates in ethanol-acetone medium. The 1-pyridino,1-(4-thiocarbamido)phenyl-dimethylpropanamine was synthesized by interacting 3-(4-chlorophenyl)-N,N-dimethyl-3-pyridin-2-yl-propan-1-amine with thiourea in isopropanol medium. The justification and identification of the structure of these newly synthesized compounds had been established on the basis of chemical characterization, elemental analysis, and through spectral data.

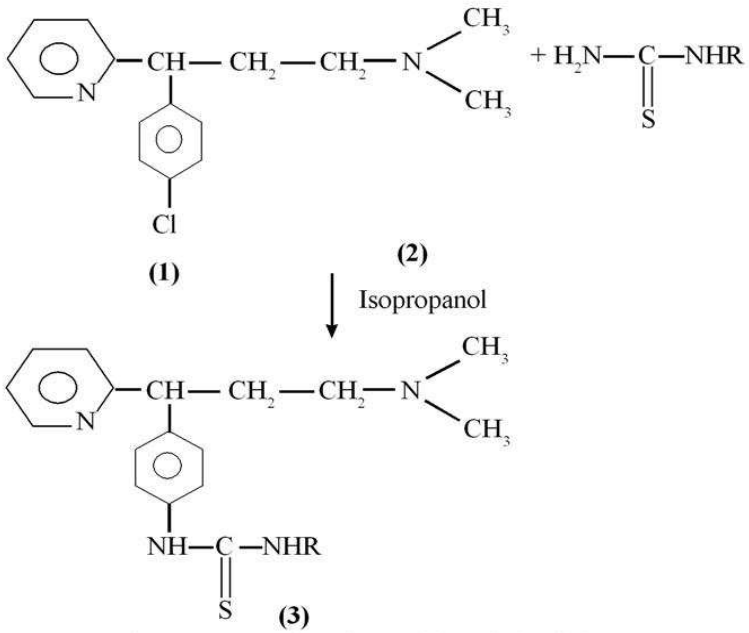
Key words - Substitutedisothiocynates, 3-(4-substitutedthiocarbamidophenyl)-N, N-dimethyl-3-pyridin-2-yl-propan-1-amine and ethanol.

Introduction

Recently in this laboratory, the synthetic applications of cyanoguanidine had been briefly explored.[1] As evident from the structure of the 1-pyridino,1-(4-thiocarbamido)dimethyl propanamine, it was observed that there are various reactive sites in this molecule for the reactions. This molecule possesses –SH, and -NH_2 important reactive sites for the reactions. As a wider porgramme of this laboratory in the synthesis of nitrogen, nitrogen and sulphur containing heteroacycles and heterocycles. The interactions of cyanoguanidine with various thiourea and alkyl or arylisothiocyanates have been investigated in sufficient details [2-5].Some of these compounds showed remarkable pharmaceutical and

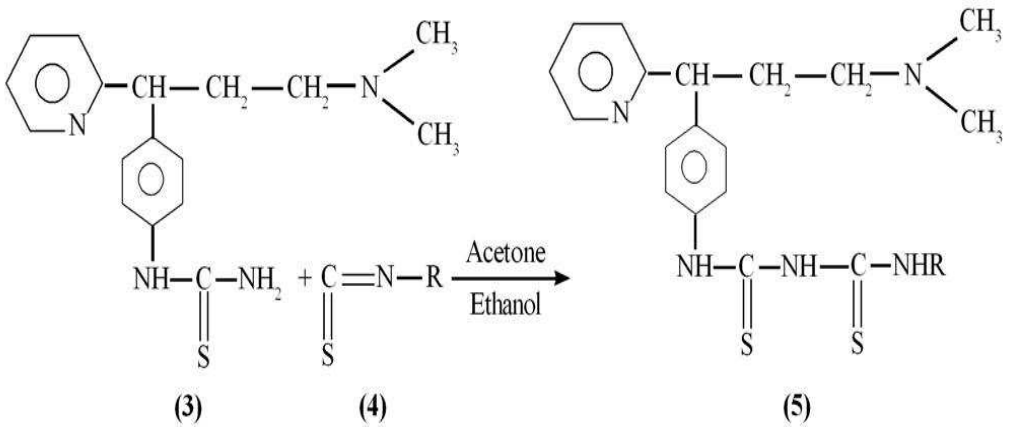
biological activities[6]. The synthesized heteroacycles are used as a best intermediated in the synthesis of thiadiazoles, dithiazoles, thiadizines, triazines, Hector's bases etc.

An exhaustive literature survey on substitutedbiureto and pyridino nucleus containing drugs created their own identity in medicinal and pharmaceutical sciences. Hence taking all these things into considerations interaction of 3-(4-chlorophenyl)-N, N-dimethyl-3-pyridin-2-yl-propan-1-amine (1) with thiourea (2) in isopropanol medium was investigated to synthesize 1-pyridino,1-(4-thiocarbamido)phenyl-dimethylpropanamine(3). **(Scheme-1)** 1-pyridino, 1-(4-thiocarbamido) phenyl-dimethylpropanamine was then interacted with alkyl or aryl isothiocyanates (4) in acetone-ethanol medium to isolate yet new series of 1-pyridino, 1-[4(1-substituted)-2, 4-dithiobiureto] phenyldimethylpropanamine. (5) (**Scheme-2)**



Where R = -H, -phenyl, -methyl, -ethyl, -allyl

Scheme 1



(3) (4) (5)

Where R = -phenyl, -p-Cl-phenyl, -methyl, -ethyl, t-butyl

(**Scheme-2**

Material and Method

The melting point of all the synthesized compounds was recorded using hot Paraffin bath. The carbon and hydrogen analysis was carried out on Carlo-ebra 1106 analyzer. Nitrogen estimation was carried out on Colman-N-analyzer-29. IR spectra were recorded on Perkin Elmer Spectrometer in range 4000-400 cm^{-1} in KBr pellets PMR spectra were recorded on Brucker Ac 300 F spectrometer with TMS as internal slandered using $CDCl_3$ and DMSO–d_6 as solvent. The purity of compound was checked on silica Gel-G pellets by TLC with layer thickness of 0.3 mm. All chemicals used were of AR-grade.

1-Pyridino,1-(4-thiocarbamido)phenyl-dimethylpropanamine (3a)

A mixture of 3-(4-chlorophenyl)-N,N-dimethyl-3-pyridin-2-yl-propan-1-amine(1) (0.1M), thiourea (2a) and isopropanol (40ml) was refluxed on boiling water bath for 4 hrs. During boiling suspended 3-(4-chlorophenyl)-N,N-dimethyl-3-pyridin-2-yl-propan-1-amine went into the solution and the new product was found to be gradually separated out ,which on basification with dilute ammonium hydroxide afforded white crystals. It was filtered in hot conditions and recrystallized with aqueous ethanol to obtained **(3a),** yield 67.7%, melting point 158^0 C. (D)

Properties

It is white, crystalline solid having melting point 158^0C. (D). It gave positive test for nitrogen and sulphur. Desulphurised with alkaline plumbite solution. It formed picrate, melting point 110 ^{0} C. **C [(**found 69.81%) calculated 70.76%]**, H** [(found 6.27%) calculated 6.66%**], N [(**found 14.21%) calculated 14.35%], **S** [(found8.18%) calculated 8.20%]**. IR Spectra:-**The IR spectra was carried out in KBr pellets and the important absorptions can be correlated as, (cm^{-1}) 3393.6 (N-H stretching), 2362.7 [C-H (Ar)] stretching, 1661.6 (C-N stretching), 1101.6 (=C=NH imino), 517.3 (N=C=S). **PMR Spectra**:-The spectrum was carried out in $CDCl_3$ and DMSO-d_6 .This spectrum distinctly displayed the signals due to

Ar-H, protons at δ7.941-8.54 ppm. Ar-NH protons at δ 6.85 ppm, pyridino-NH at δ 3.97 ppm. $-CH_2$ protons at 2.12-2.86 ppm. $-CH_3$ protons at 1.27 ppm

Synthesis 1-pyridino, 1-[4(1-phenyl)-2,4-dithiobiureto]phenyl-dimethylpropanamine (5a)

A mixture of 1-pyridino, 1-(4-thiocarbamido) phenyl-dimethylpropanamine (3) (0.05M) and phenylisothiocyanate (4a) (0.05m) was refluxed on water bath in acetone-ethanol (20ml) medium for 4 hrs in round bottom flask. It was filtered in hot conditions. The resultant filtrate on distillation gave (5a), yield 72% m.p.154^{0}C.

Examination of Product

It is white crystalline solid having melting point 186^{0}C. It gave positive test for nitrogen and sulphur. Desulphurised with alkaline plumbite solution. **C** [(Found 63.85%) calculated 64.14%], **H** [(found 5.95%) calculated 6.01%], **N** [(found 14.44%) calculated 15.59%], **S** [(found 14.20%) calculated 14.25%]

IR Spectrum

The IR spectrum was carried out in KBr pellets. The important absorption can be correlated as (cm^{-1}):- 3387.3 (N-H-Stretching) 3147.7 (Ar C-H-stretching, 1666.3 (C=N stretching), 1575.9 (C-N-stretching), 746.9 (C-S-stretching).

PMR Spectrum

The PMR spectrum was carried out in $CDCl_3$ and DMSO–d_6. This spectrum distinctly displayed signals due to Ar-NH protons at δ 7.99-8 ppm, Ar-H protons at δ 6.9 ppm, NH-proton at δ 3.25 ppm. CH-proton at δ 2.55 ppm CH_3-proton at δ 1.24 ppm

Similarly,1-pyridino,1-[4(1-p-chlorophenyl)-2,4-dithiobiureto]phenyl-dimethyl propanamine(5b),1-pyridino,1-[4(1-methyl)-2,4-dithiobiureto]phenyl-dimethyl propanamine.(5c), 1-pyridino,1-[4(1-ethyl)-2,4-dithiobiureto]phenyl-dimethylpropanamine.(5d), and 1-pyridino,1-[4(1-tert-butyl)-2,4-dithiobiureto]phenyl-dimethylpropanamine.(5e) were synthesized by interacting 1-pyridino,1-(4-thiocarbamido)phenyl-dimethylpropanamine (3) with p-chlorophenylisothiocyanate (4b) methylisothiocyanate (4c) ethylisothiocyanate (4d) and tert-butylisothiocyanate (4e) by above mentioned method and enlisted in **Table No. 1**.

Table No.1

Sr.No.	1-Pyridino,1-[4(1-substituted)-2,4-dithiobiureto] phenyl-dimethylpropanamine	Yield %	m.p. ^{0}C
1	**.....-p-Cl-phenyl……**	67	149
2	**……..methyl……**	65	184
3	**……..ethyl……**	71	181
4	**……..tert-butyl……**	59	161

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