e-ISSN: 2248-9126
Vol 4 |Issue 2 | 2014 | 119-120. Print ISSN: 2248-9118

Indian Journal of Pharmaceutical Science & Research

www.ijpsrjournal.com

SYNTHESIS OF N-(7-SUBSTITUTEDTHIOCARBAMIDOQUINOLINE-4-YL)-N,N-DIETHYL-PENTANE-1,4-DIAMINE BY USING N,N-TRIETHYLAMINE

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ABSTRACT

Heterocyclic nucleus 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. Benzonido and pyridino, dithiazolo, quinolino and alkyl amino heterocycles showed important applications in industrial, pharmaceutical, medicinal and drug chemistry. Considering all these facts into consideration recently in this laboratory interactions of N-(7-chloroquinoline-4-yl)-N,N-diethyl-pentane-1,4-diamine(1)was carried out with various thiourea (2) by using N,N-triethyl- amine as a catalyst in isopropanol medium to isolate N-(7-substitutedthiocarbamido- quinoline-4-yl)-N,N-diethyl-pentane-1,4-diamines(3). 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.

Keywords: Substitutedthiourea, N-(7-substitutedthiocarbamidoquinoline-4-yl)-N,N-diethyl-pentane-1,4-diamines.

INTRODUCTION

Recently in this laboratory, the synthetic applications of dicyandiamide had been briefly explored [1]. As evident from the structure of theN-(7-chloroquinoline-4-yl)-N,N-diethyl-pentane-1,4-diamine, it was observed that there are three reactive sites in this molecule for the reactions. This molecule possesses –Cl, -C_2H_5 and pyridine important reactive sites for the reactions. As a wider programmee of this laboratory in the synthesis of nitrogen, nitrogen and sulphur containing heteroacycles and heterocycles. The interactions of dicyandiamide with various thioureas and alkyl or aryl isothiocyanates 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 intermediate [7,8] in the synthesis of thiadiazoles, dithiazoles, thiadizines, triazines, Hector's bases etc.

An exhaustive literature survey on substituted thiobiureto, pyridino, dithiaozoyl and bezonido nucleus containing drugs created their own identity in medicinal and pharmaceutical sciences. Hence taking all these things into considerations interactions of N-7-chloroquinoline-4-yl)-N,N-diethyl-pentane-1,4-diamine (1) with thiourea (2) by using N,N-triethyl- amine as a catalyst in isopropanol medium was investigated to synthesize N-(7-thiocarbamidoquinoline-4-yl)-N,N-diethyl-pentane-1,4-diamine (3) (Scheme-1).

These reactions are hither to unknown. 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 (Scheme-I).

Experimental

The melting point of the all synthesized compounds was recorded using hot Paraffin bath. The carbon and hydrogen analysis were 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 400 F Spectrometer

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with TMS as internal standard 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.

Synthesis of N-(7-Thiocarbamidoquinoline-4-yl)-N, N-diethyl-pentane-1,4-diamines(3a):-

A mixture of N-(7-chloroquinoline-4-yl)-N,N-diethyl-pentane-1,4-diamine(1)(0.1M), thiourea(2)(0.1M), N,N-triethyl-amine (2 ml)and isopropanol (40ml) was refluxed on boiling water bath for 4 hrs. During boiling suspendedN-(7-chloroquinoline-4-yl)-N,N-diethyl-pentane-1,4-diaminewent 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 74.9%, melting point 214^0 C.

Properties:-It is white, crystalline solid having melting point 214^0C. It gave positive test for nitrogen and sulphur. Desulphurised with alkaline plumbite solution. It formed picrate, melting point 108^0 C.

Elemental analysis:-C [(found 67.4%) calculated 68.96]**, H** [(found 7.17%) calculated 7.58%**], N [(**found 16.1%) calculated 16.19], **S**[(found 6.72%)calculated 7.35]**.**

IR Spectra:-The IR spectra was carried out in KBr pellets and The important absorption can be correlated as (cm^{-1}) 3380 (N-H stretching), [C-H(Ar)] stretching 3094.26, 1368.11 (=C=S), 1213.7 (C-N stretching), 2921.30(-CH_3),1209.41(-C=N-),3275(-NH_2),3102.9(-phenyl).

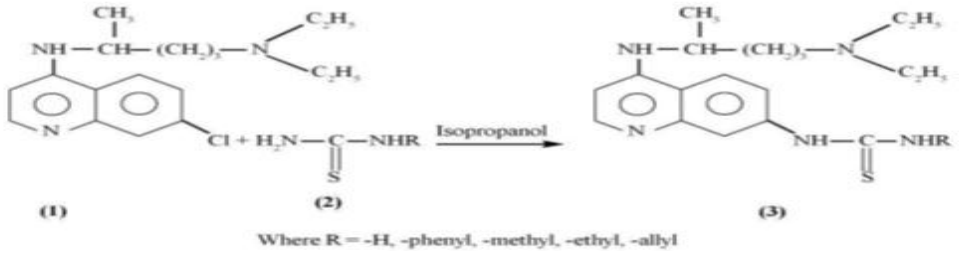
N**MR Spectra**:-The spectrum was carried out in $CDCl_3$ and DMSO-d_6 .This spectrum distinctly displayed the signals due toAr-H, protons at δ8.1188-8.5352ppm, Ar-NH protons at δ 5.0089 ppm, pyridino-NH at δ 4.2786-4.8453ppm, –CH_2 protons at 3.1030-3.9635 ppm., –CH_3 protons at δ 1.0767-1.5204ppm.

Similarly, N-(7-chloroquinoline-4-yl)-N,N-diethyl- pentane-1,4-diamine(1) was interacted with phenylthiourea(2b), methylthiourea(2c), ethylthiourea(2d) and allylthiourea(2e) in same reaction conditions as mentioned above the products which were synthesized are as depicted in Table No. 1.

Table 1. The % of yield and melting point

Sr.No	Compound No	N-(7-Substitutedthiocarbamidoquinoline-4-yl)-N,N-diethyl-pentane-1,4-diamines	Yield (%)	Melting point ^{0}C
1	2b	----------**phenyl**----------	78.73	230
2	2c	----------**methyl**----------	82.8	218
3	2d	----------**ethyl**----------	79.18	222
4	2e	----------**allyl**----------	65.10	178

Scheme I



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