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Research Article

SYNTHESIS OF 7-SUBSTITUTEDTHIOCARBAMIDO-1-METHYL-5-PHENYL-3H-1,4-BENZODIAZEPINE-2-ONE

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Abstract: Heterocyclic nucleus containing drugs showed remarkable and noticeable pharmacodynamics and pharmacokinetics properties . They generated their own identity and importance in medicinal, pharmaceutical, agricultural and drug sciences. Benzonido and pyridino, dithiazolo, quinolino and alkylaminoheterocycles showed important applications in industrial, medicinal,pharmaceutical and drug chemistry. Considering all these facts into consideration, recently in this laboratory interactions of 7-chloro-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2- one (1)was carried out with variousthiourea(2)by using inisopropanol medium to isolate 7-substitutedthiocarbamido-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one(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.

Key words: Substitutedthiourea ,7-substitutedthiocarbamido-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one

INTRODUCTION:

In this laboratory, the synthetic applications of cyanoguanidine had been briefly explored.[1] As evident from the structure 7-chloro-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2- one it was observed that there are three reactive sites in this molecule for the reactions. This molecule possesses -chloro,-aryl and –carbonyl important reactive sites for the reactions. As a wider programme of this laboratory in the synthesis of nitrogen, nitrogen and sulphur containing heteroacycles and heterocycles. The interactions of cynoguanidine with various thioureas 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 intermediate[7-8]in the synthesis of thiadiazoles, dithiazoles, thiadizines, triazines, Hector's bases etc.

An exhaustive literature survey on substitutedthiobiureto, pyridino, dithiaozoyl and bezonido nucleus containing drugs created their own identity in medicinal and pharmaceutical sciences. Hence taking all these things into considerations interactionsof 7-chloro-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2- one (1)with thiourea(2) in isopropanol medium was investigated to synthesize,7-thiocarbamido-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one**(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 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 7-Thiocarbamido-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one(3a):

A mixture of 7-chloro-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one (1)(0.1M),with thiourea(2)(0.1M)and isopropanol (40ml) was refluxed on boiling water bath for 4 hrs. During boiling suspended7-chloro-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one 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 62.8%, melting point 220^0 C.

Properties:-It is white , crystalline solid having melting point 220^0C. It gave positive test for nitrogen and sulphur. Desulphurised with alkaline plumbite solution. It formed picrate, melting point 119^0 C.

Elemental analysis:-C [(found 61.96%) calculated 62.96]**, H** [(found 4.45%)calculated 4.93 % **], N [(**found 17.27%) calculated 17.28%], **S**[(found 9.87%) calculated 9.87%]**.**

IR Spectra:-The IR spectra was carried out in KBr pellets and The important absorption can be correlated as (cm^{-1}) 3390 (-NH_2 stretching),1620(=C=NH imino), 1240(-C-N stretching), 1180 (-C=S),2850-(CH_3) and 1700 (-C=O).

N**MR 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 δ 7.6376-7.0632 ppm, Ar-NH protons at δ 6.7566-6.7404 ppm, -NH_2 at δ 4.6496-4.6229 ppm,-NH protons at 3.7897-3.445 ppm, –CH_2 protons at 2.5705-2.1807 ppm and –CH_3 protons at 1.2403-1.0642 ppm.

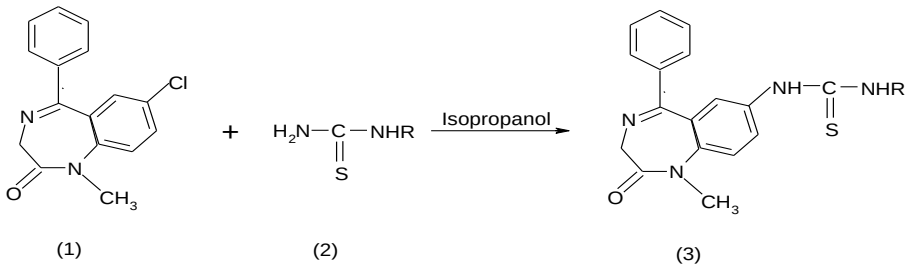
Similarly, 7-chloro-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one was interacted with phenylthiourea(2b), methylthiourea(2c), ethylthiourea(2d) and allylthiourea(2e) in same reaction conditions as mentioned above the products which were synthesized are as depicted in **Table No. 1**

Table No. 1

Sr.No	Compound No	**7-Substituted**thiocarbamido-1-methyl-5-phenyl-3H-1,4-benzodiazepine-2-one	Yield (%)	m.p. ^0C
1	2b	----------**phenyl**----------	69	230
2	2c	----------**methyl**----------	78	168
3	2d	----------**ethyl**----------	63	174
4	2e	----------**allyl**----------	73	154

Scheme-I

Scheme - I



(1) (2) (3)

Where, R = -H, -Phenyl, -Methyl, -Ethyl and -Allyl.

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