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بسم الله الرحمن الرحيم

شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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A THESIS ENTITLED

SYNTHESIS AND REACTIONS OF SOME NEW HETEROCYCLIC COMPOUNDS CONTAINING N AND/OR S OF EXPECTED BIOLOGICAL ACTIVITIES

PRESENTED

BY

MAHMOUD NASR EL-DEEN MAHMOUD GOUDA

(B.Sc., 1996)

FOR PARTIAL FULFILMENT OF THE DEGREE OF M. Sc.
(ORGANIC CHEMISTRY)

CHEMISTRY DEPARTMENT
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SYNTHESIS AND REACTIONS OF SOME NEW HETEROCYCLIC COMPOUNDS CONTAINING N AND/OR S OF EXPECTED BIOLOGICAL ACTIVITIES

BY

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ABSTRACT

Name : Mahmoud Nasr El Deen Mahmoud Gouda

Title : Synthesis and Reactions of Some New Heterocyclic Compounds Containing N and/or S of Expected Biological Activities.

Degree : M. Sc. Thesis, Chemistry Department, Faculty of Science, Cairo University.

This work has been carried out to investigate the chemical reactivity and synthetic potentiality of 2-thioxohydropyridines **6a-c** via their reactions with several active halogen-containing compounds to afford the corresponding 2-alkylthiopyridines in some cases and thieno [2, 3-b] pyridines in most cases. Thieno [2, 3-b] pyridine-2-carbohydrazides obtained through the reactions of 2-ethoxycarbonylthienopyridines with hydrazine hydrate which in turn, used to obtain the corresponding pyrimidinones and oxadiazoles. 3-Aminopyrazolopyridines obtained via the reactions of **6a-c** with hydrazine hydrate and the diazonium salt of **6a** prepared and coupled with several active-hydrogen containing reagents to give the corresponding triazines. Structures of all newly synthesized heterocyclic compounds were established by considering the data of both spectroscopic and elemental analyses.

Key Words: 2-Cyanoethanethioamide, 2-Thioxohydropyridines, 2-Alkylthiopyridines, Haloalkanes, Thienopyridines, Thiopyranopyridines, Thienopyridine-2-carbohydrazides, Formamide and Triazines.

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To

My Father

My Mother

My Wife

My Son

Dr. Rokia Yousef Saleh

Who Gave Me Help and Support

Mahmoud N. M. Gouda

M.Sc. Courses Studied by the candidates

Besides the work presented in this thesis, the candidate has attended passed successfully the following post-graduate courses as a partial fulfillment of the requirements for the degree of science.

1) Heterocyclic Chemistry
2) Advanced Physical Organic Chemistry
3) Photochemistry
4) Polymer Chemistry
5) Designing Organic Chemistry
6) Biochemistry
7) Natural Product
8) Applied Spectroscopy
9) Pericyclic Reactions
10) Organic Microanalysis
11) New Trends in Analytical Chemistry
12) Instrumental Analysis
13) Quantum Chemistry
14) Selected Topics
15) Mathematics and Scientific Compounds
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AIM OF THE PRESENT WORK

The present work aimed and was designed to fulfill the following objectives:

1- Continuation of the effort done by this group of research at Cairo University in the field of synthesis of heterocyclic derivatives of expected biological and medicinal activities.

2- Synthesis of several new heterocyclic derivatives containing nitrogen and / or sulphur using the laboratory available chemicals and reagents.

3- Establishment of the structures of the newly synthesized heterocyclic compounds by considering the data of TLC, IR, ^{1}H-NMR, mass spectra and the elemental analyses.

4- Synthesis of some of these heterocyclic derivatives via alternative routes which was also used as a tool to confirm the structures of the newly synthesized heterocyclic derivatives.

5- Study of the most probable mechanisms leading to the formation of the obtained heterocyclic products and comparison of our results with others of similar ring systems.

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Mahmoud N. M. Gouda

SUMMARY OF THE ORIGINAL WORK

SUMMARY OF THE ORIGINAL WORK

The following is the summary of the original work investigated and included in the present thesis:

1- The starting materials of the present study were synthesized by reacting 2-cyanoethanethioamide **(1)** with each of 1,3-diarylprop-2-en-1-ones **2a-c** to give the corresponding 2-thioxohydropyridine-3-carbonitriles **6a-c**. Compounds **6a-c** used as good starting materials of the present study (cf. chart 1).

2- Compounds **6a-c** reacted with active halogen containing compounds **7a-d** in basic medium to afford the corresponding 2-alkyl-thioderivatives **8f,j,k** which cyclized to their corresponding thieno[2,3-b]pyridines **9f,j,k** in some cases while in most cases the corresponding thieno[2,3-b]pyridines **9a-e,g-i,l** obtained without isolation of their corresponding 2-alkylthio derivatives (cf. Chart 2).

3- On the other hand, compounds **6a-c** reacted with chloroacetyl chloride **7e** to give the corresponding $SCOCH_2Cl$ derivatives **8m-o** which cyclized in basic medium to afford the corresponding thiopyranopyridines **9m-o** (cf. Chart 3).