

STUDYING OF (THERMAL ,MICROBIAL , SPECTRAL, SOLVATION)-BEHAVIOR OF PREVIOUSLY PREPARED COMPOUNDS OF (BENZOTHAZOLE-HETEROCYCLES)

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ABSTRACT

The aim of this work is studying of Applications and behavior of series from compounds in our previously paper⁽¹⁾ which acts (anil, lactam ,tetrazole, imidazole, diazepine , oxazepine , thiazane)- derivatives . The prepared compounds in this paper screened against types of bacteria to measured inhibition activity of types of selected bacteria , then studying of some chemical with physical properties ,solvation in various solvents , studying of thermal analysis , stability in high temperature .

Keywords: antibacterial ,anil, lactam ,tetrazole, imidazole, diazepine ,oxazepine ,thiazane

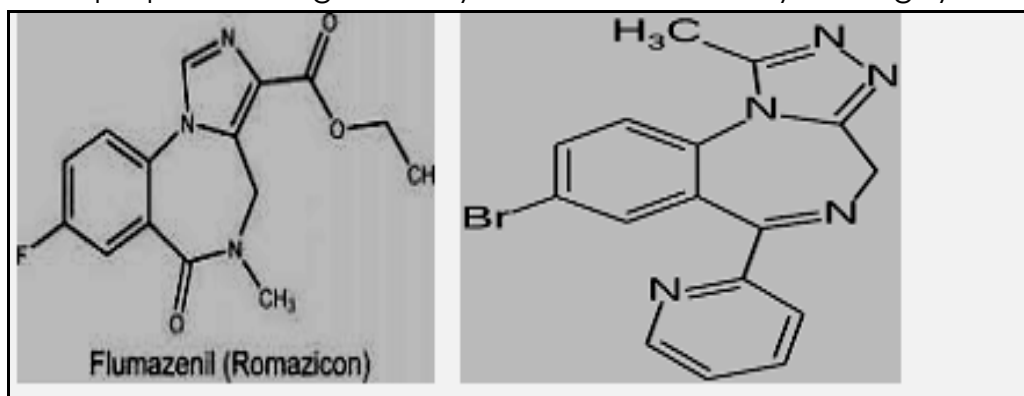
No: of Tables : 2

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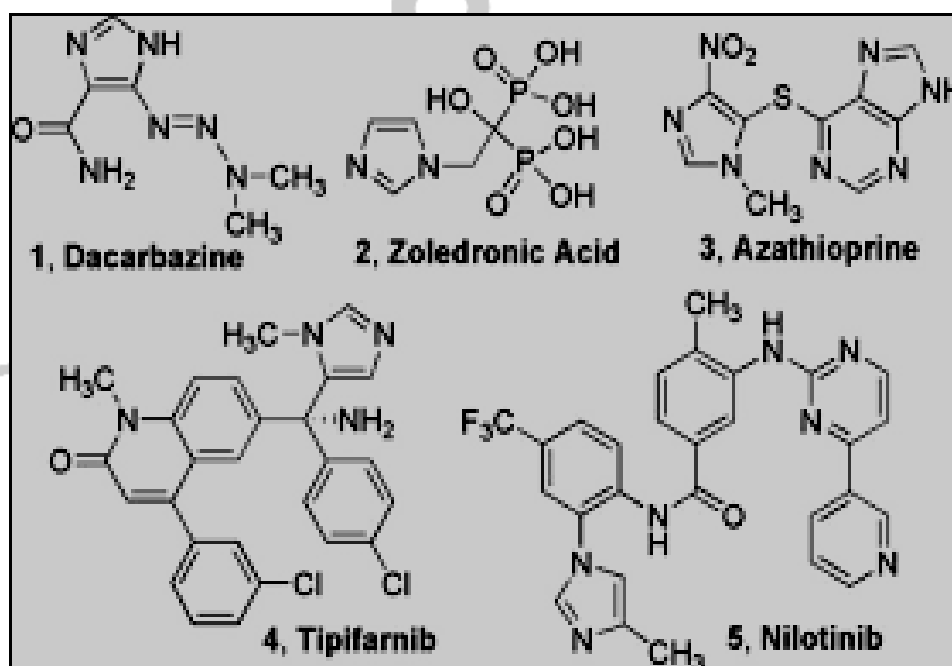
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Introduction

A large number of the heterocyclic derivatives are essential to life various molecules like alkaloids, antibiotics, essential amino acids, vitamins, hemoglobin, hormones and large number of prepared drugs and dyes contain hetero cyclic ring systems⁽¹⁻³⁾:



Benzothiazole derivatives play important role in medical field due to their biological activity which act in anti malaria, antiviral, anti-inflammatory, antitumor, antimicrobial, and anti-fungal activity⁽⁴⁻¹¹⁾.



Diazepine, oxazepine, imidazole and thiazan compounds are a class of hetero cyclic compounds which contain the (S, O, N) atoms, it is present in various chemical compounds, which linked with active group are very important to prepare a wide range of medical and industrial compound⁽¹²⁻²⁰⁾ in preparation of large numbers of organic compounds in chemistry fields, and got a special importance in the medical and pharmaceutical industry because play an active role in biological molecular system⁽²¹⁻²⁸⁾.

Experimental & Materials :

All bio- materials and chemical-bio- instrumentals used from college of education, biological studying carried out in Bio – lab in biological department , college of science ., Chemical Studying carried out in chemistry department .

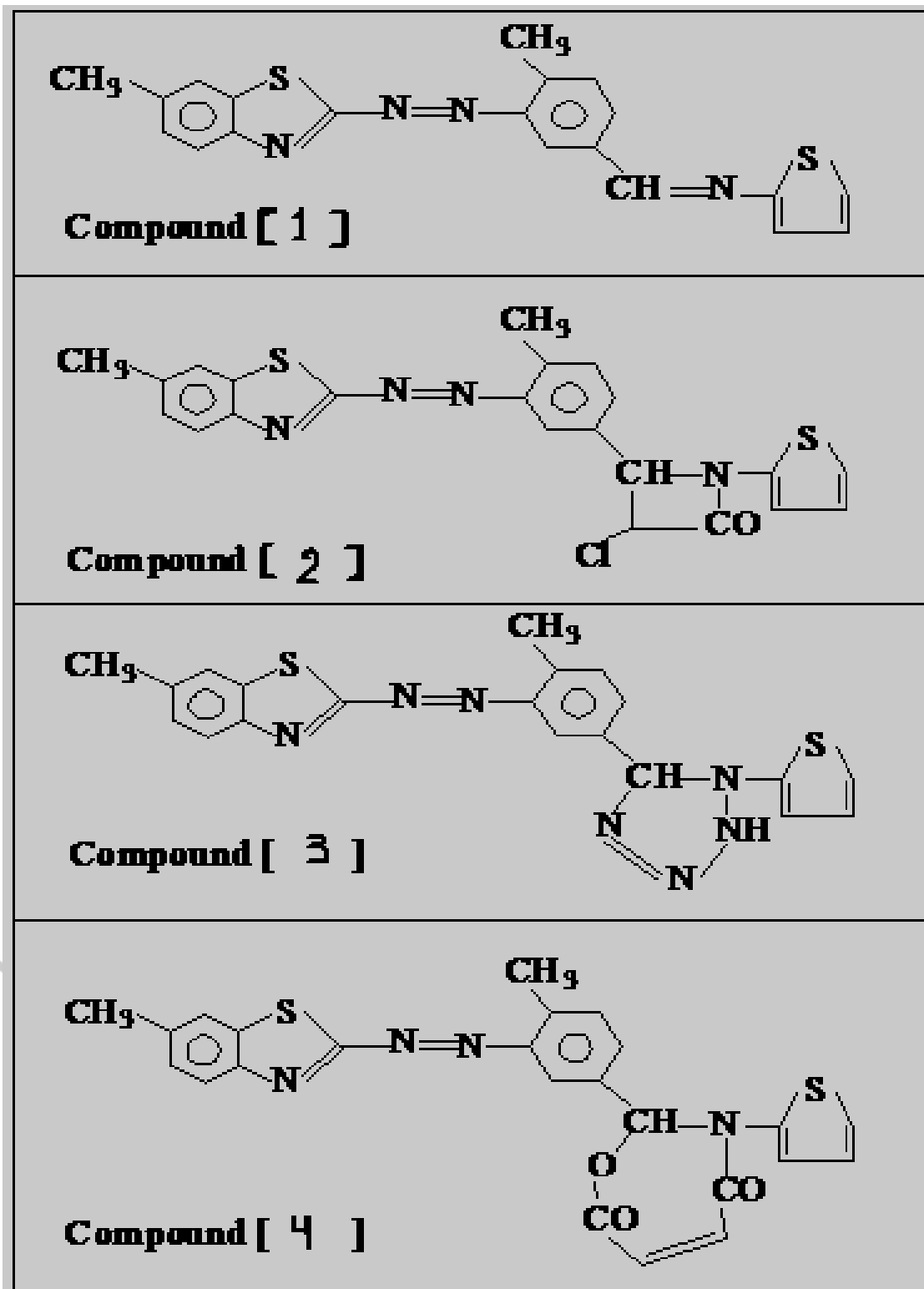
EXPERIMENTAL Part:

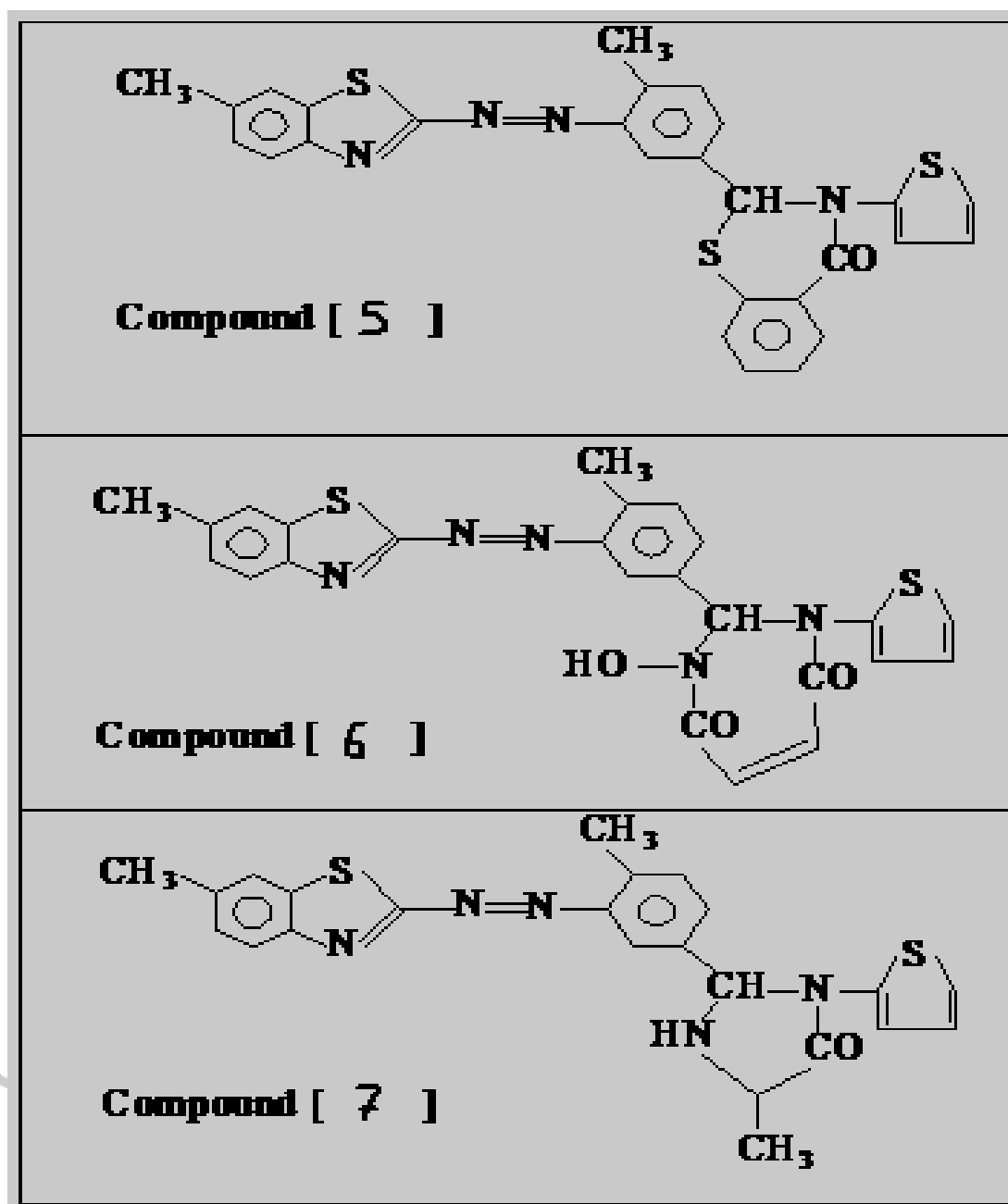
The test for biological activities of prepared compounds have been tested for their antimicrobial activities by agar via biological methods^(11, 12) .The antibacterial activities were done at (0.005 M) concentrations in (DMSO) solvent by using types of bacteria (**bacteria- *Staphylococcus. Aureu***), (**bacteria - *Lactobacillus .sp***). These bacterial strains were incubated for 24 hr at 37°C.

Synthesized Compounds In Schemes:

In our schemes , we prepared many compounds in previously work⁽¹⁾ , but now we will study((thermal curves , the biological activity , solvation , physical properties , stability of compounds)) for them in this work :







RESULTS AND DISCUSSION

The formatted compounds tested for Biological Activity against types of bacteria .

Biological Inhibition^(11, 12) :

The test of the sensitivity of the bacterial isolates were included work on five types of bacteria to measure the biological activity of bacteria for ((**bacteria- *Staphylococcus. Aureu***)), ((**bacteria - *Lactobacillus .sp***), Table (1) showed the diameter of inhibition zone for vehicles chemical measured in mm towards the species bacterial. The antimicrobial results are summarized in table (1). From data in our results of antibacterial studies it was found to be potentially activity against towards types of bacteria ,which appeared good evidence from the results that the biological activity of all compounds have high activity which inhibit the growth of bacteria .

The prepared compounds [3 , 7] have higher activity than other heterocyclic compounds which due to presence of nitrogen atoms and sulfur atom in their

structures^(11, 12), the mechanism of action for these compounds involved formation of hydrogen bonding with the active positions of the cell constituents resulting in the interference with the normal cell process.

Table(1):Antibacterial Activity of Compounds (Inhibition Zone in (mm))as average of three Concentrations for Bacteria

Compounds	(average of three Measurements) (1, 5, 10) X 10 ⁻³ (mg.ml ⁻¹)	(average of three Measurements) (1, 5, 10) X 10 ⁻³ (mg.ml ⁻¹)
	<i>Lactobacillus .sp</i>	<i>Staphylococcus. Aureus</i>
[1]	4	6
[2]	8	10
[3]	14	18
[4]	6	6
[5]	12	16
[6]	12	12
[7]	12	18



Picture (1) : Inhibition zone on *Lactobacillus .sp*



Picture(2):Inhibition zone on *Pseudomonas .aeruginos*



Picture(3): Inhibition zone(other copms) on *Pseudomonas .aeruginos*

Inhibition activities of prepared compounds were evaluated according to their action against types of bacteria are described in table (1). The presence of heterocycles like diazepine, tetrazole, imidazol, thiazane are reported^(11, 12) to possess antibacterial and antifungal effect may enhance or increase the biological activity of the nitrogen and sulfur derivatives

The results appeared that the Activity for compounds (3 and 7) the effectiveness of anti-resistant bacteria is higher than other vehicles in the inhibition of the types of

bacteria. And also Because these compounds contain multiple episodes of heteroatoms, which gives vital to the effectiveness of many of the bacteria.

Thermal Scanning Studying of Compounds :

DSC–Thermal curves scanning carried out for all compounds according to method of paper⁽²⁸⁾, all results in figures(1- 7) ,DSC-scanning curves of prepared compounds appeared high stability toward various temperature in all of thermal curves :

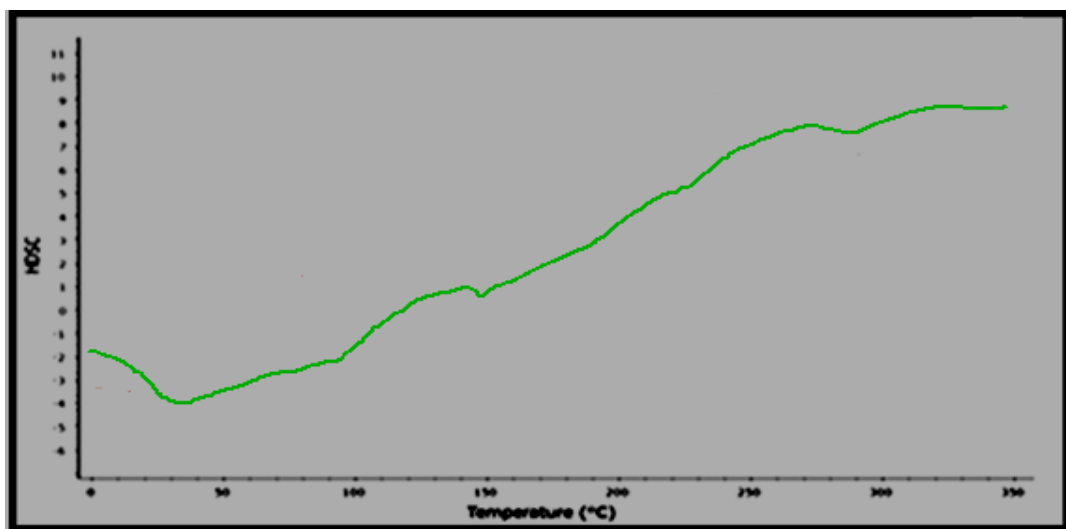


Fig (1) : DSC- Thermal Analysis of Compound [1]

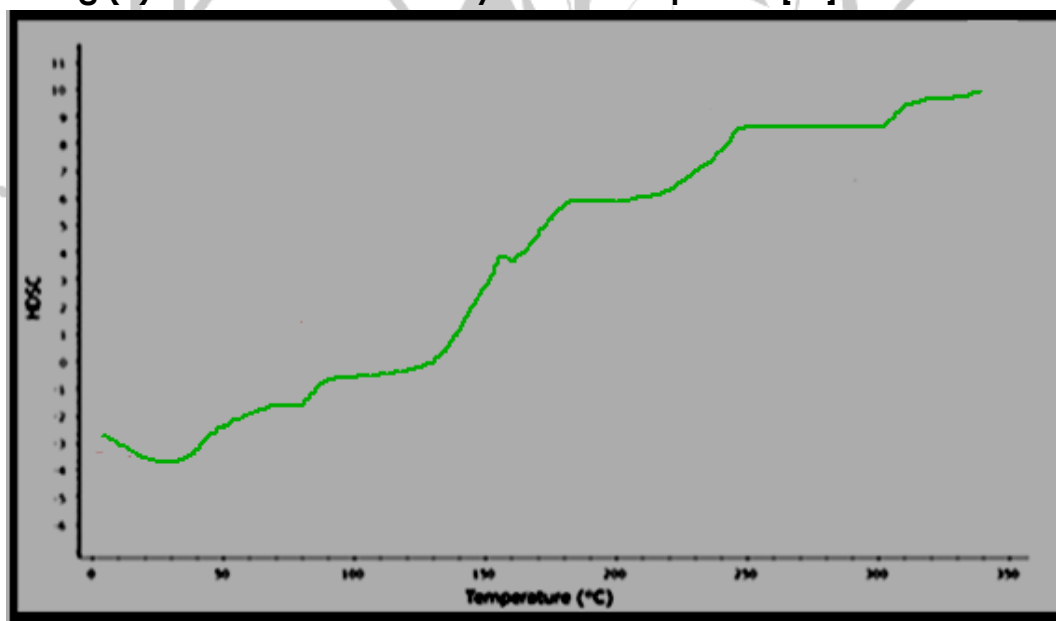


Fig (2) : DSC- Thermal Analysis of Compound [2]

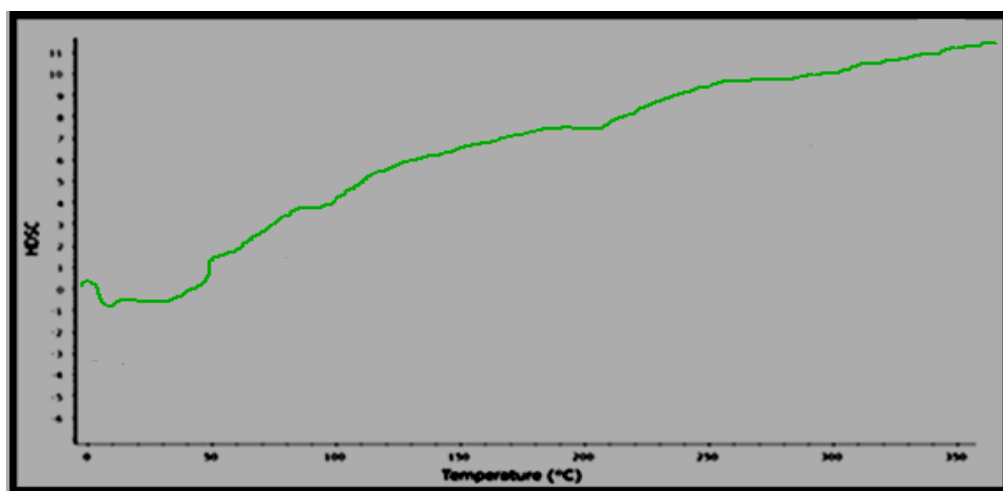


Fig (3) : DSC- Thermal Analysis of Compound [3]

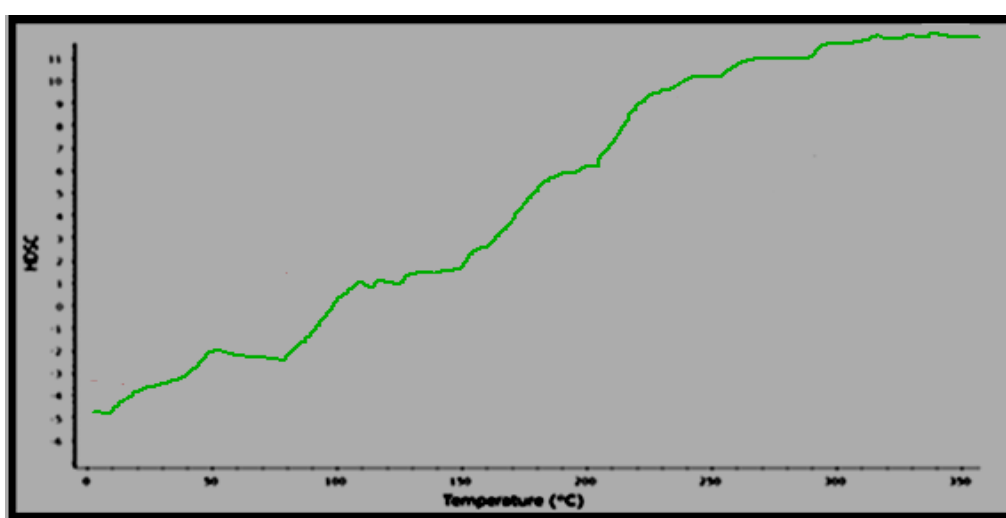


Fig (4) : DSC- Thermal Analysis of Compound [4]

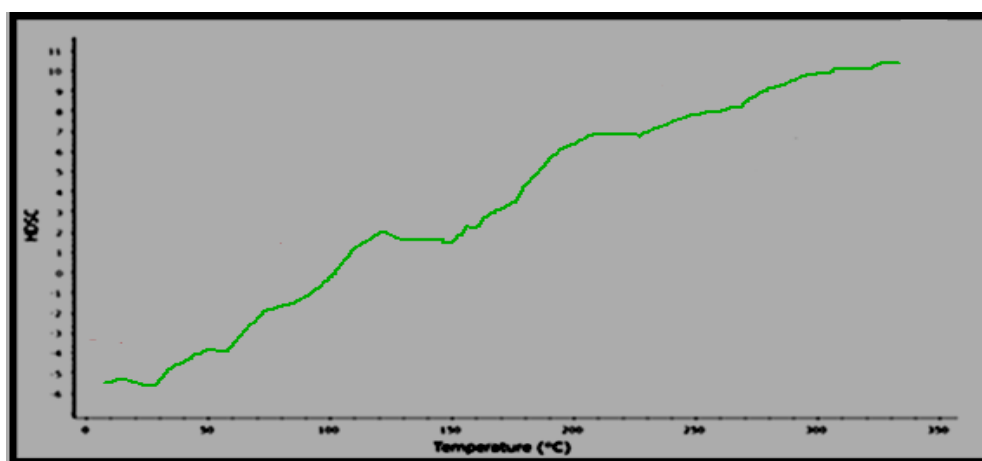


Fig (5) : DSC- Thermal Analysis of Compound [5]

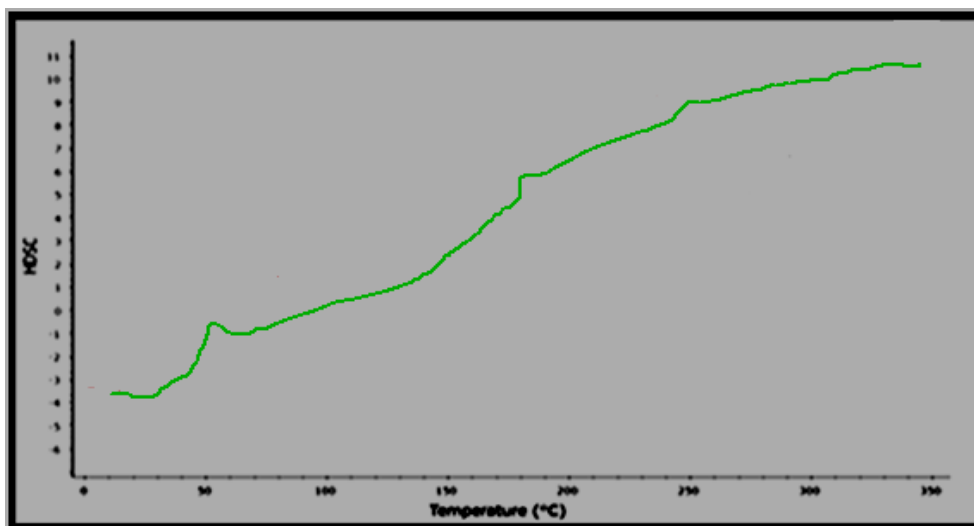


Fig (6) : DSC- Thermal Analysis of Compound [6]

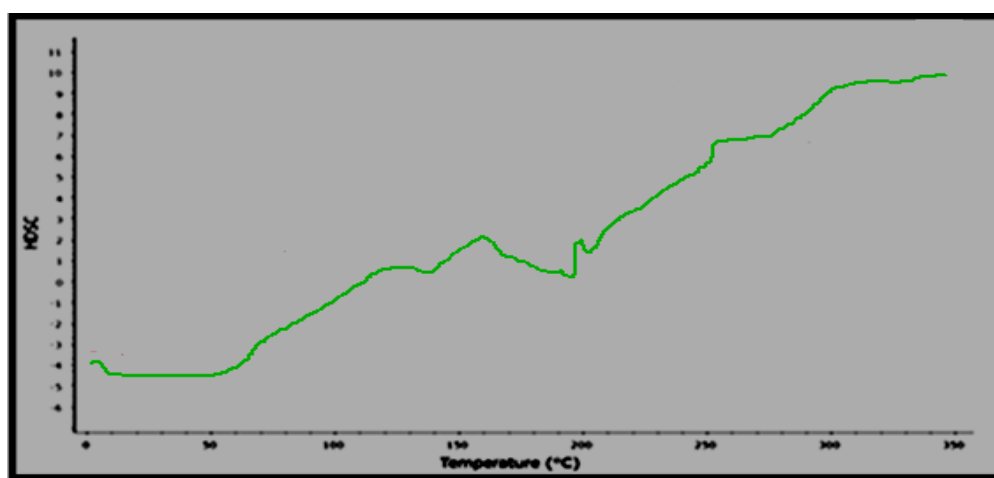


Fig (7) : DSC of Compound [7]

Solvation in Types of Solvents :

The compounds were tested in various solvents according to polarity of solvents with activity of active groups in prepared compounds in this studying , all results are summarized in Table (2).

Table (2) : Solvaton of Compounds in Various Solvents.

Compound s	Solvents					
	CH ₃ OH	DMSO	CCl ₄	1,4-Dioxane	DMF	CHCl ₃
[2]	+	+	-	-	-	-
[3]	+	+	-	-	-	-
[4]	+	+	-	-	-	-
[5]	+	+	-	-	-	-
[6]	+	+	-	-	-	-
[7]	+	+	-	-	-	-

The solubility of prepared compounds depends on nature and activity of functional group and terminal of compounds (polarity of group) in monomers which cause interaction⁽¹¹⁾ which act in : (OH – group , NH , Other groups) or any other active functional groups in our compounds.

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