

## Chemical Studying of New Organic Heterocyclic Compounds

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### Abstract

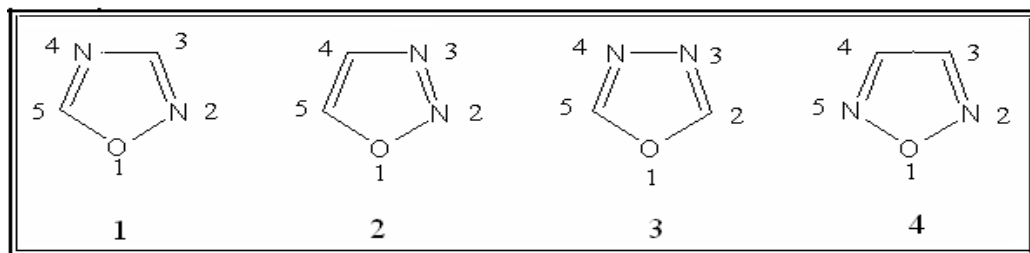
This study involved using of prepared compounds in previously paper<sup>(1)</sup> in new chemical studying , which have wide spectrum from applications and uses in many fields represented in thermal studying such as (DSC – Curves ) , chromatography applications , and other chemical studies .This studying containing heterocyclic compounds with one or more than one hetero atom such as ( sulfur , nitrogen , oxygen ) like oxadiazole , indole , thiazepine , diazepin , oxazepine which act seven membered ring and five membered ring with six membered ring .

**Keywords :** fields , indole , oxazepine .

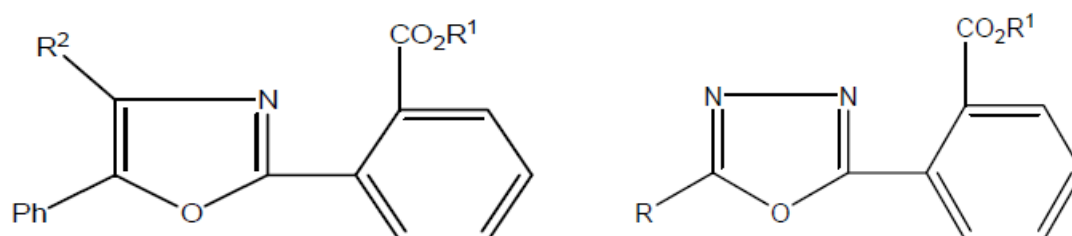
### Introduction

Many drugs are class of heterocyclic derivatives which played a vital role in the metabolism of most of living cells ; and act five , six membered heterocyclic compounds having one to three hetero atoms in their nucleus. The derivatives may be imidazole and pyrrole basis of genetic material DNA, and these heterocyclic compounds may be isolated or fused heterocyclic systems. Some of the common heterocyclic compounds used in the medicines are as amino acids like indol ,tryptophane , histidine , the vitamins and coenzymes precursors such as thiamine, riboflavin, pyridoxine, folic acid, biotin, B12 from the vitamins<sup>(1-4)</sup> . There is a vast number of pharmacologically active hetero cyclic compounds, Oxadiazole is derived

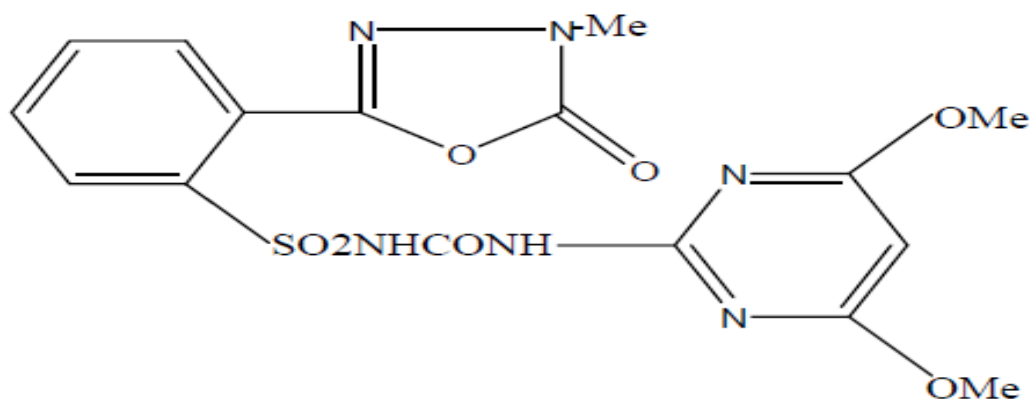
from furan ring through replacement of two carbon atoms (-CH=) group by two pyridine type nitrogen (-N-). There are four isomers of oxadiazole (**1**, **2**, **3**, **4**) ring which depending on the position of (N-) atom in the ring<sup>(5-7)</sup>



The oxadiazole ring and its derivatives have a vital role in biological properties as well known antibacterial agents<sup>(7-9)</sup> and anti fungal:



Oxadiazole commonly known as barbituric acids have important role in the pharmaceutical field which has been reported to show antispasmodic, relaxant activity.



The capacity of 1, 3, 4-oxadiazole ring to undergo variety of chemical reaction have made it medicinal backbone on which number of potential molecules can be constructed. Studying survey reveals that particularly 1, 3, 4-oxadiazole derivatives exhibit wide range of biological activities including antitumor, anti-inflammatory, fungicidal, herbicidal, analgesic, anticonvulsant, anti-HIV, antimicrobial and plant growth regulator activities. If at least one atom other than carbon, forms a part of the ring system designated as a

heterocyclic compound. Nitrogen, oxygen and sulfur are the most common hetero atoms in our derivatives<sup>(10-17)</sup>.

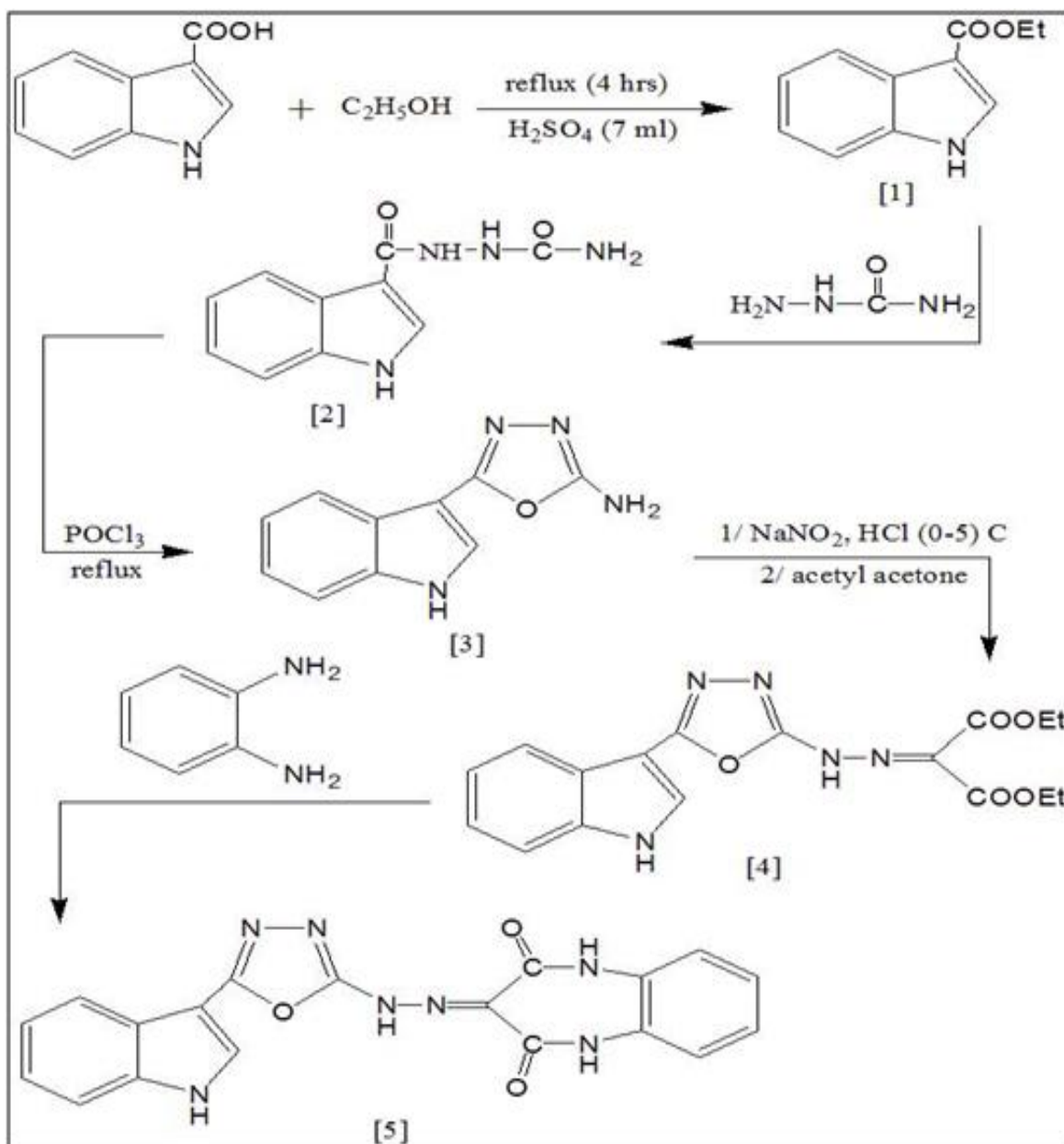
Heterocyclic compounds occur widely in nature and in a variety of non-naturally compounds, large number of heterocyclic compounds are containing in many bio molecules like alkaloids, antibiotics, amino acids, the vitamins<sup>(18-21)</sup>.

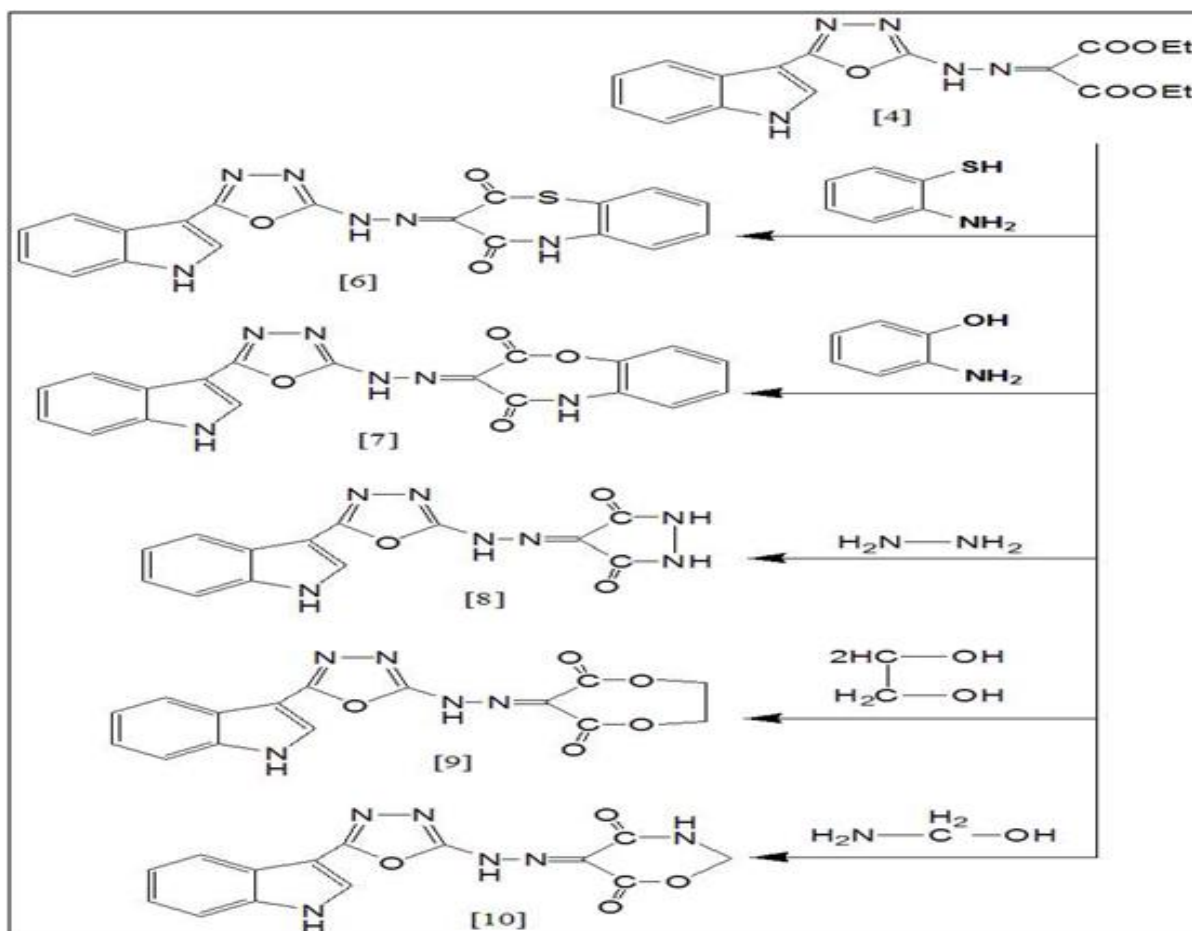
### **Experimental and Apparatuses**

All measurements and chemical instrumentals carried out in department of chemistry and chemical materials ( purity 99 % ) from merck and BHD chemical company .

### **Synthesized Compounds In Our Past Paper<sup>(1)</sup> :**

From previously paper<sup>(1)</sup> ,we prepared ten compounds , in this studying we will study the other chemical studies and other applications for them in this work :





## Results and Discussion :

From the past studying of our work, we prepared these ten cyclic compounds and now we will study of some chemical studies :

### Chemical Studying :

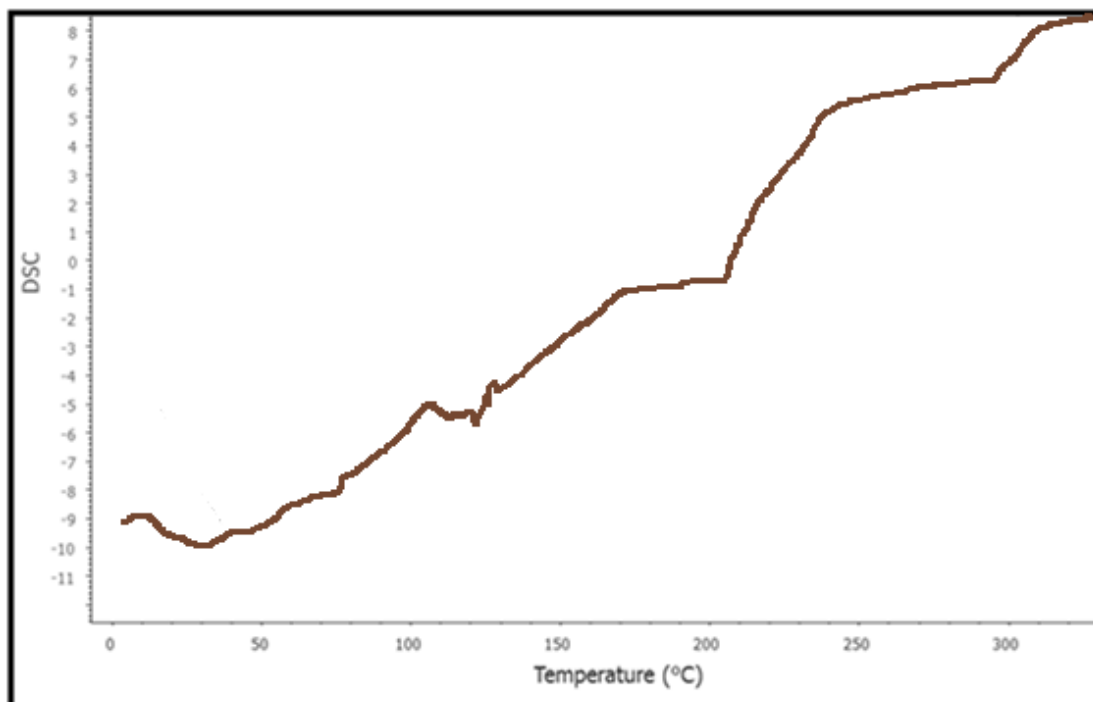
**The solvation and interaction of prepared compounds** were studied in many types of solvents according to functional groups in our compounds in solvents , the results are listed in table (1).

**Table (1) : Interaction of Compounds in types Solvents.**

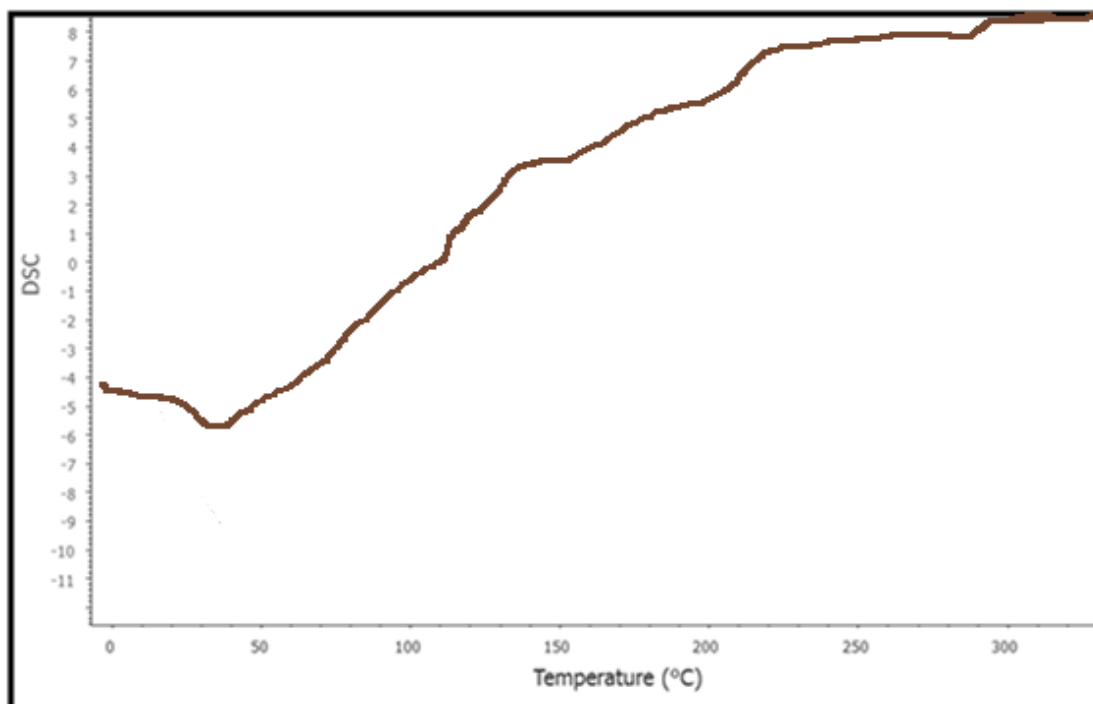
Compounds	Solvents					
	Ether	Methanol	DMSO	CHCl <sub>3</sub>	CCl <sub>4</sub>	DMF
{ 1 }	-	+	+	-	-	-
{ 2 }	-	+	+	-	-	-
{ 3 }	-	+	+	-	-	-
{ 4 }	-	+	+	-	-	-
{ 5 }	-	+	+	-	-	-
{ 6 }	-	+	+	-	-	-
{ 7 }	-	+	+	-	-	-
{ 8 }	-	+	+	-	-	-
{ 9 }	-	+	+	-	-	-
{ 10 }	-	+	+	-	-	-

**Thermal Applications :**

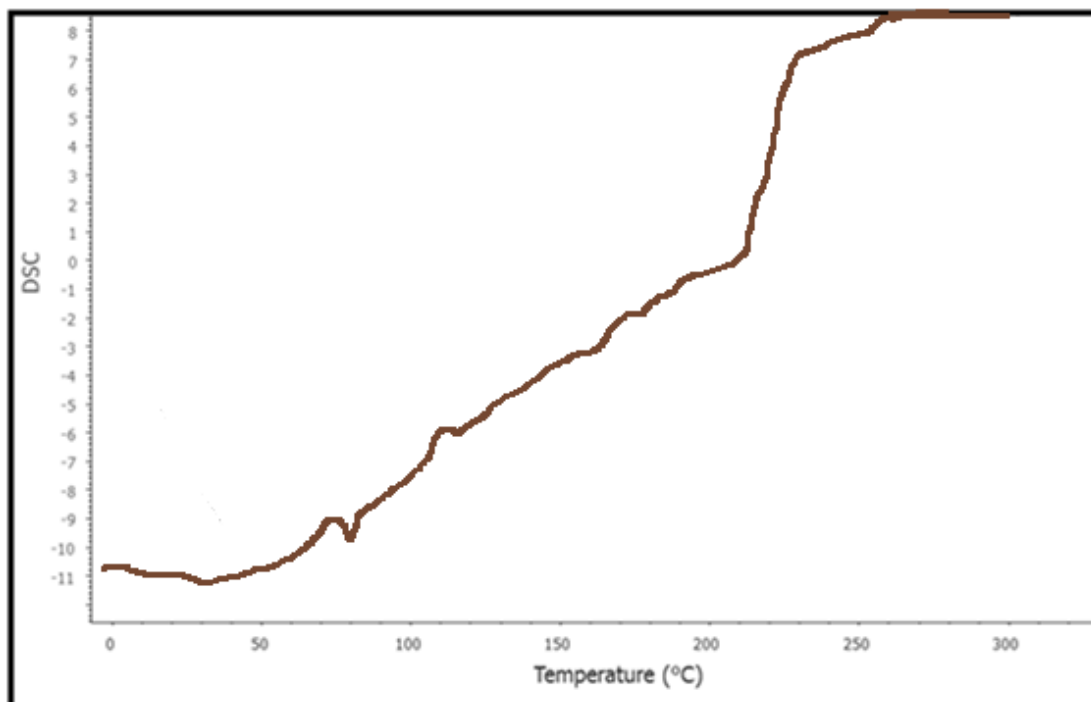
DSC – applications of many prepared compounds carried out for nitrogen and sulfur heterocyclic compounds in some figures (1- 7) :



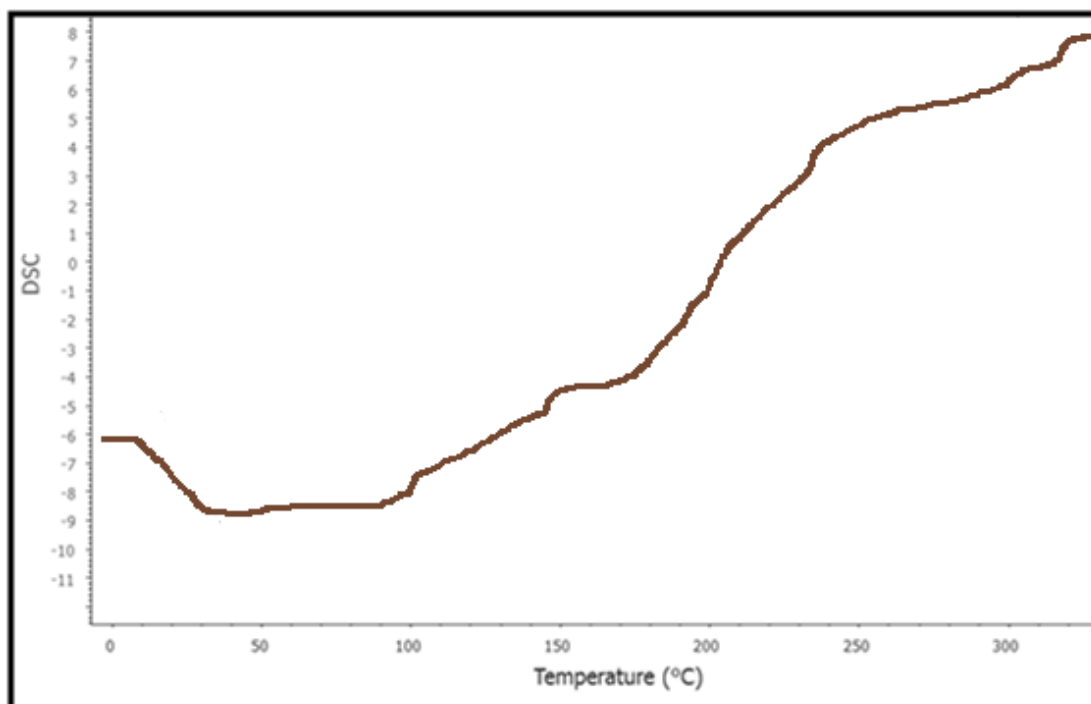
**Fig (1) : DSC of Compound { 1 }**



**Fig (2) : DSC of Compound { 2 }**

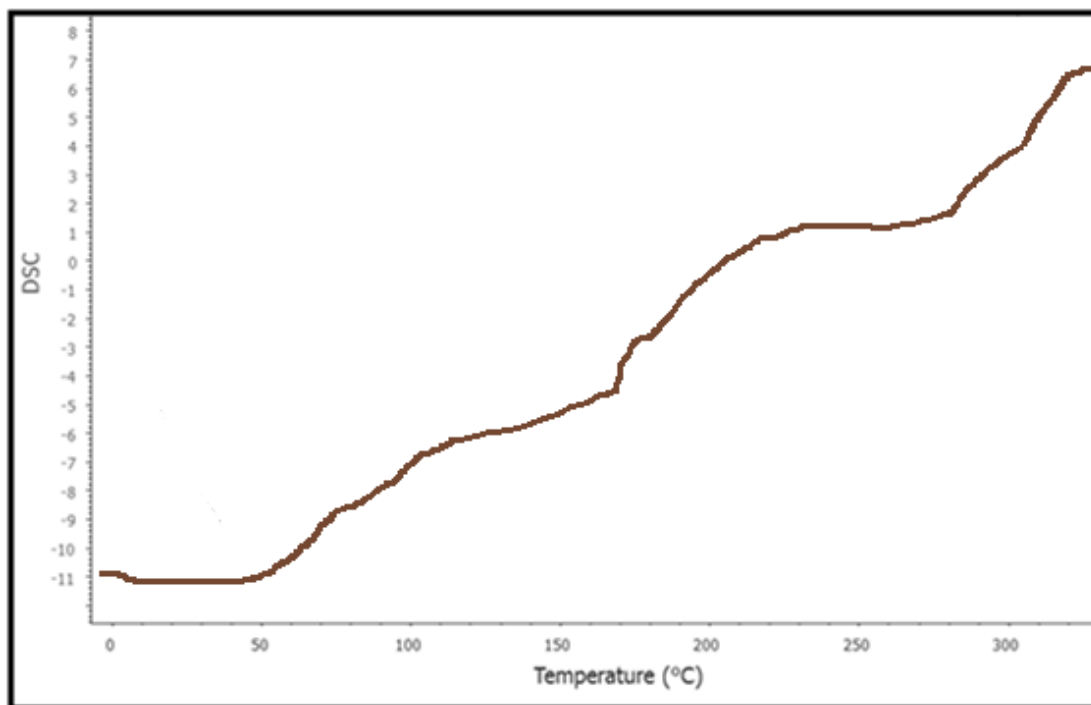


**Fig (3) : DSC of Compound { 3 }**

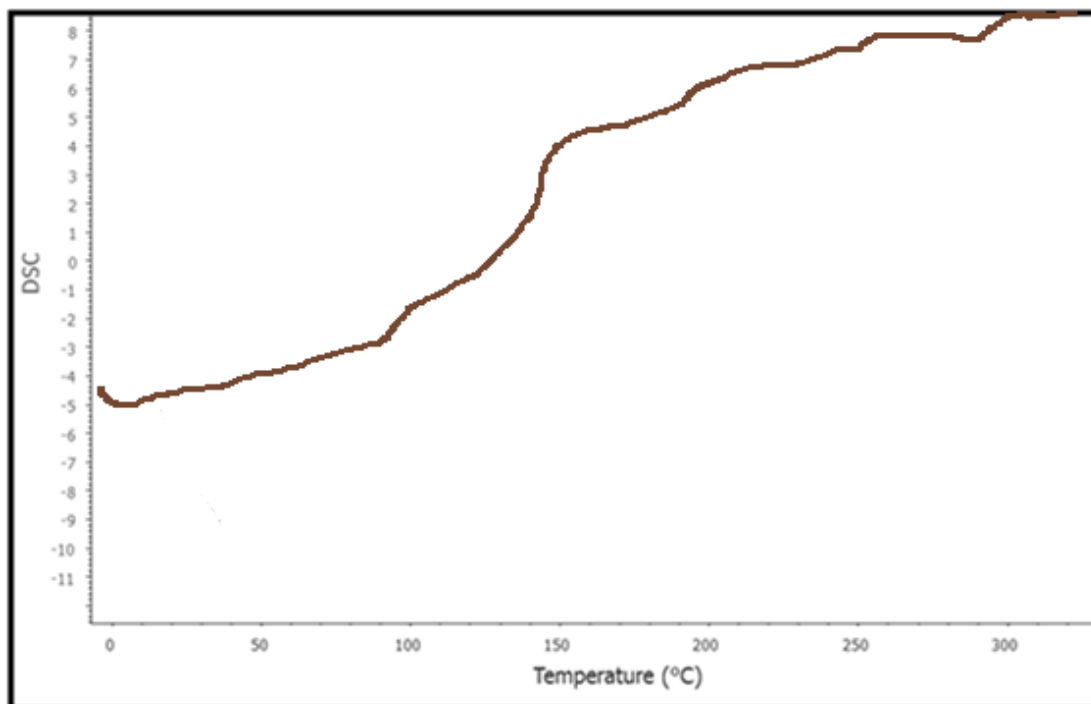


**Fig (4) : DSC of Compound { 4 }**

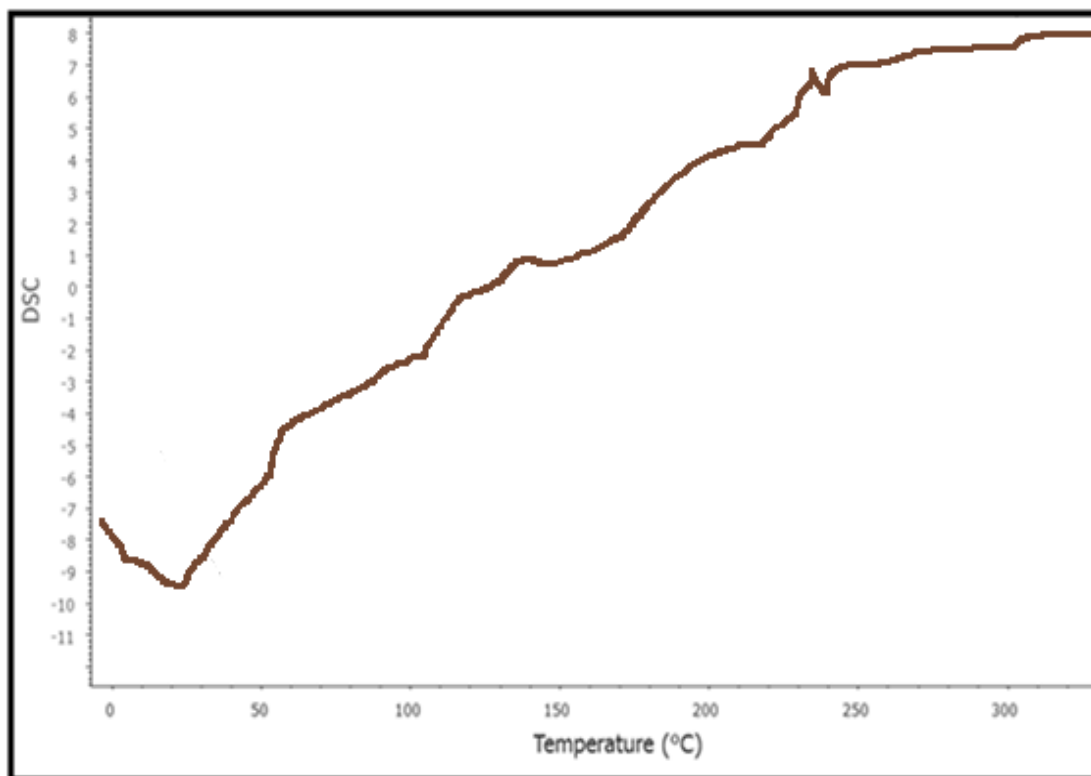




**Fig (5) : DSC of Compound { 5}**



**Fig (6) : DSC of Compound { 6}**

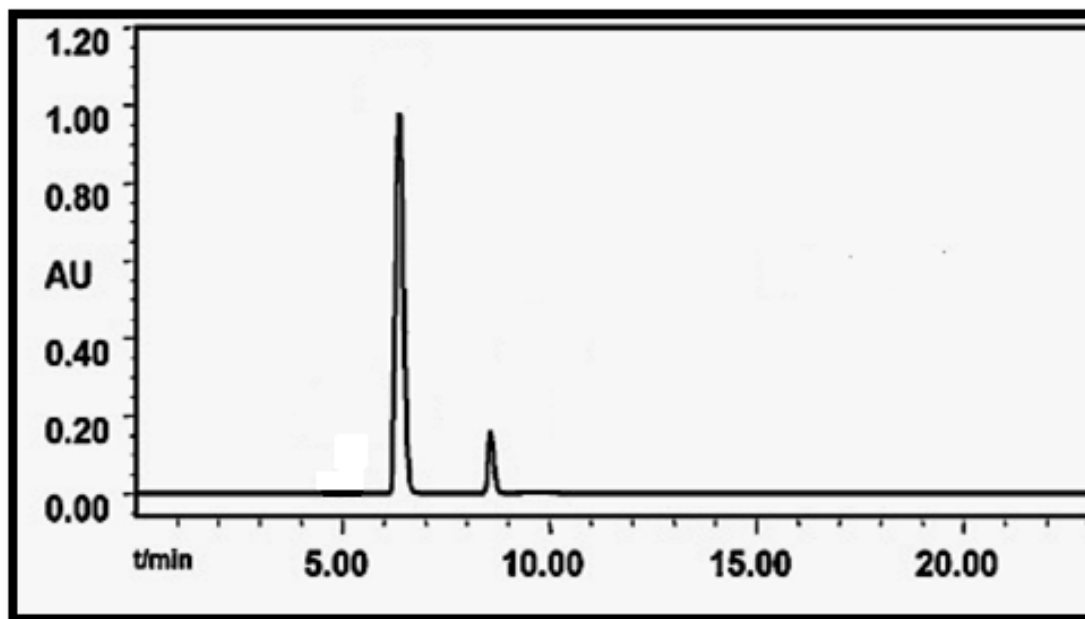


**Fig (7) : DSC of Compound { 7 }**

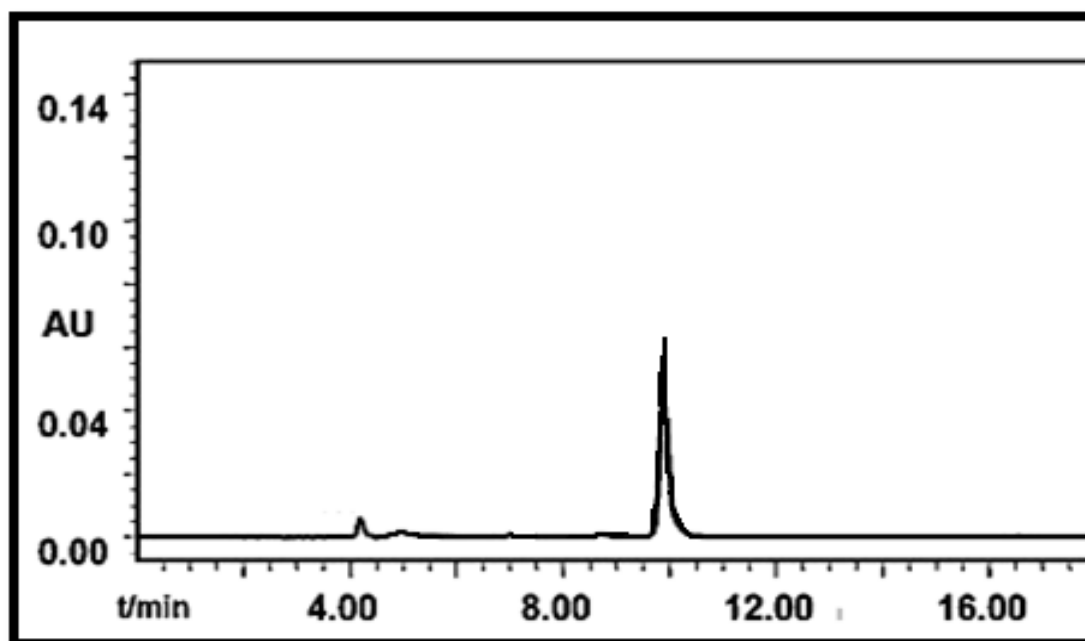
The results gave good indicators about stability of prepared compound in high temperatures for all formatted compounds.

#### **Chromatography Applications of Compounds<sup>(18)</sup> :**

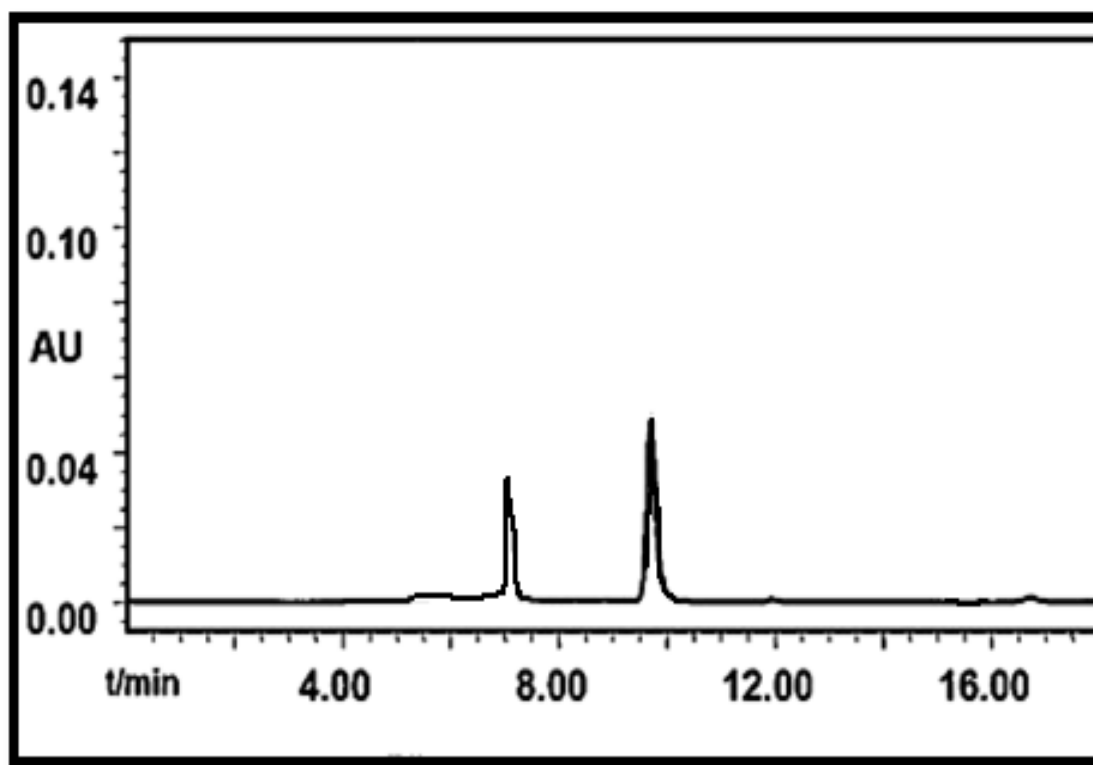
In this studying , choosing some prepared compounds for chromatography studying by diluted concentrations (( concentration of 1ppm for vehicles)) from some compounds in column and after that by using a flame ionization detector is 50C° higher than the temperatures of the column either column temperature programmed gradual increase of of(90-160)C°, taking into consideration the maximum temperature to avoid damage to the column ., all data are shown in figures (8-11)



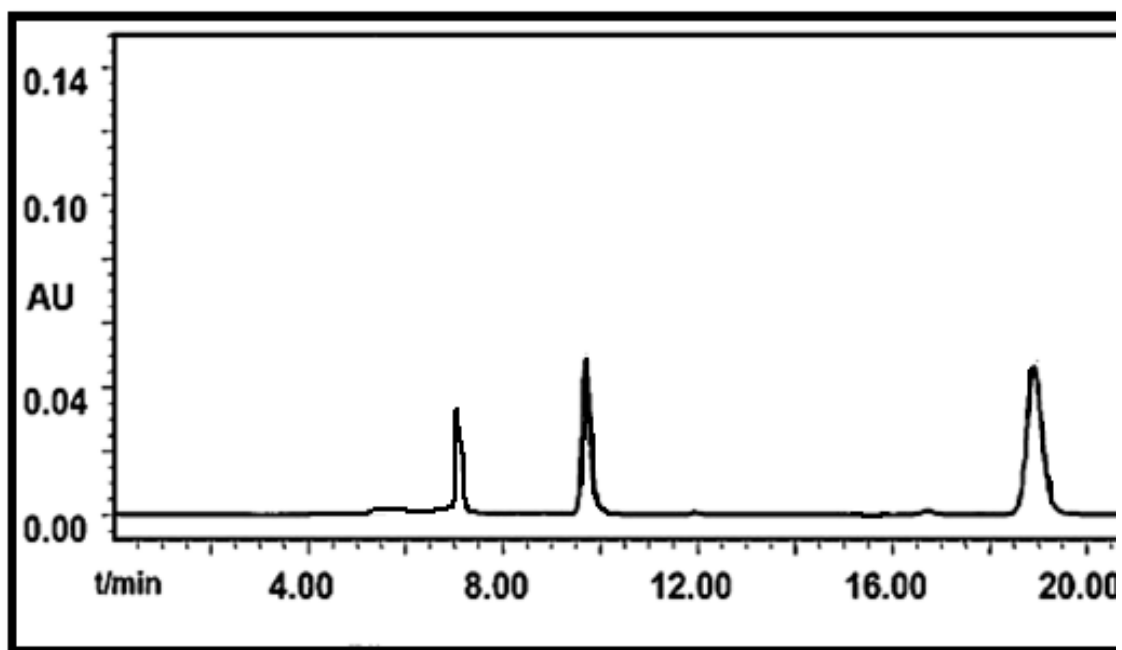
**Fig(8): Chromatogram of Compound [ 1 ]**



**Fig(9): Chromatogram of Compound [ 2 ]**



**Fig(10 ):** Chromatogram of Compound [ 3 ]



**Fig(11 ):** Chromatogram of Compound [ 6 ]

Most of our prepared compounds included heterocyclic compounds and functional groups with molecular weight of compounds which increasing interaction in compounds then will affect on separation in this technique.

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