

STUDYING OF BIO -CHEMICAL AND PHYSICAL PROPERTIES FOR SULFUR CYCLES

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ABSTRACT

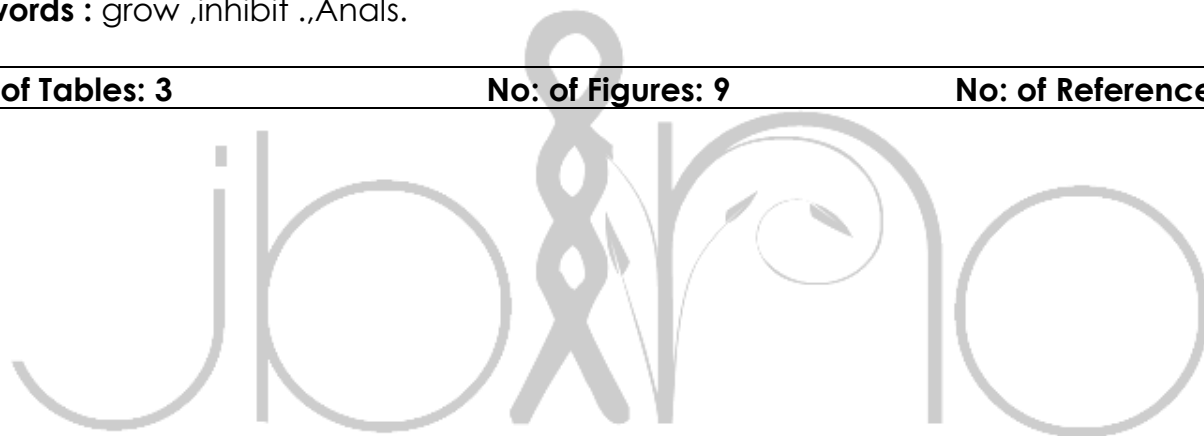
In this work , we studied chemical studying and biological activity for synthesized compounds which we prepared them in past our paper ⁽¹⁾ represented in Thiazine, Thiadiazine, Thiazepine ,Thiadiazepin , Thiazole and Thiadiazole as a sulfur cycles which have a wide range of biological properties and due to its potent and significant pharmacological activities., then studying of physical properties for some compounds like (DSC – Analysis , Solubility).

Keywords : grow ,inhibit .,Anals.

No: of Tables: 3

No: of Figures: 9

No: of References:12



INTRODUCTION

Thio hetero cyclic compounds play an important role in biological system which have important biological properties and synthetic compounds which used in various studies and past papers , especially in medicinal chemistry with drugs and a grow chemical research and development. Sulfur cycles are of a special interest pharmaceutical activities, it has attracted much attention recently as their synthesis is more accessible and their diverse properties are appreciated. The biological activity of any compound depends on its molecular structure, The compounds containing the (sulfur , sulfone)- moiety exhibit a wide range of biological activities (1-7).From these classes of sulfur heterocycles, the synthesis of new derivatives of thiazine, thiazol, thiadiazine, thiadiazole, thiazpine

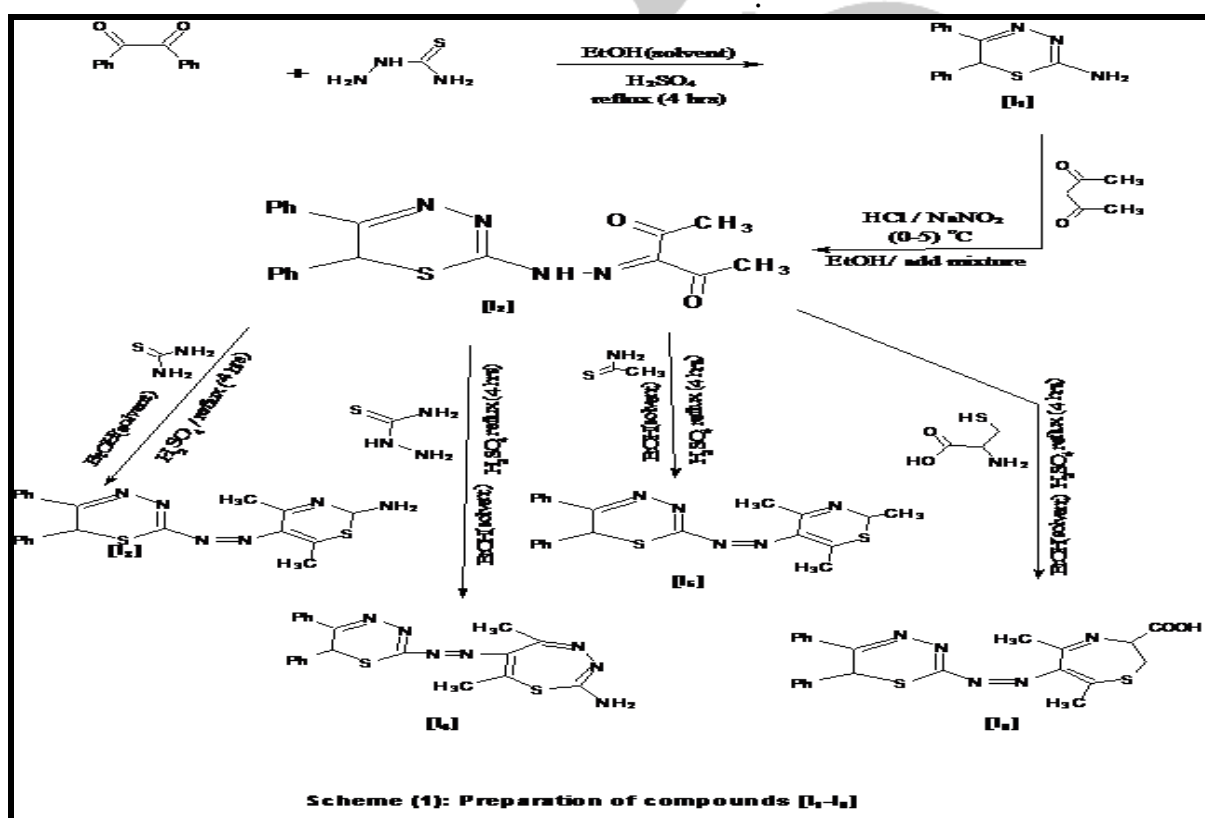
has been attracting considerable attention because of various pharmaceutical properties like antioxidant, antifungal, anticancer, DNA-Inhibitory activity, HIV- Inhibitors and other applications in medicine field and synthetic chemistry field(8-11).

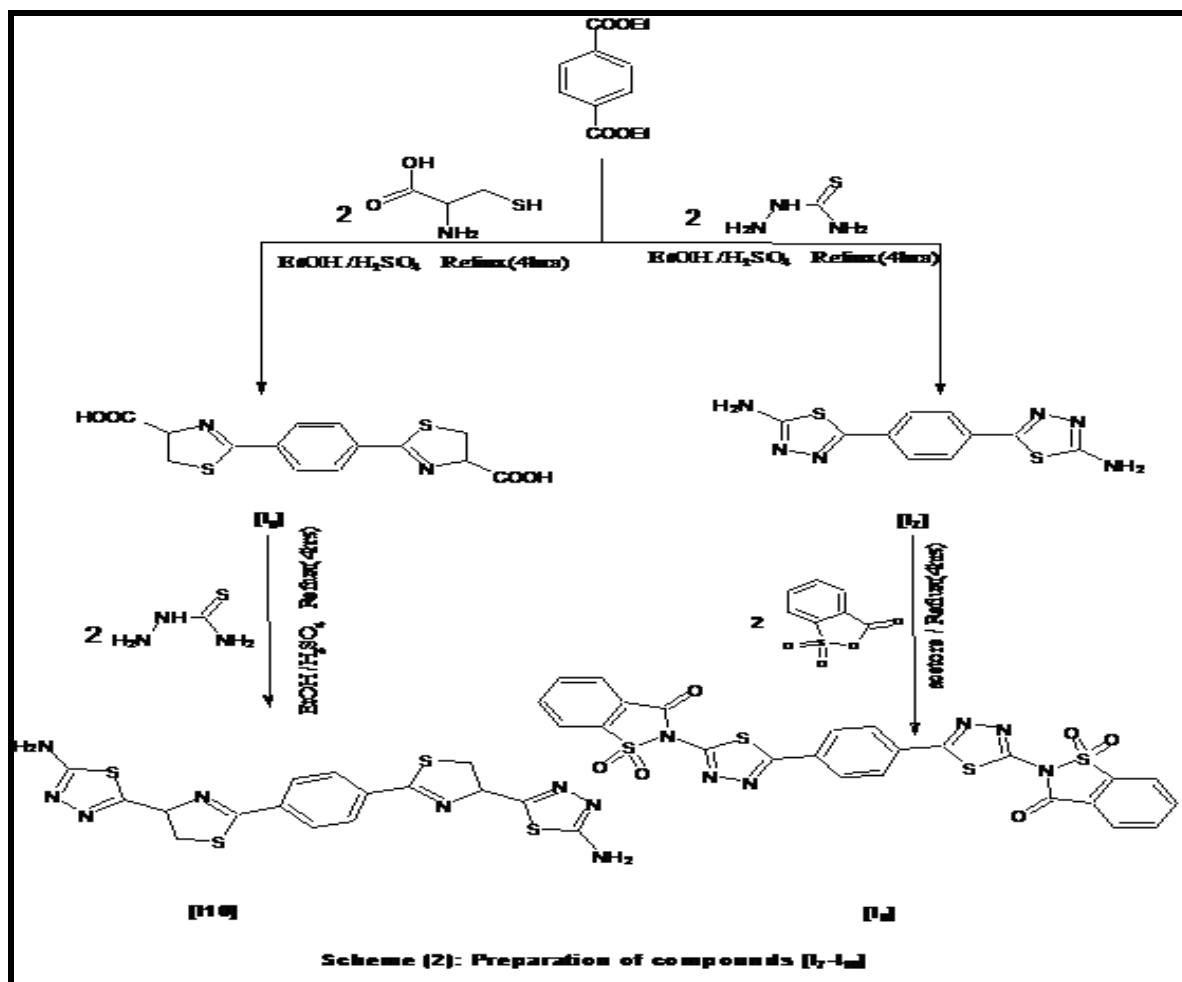
Experimental and Apparatuses

All chemicals and instrumentals carried out in college of education, biological study carried out in Bio – lab in biological department., and chemical studying in chemistry department.

Synthesized Compounds In Our Past Paper⁽¹⁾:

In our previously , we synthesized (10) compounds , but we will study the biological activity for them in this work





Antibacterial and Antifungal Assay :

Antimicrobial activities of synthesized compounds have been tested for their antibacterial and antifungal activities by agar via biological methods⁽¹⁾. The antibacterial and antifungal activities were done at 100 mg/ml concentrations in DMO solvent through using three types of bacteria (*Bacillus subtilis*, *Pseudomonas aeruginosa* and *Salmonella typhi*) and two types of fungi (*A. niger* and *P. chrysogenum*). These bacterial strains were incubated for 24hr at 37°C and fungi strains incubated for two days at 37°C.

Results and Discussion :

In past paper of our work, we synthesized these sulfur cyclic compounds but now we will study of antimicrobial activity against bacteria and fungi.

Antimicrobial Assay :

Biological activities of compounds were evaluated according to their action against bacteria and fungi are described tables (1, 2). The presence of heterocyclic ring such like thiazole, imidazole, thiadiazine are reported to possess antibacterial and antifungal effect may enhance or increase the biological activity of the sulfur derivatives.

The antimicrobial results are listed at table (1). From results of antibacterial studies it was found to be potentially active against all types of bacteria and fungi, while antifungal activity were listed in table (2). It is evident from the results that the biological activity of all compounds have high biological activity which inhibit the growth of bacteria and fungi.

The higher activity of compounds [7, 8, 9, 10] may be due to the fact that, is an essential micronutrient during transcription and transformation of nuclei

Acids which shown to inhibit cellular protein and RNA synthesis, they included some groups with sulfur atoms and hence inhibit the bacterial growth.

Furthermore, the mechanism of action of the compounds may involve the formation of hydrogen bond with the active centers of the cell constituents resulting in the interference with the normal cell process.

In general, the intake of a drug depends on the balance between hydrophilic and lipophilic properties and the solubility which are substituent dependent which increases the lipophilicity of a drug and this may be the reason for the enhanced activity upon sulfur compounds . Hydrogen bonding and the antimetabolite action of the compound may be an important factor in antimicrobial activity.



Table (1):Antibacterial Activity of Compounds (Inhibition Zone in (mm)) of Compounds [1– 10] in Concentration (100 mg.ml⁻¹)

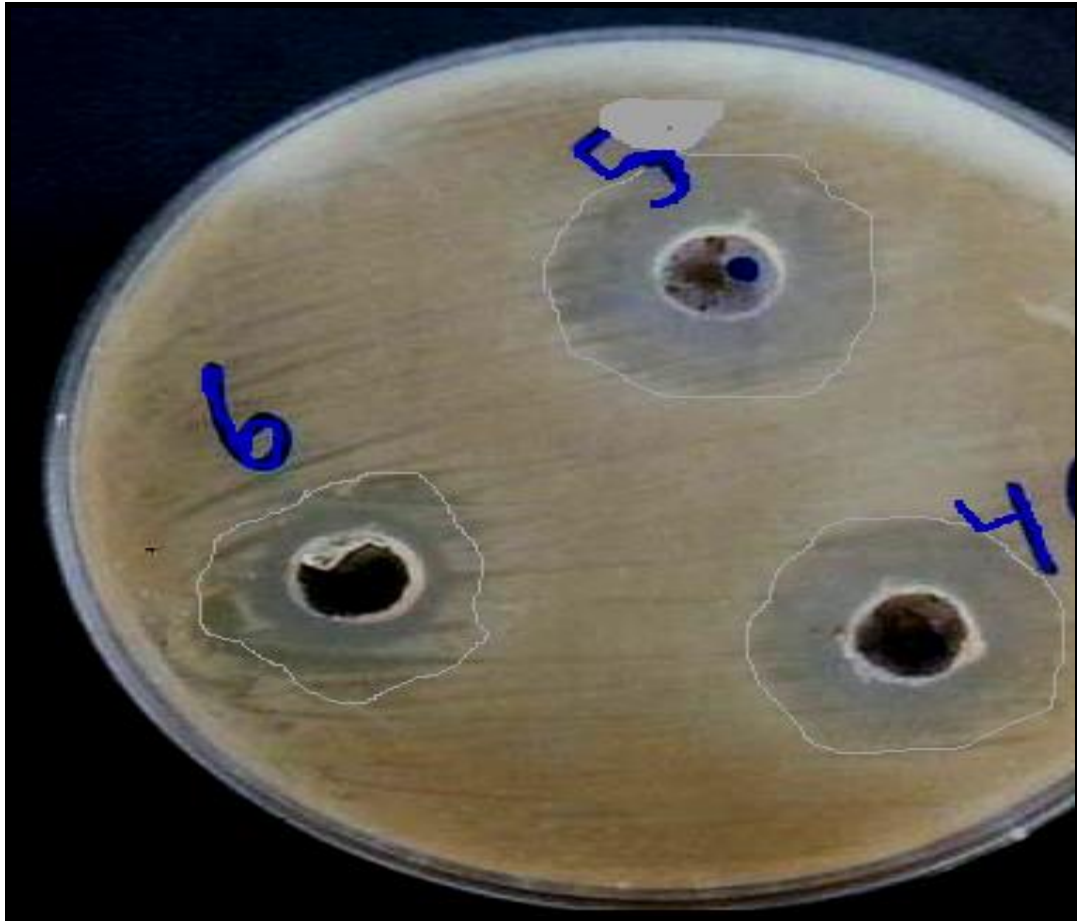
Comp. No.	<i>Pseudomonas aeruginosa</i>	<i>B. subtilis</i>	<i>Salmonella .typhi</i>
I ₁	12	12	8
I ₂	12	10	10
I ₃	22	20	22
I ₄	26	22	20
I ₅	20	16	20
I ₆	18	18	16
I ₇	28	28	24
I ₈	28	24	22
I ₉	34	30	32
I ₁₀	38	34	32

The synthesized compounds showed excellent activity against bacteria and fungi.

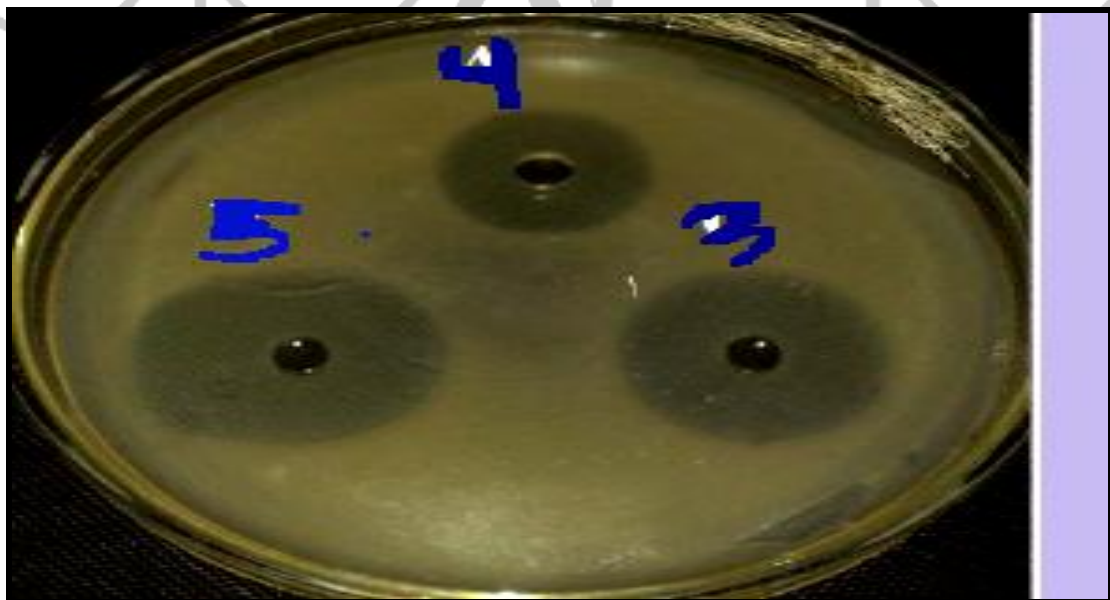
Table (2):Antifungal Activity of Compounds [1– 10] in Concentration (100 mg.ml⁻¹)

Comp. No.	<i>A. niger</i>	<i>P. crysogenum</i>
I ₁	8	8
I ₂	12	10
I ₃	18	18
I ₄	16	16
I ₅	20	18
I ₆	20	20
I ₇	24	22
I ₈	26	24
I ₉	28	26
I ₁₀	28	24

Some of Pictures for Antimicrobial for some Compounds :



Picture (1):Antibacterial activity – *P.aeruginosa*



Picture (2):Antibacterial activity – *B. subtilis*

Chemical Studying :

The solubility of all compounds was studied in different solvents according to polarity of solvents , the results are shown in table (3).

Table (3) : Solubility of Compounds in Various Solvents.

Compounds	Solvents					
	Ethanol	Methanol	DMSO	Benzene	Dioxane	THF
I ₁	+	+	+	-	-	-
I ₂	+	+	+	-	-	-
I ₃	+	+	+	-	-	-
I ₄	+	+	+	-	-	-
I ₅	+	+	+	-	-	-
I ₆	+	+	+	-	-	-
I ₇	+	+	+	-	-	-
I ₈	+	+	+	-	-	-
I ₉	+	+	+	-	-	-
I ₁₀	+	+	+	-	-	-

DSC – Analysis :

DSC – measurements of some compounds carried out for sulfur cycles in some figures (1- 5) :

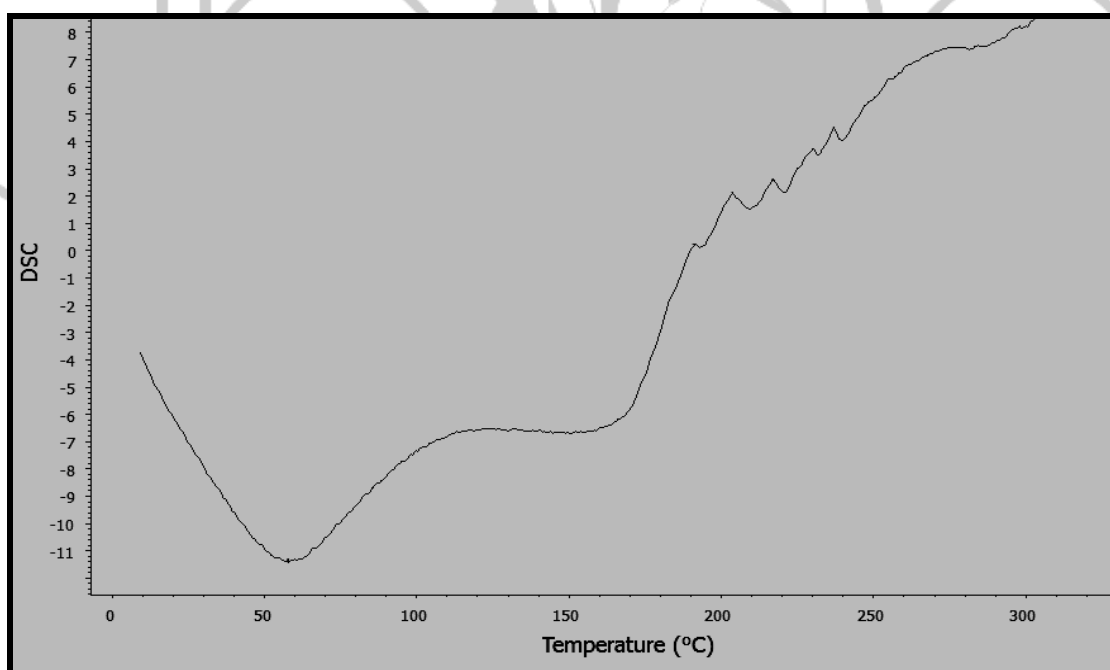


Fig (1) : DSC of Compound [4]

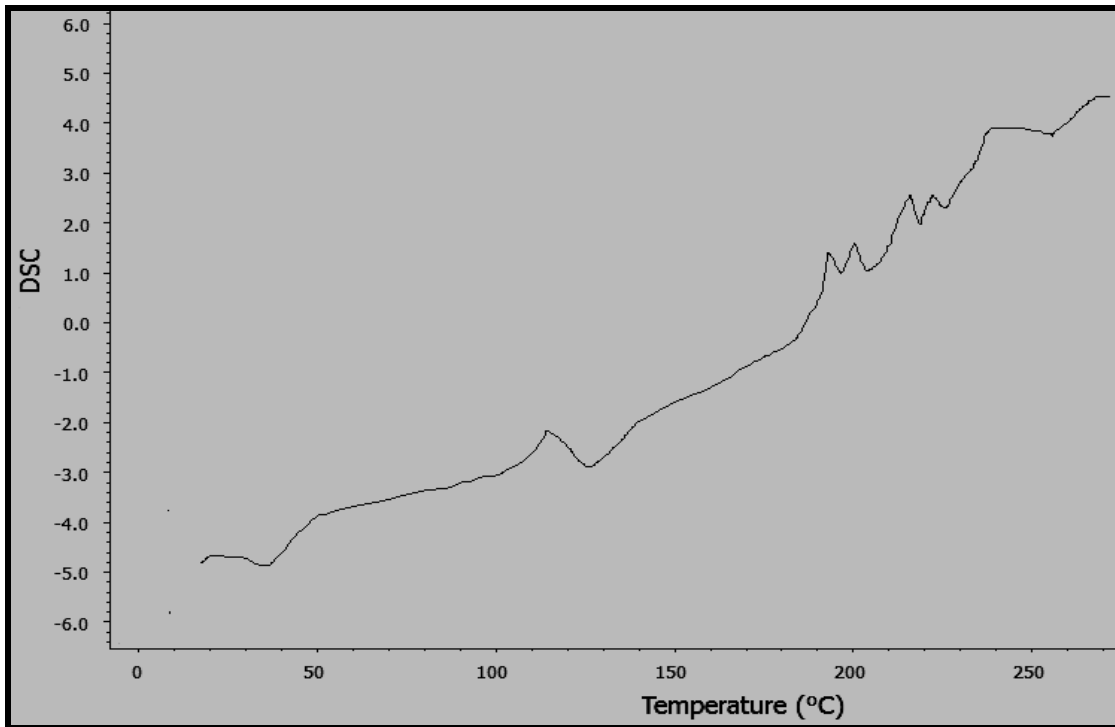


Fig (2) : DSC of Compound [5]

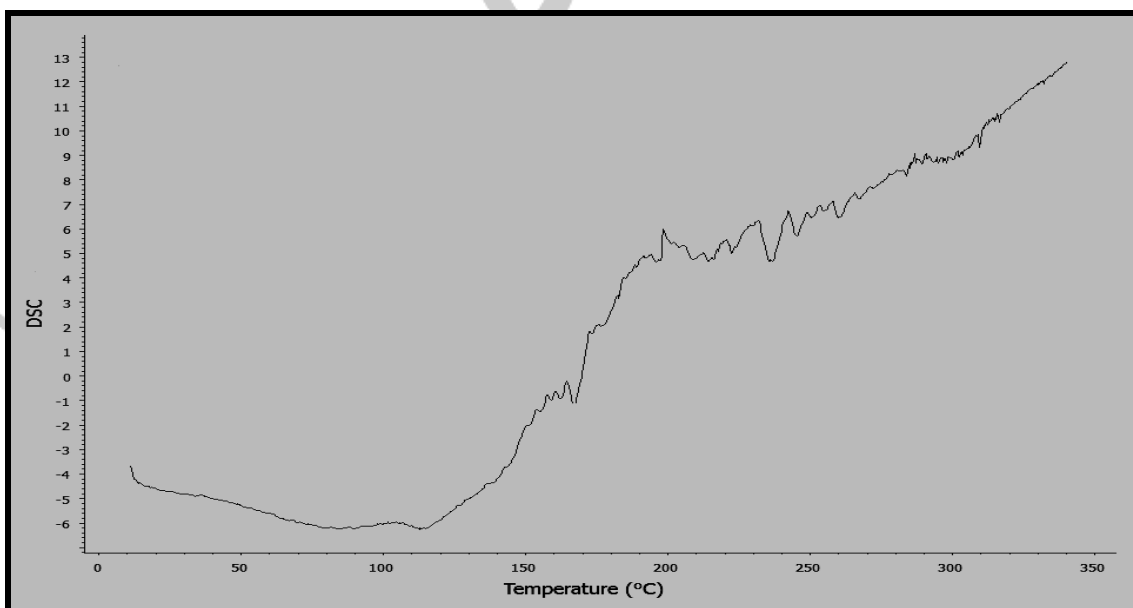


Fig (3) : DSC of Compound [8]

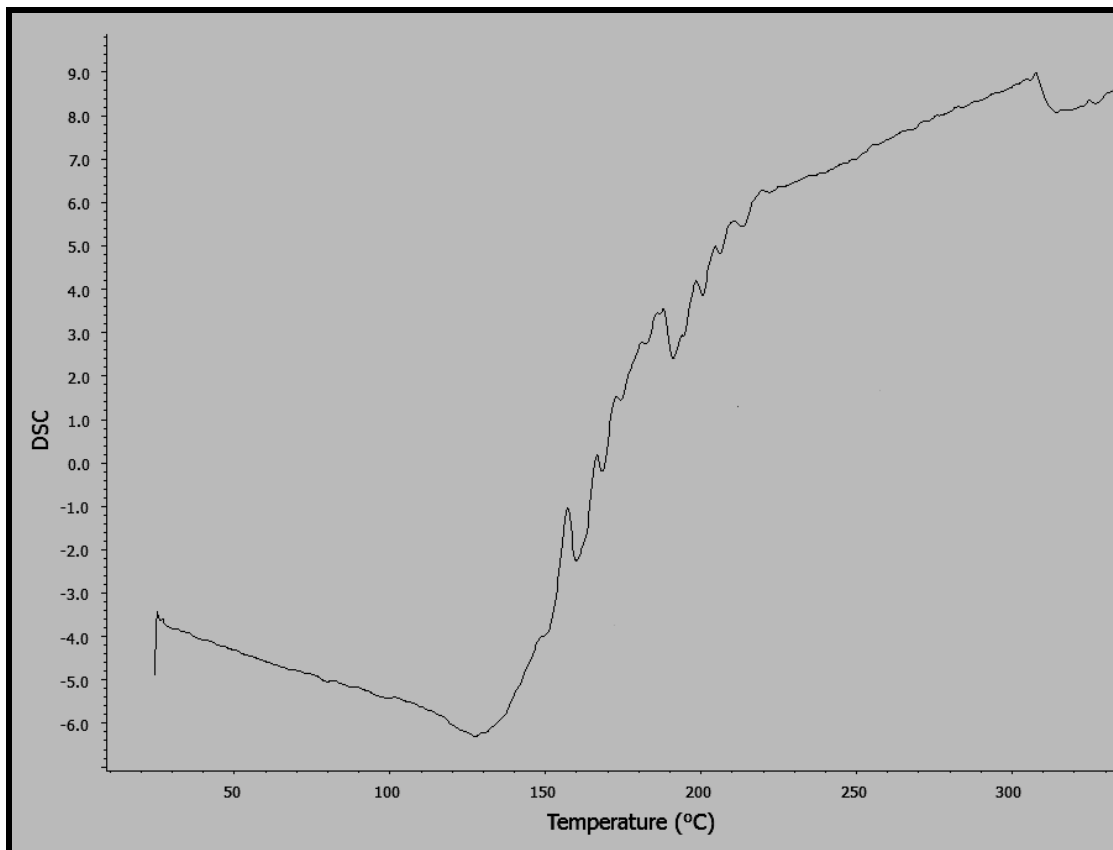


Fig (4) : DSC of Compound [9]

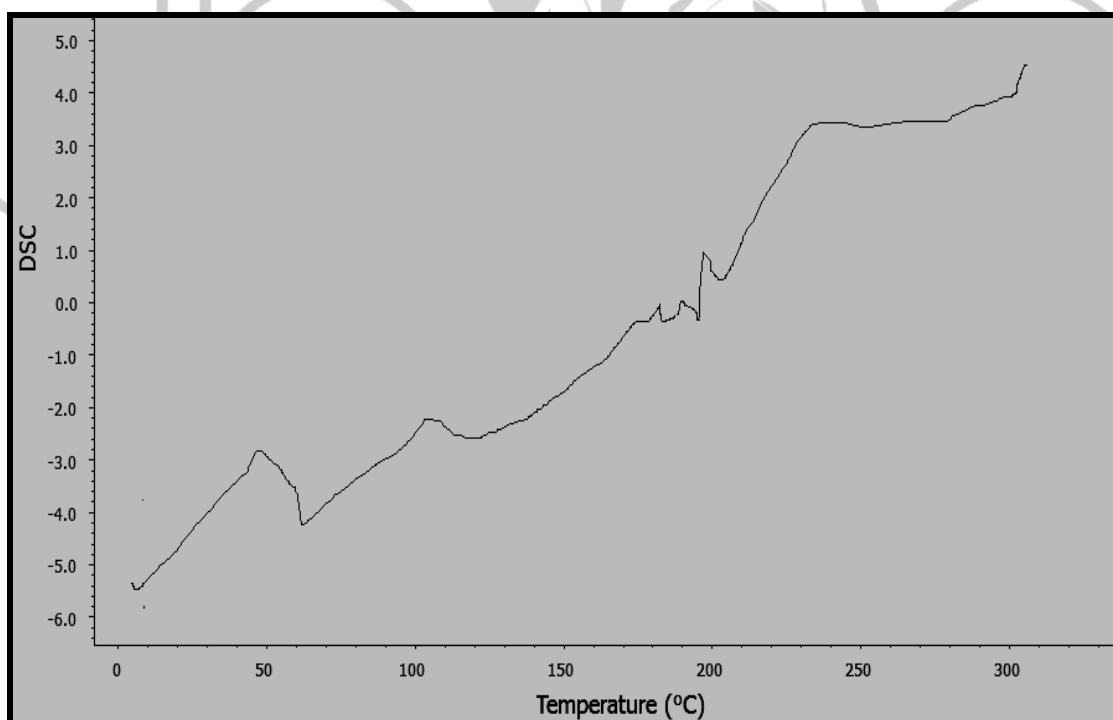


Fig (5) : DSC of Compound [10]

From results of this thermal curves , it was found that all sulfur compounds were stable in high temperature

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