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(Thermal, Antimicrobial, Solubility) – Studying of Diazepine Compounds

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ABSTRACT

In the present paper we complete first work (first paper- in first reference) through studying of thermal behavior of aldamine compound, oxazepine compound, diazepine compounds which prepared and identified in first paper with variety techniques methods in organic chemistry field, then we studied microbial assay in this paper on types of bacteria, studying of solubility our compounds in types of solvent, some physical properties. Diazepine compounds have high spectrum of pharmaceutical drugs and medical fields.

Keywords: Diazepine, oxazepine, Schiff base, antimicrobial, pericyclic.

1. INTRODUCTION

Pericyclic reactions include changes of bond in a cyclic system of atoms ,bonds are formatted but other bond broken in a cyclic transition state (T.S) of compounds, which means that there are no intermediates formed in the course of the reaction[(1-3)] .

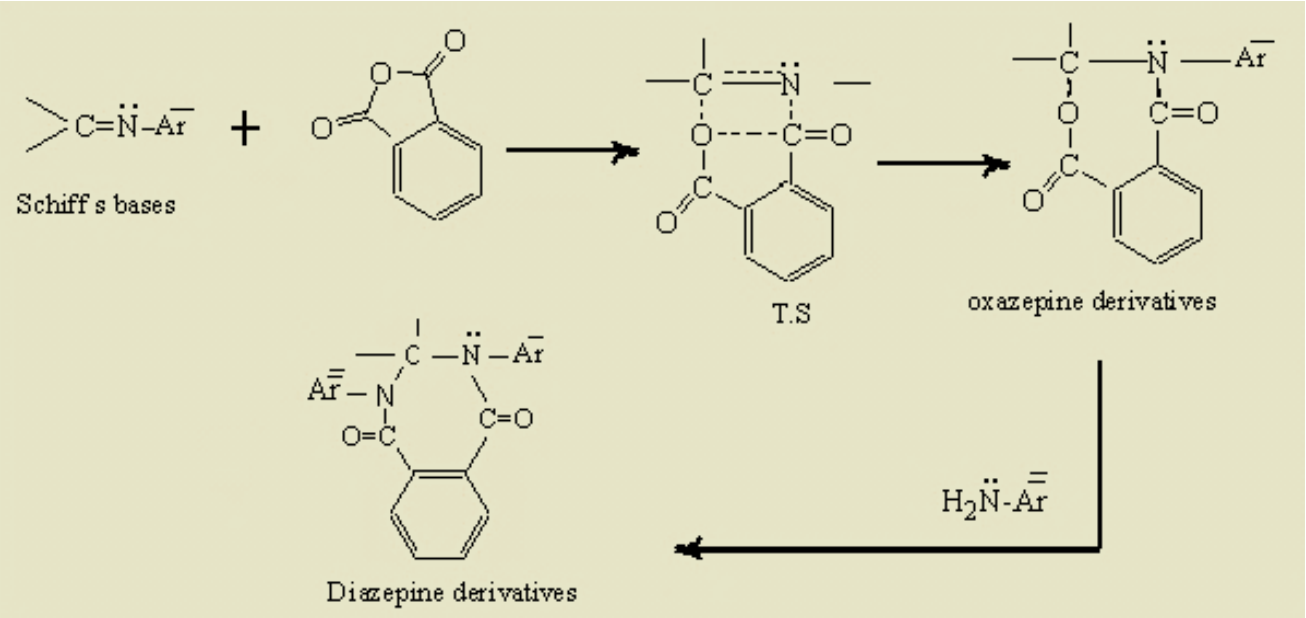


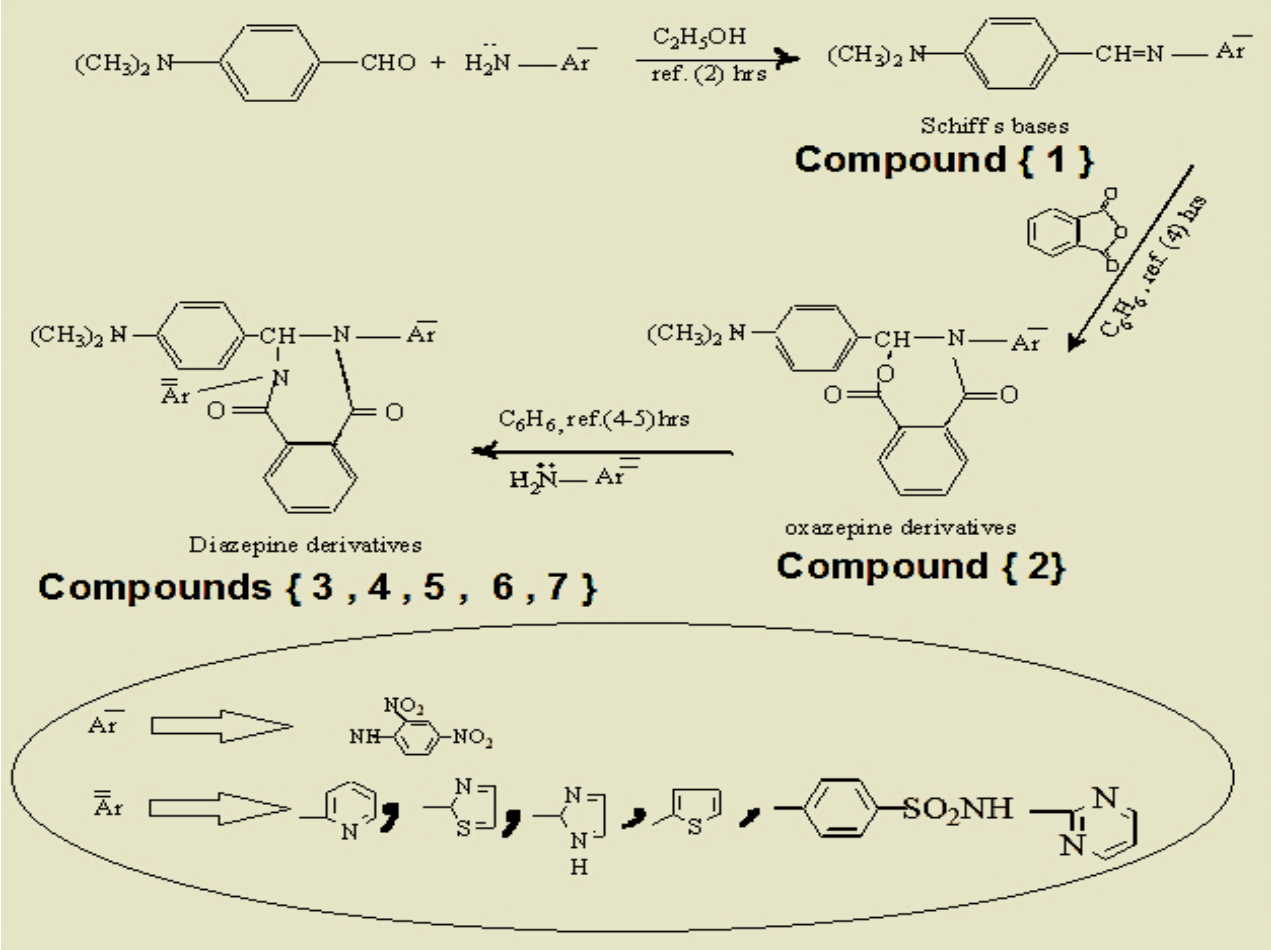
Fig (1): Mechanism of Oxazepine and Diazepine in Pericyclic Reaction

Pericyclic reactions act an important type of concerted process including pi-systems; rearrangement of the electrons due to (sigma and pi-bonds) to simultaneously break hen form which gives stereo control of the products[(4-17)] .This type of reaction (pericyclic reaction) involved three types of reactions: electrocyclic reaction, cycloaddition reaction and sigmataropic rearrangement. The transition state (cyclic) go to an arrangement of components throughout the course of the reaction[(18-24)] . The diazepine compounds have

many applications[25-34] in medical drugs, and in synthesis of pharmaceutical and biochemical compounds[35-46].

2. EXPERIMENTAL PART:

In the past studying[1] seven compounds from (aldamine, oxazepine, diazepine were formatted, now we completed our work by studying effect of compounds on classes of bacteria represented through scanning of three concentrations ,which explained in results according to data in table (1).

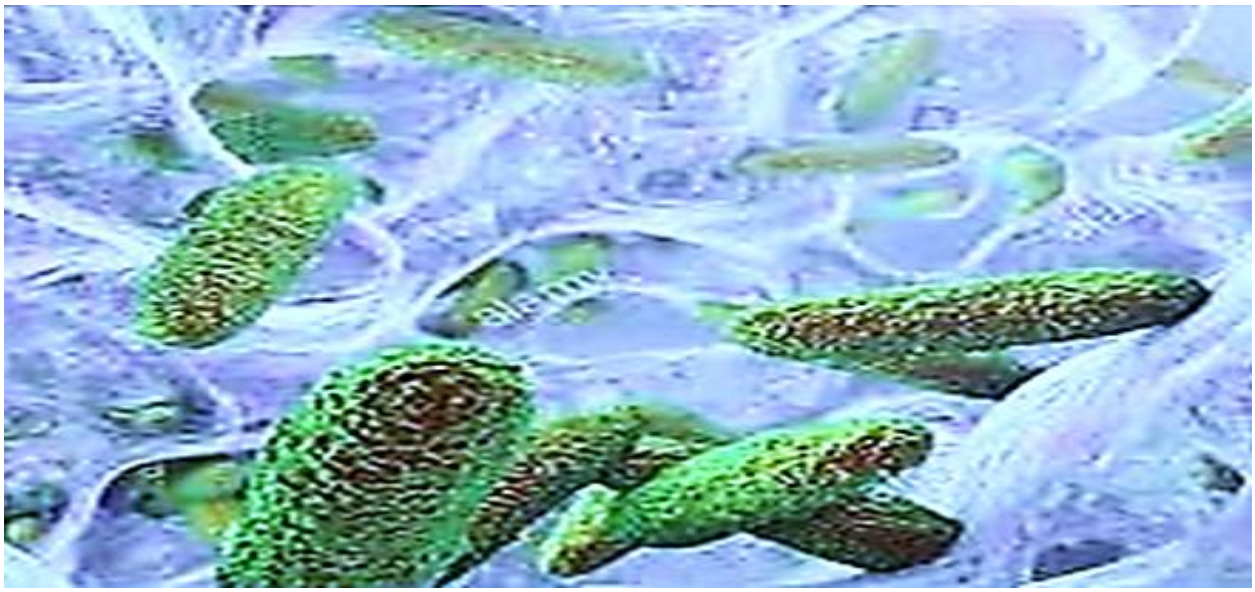


Scheme.1: Prepared Compounds { 1- 7 }

Biological Assay

Screening of Microbial activity for imine, oxazepine, diazepine derivatives have been tested with agar through past procedures [33-36]. The antimicrobial activities have done at three concentrations (3, 5, 7 micro gram) concentrations in (DMSO) solvent with class of bacteria (**bacteria - *Salmonella .typhi*},**) and (*bacteria K. Pneuomona*) .These bacterial strains were incubated for 24 hrs at 37^{o}C.

Picture.(1): bacteria *Salmonella.typhi*



Picture.(2); bacteria K.Pneuomona

3. RESULTS AND DISCUSSION

In past work[1], we produced aldamine, oxazepine, diazepine derivatives while in the present work completed the second part from our paper, we will study Thermal analysis then Activity against types of microbes, and solubility of compounds in a variety solvents with some physical properties.

Biological Studying [44-46]***:***

The scanning of microbial activity of the bacteria were involved work on classes of bacteria to study the microbial activity according to procedures[44-46] for **{**(bacteria- *K. Pneuomona*) and (bacteria *Salmonella .typhi* }, Table (1) appeared the level of inhibition for measured compounds in (mm) towards the selected

bacteria. The antibacterial results are summarized in table (1) gave good activity against classes of bacteria, which improved evidence for the results that the activity of all diazepine compounds have high microbial activity than aldamine and oxazepine compounds which inhibit the growth of bacteria. The prepared compounds [7, 4] have higher activity than other compounds which due to presence of sulfur atoms in their structures which represented by (sulphadiazine compound, thiazole ring) in structure [34 , 36] which appeared in high inhibition [33-37] in wall of cell of bacteria.

Table(1): Antimicrobial Assay of Compounds (Inhibition Zone in (mm))as average of three Concentrations (3, 5, 7 micro gram)

Compounds	**(average of three Measurements)** ***Salmonella .typhi***	**(average of three Measurements** ***K. Pneuomona***
[1]	4<	4<
[2]	4<	4
[3]	4	6
[4]	8	10
[5]	8	10
[6]	6	8
[7]	10	12

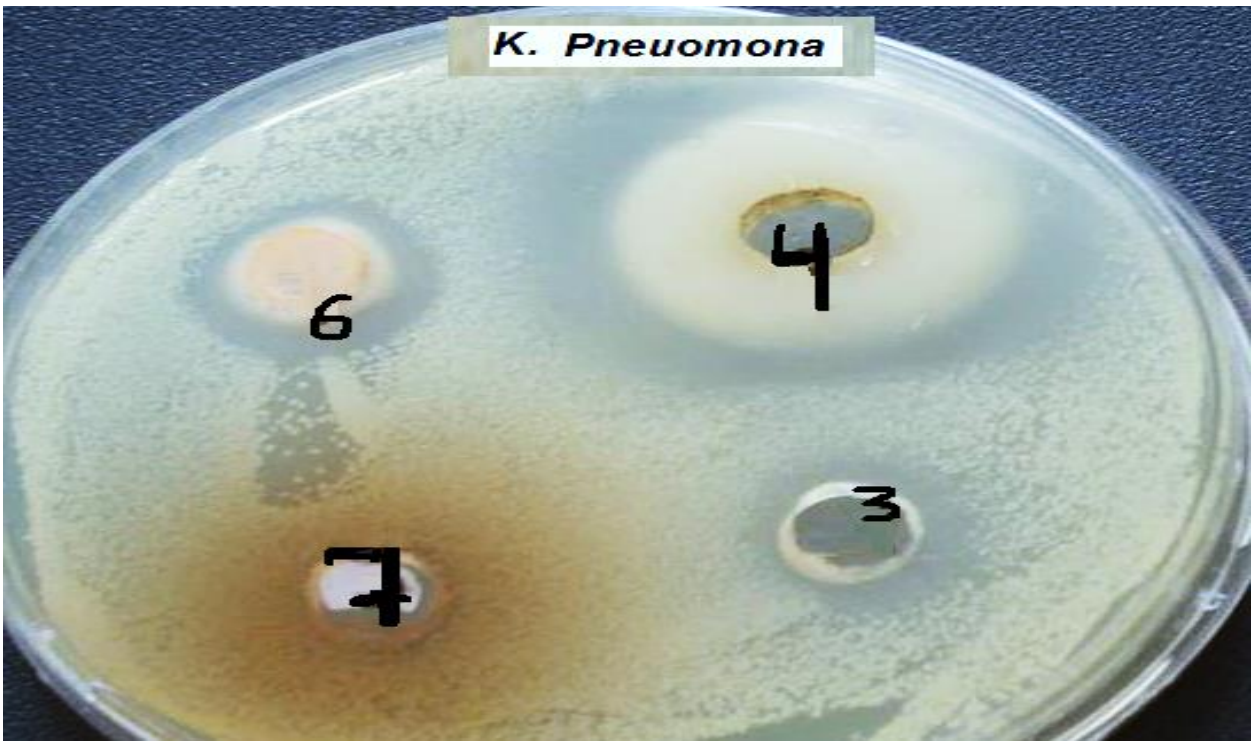


Photo.(1): Inhibition zone on *bacteria K. Pneuomona*

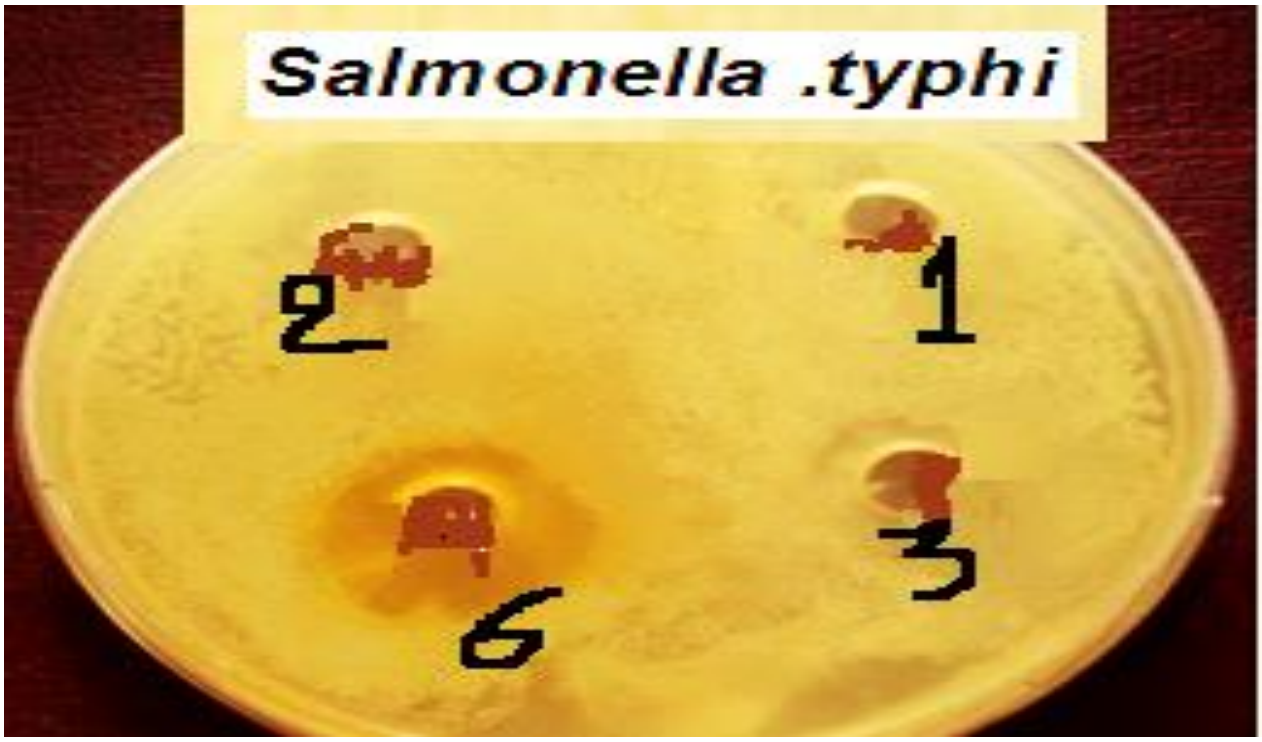


Photo.(2): Inhibition zone on *Salmonella.typhi*

Thermal – Analysis of Compounds:

The measurements of compounds showed information of stability for compounds against high temperatures in figures (2- 6):

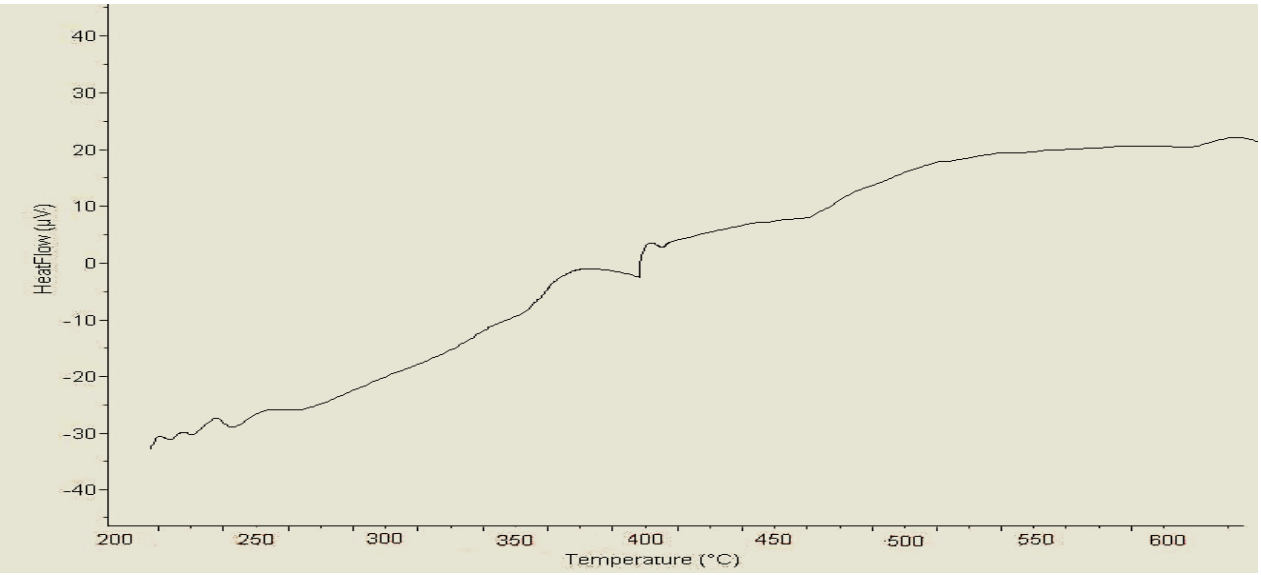


Fig (2): Thermal Curve of Compound {2}

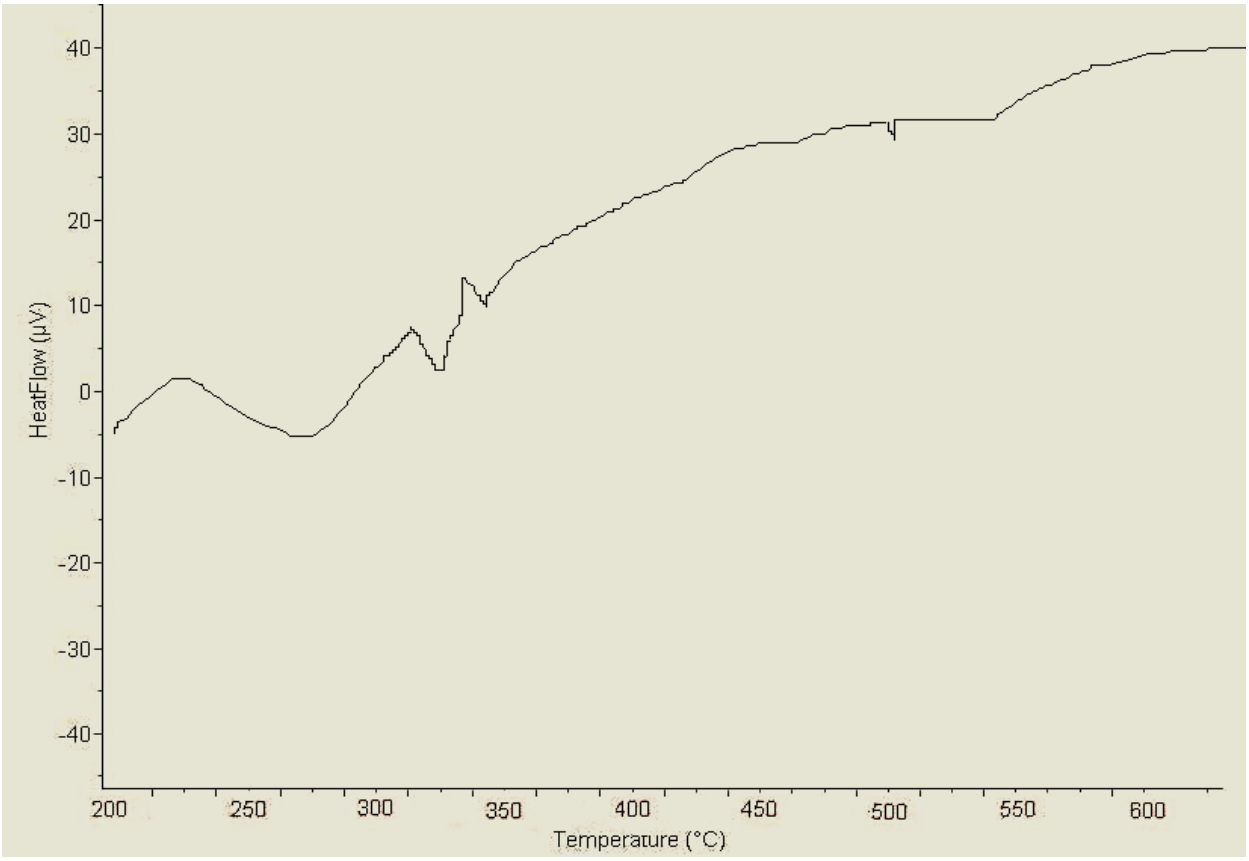


Fig (3): Thermal Curve of Compound {3}

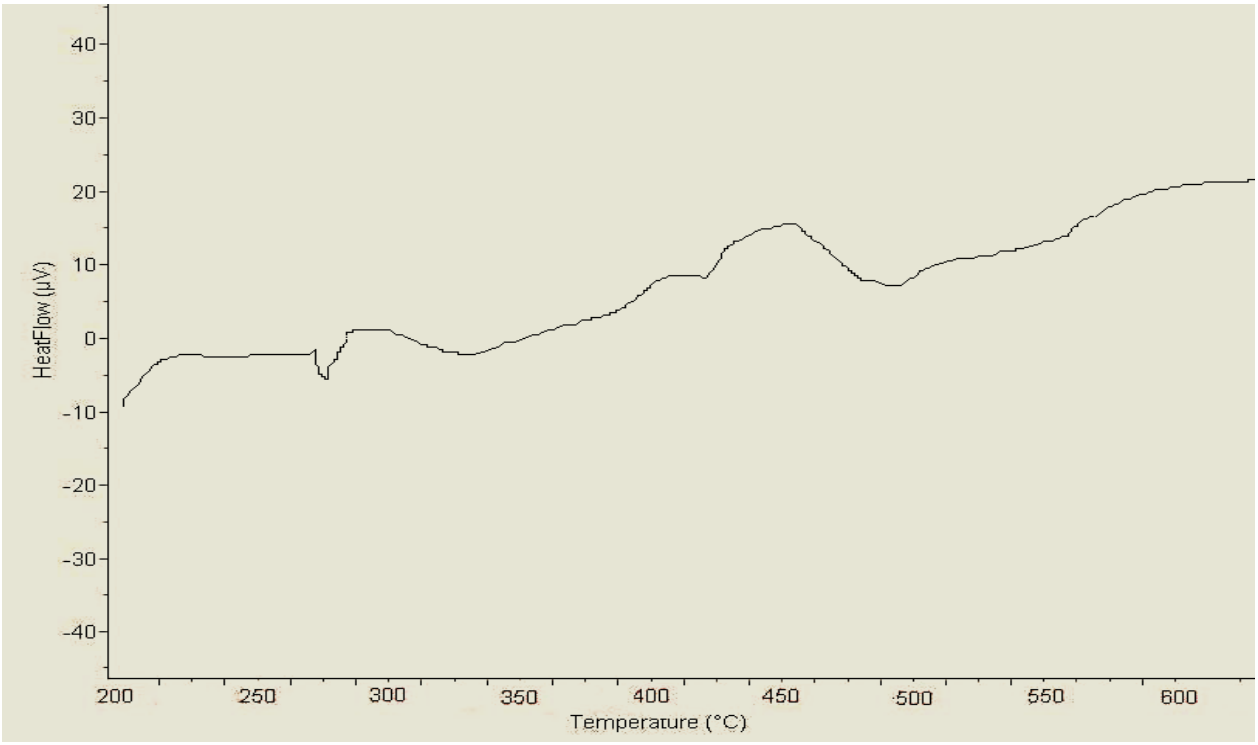


Fig (4): Thermal Curve of Compound {4}

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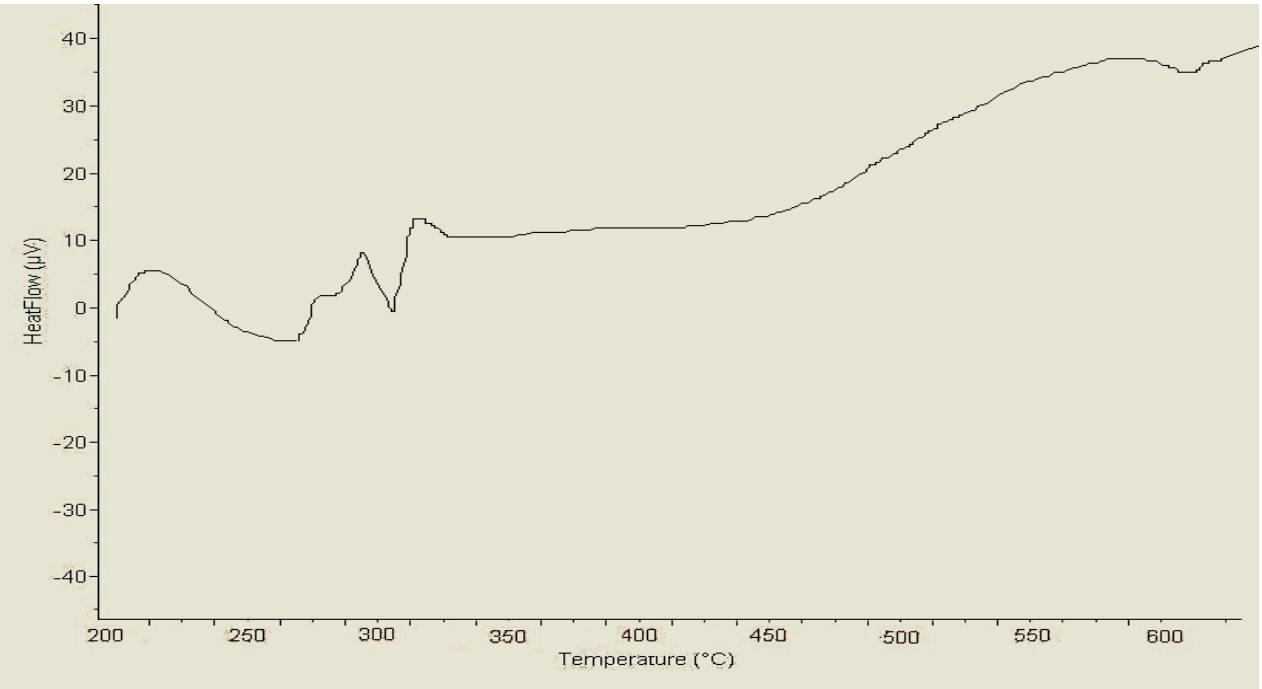

Fig (5): Thermal Curve of Compound {5}

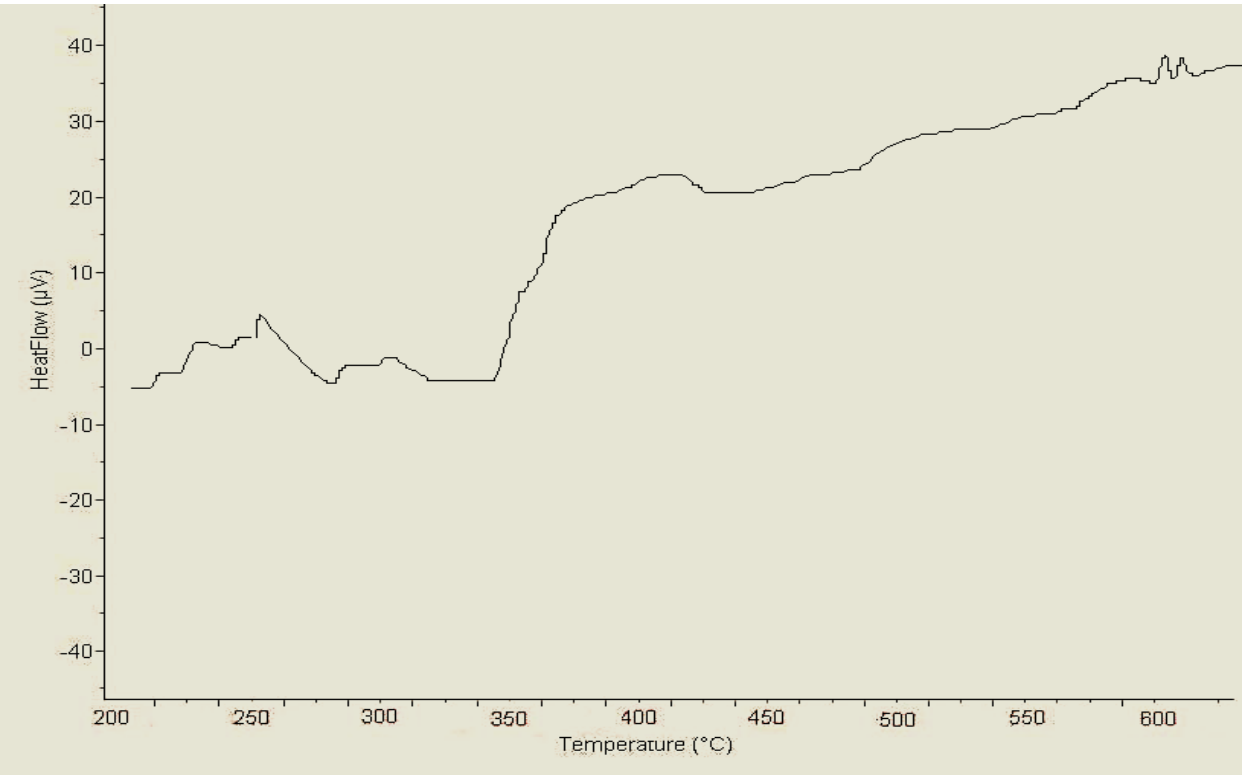

Fig (6): Thermal Curve of Compound {6}

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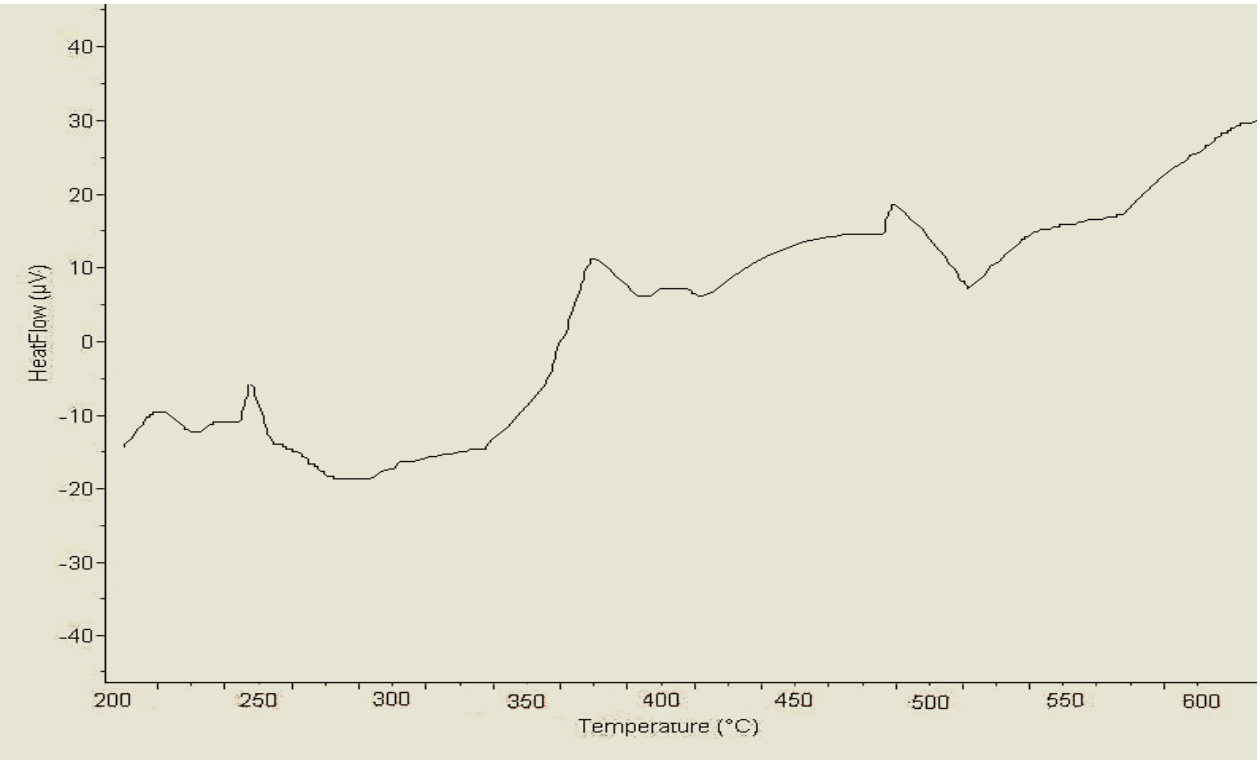

Fig (7): Thermal Curve of Compound {7}

Solubility of Compounds in Chemical Solvents:

All compounds in this paper tested with series of chemical solvents according to (nature of solvent, polarity of solvents, activity of functional groups in compounds) in our compounds in this study, the results summarized in Table (2).

Table (2): Behavior of Reagents in Many Solvents

Reagents	Solvents					
	C_2H_5OH	Methanol	Dioxane	Hexane	Benzene	Toluene
(1)	+	+	+	-	-	-
(2)	+	+	+	-	-	-
(3)	+	+	+	+	+	+
(4)	+	+	+	+	+	+
(5)	+	+	+	+	+	+
(6)	+	+	+	+	+	+
(7)	+	+	+	+	+	+

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