Tikrit Journal of Pharmaceutical Sciences 11(1) 2016 *ISSN 1817-2716*

Synthesis of some aromatic chloro acetamide from aromatic amines compounds, and (Z) -5- (4-dimctlryl amino benzelidcn) -2- amino -thiazalidin -4- one derivatives

***Abed M. Daher AI-.libory, **Halla ldrees**

**, **Department pharmaceutical chemistry, College of Pharmacy, University of Tikrit, Tikrit, lraq*

Abstract

Arylamine compounds were reacted with chloro acetyl chloride to convert the amino group to amide (compounds -1, 4, 7) these later compounds allowed to reacts with arylamino to produce the new (compounds -3, 6, 9), and the above compounds allowed to react with potassium thiocynate to prepare the new compounds which containing thiazolidinone (five membered rings) the (compounds -2, 5, 8), the later compounds allowed to react with aryl aldehydes to prepare the (compounds -10, 11, 12). The prepared compounds were identified using melting point apparatus, Infrared spectroscopy, and (H^1-NMR).

***Key words**: chloroaryl, acetamide, arylarnins, thiazolidine – 4 – one.*

تحضير بعض مركبات كلورو اسيتو امايد الاروماتية من مركبات الامين الاروماتية ومشتقات بنزلدين – 2 – امينو ثايازولدين – 4 – أون

عبد محمد ظاهر حسن الجبوري **هالة ادريس**

الخلاصة

تم مفاعلة مركبات الامين الاروماتية مع مركب (كلورواستيل كلورايد) لغرض تحويل مجموعة الامين الى الامايد كما في المركبات (7, 4, 1) وتم مفاعلة هذه المركبات الاخيرة مع مركبات الامين الاروماتية مرة اخرى لغرض الحصول على مركبات امايدية جديدة تحتوي على حلقين متقابلتين للمركبات (9, 6, 3) وهذه المركبات فوعلت مع مركب (ثايوسيانات البوتاسيوم) لغرض الحصول على مركبات خماسية الحلقة تحتوي على مجموعة (الثايوزولدين) المركبات (8, 5, 2) وهذه المركبات الاخيرة فوعلت مع مركبات الالديهايد الاروماتية للحصول على المركبات الجديدة التي تحتوي على ثلاثة حلقات هي المركبات (12, 11, 10) . و من خلال التجربة وتقييم الفعالية البيولوجية ضد مختلف الانواع من البكتيريا ، اظهرت النتائج بان هذه المركبات فعالة بشكل جيد. وتم تشخيص هذه المركبات بواسطة جهاز درجة الانصهار وطيف (FT–I.R.) وطيف الرنين النووي المغناطسيس (H^1–NMR) وكانت النتائج مطابقة للاشكال المقترحة.

Introduction

Thiazolidine ring system is considered as a structure in various synthesis pharmaceuticals displaying abroad spectrum of' biological activates [1-4]. Many compound of 2 Imino thiazolidin -4- one have been prepared by Ameya and et.al. [5]. Derivatives of thiazolidin -4- one has been prepared by different methods and chemical reagents [6- 12]. There are other methods for prepare thiazolidinones derivatives (Z) – 2 – (arylamino) thiazolidine – 4 – ones from thioureas compounds with chloro ethyl acetate [13]. The compounds – 4 – thiazolidinones from 4 – hydroxy – 6 methyl pyrene [14], and the compound 1, 3 – this zolidinones – 4 – one prepared from reaction of scheff-base with 2 – mercapto aceticaced, with catalyst [15]. Then the compounds 2 – phenyl imino – 1, 3 – thiazolide – 4 – one from (Z) – 2 – (N – phenylcarbaminidoyl) thioaceticaced with N, N – dicyclohexyl carbodiimine [16]. All above compounds will be trying and evaluate the biological and bacterial activity [17].

Experimental:

Materials:

All materials were from aldrich and were used without further purification.

Instruments:

a. FT. IR. Spectrophotometer Model Shimadzu 8400.
b. Melting point apparatus Model Gallen Kamp (11Hz).
c. (H^1-NMR) ultra-shield 300 MHz. Bruker 2003, Beirut Arab University.

Synthesis of 2·chloro –N- acetamide (compounds -1,4 , 7):

To a stirred solution of aryl amines compounds (0.04 mol.) and triethylamine (Et_3N) (0.02 mol.) in dioxane solvent(50 ml). chloro acetyl chloride (0.02 mol.) was added dropwise. The reaction mixture was refluxed for (13) hours the excess of solvent was evaporated. The solid obtained was washed with distil water, filtered dried and crystallized from ethanol [5].

Synthesis of 2·(3 - chloro phenylamino) – and N-(2, 4 – dichlorophenyl, 2 – (2-flouro – 5 – nitrophenylamino) acetamide (compounds -3, 6, 9):

(0.04 mol.) from each (compounds -1, 4, 7) mixed with substituted amine (0.01 mol.) in ethanol (25 ml) was refluxed (7 hour) after cooling the resulting solid was filtered, dried and crystalized from absolute ethanol [5].

Synthesis of 3-(substituted phenyl) –2– Iminothiazolidin -4- one (compounds -2, 5, 8):

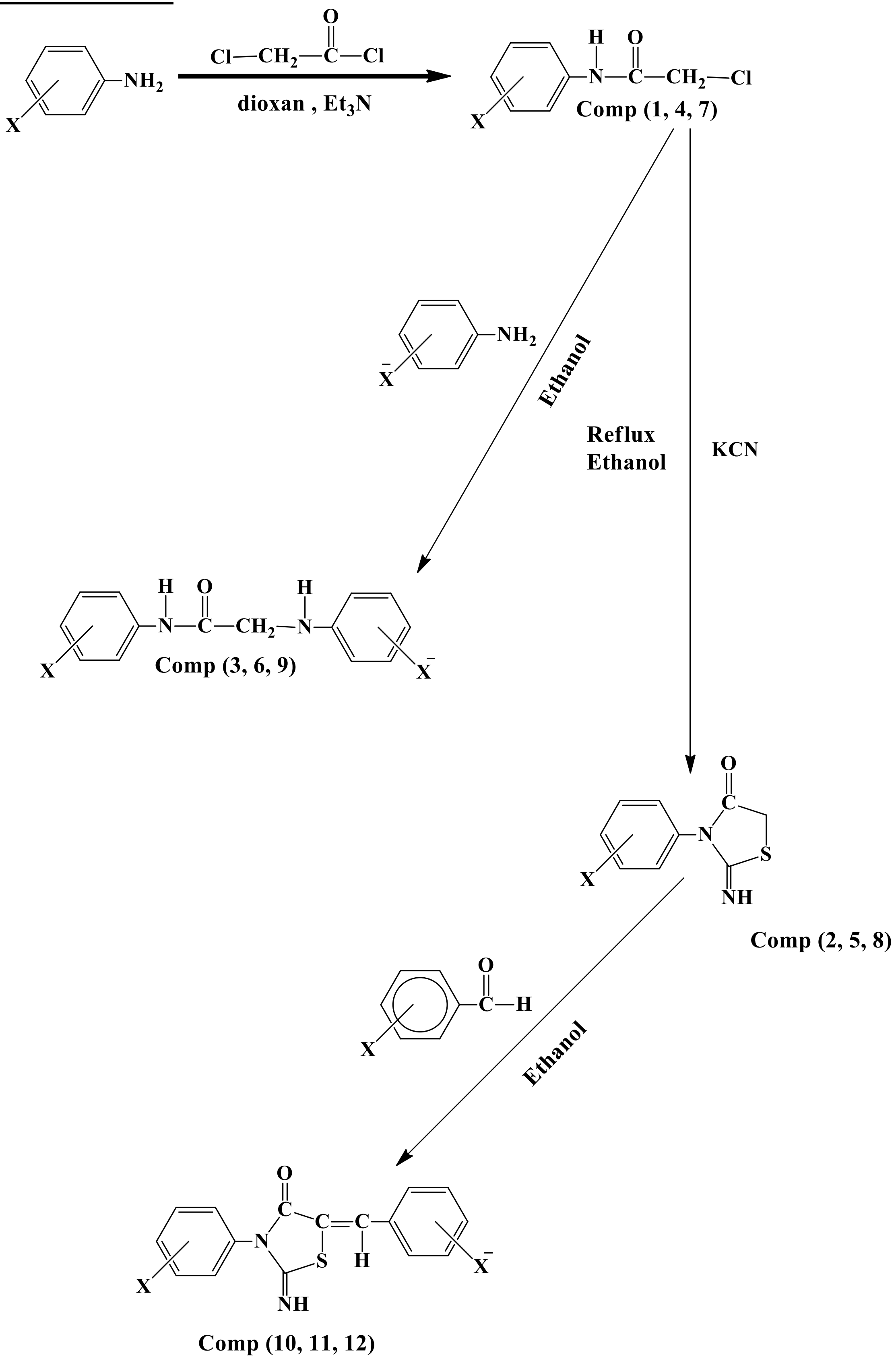
(0.01 mol.) from each (compound -1, 4, 7) mixed with (0.02 mol.) of (KCN). Potassium thiocyanate dissolved with acetone solvent (50 ml), refluxed about 4 hours.

Excess of solved is removed and residue is stirred with distal water. The solid product is filtered washed with distils water, dried and dried and crystalized from ethanol [5].

Synthesis of (Z) -5, 3, 3 (substituted phenyl) –3, 5, 5 (substituted benzylidene) –2– Iminothiazolidine -4- one (compounds -10, 11, 12):

(0.01 mol.) from each (compound 2, 5, 8) mixed with (0.02 mol.) from substituted aromatic aldehyde are added to a solution of anhydrous sodium acetate (0.02 mol.) in acetate acid (30 ml.), the mixture is refluxed for 5 hours and cooled to room temp. The solid product is filtered, washed with distil water, dried and crystallized from ethanol [5].

The scheme of reactions

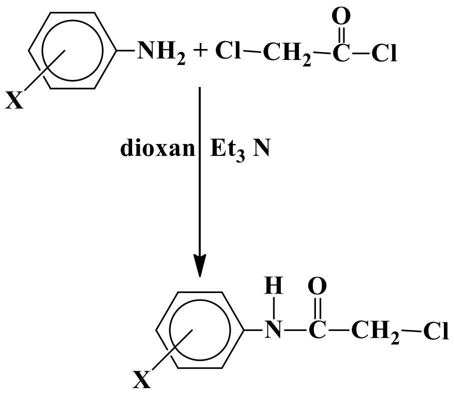


Where X: NO_2, Cl, F

Where$\bar{X}$: NO_2, Cl, F, N $(CH_3)_2$

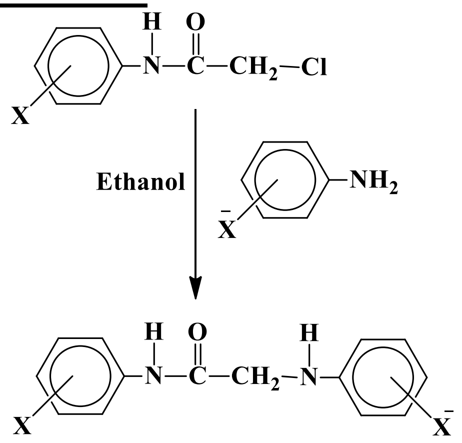
The Paths of reactions

1- **First**
2- **line**



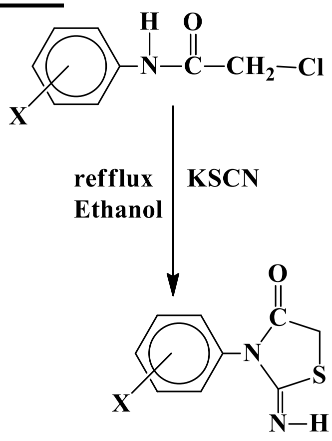
Comp (1, 4, 7)

3- Second line



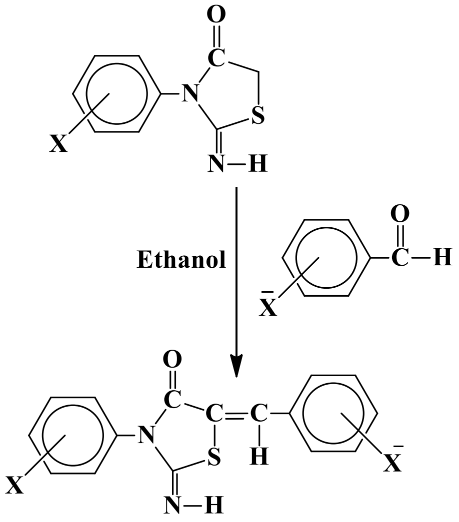
Comp (3, 6, 9)

4- Third line



Comp (2, 5, 8)

5- Fourth line

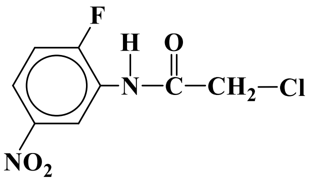


Comp (10, 11, 12)

Where X: NO_2, Cl, F
Where $\bar{X}$: NO_2, Cl, F, $N(CH_3)_2$

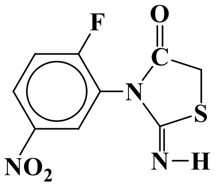
The prepared compounds:

(1)



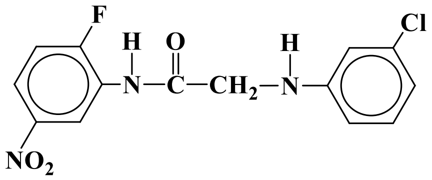
2-chloro-N-(2-fluoro-5-nitrophenyl) acetamide

(2)



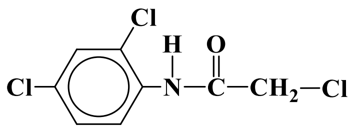
3-(2-fluoro-5-nitrophenyl)-2-iminothiazolidin-4-one

(3)



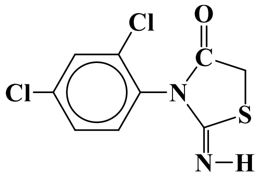
2-(3-chlorophenylamino)-N-(2-fluoro-5-nitrophenyl)acetamide

(4)



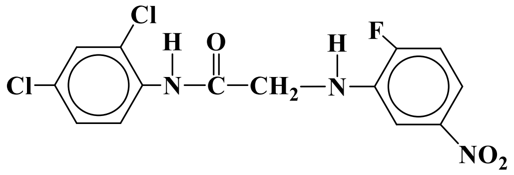
2-chloro-N-(2,4-dichlorophenyl)acetamide

(5)



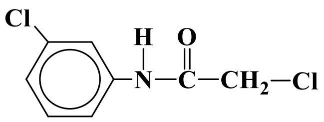
3-(2,4-dichlorophenyl)-2-iminothiazolidin-4-one

(6)



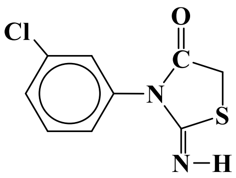
N-(2,4-dichlorophenyl)-2-(2-fluoro-5-nitrophenylamino)acetamide

(7)



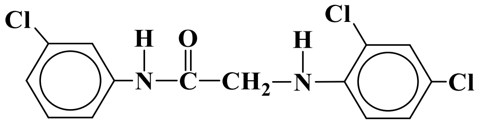
2-chloro-N-(3-chlorophenyl)acetamide

(8)



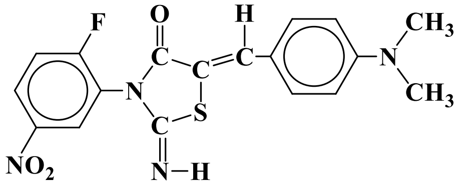
3-(3-chlorophenyl)-2-iminothiazolidin-4-one

(9)



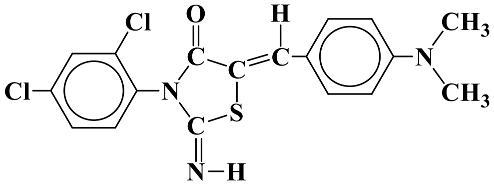
N-(3-chlorophenyl)-2-(2,4-dichlorophenylamino)acetamide

(10)



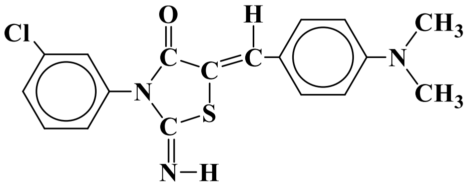
(Z)-5-(4-(dimethylamino)benzylidene)-3-(2-fluoro-5-nitrophenyl)-2-iminothiazolidin-4- one

(11)



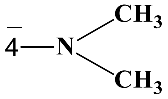
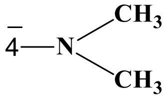
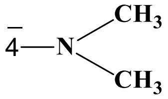
(Z)-3-(2,4-dichlorophenyl)-5-(4-(dimethylamino)benzylidene)-2-iminothiazolidin-4- one

(12)



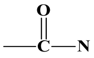
(Z)-3-(3-chlorophenyl)-5-(4-(dimethylamino) benzylidene)-2-iminothiazolidin-4- one

Table (1): Physical properties of the prepared compounds.

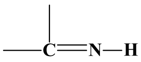
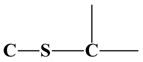
Comp No.	X	$\bar{X}$	Moleculer Formula	Colour	m.p °C	Yield %
1.	– 2F, – 5NO$_2$	---	$C_8H_6N_2O_3FCl$	Dark Brown	174 – 176	75
2.	– 2F, – 5NO$_2$	---	$C_9H_6N_3O_3FS$	Dark Brown	179 – 180	60
3.	– 2F, – 5NO$_2$	– $\bar{3}$ Cl	$C_{14}H_{11}N_3O_3FCl$	Dark Brown	183 – 185	40
4.	– 2Cl, – 4Cl	---	$C_8H_6NOCl_3$	Brown	162 – 164	73
5.	– 2Cl, – 4Cl	---	$C_9H_6N_2OSCl_2$	Orange	158 – 160	80
6.	– 2Cl, – 4Cl	– $\bar{2}$F, – $\bar{5}$NO$_2$	$C_{14}H_{10}N_3O_3Cl_2F$	Dark Brown	184 – 186	30
7.	– 3Cl	---	$C_8H_7NOCl_2$	yellow	168 – 170	85
8.	– 3Cl	---	$C_9H_7N_2OSCl$	Dark Yellow	94 – 96	25
9.	– 3Cl	– $\bar{2}$Cl, – $\bar{4}$Cl	$C_{14}H_{11}N_2OCl_3$	Brown	166 – 168	20
10.	– 2F, – 5NO$_2$	 $\bar{4}-N(CH_3)_2$	$C_{18}H_{15}N_4O_3FS$	Brown	156 – 158	65
11.	– 2Cl, – 4Cl	 $\bar{4}-N(CH_3)_2$	$C_{18}H_{15}N_3OCl_2S$	Yellow	172 – 174	78
12.	– 3Cl	 $\bar{4}-N(CH_3)_2$	$C_{18}H_{16}N_3OClS$	Black	184 – 186	62

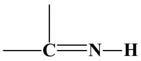
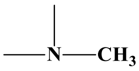
Results and Discussion

a- FT – I.R. Spectrum:

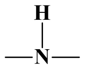
1- From the first line, the groups of (compounds 1, 4, 7) the carbonyl group  $-\overset{O}{\overset{\|}{C}}-N$ of secondary amide is observed at (1531.37) cm^{-1} and the N — H bands observed at (3317.34) cm^{-1}. The halogen stretching in group — CH_2— CI is showed as single band in (742.54) cm^{-1}. The — C = C— of benzene ring is observed at (1677.95) cm^{-1}. The chart of the compound (1) as a sample of this group.

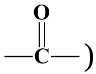
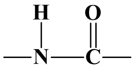
2- From the second line, the functional groups of (compounds 3, 6, 9). The doublet bands observed at (3413.77) cm^{-1} is for two of N – H attached on the benzene rings. The carbonyl group of secondary amides in solid state is observed in (1515 - 1525) cm^{-1} as two bands. The —C = C— of benzene ring is observed at (1620) cm^{-1} as double bands, the chart of the compound (6) as a sample of this group.

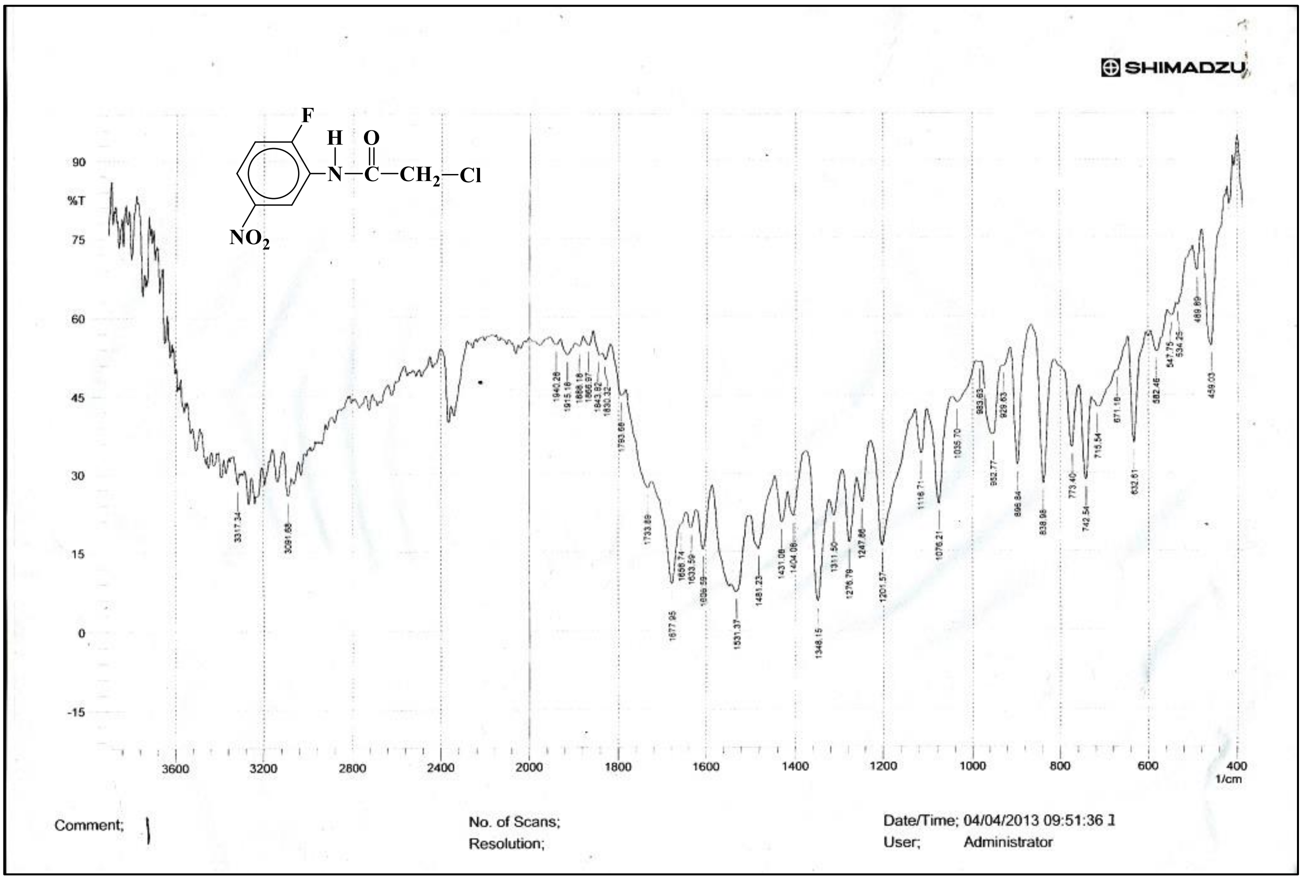
3- From the third line, the groups of (compounds 2, 5, 8) the Lactam of the five ring stretching is observed at (1735) cm^{-1} and the stretching of  $-\overset{|}{C}{=}N-H$ is observed at (1622) cm^{-1} as a broad band. The bands observed in the region (1195-1157) cm^{-1} indicate the stretching of the ( $C-S-\overset{|}{C}-$) in five heterocyclic rings as a broad band. Chart of compound (5) is as a sample of these groups.

4- From the fourth line, the Lactam of the five ring stretching is observed at (1714-1733) cm^{-1} and the stretching of  $-\overset{|}{C}{=}N-H$ is observed at the region (1622- 1652) cm^{-1} as a week broad bands. The band of the methyl groups  $-\overset{|}{N}-CH_3$ is observed in (2937.38) cm^{-1} as a small week bands. The two broad bands in region (597) cm^{-1} and the region in (1217) cm^{-1} indicate the stretching of halogens (—CI and —F) respectively. The chart of compound (10) is as a sample of this group.

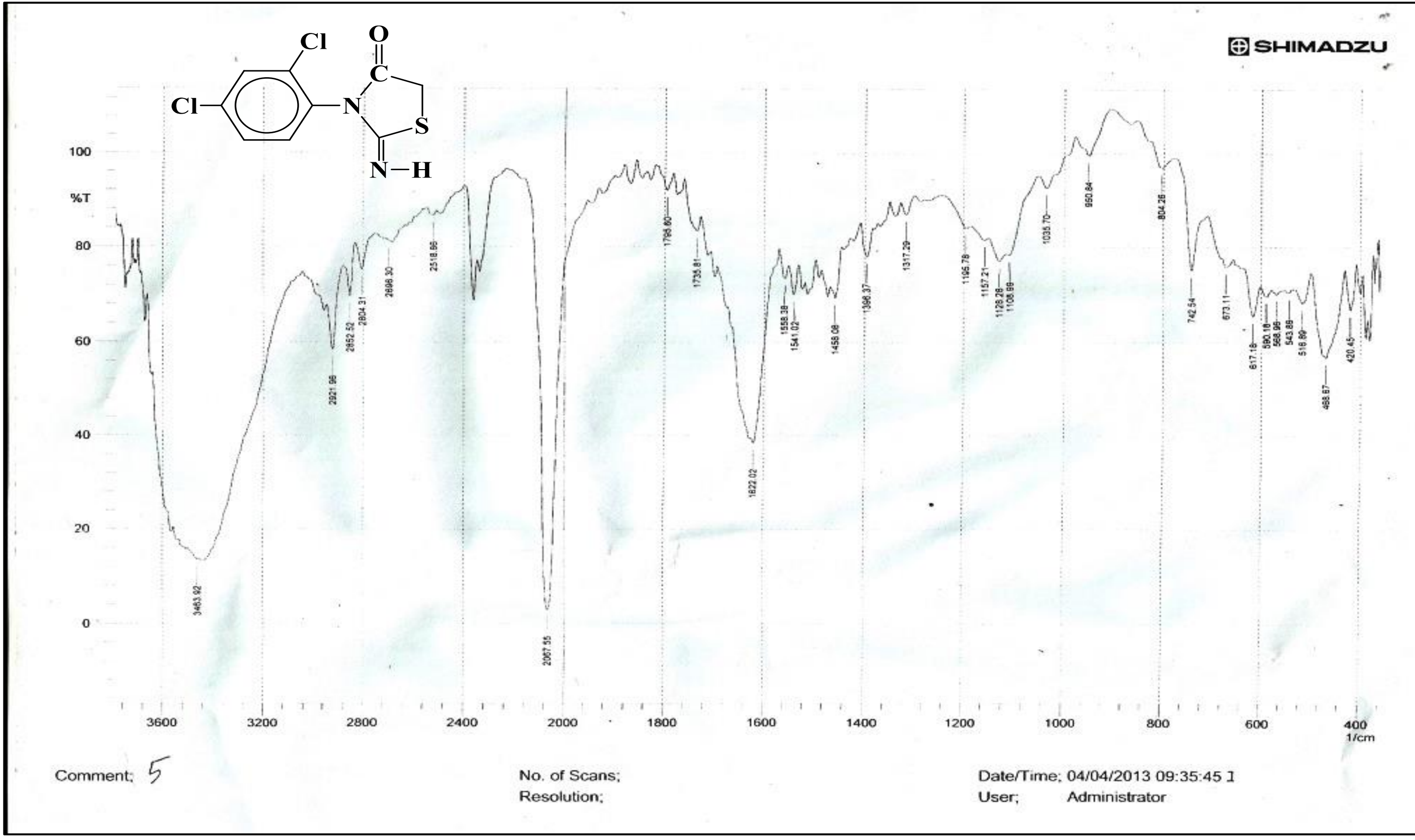
b- H^1-NMR (Nuclear Magnetic Resonance) Spectrum.

1- When study the (H^1NMR) Spectrum for compound no. (2) there is doublet weak peak at (δ=1.27 – 1.34 ppm) related to (– CH_2 –) group in the five membered ring, and the other single sharp peak observed at (δ=2.05 ppm) related to the of amine group ( $-\overset{H}{\overset{|}{N}}-$) in the five membered ring, and there is a strong bound sharp peak observed at (δ=3.17 ppm) related to the protons of aryl ring. The chart of compound (2) is as a sample.

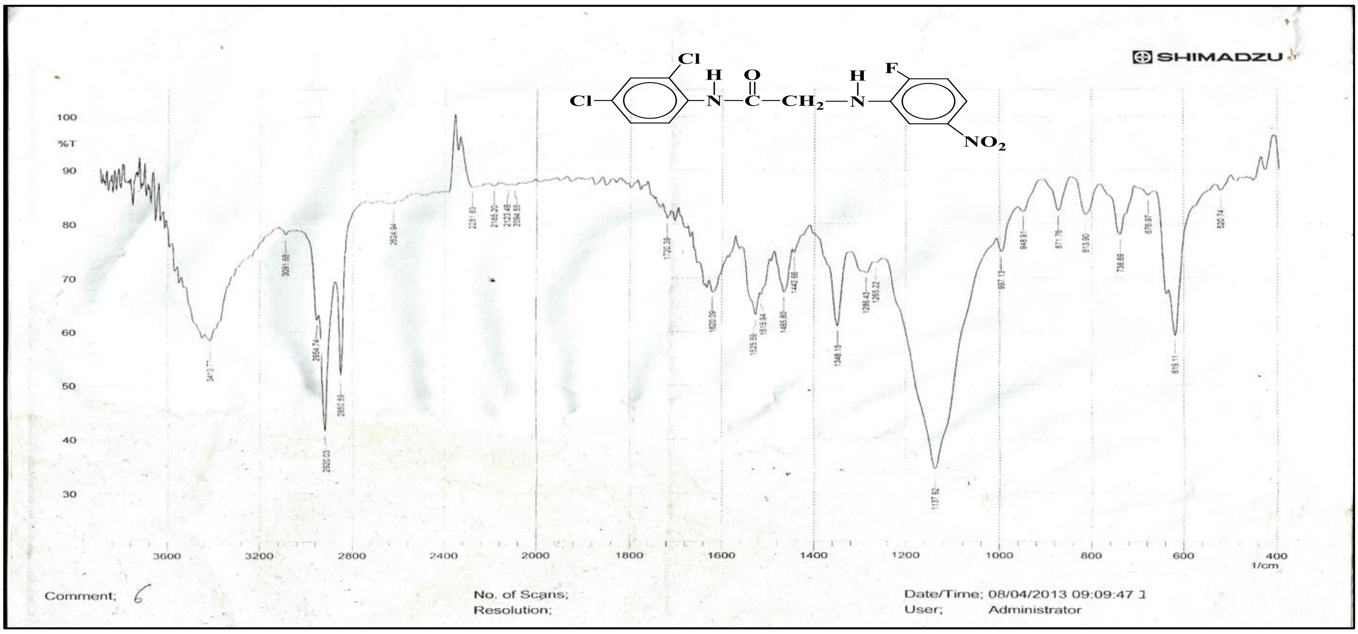
2- When study the (H^1NMR) Spectrum for compound No. (7) There are doublet sharp peak at (δ=0.0247 – 0.0427 ppm) related to Methyl group (– CH_2 –) attached to carbonyl group ( $-\overset{O}{\overset{\|}{C}}-$) and the other triplet sharp peak observed at (δ=1.9 – 1.8 ppm) related to the amide proton ( $-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-$) attached to the benzene ring. The later strong singlet peak observed at (δ=3.58 ppm) related to the aniline ring protons. The chart of compound (7) is as the sample.



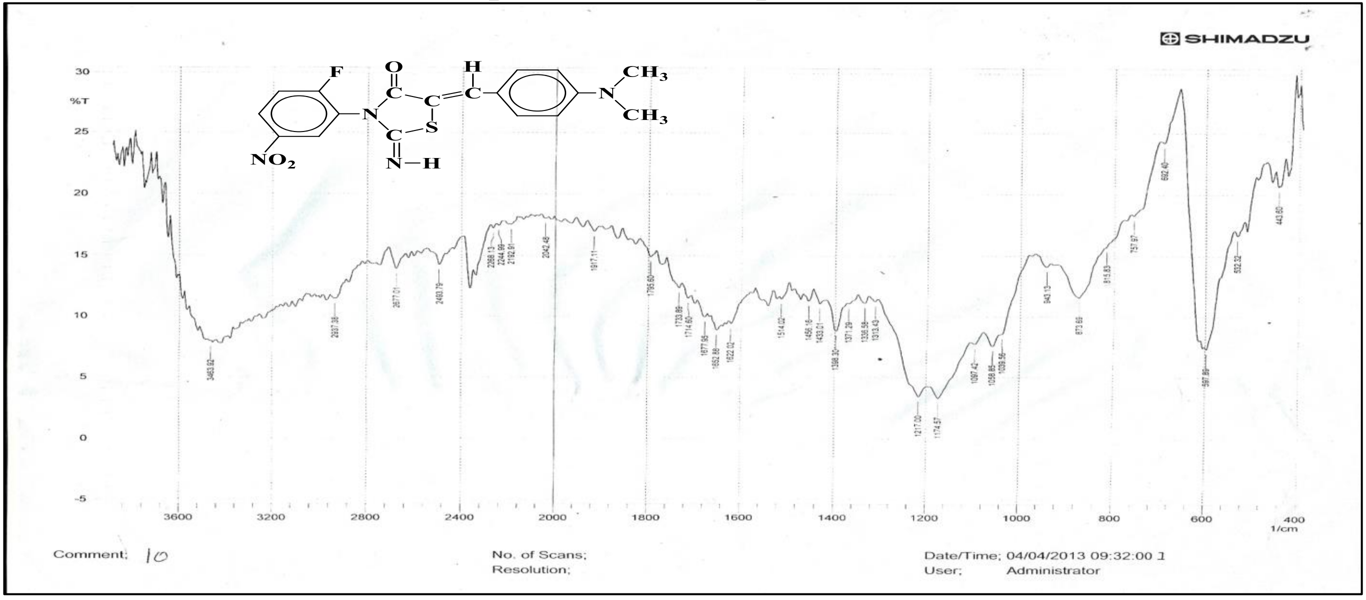
(FT-I.R.) Spectrum for compounds No. (1)



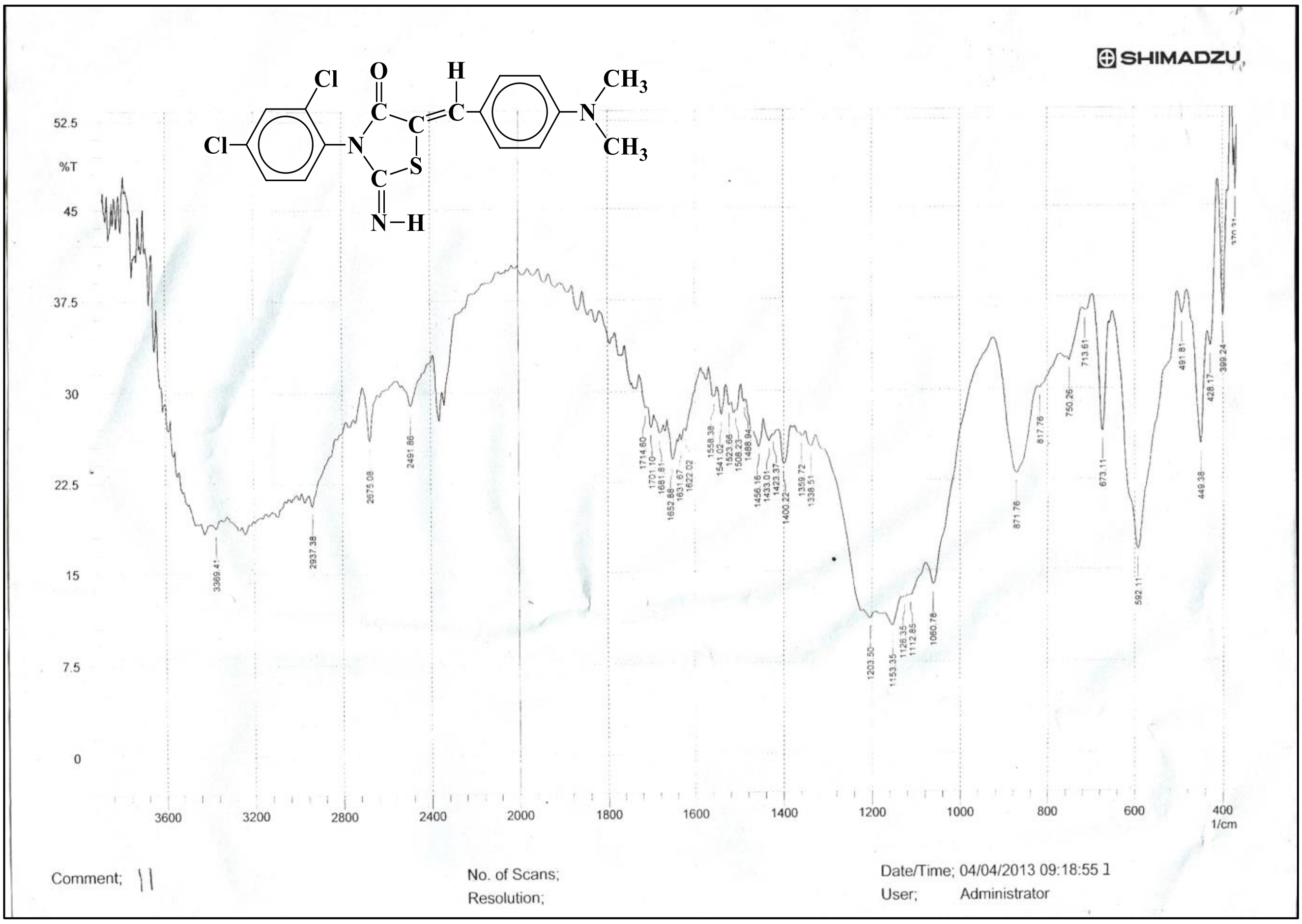
(FT-I.R.) Spectrum for compounds No. (5)



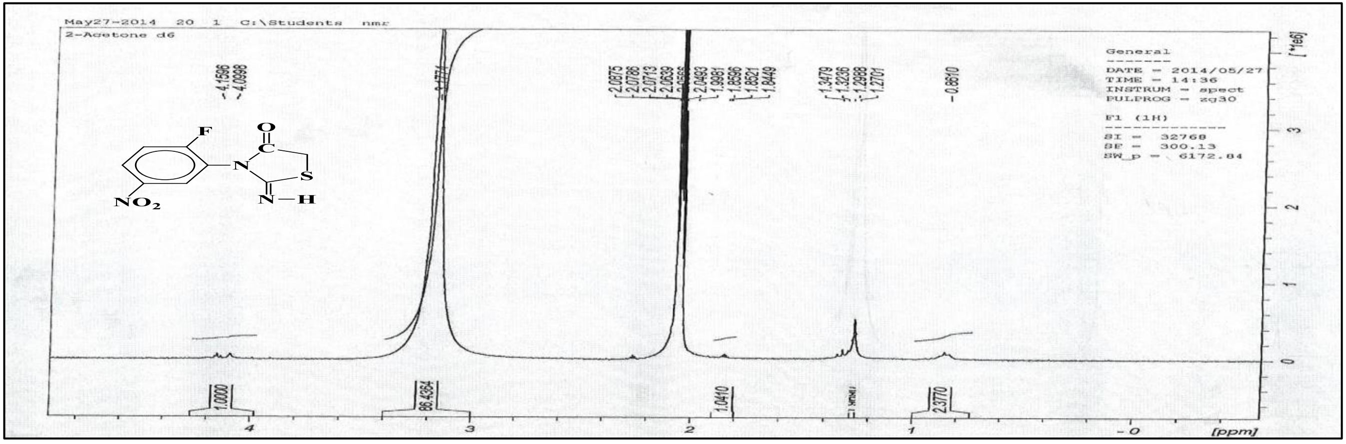
(FT-I.R.) Spectrum for compound No. (6)



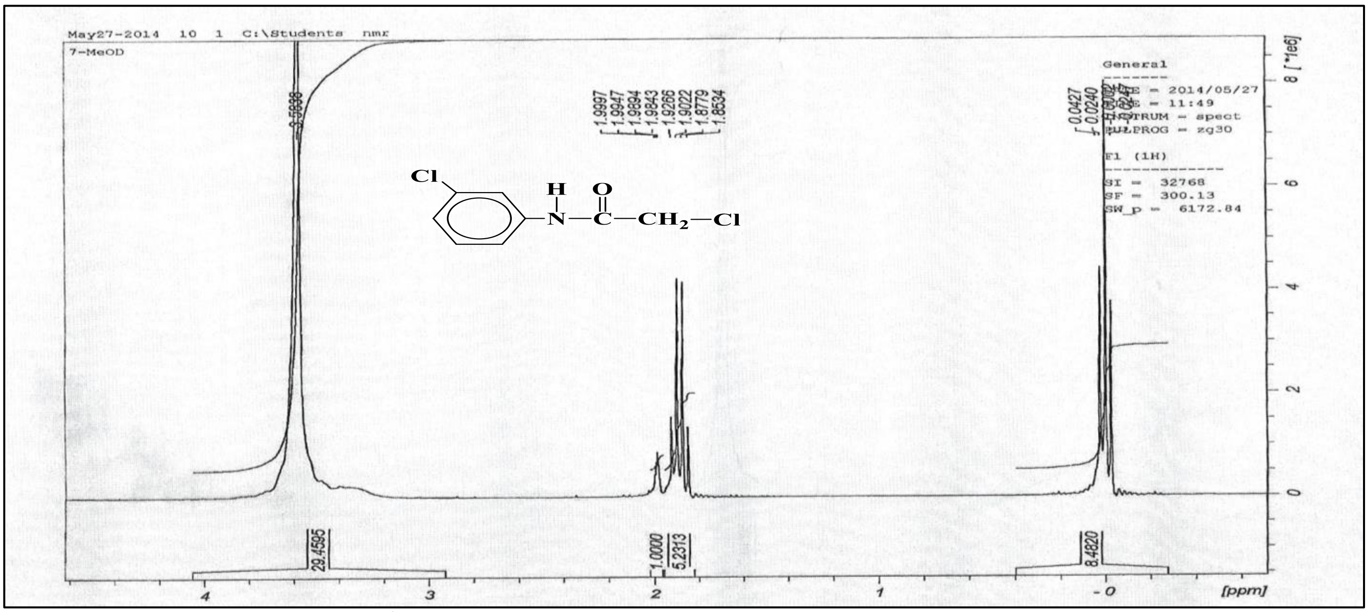
(FT-I.R.) Spectrum for compounds No. (10)



(H^1-NMR) Spectrum for compound No. (11)



(H^1-NMR) Spectrum for compound No. (2)



(H^1-NMR) Spectrum for compound No. (7)

References

1. M. Vigorita, R. Ottana, F. Monforte. Bio Med. I. et. 11. 2001, 209.
2. M. Diumo, M. Mazzoni, O. Izzo. I 1 Franco. 52, 1997, 273.
3. N. Ergene, G. Capan, I 1 Franco. 49, 1998, 449.
4. R Sharma, D. Kumar, J. Indian, Chem. Soc. 77, 2000, 492.
5. A. Ameya, R. Alandine, Arkivoc, XXl, 2007, 148 – 155.
6. D. Bryna, S. Naim, S. Paul, J. American chem. Soc. 8, 2008, 10.
7. Z. Turget, C. Yolacan, F. Aydogan, E. Bagdatali, Molecules, 12, 2007, 2151 – 2159.
8. S. Bouzoura, Y. Beutarzi, R. Kaoua, B. Nedjar. J. Org. Common, 3, 2010, 8 – 14.
9. K. Mistry, K. Desai, E., J. of chem. 1, 2004, 189 – 193.
10. R. patal, K. Desai, K. Chikhalia. Indian J. of chem. 54 b, 2006, 773 – 778.
11. A. Gursoy, T. Iyikosker, N. Terzioglu, G. Otuk. Turk. J. Pharm. Sci. 2, 2005, 1 – 10.
12. A. Niazi, S. Tameh, D. Nori, Turk. J. chem. 30, 2006, 619 – 628.
13. Samia, B.;Yamina B.; Rachedline, K.; Bellara, N – K; Sophie. P – M and Elisabit, D, Org. commune, 2010, pp. 3 – 18.
14. El-Emary, T. I.; Al-Mnaikel, N., and Moustafa, O. S., Phosphorus, sulphur and silicon, Taylor and Francis, 2002. P. 2, 1042.
15. Vartale, S.P.; Pawde; A.V.; Halikar, N.K. and pawar, Y.D., Res. J. pharm. Bio. Chem sci. 2010, P. 1061.
16. Hany, M.D.J. Chin. Chem. Soc. 2009, P. 56.
17. T. Kaio, T. Ozaki, N. Ohi, Tetrahedron. 109, 1999, 3963.
18. R. M. Silverstein, G. C. Bassler and and T. C. Morrst, spectrometric Identification of Organic compounds 4th ed. John Wiley and sons New York (1981).