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SYNTHESIS AND SPECTROSCOPIC CHARACTERIZATION OF A NEW SERIES OF BENZO[E][1,3]OXAZEPINE COMPOUNDS FROM SCHIFF BASES

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ABSTRACT:
The present work includes synthesis, characterization and investigation the biological activity of a new series of benzo [e][1, 3]oxazepine compounds which were prepared from Schiff bases. The synthetic routes have been divided into two steps as follows: The first step includes the synthesis of Schiff bases, by treatment of 4-amino diphenyl amine and different substituted benzaldehydes in absolute ethanol using glacial acetic acid as catalyst. The second step of this work is the synthesis of a series benzo [e][1, 3] oxazepine, by the reaction of the synthesized Schiff bases with phthalic anhydride in dry benzene. The structures of the synthesized products were confirmed on the basis of (UV-Visible, FT-IR, ^{1}H-NMR, ^{13}C-NMR spectroscopy. Some of the synthesized compounds were evaluated for antibacterial activity, against two types of bacteria, *Staphylococcus aureus* (Gram positive) and *Pseudomonas aeruginosa* (Gram negative).The results showed the high sensitivity of the synthesized compounds to both types of bacteria.

KEYWORDS: Schiff Base; Benzo [e][1, 3] Oxazepine; Antimicrobial Activity.

1. INTRODCUTION

The Schiff bases play a vital role and find its use in analytical chemistry, agriculture, dyes and polymer industries, besides their utility as model systems in the field of bio-inorganic chemistry (Ren et al., 2006), biological activities and industrial application (Wang et al., 2006), Seven membered heterocycle containing two hetero atoms are oxygen in position (1) and nitrogen in position (3) in addition of five carbon atoms. 1, 3-oxazipenes are prepared by condensation of Schiff bases with anhydrides (maleic anhydride, phthalic anhydride, nitro phthalic anhydride, succinic anhydride), to give corresponding cycloaddition products. A cycloaddition reaction most commonly involves two molecules reacting to form two new sigma bonds between the end atoms of their pi systems resulting in the formation of a ring.
The reaction of these anhydrides with Schiff bases is classified as a 5+2 =7, 5-atom component plus 2-atom component leading to 7-membered cyclic ring (Hanoon, 2011). Benzoxazepines are a seven-membered unsaturated heterocyclic compounds that contains two hetero atoms (oxygen and nitrogen) (Ahmed and Al-Hashimi, 2016). Oxazepine derivatives are found to exhibit a vast variety of biological activities like antibacterial (Hikmet *et al*., 2013), antifungal (Serrano-wu *et al*., 2002), hypnotic muscle relaxant (Abdelhafez and Abdelwahab, 2008), antagonistic (Hallinan *et al*., 1996), anti-inflammatory (Kubota *et al*., 2011), telomerase inhibitors (Xin-Hua *et al*., 2013) and antiepileptic (Kiran *et al*., 2003).

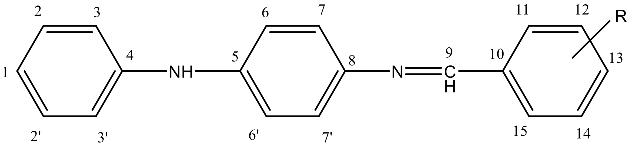
2. MATERIALS AND METHODS

2.1 Experimental notes

Melting points were determined using an Electrothermal melting point apparatus. IR spectra were recorded on IR Affinity-1 Spectrophotometer, using KBr disc. ^{1}H-NMR, and ^{13}C-NMR spectra were recorded on a Bruker (300 & 400MHz) with TMS as internal reference, using DMSO as solvent, in Jordon University of science and technology, Irbid.

2.2 Synthesis of *N*^{1} - (substituted benzylidene)-*N*^{4}-phenylbenzene-1,4-diamine (2 a-j) (AL-jamali, 2015)

In round bottom flask (1.84g, 0.01 mole) of 4-aminodiphenyl amine (1) in (50 mL) of absolute ethanol, (0.01 mole) of appropriate aromatic aldehyde with some drops of glacial acetic acid was refluxed for (3-7 hrs) .The reaction mixture was then allowed to cool to room temperature and solid product was filtered and recrystallized from ethanol to give colored compounds.



2.2.1 Synthesis of *N*^{1} - (4-Bromobenzylidene)-*N*^{4}-phenylbenzene-1,4-diamine (2d)): ($C_{19}H_{15}N_{2}Br$), m.p. (141-143 ^{o}C), yield (91 %);^{1}H-NMR: 7.7-8.4 (m, 13H, aromatic ring), 8. 7 (s, 1H, -NH), 9 (s, 1H, Schiff base proton-CH=N-). ^{13}C-NMR: 116.52:$C_{1,}$ 116.67: C3,3′,119.65: $C_{6,6'}$, 122.27: $C_{7,7',}$ 123.89: $C_{13,}$ 128.92: $C_{2,2',}$129.71: $C_{11,15,}$ 131.49: $C_{12,14,}$ 135.39: $C_{10,}$ 142.11: $C_{5,}$ 142.17: $C_{4,}$ 142.73: $C_{8,}$ 155.18: (CH=N) $C_{9.}$. ^{13}C-DEPT: 116.5 C1:116.7:C3,3′, 119.7:C6,6′, 122.3: C7,7′, 128.9: C2,2′,129.7: C11,15,131. 4: C12,14, 155.2: (CH=N) C9.

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2.2.2 Synthesis of *N*^{1} - (*N,N*-dimethylbenzylidene)-*N*^{4}-phenylbenzene-1,4-diamine (2f): ($C_{21}H_{21}N_3$), m.p. (125-127 °C), yield (81 %); ^{1}H-NMR: 4.4 (s, 6H, 2CH3), 6.54-7.8 (m, 13H, aromatic ring), 8.2 (s, 1H, -NH), 8.43(s, 1H, Schiff base proton-CH=N-). ^{13}C-NMR: 45.2: 2CH3,111.09: C12,14,115.93: C1,117.12: C3,3′,118.97: C6,6′,121.49: C7,7′, 123.88: C10, 128.76: 2,2′,129.40 :C11,15,140.52: C5,143.19: C4,143.89: C8,151.59: C13,156.48: (CH=N)C9.^{13}C-DEPT: 116.6;C1, 116.7; C3,3′,119.5; C6,6′,122.1; C7,7′,128; C12,14,128.5;C11,15,128.9; C2,2′, 130.5:C13 ,156.6:(CH=N) C9.

2.2.3 Synthesis of *N*^{1} - (benzylidene)-*N*^{4}-phenylbenzene-1,4-diamine (2g): ($C_{19}H_{16}N_2$), m.p. (99-100 °C), yield (82 %); ^{1}H-NMR: 6.83-7.39 (m, 14H, aromatic ring), 8.33 (s, 1H, -NH), 8.66 (s, 1H, Schiff base proton-CH=N-) ^{13}C-NMR: 116.55: C1,116.72; C3,3′,119.53; C6,6′,122.11;C7,7′,127.94; C12,14,128.44; C11,15,128.91; C2,2′,130.52; C13,136.18; C10,141.86; C5,142.63; C4,142.90; C8,156.55; (CH=N) C9.

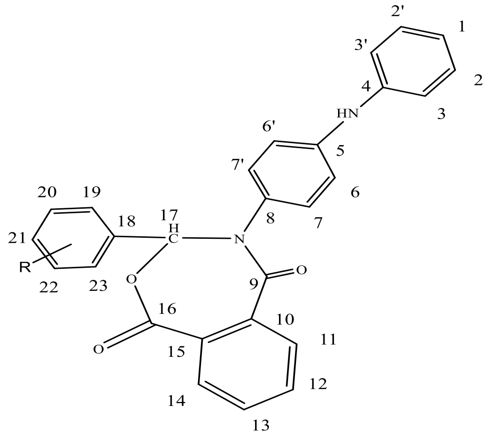
2.2.4 Synthesis of *N*^{1} - (2-hydroxybenzylidene)-*N*^{4}-phenylbenzene-1,4-diamine (2h): ($C_{19}H_{16}N_2O$), m.p. (103-105 °C), yield (84 %); 1H-NMR: 6.85-7.8 (m, 13H, aromatic ring), 8.93(s, 1H, -NH), 9.1(s, 1H, Schiff base proton-CH=N), ^{13}C-NMR: 116.03: C12,,116.29; C1,116.87; C10, 118.57; C3,3′,119.09; C6,6′,119.82; C14,122.11; C7,7′,128.84; C2,2′131.71; C15,132.03; C13,138.79; C5,142.37; C4,142.60; C8,159.13; (CH=N) C9,159.73; C11.

2.2.5 Synthesis of *N*^{1} - (2-fluorobenzylidene)-*N*^{4}-phenylbenzene-1,4-diamine (2i): m.p. (91-93 °C), yield (88 %); ^{1}H-NMR: 6.83-7.8 (m, 13H, aromatic ring), 8.28 (s, 1H, -NH), 8.59 (s, 1H, Schiff base proton-CH=N-)

2.2.6 Synthesis of *N*^{1} - (3-nitrobenzylidene)-*N*^{4}-phenylbenzene-1,4-diamine (2j): ($C_{19}H_{15}N_3O_2$), m.p. (112-114 °C), yield (95 %); ^{1}H-NMR: 6.84-8.4 (m, 13H, aromatic ring), 8.69 (s, 1H, -NH), 8.82(s, 1H, Schiff base proton-CH=N-). 116.12; C1,116.77; C3,3′,119.70; C6,6′,121.65; C7,7′, 122.44; C13,124.41; C11,128.77; C2,2′,129.91; C14,133.68; C10,137.68; C15m,141.21; C5,142.37; C4,142.55; C8,147.72; C12,153.79; (CH=N) C9.

2.3 Synthesis of (Oxazepine derivatives):3-sustituted phenyl-4-(4-(phenylamino)phenyl)-3,4-dihydro-benzo[e][1,3]oxazepine-1,5-dione (3 a-j), (Alexander *et al.*, 2016).

Mixture of Schiff base (2mmol) and phthalic anhydride (2mmol,0.0296gm) in (20mL) dry benzene was heated for (5-6 hrs) in water bath at (85◦C), the precipitate was filtered and recrystallized from toluene



2.3.1 3-(4-bromophenyl)-4-(4-(phenylamino)phenyl)-3,4-dihydro-benzo[e][1,3]oxazepine-1,5-dione (3d): ($C_{27}H_{19}N_2O_3Br$), m.p. (198-200 °C), yield (96 %); ^{1}H-NMR: 6.75-7.87 (m, 17H, aromatic rings, phthalic anhydride) , 8.06 (s, 1H, -NH),10.17 (s, 1H , -C-H proton). ^{13}C-NMR:115.28; C17,117.37; C1,118.53; C3,3′,120.38; C6,6′,127.07; C21,127.05C7,7′, 128.11; C11,128.73; C8,128.77; C19,23,128.9; C2,2′,130.34; C14,15,131.17; C10,132; C20,22,132.48; C12,13,138.52;C5,143.43; C18,142; C4,167.26; C16C=O,168.23; C9C=O. ^{13}C-DEPT: 115.3; C17, 117.4, C1, 118.5; C3,3′,120.4; C6,6′,127.4; C7,7′,128.1; C11,128.7; C19,23,128.8; C2,2′,129; C20,22,130.02; C12,13.

2.3.2 3-(*N,N*-dimetyhylphenyl)-4-(4-(phenylamino) phenyl)-3, 4-dihydro-benzo[e][1,3]oxazepine-1,5-dione (3f): ($C_{29}H_{25}N_3O_3$), m.p. (168-170 °C), yield (96 %); ^{1}H-NMR:3.55 (s, 6H, 2CH3), 6.68-8.29 (m, 17H, aromatic rings) 8.56 (s, 1H, -NH), 9.67 (s, 1H , -C-H proton).

2.3.3 3-(phenyl)-4-(4-(phenylamino)phenyl)-3,4-dihydro-benzo[e][1,3]oxazepine-1,5-dione (3g): ($C_{27}H_{20}N_2O_3$), m.p. (175-176 °C), yield (60 %); ^{1}H-NMR6.75-7.87 (m, 18H, aromatic rings), 8.06 (s, 1H, -NH),10.17 (s, 1H , -C-H proton): ^{13}C-NMR: 115.36; C17,117.35; C1,117.44; C3,3′, 118.59; C6,6′,120.45; C7,7′,127.41; C21,128.77; C19,23,129.44; C11,129.83; C20,22,8,129.86; C2,2′,129.9; C14,15,130.35; C10,131.20; C13,132; C12,133; C5,138.77; C4,143.86; C18,167.23; C16C=O,168.23; C9C=O.

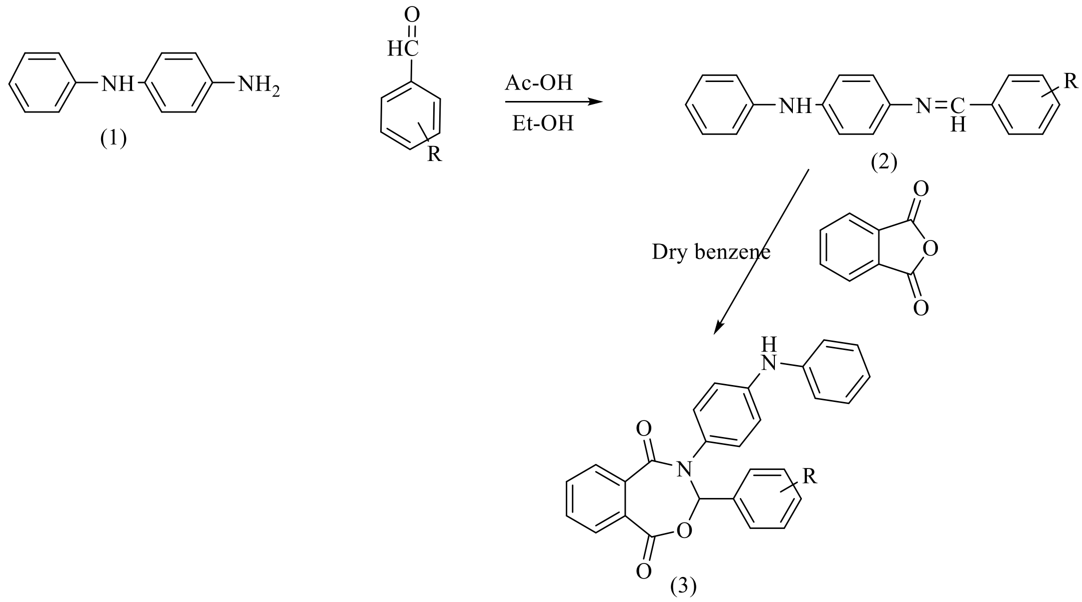
2.3.4 3-(2-hydroxyphenyl)-4-(4-(phenylamino)phenyl)-3,4-dihydro-benzo[e][1,3]oxazepine-1,5-dione (3h) : ($C_{27}H_{20}N_2O_4$), m.p. (128-130 °C), yield (69 %); ^{1}H-NMR :6.75-8.4 (m, 17H, aromatic rings), 8.92 (s, 1H, -NH),10.17 (s, 1H , -C-H proton) 13.48 (br,1H, -OH). ^{13}C-NMR: 115.24;C17,115.99; C20,116.25; C1,116.83; C3,3′,117.32; C6,6′,118.55; C22,119.04;C7,7′, 119.80;C11,120.34; C21,122.07; C23,127.31; C8,128.69; C18,128.80; C2,2′,128.98; C14,15,131.67; C10,132.01; C12,13,142.56; C5,159.11; C4,159.67; C19,166.5; C16C=O,167.1C9C=O. ^{13}C-DEPT: 115.23; C17,115.98; C20,117.31; C1,116.85; C3,3′,117.34; C6,6′,118.58; C22,119.06; C7,7′,119.82; C11, 120.36; C21,122.08; C23,128.82; C2,2′,128.99; C14,132.01; C12,13.

2.3.5 3-(2-fluorophenyl)-4-(4-(phenylamino)phenyl)-3,4-dihydro-benzo[e][1,3]oxazepine-1,5-dione (3i) : ($C_{27}H_{19}N_2O_3F$), m.p. (120-122 °C), yield (53 %); 6.75-8.72 (m, 17H, aromatic rings), 8.86 (s, 1H, -NH),10.18 (s, 1H, -C-H proton). ^{13}C-NMR: 115.43:C17,115.99: C1,117.52:C3,3′,21, 117.99:C6,6′,118.67: C19,120.53: C7,7′,127.50: C11,128.85: C8,128.96C22,129.15: C2,2′,129.84: C14,15,130.40: C10,131.28:C13,131.99: C23,132.23:C12,132.70: C5 , 138.57: C4,138.70: C18,143.84:C20, 166.51:C16,C=O,167.32:C9,C=O.

3. RESULTS AND DISCUSSION

3.1 Synthesis and characterization

In the present work we described the synthesize and characterization of some new oxazepine derivatives along with biological evaluation against two types of bacteria *Escherichia coli* gram negative and *Staphylococcus aurous* gram positive. The preparation processes as outlined in Scheme (1).



Where R a=4-NO_2, b= 4-F, c= 4-Cl,d= 4-Br, e= 4-OCH_3, f = 4-$(CH_3)_2$, g= H, h = 2-OH, i = 2-F, j= 3-NO_2

Scheme 1. Oxazepin(3) synthsesis from Schiff bases (2)

Table 1. Assignment of characteristic frequencies (cm-1) of IR spectral data for the synthesized Schiff bases (2 a-j)

Comp. No.	R	C-H str. Aromatic	C-H str. Schiff base	CH=N str.	C=C str. Aromatic	-NO_2	-NH str.
2a	4-NO_2	3066	2882	1626	1597	1512,	3414
2b	4-F	3050	2860	1624	1596	------	3414
2c	4-Cl	3025	2876	1620	1593	------	3414
2d	4-Br	3028	2872	1622	1595	------	3412
2e	4-OCH_3	3070	2850	1621	1598	------	3372
2f	4-$N(CH_3)_2$	3030	2881	1597	1577	------	3232
2g	-H	3032	2877	1622	1587	------	3414
2h	2-OH	3049	2885	1622	1597	------	3346
2i	2-F	3024	2878	1623	1602	------	3397
2j	3-NO_2	3032	2882	1627	1589	1524, 1350	3383

Table 2. Assignment of characteristic frequencies (cm^{-1}) of IR spectral data for the synthesized 3a-j

Comp. No.	R	C-H str. Aromatic	C-H str.of oxazepine ring	C=O str. C-O str. Lacton	C=O str Lactam	C=C str. Aromatic	-NH str.
3a	4-NO_2	3034	2940	1722.43;1240.23	1647.21	1599	3377
3b	4-F	3060	2893	1705.07;1244.09	1651.07	1597.06	3385
3c	4-Cl	3054	2890	1703.14;1282.66	1691.27	1560.41	3387
3d	4-Br	3070	2899	1722.43;1242.16	1695.43	1602	3377
3e	4-OCH_3	3038	2870	1720.50;1244.09	1705	1516	3310
3f	4-$N(CH_3)_2$	3053	2856	1716.65;1243.04	1653	1595	3315
3g	-H	3032	2887	1720.50;1242.16	1701.22	1598	3379
3h	2-OH	3026	2879.7	1722.43;1244.09	1699.29	1597	3311
3i	2-F	3011	2882	1701.22;1280.73	1683.86	1587.42	3385
3j	3-NO_2	3053	2937	1722.43;1242.16	1647.21	1600.92	3377

The substrate 4-aminodiphenylaniline (1) reacted with different aromatic benzaldehydes in absolute ethanol to, was cyclized when treated with phthalic anhydride to give a series of oxazipenes(3).The formations of new oxazepines (3a-j) were identified on the basis of their spectral methods: (UV-Visible, FT-IR, ^{1}H-NMR, and ^{13}C-NMR),Table (2).

The general feature of the IR spectra of oxazepines (3 a-j) which has been shown in Table **(2)** consist in the presence of strong sharp bands at (1701-1722) cm^{-1} and the appearance of the strong absorption bands at (1592-1705) were due to the stretching vibration of the (C=O) lactone and lactam groups respectively of the oxazepine compounds that is considered as an evidence for the formation of described products. The disappearance of the (C=N) band for Schiff bases in the range of the (1627-1597) cm^{-1} in all 1, 3-oxazepines is also a strong evidence for the occurrence of oxazepine compounds (AL-jamali, 2015).

3.2 Biological activity

Schiff bases and oxazepines were screened to anti-bacterial activities against two types of bacteria Gram-positive (*Staphylococcus aurous*) and Gram negative bacteria (*Escherichia coli*) as KBr discs in a sterilized Muller Hinton agar medium. The prepared discs placed on the surface of the cultured media was incubated at 37 ºC for 24 hours. The Zone of inhibition produced by each compound was measured in **mm**; most of them recorded a high order of anti-bacterial activity against Gram negative ***S-aureus* Gram +ve bacteria**) **[2c: 35, 2e: 33, 2g:22,2i:33,3c: 40, 3d: 30, 3e: 36, 3i: 39,3g:39mm] and *P. aeruginosa* Gram –ve bacteria [2c: 33, 2e: 40, 2g:40,2i:37,3c: 35, 3d: 22, 3e: 30, 3i: 40,3g:40mm]**. The results showed that the most of compounds (Schiff bases and oxazepines) showed highly effective against two types of bacteria, while the compounds (3g, 4 d) showed moderately active, Table (3).

Table 3. The antibacterial activity of some of the synthesized Schiff base and Oxazepines with inhibition zone diameters in (mm) scale against two strain of bacteria.

Compounds	Zone of inhibition in (mm)	
	S-aureus Gram +ve bacteria	*P. aeruginosa* Gram –ve bacteria
2 c	35	33
2 e	33	40
2 g	22	40
2 i	33	37
3 c	40	35
3 d	30	22
3 e	36	30
3 i	39	40
3 g	39	40

4. CONCLUSION

The prepared new Schiff base and heterocyclic derivatives containing oxazepine ring are biological active against both types of bacteria *Staphylococcus aureus* and *Pseudomonas aeruginosa*. The results of biological activity for synthesized compounds were showed good effect against *Staphylococcus aureus* (Gram +ve) and *Pseudomonas aeruginosa* (Gram –ve).All compounds were found to be stable at room temperature. An electron-withdrawing group on banzaldehydes lead to formation of Schiff bases and oxazepine in higher yields than electron donating group because of the increasing the of positivity or electrophilicity of the carbon of carbonyl group in substituted benzaldehydes.

REFERENCES

Abdelhafez, A. A., and Abdelwahab, B. A. (2008). 5-(4-Chlorophenyl)-5, 6-dihydro-1, 3-oxazepin-7(4H)-one derivative as lipophilic cyclic analogues of baclofen: design, synthesis, and neuropharmacological evaluation. *Bioorganic and Medicinal Chemistry,* 16(17).p.7983-7991.

Ahmed N. G. and Al-Hashimi H. Y. (2016). Preparation and Characterization of Some New Oxazepine Compounds, *Eur. Chem. Bull.* 5(3).p. 88-9

Alexander, A. K., Joseph, L., and George, M. (2016). Synthesis of Novel 5, 6 – Benz 1, 3 – Oxazepine 4, 7 – Dione Derivatives and Screening for Antibacterial, Antioxidant and Anti-Inflammatory Activities. *European Journal of Pharmaceutical and Medical Research,* 3(7).p.330-336.

Aljamali, N.M. (2015).Comparison and Bio-Chemical Study of (Imine, Oxazepam, Diazepam, Sulfide) - Derivatives on Microbial. *International Journal of Current Research in Science and Technology,* 1(1).p. 9-15.

Hallinan, E. A., Hagen, T. J., Tsymbalov, S., Husa, R. K., Lee, A. C., Stapelfeld, A., and Savage, M. A. (1996). Aminoacetyl moiety as a potential surrogate for diacylhydrazine group of SC-51089, a potent PGE2 antagonist, and its analogs. *Journal of Medicinal Chemistry,* 39(2).p. 609-613.

Hanoon, H.D. (2011). Synthesis and Characterization of New Seven-Membered Heterocyclic Compounds from Reaction of New Schiff-Bases with Maleic and Phthalic anhydrides. *National Journal of Chemistry,* 41, p.77- 89.

Hikmet, A., Berat, K., and Fatma, B. (2013). Synthesis and structure-antibacterial activity relationship studies of 4-substituted phenyl-4, 5-Dihidrobenzo[f] [1, 4] oxazepin-3(2H)-thiones. *Medicinal Chemistry Research,* 20, p.1170-1180.

Kiran, B., Srivastava, V. K. and Ashok, K. (2003). Synthesis of 1, 5-benzothia/oxazepines as potent neuroleptic agents”, *Indian Journal of chemistry,* 42B, p.1149-1155.

Kubota, K., kurebayashi, H., Miyachi, H., Tobe, M., Onishi, M., and Isobe, Y. (2011). Synthesis and structure-activity relationship of tricyclic carboxylic acids as novel anti-histamines. *Bioorganic and Medicinal Chemistry,* 19(9).p.3005-3021.

Ren, S., Wang, R., Komastu, K., Bonaz-Krause, P., Zyrianov, Y., Mckenna, C.E., Csipke, C., Tokes, Z.A. and Lein E.J. (2006). Synthesis, biological evaluation, and quantitative structure-activity relationship analysis of new Schiff bases of hydroxysemicarbazide as potential antitumor agents. *.J. Med. Chem.* 45, p. 410-419.

Serrano-Wu, M. H., Laurent, D. R., Chen, Y., Huang, S., Lam, K. R., Matson, J. A., Mazzucco, C. E., Stickle, T. M., Tully, T. P., Wong, H. S., Vyas, D. M., and Balasubramanian, B. N., (2002). Sordarinoxazepine derivatives as potent antifungal agents. *Bioorganic and Medicinal Chemistry Letters,* 12(19).p.2757-2760.

Wang, L., Feng, Y., Xue, J. and Li, Y. (2006). Synthesis and characterization of novel pophyrin Schiff bases. *J .Serb Chem. Soc.* 73, p. 1-6.

Xin-Hua, L., Ying-Ming, J., Bao-An, S., Zhi-Xiang, P., and Song, Y. (2013). Design and synthesis of novel 2-methyl-4,5-substitutedbenzo[f]-3,3a,4,5-tetrahydro-pyrazolo[1,5-d][1,4]oxazepin-8(7H)-one derivatives as telomerase inhibitors. *Bioorganic and Medicinal Chemistry Letters,* 23(3).p.720-723.

APPENDIX

Some related figures.

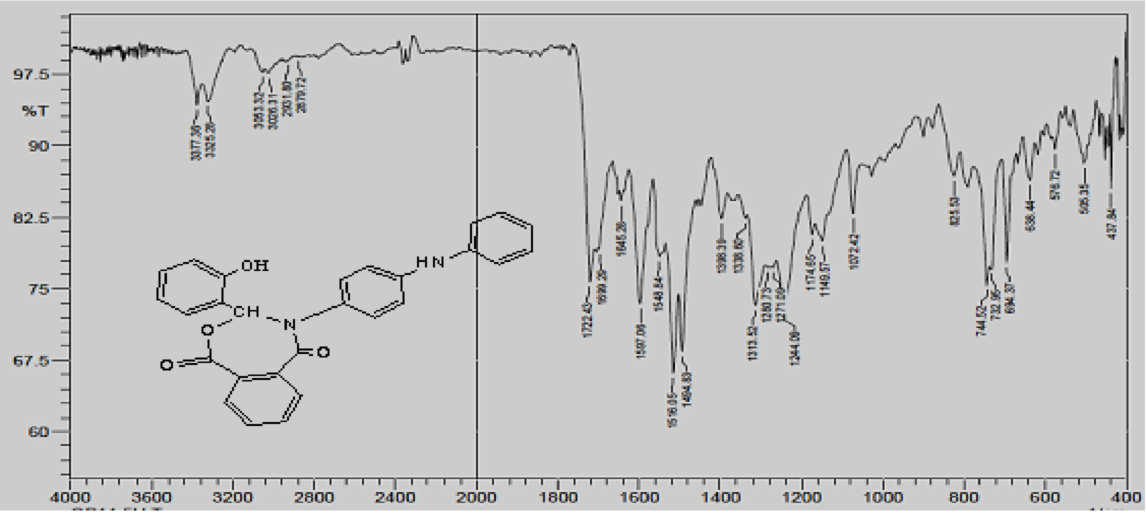


Figure 1. IR spectrum of oxazepine (3h)

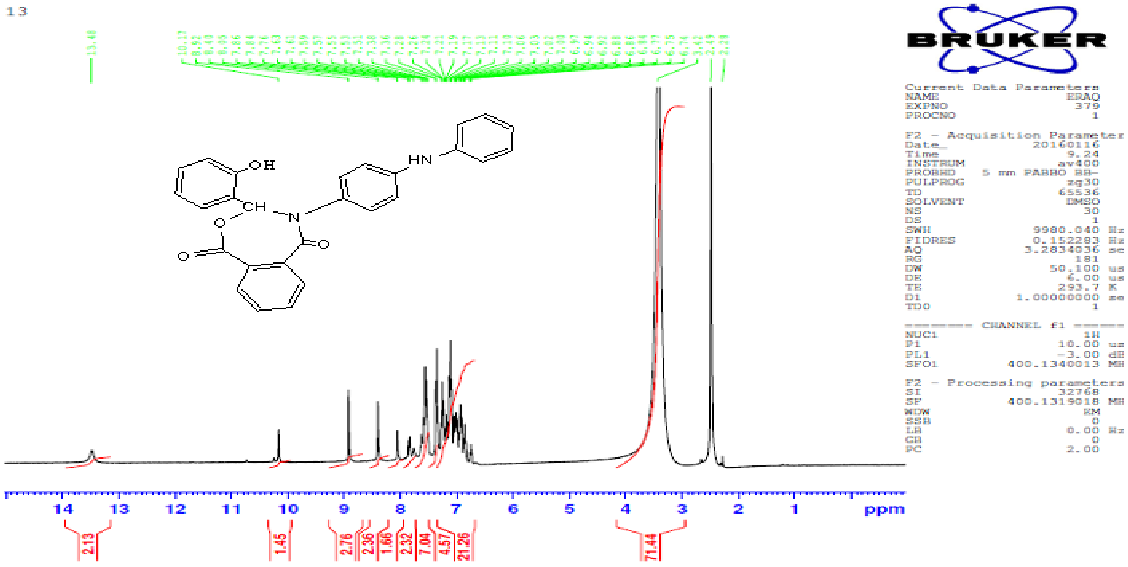


Figure 2. ^{1}H-NMR spectrum of oxazepine (3h)

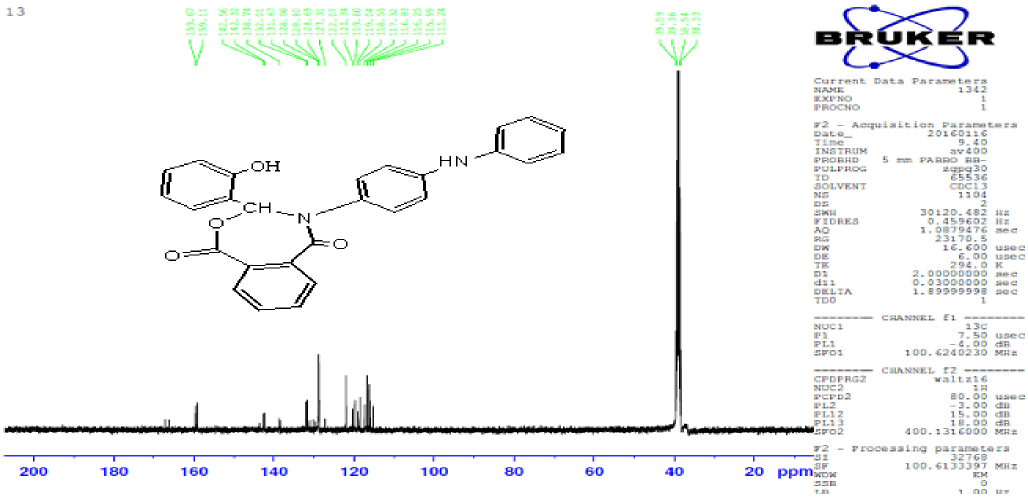


Figure 3. ^{13}C-NMR spectrum of oxazepine (3h)

ئامادە کردن و دەستنیشانکردنی شەبەنگی زنجیرە یە کی نوێ لە ئاوێتەکانی بێنزۆ [e] [١،٣] ئۆکسازیپین لەئاوێتەکانی تفتی شیف

کورتیا لێکولینێ:

لەم توێژینەوەیەدا ئامادەکردن و دەستنیشانکردنی شەبەنگی بۆ زنجیرەی بێنزۆ [e] [١،٣] ئۆکسازیپینی نوێ و شێوگی پێکهاتەی و چاڵاکی بایەلۆجی دەخەینە روو لە ئاوێتەکانی تفتی شیف ، پرۆسەی ئامادەکرنەکە دابەشکرا بۆ دوو بەشی سەرەکی بەم شێوەیەی خوارەوە: بەشی یەکەم بریتیە لە ئامادەکردنی هەندێ لە ئاوێتەی تفتی شیف (2 a-j) لە ٤ - ئەمینو دای فەنیل ئەمین دوای کارلێکردنیان لەگەڵ چەند بەنزەڵدیهایدی لە بری خراو بەهۆی بەکار هێنانی ئیسانۆڵی پەتی وەکو توێنەر بە بوونی ترشی سرکیکی بە فری وەك کارای یاریدەدەر. بەشی دووەمی لێکۆڵینەوەکە بریتی بوو لە ئامادەکردنی زنجیرەی نوێ لە بێنزۆ [e] [١،٣] ئۆکسازیپینی (3 a-j) بەهۆی کارلێکی نێوان ئیمینی ئامادەکراو (2 a-j) لەگەڵ ئاوێتەی فسالیك ئەنهدرید لەناو بەنزینی وشکدا. شێوگی کیمیاوی مادە بەرهەم هاتوەکان دیاریکران بە بەکارهێنانی رێگای شەبەنگەکان وەك شەبەنگی ژێر سوور (FT-IR) وشەبەنگی سەرووی وەنەوشەیی و بینراو هەوروەها شەبەنگی لەرینەوەی ناوکی موگناتیسی (UV-Visible ,^{1}H-NMR, ^{13}C-NMR). هەندێ لە ئاوێتە بەرهەم هاتوەکان تاقیکرانەوە لە روی دژە بەکتریایەوە دژی دوو جۆر لە بەکتریا گرام نێگەتیف (*P. aeruginosa*) لەگەڵ گرام پۆزەتیف (*S. aureus*) وە لە ئەنجامەکان هەستیاری بەرزی ئاوێتە ئامادەکراوەکان دەردەخەن دژی هەر دوو جۆری بەکتریا

التحضير و التشخيص الطيفي لسلسلة جديدة من المركبات بنزو(e) [1و3]اوكسازبين من قواعد شف

خلاصة البحث:

يتضمن البحث تحضير و التشخيص الطيفي ودراسة الفعالية البايولوجية لسلسلة جديدة من المركبات بنزو (e) [1و3]اوكسازبين من قواعد شف.ان طريقة العمل تقسم الى خطوتان: الخطوة الاولى تفاعل 4-امينو ثنائى فنيل امين مع مختلف بنزاليهايدات المختلفة في الايثانول المطلق باستعمال حامض الخليك الثلجي كعامل مساعد. أما الخطوة الثانية هي تحضير لسلسلة جديدة من المركبات بنز (e)[1,3]اوكسازبين بواسطة تفاعل قواعد الشف المحضرة مع انهدريد الفثاليك في البنزين الجاف.تم التأكد على تركيب المركبات المحضرة على اساس اطياف , UV-Visible,FT-IR, ^{1}H-NMR, ^{13}C-NMR .تم دراسة تأثير بعض المركبات المحضرة ضد نوعي من البكتريا Staphylococcus (gram positive) , Pseudomonas aeruginosa (gram negative) وقد تبين من النتائج بوجود الحساسية العالية للمركبات المحضرة تجاه نوعي من البكتريا.