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Synthesis and Characterization of New Derivatives of 2,3-Disubstituted-1, 3- oxazine-6-one via (4+2) Dipolar Cycloaddition Reactions

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ABSTRACT

Synthesis of new derivatives of 1,3-oxazine-6-one have been achieved via (4+2) polar cycloaddition reactions of β-butyrolactone with various Schiff,s bases which have been synthesized from heterocyclic primary amines and heterocyclic aldehydes and ketones in anhydrous tetrahydrofuran with good yields. The synthesized Schiff,s bases and the products were characterized by their melting points and their molecular structures were assigned by FT-IR, UV-Vis. and 1H NMR absorption spectra.

Introduction

Oxazines are an important class of heterocyclic compounds due to their wide range of biological activities; such as: sedative, hypnotic, anti-inflammatory, ovicida, analgesic, anti-fertility anti-tubercular, anti-tumor and anti-microbial, anti-bacterial ,fungicidal, plant growth regulator [1-5] and their unique usefulness in organic and bio-organic synthesis[6-9]. The synthesis of 1, 3-oxazines has already been explored and reported in the literature via several synthetic methods [10-13] .Thus, a one-pot synthesis from Schiff's bases and formaldehyde of 1,3-oxazines under reflux conditions [1] and of anti-microbial symmetrical bis-1,3-oxazines using microwave irradiation is reported [4].Novel 2-aryl/heteroaryl-substituted-5,6-dihydro-4H-1,3-oxazines were synthesized by NBS-catalized reactions of 3-aminopropanol with various aryl/heteroaryl aldehydes under microw- ave irradiation conditions in aqueous medium [5].

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Synthesis of new anti-bacterial benzoles tethered 1,3-oxazines through three- components one-pot Mannich type condensation-cyclization reactions of substituted phenols or β - naphthols with formaldehyde and benzazolophenylamines is known [6].

The1,3-oxazines were synthesized by the reactions of maleic / aryl maleic anhydrides with trimethylsilyl azides[14], and by reactions of ketenes with various compounds such as: 2-methoxypyrrolidine and/or 2-methoxypiperidine, isocyanic acid, N,N-diphenylguanidine, cyanam- ides, fluorosulphinyl isocyanate, ethyl benzimi- date and butyrimidate [15].

Other synthetic routes are based on reactions of nitriles with azido-1- propanol [16], diols in strongly acidic conditions [17], and amino alcohols in presence of mild Lewis acids such as $Cu(OAC)_2$ or $ZnCl_2$ as catalyst[18].

Synthesis of 1,3-oxazines via polar cycloa-ddition reactions of N-acylimines and/or N- iminium ions with alkenes and heterodynes [19,20], and an electron-rich 2-azadienes with an electron-deficient alkynes [21,22], was demonst- rated.

The intramolecular hydroamination of alkynes with trichloroacetimidates in presence of Au^+ complexes as a catalyst [23], and the intramolecular

polar cyclization of N- thioacyl-1,3- aminoalcohol with Bu_4N I and Et_4NI [24], is another synthetic approach.

Reactions of various N-acyl-4-acyloxy-β-lactams under basic conditions [25], and/or o-iodophenols or o- iodoanilines with heterocum- ulenes and carbon dioxide in presence of Pd- catalyst is known to give different 1,3- oxazine derivatives [26].

A green synthesis of 1,3-oxazine systems via reactions under solvent-free and microwave irradiation conditions is demonstrated.Thus synthesis of pyrano /furo1,3oxazine-2-ones (thiones) by montmorillonite K-10-clay-catalyzed reactions of D-xylose /D-glucose with semicarb- azides/thiosemicarbazides in presence of sodium acetate [27], and 2-aryl/heteroaryl-substituted-5,6-dihydro-4H-1,3-oxazines by condensation of various aryl/hetercarboxylic acids[28] is achieved. Whereas reactions of p-toluenesulphonyl chloride (p-Ts-Cl) with N-acylaminoalcohols or 3-amino- propanol with aryl nitriles (Ar-CN) in refluxed CH_2Cl_2 gave 2-aryl/heteroaryl-substituted-5, 6- dihydro - 4H-1,3- oxazines [28].

Reduction of Schiff's bases derived from various anilines with salicylaldehyde and 2-hydroxynaphthaldehyde by $NaBH_4$ which were cyclized with thiophopsgene afforded 3,4-dihy-drobenzo[e][1,3] oxazine-2-thiones and 1,2-dihydronaphtho [2,1- e][1,3]oxazine-3- thiones respectively[29] .

Cyclization of triphosgen{bis-(trichlorom-ethyl)carbonate}with hydrazones derived from 2-acetyl-1- naphthol and 1-acetyl-2- naphthol is reported to give naphtho[1,2- e] 1,3- oxazines, naphtho[2,1-e] [1,3] oxazines and their spiro dimers respectively[30].

Novel synthesis of (benzo[d][1,3]oxazine-2yl) propionamide and (benzo[d][1,3]oxazine-4-ones through multi steps reaction of isothi- ocyanate with phenylendiamine and anthranilic acid and/or through the reaction of 2- [2- (6- methoxynaphthalen-2-yl)-propionylamino] benz- oic acid derivatives with acetic anhydride is demonstrated[31].

Various derivatives of 1-arylnaphtho [1, 2-e][1,3]oxazine-3-one have been synthesized from aryl aldehydes, β-naphthol and urea in presence of ($HClO_4/SiO_2$) as catalyst in the absence of solvent[32].

Condensation of Beti base analogues amin-onaphthols with substituted benzaldehydes gave1,3-diaryl-2,3-dihydro-1H-naphth[1,2-e][1,3] oxazine [33].

Experimental

All solvents were redistilled and dried over anhydrous calcium chloride. Melting points are uncorrected and were determined by Bruker melting point smp 30. FT-IR spectra in KBr disc were recorded on Alpha Bruker optics infrared spectrophotometer at room temperature in the range (400-4000) cm^{-1} . UV-Vis. spectra in methanol were recorded on Schimadzu Recc Spectra Scan 60 DV spectrophotometer at room temperature in the range (500-200) nm. ^1H NMR spectra were recorded on Bruker Ac-300 MHz Spectrometer in DMSO- d_6 as a solvent and TMS was used as an internal reference .

General procedure for the synthesis of Schiff's bases(3a-g).

A mixtures of 0.01 mole (0.96g) of furan-2-carboxaldehyde and 0.01 mole (1.5g) of 2-aminobenzothiazole in (20 ml) of absolute ethanol and few drops of glacial acetic acid as catalyst was allowed to reflux for (3hr), then left to cool down in cold- water bath wereby crystalline solid separated out .The solid product was filtered off, washed with distilled water and recrystallized twice from ethanol [1].

Other Schiff's bases were prepared following the same procedure and using equimolar ratios of the heterocyclic amines and the heterocyclic aldehydes or ketones. Their structural formula, IUPAC names, percentage yields and some physical data are given in table1.

General procedure for synthesis of derivatives of 2,3-disubstituted-1, 3-oxazine-6-one (5a-g)

A mixture of 0.01mole (1.5g) of (Z)-3-(benzo [d]thiazol-2-yliminoindolin-2-one, (3a) and 0.01mole (1.33 g) of β- butyrolactone in (10ml) of anhydrous tetrahydrofuran and few drops of glacial acetic acid as catalyst was reacted under reflux conditions for (5hr) .The solvent was partially removed by rotary evaporation at reduced pressure and the reaction mixture was left to cool down in an ice- water bath for

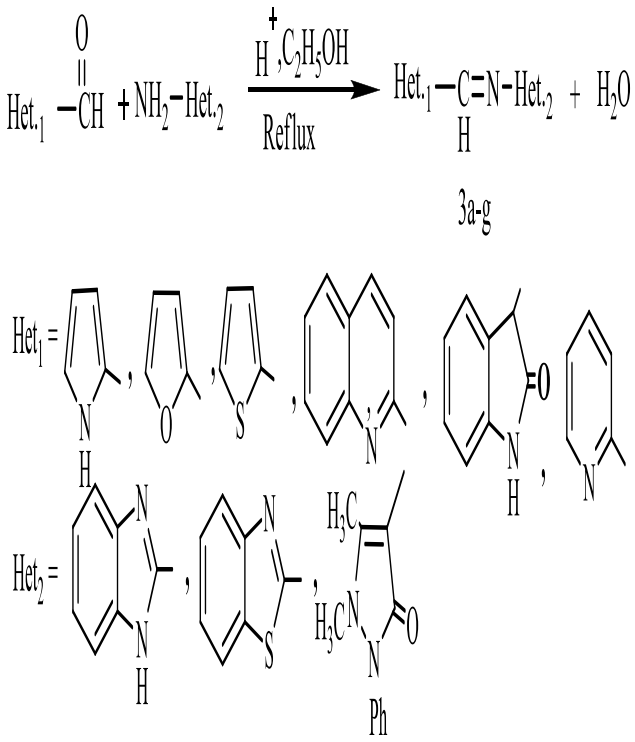
(3 hr) until a crystalline precipitate separated out. The solid product was filtered off, recrystallized from dioxane and identified.

Other derivatives of 1,3- oxazine were synthesized using this procedure by reacting an equivalent amounts of various Schiff's bases with β-butyrolactone. Structural formula, IUPAC names and some physical data are given in table2.

Results and Discussion

In this work a one-step direct synthesis of new derivatives of 2,3- disubstituted -1,3-oxazine(5a-h) from Schiff's bases and β-butyrolactone in high yields is reported.

Schiff's bases were synthesized by acid-catalized condensation of heterocyclic primary amines with heterocyclic aldehydes and ketones,(Scheme-1).



Scheme 1: Synthesis of Schiff's bases (3a-g)

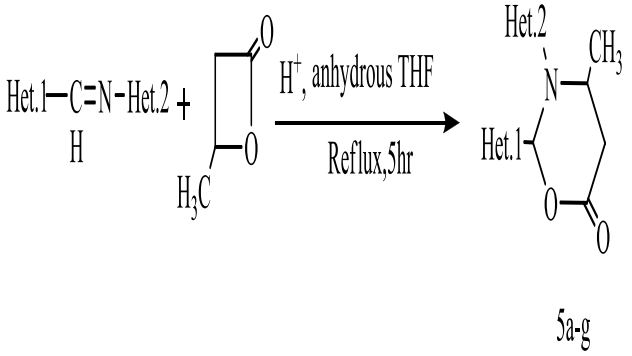
The formation of Schiff's bases was followed up by the disappearance of the characteristic absorption frequencies($\nu_{str.}$ *band*) of : C=O of the carbonyl compounds at (1690-1730) cm^{-1} andNH_2 of the primary amines at (3250-4230) cm^{-1} and the appearance of C-H of the N=C-H at(3100 -3180) cm^{-1}, C-H of heteroaromatic rings at (3010-3080) cm^{-1} , C=N of isomethine group at (1610-1640)$cm^{-1}$and C=C of aromatic and heteroaromatic rings at (1600-1500)cm^{-1}, table3 .

The UV-Vis. absorption spectra of Schiff's bases showed significant absorption maxima at λ_{max} (420-200)nm, owing to electronic transitions $\pi\rightarrow\pi^*$ of due to aromatic and heteroaromatic systems and $n\rightarrow\pi^*$ of the lone pair of electrons in each individual structure, table 5. Both FT-IR and UV-Vis. spectra are in good agreement with the literature values for compounds of identical molecular structures of similar compounds [34].

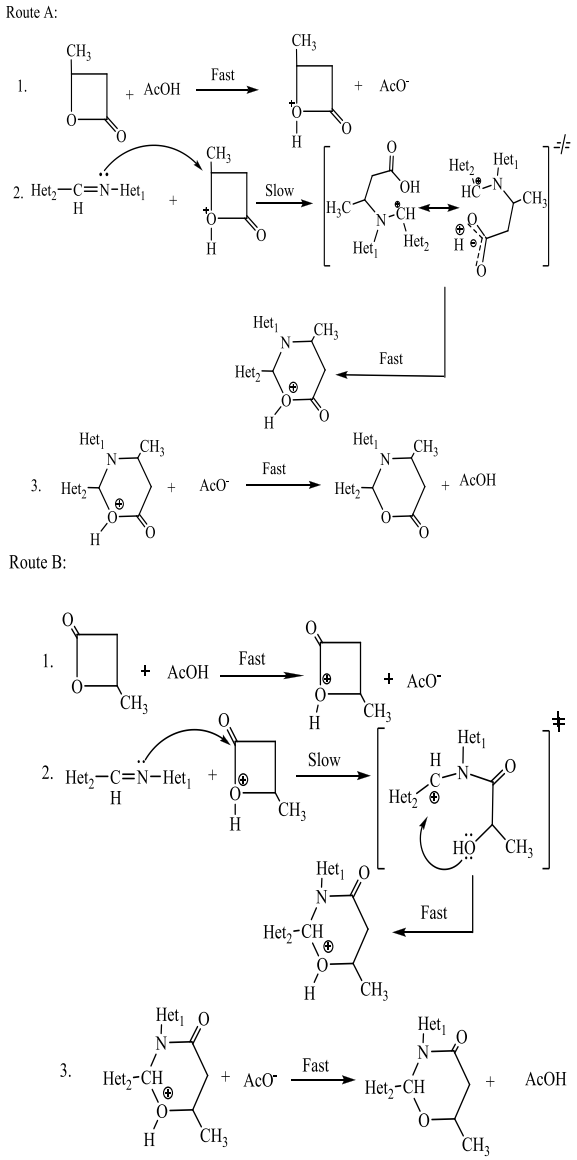
New derivatives of 2,3-disubstituted-1,3-oxazine were synthesized by acid-catalyzed reaction of Schiff's bases with β-butyrolactone in refluxing anhydrous tetrahydrofuran, Scheme-2.

In the special case; the plausible reaction mechanism of the polar cycloaddition reaction of Schiff's bases with β-butyrolactone, may be suggested as in the proposed mechanism (scheme -3).

Nucleophilic addition (rout A) of isomethine group as a mild nucleophile to the electropositive carbon atom of β- butyrolactone ring brings about an alkyl- oxygen bond fission to give somewhat a dipolar reactive complex with formal positive charge on carbon and negative charge on the terminal carboxylate group. The reactive complex immediately collapses to give the stable six-membered heterocyclic intermediate, via an intramolecular nucleophilic (4+2) dipolar cycloaddition process [35], which is converted to the product by abstracting the proton.This mechanism is in quite consistency with



Scheme 2. Synthesis of derivatives of 1,2- disubstituted -1,3-oxazine(5a-g)



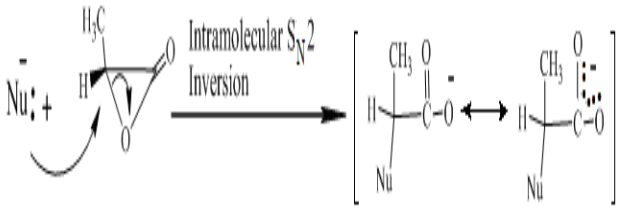
the nucleophilic addition reactions of alpha-

Scheme 3: The proposed mechanisms (A&B) for the polar cycloaddition reaction of Schiff's bases with β -butyrolactone

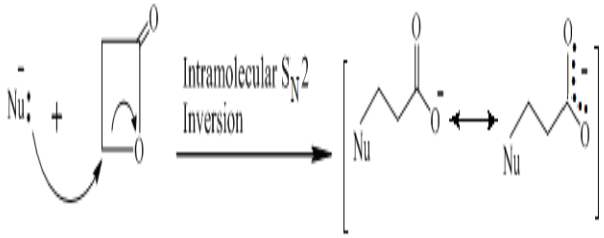
lactones [36] and β-lactones [37][38] in an aprotic solvent (acetonitrile, dioxane, nitromethane or tetrahydro furan), when small-angle strain is an important factor.

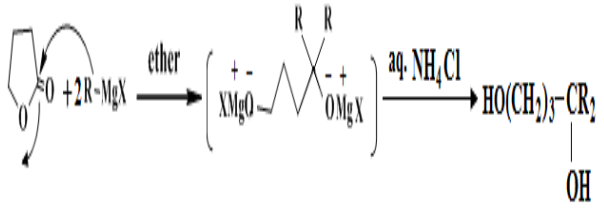
In the case of nucleophilic addition to the carbonyl group (acyl fission), isomethine group should attack the carbonyl carbon to give a specific addition dipolar reactive complex (rout B) with positive charge on carbon (carbocation) and lone pair on the electronegative oxygen atom .This type of nucleophilic addition would require very reactive nucleophile, stericaly unhindered electropositive center and unstrained ring structure such as γ-lactone [39].

Since hydroxyl or alkoxy anion is more reactive nucleophile than isomethine, it attacks the carbonyl group and expel the isomethine group. The methyl group flanks the reaction center exerting partial steric effect and β-butyrolactone is highly strained ring, therefore for these reasons this mechanism is excluded. The products were identified by their melting points, table 2 and their molecular structures were characterized by FT- IR ,UV-Vis. and ^{1}H NMR spectra, tables,4,6 and 7.



Nu: =NH_3, RNH_2, R_2NH, ROH and R_2S





FT-IR spectra of the 1,3-oxazines,which are given in table 4, showed the disappearance of the characteristic absorption frequencies ;($\nu_{str.}$ *bands*) of C-H of the N=C-H at (3100- 3180) cm^{-1} and C=N of isomethine group at (1610-1640) $cm^{-1}$and the appearance of ($\nu_{str.}$ *bands*) of X =C-H of heteroaromatic rings at (3010-3080) cm^{-1} ,C-H of -CH_2 at (1930-2865) cm^{-1} , C-H of -CH_3 at (2840-2884) cm^{-1}, C-H of -N -CH_2 at (2785-2805)cm^1 , and both of C=O at (1740-1780) cm^{-1} and

C-O at (1180-1300) cm^{-1}) of the lactone ring. In addition to the appearance of the characteristic absorption frequencies ($\delta_{sc.}$band) of C-H of -CH_2 at (1447) cm^{-1} , ($\delta_{wag.}$band) of C-H of O-CH_2- at(1338) cm^{-1} and (δ_{rock}.band) of C-H of -CH_2 at (710-720) cm^{-1} , which are indicative of the formation of the new six-membered ring 1,3-oxazines.

The UV-Vis absorption spectra showed significant absorption maxima at λ_{max} (420-200) nm, owing to the electronic transitions $\pi \rightarrow \pi^*$ due to aromatic and heteroaromatic systems and $n \rightarrow \pi^*$ of the lone pair of electrons in each individual structure as given in table6.

The ^{1}H NMR spectra showed chemical shifts (δppm) relative to TMS at: 1.2(3H of CH_3),2.2(2H of CH_2-CO-O-) , 2.5 (H of –C-CH-N) , 2.7(H of-C-CH-N) ,3.8(H of N-CH-O-CO),6.2-7.3(het.arom. protons) 6.8-7.8(arom. protons) 9.2(N-H, het.arom.) ,11 (H of -CO-N-H) which are indicative of the formation of the proposed molecular structures of these products. Spectral data of FT-IR, UV-Vis. and^{1}H NMR spectra are in good agreement with the literature values for compounds of identical molecular structures [34].

Table 1: Structure formulas, names, melting points, coloures, and yields of Schiff's bases (3a- g)

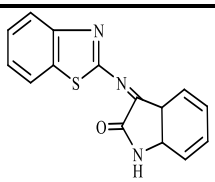
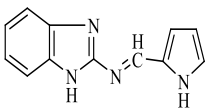
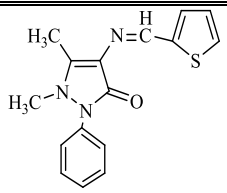
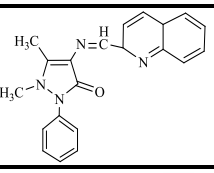
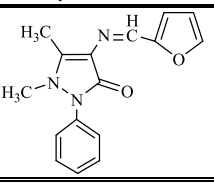
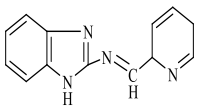
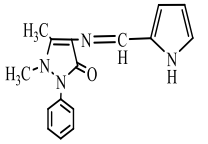
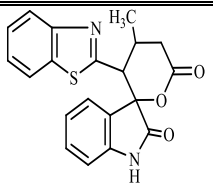
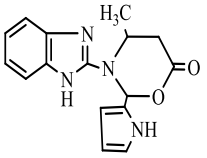
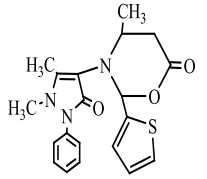
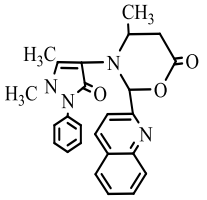
Comp. No.	Structural formula	Name	m.p.^{0}C	Yield	Color
3a		(Z)-3-(benzo[*d*]thiazol-2-ylimino) indolin-2-one	196-198	86	Orange
3b		N-{[1H-pyrol-2-yl]methylene}-1H-benzo[d]imidazol-2-amine	168-169	88	Yellow
3c		1,5-dimethyl-2-phenyl-4-((thiophen-2-ylmethylene) amino)pyrazolidin-3-one	220-221	79	Light yellow
3d		4-((2,4a-dihydroquinolin-2-yl)methylene)amino) -1,5-dimethyl-2-phenylpyrazolidin-3-one	209-210	91	Yellow
3e		4-((furan-2-ylmethylene)amino)-1,5-dimethyl -2-phenylpyrazolidin-3-one	191-192	82	Green
ef		(Z)-*N*-((2,5-dihydropyridin-2-yl)methylene) -1*H*-benzo[*d*]imidazol-2-amine	165-164	87	Green
3g		4-(((1*H*-pyrrol-2-yl)methylene)amino)-1,5-dimethyl-2-phenyl-1*H*-pyrazol-3(2*H*)-one	215-216	81	Green

Table 2: Structure formulas, names, melting points, coloures, and yields of the synthesized 1, 3-Oxazine (5a- g)

Comp.No.	Structural formula	Name	Yield	m.p.^{0}C	Color
5a		3'-(benzo[*d*]thiazol-2-yl)-4'-methylspiro[indoline -3,2'-[1,3]oxazin]-2,6'-dione	77	208-210	Orange
5b		3-(1*H*-benzo[*d*]imidazol-2-yl)-2-(1*H*-pyrrol-2-yl)-1,3-oxazin	82	150-151	Yellow
5c		3-(1,5-dimethyl-3-oxo-2-phenyl-2,3-dihydro-1*H*-pyrazol-4-yl)-4-methyl-2-(thiophen-2-yl)-1,3-oxazinan-6-one	75	169-170	Yellow
5d		(2*R*,4*S*)-3-(1,5-dimethyl-3-oxo-2-phenyl-2,3-dihydro-1*H*-pyrazol-4-yl) -4-methyl-2-(quinolin-2-yl)-1,3-oxazin 6-one	80	200-199	White

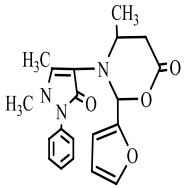
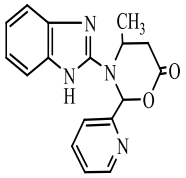
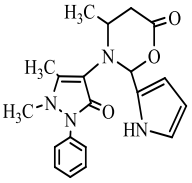
5e		(2*R*,4*S*)-3-(1,5-dimethyl-3-oxo-2-phenyl-2,3-dihydro-1*H*-pyrazol-4-yl) -2-(furan-2-yl)-4-methyl-1,3-oxazin 6-one	73	177-178	Green
5f		3-(1*H*-benzo[*d*]imidazol-2-yl)-4-methyl-2-(pyridin-2-yl)-1,3-oxazin 6-one	76	129	Yellow
5g		3-(1,5-dimethyl-3-oxo-2-phenyl-2,3-dihydro-1*H*-pyrazol-4-yl)-4-methyl-2-(1*H*-pyrrol-2-yl)-1,3-oxazinan-6-one	200		Orange

Table 3: The major FT-IR absorptions (cm-1) of the prepared (3a-g) Imines

Comp. Code	ν_s N-H Lactam	ν_sC-H (N=C-H)	ν_s C-H Arom.	ν_s C-H Aliph.	ν_s C=O Lactam	ν_s C=N Imine	ν_s C=C Arom.	ν_s C-N	δ_{sc} N-CH_3	δ_{ben} -CH_3
3a	3412	3150	3054	-	1735	1640	1448-1537	1254	-	-
3b	3397	3140	3058	2928	-	1644	1446-1468	1310	-	-
3c	-	3100	3045	2958	1654	1592	1415	1305	1455	1381
3d	-	3120	3039	2927	1668	1650	1568	1301	1454	1357
3e	3398	3144	3020	2925	1644	1589	1562	1248	1446	1368
3f	3398	3130	3055	2923		1669	1445	1308	-	-
3g	3421	3125	3052	2922	1727	1655	1461	-	-	-

Table 4: The major FT-IR absorptions (cm-1) of the prepared 1,3-oxazine (5a-g)

Comp. Code	ν_s N-H Lactam	ν_s C-H Arom.	ν_s C-H Aliph.	ν_s C=O Lacton	ν_s C=O Lactam	ν_s C=C Arom.	ν_s C-O Lacton	ν_s C-N	δ_{sc} N-CH_3	δ_{ben} -CH_3
5a	3269	3056	2958	1813	1641	1562	-	1307	-	1411
5b	3395	3055	2923	-	1643	1527	-	1308	-	1445
5c	-	3045	2924	1768	1646	1487	1298	1304	1420	1415
5d	-	3042	2978	1736	1635	1521	1241	1333	1442	1496
5e	-	3062	2932	1746	1680	1572	1208	1306	1490	1415
5f	3321	3145	2933	1707	-	1552	1213	1313	1442	1469
5g	3396	3056	-	1748	-	1590	1200	1327	1504	1348

Table 5 : The UV-Visible absorption λ max(nm) in ethanol of Imens (5a-g)

Comp.	λ max (nm)			
3a	225	367	453	__
3b	240	289	396	__
3c	241	295	309	401
3d	305	390	480	__
3e	284	300	346	__
3f	212	252	363	396
3g	200	360	400	__

Table 6 :The UV-Visible absorption λ max(nm) in ethanol of 1,3-Oxazine (5a-g)

Comp.	λ max (nm)			
5a	225	246	281	338
5b	240	270	312	395
5c	238	268	294	__
5d	230	255	300	420
5e	239	267	307	435
5f	245	289	349	379
5g	228	246	282	378

Table 7: The H-NMR spectra of Compounds 5a-g in DMSO-d6 relation to TMS

Comp.	Chemical shift δ ppm

5a	**1.2 (3H,-CH_3), 2.2 (2H,-CH_2-C=O-O-), 2.5 (1H,-CH-N-),6.8-7.6 (8H,-CH-arom.), 11.01(1H,-NH).**
5b	**1.2 (3H,-CH_3), 2.3(2H,-CH_2-C=O-O-), 2.6 (1H,-CH-N-), 6.1-6.5,(3H,-CH-Het.arom.) 7.2-7.8 (4H,-CH-arom.) 9.4(1H,-NH),11.4 (1H,-NH-).**
5c	**1.2 (3H,-CH_3), 2.3(2H,-CH_2-C=O-O-),6.51-7.83(7H,arom.),6.27(2H,-CH_2-Het.), 3.09 (3H,-N-CH_3), 3.48 (2H,-CH_2-CH_3).**
5d	**1.3 (3H,-CH_3), 3.13(3H,-N-CH_3), 2.26 (2H,-CH_2-C=O-O-),3.45(2H,-CH_2-CH_3),6.33(2H,-CH_2-Het.),6.9-8.89 (8H,Ar.).**
5e	**1.2 (3H,-CH_3), 2.3 (2H,-CH_2-C=O-O-), 6.39 (2H,-CH_2-Het.), 6.71-7.89 (7H,Ar.), 3.2 (3H,-N-CH_3), 2.22 (3H,C-CH_3).**
5f	**1.1 (3H,-CH_3),2.2 (2H,-CH_2-C=O-O-),2.6 (1H,-CH-N-),3.2(1H,-N-CH-O-),7.1-7.8 (4H,-CH Ar.),7.4-7.9 (4H,-CH- Het.Ar.).**
5g	**1.1 (3H,-CH_3), 2.2 (2H,-CH_2-C=O-O-),2.26 (3H,-C-CH_3), 3.2 (3H,-N-CH_3), 3.42 (2H,-CH_2-N-), 5.1 (1H,-NH-), 6.48 (2H,-CH_2-Het.),6.8-8.1(6H,Ar.).**

References

[1] Vibhute A. Y., Zangade S. B., Chavan S. B. & Vibhute Y. B,.**(2011).**A one pot synthesis of 1,3-benzoxazines from Schiff's bases. **Der Pharmacia Sinica**. vol. 2, No.5, pp 217-222.

[2] Palmar B. D., Thompson A. M., Sutherland H. S., Blaser A., Kmentova I., Franzblau S. G., Wan B., Wang Y., Ma Z. & Denny W. A., **(2010).**Synthesis &structure; Activity studies of biphenyl analogues of the tuberculosis drug (PA-824), **J. Med. Chem.**, vol. 53, No. 1, pp:282-284.

[3] Cieplik J., Stolarczyk M., Pluta J., Gubrynowicz O., Bryndal I., Lis T.,

[4] Mikulewicz M., **(2011)** Synthesis &antibacterial properties of pyrimidines

[5] derivatives. **Acta Polonuae Pharmaceutica Drug Research**, vol. 68.No.1:57-65.

[6] Manikannan R. & Muthusubramanian S., **(2010)** Synthesis &biological activity of 6-alkyl/chloro-3-{4(6-alkyl/chloro-2H-benzo{e}{1,3}-oxazine-3(4H)-YL)phenyl}3,4-dihydro-2H- benzo/[e][1,3]-oxazines. **Ind, J. Chem**., vol. 49B, pp1083-1087.

[7] Sekhar K. C., Rasheed S., Ramana L. V., Nag.C, **(2012)** A green alternative approach for synthesis of 2-substituted-5,6-dihydro-4H-1,3-oxazines cataliyzed by NBS: Ultra Sonication. **Der. Phar. Chem.**, vol. 4, No.1, pp 242-247.

[8] Prasad D., Rohilla R. K., Roy N., Nath M., **(2012)** Synthesis and antibacterial evaluation of benzazoles tethered dihydro [1,3]oxazines. **Ind. J. Chem.**, vol.51B, pp 739-745.

[9] Ozturkcan S.A., Turhan K.andTurgut Z. (2011) Synthesis and characterization of new 1,3-oxazine derivatives. **J. Chem. Pak.** vol.33, No.6, pp939-944.

[10] Turgut Z., Pelit E., Köycü A. **(2007)** Synthesis of New 1,3-disubstituted -2,3-dihydro- 1H-naphth-[1,2-e][1,3] oxazines. **Molecules**, vol.12, pp 345-352.

[11] Laobuthee A., Chirachanchai S., Ishida H., Tashiro K., **(2001)** Asymmetric Mono- oxazine, **J. Am. Chem. Soc.**,vol.123, pp 9947-9955.

[12] Valters R. E., Fülöp F. and Karbonits D. **(1996) Advaces in Heterocyclic Chemistry**,vol.66 p1.

[13] Mayer A. I.**(1974), Heterocycles in Organic Chemistry**. John-Wiley &Sons, New York. pp 201-210.

[14] Sainsbury M.**(1984) Comprehensive Heterocyclic Chemstry Pergamon Press,London, vol.2, pp 995.**

[15] Dyachenko V. D., Karpov E. N., **(2011)** Aliphatic Aldehydes in the Synthesis of Carbon & Heterocyclic, Part 2.Synthesis of six-and seven-membered rings; Bicyclic Compounds

&Macrocycles**, Russ. J. Org. Chem.**, vol.74, No.1, pp 29.

[16] Warren J. D., Macmillan J. H., Washburn S. S. **(1975)** Synthesis of substituted 2H-1,3- oxazine-2,6-diones by Reaction of trimethylsilyl azide &maleic anhydrides, **J. Org. Chem.**, vol. 40, No.6, pp 743-746.

[17] Robert J. Clemens **(1986)** "Diketene", **Chem. Rev.,** vol.86, No.2, pp 241-262.

[18] Badiang J. G., Aube J. **(1996)** One-step conversion of aldehydes to oxazines &5,6-dihydro-4H-1,3-oxazines using 1,2-and 1,3-azido alcohols, **J.Org. Chem.**, vol.61, pp 2482- 2487.

[19] Tillmanns E. J., Ritter J. J., **(1957)** Nitriles in nuclear heterocyclic synthesis, I. Dihydro- 1,3-oxazine, **J. Org. Chem.**,vol.22, pp 839-840.

[20] Lee J., Lee K., Kim H. **(1996)** A facile Synthesis of 5,6-dihydro-4H-1,3-oxazine derivatives. Bull., **Korean Chem. Soc.**vol.17, No.2, pp 115-116.

[21] Weinreb S. M., Scola P. M. **(1989)** N-Acyl imines &related heterocyclic dienes in [4+2] cycloaddition reactions., **Chem. Rev.**,vol.89, pp 1525-1534.

[22] Toujas J. L., Jost E., Vaultier M. **(1997)** Synthesis of homochiral N- Boc-beta - aminoaldehydes from N-Boc-beta-aminonitriles. Bull., **Soc. Chem. Fr.**, pp 713-715.

[23] Palacios F., Heran E., Rubiales G., Ezpeleta M. J. **(2002)** Cycloaddition reaction of 2-azadiens derived from β-amino acids with electron-rich and electron deficient alkenes &carbonyl compounds, **J. Org. Chem.**, vol.67, pp 2131-2135.

[24] Palacios F., Alonso C., Rubiales G. **(1997)** Aza-Wittig reaction of N-vinylic phosphazenes with carbonyl compounds, **J. Org. Chem.**, vol.62, pp 1146-1154.

[25] Kang J. E., Kim H. B., Lee J. W., Shin S. **(2006)**Gold (I)-catalyzed intramolecular hydroamination of alkyne with trichloroacetimidates, **Org. Lett.**, vol.8, No.16, pp 3537-3540.

[26] Murai T., Samo H., Kawai H., Aso H., Shibahara F. **(2005)** Synthesis via ring-opening of oxazines with thioamide dianion &applications as intermediates leading to stereochemically defined 5,6-dihydro-44-1,3-oxazine &1,3-aminoalcohols, **J. Org. Chem.**, vol.70, pp 8148-8153.

[27] Tavor F., Ochoa G. **(2000)** Conversion of N-acyl-4-acyloxy-β-lactam into 1,3-oxazine -6-ones:two consecutive pseudopericyclic processes, **Org. Lett.**, Vol. 2, No.7, pp 965-968.

[28] Lar ksarp C., Alper H. **(1999)** Palladium (Pd)-catalyzed cyclocarbonylation of 2-iodophenols & 2-hydroxy-3-iodopyridine with heterocumulenes: regioselective synthesis of benzo[e] [1,3]-oxazine-4-one & pyrido[3,2-e][1,3] oxazine-4-one derivatives. **T. Org. Chem.**, vol. 64, pp 9194-9200.

[29] Yadav. Lal -Dhar S.,Srivastava V,P,Rai V.K. ,Patel R. **(2008)** Diversity oriented synthesis of fused-ring 1,3-oxazines from carbohydrates as biorenewable feedstocks. **Tetrahydron,** vol.64, pp4246-4253.

[30] Taati M.R ,Mamaghani M., MahmoodiN.O., and Loghmanifar **,(2009)** A simple access to the synthesis of 5,6-dihydro-4H-1,3-oxazines under solvent-free condition and microewave irradiation.Transaction C: Chem.&Chem. Eng. (Scientia Iranica),vol.16 No.1,pp17-21.

[31] Agirbas H., Sagdinc S., Kandermirli F., Ozturk D. **(2007)** Synthesis, IR Spectral studies and quantum-Chemical calculations on 1,2_ dihydronaphtho [1,2-e] oxazine-3-thiones & 3,4-dihydrobenzo [e][1,3] oxazine-2-thione, **J. Mol. Str.**, No.830, pp 116-125.

[32] Al-Bogami A. S., Al-Majid A. M., Al-Saad M. A., Mousa A. A., Al-Muzroa S. A. , Alkhathlan H. Z., **(2009)**Cyclization of hydrazones of z-acetyl-1-naphthol and 1-acetyl-2-naphthol with triphosgen. Synthesis of spiro naphthoxazine dimers. **Molecules**, vol.14, pp 2147-2159.

[33] Al-Sehami A. G. M., Al-Sharief A. M. S., Ammar Y. A. **(2006)** Propionic acids in organic synthesis :Novel synthesis of benzimidazol-1,3-benzoxazine, 3-amino quinazoline, and 3-amino[2,3-d] pyrimidine derivatives containing 2-naphthyl propionyl moiety. **Ind.J.Chem.**,vol.45B, pp 450-455.

[34] Ahangar H. A., Mahdavina G. H., Marjani K., Hafezian A., **(2010)** A one-pot synthesis of 1,2-dihydro-1-arylnaphtho [1,2-e][1,3] oxazine-3-one Derivatives catalyzed by perchloric acid supported by silica ($HClO_4/SiO_2$) in the absence of solvent. **J. Iran. Chem. Soc.**, vol.7, No.3, pp 770-774.

[35] Szatmári I., Martinek T. A., and Fülöp F., **(2003)** Substituent effectsin ring –chain tautomerism of give1,3-diaryl-2,3-dihydro-1H-naphth[1,2-e] [1,3] oxazine .Tetrahydron,vol. 59,pp2877-2884.

[36] Larkin P., **(2011**), **Infrared and Raman Spectroscopy, Principles and Spectral Interpretation**, Elsevier Inc., Oxford, UK.

[37] Huisgen Von R. **(1968)**. Cycloadditionen- Begriff, Einteilung und Kenzeichnung, **Angew. Chem.**, vol. 80, No. 9:329-372.

[38] Jones Jr M., Fleming S. A., **(2010)** , **Organic Chemistry**, 4th.Ed., W. W. Norton &Company Inc., pp.1084-1085.

[39] Smith M. B., March J **.(2007),** March's Advanced Organic Chemistry, 6th.Ed., John-Wiley &Sons, Inc. pp.1437-1439

[38] Leo A., Paquette, **(1964), Principles of Modern Heterocyclic Chemistry**, Academic press, New York.

[39] Cram D. J., Hammond G. S., **(1964) , Organic Chemistry**, 2nd. Ed., Mc Graw-Hill Book Company Inc., New York pp 316.

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تحضير وتشخيص مشتقات 3,1 – اوكسازين جديدة بواسطة تفاعلات الاضافة القطبية (2+4) بين بيتا–بيوتيرولاكتون وقواعد شف

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الخلاصة

تم التوصل الى اصطناع مشتقات جديدة للمركب 1,3-oxazine-6-oneبواسطة الاضافه الحلقيه (2+4) القطبيه لبيتابيوتايرولاكتون مع قواعد شف مختلفه من الامينات اوليه حلقيه غير متجانسة والديهايدات وكيتونات حلقيه غير متجانسة بمذيب رباعي هيدروفيوران جاف بمنتوج جيد.شخصت قواعد شف المحضرة والنواتج بتعيين درجات انصهارها وباطياف الاشعه فوق البنفسجية المرئية والأشعة تحت الحمراء وأطياف الرنين النووي المغناطيسي للبروتون.