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Synthesis And Characterization Of New Oxazepines Derived From D-Erythroascorbic Acid

A. A. Mukhlus , M. S. Al-Rawi, J. H. Tomma, A. H. Al-Dujaili

Department of Chemistry , College of Education Ibn Al- Haitham

University of Baghdad

Abstract

The new schiff bases derived from D-erythroascorbic acid contaning heterocyclic unit were synthesized by condensation of D-erythroascorbic acid with aromatic amine (containing 1,3,4-oxadiazole or 1,3,4-thiadiazole unit) in dry benzene using glacial acetic acid as a catalyst. D-erythroascorbic acid [IV] was synthesized by four steps (Scheme 1), while the primary aromatic amine which is containing 1,3,4-oxadiazole [VII] or 1,3,4-thiadiazole [VIII] synthesized by the reaction of 4-methoxy benzoyle hydrazine [VI] with 4-amino benzoic acid or by the reaction tuloic acid with thiosemicarbazide, respectively in the presence of $POCl_3$. The new 1,3-oxazepine derivatives were obtained by addition reaction of Schiff bases with different anhydrides in dry benzene, The new 1,3-oxazepine derivatives $[XII]_{a-d}$, $[XIV]_{a-d}$ were synthesized by refluxing compound [IX] , [X] or [XI] with different anhydride (maleic, phthalic, naphthalic anhydride or pyromellitic dianhydride) in presence of dry benzene.

The structure of synthesized compounds have been characterized by their melting points , elemental analysis and by their spectral data; FTIR , UV-Vis, Mass and (^{1}HNMR , ^{13}CNMR of some of them) spectroscopy . All the synthesized compounds have been screened for their antibacterial activities. They exhibited good antibacterial activity against Escherichia coli (G-) and Staphylococus aureus (G+) .

Key word : 1,3-oxazepine, Schiff bases , L-Ascorbic acid .

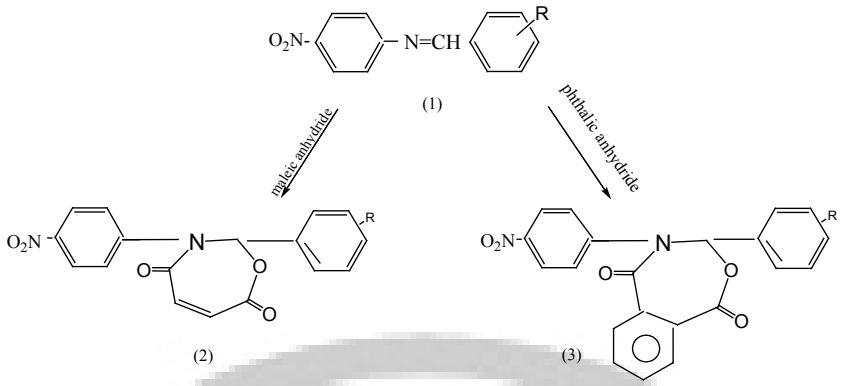
Introduction

L-Ascorbic acid is one of the most important biomolecules . It acts as an antioxidant and radical scavenger widely distributed in aerobic organisms [1]. L-Ascorbic acid derivatives have been found to possess antitumor and antiviral activities [2-4].

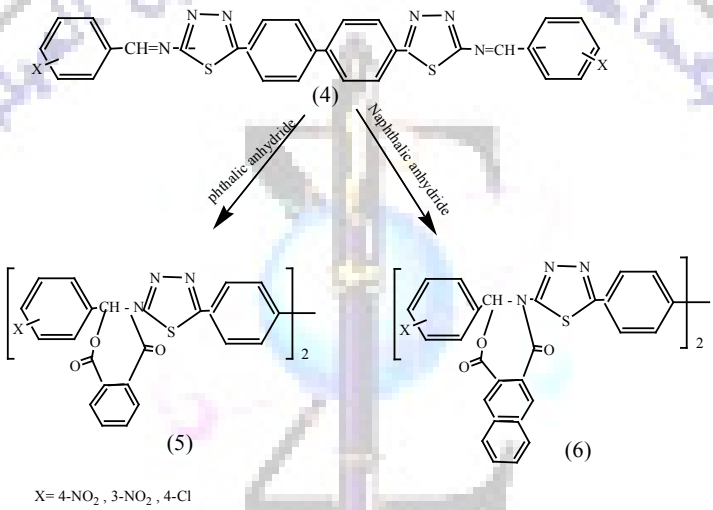
Schiff bases are used as substrates in the preparation of a large of bioactive and industrial compounds via ring closure , cyclo addiation and replacement reactions. In addition , Schiff bases are well known to have biological activities [5-7].

1,3-Oxazepines is non-homologous seven member ring, that contains two heteroatoms (Oxygen and Nitrogen). Oxazepines is used as antibiotics , enzyme inhibitors pharmacological interst , it has much chemical and biological studied[8-12].

Hussein[13] et. al. ,synthesized 1,3- oxazepine -4,7-dione (2) and (3) from the reaction of Shciff bases (1) with maleic or phthalic anhydride, respectively.



Recently, Tomma et al. [14] synthesized a new 1,3-oxazepines (5), (6) derivatives by the cycloaddition reaction of Schiff bases [4] with phthalic anhydride and naphthalic anhydride, respectively.

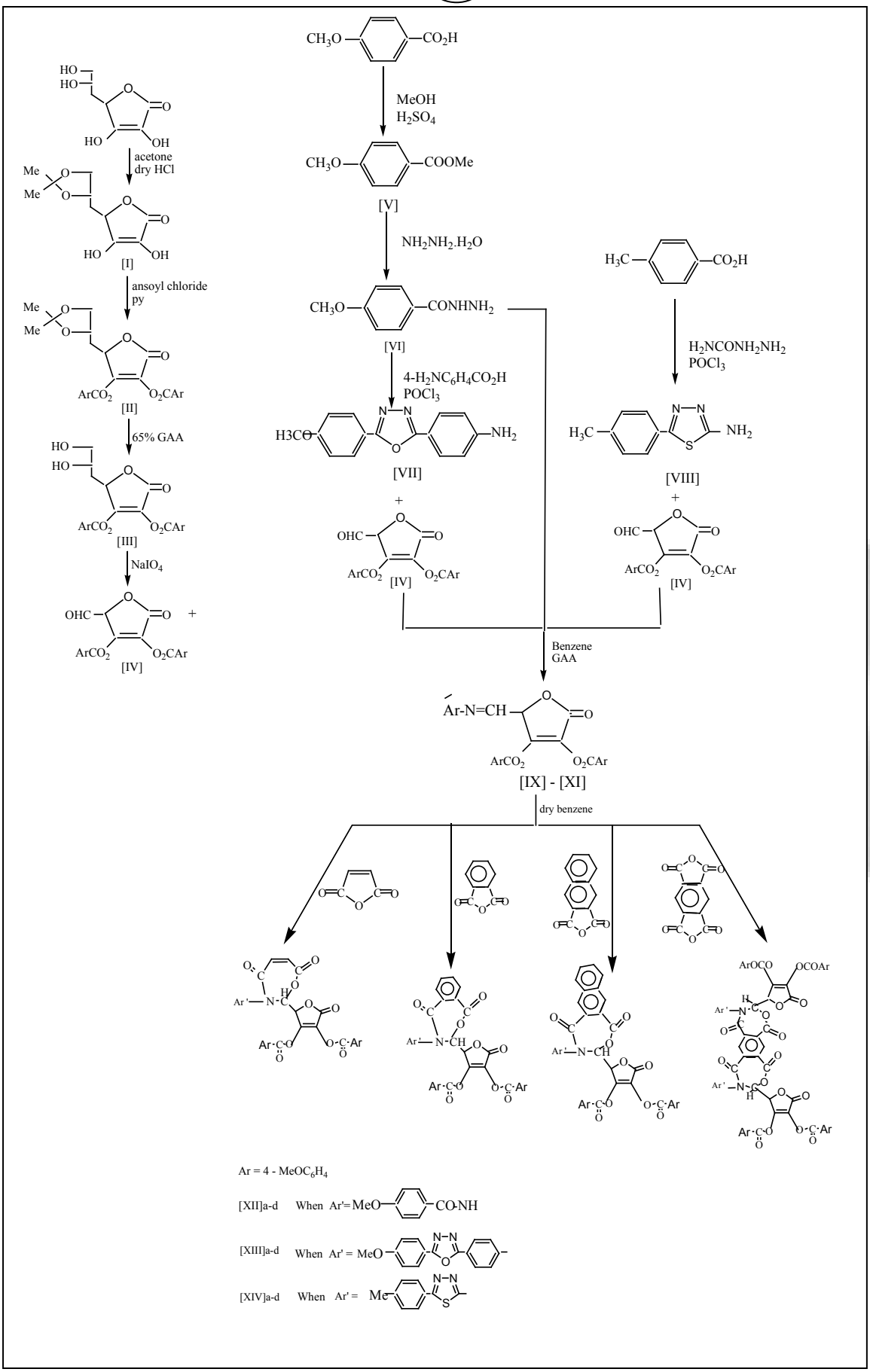


The literatures servey revales that no evidience to synthesis oxazepines derived from D-erythroascorbic acid therefor we decided synthesis , characterization and study anti-bacterial activity of new derivatives of D-erythroascorbic acid containing imidazole unit.

Experimental

Materials : All chemicals were supplied from Merck , GCC and Aldrich Chemicals Co. and used as received .

Techniques : FTIR spectra were recorded using potassium bromide discs on a 8400s Shimadzu spectrophotometer and FTIR spectrophotometer , Shimadzo (Ir prestige-21) . ^{1}HNMR spectra were carried out by : Bruker , model: ultra shield 300 MHz , origin : Switzerland and are reported in ppm(δ), DMSO or $CDCl_3$ were used as a solvent with TMS as an internal standard . Measurements were made at chemistry department, Al-albyat university, Jordan. Uncorrected melting points were determined by using Hot-Stage, Gallen Kamp melting point apparatus. UV-Vis spectra were performed on CECL 7200 England Spectrophotometer using $CHCl_3$ as a solvent . Mass spectra were recorded on IEOL JMS-7 high resolution instrument. ^{13}C-NMR spectra of the compounds were recorded on a varian Mercury plus 100 MH_Z spectrometer, Jordan.


MeOH
H_2SO_4
[V]
$NH_2NH_2.H_2O$
[VI]
$4\text{-}H_2NC_6H_4CO_2H$
$POCl_3$
[VII]
$H_2NCONH_2NH_2$
$POCl_3$
[VIII]
acetone
dry HCl
[I]
ansoyl chloride
py
[II]
65% GAA
[III]
$NaIO_4$
[IV]
Benzene
GAA
[IX] - [XI]
dry benzene
Ar = 4 - $MeOC_6H_4$
[XII]a-d When Ar'= MeO CO-NH
[XIII]a-d When Ar' = MeO
[XIV]a-d When Ar' = Me

Scheme(1)

Synthesis

preparation of 5,6-*O*-isopropylidene-L-ascorbic acid[I]: This compound was prepared from the reaction of L-ascorbic acid with Acetone in acidic media , following Salomon methode [15].

Synthesis of 2,3-*O*-dianisoyl-5,6-*O*-isopropylidene-L-ascorbic acid [II]:

To a cold solution of [I](10gm , 0.046mol) in pyridine (50 mL) , Anisoyl chloride was added (17.5mL , 0.129mol) with stirring for 2 hrs, then kept in dark place at room temperature for 24 hrs. The mixture was poured into ice-water the organic layer was extracted with (150mL) chloroform , washed with water and driyed over anhydrous magnesium sulfate [16] . Filtered and the solvent evaporated , purified from chloroform:petroleum ether(1:5) to give [II] (76.5%) as a pale yellow solid ,m.p (102-104 ^{0}C) , Rf(0.80) (benzene:methanol) (5:5).

Synthesis of 2,3-*O*-dianisoyl-L-ascorbic acid[III]:

Compound[II](10g, 0.0236 mol) was dissolved in a mixture of (65%) acetic acid (30mL) add absolute methanol(10mL) and stirred for 48 hrs at room temperature. To the resulting solution a benzene(40mL) was added and evaporated to yield[III] [16], (78%) as a white crystals, m.p(130-132 ^{0}C), Rf (0.42) (benzene:methanol) (4:6).

Synthesis of pentulosono-Lacton-2,3- ene - dianisoate[IV]:

To a stirred solution of sodium periodate (5.6gm) in distilled water (60mL) at (0 ^{0}C) , a solution of [III](10gm,0.026mol) in absolute ethanol (60mL) was added dropwise . After stirring15 min, ethylene glycol(0.5mL) was added and stirred for one hour. The mixture was extracted with ethyl acetate (3x50mL) [16]. The extracts dried over anhydrouse $MgSO_4$, filtered and the solvent evaporated , the residue recrystallized from benzene to yield [IV] (45%) as a white crystals , m.p (156-158 ^{0}C), Rf(0.7) (benzene: methanol) (6:4).

preparation of Methyl 4-methoxy benzoate [V]

It was prepared following the procedure described by Vogel [17]. m.p.(49-51°C).

preparation of Methoxy benzoyl hydrazine [VI]

It was prepared following the procedure described by Smith [18]. m.p.(135-137°C).

preparation of 2-(4′-aminophenyl) -5-(4″-methoxyphenyl) -1,3,4-oxadiazole[VII]

A mixture of 4-methoxybenzoyl hydrazine (0.01 mol), 4-aminobenzoic acid (0.01 mol) and phosphorus oxy chloride (5 mL) was refluxed for 7 hrs. The cold reaction mixture was poured into ice-water and made alkaline using sodium bicarbonate solution . The solid product was filtered , dried and purified by refluxing with ethanol ,yield (89%), m.p.(196 °C)[19].

preparation of 2- amino-5- (4`-tolyl) -1,3,4-thiadiazole[VIII]

A mixture of tuloic acid (0.01mol), thiosemicarbazide(0.01mol) , phosphorus oxy chloride (5mL) was refluxed gently for 6 hrs. After cooling, ice water (50mL) was added in portions with stirring . The yellow precipitate was filterd, washed with water , dried and crystallized from ethanol yield(68%), m.p.(246-248°C)[20].

Synthesis of Schiff bases [IX] - [XI]

A mixture of new primary amine compounds [VI], [VII] or [VIII] (0.01 mol) , aldehyde [IV] (0.01 mol) , dry benzene (15 mL) and 2 drops of glacial acetic acid were refluxed for 6hrs. The solvent was evaporated under vaccum and the residue crystallized from chloroform. The physical properties of all Schiff bases are listed in Table(1).

Synthesis of 1,3-oxazepine $[XII]_{a-d}$-$[XIV]_{a-d}$

A mixture of equimolar amounts (0.01mol) of Schiff bases [IX], [X] or [XI] and different acid anhydriedes in dry benzene was refluxed for 6 hrs [14] , the solvent was removed and the resulting colored crystalline solid recrystallized from petroleum ether to obtained 1,3-oxazipenes $[XII]_{a-c}$, $[XIII]_{a-c}$ and $[XIV]_{a-c}$.

To synthesis compounds $[XII]_d$, $[XIII]_d$ and $[XIV]_d$, a mixture of (0.02mol) of Schiff bases [IX] , [X] or [XI] and pyromellitic dianhydride (0.01mol) in dry benzene was refluxed for 6 hrs , the solvent was removed and the resulting colored crystalline solid recrystallized from petroleum ether . The physical properties of all synthesized 1,3-oxazepines are listed in Table (2) .

Elemental analysis of compound $[XII]_b$:

Calcd. : C% = 62.71 , H% = 3.95 , N% = 3.95

Found : C% = 62.82 , H% = 3.86 , N% = 3.49

Results and Discussion

5,6-*O*-isopropylidene-L-ascorbic acid[I] was prepared by the reaction of L-ascorbic acid with acetone in dry HCl [15] . The FTIR spectrum showed a broad stretching band at(3240-3074) cm^{-1} for O-H vinylic, stretching bands at (2993-2908) cm^{-1} for C-H aliphatic, a stretching band at 1751 cm^{-1} due to C=O of Lactone ring, a stretching band at 1663 cm^{-1} for C=C and stretching bands at (1141-900) cm^{-1} for C-O stretching .

Compound [I] reacts with excess of anisoyl chloride in dry pyridine to give the corresponding ester[II]. The FTIR spectrum exhibited appearance of a stretching band at 1712 cm^{-1} for C=O of the ester, and disappearance of the stretching bands for O-H of compound[I] ,a stretching bands at(2961-2834)cm^{-1} for C-H aliphatic group ,finally a stretching band at 1604 cm^{-1} could be attributed to C=C aromatic. The hydrolysis of compound [II] in acid media result hydrolyzed of isopropylidene ring to yield 2,3-*O*-dianisoyl-L-ascorbic acid [III] which characterized by melting point and FTIR . The FTIR spectrum showed band at 3444 cm^{-1} for O-H , a stretching at 3009 cm^{-1} for C-H aromatic.

Compound [III] oxidized by periodate, which cleaves the C_5-C_6 bond (bearing OH groups) and formation the aldehyde derivative of D-erythroascorbic acid [IV].This compound is characterized by melting point , FTIR, UV-Vis, Mass and ^{1}HNMR spectroscopy. The FTIR spectrm showed two bands at (2873-2661)cm-1 for C-H aldehyde stretching, a stretching band at 1715 cm^{-1} for C=0 of aldehydic group[21] ,UV-Vis showed λ_{max} at 300 nm and Mass spectrum showed M+1=413. ^{1}HNMR spectrum(δ, DMSO) showed the following signals: a singlet signal at δ(12.5)ppm that could be attributed to the aldehydic proton. Two doublet of doublets in the region δ (7.00-7.97) ppm due to eight aromatic protons, a singlet at δ(3.86)ppm for proton of lactone ring at C_4 . A sharp singlet at δ(3.82)ppm for the (OCH_3) group.^{13}CNMR spectrum (δ , Acetic) two signal in the region δ(167.5-163.32) ppm for carbon C=O of the lactone ring and carbonyl ester, respectively. signals at δ(131.86, 131.83, 131.81) ppm for C_4, C_3, C_2, signals at δ(114.31, 114.26, 123.44) ppm for aromatic carbons [22], signal at δ(55.90)ppm for OCH_3 group. The signal of aldehydic carbonyl was disappeared due to it showed out of the scale .

Methyl-4-methoxy benzoate [V] was obtained by esterification of 4-methoxy benzoic acid (anisic acid) with methanol [18]. The reaction of 4-methoxy benzoate with hydrazine hydrate in ethanol under reflux give 4-methoxy benzoyl hydrazide[VI] in good yield. Condensation of acid

hydrazid with 4-aminobenzoic acid in the presence of dehydrating agent phosphorus oxychloride yielded the oxadiazole derivative[VII]. The FTIR absorption spectrum showed the disappearance of absorption bands due to C=O group (amid) of the hydrazide together with appearance of a stretching band at 1610 cm^{-1}which is assigned to C=N stretching of oxadiazole ring. It also shows two peaks at 3200cm^{-1}, 3350 cm^{-1}, which are assigned to the symmetric and asymmetric stretching bands of NH_2 group and two peaks at1070 cm^{-1} , 1245 cm^{-1} due to symmetrical and asymmetrical C-O-C stretching vibration. Stretching bands at (2841-2935) cm^{-1} due to aliphatic CH_2 group. The ^{1}HNMR spectrum(δ, $CDCl_3$) showed a broad signal at δ (1.6-1.75)ppm for two protons singlet NH_2 group , two pair doublet of doublets at δ (6.7-8.01)ppm doublets that could be attributed to the eight aromatic protons and a singlet signal at δ 3.90 which could be to three protons of the OCH_3 group. The ^{13}C NMR spectrum showed signals at δ(162.22)pmm (C-NH_2), δ(114.54-128.63) (C_6H_4) , δ(76.64-77.49) (O-C=N) and δ(55.53) (OCH_3). Elemental analysis: Found : C%=67.89 , H%=5.44 , N%=15.49 : Calcd. :C%=67.41 , H%=4.86 , N%=15.73.

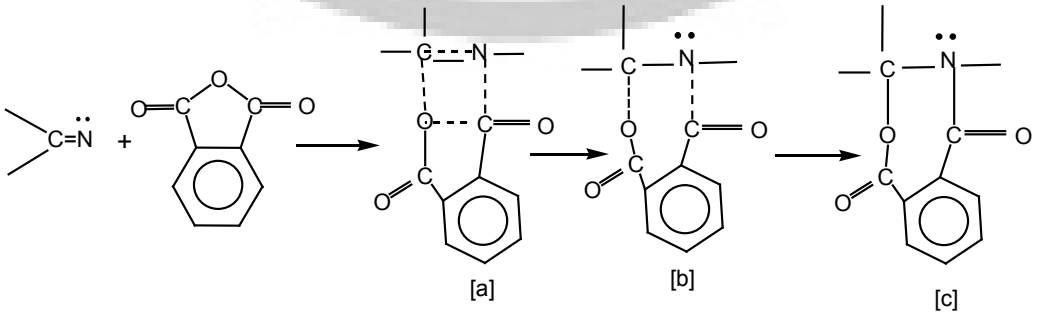
The reaction of tuloic acid with thiosemicarbazide in the presence of phosphorous oxychloride under reflux for 8 hrs gave 2- amino-5- (4′-tolyl) -1,3,4-thiodiazole [VIII]. The FTIR absorption spectrum showed two peaks at 3179cm^{-1} ,3280 cm^{-1} attributed to the NH_2 group, 3020cm^{-1} for CH aromatic, peak at 1635cm^{-1} due to C=N of thiadiazole ring and peak at 813cm^{-1} of bending para substituted benzene ring .

The novel Schiff bases[IX] and [X] were synthesized by refluxing equemolare amount of D-erythroascorbic acid [VI] with amino compounds [VII] or [VIII] in dry benzene with some drops of glacial acetic acid (GAA). These Schiff bases[IX] and [X] were identified by their melting points, FTIR, UV-Vis and ^{1}HNMR spectroscopy. FTIR absorption spectra showed the disappearance of absorption bands due to NH_2 and C=O groups of the starting meterials together with appearance of new absorption band at 1635 cm^{-1} in the region (1627-1637) cm^{-1} which is assigned to azomethine group(C=N stretching), peak at 1685 cm^{-1} due to C=C of lactone ring and stretching band at 1770 cm^{-1} for C=O of lactone ring[16]. UV-Vis spectra showed λ_{max} at 262 and 267.5 data which are characteristic of compounds [IX] and [X] , respectively. ^{1}HNMR spectrum (in DMSO) of Schiff bases [IX], showed a sharp signals at δ 10.3ppm for one proton could be attributed to the CH=N, two doublet pairs at δ (7.10-8.20)ppm that could be attributed to the sixteen aromatic protons and a sharp signals at δ 3.85ppm due to nine protons of three OCH_3 groups, and a singlet signal at δ 3.99 ppm that could be attributed to the proton at C_4 of lactone ring.

The ^{1}HNMR spectrum (in DMSO) of Schiff bases [X] showed two sharp signals at δ 8.9 ppm and δ 3.81 ppm for one proton and six protons which could be to the (CH=N) and two (OCH_3) groups , respectively. Two doublet pairs of at δ (6.99-7.90)ppm that could be attributed to the tweleve aromatic protons , a singlet signal at δ 3.81 ppm which could be to the six protons of two OCH_3 groups. Also a sharp peak at δ 2.35 ppm could be assigned to three proyons of CH_3 group.

The 1,3-oxazepine derivatives were obtained by addition reaction of Schiff bases with different anhydrides in dry benzene.

The mechanism for this reaction[14] may be outlined in scheme(2):



Scheme(2)

The mechanism involves the addition of one σ- carbonyl to π-bond ($\overset{\bullet\bullet}{N}$=C) to give 4-membered cyclic and 5-membered cyclic ring of anhydride in the same transition state $[T.S]_a$, which opens into maleic anhydride , phthalic maleic, naphthalic anhydride or pyromellitic dianhydride to give 7-membered cyclic ring 1,3-oxazepine [C].

The characteristic FTIR absorption bands of these compounds, Figure (1), was confirmed from the disappearance of band due to C=N of schiff base and other peaks characterized of cyclic anhydride of the starting materials together, Besides this, the appearance of two bands at 1770 $cm^{-1}$and 1710 $cm^{-1}$for two carbonyl groups in lactone ring and oxazepine ring, respectively. A peak around 1730 cm^{-1} due to C=O of lactone ring, C-H aliphatic band in the region (2983 -2845)cm^{-1} and bands around (1280 and 1103 cm^{-1}) belong to asymmetric and symmetric (C-O-C) band. All the spectral data of FTIR and UV-Vis for other compounds are listed in Table (3). The UV-Vis spectra, have electron transition (n → π*) and (π →π*).

The ^{1}HNMR spectrum (in DMSO), Figure (2) of compounds $[XII]_a$ showed a sharp signal at δ 3.8 ppm for nine protons of OCH_3 groups and doublet signal at δ 6.1ppm for two protons of CH=CH, twelve aromatic protons appear at the range (δ 7.00-7.89) ppm. Furthermore, a sharp signal of N-H proton absorbed at δ 10.3 ppm .

The ^{1}HNMR spectrum of compound $[XIII]_b$, showed twenty aromatic ring protons appear as multiplet at the range (δ 7.02-8.19) ppm, a singlet signal of N-CH proton of oxazepine absorbed at δ 6.75 ppm . Furthermore, a singlet signals at δ 3.39ppm for OCH_3 protons absorbed.

The ^{1}HNMR spectrum of compound $[XII]_c$ (in DMSO), showed a singlet signal of N-CH proton absorbed at δ 7.00 ppm, the aromatic ring protons appears at the range (δ 7.87-8.57) ppm, two singlet signals at δ3.82 ppm and 3.83 for OCH_3 protons absorbed, finally, a singlet signal at δ 10.3 ppm that could be attributed to the proton of NH group.

Finally, the ^{1}HNMR spectrum of compound $[XIV]_d$ (in DMSO), also showed a singlet signal that could be attributed to the proton of N-CH absorbed at δ 7.15 ppm, a singlet signals for aromatic benzene ring[22] center appears at δ 8.05ppm and the other aromatic ring protons appear at the range (δ 7.0-7.90) ppm. . Furthermore a singlet signals at δ3.81ppm that could be attributed to eighteen protons of six OCH_3 groups [22].

Biological Activity

The antibacterial activity of the synthesized compounds was performed according to the agar diffusion method [18]. The prepared compounds were tested against *E.coli* and *Staph. aureus* .Each compounds was dissolved in DMSO to give concentration 1ppm. The plates were then incubated at 37 ^{0}C and examined after 24 hrs. The zones of inhibition formed were measured in millimeter and are represented by (-), (+), (+ +) and (+ + +) depending upon the diameter and clarity as in Table (4). All the compounds exhibit the high or low biological activity while the compound $[XIII]_C$ showed no activity against both the organisms. The compounds showed good inhibition against of the two types of the bacteria, this could be related to the presence of the D-erythroascorbic acid , 1,3-oxazepine and imine linkage.

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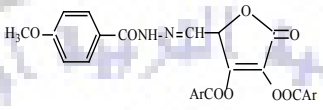
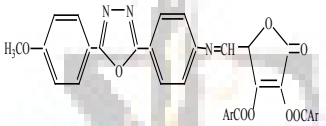
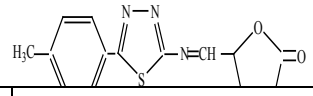
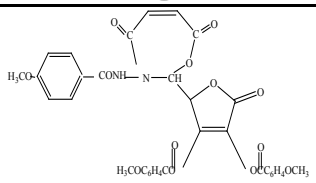
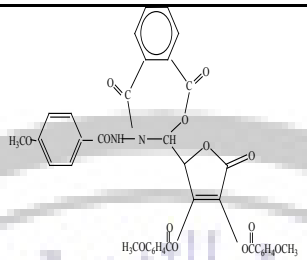
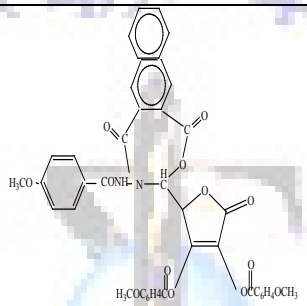
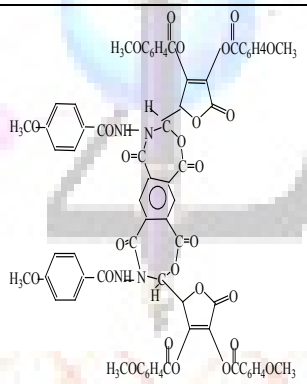
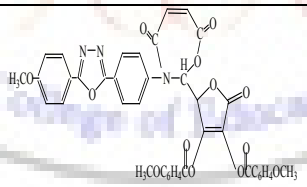
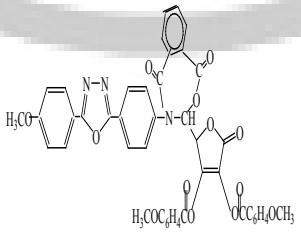
Comp .No.	Nomenclature	Structural Formula	Molecular Formula	M. P.° C	Yield %	Color
[IX]	5-C-(4-methoxyphenyl) semicarbazone -pentulose-γ-lactone-2,3-enedianisoate		$C_{29}H_{24}O_{10}N_2$	138 - 140	65	Yellow
[X]	4-{4′[-5-(4′′-methoxyphenyl)-1,3,4-oxadiazole-2-yl]phenyl-imine}-pentulose-γ-lactone-2,3-enedianisoate		$C_{36}H_{27}O_{10}N_3$	170 - 172	75	Yellow

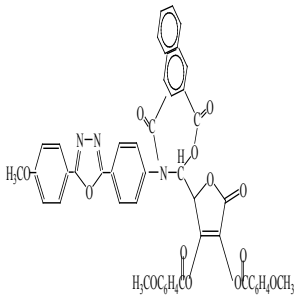
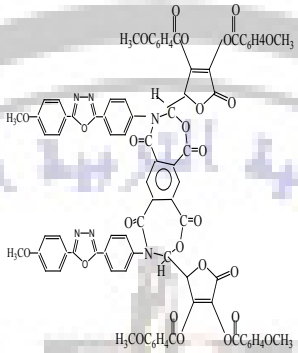
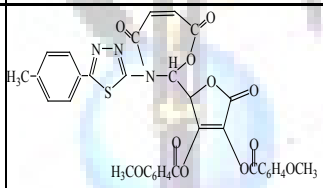
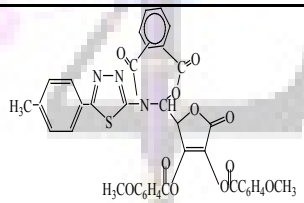
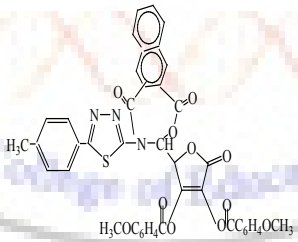
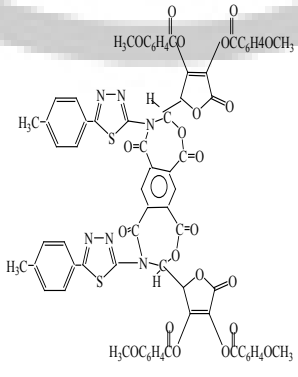
Ind. 122:233.

Table(1)The physical properties of compounds[IX],[X] and[XI]

Comp. No.	Nomenclature	Structural Formula	Molecular Formula	Yield %	M.P. °C	Color
[XII]	5-(4′-tolyl)-2[(pentulose-γ- lactone – 2		C H O N S	166	60	Yellow

Table(2)The physical properties of compounds $[XII]_{a-d}$, $[XIII]_{a-d}$ and $[XIV]_{a-d}$

$[XII]_a$	2-(pentulose-γ- lactone-2,3-enedianisoate) -3- (4'-methoxy benzamide)-2,3-dihydro-[1,3]-oxazepine-4,7-diones		$C_{33}H_{26}O_{13}N_2$	60	178-180	Brown
$[XII]_b$	2-(pentulose-γ- lactone-2,3-enedianisoate)-3-(4′-methoxy benzamide)-2,3-dihydro benz [1,2e][1,3]- oxazepine-4,7-diones		$C_{37}H_{28}O_{13}N_2$	65	164-166	Yellow
$[XII]_c$	2-(pentulose-γ- lactone-2,3-enedianisoate)-3-(4-methoxy benzamide)-2,3-dihydro naphtha[2,3e][1,3]-oxazepine-4,7-diones		$C_{40}H_{30}O_{13}N_2$	75	198-200	Brown
$[XII]_d$	Benzene1,2,4,5-bis{2-(pentulose -γ- lactone-2,3-enedianisoate)-3-(4′-methoxy benzamide) -2,3-dihydro-[1,3] oxazepine-4,7-diones}		$C_{68}H_{50}O_{26}N_4$	60	172-174	Brown
$[XIII]_a$	2-(pentulose-γ- lactone-2,3-enedianisoate)-3-{4′-[5-(4′′-methoxyphenyl)-1,3,4-oxadi-azole -2-yl]-phenyl}-2,3-dihydro-[1,3]-oxazepine-4,7-diones		$C_{40}H_{29}O_{13}N_3$	55	220dec.	Pale Yellow
$[XIII]_b$	2- pentulose-γ- lactone-2,3-enedianisoate-3-4′-[5-(4′′-methoxy phenyl) -1,3,4-oxadiazole -2-yl]phenyl} -2,3-dihydrobenz-[1,2e] [1,3]-oxazepine-4,7-diones		$C_{44}H_{31}O_{13}N_3$	70	160-162	Yellow

$[XIII]_c$	2- pentulose-γ- lactone-2,3-enedianisoate-3-{4′-5-(4′′-methoxyphenyl) -1,3,4-oxadiazole-2-yl]phenyl} -2,3-dihydro naphthal [2,3e] [1,3] oxazepine-4,7-diones		$C_{48}H_{33}O_{13}N_3$	70	180-182	Brown
$[XIII]_d$	Benzene1,2,4,5-bis{2-(pentulose -γ- lactone-2,3-enedianisoate)-3-{4′-[5-(4′′-methoxyphenyl)-1,3,4-oxadiazole-2-yl] phenyl}-2,3-dihydro-[1,3]oxazepine-4,7-diones}		$C_{82}H_{64}O_{26}N_6$	58	162-164	Yellow
$[XIV]_a$	2- (pentulose-γ- lactone-2,3-enedianisoate)[5-(4′-tolyl) -1,3,4-thiadiazole-2-yl])-2,3-dihydro-[1,3]-oxazepine-4,7-diones		$C_{34}H_{25}O_{11}N_3S$	50	228-230	Brown
$[XIV]_b$	2- (pentulose-γ- lactone-2,3-enedianisoate)-3-[5-(4′-tolyl) 1,3,4-thiadiazole-2-yl])-2,3-dihydro benz[1,2e][1,3]-oxazepine-4,7-diones		$C_{38}H_{27}O_{11}N_3S$	58	195-197	Brown
$[XIV]_c$	2- (pentulose-γ- lactone-2,3-enedianisoate)-3-[5-(4′-tolyl) 1,3,4-thiadiazole-2-yl])-2,3-dihydro naphth[2,3e][1,3]-oxazepine-4,7-diones		$C_{42}H_{29}O_{11}N_3S$	50	182-184	Brown
$[XIV]_d$	Benzene1,2,4,5-bis{2-(pentulose -γ- lactone-2,3-enedianisoate)-3′-[5-(4′-tolyl) -1,3,4- thiadiazole-2-yl] phenyl}-2,3- dihydro-[1,3]oxazepine-4,7-diones}		$C_{66}H_{48}O_{22}N_6S_2$	50	150-152	Brown

Table(3) Charcterrisitic FTIR absorption band and UV-VIS (λ_{max}) of compounds $[XII]_{a-d}$ $[XIV]_{a-d}$

Comp. No.	UV-VIS λ_{max} (nm)	Characteristic bands FTIR spectra(cm^{-1})				
		V(C-H) aromatic	V(C-H) Aliphatic	V (C=O) Lactone	V (C=O) lactam	V (C=C) aromatic
$[XII]_a$	234	3010	2982-2843	1770,1685	1740	1604
$[XII]_b$	259	3093	2974-2846	1765,1642	1755	1604
$[XII]_c$	317.5	3088	2956-2848	1772,1685	1735	1604
$[XII]_d$	262	3024	2943-2843	1760,1676	1728	1606
$[XIII]_a$	322	3066	2924-2851	1778,1685	1713	1600
$[XIII]_b$	325	3028	2927-2856	1770,1681	1730	1600
$[XIII]_c$	330	3072	2927-2846	1770,1689	1739	1604
$[XIII]_d$	261	3030	2941-2843	1760,1685	1730	1604
$[XIV]_a$	292	3020	2904-2850	1770,1685	1740	1600
$[XIV]_b$	289	3020	2924-2727	1770,1687	1740	1627
$[XIV]_c$	246	3066	2920-2850	1770,1674	1739	1630
$[XIV]_d$	270	3059	2940-2842	1770,1685	1740	1600

Table(4)Antibacterial activity of the synthesized compounds [IV]-$[XIV]_{a-d}$.

Comp.No.	*E.Coli*(G-)	*Staph. aurus*(G+)	Comp.No.	*E.Coli*(G-)	*Staph. aurus*(G+)
[IV]	+ +	+ +	$[XII]_c$	+	+
[VI]	+ + +	+ + +	$[XII]_d$	+	+
[VII]	+	+	$[XIII]_a$	+	+
[VIII]	+ + +	+ + +	$[XIII]_b$	+	+
[IX]	+	+	$[XIII]_d$	+ + +	+ + +
[X]	+	+	$[XIII]_a$	+ + +	+ +
[XI]	+	+	$[XIV]_b$	++	+ + +
$[XII]_a$	+	+	$[XIV_c$	+ +	+ + +
$[XII]_b$	+ +	+ +	$[XIV]_d$	+	+

Key to symbols: Highly active = + + +(mor than)15 mm.

Moderately active = + +(11-15) mm. and Slightly active = + (5-10) .

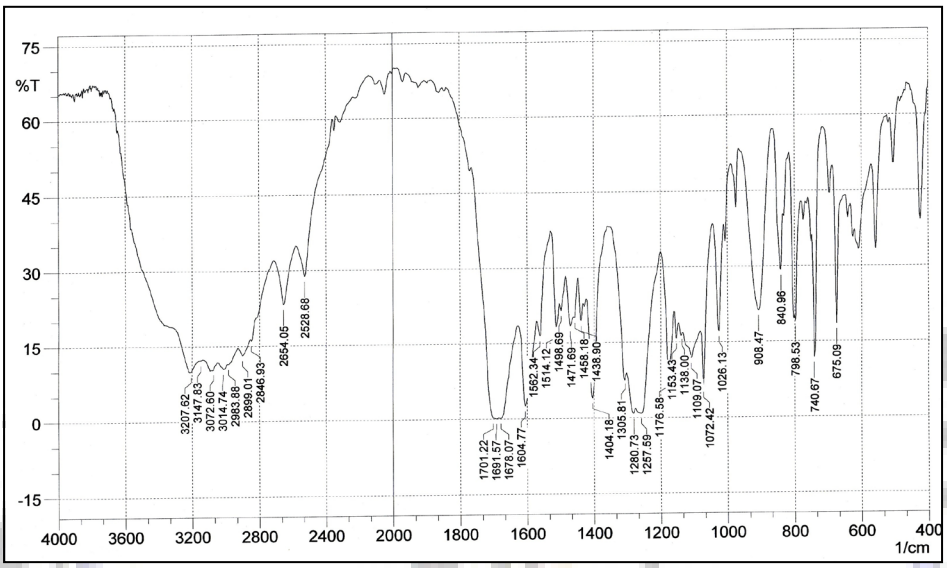


Fig. (1): FTIR- spectrum of compound $[XII]_b$

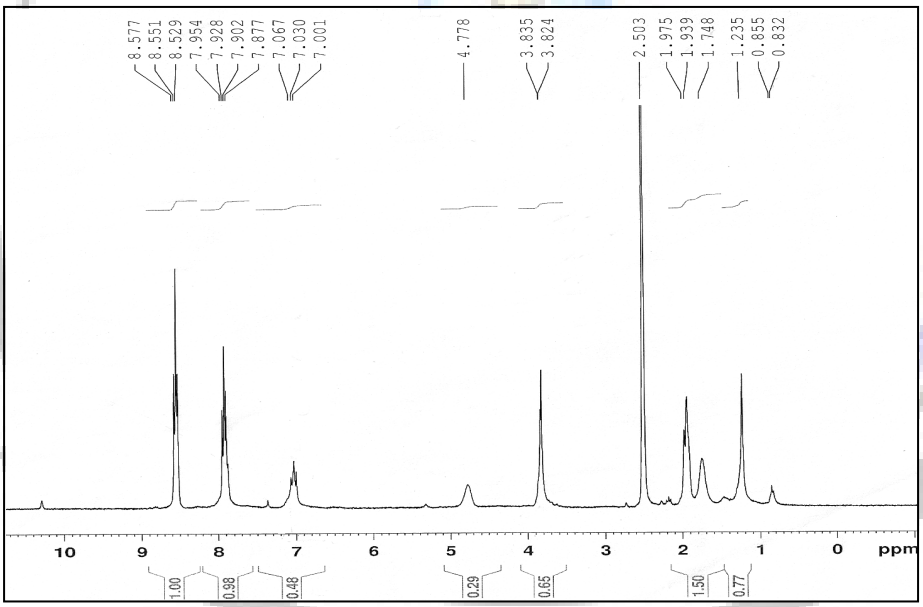


Fig. (2): ^{1}HNMR spectrum of compound $[XII]_c$

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تحضير و تشخيص مركبات الاوكسازبين المشتقة من D -ارثروحامض الاسكوربيك

عبد الجبار عبد القادر مخلص ، منى سمير الراوي ، جمبد هرمز توما ، عمار هاني الدجيلي

قسم الكيمياء،كلية التربية – ابن الهيثم ،جامعة بغداد

الخلاصة

حضرت المركبات الجديدة لقواعد شف [X] و [IX] المشتقة من D -ارثرو حامض اسكوربيك التي تحتوي على حلقة غير متجانسة من تكاثف D -ارثرو حامض اسكوربيك مع الامينات الاروماتية (المحتوية على وحدة4,3,1- اوكسادايازول او - 4,3,1 ثايادايازول) في البنزين الجاف وباستعمال قطرات من حامض الخليك الثلجي محفزا . حضر المركب D - ارثرو حامض اسكوربيك باربع خطوات متتالية كما في المخطط رقم (1) بينما حضر الامين الاروماتي المحتوي 4,3,1- اوكسادايازول او 4,3,1- ثايادايازول من تفاعل 4-ميثوكسي بنزوايل هايدرازين مع 4-امينو حامض البنزويك او من تفاعل حامض التلويك مع ثايوسميكاربازايد بوجود $POCl_3$ وعلى التوالي .

تناول البحث تحضير وتشخيص مشتقات الاوكسازبين الجديدة والمشتقة اساسا من قواعد شف [XII] -[XIV]الى الانهايدرايدات المختلفة من تفاعل الاضافة في البنزين الجاف . حضرت مشتقات الاوكسازبين - الجديدة بالتصعيد العكسي لقواعد شف مع مختلف الانهايدرايدات (ماليك ، فثاليك، نفثالك، بايرومالتيك داي انهايدريد) في البنزين الجاف.

شخصت جميع المركبات المحضرة بقياس درجات انصهارها وبوساطة طيف FTIR، طيف UV-Vis ، طيف ^{1}HNMR ، طيف الكتلة والتحليل الدقيق للعناصر (C.H.N) للبعض منها .درست الفعالية البايولوجية للمركبات المحضرة ضد نوعين من البكتريا واظهرت النتائج فعالية بايولوجية جيدة ضد البكتريا بنوعيها *Echerichia coli* (G-), *Staphylococcus* (G+) .

الكلمات المفتاحية : 3,1 – اوكسازبين ، قواعد شف، حامض الاسكوربيك.