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.Synthesis of New 1,3-Oxazole Derivatives

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A r t i c l e i n f o

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ABSTRACT

1,3- Oxazole derivatives (2a – d) have been Synthesized by cyclization of hippuric acid with different aromatic aldehydes , hippuric acid was readily obtained by reaction of benzoyl chloride with glycine (2-amino acetic acid) . Compounds (2a – d) were converted in to aviary of derivatives. All new compounds were characterized by ^{1}H NMR, FTIR and UV spectroscopy

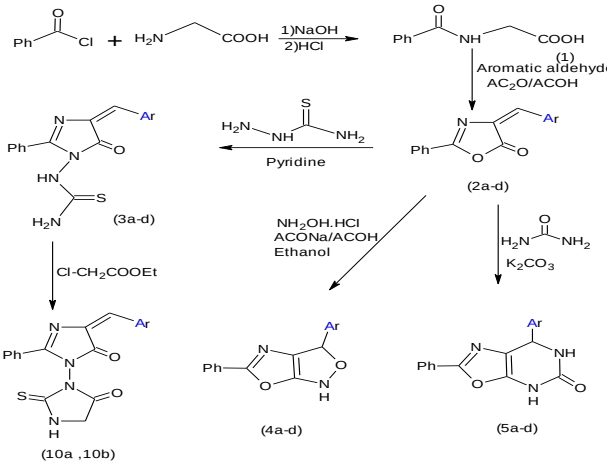
الخلاصة

تم في هذا البحث تحضير مركبات (2a-d) من خلال اجراء عملية الغلق الحلقي لحامض الهبيوريك مع الديهايدات اروماتية مختلفة بينما حضر المركب الاساسي حامض الهبيوريك من تفاعل المركب benzoyl chloride مع الحامض الاميني (Glycine) ثم بعد ذلك تم تحويل المركبات (2a-d) الى بقية المشتقات . كل المركبات المحضرة تم تشخيصها بأستخدام الطرائق الطيفية ^{1}H NMR, FTIR and UV

INTRODUCTION

Oxazoles are a kind of attractive heterocycles not only because of their unique structures and varied applications but also they serve as structural elements for a variety of natural products[1], pharmaceuticals[2] and bioactive compounds[3] , A number of synthetic methods to prepare oxazoles have been reported[4] . The typical procedure for the synthesis of oxazoles involves the reaction of readily available substituted urea derivatives with halogenated alkenes or α-haloketones [5]. Imidazoles are an important class of heterocycles being the core fragment of different natural products and biological systems[6], Compounds containing imidazole moiety have many pharmacological properties and play important roles in biochemical processes [7]. Imidazolones have been associated with several pharmacological activities such as antimicrobial (antifungal, antibacterial and antiviral), anticancer activity, CNS depressant activity[8]. Chalcones are an important class of compounds which are good intermediates for the synthesis of various heterocyclic compounds like flavones, isoxazolines, pyrimidines, quinoxalines, benzalcoumaranones [9] .Chalcones display a wide range of pharmacological properties, including cytotoxity towards cancer cell lines[10]. Pyrimidine is the most important six membered heterocyclic containing 2 nitrogen atoms at position 1 and 3. It is isomeric with two other forms of diazene[11] . Pyrazole is a five-membered heterocyclic moiety having two adjacent nitrogen atoms within the ring , and It is basic in nature [12] , pyrazole is one of the most important one as large variety of biological activities have been reported for various pyrazole derivatives . Conventional method of synthesis of pyrazoles involves the base-catalyzed condensation of aromatic ketones to give α, β- unsaturated ketones (also called as chalcones) , which undergo subsequent cyclization with hydrazine and hydrazine derivatives[13,14]. The pyrazole nucleus is a ubiquitous feature of pharmacological interest and has been proven to be a fertile source of medicinal agents , pyrazole derivatives have also exhibited antidiabetic properties ,and some of these have biological activities such as anti-inflammatory[15,16].

MATERIALS AND METHODS



Ar = 4-$(CH_3)_2$N-C_6H_4 , 4-Br-C_6H_4 , 4-Cl-C_6H_4 , 2-NO_2-C_6H_4

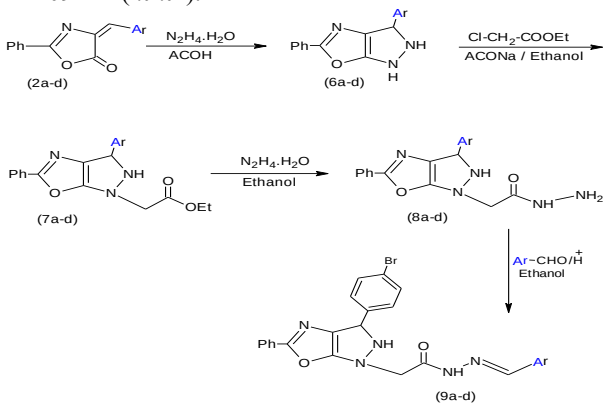
Scheme(l)

Synthesis of 2-benzamidoacetic acid (1)[17]

To a mixture of glycine (0.18 mole ,13.2 gm) in mixture of sodium hydroxide (60 ml) 10% NaOH was added and stirred for 10 min ,then benzoyl chloride (0.18 mole , 25 gm) was added to the mixture,then the reaction mixture was allowed to cool then acidified with cons HCl, ice cooled water was added to the solid product obtained and filtered and recrystallized from apposite solvent.

(1) :Yield, 74% , m.p. 184-185 C° , IR(cm^{-1}): 3342 υ(NH), 2484-3400 υ(O-H) 3070 υ(C-H)aromatic, 2893,2939 υ(C-H)aliphatic , 1753 υ(C=O) acid ,

1687 υ(C=O)amide. U.V (MeOH) : 229 nm (n-π*), 209 nm (π-π*).



Ar = 4-$(CH_3)_2$N-C_6H_4 , 4-Br-C_6H_4 , 4-Cl-C_6H_4 , 2-NO_2-C_6H_4

Scheme(ll)

Synthesis of (E)-4-(Arylidene)-2-phenyl-1,3- oxazol-5(4H)-ones(2a-d)[18]

A mixture of (1) (0.02 mole, 3.58 gm)and aromatic aldehydes (0.02 mole) in acetic anhydride (20 ml) and acetic acid (5 ml)was refluxed for 3 hrs, then the reaction mixture was added to ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

2_a : Yield**,** 89 % , m.p. 214-215 C° , IR(cm^{-1}): 3016 υ(C-H)aromatic, 2812,2899 υ(C-H)aliphatic ,1784 υ(C=O) lactone ,1645 υ(C=N) , (1606,1581) υ(C=C) ar . U.V (MeOH) :301 nm (n-π*), 242 nm(π-π*).

2_b : Yield**,** 75% ,m.p. 154-156 C°,IR(cm^{-1}):3057 υ(C-H)aromatic, 2839,2985 υ(C-H)aliphatic ,1795 υ(C=O) lactone , 1653 υ(C=N) , (1583,1554) υ(C=C) ar . U.V (MeOH) : 388 nm(n-π*), 252 nm (π-π*).

2_c : Yield**,** 83 % , m.p. 116-118 C° , IR(cm^{-1}): 3078 υ(C-H)aromatic, 2847,2991 υ(C-H)aliphatic ,1795 υ(C=O) lactone , 1653 υ(C=N) , (1556 ,1589) υ(C=C) ar . U.V (MeOH) : 348 nm (n-π*), 232 nm (π-π*). ^{1}H-NMR (DMSO) (ppm) 7.38 (s,=CH- alkene) ,7.60-7.77 (s ,5H for phenyl ring), 8.13-8.34 (dd,4H for aryl ring).

2_d : Yield**,** 70% , m.p. 165-167 C° , IR(cm^{-1}): 3070 υ(C-H)aromatic, 2839,2985 υ(C-H)aliphatic ,1797 υ(C=O) lactone , 1654 υ(C=N) , (1550, 1599) υ(C=C) ar . U.V (MeOH) : 362 nm (n-π*), 245 nm (π-π*).

Synthesis of (E)-1-(4-(Arylidene)-5-oxo-2-phenyl-4,5-dihydro-1H-imidazol-1-yl)thiourea(3a-d)[19]

A mixture of (2a-d) (0.02 mole) and thiosemicarbazide (0.02 mole , o.18 gm) in pyridine (20 ml) was refluxed for 20 hrs , then the reaction mixture was added to ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

3_a : Yield**,** 76 % , m.p. 192-194 C° , IR(cm^{-1}): 3412,3466 υ(NH_2) , 3075 υ(C-H)aromatic, 2858,2906 υ(C-H)aliphatic ,1693 υ(C=O)lactam ,1633 υ(C=N).

3_b : Yield**,** 70% , m.p. 145-147 C°, IR(cm^{-1}): 3317,3336 υ(NH_2) , 3070 υ(C-H)aromatic, 2870,2928 υ(C-H)aliphatic , 1708 υ(C=O) lactam , 1631 υ(C=N). U.V (MeOH) : 389 nm (n-π*), 272 nm (π-π*).

3_c : Yield**,** 67 % , m.p. 135-137 C°, IR(cm^{-1}): 3400,3439 υ(NH_2) , 3073 υ(C-H)aromatic, 2852,2926 υ(C-H)aliphatic, 1710 υ(C=O)lactam, 1645 υ(C=N).

3_d : Yield**,** 74% , m.p. 165-167 C°, IR(cm^{-1}): 3375,3444 υ(NH_2) 3068 (C-H)aromatic, 2870,2920 υ(C-H)aliphatic , 1707 υ(C=O) lactame, 1641 υ(C=N). U.V (MeOH) : 315 nm (n-π*), 266 nm (π-π*).

Synthesis of 3-(Aryl)-5-phenyl-1,3-dihydrooxazolo [5,4-c] isoxazol (4a-d)[20]

A mixture of (2a-d) (0.001 mole) and hydroxyl amine hydrochloride (0.003 mole , 0.2 gm) and sodium acetate anhydrous (0.003 mole , 0.24 gm) in (15 ml) ethanol and (5 ml) glacial acetic acid was refluxed for 8 hrs, then the reaction mixture was added to ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

4_a : Yield**,** 70 % , m.p. 147-148 C° , IR(cm^{-1}):3201 υ(NH) , 2858,2912 υ(C-H)aliphatic , 1670 υ(C=N) , 1516,1587 υ(C=C)aromatic . U.V (MeOH) : 472 nm (n-π*), 281 nm (π-π*).

4_b : Yield**,** 84% , m.p. 160-162 C° , IR(cm^{-1}): 3151 υ(NH) , 2816,2912 υ(C-H)aliphatic , 1703 υ(C=N) , 1560,1583 υ(C=C)aromatic . U.V (MeOH) : 387 nm(n-π*) , 262 nm (π-π*) . ^{1}H-NMR (DMSO) (ppm) 7.02(-CH-) isoxazole ring , 7.58-8.28 (5H s for phenyl ring ,4H dd for aryl ring) , 11.34(1H s , NH).

4_c : Yield**,** 62 % , m.p. 170-172 C° , IR(cm^{-1}): 3180 υ(NH) , 2850,2918 υ(C-H)aliphatic ,1701 υ(C=N). U.V(MeOH) :380 nm (n-π*), 238 nm (π-π*).

4_d : Yield**,** 57% , m.p. 128-130 C° , IR(cm^{-1}): 3178 υ(NH) , 2870,2987 υ(C-H) aliphatic , 1716 υ(C=N).

Synthesis of 7-(Aryl)-2-phenyl-6,7-dihydrooxazolo [5,4-d] pyrimidine-5(4H)-one (5a-d)[21]

A mixture of (2a-d) (0.002 mole)and urea (0.002mole, 0.12gm) was dissolved in a mixture of acetone (15 ml) and ethanol (15 ml),then potassium carbonate (0.002 mole , 0.27 gm) was added with vigorous stirring then the mixture was refluxed for 14 hrs, after this the reaction mixture was poured in ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

5_a : Yield**,** 86 % , m.p. 144-145 C° , IR(cm^{-1}):3309 υ(NH) , 2812,2978 υ(C-H)aliphatic ,1707 υ(C=O) , 1645 υ(C=N)cyclic . U.V (MeOH) : 365 nm (n-π*), 234 nm (π-π*).

5_b : Yield**,** 58 % , m.p. 179-181 C° , IR(cm^{-1}): 3211 υ(NH) , 2890,2978 υ(C-H) aliphatic , 1716 υ(C=O), 1649 υ(C=N) cyclic. U.V(MeOH): 358 nm (n-π*) , 292 nm (π-π*)

5_c : Yield**,** 75 % , m.p. 50-52 C° , IR(cm^{-1}): 3209 υ(NH) , 2899,2976 υ(C-H)aliphatic , 1718 υ(C=O) ,1649 υ(C=N) cyclic. U.V(MeOH) :289 nm (n-π*), 228 nm (π-π*).

5_d : Yield**,** 57% , m.p. 150-152 C° , IR(cm^{-1}): 3221 υ(NH) , 2812,2985 υ(C-H) aliphatic , 1726 υ(C=O) , 1651 υ(C=N) cyclic.

Synthesis of 3-(Aryl)-5-phenyl-2,3-dihydro-1H-pyrazolo [4,3-d] oxazole(6a-d)[22]

A mixture of (2a-d) (0.005 mole) and hydrazine hydrate (0.005 mole , 0.25 gm) in (20 ml) acetic acid was refluxed for 8 hrs, then the reaction mixture was added to ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

6_a : Yield**,** 78 % , m.p. 170-172 C° , IR(cm^{-1}):3130 υ(NH)*far from oxazole ring* , 3200 υ(NH)*near from oxazole ring* , 2848,2943 υ(C-H)aliphatic , 1662 υ(C=N)cyclic .U.V(MeOH) : 305 nm(n-π*), 259 nm (π-π*).

6_b : Yield**,** 68 % , m.p. 211-213 C° , IR(cm^{-1}):3201 υ(NH)*far from oxazole ring* , 3311 υ(NH)*near from oxazole ring*, 2893,2953 υ(C-H) aliphatic ,1658 υ(C=N) cyclic. U.V(MeOH) :259 nm(n-π*) , 228 nm (π-π*).

6_c : Yield**,** 71 % , m.p. 126-128 C° , IR(cm^{-1}):3130 υ(NH)*far from oxazole ring* , 3209 υ(NH)*near from oxazole ring* , 2852,2960 υ(C-H)aliphatic ,1654 υ(C=N) cyclic. U.V(MeOH) :284 nm (n-π*), 228 nm (π-π*).

6_d : Yield**,** 76% , m.p. 208-210 C° , IR(cm^{-1}):2211 υ(NH)*far from oxazole ring* , 3258 υ(NH) *near from oxazole ring* , 2812,2985 υ(C-H) aliphatic , 1726 υ(C=O), 1664 υ(C=N) cyclic. U.V(MeOH) :258 nm (n-π*), 224 nm (π-π*). ^{1}H-NMR (DMSO) (ppm) 4.63 (s ,NH *far from oxazole ring and* -CH-*)* ,7.40-8.26 (5H s for phenyl ring , 4H dd for aryl ring), 13.59 (s , NH *near from oxazole ring)*.

Synthesis of Ethyl 2-(3-(Aryl)-5-phenyl-1H-pyrazolo [4,3-d] oxazol -2 (3H)-yl)acetate (7a-d)[23]

A mixture of (6a-d) (0.003 mole) and ethyl chloro acetate (0.003 mole,0.36 gm) and sodium carbonate (0.003mole,0.31gm) in ethanol (20 ml) was refluxed for 7 hrs, then the reaction mixture was added to ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

7_a : Yield**,** 62 % , m.p. 153-155 C° , IR(cm^{-1}):3130 υ(NH) , 3003 υ(C-H) aromatic, 2854,2970 υ(C-H)aliphatic ,1734 υ(C=O) ,1658 υ(C=N) . U.V(MeOH) : 306 nm(n-π*), 260 nm (π-π*).

7_b : Yield**,** 71 % , m.p. 133-135 C° , IR(cm^{-1}):3078 υ(NH) , 3051 υ(C-H) aromatic, 2843,2939 υ(C-H)aliphatic ,1747 υ(C=O),1658 υ(C=N) . U.V(MeOH) : 269 nm(n-π*), 253 nm (π-π*).

7_c : Yield**,** 60 % , m.p. 123-125 C° , IR(cm^{-1}):3203 υ(NH) , 3073 υ(C-H) aromatic, 2864,2978 υ(C-H)aliphatic ,1737 υ(C=O),1664 υ(C=N) . U.V(MeOH) : 229 nm(n-π*), 214 nm (π-π*).

7_d : Yield**,** 71% , m.p. 100-102 C° , IR(cm^{-1}):3080 υ(NH) , 3001 υ(C-H) aromatic, 2912,2951 υ(C-H)aliphatic ,1749 υ(C=O),1656 υ(C=N). U.V(MeOH): 306 nm(n-π*), 260 nm (π-π*). ^{1}H-NMR (DMSO) (ppm) 1.21-1.25 (triplet -CH_3) , 4.17 – 4.24 (quartate , -$\underline{C}H_2$-O-) , 4.68 (-$\underline{C}H_2$-C=O) , 4.98 (s ,NH *and* -CH-), 7.42-8.28 (5H s for phenyl ring ,4H dd for aryl ring) .

Synthesis of 2-(3-(Aryl)-5-phenyl-1H-pyrazolo[4,3-d]oxazol-2(3H)-yl)acetohydrazide(8a-d)[24]

A mixture of (7a-d) (0.002 mole) and hydrazine hydrate (0.002 mole , 0.1 gm) in ethanol (20 ml) was refluxed for 10 hrs, then the reaction mixture was added to ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

8_a : Yield**,** 56 % , m.p. 187-189 C° , IR(cm^{-1}): 3252,3288 υ(NH_2) , 3034 υ(C-H)aromatic, 2850,2920 υ(C-H) aliphatic , 1651 υ(C=O) amide . U.V (MeOH) : 304 nm (n-π*), 244 nm (π-π*).

8_b : Yield**,** 77% ,m.p. 182-184 C°, IR(cm^{-1}): 3290,3296 υ(NH_2) , 3070 υ(C-H) aromatic, 2854,2929 υ(C-H) aliphatic , 1658 υ(C=O) amide . U.V (MeOH) : 228 nm (n-π*), 213 nm (π-π*).

8_c : Yield**,** 60 % , m.p. 128-130 C° , IR(cm^{-1}): 3294,3317 υ(NH_2), 3067 υ(C-H) aromatic, 2848,2916 υ(C-H) aliphatic , 1629 υ(C=O) amide . U.V (MeOH) :385 nm(n-π*), 236 nm (π-π*). Mass Spectra(367 g / mole) .

8_d : Yield**,** 64% , m.p. 178-180 C° ,IR(cm^{-1}): 3311,3319 υ(NH_2) ,3061 υ(C-H) aromatic, 2848,2918 υ(C-H) aliphatic , 1683 υ(C=O) amide . U.V (MeOH) : 260 nm (n-π*), 226 nm (π-π*).

Synthesis of (E)-N-(4-bromobenzyl)-2-(3-(Aryl)-5-phenyl-1H-pyrazolo [4,3-d]oxazol-2(3H)-yl)acetohydrazide (9a-d)[25]

A mixture of aromatic aldehydes (0.001 mole) was dissolved in (20 ml) ethanol with (3 drops) from glacial acetic acid, then added (0.001 mole , 0.41 gm) from the compounde (8b) to the mixture and refluxed for 6 hrs, then the reaction mixture was added to ice water and the solid product obtained was filtered and recrystallized from apposite solvent.

9_a : Yield**,** 75 % , m.p. 135-136 C° , IR(cm^{-1}): 3244 υ(NH) , 3059 υ(C-H) aromatic, 2854,2922 υ(C-H) aliphatic , 1681 υ(C=O) amide , 1666 υ(C=N) . U.V (MeOH) : 341 nm (n-π*), 229 nm (π-π*).

9_b : Yield**,** 70% ,m.p. 295 C° decompostion , IR(cm^{-1}): 3134 υ(NH) , 3066 υ(C-H) aromatic, 2852,2924 υ(C-H) aliphatic , 1660 υ(C=O) amide , 1629 υ(C=N) . U.V (MeOH) : 288 nm (n-π*), 227 nm (π-π*).

9_c : Yield**,** 68 % , m.p. 173-175 C° , IR(cm^{-1}): 3130 υ(NH), 3049 υ(C-H) aromatic, 2881,2929 υ(C-H) aliphatic , 1681 υ(C=O) amide , 1624 υ(C=N) . U.V (MeOH) : 260 nm (n-π*), 227 nm (π-π*).

9_d : Yield**,** 68% , m.p. 268-270 C° ,IR(cm^{-1}): 3213 υ(NH) , 3068 υ(C-H) aromatic, 2852,2924 υ(C-H) aliphatic , 1654 υ(C=O) amide , 1639 υ(C=N) . U.V (MeOH) : 260 nm (n-π*), 227 nm (π-π*).

Synthesis of (E)-4-(Arylidene)-1-(5-oxo-2-thioxoimidazolidin-1-yl)-2-phenyl-1H-imidazol-5(4H)-one (10 a,b)[23]

A mixture of (3a,b) (0.001 mole) and ethyl chloro acetate (0.001 mole , 0.122 gm) in ethanol (20 ml) was refluxed for 10 hrs,then the reaction mixture was added to ice water and the solid product obtainedwas filtered and recrystallized from apposite solvent.

10_a : Yield**,** 76 % , m.p. 123-125 C° , IR(cm^{-1}): 3300 υ(NH) , 3086 υ(C-H) aromatic, 2858,2910 υ(C-H) aliphatic , 1720 υ(C=O) *New imidazole ring* . U.V (MeOH) : 354 nm (n-π*), 269 nm (π-π*).
10_b : Yield**,** 72% ,m.p. 130-132 C° , IR(cm^{-1}): 3318 υ(NH) , 3077 υ(C-H) aromatic, 2850,2949 υ(C-H) aliphatic , 1714 υ(C=O) *New imidazole ring* . Mass Spectra (442 g /mole) .

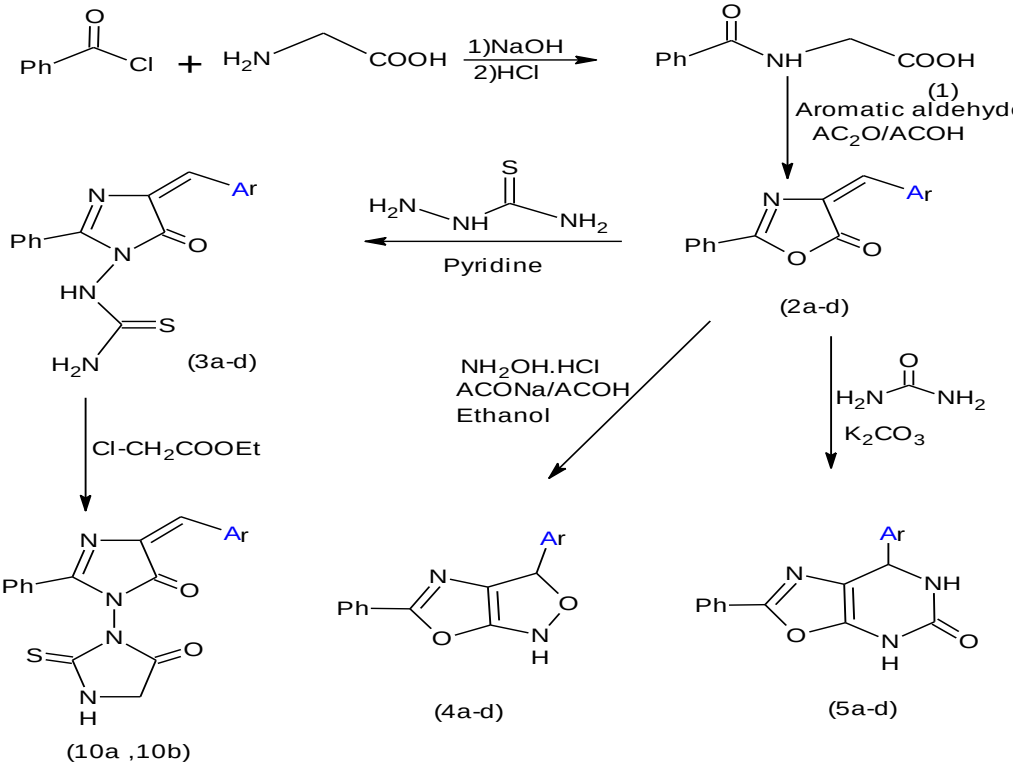
RESULTS AND DISCUSSION

Schemes (I - II) were summarized the synthesis of different derivatives of hippuric acid (1) which was synthesized by treatment of benzoyl chloride with glycine. The reaction is followed by the appearance of the new (C=O) band at (1687 Cm^{-1}) due to carbonyl of amide and band at 1753 for (C=O acid) and bands at (2484-3400 Cm^{-1}) for stretching vibration of (acidic OH). λ_{max} (MeOH) at (229 nm) responsible for ($n \rightarrow \pi^*$) transition of (N and O) atoms and at (209 nm) due to ($\pi \rightarrow \pi^*$). Compounds (2a - d**)** have been synthesized by the reaction of compound (1) with different aromatic aldehydes in acetic anhydride and acetic acid, the reaction proceeds by elimination of H_2O molecule. The reaction is followed by appearance of the new (C=O) band at (1784-1797 Cm^{-1}) for lactone ring which showed the increase of frequency of carbonyl and band at (1645-1654 Cm^{-1}) for stretching vibration of (C=N). The λ_{max} (MeOH) at (301-388 nm) responsible for ($n \rightarrow \pi^*$) transition of (N and O) atoms and at (232-252 nm) due to ($\pi \rightarrow \pi^*$). ^{1}H-NMR (DMSO)(ppm) for compound (2c) shows appearance asinglet band at (7.38) due to proton of(-CH=) and many signals at (7.60-8.34) due to aromatic protons (5H s for phenyl ring , 4H dd for aryl ring) . The treatment of compound (2a- d) with Thiosemicarbazide led to the formation of (3a- d). Compound (3a - d) have been identified by IR spectrum which it shows the appearance of the new two bands (asymmetric & symmetric at (3466-3336 Cm^{-1}) and (3412-3317 Cm^{-1}) and band at (1693-1710 Cm^{-1}) for stretching vibration of (C=O lactam). The λ_{max} (MeOH) at (315-389 nm) responsible for ($n \rightarrow \pi^*$) transition of (N and O) atoms and at (272-266 nm) due to ($\pi \rightarrow \pi^*$). Compounds (4a - d) have been obtained by the reaction of hydroxyl amine hydrochloride and sodium acetate anhydrous with compounds (2a - d) in ethanol and glacial acetic acid. The reaction is followed by the appearance of the new band at (3201-3151 Cm^{-1}) due to (N-H) group and disappearance the band of (C=O) for lactone ring. The λ_{max} (MeOH) at (472-387 nm) responsible for ($n \rightarrow \pi^*$) transition of (N and O) atoms and at (281-262 nm) due to ($\pi \rightarrow \pi^*$). ^{1}H-NMR (DMSO) (ppm) for compound (4b) shows appearance asinglet band at (7.02) due to proton of (-CH-) isoxazole ring and many bands at (7.5-8.2) due to aromatic protons (5H s for phenyl ring , 4H dd for aryl ring) and other singlet band at(11.34) due to proton of (NH) group .

The treatment of compounds (2a- d) with urea in a mixture of ethanol and acetone and K_2CO_3 led to the formation of (5a- d). The reaction is followed by show appearance of the new (C=O) band at (1726-1707 Cm^{-1}) due to urea moity in pyrimidine ring , and appearance a new band at (3309-3209 Cm^{-1}) due to (N-H) which near from oxazole ring , and other band at (3273-3155 Cm^{-1}) due to (N-H) which far from oxazole ring .The λ_{max} (MeOH) at (365-289 nm) responsible for ($n \rightarrow \pi^*$)transition of (N and O)atoms and at (292-228 nm) due to ($\pi \rightarrow \pi^*$) . Compounds (10a,b**)** have been synthesized by the reaction of compounds (3a,b) with chloro ethyl acetate in ethanol .The reaction is followed by the appearance of the new (C=O) band at(1720,1714 Cm^{-1}) for the new imidazole ring , and shows the disappearance the bands of (NH_2) group.The λ_{max}(MeOH) for compound(10a) at(354 nm) responsible for ($n \rightarrow \pi^*$)transition of (N and O)atoms and at (269 nm)due to ($\pi \rightarrow \pi^*$). Mass Spectra for compound (10b) shows identical the experimental molecular weight with theoretical molecular weight which equal to (442 g/mole).

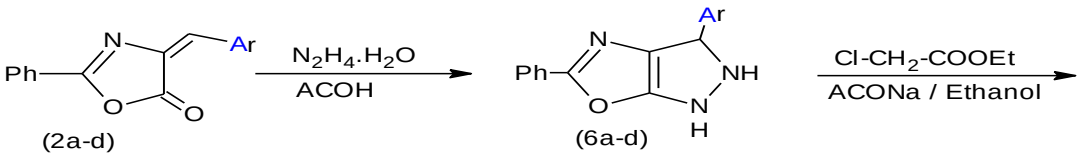
Scheme (II) Compounds (6a-d**)** have been synthesized by the reaction of hydrazine hydrate with compounds (2a-d) in acetic acid. The reaction is followed by the appearance of two new bands at (3311-3200 Cm^{-1}) and (3211-3130 cm^{-1})due to two (N-H)group pyrazole ring and disappearance the band of (C=O) for lactone ring . The λ_{max} (MeOH) at (305-258 nm) responsible for ($n \rightarrow \pi^*$) transition of (N and O) atoms and at (259-224 nm) due to ($\pi \rightarrow \pi^*$) . ^{1}H-NMR (DMSO)(ppm) for compound (6d) shows appearance asinglet band at (4.63) due to proton of (NH) group far from oxazole ring which overlapped with proton of (-CH-) pyrazole ring and many bands at(7.40-8.26) due to aromatic protons (5H S , 4H d,d) and asinglet band at (13.59) due to proton of (NH) group which near from oxazole ring . The treatment of compounds (6a- d) with Chloro ethyl acetate led to the formation of (7a- d) . Compounds (7a - d) have been identified by IR spectrum which it show appearance of the new (C=O) band at (1749-1734 Cm^{-1})for ester group . The λ_{max} (MeOH) at (306-229 nm) responsible for ($n \rightarrow \pi^*$) transition of (N and O)atoms and at (260-214 nm) due to ($\pi \rightarrow \pi^*$) . ^{1}H-NMR (DMSO)(ppm) for compound (7d) shows appearance atriplet band at (1.21-1.25) due to protons of (-CH_3) , and aquartate band at (4.17-4.24) due to two protons of (-$\underline{CH_2}$-O) and asinglet band at (4.68) due to two protons of (-$\underline{CH_2}$-C=O) , and other singlet band at (4.98) due to proton of (NH) group which overlapped with proton of (-CH-) pyrazole ring , and many bands at (7.42-8.28) due to aromatic protons (5H s for phenyl ring , 4H dd for aryl ring) . Compounds (8a-d**)** have been synthesized by the reaction of Compounds (7a-d**)** with hydrazine hydrate in ethanol, the reaction proceeds by elimination of (C_2H_5OH) molecule. The reaction is followed by appearance of the new two bands (asymmetric & symmetric) at (3319-3252 Cm^{-1}) and (3311-3288 Cm^{-1}) due to (NH_2) group ,and anew (C=O) band at (1683-1629 Cm^{-1}) for amide which shows decrease of frequency of carbonyl .The λ_{max} (MeOH) at (385-228 nm) responsible for ($n \rightarrow \pi^*$)transition of (N and O)atoms and at (244-213 nm) due to ($\pi \rightarrow \pi^*$) . Mass Spectra for compound (8c) shows identical the experimental molecular weight with theoretical molecular weight which equal to (367 g/mole) . Schiff bases (9a-d) have been obtained by reaction of compound (8b) with different aromatic aldehydes in

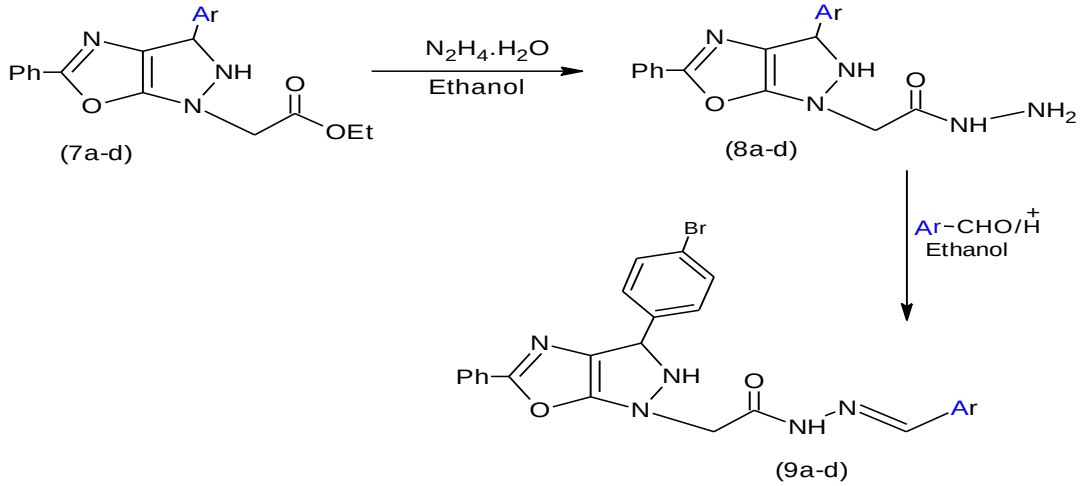
ethanol and glacial acetic acid .The reaction is followed by disappearance the band of (NH_2) group and appearance anew band at (3331-3150 Cm^{-1}) due to (NH amide) . The λ_{max} (MeOH) at (341-260 nm) responsible for ($n \rightarrow \pi^*$) transition of (N and O)atoms and at (229-227 nm) due to ($\pi \rightarrow \pi^*$) .



Ar = 4-$(CH_3)_2$N-C_6H_4 , 4-Br-C_6H_4 , 4-Cl-C_6H_4 , 2-NO_2-C_6H_4

Scheme(l)





Ar = 4-$(CH_3)_2$N-C_6H_4 , 4-Br-C_6H_4 , 4-Cl-C_6H_4 , 2-NO_2-C_6H_4

Scheme(ll)

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