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Reactions of 6,8-dibromo-2-(3,5-dinitrophenyl)-*4H*-Benzo[*d*] [1,3]oxazin-4-one with Nitrogen and Carbon Nucleophiles

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Abstract: The hitherto unknown 6,8-dibromo-2-(3,5-dinitrophenyl)-*4H*-benzo [*d*] [1,3] oxazin-4-one **1** was constructed and its proclivity with some nitrogen and carbon nucleophiles was studied. Compound **1** was utilized as scaffold for novel quinazolinone derivatives **8-10** and **12**. Novel heterocycles **11,13-15** were also constructed from benzoxazinone **1**. All the newly synthesized compounds were characterized by physical and chemical tools.(I.R, ^{1}HNMR and MASS spectra).

Key words: *4H*-benzo[d][1,3]oxazin-4-one · Quinazoline-4(*3H*)-one · Benzo [d] imidazol · Quinoline-3-carboxylic acid and quinoline-3-carbonitrile

INTRODUCTION

Benzoxazines and their derivatives have been received great attention, some of them proved to be of special importance in medicine as antifungai, anticoagulant, antispasmodic and antiallergic agents [1]. 2-(4-Toluenesulphonyloxy phenyl 3,1-benzoxazine-4-one was prepared and reacted with some nitrogen nucleophiles, the antimicrobial antifungal activity of all the products were evaluated [2]. A series of 2,8-disubstituted benzoxazinones were synthesized and subjected to anti-platelet aggregation, inhibition of superoxide anion generation and inhibition of neutrophil elastase release assays [3].

One-pot montmorillonite K-10 clay-supported three-component reactions of substituted salicylaldehydes, ribosyl/deoxyribosylureas and ammonium acetate expeditiously yield the novel *N*-nucleosides, 4-amino-3,4-dihydro-3-(b-D-ribo- or b-D-20-deoxyribofuranosyl)- *2H*-benz [*e*]-1,3-oxazin-2-ones; via cycloisomerisation of an aldimine intermediate under solvent-free microwave irradiation conditions [4]. A series of 2-substituted benzoxazinones were synthesized and subjected to anti-human coronavirus and ICAM-1 expression inhibition assays [5].

A new method has been designed to prepare the known benzoxazinone derivative 2-(*N*-phthaloylmethyl)-*4H*-3,1-benzoxazin-4-one. The acyl chloride derivative N-phthaloylglycine reacts with anthranilic acid in chloroform; in the presence of triethylamine, to give an intermediate that is then reacted with cyanuric chloride, used as a cyclization agent; to produce the benzoxazinone derivative [6]. A new series of 6-iodo-2-undecylquinazolin-4(3H)-ones were prepared via reaction of 6-iodo-2-undecyl-4H-benzoxazin-4-one with nitrogen nucleophiles, namely, primary amines, 4-amino antipyrine, hydrazine hydrate, diamines, ethanol amine and/or hydrazide derivatives and screened for their antitumor activity in vitro against a panel of three human tumor cell lines namely; hepatocellular carcinoma (liver) HepG2; colon cancer HCT-116; and mammary gland breast MCF-7 [7].

6,8-Dibromo-(*4H)*-3,1-benzoxazinone was synthesized and allowed to react with some nitrogen nucleophiles [8]. A series of benzoxazinones were synthesized *via* reaction of anthranilic acid with various substituted benzoyl chlorides in the presence of triethylamine in chloroform, showed a good inhibition of α-chymotrypsin with IC50 ± SEM values between 6.5 and 341.1 µM [9].

In continuation of our efforts towards construct heterocyclic compounds and evaluate their pharmaceutical importance [10-28], the present work deals with synthesis of new benzoxazinone derivative bearing a bulky moiety at position 2, in order to study the stability and reactivity of benzoxazinone nucleus toward some different nucleophilic reagents.

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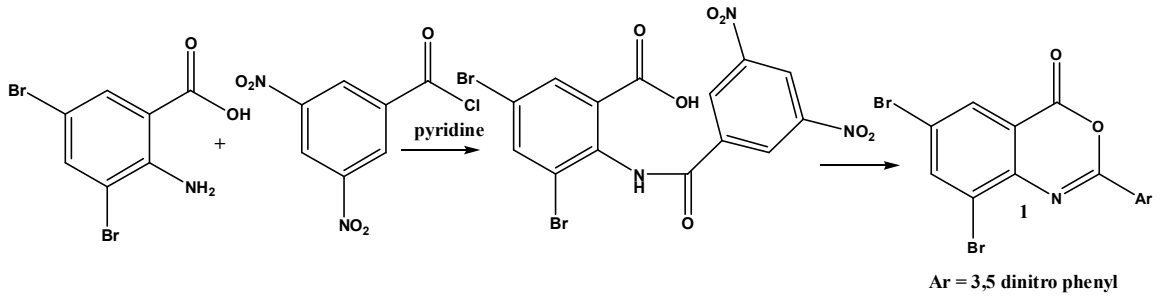


Scheme 1: Formation of 6,8-dibromo-2-(3,5-dinitrophenyl)-*4H*-benzo[*d*] [1,3] oxazin-4-one

RESULTS AND DISCUSSION

The hitherto unknown 6;8-dibromo-2-(3,5-dinitrophenyl)-4H-benzo [d] [1,3] oxazin-4-one **1** was constructed in situ from the reaction of 3,5 dibromoanthranilic acid and 3,5 dinitrobenzoyl chloride in the presence of dry pyridine as a solvent. (Scheme 1).

The structure assignment of compound **1** was substantiated from its correct elemental analysis (c.f. experimental section). I.R of compound **1** showed absorption bands at ύ 1766cm^{-1} (lactonic C=O), ύ 1621cm^{-1} (C=N), The EI-MS of **1** showed the correct molecular ion peak at m/z= 469 (28.6%) together with [M+2] and [M+4] peaks at m/z= 471 (54.6%), 473 (30%) respectively and the base peak at m/z= 75 (100%). ^{1}H-NMR spectrum (DMSO-d_6) of **1** revealed a signals at δ ppm. 9.10-9.05 (m, 2H$_{arom}$), 8.55-8.29 (m, 3H$_{arom}$).

In this work the proclivity of benzoxazinones with some nitrogen and carbon nucleophiles was studied, Indeed compound **1** was allowed to react with primary and secondary amines under different conditions, (in ethanol and in n-butanol as a solvent) in mild conditions, ethanol as low B.P solvent the amides **2-7** were produced, where as in n-butanol as high B.P solvent the quinazolinones **8-10** were performed. The structures of compound **2-7** were confirmed from their I.R. spectra exhibited a strong absorption band at ύ 3424-3181cm^{-1} corresponding to the amide NH functions and ύ 1680-1656cm^{-1} for the carbonyl groups and the ^{1}H-NMR spectrum (DMSO-d_6) of **2** revealed a signals at δ ppm. 12.3-10.78 (br.s, 1H, NH, exchangeable with D_2O), (c.f. the experimental section).

Reaction of compound **1** with ammonia derivatives such as benzyl amine, hydrazine hydrate, benenzoyl hydrazine and guanidine in boiling ethanol afforded 2-(3,5-dinitrobenzoylamino)-3,5 dibromo-*N*-substituted benzamides **2-5**, their structures were confirmed from correct elemental and spectral analysis. However, reaction of compound **1** with secondary amines for instance, morpholine and pipridine afforded the benzamides **6** and **7**.

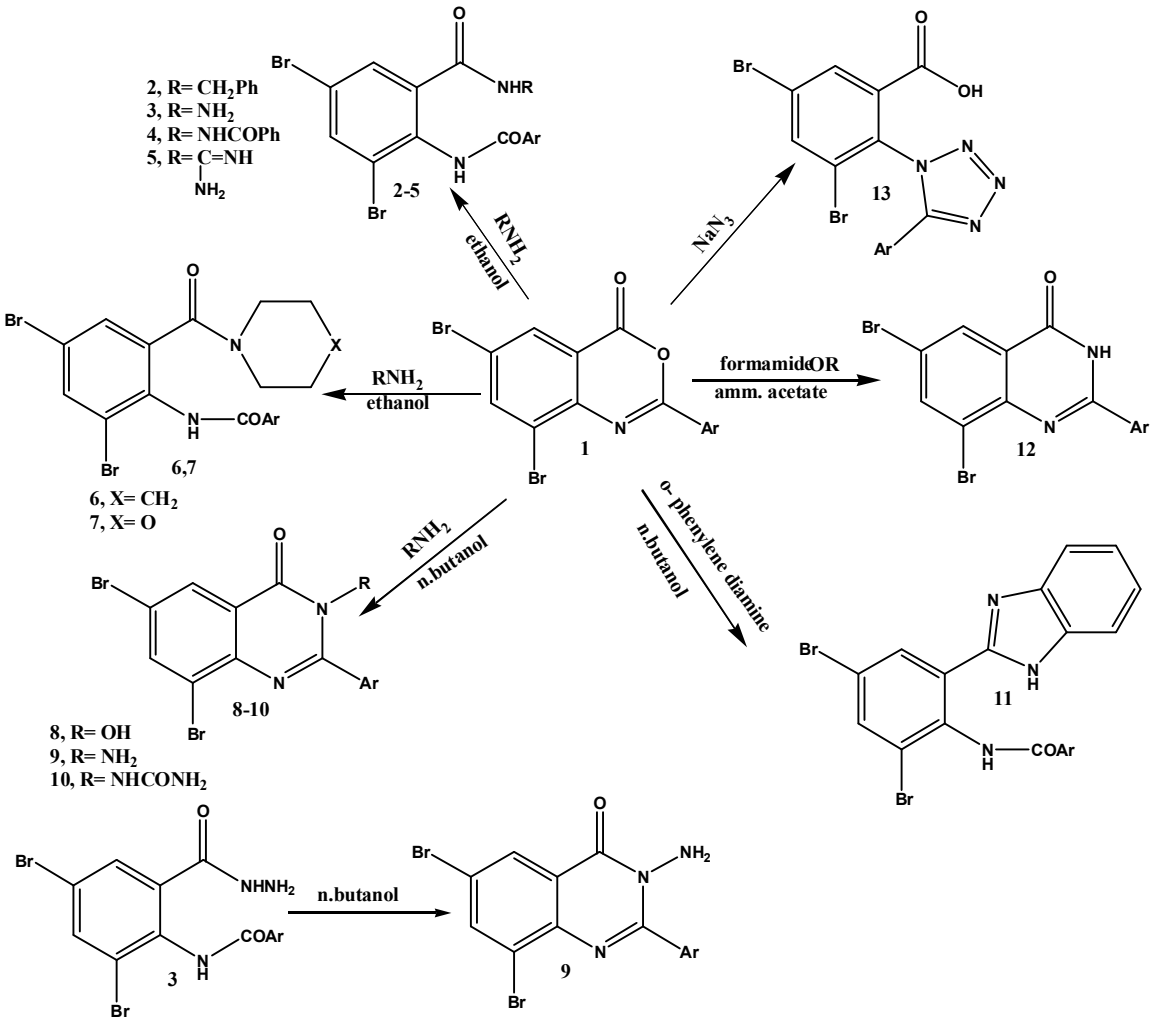
6,8 dibromo- 2-(3,5-dinitrophenyl)-*N*- substituted quinazoline-4-ones **8-10** were constructed from the reaction of compound **1** with hydroxylamine hydrochloride, hydrazine hydrate and semicarbazide hydrochloride in n-butanol as a solvent. The structure assignment of compounds **8-10** was substantiated from their I.R spectra which exhibited no signal corresponding the lactonic carbonyl at ύ 1766 cm^{-1} and showed a signal at ύ 1691-1660 cm^{-1} for the lactam carbonyl of quinazolines.

As a chemical evidence of the structures of compound **2-10**, Compound **3** was underwent ring closure on boiling in n-butanol to compound **9** (Scheme 2).

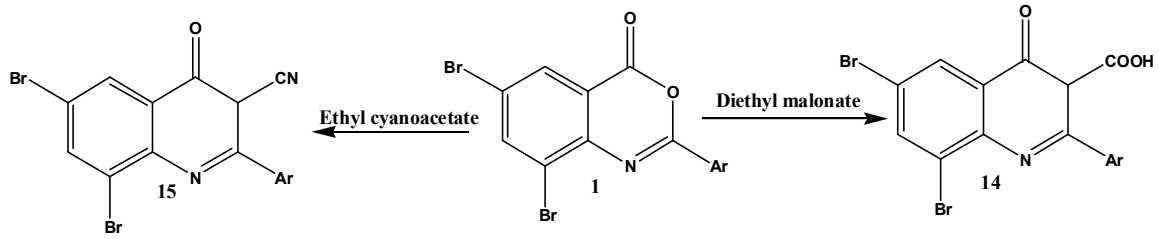
On the other hand *o*-phenylene diamine reacted with benzoxazinone **1** in boiling n-butanol afforded the *N*-(2-(1*H*-benzo[d]imidazol-2-yl)-4,6-dibromophenyl)-3,5-dinitrobenzamide **11** which structure was proved from the I.R spectrum which displayed a strong absorption band at ύ 1662 cm^{-1} (C=O), 1625 cm^{-1} (C=N) and 3230 cm^{-1} (NH), the mass spectrum confirms the structure of compound **11**, showed the correct molecular ion peak at m/z= 559 (14.6%) together with [M+2] and [M+4] peaks at m/z= 561 (27.6%), 563 (15%) respectively and the base peak at m/z= 75 (100%).

Fusion of benzoxazinone **1** with foramide and/or ammonium acetate yielded 6,8-dibromo-2-(3,5-dinitrophenyl)quinazolin-4(3H)-one **12**. The structure of quinazolin-4-on derivative **12** was elucidated from the following data, IR (ύ cm^{-1}): 3174, (NH/OH),1671 cm^{-1} (C=O), 1608 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.01 (s,1H, NH), disappeared by D_2O 9.02-8.81 (m, 2H$_{arom}$), 8.75-8.69 (m, 3H$_{arom}$).

Ring opening of compound **1** with hydrazoic acid gave 3,5-dibromo-2-(5-(3,5-dinitrophenyl)-1H-tetrazol-1-yl)benzoic acid **13**.

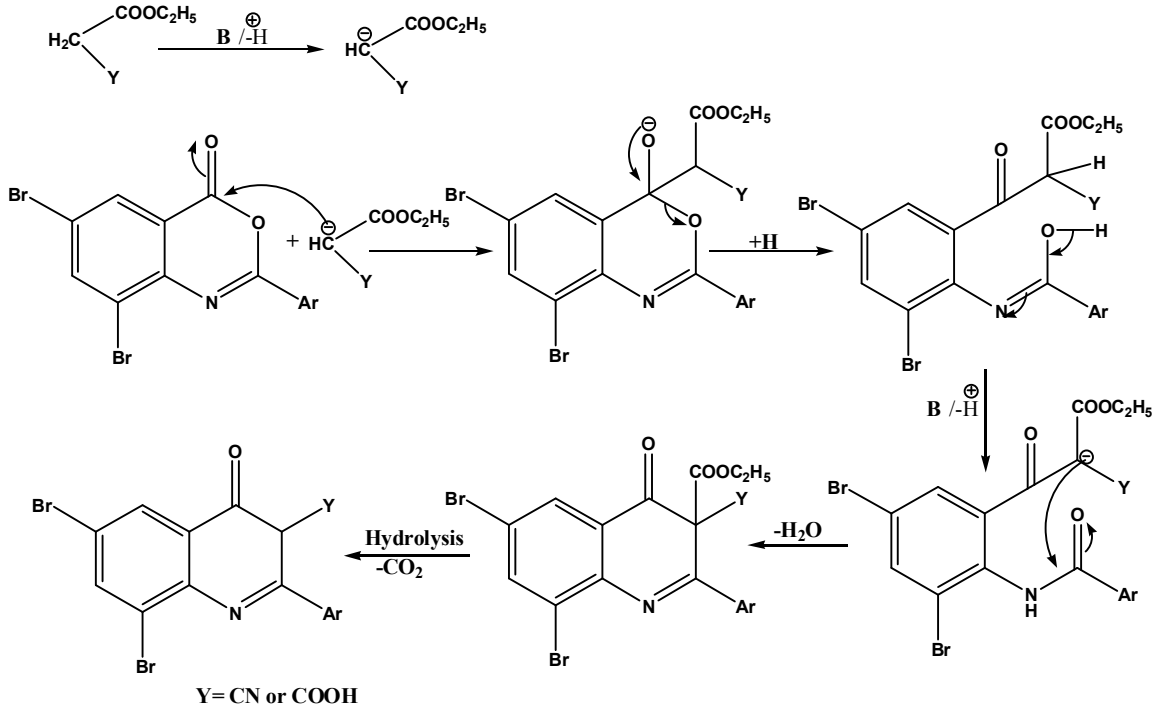


Scheme 2: Reaction of benzoxazinone **1** with some nitrogen nucleophiles.



Scheme 3: Reaction of benzoxazinone **1** with carbon nucleophiles.

By studying the reaction of benzoxazinone **1** with active methylene compounds as carbon nucleophiles, compound **1** was allowed to react with diethyl malonate and /or ethyl cyanoacetate in the presence of dry pyridine as a catalyst base the reaction occurred via heterocyclic ring opening at position -4- by carbanion of active methyleneto form firstly an open adduct as an intermediate which cyclized to form afforded 6,8-dibromo-2-(3,5-dinitrophenyl)-4-oxo-3,4-dihydroquinoline-3-carboxylic acid, **14** and 6,8-dibromo-2-(3,5-dinitrophenyl)-4-oxo-3,4-dihydroquinoline-3-carbonitrile **15** (Scheme 3). The structure assignment of compounds **14** and **15** were substantiated from its correct elemental and spectral data (I.R,^{1}HNMR and MASS).



Scheme 4: The mechanism of the reaction on benzoxazinone with active methylene compounds

The mechanism of formation of 14 and 15 was discussed in the following scheme (scheme 4).

Experimental: Melting points are uncorrected and were measured by an electric melting point apparatus (G-K). The IR spectra were recorded on a Pye-Unicam SP1200 spectrophotometer using KBr Wafer technique. The ^{1}H-NMR spectra were determined on a Varian GEMINI 200 MHz NMR spectrophotometer using $CDCl_3$ or DMSO-d_6 as solvent and TMS as an internal standard. All chemical shifts are in ppm downfield from TMS. The elemental analysis were carried out in faculty of Science, Ain Shams University. MS were recorded on Shimadzu GC-MS QP1000EX instrument in micro analytical lab, Cairo University. The monitoring of the progress of all reactions and homogeneity of the synthesized compound was carried out by TLC.

6,8-dibromo-2-(3,5-dinitrophenyl)-4H-benzo[d][1,3]oxazin-4-one (1): To a solution of 3,5 dibromoanthranilic acid (0.01mol) in dry pyridine (50ml), 3,5 dinitrobenzoyl chloride (0.01mol) in dry diethyl ether (30ml) was added dropwise with stirring. The reaction mixture was heated on water bath for 2 hours, poured on ice cold water and HCl. The solid separated was filtered off dried and recrysallized from benzene/ethano mixture to give **1** as pale yellow crystals, m.p: 238-240°C.Yield (80%). Anal. Calcd.: for $C_{14}H_5Br_2N_3O_6$ (471): C, 35.66; H, 1.06; N, 8.91 Found: C, 35.26; H, 1.02; N, 8.73; IR (ύ cm^{-1}): 1766cm^{-1} (lactonic C=O), ύ 1621cm^{-1} (C=N). MS m/z (%) m/z= 469 (28.6%) together with [M+2] and [M+4] peaks at m/z= 471 (54.6%), 473 (30%) respectively and the base peak at m/z= 75 (100%). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 9.10-9.05 (m, $2H_{arom}$), 8.55-8.29 (m, $3H_{arom}$).

General Procedure For The Synthesis of Compounds 2-7: A mixture of benzoxazinone **1** (0.01mol) and primary amines and/or secondary amines namely benzyl amine, hydrazine, benzoyl hydrazine, guanidine hydrochloride, pipridine and morpholine (0.01mol) in ethanol (50ml) was refluxed for four hours. The solid obtained was filtered off dried and recrystallized from proper solvent.

N-benzyl-3,5-dibromo-2-(3,5-dinitrobenzamido) benzamid (2): Recrystallized from dioxane. m.p: 260-262°C.Yield (68%). Anal. Calcd.: for $C_{21}H_{14}Br_2N_4O_6$ (578): C, 43.60; H, 2.42; N, 9.68. Found: C, 43.35; H, 2.22; N, 9.56; IR (ύ cm^{-1}): 3426 and 3419 (NH/OH),1656cm^{-1} (C=O), 1630cm^{-1} (C=N). MS m/z (%) m/z= 578 (18.6%) together with [M+2] and [M+4] peaks at m/z= 581 (34.6%), 583 (30%) respectively and the base peak at m/z= 75 (100%). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 11.02 (s,1H, NH), 10.76 (S,1H, NH), 9.10-9.05

(m, $2H_{arom}$), 8.55-8.29 (m, $3H_{arom}$), 8.05(m,$5H_{arom}$) and 1.98 (s, 2H, CH_2).

3,5-dibromo-2-(3,5-dinitrobenzamido)benzohydrazide (3) Recrystallized from dimethylformamide. m.p: 272-274°C.Yield (61%). Anal. Calcd.: for $C_{14}H_9Br_2N_5O_6$ (503): C, 33.40; H, 1.78; N, 13.91. Found: C, 33.23; H, 1.69; N, 13.72; IR (ύ cm^{-1}): 3232, 3380-3454 (NH/OH),1654 cm^{-1} (C=O), 1620 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.02 (s,1H, NH), 9.76 (s,1H, NH),disappeared by D_2O 9.09-9.01 (m, $2H_{arom}$), 8.65-8.39 (m, $3H_{arom}$) and 6.98 (s, 2H, NH_2). disappeared by D_2O.

N-benzoylamino-3,5-dibromo-2-(3,5-dinitrobenzamido) Benzamid (4): Recrystallized from dioxane. m.p: 255-257.Yield (58%). Anal. Calcd.: for $C_{21}H_{13}Br_2N_5O_7$ (607): C, 41.50; H, 2.14; N, 11.50. Found: C, 41.23; H, 2.01; N, 11.32; IR (ύ cm^{-1}): 3235 (NH/OH),1656 cm^{-1} (C=O), 1610 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.02 (s,1H, NH), 9.76 (s,1H, NH), 9.52 (s,1H, NH) disappeared by D_2O 9.02-8.91 (m, $2H_{arom}$), 8.85-8.39 (m, $3H_{arom}$) and 7.98 (s, $5H_{arom}$).

N-(2,4-dibromo-6-(guanidinocarbonyl)phenyl)-3,5-dinitrobenzamide (5): Recrystallized from dioxane. m.p: 240-242°C.Yield (72%). Anal. Calcd.: for $C_{15}H_{10}Br_2N_6O_6$ (530): C, 33.96; H, 1.88; N, 15.84. Found: C, 33.89; H, 1.59; N, 15.78; IR (ύ cm^{-1}): 3262,3424 (NH/OH),1680 cm^{-1} (C=O), 1620 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 9.92 (s,1H, NH), 9.16 (s,1H, NH), disappeared by D_2O 8.92-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$) and 6.92 (s,2H, NH_2), 3.16 (s,1H, NH), disappeared by D_2O.

N-(2,4-dibromo-6-(piperidine-1-carbonyl)phenyl)-3,5-dinitrobenzamide(6): Recrystallized from dimethlyformamide. m.p: 230-232°C.Yield (48%). Anal. Calcd.: for $C_{19}H_{16}Br_2N_4O_7$ (556): C, 41.00; H, 2.87; N, 10.07. Found: C, 39.68; H, 2.67; N, 9.92; IR (ύ cm^{-1}): 3181, 3442 (NH/OH),1677 cm^{-1} (C=O), 1608 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.22 (s,1H, NH), disappeared by D_2O 8.92-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$) and 4.92 (m,10H, CH_2). MS m/z (%) m/z= 556 (30.6%) together with [M+2] and [M+4] peaks at m/z= 558 (60.6%), 562 (30%) respectively, m/z=232 (4.8%), m/z=234 (12.8%), m/z=236 (7.8%), m/z=193 (13.8%) and the base peak at m/z= 74 (100%).

N-(2,4-dibromo-6-(morpholine-4-carbonyl)phenyl)-3,5-dinitrobenzamide(7): Recrystallized from dimethlyformamide. m.p: 240-242°C.Yield (45%). Anal. Calcd.: for $C_{18}H_{14}Br_2N_4O_7$ (558): C, 38.71; H, 2.51; N, 10.03. Found: C, 38.68; H, 2.34; N, 9.98; IR (ύ cm^{-1}): 3212, 3448 (NH/OH),1679 cm^{-1} (C=O), 1614 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 9.92 (s,1H, NH), disappeared by D_2O 8.82-8.78 (m, $2H_{arom}$), 8.71-8.62 (m, $3H_{arom}$) and 4.62 (m,8H, CH_2).

General Procedure For The Synthesis of Compounds 8-10: A mixture of primary amines namly hydroxyl amine hydrochloride, hydrazine hydrate and semicarbazide hydrochloride (0.01mol) in n-butanol (50ml) was refluxed for four hours the solid obtained after evaporating the solvent was filtered off, dried and recrystallized from suitable solvent.

6,8-dibromo-2-(3,5-dinitrophenyl)-3-hydroxyquinazolin-4(3H)-one (8): Recrystallized from dimethylformamide. m.p: 250-252°C.Yield (68%). Anal. Calcd.: for $C_{14}H_6Br_2N_4O_6$ (486): C, 34.60; H, 1.24; N, 11.53. Found: C, 34.35; H, 1.12; N, 11.35; IR (ύ cm^{-1}): 3442, (NH/OH),1691 cm^{-1} (C=O), 1602 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 9.82 (s,1H, OH), disappeared by D_2O 8.92-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$).

3-amino-6,8-dibromo-2-(3,5-dinitrophenyl)quinazolin-4(3H)-one (9): Recrystallized from dioxane. m.p: 245-247°C.Yield (58%). Anal. Calcd.: for $C_{14}H_7Br_2N_5O_5$ (486): C, 34.63; H, 1.44; N, 11.53. Found: C, 34.35; H, 1.32; N, 11.35; IR (ύ cm^{-1}): 3180-3291, (NH_2),1696 cm^{-1} (C=O), 1610 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 8.72-8.51 (m, $2H_{arom}$), 8.45-8.29 (m, $3H_{arom}$) and 6.32 (s,2H, NH_2), disappeared by D_2O.

1-(6,8-dibromo-2-(3,5-dinitrophenyl)-4-oxoquinazolin-3(4H)-yl)urea (10): Recrystallized from ethano/dioxane. m.p: 222-224°C.Yield (84). Anal. Calcd.: for $C_{15}H_8Br_2N_6O_6$ (528): C, 34.10; H, 1.51; N, 15.90. Found: C, 33.95; H, 1.42; N, 15.35; IR (ύ cm^{-1}): 3100, (NH),3291-3320 (NH_2), 1680,1660, cm^{-1} (C=O), 1604 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.92 (s,1H, NH), disappeared by D_2O 8.92-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$) and 6.92 (s,2H, NH_2), disappeared by D_2O.

N-(2-(1H-benzo[d]imidazol-2-yl)-4,6-dibromophenyl)-3,5-dinitrobenzamide (11): A mixture of benzoxazinone **1** (0.01mol) and *0* phenylene diamine (0.01mol) in ethano was refluxed for four hours. The solid obtained after evaporating the solvent was filtered off, dried and recrystallized from dioxane to give **11** as ehite crystals.

m.p: 280-282°C. Yield (78%). Anal. Calcd.: for $C_{20}H_{11}Br_2N_5O_5$ (561): C, 42.78; H, 1.96; N, 12.47. Found: C, 42.63; H, 1.88; N, 12.32; IR (ύ cm^{-1}): 3477, (OH), 3477, 3230, (NH),1662 cm^{-1} (C=O), 1625 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.02 (s,1H, NH), disappeared by D_2O 8.92-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$) and 7.92 (m, $4H_{arom}$), 3.16 (s,1H, NH), disappeared by D_2O.

6,8-dibromo-2-(3,5-dinitrophenyl)quinazolin-4(3H)-one (12): A mixture of benzoxazinone **1** (0.01mol) and 20 ml formamide and/or (0.01) mol amm. Acetate was refluxed on oil bath at 220°C for three hours.the reaction mixture was poured onto cold water and the solid separated was filtered off, dried and recrystallized from dimethylformamide, to give **12** as pale yellow crystals. m.p: over 300°C.Yield (78%). Anal. Calcd.: for $C_{14}H_6Br_2N_4O_5$ (470): C, 35.74; H, 1.27; N, 11.91. Found: C, 34.23; H, 1.19; N, 11.78; IR (ύ cm^{-1}): 3174, (NH/OH), 1671 cm^{-1} (C=O), 1608 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.01 (s,1H, NH), disappeared by D_2O 9.02-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$). MS m/z (%) m/z= 468 (28.6%) together with [M+2] and [M+4] peaks at m/z= 471 (54.6%), 472 (30%) respectively, m/z=388 (4.8%), m/z=275 (30.8%), m/z=377 (52.8%), m/z=379 (29.8%) and the base peak at m/z= 167 (100%).

3,5-dibromo-2-(5-(3,5-dinitrophenyl)-1H-tetrazol-1-yl)benzoic acid (13): A mixture of benzoxazinone **1** (0.01mol) and sod. azide (0.20) molin acetic acid was refluxed on oil bath at 220°C for six hours. the reaction mixture was cooled. The solid separated was filtered off, washed with water, dried and recrystallized from benzene, to give **13** as pale yellow crystals. m.p: 202-204°C. Yield (87%). Anal. Calcd.: for $C_{14}H_6Br_2N_6O_6$ (514): C, 32.68; H, 1.16; N, 16.34. Found: C, 32.59; H, 1.09; N, 16.24; IR (ύ cm^{-1}): 3445, (OH),1690 cm^{-1} (C=O). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 12.01 (s,1H, COOH), disappeared by D_2O 9.02-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$).

General Procedure For The Reaction of Benzoxazinone With Active Methylene Compounds: A mixture of benzoxazinone **1** (0.01mol) and active methylene compounds namly diethyl malonate and/or ethyl cyanoacatate (0.01mol) in dry pyridine (30ml) was refluxed for ten hours. The reaction mixture was poured onto crushed ice and acidified with 10% cold Hcl (20ml). The formed precipitate was filtered off, washed with water, dried and recrystallized from benzene/ethanol mixture to give **14** and **15** as yellow crystals.

6,8-dibromo-2-(3,5-dinitrophenyl)-4-oxo-3,4-dihydroquinoline-3-carboxylic acid (14): m.p: 210-212°C.Yield (40%). Anal. Calcd.: for $C_{16}H_7Br_2N_3O_7$ (513): C, 37.42; H, 1.36; N, 8.18. Found: C, 37.23 H, 1.29; N, 8.02; IR (ύ cm^{-1}): 3452, (OH),1690 cm^{-1} (C=O), 1604 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 10.92 (s,1H, COOH), 8.92-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$) and 5.16 (s,1H, CH).

6,8-dibromo-2-(3,5-dinitrophenyl)-4-oxo-3,4-dihydroquinoline-3-carbonitrile (15): m.p: 220-222°C.Yield (38%). Anal. Calcd.: for $C_{16}H_6Br_2N_4O_5$ (494): C, 38.86; H, 1.21; N, 11.33. Found: C, 38.76; H, 1.12; N, 11.20; IR (ύ cm^{-1}): 2212, (CN),1680 cm^{-1} (C=O), 1604 cm^{-1} (C=N). ^{1}H-NMR (DMSO-d_6) of t δ ppm. 8.92-8.81 (m, $2H_{arom}$), 8.75-8.69 (m, $3H_{arom}$). 4.96 (s,1H, CH).

CONCLUSION

During the current investigation, we synthesized a new building block; namely 6,8-dibromo-2-(3;5-dinitrophenyl)-4H-benzo[d][1;3]oxazin-4-one and its proclivity with nitrogen and carbon nucleophiles was studied.From that compound, a series of different quinazoline and quinoline derivatives were synthesized and their structural and spectral data were elucidated.

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REFERENCES

1. Dash, B., E.K. Dora, and C.S. Panda, 1982. Heterocycles, 19: 2093.
2. Osman M.O. Habib, Hussein, M. Hassan and Ahmed, El-Mekabaty. 2012. American Journal of Organic Chemistry; 2(3): 45.
3. Pei-Wen, H., H. Tsong-Long, W. Chin-Chung, C. Fang-Rong, W. Tsai-Wei and W. Yang-Chang, 2005. Bioorganic & Medicinal Chemistry Letters, 15: 2786.
4. Lal Dhar, S. Yadav and Vijai, K. Rai, 2006. Tetrahedron Letters, 47: 395.

5. Pei-Wen, H., H. Tsong-Long, W. Chin-Chung, C. Fang-Rong, W. Tsai-Wei and W. Yang-Chang, 2004. Bioorganic & Medicinal Chemistry Letters, 14: 4751.
6. Mehdi, S. and A. Sohrab, 2004. Molecules, 9(8): 705.
7. Mohamed, H. Hekal and S.M. Fatma, 2018. Anu AlAzm. Synthetic Communications, 48(18) 2391.
8. Madkour, H.M.F. 2004. ARKIVOC (i) 36-54.
9. Bishnu P. Marasini, R. Fazal, P. Shahnaz, A. Karim Khalid and K. Mohamed, 2017. Autta-ur Rahman and M. Iqbal Choudhary. Bioorganic chemistry, 70: 210.
10. Shaban, M.E., A.M. Youssef, N.K. Elaasar, A.K. El-Ziaty, 2008. Pak. J. Sci. Ind. Res., 51(3): 119-123.
11. Shiba, S.A., A.K. El-Ziaty, N.K. El-Aasar and H.A. Al-Saman, 2008. J. Chem. Res., 500.
12. Shiba, S.A., A.K. El-Ziaty, N.K. El-Aasar and H.A. Al-Saman, 2012. Org. Chem. Indian J., 8(4): 135.
13. El-Ziaty, A.K., A. Abdalh, A.A. Hamed, S.A. Shiba and A. Abdullha, 2012. Eur. J. Chem., 3(1): 65.
14. Mahmoud, M.R., A.K. El-Ziaty and A.M. Hussein, 2013. Synthetic Communications, 43(7): 961.
15. Elshahawi, M.M., A.K. EL-Ziaty, J.M. Morsy and A.F. Aly, 2016. Journal of Heterocyclic Chemistry, 53(5): 1443.
16. El-Sayed, N.S., M. Sharma, H.M. Aliabadi, M.G. El-Meligy, A.K. El-Zaity, Z.A. Nageib and R.K. Tiwari, 2018. International Journal of Biological Macromolecules, 112: 694.
17. El-Sayed, N.S.; A.N. Shirazi, M.G. El-Meligy, A.K. El-Ziaty, Z.A. Nagieb, R.K. Tiwai and K. Parang, 2016. International Journal Of Biological Macromolecules, 87: 611.
18. Mahmoud, M.R., A.K. El-Ziaty and A.M. Hussein, 2012. World Applied Sciences Journal, 17(1): 101.
19. Shaban, M.E., A.M. Youssef, N.K. Elaasar and A.K. El-Ziaty, 2019. World Journal of Chemistry, 14(1): 07.
20. Shahawi, M.M. and A.K. El-Ziaty, 2017. J. Chemistry, 5610707.
21. El-Sayed, A.A., A.E.G.E. Amr, A.K. EL-Ziaty and E.A. Elsayed, 2019. Molecules, 24(10): 1965.
22. Shiba, S.A., A.K. El-Ziaty, N.K. El-Aasar and H.A. Al-Saman, 2010. Phosphorus, Sulfur and Silicon and the Related Elements, 185(8): 1645.
23. Mahmoud, M.R. El-Ziaty, A.K Abu F.S.M. El-Azm M.F. Ismail and S.A. Shibab, 2013. Journal of Chemical Research, 37(2): 80.
24. El-ziaty, A.K., S.A. Mohamed, M. El-Sakhawy, M.A. Nassar and H.M.F. Madkour, 2014. Nordic Pulp & Paper Research Journal, 29(4): 741.
25. Mahmoud, M.R., A.K. El-Ziaty, F.S.M. Abu El- Azm, M.F. Ismail and S.A. Shibab, 2014. Synthetic Communications, 44(8): 1094.
26. El-Ziaty, A.K. and S.A. Shiba, 2007. Synthetic Communications, 37(22): 4043.
27. Shiba, S.A. and M.F. Ismail, 2011. Mahmoud, M.R. and El-ziaty, A. K. European Journal of Chemistry 2(3): 347.
28. Nabil, M., H.M.F. Madkour, A.K. El-ziaty, O.E.A. Mostafa and E.A. El-Bordany, 2014. International Journal of Scientific & Engineering Research, 5(1): 727.