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Studies on 2-Substituted-6,8-dibromo-4(*H*)-3,1-benzoxazin-4-one

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The behaviour of substituted 6,8-dibromo-4(*H*)-3,1-benzoxazin-4-one (**II**) towards nitrogen nucleophile (formamide, hydrazine hydrate, hydroxylamine, amines, *o*-phenylene diamine) to yield quinoazolinone (**III-VII**), respectively. When **IV** react with anhydrides, carbon electrophiles, aromatic ketone, benzylidine malononitrile, carbon disulphide, chloroacetyl chloride and ethylbromo acetate, benzoxazinone (**II**) to give quinazolinone (**IX-XVIII**). The reaction of **III** with ethylbromo acetate, methyl iodide and aromatic aldehyde were carried out to obtaine the quinazolinone derivatives (**XIX**, **XXII**, **XXIII**), respectively. The reaction of hydrazine hydrate on quinazolin-4-one (**XIX**) to form corresponding hydrazide **XX** which is converted to hydrazone **XXI** when reacted with aromatic aldehydes.

Key Words: 2-Substituted 6,8-dibromo-4[*H*]-3,1-benzoxazine-4-one, 2-Substituted quinazoline and pyridizino quinaziline derivative.

INTRODUCTION

In the present work, the synthesis and behaviour of 2-methyl-6,8-dibromo-4(*H*)-3,1-benzoxazinone towards some nitrogen nucleophile and some studies with the products. In continuation of our studies[1-8] the behaviour of 6,8-dibromo-2-methyl-4(*H*)-3,1-benzoxazinone (**II**) towards nitrogen nucleophilies are reported.

EXPERIMENTAL

Melting points reported are uncorrected and determined on electric melting apparatus. Elemental analysis were performed by the micro analytical center, Faculty of Science, Cairo University. IR spectra were recorded on spectrometer using KBr waver technique on satellite 1000, Faculty of Science, Fayoum University. ^{1}H NMR were determined on avarian 300 MHz Brucher AC 300-MHz using TMS as internal standard (chemical shifts in δ scale). The mass spectra were determined using HP model MS-5988 spectrometer at electron ionizing energy 70 ev.

Synthesis of 2-methyl-6,8-dibromo benzoxazin-4-one (II): A mixture of 2,4-dibromo anthranilic acid (0.02 mol) and acetic anhydride (2 mL) was heated for (1 h), the reaction mixture was left to cool, then filtered of and washed with

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petroleum ether several times, dried and purified by crystallization to give 2-methyl-6,8-dibromobenzoxazine-4-one (**II**).

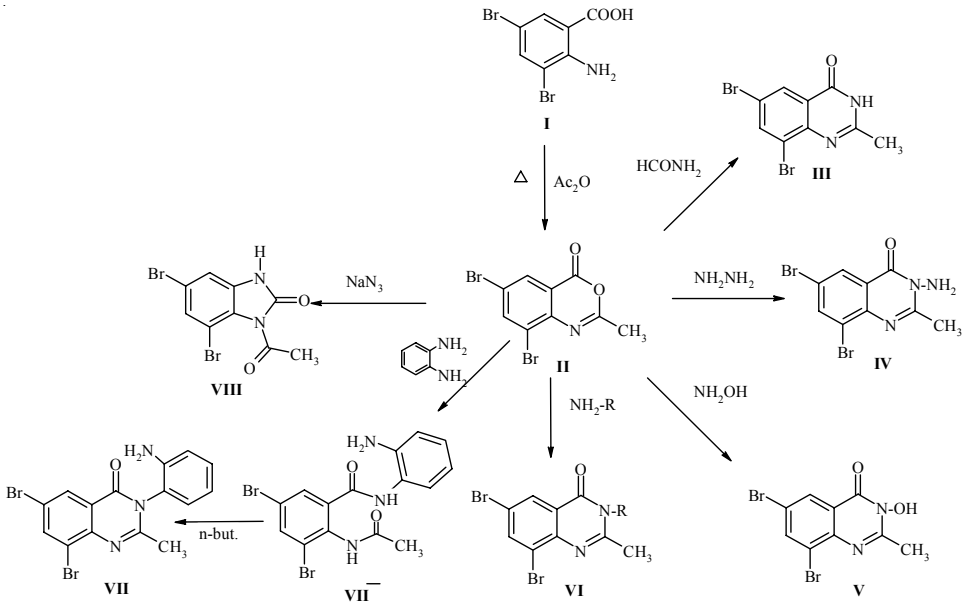
Synthesis of 2-methyl-6,8-dibromo-4-(3*H*)-quinazolinone (III): A solution of benzoxazine **II** (3.19 g, 0.01 mol) in formamide (15 mL) was heated under reflux for 3 h. The reaction mixture was diluted with cold water and the solid was separated out, dried and crystallized from the proper solvent to give the quinazolinone **III**.

Synthesis of 3-amino-2-methyl-6,8-dibromoquinazolinone (IV): A mixture of benzoxazine **II** (3.19 g, 0.01 mol) and hydrazine hydrate (1 g, 0.02 mol) in ethanol (30 mL) was heated under reflux for 3 h. The reaction mixture was concentrated and the solid was separated out was dried and crystallized from the proper solvent to give quinazolinone **IV**.

Synthesis of 2-methyl-3-(hydroxyl)-6,8-dibromoquinazolinone (V): A mixture of benzoxazine **II** (3.19 g, 0.01 mol) and hydroxylamine hydrochloride (0.69 g, 0.01 mol) in pyridine (15 mL) was heated under reflux for 3 h. The reaction leave to cool and poured on ice/HCl to give the quinazolinone **V**.

Synthesis of 3-(Aryl)-2-(methyl)-6,8-dibromoquinazolinone (VI): A mixture of benzoxazine **II** (3.19 g, 0.01 mol) and aromatic amines namely, (benzylamine, aniline and/or *p*-toluidene) in ethanol (20 mL) was heated under reflux for 3 h. The solid was separated filtered off and purified by crystallization to give the quinazolinone **VI**.

Synthesis of 3-(2-aminophenyl)-2-methyl-6,8-dibromoquinazolinone: A mixture of benzoxazine **II** (3.19 g, 0.01 mol) and *o*-phenylenediamine (1.08 g, 0.01 mol) was stirred in chloroform (20 mL) for 16 h at room temperautre, over night to give quinazolinone **VII**, which was boiling in butanol to give the quinazolinone **VII** (**Scheme-I**).



Scheme-I

Synthesis of 3-(malimido, succinimido or phthalimido)-6,8-dibromoquinazolinone (IX): A mixture of quinazolinone **IV** (3.33 g, 0.01 mol) and respective acid anhydride (0.01 mol) namely, (maleic, succinic and/or phthalic anhydride) was heated in an oil bath for 1 h. The reaction mixture was diluted with water and filtered off, the solid that obtained was crystallized from the proper solvent to give quinazolinone derivative **IX**.

Synthesis of 3-(N-arylidine derivatives)-2-methyl-6,8-dibromo quinazolinone (X): A mixture of quinazolinone **IV** (3.33 g, 0.01 mol) and respective aromatic aldhydes (0.01 mol) namely, (pipronal and/or *p*-chlorobenzaldhyde), few drops of piperidine was heated in an oil bath for 1 h, the reaction mixture diluted with water, the solid that separated out, dried and crystallized from the proper solvent to give 3-(N-arylidine derivatives)-2-methyl-6,8-dibromo quinazolinone (**X**).

Synthesis of Schiff bases (XI): A mixture of quinazolinone **IV** (3.33 g, 0.01 mol) with different cyclic ketones namely, cyclohexanone or cyclopentanone (0.02 mol) few drops of piperidine was heated in an oil bath for 1 h. The reaction mixture diluted with water, the solid that separated out, dried and crystallized from the proper solvent to give Schiff bases **XI**.

Synthesis of 3-(2-aryl-3-carbonitryl-4-aminoazitin-1-yl)-2-methyl-6,8-dibromoquinazolinone (XII): A mixture of quinazolinone **IV** (3.33 g, 0.01 mol), benzelydine malononitrile (1.54 g, 0.01 mol) and few drops of piperidine was heated in an oil bath for 1 h. The reaction mixture diluted with water, the solid that separated out, dried and crystallized from the proper solvent to give 3-(2-aryl-3-carbonitryl-4-aminoazitin-1-yl)-2-methyl-6,8-dibromoquinazolinone (**XII**).

Synthesis of 2-methyl-3-dithioxymethylmethyleneamino-6,8-dibromo-quinazolinone (XIII): To a vigorously stirred solution of 3-amino-2-methyl-6,8-dibromo-quinazolinone (**IV**) (3.33 g, 0.01 mol) in dimethyl sulphoxide (30 mL) at room temperature, carbon disulphide (0.026 mol) and sodium hydroxide (1.2 mL, 2 mol) were added drop wise with constant stirring for *ca.* 0.5 h, dimethyl sulphate (2.5 g, 0.02 mol) was added at 5-10 ºC, stirring was continued for 3 h. The solid was filtrated and crystallized from ethanol to give quinazolinone 2-methyl-3-dithioxymethylmethyleneamino-6,8-dibromo-quinazolinone (**XIII**).

Synthesis of 3-(4-chloroacetylamino)-2-methyl-6,8-dibromo-quinazolinone (XIV): To a solution of quinazolinone **IV** (3.33 g, 0.01 mol) in dioxane, in an ice bath, chloroacetyl chloride (1.12 g, 0.01 mol) was added drop wise with stirring and the mixture was refluxed for 10 h, poured into ice, filtrated and crystallized from proper solvent to give 3-(4-chloroacetylamino)-2-methyl-6,8-dibromo-quinazolinone (**XIV**).

Synthesis of 3-(acetylamino)-2-methyl-6,8-dibromoquinazolinone (XV): To a solution of quinazolinone **IV** (3.33 g, 0.01 mol) in dioxane, acetyl chloride (0.78 g, 0.01 mol) was added drop wise with stirring in an ice bath, poured into ice, filtrated and crystallized from proper solvent to give 3-(acetylamino)-2-methyl-6,8-dibromoquinazolinone (**XV**).

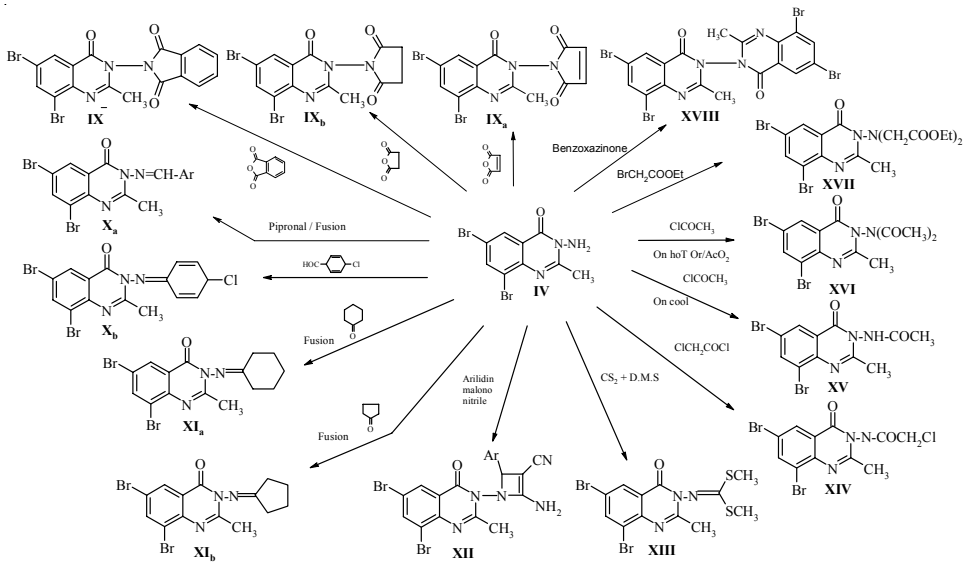
Synthesis of 3-(N-diacetylamino)-2-methyl-6,8-dibromoquinazolinone (XVI):

Method (A): To a solution of quinazolinone **IV** (3.33 g, 0.01 mol) in dioxane, excess acetyl chloride (0.78 g, 0.01 mol) was added drop wise with stirring in an ice bath. The reaction mixture was refluxed for 10 h, then cooled and poured into ice, filtrated and crystallized from proper solvent to give compound **XVI**.

Method (B): A solution of quinazolinone **IV** (3.33 g, 0.01 mol) in (30 mL) acetic acid and (10 mL) acetic anhydride was refluxed for 1 h, then cooled, filtrated and crystallized from proper solvent to give compound **XVI**.

Synthesis of 3-(N,N-diethoxycarbonyl)-2-methyl-6,8-dibromo quinazolinone (XVII): A mixture of quinazolinone **IV** (3.33 g, 0.01 mol) and ethyl bromoacetate (6.68 g, 0.04 mol) and anhydrous potassium carbonate K_2CO_3 (5.0 g, 0.04 mol) in dry acetone (50 mL) was refluxed for 24 h. The excess acetone was evaporated and the reaction mixture was diluted with H_2O, the solid that separated was crystallized from proper solvent to give compound **XVII**.

Synthesis of *bis*(2-methyl-6,8-dibromoquinazolinone (XVIII): A mixture of quinazolinone **IV** (3.33 g, 0.01 mol) and benzoxazinone **II** (3.19 g, 0.01 mol) was fused in an oil bath for 1 h. The solid that separated out, dried and crystallized from the proper solvent to give compound **XVIII** (**Scheme-II**).



Scheme-II

Synthesis of 3-(ethoxycarbonylmethyl)-2-methyl-6,8-dibromo quinazolinone (XIX): A mixture of quinazolinone **IV** (3.33 g, 0.01 mol), ethyl bromoacetate (6.68 g, 0.04 mol) and anhydrous potassium carbonate K_2CO_3 (5.0 g, 0.04 mol) in dry acetone (50 mL) was refluxed for 24 h. The excess acetone removed by distillation and the residue poured with stiring into water, the solid that precipitated was filtered off, dried and then crystallized from proper solvent to give compound **XIX**.

Synthesis of 3-(aminocarbamyol methyl)-2-methyl-6,8-dibromo quinazolinone (XX): A mixture of quinazolinone **XIX** (4.04 g, 0.01 mol) and hydrazine hydrate (1.0 g, 0.02 mol) in ethanol (20 mL) was heated under reflux for 6 h. The reaction mixture was concentrated, filtered off and the solid that separated out was crystallized to give 3-(aminocarbamyolmethyl)-2-methyl-6,8-dibromoquinazolinone (**XX**).

Synthesis of hydrazone XXI: A mixture of quinazolinone **XX** (3.9 g, 0.01 mol) and benzaldehyde (1.06 g, 0.01 mol) in butanol (50 mL) was heated under refluxe for 8 h, the reaction mixture was concentrated, filtered off and the solid that separated out was crystallized to give the corresponding hydrazone **XXI**.

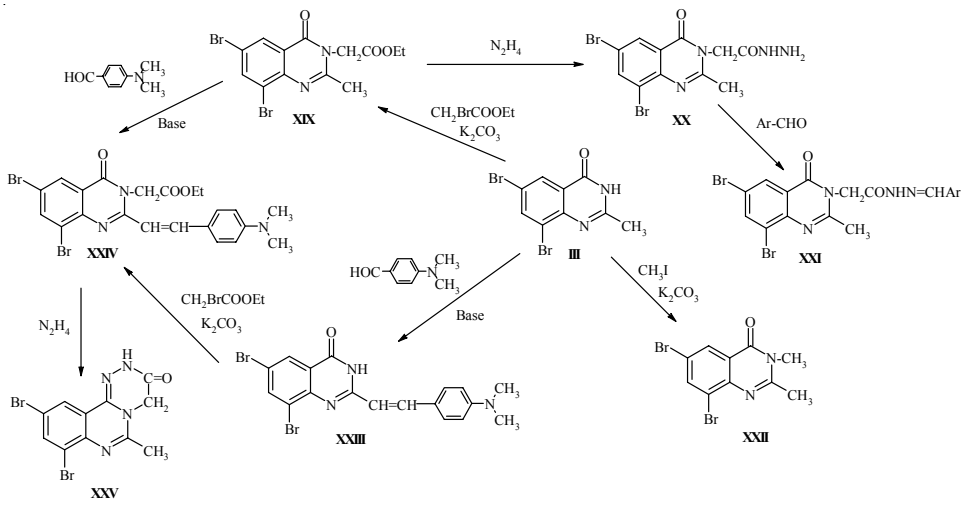
Synthesis of 3-(methyl)-2-methyl-6,8-dibromoquinazolinone (XXII): A mixture of quinazolinone **III** (3.17 g, 0.01 mol) and methyl iodide (1.0 g, 0.02 mol) and anhydrous potassium carbonate K_2CO_3 (5.0 g, 0.04 mol) in dry acetone (50 mL) was refluxed on water bath for 24 h. The excess acetone was removed by distillation and the residue poured with stirring into water, the solid that precipitated was filtered off, dried and then crystallized from proper solvent to give compound **XXII**.

Synthesis of 2-(4-N,N-dimethylaminostyryl)-6,8-dibromoquinazolinone (XXIII): A mixture of quinazolinone **III** (3.17 g, 0.01 mol) and 4-(N,N-dimethylaminobenzaldehyde) (1.49 g, 0.01 mol), with a few drops of piperidine was fused in oil bath for 1 h and then reflux with DMF for *ca.* 2 h. The reaction mixture was concentrated and the solid that precipitated was filtered off, dried and then crystallized from proper solvent to give compound **XXIII**.

Synthesis of 3-(ethoxycarbonylmethyl)-2-(4-N,N-dimethylaminostyryl)-6,8-dibromoquinazolinone (XXIV): A mixture of quinazolinone **XXIII** (4.49 g, 0.01 mol) and ethyl bromoacetate (6.68 g, 0.04 mol) and anhydrous potassium carbonate K_2CO_3 (5.0 g, 0.04 mol) in dry acetone (50 mL) was refluxed for 24 h. The excess acetone was removed by distillation and the residue poured with stirring into water. The solid that precipitated was filtered off, dried and then crystallized from proper solvent to give compound **XXIV**.

Synthesis of 3-(ethoxycarbonylmethyl)-2-(4-N,N-dimethyl-amino styryl)-6,8-dibromoquinazolinone (XXIV): A mixture of 3-(ethoxycarbonylmethyl)-2-(methyl)-6,8-dibromoquinazolinone (**XIX**) (4.04 g, 0.01 mol) and 4-(N,N-dimethylaminobenzaldehyde) (1.44 g, 0.01 mol), with a few drops of piperidine was fused in oil bath for 1 h and then reflux in dioxane for *ca.* 2 h. The reaction mixture was concentrated and the solid that precipitated was filtered off, dried and then crystallized from proper solvent to give 3-(ethoxycarbonylmethyl)-2-(4-N,N-dimethylaminostyryl)-6,8-dibromoquinazolinone (**XXIV**).

Synthesis of compound XXV: A mixture of 3-(ethoxycarbonylmethyl)-2-(4-N,N-dimethyl amino styryl)-6,8-dibromoquinazolinone (**XXIV**) and hydrazine hydrate (1.49 g, 0.01 mol), was reflux in boiling butanol for 5 h. The reaction mixture was concentrated and the solid that precipitated was filtered off, dried and then crystallized from proper solvent to give compound **XXV** (**Scheme-III**).



Scheme-III

RESULTS AND DISCUSSION

The characterization and physical data of all the synthesized compounds are presented in Table-1.

Ammonolysis of compound **II** with formamide in an oil bath at 150 ºC to yield 2- methyl-6,8-dibromo-3(*H*)-quinazoline-4-one **III**, the structure of compound **III** was confirmed by elemental analysis. The IR spectra of compound **III** exhibit bands at 1628 cm^{-1} due to ν(C=N), 1688 cm^{-1} due to ν(C=O) and 3158 cm^{-1} due to ν(NH).

When compound **II** was allowed to react with hydrazine hydrate in boiling ethanol, it give 3-amino-2-methyl-6,8-dibromo quinazoline-4-one (**IV**). The structure of **IV** was obtained from elemental analysis. The IR spectra of compound **IV** exhibit strong absorption bands at 1620 cm^{-1} due to ν(C=N), 1665 cm^{-1} due to ν(C=O) amides and 3202, 3305 cm^{-1} due to NH_2, electron impact fragmentation of 3-amino-2-methyl-6,8-dibromo-3(*H*)-quinazolin-4-one (**IV**) revealed m/e (332.9) (100 %).

When compound **II** reacts with hydroxylamine hydrochloride in pyridine it gives 3-hydroxy-2-methyl-6,8-dibromo-3(*H*)-quinazoline-4-one (**V**), which is confirmed by elemental analysis. The IR spectrum show strong absorption band at 1672 cm^{-1} due to ν(C=O) (amide). The electron impact fragmentation revealed to m/e (333.9) (100 %) then primary loss of OH to give (316.9) (18.07 %), loss of CH_3 to give (301.9) (11.15 %) then decompose.

Compound **II** was allowed to react with aromatic amines namely, (benzylamine, aniline and *p*-toludine) in boiling butanol it gives 3-(aryl-2-methyl-6,8-dibromo-3(*H*)-quinazolin-4-one (**VI**). The structure of compound **VIc** was confirmed by elemental analysis and IR. Spectrum shows strong absorption band at 1678 cm^{-1} due to ν(C=O) (amide). The electron impact fragmentation revealed to m/e (407.9) (100 %). The primary loss of CH_3, to give (392.9) (22.48 %) loss of $C_6H_4CH_3$ to give (300.9) (14.22 %) then decompose.

TABLE-1
CHARACTERISTICS DATA OF THE SYNTHESIZED COMPOUNDS

Compd.	m.p. (ºC)	Solvent of crystallization colour	Yield (%)	m.f. / m.w.	Elemental analysis (%): Calcd. (found)		
					C	H	N
(III)	310-312	Dioxane Grey needles	85	$C_9H_6N_2OBr_2$ 318	33.96 (33.19)	1.88 (1.62)	8.80 (8.86)
(IV)	231-232	Benzene White plates	90	$C_9H_7N_3OBr_2$ 333	32.43 (32.42)	2.10 (2.11)	1.26 (1.21)
(V)	272	Ethanol Pink plates	90	$C_9H_6N_2O_2Br_2$ 334	32.33 (32.31)	1.79 (1.62)	8.38 (8.29)
(VI)	283	Ethanol White powder	80	$C_{16}H_{14}N_2O_2Br_2$ 426	45.07 (44.62)	3.28 (3.52)	6.57 (6.43)
(**VI**)a-c	216	Ethanol	85	$C_{16}H_{12}N_2OBr_2$	47.05	2.44	6.80
a-NH_2CH_2Ar		White plates		408	(46.82)	(2.53)	(7.13)
b-NH_2Ar	220	Ethanol White plates	80	$C_{15}H_{10}N_2OBr_2$ 394	45.68 (44.98)	2.53 (2.41)	7.10 (7.12)
c-NH_2ArCH_2	174	Ethanol White plates	90	$C_{16}H_{12}N_2OBr_2$ 408	47.05 (46.89)	2.94 (2.76)	6.86 (6.45)
(VII)	253	Benzene + PE White plates	70	$C_{15}H_{13}N_3O_2Br_2$ 411	43.79 (43.72)	3.16 (2.68)	10.21 (10.13)
(VIII)	165	Ethanol White plates	65	$C_9H_6N_2O_2Br_2$ 334	32.33 (32.73)	1.79 (1.52)	8.38 (8.34)
)**IX**)a-Succinic anhydride	226	Benzene + PE Yellow powder	90	$C_{13}H_9N_3O_3Br_2$ 415	37.59 (37.42)	2.16 (2.03)	10.12 (10.11)
b-Malic anhydride	<300	Benzene + PE Browne powder	75	$C_{13}H_7N_3O_3Br_2$ 413	37.77 (37.52)	1.69 (1.62)	10.16 (9.59)
c-Phthalic anhydride	230	Benzene White powder	85	$C_{17}H_9N_3O_3Br_2$ 463	44.06 (44.06)	1.94 (1.93)	9.07 (9.10)
(**X**)a-pipronal	265	DMF Grey powder	80	$C_{17}H_{11}N_3O_3Br_2$ 465	43.87 (43.88)	2.36 (2.27)	9.03 (9.12)
b-*p*-Chloro-benzaldehyde	252	Benzene White powder	70	$C_{16}H_{10}N_3OBr_2Cl$ 455	42.19 (41.80)	2.19 (2.17)	9.23 (9.01)
(**XI**)a-Cyclo-hexanone	133	Benzene + PE Colourless crystals	85	$C_{15}H_{15}N_3OBr_2$ 413	43.58 (43.33)	3.63 (3.14)	10.16 (10.12)
b-Cyclo-pentanone	195-7	Benzene + PE White powder	70	$C_{14}H_{13}N_3OBr_2$ 399	42.10 (42.10)	3.25 (2.19)	10.52 (11.13)
(XII)	198	Benzene White powder	65	$C_{19}H_{13}N_5OBr_2$ 487	46.81 (46.82)	2.66 (3.15)	14.37 (14.37)
(XIII)	205	Alcohol Brown powder	85	$C_{12}H_{11}N_3S_2OBr_2$ 437	32.95 (32.17)	2.51 (2.14)	9.61 (9.87)
(XIV)	202	Benzene + PE White powder	95	$C_{11}H_8N_3O_2Br_2Cl$ 409	32.27 (32.17)	1.95 (1.88)	10.26 (10.11)
(XV)	245	Methanol Yellow crystals	85	$C_{11}H_9N_3O_2Br_2$ 375	35.2 (35.27)	2.40 (2.13)	11.2 (10.92)
(XVI)	175	Benzene White powder	90	$C_{13}H_{11}N_3O_3Br_2$ 417	37.41 (37.22)	2.63 (2.53)	10.07 (10.21)
(XVII)	172	Benzene + PE White plates	80	$C_{17}H_{19}N_3O_5Br_2$ 505	40.39 (39.99)	3.76 (3.65)	8.31 (7.94)
(XVIII)	304	DMF Brown powder	80	$C_{18}H_{10}N_4O_2Br_4$ 634	34.06 (33.99)	1.57 (1.58)	8.83 (8.63)

XIX	166	PE	75	$C_{13}H_{12}N_2O_3Br_2$	38.61	2.97	6.93
		White crystals		404	(38.21)	(2.93)	(7.44)
XX	300	Ethanol	80	$C_{11}H_{10}N_4O_2Br_2$	33.84	2.56	14.35
		Yellow powder		390	(33.95)	(2.70)	(14.21)
XXI	262	Dioxane	80	$C_{18}H_{14}N_4O_2Br_2$	45.18	2.92	11.71
		White powder		478	(44.62)	(1.96)	(12.56)
XXII	140	Ethanol	90	$C_{10}H_8N_2OBr_2$	36.14	2.40	8.45
		White crystals		332	(34.92)	(1.29)	(9.32)
XXIII	320	DMF	80	$C_{18}H_{15}N_3OBr_2$	48.10	3.34	9.35
		Orange powder		449	(47.90)	(2.18)	(10.11)
XXIV	233	Ethanol	85	$C_{22}H_{21}N_3O_3Br_2$	49.34	3.92	7.85
		Orange powder		535	(49.42)	(3.91)	(8.21)
XXV	310	Dioxane	75	$C_{20}H_{17}N_5OBr_2$	47.71	3.37	13.91
		White powder		503	(48.22)	(3.22)	(13.67)

For **XIII**: elemtnal analysis (%): found (calcd.) S: 14.64 (14.83); PE = Petroleum ether.

Compound **II** on reaction with *o*-phenylenediamine yielded N-(2-amino)phenyl-2-acetyl-3,5-dibromobenzamide **VII**, which on boiling with *n*-butanal afforded compound **VII** which was identified with TLC, m.p., m.m.p. determimation and elemental analysis. The IR spectrum show strong absorption bands at 1629 cm^{-1} due to ν(C=N) 1678 cm^{-1} due to ν(C=O) amide and 3362, 3446 cm^{-1} due to ν(NH_2).

The compound **IV** on reaction with acid anhydrides namely (maleic, succinic and phthalic anhydride) by fusion in an oil bath give 3-(imide substituted)-2-methyl-6,8-dibromo-4(3*H*)-quinazolinone **IXa,b** and **IXc**. The structures of the quinazolinones **IX** was confirmed by elemental analysis, IR. spectra of compound **IXa**, show strong absorption bands at 1746 cm^{-1} due to ν(C=O) of two carbonyl group, 1711 cm^{-1} due to ν(C=O) (amide) and 1613 cm^{-1} due to ν(C=N). The electron impact fragmentation of compound **IX** revealed to m/e (463) (100 %).

When quinazolinone **IV** reacted with aromatic aldehydes namely pipronal or *p*-chlorobenzaldehyde by fusion on oil bath at 150 ºC it gives 3-(3,4-methylene dioxbenzylidene and *p*-chlorobenzylidene)-2-methyl-6,8-dibromo-(3H)-quinazolin-4-one.

The structure of the compound **X** was confirmed by elemental analysis, IR spectra of compound **Xa** show strong absorption bands at 1678 cm^{-1} due to ν(C=O) amide. The electron impact fragmentation of compound **Xa** revealed m/e (465) (4.4 %) followed by loss of $C_8H_6NO_2$ yield m/e (318) (100 %) and the daughters m/e (303) (1.7 %) and m/e (275) (23.3 %) due to loss of CH_3 and CO, respectively.

When quinazlinone **IV** was subjected to react with ketones namely, cyclohexanone or cyclopentanone by fusion in an oil bath it gives Schiff bases **XIa,b**. The structure of the compound **XI** was confirmed by elemental analysis and IR spectrum of compound **XIa** show strong absorption bands at 1625 cm^{-1} due to ν(C=N) and 1672 cm^{-1} due to ν(C=O) amide.

When quinazolinone **IV** reacts with benzylidine malononitril by fusion in oil bath at 150 ºC it gives 3-(2-amino-3-carbonitile-4-phenylazetiden-1-y1)-2-methyl-6,8-dibromo-3(*H*)-quinazolin-4-one (**XII**). The structure of the compound **XII** was

confirmed by analytical data. The IR spectrum show strong absorption bands at 1619 cm^{-1} due to ν(C=N), 1670 cm^{-1} due to ν(C=O), 2201 cm^{-1} due to ν(CN) and 3305, 3204 cm^{-1} due to ν(NH_2). The mass spectroscope represent the molecular weight m/e (437) (17.3 %).

When quinazolnone **IV**[4-8] was allowed to react with carbon disulphide in dimethyl-sulphoxide, sodium hydroxide and dimethyl sulphate it give 3-(dithioxy methyl methylene amino)-2-methyl-6,8-dibromo-3(*H*)-quinazalin-4-one (**XIII**). The reaction could be takes place *via* nucleophilic attack on the C=S group. The structure of compound **XIII** was confirmed by analytical data and IR spectrum show a strong absorption band at 1687 cm^{-1} due to ν(C=O) (amide).

A 3-amino quinazolinone **IV**[7-8] on reaction with chloroacetyl chloride as carbon electrophiles by reflux in dioxane gives 3-(chloroactyl amino)-2-methyl-6,8-dibromo-3*H*-quinazolin-4-one (**XIV**). The structure of the compound **XIV** was confirmed by the elemental analysis and IR spectra show a strong absorption bands at 1670, 1722 cm^{-1} due to two ν(C=O) (amide), 3219 cm^{-1} due to ν(NH) and 3447 cm^{-1} due to ν(OH) group. The electron impact fragmentation of compound **XIV** revealed to m/e (408) (35.31 %) followed by loss of CH_2Cl yield m/e (359) (36.7 %) followed by loss of NH_2, CH_3 yield m/e (331) (15.4 %) followed by loss of CON yield m/e (259) (3.1 %) followed by loss of CH_2N yield m/e (231) (11.1 %) followed by loss of two Br yield m/e (151) (45 %), (76) (76.1 %).

The 3-aminoquinazolinone **IV** is allowed to reacts with acetylchloride in ice bath, it give 3-(acetyl amino)-2-methyl-6,8-dibromo-3*H*-quinazolin-4-one (**XV**). The structure of the compound **XV** was confirmed by analytical data and IR spectra show a strong absorption bands at 1698, 1679 cm^{-1} due to two ν(C=O) and 3170 cm^{-1} due to ν(NH).

When quinazoline **IV** was allowed to reacts with acetyl chloride by reflux in dioxane or (with mixture at acetic acid and acetic anhydride) it gives 3-(diacetyl amino)-2-methyl-6,8-dibromo quinazolinone (**XVI**). The structure of the compound **XIV** was confirmed by analytical data. The IR spectrum show a strong absorption bands at 1707, 1739 cm^{-1} due to ν(CO) and electron impact fragmentatian show parent peak m/e (417) (29.2 %) followed by loss of $2COCH_3$ yield m/e (375) (70.7 %), (333) (100 %) followed by loss of CH_3N, yield m/e (304) (31.5 %) followed by loss of CO, Br yield m/e (196) (5.8 %) followed by loss of Br, N_2CH yield m/e (116) (5.0 %), m/e (74) (45.5 %).

When quinazoilnone **IV**[5,6] was allowed to reacts with ethyl bromo acetate in dry actone and anhydrous potassium carbonate it gives 3-(N,N-diethoxy carbonyl methyl)-2-methyl-6,8-dibromo-3*H*-quinazolin-4-one (**XVII**). The structure of the compound **XVII** was confirmed by elemental analysis. The IR spectrum show a strong absorption bands at 1734, 1683 cm^{-1} due to ν(C=O).

The quinazolinone **IV** on reaction with 2-methyl-6,8-dibromo-4(*H*)-3.1-benzoxazinon in an oil bath at 150 ºC it gives *bis*(2-methyl-6,8-dibromo-4-(3*H*)-quinazolinone (**XVIII**). This reaction takes place *via* the nucleophilic attack on the

carbonyl group at benzoxazinone followed by recyclization. The structure of the compound **XVIII** was confirmed by elemental analysis. The IR spectra show strong absorption band at 1701 cm^{-1} due to ν(C=O). The electron fragmentation show parent peak m/e (634) (11.1 %).

When quinazolonone **III** was reacted with ethyl bromoacetate in dry acetone in presence of anhydrous potassium carbonate as a catalyst to give 3-(ethoxy carbonyl methyl)-2-methyl-6,8-dibromo-4-(3*H*)-quinazoline (**XIX**). The structure of the compound **XIX** was confirmed by analytical data. The IR spectrum show a strong absorption band at 1736, 1679 cm^{-1} due to ν(C=O).

The interaction of the ester **XIX** with hydrazine hydrate in boiling ethanol afforded the corresponding hydrazide **XX**, the reaction proceed *via* tetrahedral mechanism.

The structure of compound **XX** was confirmed by elemental analysis. The IR spectrum show a strong absorption bands at 1674, 1646 cm^{-1} due to ν(C=O) of the amide group, 3209 cm^{-1} due to ν(NH) and 3337, 3246 cm^{-1} due to ν(NH_2).

When compound **XX** was subjected to react with benzaldehyde in boiling butanol it gives the hydrazone derivatives **XXI**. The structure of the compound **XXI** was confirmed by elemental analysis. The IR spectrum show a strong absorption bands at 1609 cm^{-1} due to ν(C=N), 1663, 1704 due to ν(CO) and 3235 cm^{-1} due to ν(NH).

When quinazolinone **III** reacts with methyl iodide in dry acetone in the presence of anhydrous potassium carbonate as a catalyst afforded 3-(methyl)-2-methyl-6,8-dibromo-3*H*-quinazolinone (**XXII**). The structure of compound **XXII** was confirmed by analytical data. The IR spectra show a strong absorption band at 1671 cm^{-1} due to ν(C=O) amide. The electron impact fragment at an show parent peak m/e (332) (27.2 %).

When quinazolinone **III** was allowed to react with 4-N,N-dimethylaminobenzaldehyde in an oil bath at 150 ºC in the presence of few drops of piperidene it gave 2-(4-N,N-dimethyl amino)-styryl-6,8-dibromo-3*H*-quinazolin-4-one (**XXIII**).

The structure of the compound **XXIII** was confirmed by its analytical data. The IR spectrum show a strong absorption band at 1625 cm^{-1} due to ν(C=C), 1687 cm^{-1} due to ν(C=O) amide, 3160 cm^{-1} due to ν(NH).

The quinazolinone **XXIII** was allowed to react with ethyl bromoacetate in dry acetone in the presence of anhydrous potassium carbonate as a catalyst, gave 3-(ethoxy-carbonyl methyl)-2-(4-N,N-dimethylaminostyryl)-6,8-dibromo-3*H*-quinazolin-4-one (**XXIV**).

When 3-(ethoxy carbonyl)-2-methyl-6,8-dibrome-3*H*-quinazolin-4-one (**XIX**) allowed to react with 4-N,N-dimethylaminobenzaldehyde in presence of piperidine, it gave 3-(ethoxy carbonyl)-2(4-N,N-dimethylaminostyryl)-6,8-dibromo-3*H*-quinazolin-4-one (**XXIV**). The structure of the compound **XXIV** was confirmed by analytical data and IR spectrum show a strong absorption bands at 1602 cm^{-1} due to ν(C=C) and 1736, 1670 cm^{-1} due to ν(CO). ^1H NMR spectrum ($CDCl_3$) showed signals at δ5(s, 2H, NCH_2CO), δ 4.15 (q, 2H, CH_2-CH_3), δ1.2 (t, 3H, CH_3 of ester), δ 3.7 (s, 6H, $N(CH_3)_2$) and δ 6.4-8 (m, 8H, ArH).

The compound **XXIV** on reaction with hydrazine hydrate in boiling butanol gave the triazinone derivative **XXV**. The structure of compound **XXV** was confirmed by its analytical data and the IR spectrum show a strong absorption bands at 1623 cm^{-1} due to ν(C=C), 1647 cm^{-1} due to ν(C=O) and 3223 cm^{-1} due to ν(NH).

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