An Efficient Synthesis of Quinazoline Derivatives With the Aid of Low-valent Titanium Reagent

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Quinazolin-4(3*H*)-ones, 1,2-dihydroquinazolin-4(3*H*)-ones, 3,4-dihydroquinazolines, imidazo[1,2-*c*]-quinazolines and 5,6-dihydroimidazo[1,2-*c*]quinazolines were synthesized by the novel reductive reaction of nitro group, N-H bond and ortho-ester, aldehydes or ketones promoted by the low-valent titanium reagent ($TiCl_4$-Zn system). The structures of these compounds were characterized by elemental analysis, IR and ^{1}HNMR spectra and further confirmed by single crystal X-ray diffraction analysis.

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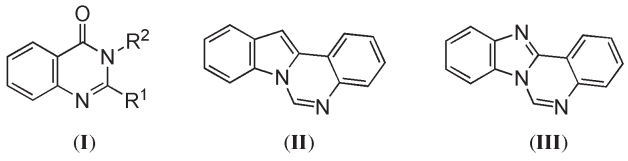
The pyrimidine ring constitutes a basic heteroaromatic structure. It is a vital building block for the construction of other heterocyclic ring compounds and alkloids. A large number of compounds containing the pyrimidine ring possess a wide range of pharmacological activities. Quinazolin-4(3*H*)-one derivatives (**I**) have been reported to exhibit anticonvulsant [1], antihypertensive [2], antidiabetic [3], antibacterial [4], antitumor [5], antihistaminic [6] and anti-inflammatory [7] activities. Some polyheterocyclic structures such as indole[1,2-*c*]quinazoline (**II**) and benzimidazo[1,2-*c*]quinazoline (**III**) skeletons have been reported to represent potent cytotoxic agents [8] (Figure 1). Therefore, the development of novel and convenient synthetic methods for the preparation of quinazolin-4(3*H*)-ones and quinazolines still remains an active research area.



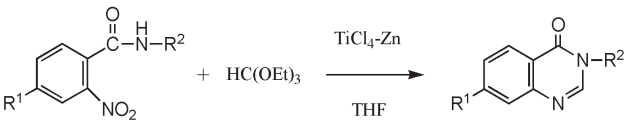
(**I**) (**II**) (**III**)

Figure 1

Low-valent titanium reagents have an exceeding high ability to promote reductive coupling of carbonyl compounds and are attracting increasing interest in organic synthesis [9]. Many other functional groups can be reacted [10]. Recently, we have reported the low-valent titanium-induced intermolecular reductive coupling reaction of carboxylic derivatives with aromatic ketones [11], the intramolecular reductive coupling reaction of 4,4-dicyano-1,3-diaryl-1- butanone [12] and the cyclodimerization of α,β-unsaturated ketones [13]. In the course of our work on the application of low-valent titanium reagents in the preparation of bioactive heterocyclic compounds, we have reported the synthesis of indoles [14], 2-aminoquinolines [15] and 2-arylquinolines [16] with the aid of low-valent titanium reagent. We have reported the primary results for the synthesis of the quinazolin-4(3*H*)-ones and 1,2-dihydroquinazolin- 4(3*H*)-ones with the aid of a low-valent titanium reagent [17]. Here, we wish to describe in detail the methods induced by the $TiCl_4$-Zn system for the preparation of quinazolin-4(3*H*)-ones, quinazolines and imidazo[1,2-*c*]quinazolines.

When *N*-substituted-*o*-nitrobenzamides **1** and triethyl orthoformate **2** were treated with low-valent titanium prepared from titanium tetrachloride and zinc powder in anhydrous THF, the intermolecular reductive cross-coupling products 3-substituted quinazolin- 4(3*H*)-ones **3** were obtained (Scheme 1).

Scheme 1



1 **2** **3**

Table 1 summarized our results on the reaction of *N*-substituted-*o*-nitrobenzamides and triethyl orthoformate with low-valent titanium reagent. The chloro and bromo groups of the substrates could not be reduced under the reaction conditions and no influence on the rate of reductive coupling reaction was observed. On treating triethyl orthoformate with *N*-phenyl-*o*-aminobenzamide under the same reaction conditions, no reaction took place and no 3-phenylquinazolin-4(3*H*)-one could be detected.

Treatment of *o*-nitrobenzyl amines **4** and triethyl orthoformate **2** with $TiCl_4$/Zn in anhydrous THF under the same reaction conditions afforded 3,4-dihydroquinazolines **5** in good yields (Scheme 2). Table 2 summarized our results.

Table 1

Synthesis of 3-Substituted Quinazolin-4(3*H*)-ones Induced by Low-valent Titanium Reagent

Entry	R^1	R^2	Yield(%)
3a	H	C_6H_5	84
3b	H	4-$CH_3C_6H_4$	84
3c	H	$C_6H_5CH_2$	71
3d	Cl	$C_6H_5CH_2$	79
3e	Cl	4-$ClC_6H_4CH_2$	72
3f	Cl	C_6H_{11}-c	46
3g	H	4-IC_6H_4	73
3h	Cl	4-IC_6H_4	81
3i	H	2-ClC_6H_4	72
3j	Cl	2-ClC_6H_4	86

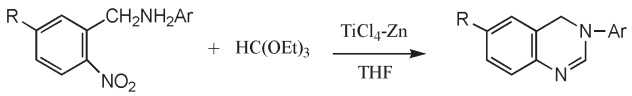
Table 2

Synthesis of 3,4-Dihydroquinazolines Promoted by Low-valent Titanium Reagent

Entry	R	Ar	Yield(%)
5a	H	4-ClC_6H_4	73
5b	H	4-BrC_6H_4	84
5c	Cl	C_6H_5	71
5d	Cl	4-$CH_3C_6H_4$	83
5e	Cl	4-ClC_6H_4	79
5f	Cl	4-BrC_6H_4	82

Similarly, 2-(*o*-nitrophenyl)imidazole **6** and ortho-ester **7** were treated with low-valent titanium reagent in anhydrous THF under the same reaction conditions. The desired products imidazo[1,2- *c*]quinazolines **8** were obtained in moderate yields (Scheme 3). The results are summarized in Table 3.

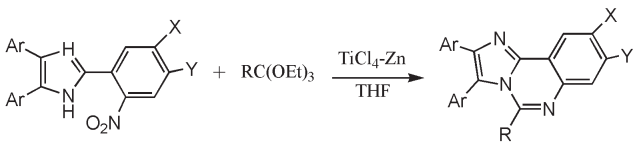
Scheme 2



4 **2** **5**

Moroever, treatment of *o*-nitrobenzamides **1** and ketones or aromatic aldehydes **9** with $TiCl_4$/Zn in anhydrous THF under the same reaction conditions afforded 1,2-dihydro-

Scheme 3



6 **7** **8**

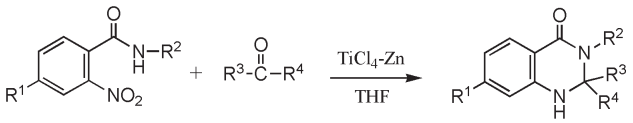
Table 3

Synthesis of IImidazo[1,2-*c*]quinazolines Induced by Low-valent Titanium Reagent

Entry	Ar	X	Y	R	Yield (%)
8a	C_6H_5	H	H	H	68
8b	C_6H_5	Cl	H	H	74
8c	C_6H_5	CH_3O	CH_3O	H	62
8d	C_6H_5	H	H	CH_3	70
8e	C_6H_5	CH_3O	CH_3O	CH_3	61
8f	C_6H_5	Cl	H	CH_3	65
8g	4-$CH_3C_6H_4$	H	H	H	68
8h	4-$CH_3C_6H_4$	Cl	H	H	72
8i	4-BrC_6H_4	H	H	H	63
8j	4-BrC_6H_4	Cl	H	H	69

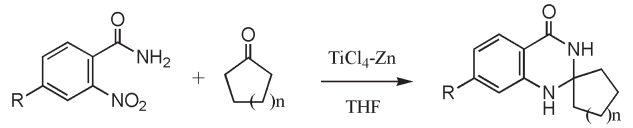
quinazolin-4(3*H*)-ones **10** in good yields (Scheme 4). Table 4 summarized our results. All reactions could be carried out under mild conditions. However, *N*-phenyl-*o*-nitrobenzamide failed to react with butanone, 3-pentanone, cyclopentanone, cyclohexanone, benzaldehyde or acetophenone under these conditions, although the reaction of *o*-nitrobenzamide **1** and the cyclic ketone **11** with the same reagent system afford 2,2-polymethylene-1,2-dihydroquinazolin-4(3*H*)-ones **12** (Scheme 5) and the results are summarized in Table 5. However, *o*-nitrobenzamide failed to react with acetophenone or 1-tetralone.

Scheme 4



1 **9** **10**

Scheme 5



1 **11** **12**

However, treatment of 2-(*o*-nitrophenyl)imidazolines **6** and ketones or aromatic aldehydes **9** with $TiCl_4$/Zn system in dry THF under the same reaction conditions gave the desired cross-coupling products 5,6-dihydroimidazo[1,2-*c*]quinazolines **13** were obtained in moderated yields (Scheme 6).

Table 4

Synthesis of 1,2-Dihydroquinazolin-4(3*H*)-ones Promoted by Low-valent Titanium Reagent

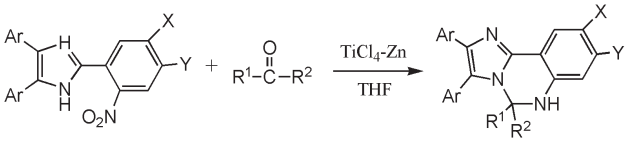
Entry	R^1	R^2	R^3	R^4	Yield (%)
10a	H	4-$CH_3C_6H_4$	CH_3	CH_3	88
10b	H	4-ClC_6H_4	CH_3	CH_3	71
10c	H	4-BrC_6H_4	CH_3	CH_3	83
10d	Cl	C_6H_5	CH_3	CH_3	85
10e	Cl	4-$CH_3C_6H_4$	CH_3	CH_3	89
10f	Cl	4-BrC_6H_4	CH_3	CH_3	87
10g	H	$CH_3(CH_2)_7$	CH_3	CH_3	72
10h	Cl	$CH_3(CH_2)_7$	CH_3	CH_3	73
10i	H	$C_6H_5CH_2$	CH_3	CH_3	71
10j	H	H	CH_3	C_2H_5	79
10k	H	H	C_2H_5	C_2H_5	86
10l	Cl	H	CH_3	C_2H_5	74
10m	Cl	H	C_2H_5	C_2H_5	71
10n	H	H	H	4-$CH_3C_6H_4$	91
10o	H	H	H	3,4-$OCH_2OC_6H_3$	93
10p	Cl	H	H	4-$CH_3C_6H_4$	80
10q	Cl	H	H	4-$CH_3OC_6H_4$	87

Table 5

Synthesis of 2,2-Polymethylene-1,2-dihydroquinazolin-4(3*H*)-ones Induced by Low-valent Titanium Reagent

Entry	R	n	Yield (%)
12a	H	1	84
12b	H	2	63
12c	Cl	1	89
12d	Cl	2	83

Scheme 6



6 **9** **13**

Table 6 summarizes our results. All reactions could be carried out under mild conditions. However, 2-(*o*-nitrophenyl)imidazoles failed to react with butanone, 3-pentanone, cyclohexanone or acetophenone under these conditions.

Table 6

Synthesis of 5,6-Dihydroimidazo[1,2-*c*]quioazolines Promoted by Low-valent Titanium Reagent

Entry	Ar	X	Y	R^1	R^2	Yield (%)
13a	C_6H_5	H	H	CH_3	CH_3	71
13b	C_6H_5	Cl	H	CH_3	CH_3	74
13c	C_6H_5	OCH_2	O	CH_3	CH_3	62
13d	4-$CH_3C_6H_4$	H	H	CH_3	CH_3	82
13e	4-$CH_3C_6H_4$	Cl	H	CH_3	CH_3	84

Table 6

Entry	Ar	X	Y	R^1	R^2	Yield (%)
13f	4-BrC_6H_4	H	H	CH_3	CH_3	80
13g	4-BrC_6H_4	Cl	H	CH_3	CH_3	83
13h	4-$CH_3OC_6H_4$	H	H	CH_3	CH_3	69
13i	4-$CH_3OC_6H_4$	Cl	H	CH_3	CH_3	73
13j	4-FC_6H_4	H	H	CH_3	CH_3	75
13k	C_6H_5	H	H	H	4-$CH_3C_6H_4$	76
13l	C_6H_5	H	H	H	3,4-$(CH_3O)_2C_6H_3$	81
13m	C_6H_5	Cl	H	H	4-$CH_3C_6H_4$	79
13n	C_6H_5	Cl	H	H	4-$CH_3OC_6H_4$	70

All the products **3**, **5**, **8**, **10**, **12** and **13** were characterized by IR, ^{1}HNMR and elemental analysis. The structures of **8f**, **10a**, **12b** and **13c** were further confirmed by single crystal X-ray diffraction analysis. Fig.2 to Fig.5 show the molecular structures of **8f**, **10a**, **12b** and **13c**, respectively. The crystallographic data of these compounds are summarized in Table 7

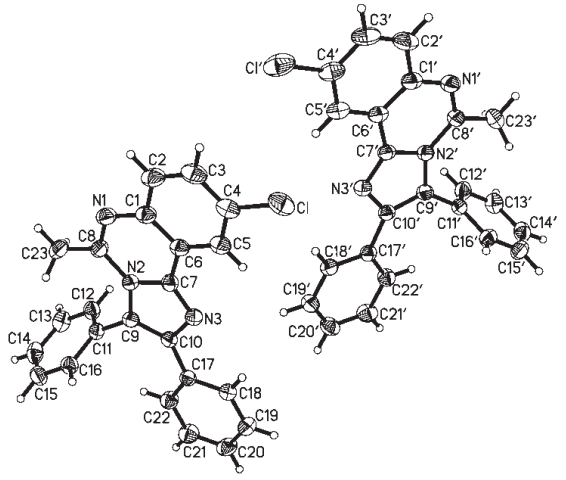


Figure 2 X-ray structure of **8f**.

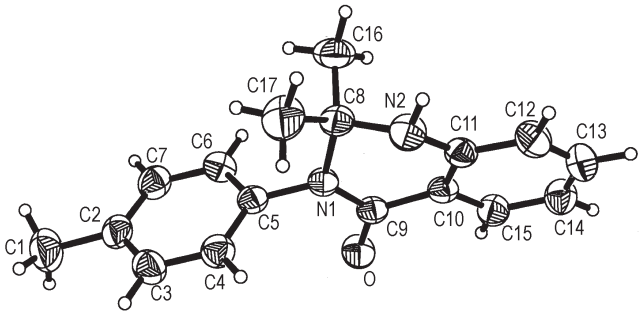


Figure 3 X-ray structure of **10a**.

Table 7

Crystallographic Data for **8f**, **10a**, **12b** and **13c**

	8f	**10a**	**12b**	**13c**
Empirical formula	$C_{23}H_{16}ClN_3$	$C_{17}H_{18}N_2O$	$C_{13}H_{16}N_2O$	$C_{25}H_{21}N_3O_2$
Formula weight	369.84	266.33	216.28	395.45
Temperature (K)	291(2)	295(2)	296(2)	296(2)
Wave length (Å)	0.71073	0.71073	0.71073	0.71073
Crystal system	Monoclinic	Monoclinic	Monoclinic	Monoclinic
Space group	$P2_1/c$	$P2_1/n$	$P2_1/n$	$P2_1/c$
a (Å)	7.789(1)	11.917(2)	10.387(1)	9.594(2)
b (Å)	17.777(2)	6.911(1)	10.954(2)	16.928(4)
c (Å)	26.040(3)	17.821(4)	10.827(2)	12.865(3)
α (˚)	90	90	90	90
β (˚)	94.70(1)	98.81(1)	110.77(1)	95.73(2)
γ (˚)	90	90	90	90
V (Å^3)	3593.7(9)	1450.4(5)	1151.8(4)	2079.1(8)
Z	8	4	4	4
Dcalc. (Mg/m^3)	1.367	1.220	1.247	1.263
Absorption coefficient(mm^{-1})	0.225	0.077	0.080	0.082
F(000)	1536	568	464	832
Crystal size (mm)	0.54x0.48x0.34	0.56x0.52x0.32	0.52x0.48x0.44	0.48x0.38x0.26
θ Range (˚)	1.39 to 25.00	1.93 to 25.50	2.34 to 25.00	1.99 to 25.50
Limiting indices	0≤h≤9	0≤h≤14	0≤h≤12	0≤h≤11
	0≤k≤21	0≤k≤8	0≤k≤13	0≤k≤20
	-30≤l≤30	-21≤l≤21	-12≤l≤12	-15≤l≤15
Reflections collected	7325	3202	2681	4424
Independent reflections	6330	2706	2033	3873
Data/restraints/parameters	6330/0/490	2706/0/189	2033/0/146	3873/0/278
Goodness-of-fit on F^2	0.795	0.921	1.087	0.817
Final R indices [I>2σ(I)]	R_1=0.0391	R_1=0.0433	R_1=0.0449	R_1=0.0482
	wR=0.0747	wR=0.1076	wR=0.1217	wR=0.1134
R indices (all data)	R_1=0.0983	R_1=0.0770	R_1=0.0572	R_1=0.1065
	w R=0.0868	w R=0.1194	w R=0.1276	wR=0.1274
Extinction coefficient	0.0035(2)	0.0114(16)	0.068(6)	0.0096(12)
Largest diff. Peak and hole (e•Å^{-3})	0.136 and –0.225	0.136 and –0.136	0.296 and –0.310	0.281 and –0.204

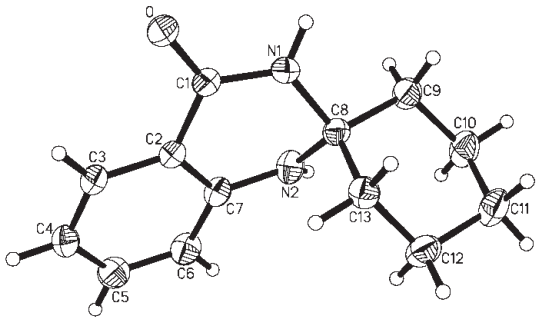


Figure 4. X-ray structure of **12b**.

In conclusion, a series of quinazolin-4(3*H*)-ones, 1,2-dihydroquinazolin-4(3*H*)-ones, 3,4-dihydroquinazolines, imidazo[1,2-*c*]quinazolines and 5,6-dihydroimidazo[1,2-*c*]quinazolines were synthesized *via* novel reductive reaction of nitro group, N-H bond and ortho-ester or carbonyl group induced by the $TiCl_4$/Zn system. The advantages of our methods are the easily accessible starting materials, convenient manipulation and moderate to high yields.

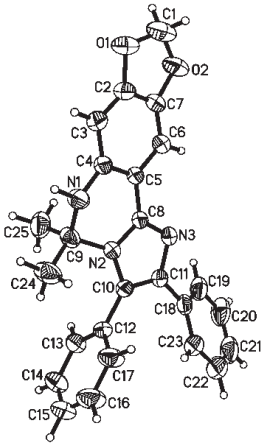


Figure 5. X-ray structure of **13c**.

EXPERIMENTAL

Melting point were determined in open capillaries and are uncorrected. IR spectra were recorded on a FTIR-8101 spectrometer. ^{1}HNMR spectra were measured on an Inova-400 MHz spectrometer

using TMS as internal standard, $CDCl_3$ as solvent. Microanalysis were carried out on Perkin-Elmer 2400 II instruments. X-ray diffraction was recorded on a Siemens P4 diffractometer.

General Procedure for the Synthesis of Quinazolin-4(3*H*)-ones.

$TiCl_4$ (2.2 mL, 20 mmol) was added dropwise using a syringe to a stirred suspension of zinc dust (2.6 g, 40 mmol) in freshly distilled anhydrous THF (20 mL) at room temperature under a dry nitrogen atmosphere. After completion of the addition, the mixture was refluxed for 2 h. The suspension of the low-valent titanium reagent formed was cooled to room temperature and a solution of N-aryl-*o*-nitrobenzamide (5 mmol) and triethyl orthoformate (10 mmol) in THF was added dropwise. The mixture was refluxed for 5 h under N_2 (the reaction was monitored by TLC). The reaction mixture was quenched with 10% HCl (50 mL) and extracted with $CHCl_3$ (3x50 mL). The combined extracts were washed with water (3x50 mL) and dried over anhydrous Na_2SO_4. After evaporation of the solvent under reduced pressure, the crude products **3a-j** were purified by recrystallization from 95% ethanol.

3-Phenylquinazolin-4(3*H*)-one (**3a**).

This compound was obtained as solid with mp 140-142 ºC (Lit.18 138-140 ºC); ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.38 (d, *J* = 8.4 Hz, 1H, H5), 8.15 (s, 1H, H2), 7.81 (dd, J_1 = 8.4 Hz, J_2 = 7.6 Hz, 1H, H7), 7.78 (d, *J* = 8.4 Hz, 1H, H8), 7.57 (dd, J_1 = 8.4 Hz, J_2 = 7.6 Hz, 1H, H6), 7.54-7.51 (m, 3H), 7.46-7.43 (m, 2H); IR (KBr): 3030, 1672, 1610, 1473, 1402, 1262, 1181, 1111, 1024, 933, 913, 767, 699 cm^{-1}.

3-(4'-Methylphenyl)quinazolin-4(3*H*)-one (**3b**).

This compound was obtained as solid with mp 147-149 ºC (Lit.18 148-149 ºC); ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.38 (d, *J* = 8.4 Hz, 1H, H5), 8.13 (s, 1H, H2), 7.81 (dd, J_1 = 8.4 Hz, J_2 = 8.4 Hz, 1H, H7), 7.77 (d, *J* = 8.4 Hz, H8), 7.55 (dd, J_1 = 8.4 Hz, J_2 = 8.4 Hz, 1H, H6), 7.36 (d, *J* = 8.4 Hz, 2H), 7.31 (d, *J* = 8.4 Hz, 2H), 2.44 (s, 3H, CH_3); IR (KBr): 3030, 1689, 1600, 1514, 1471, 1323, 1293, 1192, 1114, 1025, 917, 836, 817, 770, 749, 694 cm^{-1}.

3-Benzylquinazolin-4(3*H*)-one (**3c**).

This compound was obtained as solid with mp 114-115 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.36 (d, *J* = 7.6 Hz, 1H, H5), 8.15 (s, 1H, H2), 7.80-7.72 (m, 2H), 7.54 (dd, J_1 = 7.2 Hz, J_2 = 7.6 Hz, 1H), 7.37-7.29 (m, 5H), 5.21 (s, 2H, CH_2); IR (KBr): 3036, 2945, 1677, 1604, 1473, 1440, 1411, 1365, 1320, 1289, 1161, 1149, 1076, 937, 869, 776, 706, 692 cm^{-1}.

Anal. Calcd. for $C_{15}H_{12}N_2O$: C, 76.25; H, 5.12; N, 11.86. Found: C, 76.42; H, 4.93; N, 11.90.

7-Chloro-3-benzylquinazolin-4(3*H*)-one (**3d**).

This compound was obtained as solid with mp 119-120 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.25 (d, *J* = 8.8 Hz, 1H, H5), 8.13 (s, 1H, H2), 7.77 (s, 1H, H8), 7.47 (d, *J*= 8.8 Hz, 1H, H6), 7.39-7.31 (m, 5H), 5.19 (s, 2H, CH_2); IR (KBr): 2947, 1690, 1601, 1554, 1456, 1400, 1365, 1316, 1216, 1167, 1110, 1070, 946, 894, 876, 819, 781, 756, 715, 699 cm^{-1}.

Anal. Calcd. for $C_{15}H_{11}ClN_2O$: C, 66.55; H, 4.10; N, 10.35. Found: C, 66.78; H, 3.86; N, 10.51.

7-Chloro-3-(4'-chlorobenzyl)quinazolin-4(3*H*)-one (**3e**).

This compound was obtained as solid with mp 139-140 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.23 (d, *J* = 8.4 Hz, 1H, H5), 8.10 (s, 1H, H2), 7.70 (s, 1H, H8), 7.46 (d, *J*= 8.4 Hz, 1H, H6), 7.34-7.21 (m, 4H), 5.14 (s, 2H, CH_2); IR (KBr): 3050, 2946, 1672, 1626, 1602, 1530, 1456, 1409, 1350, 1317, 1303, 1232, 1106, 1089, 1015, 910, 841, 798 cm^{-1}.

Anal. Calcd. for $C_{15}H_{10}Cl_2N_2O$: C, 59.04; H, 3.30; N, 9.18. Found: C, 58.89; H, 3.53; N, 8.96.

7-Chloro-3-cyclohexylquinazolin-4(3*H*)-one (**3f**).

This compound was obtained as solid with mp 120-121 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.24 (d, *J* = 8.8 Hz, 1H, H5), 8.13 (s, 1H, H2), 7.70 (s, 1H, H8), 7.44 (d, *J*= 8.8 Hz, 1H, H6), 4.79 (m, 1H, NCH), 2.02-1.94 (m, 6H, 3xCH_2), 1.65-1.51 (m, 4H, 2xCH_2); IR (KBr): 2933, 2854, 1678, 1600, 1461, 1402, 1352, 1318, 1270, 1162, 1130, 1068, 910, 891, 872, 827, 778 cm^{-1}.

Anal. Calcd. for $C_{14}H_{15}ClN_2O$: C, 64.00; H, 5.75; N, 10.66. Found: C, 64.25; H, 5.63; N, 10.58.

3-(4'-Iodophenyl)quinazolin-4(3*H*)-one (**3g**).

This compound was obtained as solid with mp 194-195 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.36 (d, *J* = 7.2 Hz, 1H, H5), 8.09 (s, 1H, H2), 7.89 (d, *J* = 8.4 Hz, 2H), 7.84-7.77 (m, 2H), 7.59-7.55 (m, 1H), 7.18 (d, *J* = 8.4 Hz, 2H);IR (KBr): 3041, 1674, 1607, 1487, 1469, 1397, 1322, 1295, 1185, 1109, 1006, 911, 849, 812, 769, 690 cm^{-1}.

Anal. Calcd. for $C_{14}H_9IN_2O$: C, 48.30; H, 2.61; N, 8.05. Found: C, 48.47; H, 2.76; N, 7.81.

7-Chloro-3-(4'-iodophenyl)quinazolin-4(3*H*)-one (**3h**).

This compound was obtained as solid with mp 239-240 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.30 (d, *J* = 8.4 Hz, 1H, H5), 8.11 (s, 1H, H2), 7.92 (d, *J* = 8.4 Hz, 2H), 7.79 (s, 1H, H8), 7.55 (d, *J* = 8.4 Hz, 1H, H6), 7.20 (d, *J* = 8.4 Hz, 2H); IR (KBr): 3049, 1688, 1605, 1483, 1464, 1428, 1396, 1307, 1294, 1085, 1059, 1008, 915, 895, 835, 815, 784, 693 cm^{-1}.

Anal. Calcd. for $C_{14}H_8ClIN_2O$: C, 43.95; H, 2.11; N, 7.32. Found: C, 44.19; H, 1.93; N, 7.58.

3-(2'-Chlorophenyl)quinazolin-4(3*H*)-one (**3i**).

This compound was obtained as solid with mp 221-222 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.38 (d, *J* = 8.0 Hz, 1H, H5), 7.98 (s, 1H, H2), 7.86-7.79 (m, 2H), 7.64-7.43 (m, 5H); IR (KBr): 3062, 1681, 1605, 1470, 1394, 1373, 1301, 1266, 1186, 1114, 1083, 1021, 917, 867, 776, 755, 726, 696 cm^{-1}.

Anal. Calcd. for $C_{14}H_9ClN_2O$: C, 65.51; H, 3.53; N, 10.91. Found: C, 65.72; H, 3.28; N, 11.15.

7-Chloro-3-(2'-chlorophenyl)quinazolin-4(3*H*)-one (**3j**).

This compound was obtained as solid with mp 188-189 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.30 (d, *J* = 8.8 Hz, 1H, H5), 7.99 (s, 1H, H2), 7.81 (s, 1H, H8), 7.63 (d, J = 8.8 Hz, 1H, H6), 7.55-7.45 (m, 4H); IR (KBr): 3032, 1682, 1646, 1604, 1528, 1466, 1440, 1390, 1302, 1266, 1087, 900, 836, 761, 692 cm^{-1}.

Anal. Calcd. for $C_{14}H_8Cl_2N_2O$: C, 57.76; H, 2.77; N, 9.62. Found: C, 57.94; H, 2.47; N, 9.76.

General Procedure for the Synthesis of 3,4-Dihydroquinazolines.

A solution of *o*-nitrobenzyl amine **4** (5 mmol) and triethyl orthoformate (10 mmol) in anhydrous THF (10 mL) was added carefully at room temperature to a suspension of low-valent titanium reagent (20 mmol) prepared as mentioned above. When the reaction was completed (at refluxing under N_2), most of the

solvent was removed *in vacuo*. The residue was poured into 10% HCl (100 mL), and extracted with $CHCl_3$ (3x50 mL). The combined organic layers were washed with water (3x50 mL), dried (Na_2SO_4), and the solvent was removed *in vacuo* to give the crude product. The crude product was recrystallized from ethanol to give the pure product.

3-(4'-Chlorophenyl)-3,4-dihydroquinazoline (**5a**).

This compound was obtained as solid with mp 140-141 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.56 (s, 1H, H2), 7.40 (d, *J* = 8.8 Hz, 2H), 7.29-7.21(m, 2H, H6, H7), 7.15 (d, *J* = 7.6 Hz, 1H, H8), 7.10 (d, *J* = 8.8 Hz, 2H), 7.01 (d, *J* = 6.4 Hz, 1H, H5), 4.92 (s, 2H, H4); IR (KBr): 3067, 2810, 1600, 1565, 1550, 1470, 1290, 1230, 1160, 920, 800, 735 cm^{-1}.

Anal. Calcd. for $C_{14}H_{11}ClN_2$: C, 69.29; H, 4.57; N, 11.54. Found: C, 69.53; H, 4.26; N, 11.72.

3-(4'-Bromophenyl)-3,4-dihydroquinazoline (**5b**).

This compound was obtained as solid with mp 144-145 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.58 (s, 1H, H2), 7.55 (d, *J* = 8.8 Hz, 2H), 7.27-7.13 (m, 3H, H6, H7, H8), 7.05 (d, *J* = 8.8 Hz, 2H), 7.01 (d, *J* = 7.2 Hz, 1H, H5), 4.92 (s, 2H, H4); IR (KBr): 3055, 1610, 1560, 1550, 1490, 1370, 1300, 1235, 1165, 1080, 1000, 920, 800, 750 cm^{-1}.

Anal. Calcd. for $C_{14}H_{11}BrN_2$: C, 58.56; H, 3.86; N, 9.76. Found: C, 58.75; H, 3.68; N, 9.54.

6-Chloro-3-phenyl-3,4-dihydroquinazoline (**5c**).

This compound was obtained as solid with mp 126-127 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.59 (s, 1H, H2), 7.47-7.43 (m, 2H), 7.24-7.14 (m, 5H), 6.99 (s, 1H, H5), 4.93 (s, 2H, H4); IR (KBr): 3060, 1593, 1580, 1550, 1500, 1367, 1283, 1217, 810, 740 cm^{-1}.

Anal. Calcd. for $C_{14}H_{11}ClN_2$: C, 69.29; H, 4.57; N, 11.54. Found: C, 69.45; H, 4.38; N, 11.39.

6-Chloro-3-(4'-methylphenyl)-3,4-dihydroquinazoline (**5d**).

This compound was obtained as solid with mp 181-182 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.55 (s, 1H, H2), 7.24 (d, *J* = 8.0 Hz, 2H), 7.20 (d, *J* = 8.0 Hz, 1H, H7), 7.13 (d, *J* = 8.0 Hz, 1H, H8), 7.06 (d, *J* = 8.0 Hz, 2H), 6.98 (s, 1H, H5), 4.91 (s, 2H, H4), 2.37 (s, 3H, CH_3); IR (KBr): 3045, 1593, 1550, 1490, 1380, 1283, 1250, 1207, 907, 817, 800 cm^{-1}.

Anal. Calcd. for $C_{15}H_{13}ClN_2$: C, 70.18; H, 5.10; N, 10.91. Found: C, 70.41; H, 4.86; N, 11.07.

6-Chloro-3-(4'-chlorophenyl)-3,4-dihydroquinazoline (**5e**).

This compound was obtained as solid with mp 187-188 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.53 (s, 1H, H2), 7.41 (d, *J* = 8.8 Hz, 2H), 7.22 (d, *J* = 8.8 Hz, 1H, H7), 7.14 (d, *J* = 8.8 Hz, 1H, H8), 7.10 (d, *J* = 8.8 Hz, 2H), 7.00 (s, 1H, H5), 4.88 (s, 2H, H4); IR (KBr): 3060, 1600, 1565, 1550, 1480, 1380, 1280, 1230, 1160, 1100, 930, 870, 810 cm^{-1}.

Anal. Calcd. for $C_{14}H_{10}Cl_2N_2$: C, 60.67; H, 3.64; N, 10.11. Found: C, 60.83; H, 3.54; N, 10.36.

6-Chloro-3-(4'-bromophenyl)-3,4-dihydroquinazoline (**5f**).

This compound was obtained as solid with mp 187-188 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.58 (s, 1H, H2), 7.56 (d, *J* = 8.8 Hz, 2H), 7.23 (d, *J* = 8.4 Hz, 1H, H7), 7.17 (d, *J* = 8.4 Hz, 1H, H8), 7.05 (d, *J* = 8.8 Hz, 2H), 7.01 (s, 1H, H5), 4.90 (s, 2H, H4); IR (KBr): 3060, 1600, 1560, 1550, 1490, 1280, 1230, 1170, 1090, 925, 820 cm^{-1}.

Anal. Calcd. for $C_{14}H_{10}B_rClN_2$: C, 52.29; H, 3.13; N, 8.71. Found: C, 52.53; H, 2.94; N, 8.97.

General Procedure for the Synthesis of Imidazo[1,2-*c*]quinazolines.

A solution of 2-(*o*-nitrophenyl)imidazole **6** (2 mmol) and ortho-ester **7** (4 mmol) in anhydrous THF (10 mL) was added carefully at room temperature to a suspension of low-valent titanium reagent (10 mmol) prepared as mentioned above. When the reaction was completed (at room temperature under N_2), most of the solvent was removed *in vacuo*. The residue was poured into 10% HCl (50 mL), and extracted with $CHCl_3$ (3x50 mL). The combined organic layers were washed with water (3x50 mL), dried (Na_2SO_4), and the solvent was removed *in vacuo* to give the crude product. The crude product was purified by column chromatography on silica gel (200-300 mesh) using petroleum ether (b. p. 60-90 ºC) – acetone (5:1) as eluent.

2,3-Diphenylimidazo[1,2-*c*]quinazoline (**8a**).

This compound was obtained as solid with mp 193-195 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.72 (s, 1H), 7.97 (d, *J* = 7.6 Hz, 1H), 7.86 (d, *J* = 8.0 Hz, 1H), 7.74-7.70 (m, 4H), 7.59-7.50 (m, 5H), 7.41-7.30 (m, 3H); IR (KBr): 3058, 1603, 1473, 1379, 1353, 1310, 1262, 1235, 894, 778, 746, 704, 693 cm^{-1}.

Anal. Calcd. for $C_{22}H_{15}N_3$: C, 82.22; H, 4.70; N, 13.08. Found: C, 82.41; H, 4.46; N, 13.16.

9-Chloro-2,3-diphenylimidazo[1,2-*c*]quinazoline (**8b**).

This compound was obtained as solid with mp 216-217 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.75 (s, 1H), 8.49 (s, 1H), 7.98 (d, *J* = 8.4 Hz, 1H), 7.81 (d, *J* = 8.4 Hz, 1H), 7.67-7.61 (m, 7H), 7.38-7.31 (m, 3H); IR (KBr): 3049, 1601, 1468, 1404, 1352, 1309, 1082, 1024, 901, 831, 781, 750, 700, 683 cm^{-1}.

Anal. Calcd. for $C_{22}H_{14}ClN_3$: C, 74.26; H, 3.97; N, 11.81. Found: C, 74.42; H, 3.75; N, 11.69.

8,9-Dimethoxy-2,3-diphenylimidazo[1,2-*c*]quinazoline (**8c**).

This compound was obtained as solid with mp 206-207 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.63 (s, 1H), 7.82 (s, 1H), 7.68-7.56 (m, 7H), 7.43 (s, 1H), 7.36-7.29 (m, 3H), 4.02 (s, 3H, CH_3O), 3.94 (s, 3H, CH_3O); IR (KBr): 3049, 2933, 1622, 1495, 1462, 1383, 1340, 1271, 1217, 1134, 1030, 984, 883, 860, 818, 787, 744, 704 cm^{-1}.

Anal. Calcd. for $C_{24}H_{19}N_3O_2$: C, 75.57; H, 5.02; N, 11.02. Found: C, 75.71; H, 4.86; N, 11.23.

5-Methyl-2,3-diphenylimidazo[1,2-*c*]quinazoline (**8d**).

This compound was obtained as solid with mp 188-189 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.02-7.84 (m, 4H), 7.70-7.50 (m, 7H), 7.40-7.36 (m, 3H), 2.66 (s, 3H, CH_3); IR (KBr): 3050, 1697, 1623, 1575, 1537, 1358, 1333, 1280, 1242, 1174, 823, 766, 743, 703 cm^{-1}.

Anal. Calcd. for $C_{23}H_{17}N_3$: C, 82.36; H, 5.11; N, 12.53. Found: C, 82.56; H, 4.83; N, 12.47.

5-Methyl-8,9-dimethoxy-2,3-diphenylimidazo[1,2-*c*]quinazoline (**8e**).

This compound was obtained as solid with mp 254-256 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.62-7.53 (m, 9H), 7.29-7.26

(m, 3H), 4.04 (s, 6H, 2xCH_3O), 2.64(s, 3H, CH_3); IR (KBr): 3057, 2957, 1628, 1535, 1495, 1438, 1380, 1339, 1265, 1228, 1206, 1182, 1025, 925, 784, 768, 707 cm^{-1}.

Anal. Calcd. for $C_{25}H_{21}N_3O_2$: C, 75.93; H, 5.35; N, 10.63. Found: C, 75.89; H, 5.28; N, 10.81.

5-Methyl-9-chloro-2,3-diphenylimidazo[1,2-*c*]quinazoline (**8f**).

This compound was obtained as solid with mp 179-180 ºC;^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.66 (s, 1H), 7.76 (d, J = 8.0 Hz, 1H), 7.60-7.52 (m, 8H), 7.26-7.22 (m, 3H), 2.29 (s, 3H, CH_3); IR (KBr): 3054, 1607, 1538, 1499, 1467, 1442, 1379, 1331, 1258, 1186, 1071, 1019, 920, 886, 871, 820, 778, 761, 703 cm^{-1}.

Anal. Calcd. for $C_{23}H_{16}ClN_3$: C, 74.69; H, 4.36; N, 11.36. Found: C, 74.83; H, 4.15; N, 11.29.

2,3-Di(4'-methylphenyl)imidazo[1,2-*c*]quinazoline (**8g**).

This compound was obtained as solid with mp 227-229 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.71 (s, 1H), 8.52 (d, J = 7.6 Hz, 1H), 7.95 (d, J = 8.8 Hz, 1H), 7.79-7.75 (m, 2H), 7.55 (d, J = 8.4 Hz, 2H), 7.51 (d, J = 8.0 Hz, 2H), 7.43 (d, J = 8.0 Hz, 2H), 7.16 (d, J = 8.4 Hz, 2H), 2.45 (s, 3H, CH_3), 2.31 (s, 3H, CH_3); IR (KBr): 3050, 1619, 1600, 1530, 1491, 1472, 1453, 1379, 1351, 1308, 1268, 1176, 894, 835, 822, 759, 733, 704 cm^{-1}.

Anal. Calcd. for $C_{24}H_{19}N_3$: C, 82.49; H, 5.48; N, 12.03. Found: C, 82.56; H, 5.34; N, 11.98.

9-Chloro-2,3-di(4'-methylphenyl)imidazo[1,2-*c*]quinazoline (**8h**).

This compound was obtained as solid with mp 237-239ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.74 (s, 1H), 8.46 (s, 1H), 7.97 (d, J = 8.8 Hz, 1H), 7.80 (d, J = 8.8 Hz, 1H), 7.55 (d, J = 8.0 Hz, 2H), 7.51 (d, J = 8.0 Hz, 2H), 7.43 (d, J = 8.0 Hz, 2H), 7.17 (d, J = 8.0 Hz, 2H), 2.46 (s, 3H, CH_3), 2.31 (s, 3H, CH_3); IR (KBr): 3040, 1603, 1530, 1500, 1468, 1377, 1345, 1174, 1078, 900, 821, 734 cm^{-1}.

Anal. Calcd. for $C_{24}H_{18}ClN_3$: C, 75.09; H, 4.73; N, 10.95. Found: C, 75.21; H, 4.66; N, 11.06.

2,3-Di(4'-bromophenyl)imidazo[1,2-*c*]quinazoline (**8i**).

This compound was obtained as solid with mp 239-240 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.81 (s, 1H), 7.80 (d, J = 8.4 Hz, 1H), 7.97 (d, J = 8.4 Hz, 1H), 7.84-7.77 (m, 5H), 7.62-7.59 (m, 5H); IR (KBr): 3050, 1613, 1530, 1493, 1471, 1396, 1374, 1351, 1301, 1261, 1175, 1121, 1009, 959, 894, 827, 732 cm^{-1}.

Anal. Calcd. for $C_{22}H_{13}Br_2N_3$: C, 55.14; H, 2.73; N, 8.77. Found: C, 55.32; H, 2.64; N, 8.54.

9-Chloro-2,3-di(4'-bromophenyl)imidazo[1,2-*c*]quinazoline (**8j**).

This compound was obtained as solid with mp 248-250 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 8.83 (s, 1H), 8.48 (s, 1H), 7.99 (d, J = 8.0 Hz, 1H), 7.83 (d, J = 8.4 Hz, 2H), 7.65-7.54 (m, 7H); IR (KBr): 3050, 1608, 1358, 1494, 1469, 1397, 1375, 1345, 1124, 1079, 1009, 900, 821, 734, 715 cm^{-1}.

Anal. Calcd. for $C_{22}H_{12}Br_2ClN_3$: C, 51.45; H, 2.35; N, 8.18. Found: C, 51.68; H, 2.28; N, 8.40.

General Procedure for the Synthesis of 1,2-Dihydroquinazolin-4(3*H*)-ones.

A solution of *o*-nitrobenzamide **1** (3 mmol) and ketone or aldehyde **9** (3 mmol) in anhydrous THF (10 mL) was added carefully at room temperature to a suspension of low-valent titanium reagent (10 mmol) prepared as mentioned above. When the reaction was completed (at room temperature under N_2), most of the solvent was removed *in vacuo*. The residue was poured into 10% HCl (50 mL), and extracted with $CHCl_3$ (3x50 mL). The combined organic layers were washed with water (3x50 mL), dried (Na_2SO_4), and the solvent was removed *in vacuo* to give the crude product. The crude product was recrystallized from ethanol to give the pure product.

2,2-Dimethyl-3-(4'-methylphenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10a**).

This compound was obtained as solid with mp 255-256 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.95 (d, *J* = 8.4 Hz, 1H, H5), 7.32 (dd, J_1 = 8.8 Hz, J_2 = 7.2 Hz, 1H, H7), 7.23 (d, *J* = 8.4 Hz, 2H), 7.12 (d, *J* = 8.4 Hz, 2H), 6.87 (dd, J_1 = 8.4 Hz, J_2 = 7.2 Hz, 1H, H6), 6.67 (d, *J* = 8.8 Hz, 1H, H8), 2.38 (s, 3H, CH_3), 1.49 (s, 6H, 2xCH_3); IR (KBr): 3305, 2973, 1627, 1575, 1519, 1489, 1464, 1433, 1399, 1378, 1277, 1225, 1175, 1107, 1022, 947, 813, 784, 755,718, 697 cm^{-1}.

Anal. Calcd. for $C_{17}H_{18}N_2O$: C, 76.66; H, 6.81; N, 10.52. Found: C, 76.83; H, 6.59; N, 10.63.

2,2-Dimethyl-3-(4'-chlorophenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10b**).

This compound was obtained as solid with mp 255-256 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.94 (d, *J* = 7.2Hz, 1H, H5), 7.41 (d, *J* = 8.4 Hz, 2H), 7.35 (dd, J_1 = 8.4 Hz, J_2 = 8.0 Hz, 1H, H7), 7.19 (d, *J* = 8.4 Hz, 2H), 6.89 (dd, J_1 = 8.0 Hz, J_2 = 7.2 Hz, 1H, H6), 6.69 (d, *J* = 8.4 Hz, 1H, H8), 1.50 (s, 6H, 2xCH_3); IR (KBr): 3307, 2972, 1628, 1518, 1489, 1465, 1433, 1398, 1377, 1338, 1273, 1179, 1088, 1016, 872, 818, 756, 727, 696 cm^{-1}.

Anal. Calcd. for $C_{16}H_{15}ClN_2O$: C, 67.02; H, 5.27; N, 9.77. Found: C, 67.18; H, 5.03; N, 9.83.

2,2-Dimethyl-3-(4'-bromophenyl)-1,2-dihydroquinazolin-4(3H)-one (**10c**).

This compound was obtained as solid with mp 264-265 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.94 (d, *J* = 8.0 Hz, 1H, H5), 756 (d, *J* = 8.0 Hz, 2H), 7.34 (dd, J_1 = 8.0 Hz, J_2 = 7.2 Hz, 1H, H7), 7.13 (d, *J* = 8.0 Hz, 2H), 6.88 (dd, J_1 = 8.0 Hz, J_2 = 7.2 Hz, 1H, H6), 6.68 (d, *J* = 8.0 Hz, 1H, H8), 1.49 (s, 6H, 2xCH_3); IR (KBr): 3307, 2968, 1627, 1579, 1489, 1465, 1433, 1397, 1377, 1271, 1171, 1098, 1067, 1012, 871,756,696 cm^{-1}.

Anal. Calcd. for $C_{16}H_{15}BrN_2O$: C, 58.02; H, 4.56; N, 8.46. Found: C, 58.18; H, 4.54; N, 8.65.

7-Chloro-2,2-dimethyl-3-phenyl-1,2-dihydroquinazolin-4(3*H*)-one (**10d**).

This compound was obtained as solid with mp 270-272 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.87 (d, *J* = 8.4 Hz, 1H, H5), 7.55-7.22 (m, 5H), 6.83 (d, *J* = 8.4 Hz, 1H H6), 6.68 (s, 1H, H8), 1.49 (s, 6H, 2xCH_3); IR (KBr): 3286, 2968, 1628, 1606, 1516, 1488, 1454, 1411, 1389, 1371 1279, 1224, 1178, 1077, 1032, 1002, 988, 950, 931, 898, 850, 809, 758, 733, 699 cm^{-1}.

Anal. Calcd. for $C_{16}H_{15}ClN_2O$: C, 67.02; H, 5.27; N, 9.77. Found: C, 67.25; H, 5.18; N, 9.69.

7-Chloro-2,2-dimethyl-3-(4'-methylphenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10e**).

This compound was obtained as solid with mp 278-280 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.87 (d, *J* = 8.0 Hz, 1H, H5),

7.23 (d, *J* = 7.2 Hz, 2H), 7.10 (d, *J* = 7.2 Hz, 2H), 6.82 (d, *J* = 8.0 Hz, 1H H6), 6.67 (s, 1H, H8), 2.38 (s, 3H, CH_3), 1.49 (s, 6H, 2xCH_3); IR (KBr):3300, 2971, 1633, 1510, 1484, 1457, 1413, 1366, 1284, 1258, 1175, 1106, 1077, 1025, 992, 901, 849, 811, 786, 765, 709, 693 cm^{-1}.

Anal. Calcd. for $C_{17}H_{17}ClN_2O$: C, 67.88; H, 5.70; N, 9.31. Found: C, 67.93; H, 5.54; N, 9.49.

7-Chloro-2,2-dimethyl-3-(4'-bromophenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10f**).

This compound was obtained as solid with mp 270-272 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.86 (d, *J* = 8.0 Hz, 1H, H5), 7.57 (d, *J* = 8.0 Hz, 2H), 7.11 (d, *J* = 8.0 Hz, 2H), 6.84 (d, *J* = 8.0 Hz, 1H H6), 6.69 (s, 1H, H8), 1.49 (s, 6H, 2xCH_3); IR (KBr): 3297, 2965, 1625, 1515, 1486, 1455, 1409, 1372, 1279, 1174, 1097, 1068, 1023, 1010, 903, 856, 814, 768, 715, 695 cm^{-1}.

Anal. Calcd. for $C_{16}H_{14}BrClN_2O$: C, 52.56; H, 3.86; N, 7.66. Found: C, 52.68; H, 3.74; N, 7.54.

2,2-Dimethyl-3-(*n*-octyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10g**).

This compound was obtained as solid with mp 110-112 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.90 (d, *J* = 7.2 Hz, 1H, H5), 7.21 (dd, J_1 = 7.6 Hz, J_2 = 8.0 Hz, 1H, H7), 6.72 (dd, J_1 = 7.2 Hz, J_2 = 7.6 Hz, 1H, H6), 6.60 (d, *J* = 8.0 Hz, 1H, H8), 3.48-3.38 (m, 2H, CH_2N), 1.66-1.56 (m, 2H, CH_2), 1.55 (s, 6H, 2xCH_3), 1.40-1.23 (m, 10H, 5xCH_2), 0.92-0.85 (m, 3H, CH_3); IR (KBr):3281, 2925, 2851, 1621, 1517, 1487, 1465, 1434, 1401, 1367, 1352, 1326, 1282, 1191, 1148, 1029, 752, 699 cm^{-1}.

Anal. Calcd. for $C_{18}H_{28}N_2O$: C, 74.96; H, 9.78; N, 9.71. Found: C, 75.03; H, 9.57; N, 9.62.

7-Chloro-2,2-dimethyl-3-(*n*-octyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10h**).

This compound was obtained as solid with mp 110-111 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.82 (d, *J* = 8.4 Hz, 1H, H5), 7.21 (d, *J* = 8.4 Hz, 1H, H6), 6.68 (s, 1H, H8), 3.45-3.35 (m, 2H, CH_2N), 1.65-1.58 (m, 2H, CH_2), 1.55 (s, 6H, 2xCH_3), 1.38-1.22 (m, 10H, 5xCH_2), 0.92-0.85 (m, 3H, CH_3); IR (KBr): 3299, 2960, 2928, 2854, 1623, 1516, 1468, 1417, 1367, 1324, 1279, 1181, 1079, 987, 847, 768, 693 cm^{-1}.

Anal. Calcd. for $C_{18}H_{27}ClN_2O$: C, 66.96; H, 8.43; N, 8.68. Found: C, 67.21; H, 8.27; N, 8.56.

2,2-Dimethyl-3-benzyl-1,2-dihydroquinazolin-4(3*H*)-one (**10i**).

This compound was obtained as solid with mp 200-201 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.98 (d, *J* = 7.2 Hz, 1H, H5), 7.30-7.23 (m, 5H), 7.22 (dd, J_1 = 7.6 Hz, J_2 = 8.4 Hz, 1H, H7), 6.87 (dd, J_1 = 7.2 Hz, J_2 = 7.6 Hz, 1H, H6), 6.64 (d, *J* = 8.4 Hz, 1H, H8), 4.82 (s, 2H, CH2), 1.55 (s, 6H, 2xCH_3); IR (KBr): 3321, 3030, 2997, 2927, 1625, 1514, 1458, 1364, 1284, 1179, 1073, 1025, 918, 858, 756, 694 cm^{-1}.

Anal. Calcd. for $C_{17}H_{18}N_2O$: C, 76.66; H, 6.81; N, 10.52. Found: C, 76.59; H, 7.05; N, 10.67.

2-Methyl-2-ethyl-1,2-dihydroquinazolin-4(3*H*)-one (**10j**).

This compound was obtained as solid with mp 184-186 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.87 (d, *J* = 8.0 Hz, 1H, H5), 7.30 (dd, J_1 = 8.0 Hz, J_2 = 7.2 Hz, 1H, H7), 6.81 (dd, J_1 = 8.0 Hz, J_2 = 7.2 Hz, 1H, H6), 6.62 (d, *J* = 8.0 Hz, 1H, H8), 6.16 (br s, 1H, NH), 1.81 (q, *J* = 8.0 Hz, 2H, CH_2), 1.50 (s, 3H, CH_3), 0.99 (t, *J* = 8.0 Hz, 3H, CH_3); IR (KBr):3279, 3178, 2974, 1643, 1609, 1512, 1489, 1430, 1395, 1331, 1275, 1182, 1153, 758 cm^{-1}.

Anal. Calcd. for $C_{11}H_{14}N_2O$: C, 69.45; H, 7.42; N, 14.73. Found: C, 69.58; H, 7.14; N, 14.89.

2,2-Diethyl-1,2-dihydroquinazolin-4(3*H*)-one (**10k**).

This compound was obtained as solid with mp 190-191 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.85 (d, *J* = 8.0 Hz, 1H, H5), 7.28 (dd, J_1 = 8.0 Hz, J_2 = 8.0 Hz, 1H, H7), 6.78 (dd, J_1 = 8.0 Hz, J_2 = 8.0 Hz, 1H, H6), 6.60 (d, *J* = 8.0 Hz, 1H, H8), 5.98 (br s, 1H, NH), 1.76 (q, *J* = 8.0 Hz, 4H, 2xCH_2), 0.97 (t, *J* = 8.0 Hz, 6H, 2xCH_3); IR (KBr):3320, 3175, 2974, 1646, 1607, 1510, 1489, 1463, 1429, 1395, 1329, 1274, 1150, 758 cm^{-1}.

Anal. Calcd. for $C_{12}H_{16}N_2O$: C, 70.56; H, 7.90; N, 13.71. Found: C, 70.83; H, 7.84; N, 13.62.

7-Chloro-2-methyl-2-ethyl-1,2-dihydroquinazolin-4(3*H*)-one (**10l**).

This compound was obtained as solid with mp 173-174 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.78 (d, *J* = 8.0 Hz, 1H, H5), 6.96 (br s, 1H, NH), 6.75 (d, *J* = 8.0, 1H, H6), 6.63 (s, 1H, H8), 1.79 (q, *J* = 8.0 Hz, 2H, CH_2), 1.50 (s, 3H, CH_3), 0.98 (t, *J* = 8.0 Hz, 3H, CH_3); IR (KBr):3304, 3191, 2974, 1642, 1608, 1510, 1480, 1454, 1419, 1320, 1276, 1156, 1079, 896, 854, 778 cm^{-1}.

Anal. Calcd. for $C_{11}H_{13}ClN_2O$: C, 58.80; H, 5.83; N, 12.47. Found: C, 58.92; H, 5.71; N, 12.56.

7-Chloro-2,2-diethyl-1,2-dihydroquinazolin-4(3*H*)-one (**10m**).

This compound was obtained as solid with mp 164-166 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.76 (d, *J* = 8.0 Hz, 1H, H5), 6.71 (d, *J* = 8.0 Hz, 1H, H6), 6.61 (s, 1H, H8), 6.59 (br s, 1H, NH),1.75 (q, *J* = 8.0 Hz, 4H, 2xCH_2), 0.96 (t, *J* = 8.0 Hz, 6H, 2xCH_3); IR (KBr):3286, 3215, 2967, 1644, 1608, 1513, 1483, 1461, 1420, 1363, 1324, 1276, 1175, 1155, 1082, 986, 912, 874, 774 cm^{-1}.

Anal. Calcd. for $C_{12}H_{15}ClN_2O$: C, 60.38; H, 6.33; N, 11.74. Found: C, 60.51; H, 6.31; N, 11.59.

2-(4'-Methylphenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10n**).

This compound was obtained as solid with mp 231-233 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.94 (d, *J* = 7.2 Hz, 1H, H5), 7.48 (d, *J* = 8.0 Hz, 2H), 7.34 (dd, J_1 = 8.4 Hz, J_2=8.4 Hz, 1H, H7), 7.25 (d, *J* = 8.0 Hz, 2H), 6.90 (dd, J_1 = 8.4 Hz, J_2 = 7.2 Hz, 1H, H6), 6.67 (d, *J* = 8.4 Hz, 1H, H8), 5.87 (s, 1H, H2), 5.78 (br s, 1H, NH), 2.40 (s, 3H, CH_3); IR (KBr): 3312, 3194, 1657, 1611, 1509, 1486, 1438, 1385, 1328, 1297, 1151, 1133, 1022, 948, 909, 859, 800, 751 cm^{-1}.

Anal. Calcd. for $C_{15}H_{14}N_2O$: C, 75.61; H, 5.92; N, 11.76. Found: C, 75.82; H, 5.74; N, 11.85.

2-(3',4'-Methylenedioxylphenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10o**).

This compound was obtained as solid with mp 199-201 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.94 (d, *J* = 7.2 Hz, 1H, H5), 7.34 (dd, J_1 = 7.6 Hz, J_2 = 8.4 Hz, 1H, H7), 7.15 (s, 1H), 6.99 (d, *J* = 8.0 Hz, 1H), 6.91 (dd, J_1 = 7.2 Hz, J_2 = 7.6 Hz, 1H, H6), 6.83 (d, *J* = 8.0 Hz, 1H), 6.67 (d, *J* = 8.0 Hz, 1H, H8), 6.02 (s, 2H, OCH_2O), 5.82 (s, 1H, H2), 5.80 (br s, 1H, NH); IR (KBr):3282, 3181, 1654, 1612, 1486, 1446, 1388, 1327, 1297, 1248, 1187, 1164, 1149, 1121, 1105, 1036, 930, 864, 786, 754 cm^{-1}.

Anal. Calcd. for $C_{15}H_{12}N_2O_3$: C, 67.16; H, 4.51; N, 10.44. Found: C, 67.27; H, 4.38; N, 10.49.

7-Chloro-2-(4'-methylphenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10p**).

This compound was obtained as solid with mp 242-244 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.87 (d, *J* = 8.8 Hz, 1H, H5), 7.45 (d, *J* = 8.0 Hz, 2H), 7.25 (d, *J* = 8.0 Hz, 2H), 6.86 (d, *J* = 8.8 Hz, 1H, H6), 6.67 (s, 1H, H8), 5.87 (s, 1H, H2), 5.78 (br s,1H, NH), 2.40 (s, 3H, CH_3); IR (KBr): 3294, 3181, 1654, 1606, 1510, 1471, 1432, 1370, 1297, 1172, 1133, 1079, 1014, 922, 858, 816, 748, 721, 678 cm^{-1}.

Anal. Calcd. for $C_{15}H_{13}ClN_2O$: C, 66.06; H, 4.80; N, 10.27. Found: C, 66.24; H, 4.76; N, 10.19.

7-Chloro-2-(4'-methoxyphenyl)-1,2-dihydroquinazolin-4(3*H*)-one (**10q**).

This compound was obtained as solid: with mp 215-216 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.86 (d, *J* = 8.8 Hz, 1H, H5), 7.51 (d, *J* = 8.0 Hz, 2H), 6.96 (d, *J* = 8.0 Hz, 2H), 6.86 (d, *J* = 8.0 Hz, 1H, H6), 6.67 (s, 1H, H8), 5.86 (s, 1H, H2), 5.77 (br s, 1H, NH), 3.85 (s, 3H, CH_3O); IR (KBr): 3295, 3185, 1654, 1610, 1510, 1480, 1427, 1369, 1294, 1254, 1171, 1135, 1110, 1079, 1038, 923, 863, 834, 782, 748, 680 cm^{-1}.

Anal. Calcd. for $C_{15}H_{13}ClN_2O_2$: C, 62.40; H, 4.54; N, 9.70. Found: C, 62.56; H, 4.32; N, 9.81.

2,2-Tetramethylene-1,2-dihydroquinazolin-4(3H)-one (**12a**).

This compound was obtained as solid with mp 251-253 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.88 (d, *J* = 7.2 Hz, 1H, H5), 7.31 (dd, J_1 = 8.4 Hz, J_2 = 7.2 Hz, 1H, H7), 6.85 (dd, J_1 = 7.2 Hz, J_2 = 7.2 Hz, 1H, H6), 6.65 (d, *J* = 8.4 Hz, 1H, H8), 6.17 (br s, 1H, NH), 1.97-1.88 (m, 4H, 2xCH_2), 1.80-1.79 (m, 4H, CH_2CH_2); IR (KBr): 3292, 3159, 2972, 1638, 1606, 1517, 1485, 1431, 1385, 1334, 1270, 1149, 1088, 1049, 954, 849, 803, 781, 753 cm^{-1}.

Anal. Calcd. for $C_{12}H_{14}N_2O$: C, 71.26; H, 6.98; N, 13.85. Found: C, 71.38; H, 6.71; N, 14.02.

2,2-Pentamethylene-1,2-dihydroquinazolin-4(3*H*)-one (**12b**).

This compound was obtained as solid with mp 224-225 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.87 (d, *J* = 7.6 Hz, 1H, H5), 7.30 (dd, J_1 = 8.4Hz, J_2 = 7.2 Hz, 1H, H7), 6.82 (dd, J_1 = 7.6 Hz J_2 = 7.2 Hz, 1H, H6), 6.65 (d, *J* = 8.4 Hz, 1H, H8), 6.19 (br s, 1H, NH), 1.84-1.80 (m, 4H, 2xCH_2), 1.60-1.53 (m, 4H, 2xCH_2), 1.48-1.47 (m, 2H, CH_2); IR (KBr): 3367, 3170, 2923, 1651, 1612, 1507, 1484, 1417, 1382, 1269, 1210, 1178, 1145, 1093, 1040, 1004, 951, 914, 855, 802, 760 cm^{-1}.

Anal. Calcd. for $C_{13}H_{16}N_2O$: C, 72.19; H, 7.46; N, 12.95. Found: C, 72.32; H, 7.28; N, 13.15.

7-Chloro-2,2-tetramethylene-1,2-dihydroquinazolin-4(3*H*)-one (**12c**).

This compound was obtained as solid with mp 223-225 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.80 (d, *J* = 8.8 Hz, 1H, H5), 6.80 (d, *J* = 8.8 Hz, 1H, H6), 6.65 (s, 1H, H8), 6.23 (br s, 1H, NH), 1.96-1.81 (m, 4H, 2_CH_2), 1.80-1.62 (m, 4H, 2xCH_2); IR (KBr): 3260, 3189, 1650, 1608, 1519, 1480, 1421, 1361, 1318, 1277, 1154, 1078, 1044, 936, 899, 855, 768 cm^{-1}.

Anal. Calcd. for $C_{12}H_{13}ClN_2O$: C, 60.98; H, 5.54; N, 11.84. Found: C, 61.02; H, 5.36; N, 11.97.

7-Chloro-2,2-pentamethylene-1,2-dihydroquinazolin-4(3*H*)-one (**12d**).

This compound was obtained as solid with mp 221-222 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.79 (d, *J* = 8.8 Hz, 1H, H5), 6.77 (d, *J* = 8.8 Hz, 1H, H6), 6.66 (s, 1H, H8), 6.17 (br s, 1H, NH), 1.83-1.78 (m, 4H, 2xCH_2), 1.67-1.53 (m, 4H, 2xCH_2), 1.49-1.45 (m, 2H, CH_2); IR (KBr): 3362, 3249, 1699, 1600, 1576, 1507, 1464, 1336, 1152, 1044, 890, 751 cm^{-1}.

Anal. Calcd. for $C_{13}H_{15}ClN_2O$: C, 62.28; H, 6.03; N, 11.17. Found: C, 62.43; H, 5.96; N, 11.33.

General Procedure for the Synthesis of 5,6-Dihydroimidazo[1,2-*c*]-quinazolines.

A solution of 2-(*o*-nitrophenyl)imidazole **6** (3 mmol) and ketone or aldehyde **9** (3 mmol) in anhydrous THF (10 mL) was added carefully at room temperature to a suspension of low-valent titanium reagent (10 mmol) prepared as mentioned above. When the reaction was completed (at room temperature under N_2), most of the solvent was removed *in vacuo*. The residue was poured into 10% HCl (50 mL), and extracted with $CHCl_3$ (3_50 mL). The combined organic layers were washed with water (3x50 mL), dried (Na_2SO_4), and the solvent was removed *in vacuo* to give the crude product. The crude product was purified by column chromatography on silica gel (200-300 mesh) using petroleum ether (b.p. 60-90 ºC) – acetone (5:1) as eluent.

5,5-Dimethyl-2,3-diphenyl-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13a**).

This compound was obtained as solid with mp 240-241 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.84 (d, *J* = 7.2 Hz, 1H), 7.51-7.54 (m, 5H), 7.36 (d, *J* = 7.2 Hz, 2H), 7.08-7.19 (m, 4H), 6.83 (d, *J* = 7.2 Hz, 1H), 6.79 (d, *J* = 8.8 Hz, 1H), 6.52 (br s, 1H, NH), 1.36 (s, 6H, 2xCH_3); IR (KBr): 3240, 3012, 2979, 1614, 1512, 1479, 1444, 1367, 1275, 1211, 1161, 1072, 964, 916, 791, 772, 752, 698 cm^{-1}.

Anal. Calcd. for $C_{24}H_{21}N_3$: C, 82.02; H, 6.02; N, 11.96. Found: C, 82.25; H, 5.89; N, 12.10.

5,5-Dimethyl-9-chloro-2,3-diphenyl-5,6-dihydroimidazo[1,2-*c*]-quinazoline (**13b**).

This compound was obtained as solid with mp 228-229 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.77 (s, 1H), 7.58-7.48 (m, 5H), 7.36 (d, *J* = 7.6 Hz, 2H), 7.21-7.10 (m, 4H), 6.80 (d, *J* = 8.4 Hz, 1H), 6.76 (br s, 1H, NH), 1.35 (s, 6H, 2xCH_3); IR (KBr): 3247, 3087, 2979, 1603, 1557, 1525, 1508, 1477, 1444, 1389, 1368, 1309, 1226, 1161, 814, 774, 697 cm^{-1}.

Anal. Calcd. for $C_{24}H_{20}ClN_3$: C, 74.70; H, 5.22; N, 10.89. Found: C, 74.82; H, 5.06; N, 10.96.

5,5-Dimethyl-8,9-methylenedioxy-2,3-diphenyl-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13c**).

This compound was obtained as solid with mp 239-240 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.48-7.53 (m, 5H), 7.33 (d, *J* = 7.2 Hz, 2H), 7.29 (s, 1H), 7.16-7.06 (m, 3H), 6.41 (s, 1H), 6.32 (br s, 1H, NH), 5.97 (s, 2H, CH_2), 1.31 (s, 6H, 2xCH_3). IR (KBr): 3230, 2976, 1626, 1502, 1469, 1354, 1265, 1198, 1148, 1039, 941, 864, 831, 781, 700 cm^{-1}.

Anal. Calcd. for $C_{25}H_{21}N_3O_2$: C, 75.93; H, 5.35; N, 10.63. Found: C, 76.03; H, 5.28; N, 10.55.

5,5-Dimethyl-2,3-di(4'-methylphenyl)-5,6-dihydroimidazo[1,2-*c*]-quinazoline (**13d**).

This compound was obtained as solid with mp 222-224 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.81 (d, J = 7.6 Hz, 1H), 7.40-

7.14 (m, 7H), 6.97 (d, J = 8.4 Hz, 2H), 6.96-6.77 (m, 2H), 6.52 (br s, 1H, NH), 2.42 (s, 3H, CH_3), 2.21 (s, 3H, CH_3), 1.34 (s, 6H, 2xCH_3); IR (KBr): 3224, 3012, 1613, 1513, 1500, 1490, 1388, 1367, 1311, 1278, 1232, 1211, 1167, 1107, 1022, 968, 824, 754, 705 cm^{-1}.

Anal. Calcd. for $C_{26}H_{25}N_3$: C, 82.29; H, 6.64; N, 11.07. Found: C, 82.17; H, 6.75; N, 11.23.

5,5-Dimethyl-2,3-di(4'-methylphenyl)-9-chloro-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13e**).

This compound was obtained as solid with mp 215-217 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.73 (d, J = 8.8 Hz, 1H), 7.32-7.24 (m, 5H), 7.19 (d, J = 7.6 Hz, 1H), 7.04 (d, J = 8.4 Hz, 1H), 6.98 (d, J = 8.0 Hz, 1H), 6.88 (d, J = 8.8 Hz, 1H), 6.79 (d, J = 8.4 Hz, 1H), 6.75 (br s, 1H, NH), 2.42 (s, 3H, CH_3), 2.21(s, 3H, CH_3), 1.35 (s, 6H, 2xCH_3); IR (KBr): 3212, 1613, 1508, 1490, 1389, 1369, 1306, 1258, 1229, 1205, 1163, 1108, 1083, 1019, 971, 813, 767, 738, 678 cm^{-1}.

Anal. Calcd. for $C_{26}H_{24}ClN_3$: C, 75.44; H, 5.84; N, 10.15. Found: C, 75.59; H, 5.66; N, 10.37.

5,5-Dimethyl-2,3-di(4'-bromophenyl)-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13f**).

This compound was obtained as solid with mp 262-264 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.83 (d, J = 7.6 Hz, 1H), 7.74 (d, J = 8.4 Hz, 1H), 7.50-7.40 (m, 6H), 7.27 (d, J = 8.4 Hz, 1H), 7.17 (d, J = 7.2 Hz, 1H), 6.83 (d, J = 7.6 Hz, 1H), 6.79 (d, J = 7.2 Hz, 1H), 6.61 (br s, 1H, NH), 1.39 (s, 6H, 2xCH_3); IR (KBr): 3354, 3050, 1610, 1532, 1496, 1401, 1328, 1152, 1098, 1079, 1009, 969, 810, 748, 717 cm^{-1}.

Anal. Calcd. for $C_{24}H_{19}Br_2N_3$: C, 56.61; H, 3.76; N, 8.25. Found: C, 56.83; H, 3.51; N, 8.09.

5,5-Dimethyl-2,3-di(4'-bromophenyl)-9-chloro-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13g**).

This compound was obtained as solid with mp 286-288 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.74 (d, J = 8.4 H, 2H), 7.50-7.45 (m, 3H), 7.42 (d, J = 8.8 Hz, 2H), 7.28 (d, J = 8.8 Hz, 2H), 7.22 (d, J = 8.4 Hz, 1H), 6.83 (br s, 1H, NH), 6.81 (d, J = 8.4 Hz, 1H), 1.41 (s, 6H, 2xCH_3); IR (KBr): 3390, 3012, 2973, 1610, 1592, 1536, 1491, 1387, 1307, 1195, 1167, 1099, 1070, 1009, 829 cm^{-1}.

Anal. Calcd. for $C_{24}H_{18}Br_2ClN_3$: C, 53.02; H, 3.34; N, 7.73. Found: C, 53.26; H, 3.15; N, 7.96.

5,5-Dimethyl-2,3-di(4'-methoxyphenyl)-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13h**).

This compound was obtained as solid with mp 187-189 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.82 (d, J = 7.2 Hz, 1H), 7.44 (d, J = 8.8 Hz, 2H), 7.38 (d, J = 8.4 Hz, 1H), 7.31 (d, J = 8.0 Hz, 1H), 7.14 (t, J = 7.2 Hz, 1H), 7.08-7.05 (m, 2H), 6.82 (d, J = 7.2 Hz, 1H), 6.77 (d, J = 8.4 Hz, 2H), 6.58 (t, J = 7.2 Hz, 1H), 6.53 (br s, 1H, NH), 3.84 (s, 3H, CH_3O), 3.69 (s, 3H, CH_3O), 1.35 (s, 6H, 2xCH_3); IR (KBr): 3305, 1613, 1540, 1489, 1384, 1363, 1287, 1176, 1106, 1030, 966, 837, 742 cm^{-1}.

Anal. Calcd. for $C_{26}H_{25}N_3O_2$: C, 75.89; H, 6.12; N, 10.21. Found: C, 75.94; H, 5.96; N, 10.37.

5,5-Dimethyl-2,3-di(4'-methoxyphenyl)-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13i**).

This compound was obtained as solid with mp 196-197 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ =7 .74 (s, 1H), 7.39 (d, J = 8.8 Hz, 2H), 7.31 (d, J = 8.8 Hz, 2H), 7.17 (d, J = 8.4 Hz, 1H), 7.07 (d, J = 8.8 Hz, 2H), 6.80-6.75 (m, 4H), 6.74 (br s, 1H, NH), 3.84 (s, 3H, CH3), 3.69 (s, 3H, CH3), 1.35 (s, 6H, 2xCH_3); IR (KBr): 3389, 1611, 1530, 1493, 1385, 1367, 1238, 1107, 1029, 966, 879, 841, 803, 774, 745, 713, 681 cm^{-1}.

Anal. Calcd. for $C_{26}H_{24}ClN_3O_2$: C, 70.03; H, 5.42; N, 9.42. Found: C, 70.18; H, 5.27; N, 9.53.

5,5-Dimethyl-2,3-di(4'-fluorophenyl)-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13j**).

This compound was obtained as solid with mp 261-262 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.83 (d, J = 7.6 Hz, 1H), 7.57 (dd, J_1 = 8.8 Hz, J_2 = 5.6 Hz, 2H), 7.39-7.34 (m, 4H), 7.20-7.15 (m, 1H), 7.04 (dd, J_1 = 8.8 Hz, J_2 = 5.6 Hz, 2H), 6.83 (d, J = 7.6 Hz, 1H), 6.79 (d, J = 8.4 Hz, 1H), 6.58 (br s, 1H, NH), 1.36 (s, 6H, 2xCH_3). IR (KBr): 3416, 2987, 1619, 1595, 1538, 1485, 1385, 1364, 1321, 1279, 1214, 1159, 855, 843, 818, 748, 703 cm^{-1}.

Anal. Calcd. for $C_{24}H_{19}F_2N_3$: C, 74.40; H, 4.94; N, 10.85. Found: C, 74.37; H, 4.89; N, 11.03.

5-(4'-Methylphenyl)-2,3-diphenyl-5,6-dihydroimidazo[1,2-*c*]-quinazoline (**13k**).

This compound was obtained as solid with mp 239-240 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.52-7.51 (m, 5H), 7.40-7.38 (m, 2H), 7.33-7.31 (m, 5H), 7.21-7.12 (m, 4H), 6.98-6.78 (m, 1H), 6.75-6.77 (m, 1H), 4.47 (s, 1H), 2.42 (s, 3H, CH_3); IR (KBr): 3367, 3055, 2920, 1609, 1584, 1535, 1517, 1505, 1477, 1441, 1334, 1306, 1283, 1067, 817, 765, 739, 714, 695 cm^{-1}.

Anal. Calcd. for $C_{29}H_{23}N_3$: C, 84.23; H, 5.61; N, 10.16. Found: C, 84.46; H, 5.38; N, 10.24.

5-(3',4'-Dimethoxyphenyl)-2,3-diphenyl-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13l**).

This compound was obtained as solid with mp 237-239 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.51-7.37 (m, 11H), 7.17-7.14 (m, 3H), 7.02 (s, 1H), 6.87 (d, *J* = 8.0 Hz, 1H), 6.70 (d, *J* = 8.0 Hz, 1H), 4.44 (s, 1H),3.91 (s, 3H, CH_3O), 3.80 (s, 3H, CH_3O); IR (KBr): 3241, 3066, 2982, 1611, 1512, 1476, 1443, 1386, 1371, 1312, 1277, 1229, 1211, 1164, 1029, 967, 770, 752, 722, 700 cm^{-1}.

Anal. Calcd. for $C_{30}H_{25}N_3O_2$: C, 78.41; H, 5.48; N, 9.14. Found: C, 78.57; H, 5.23; N, 9.29.

5-(4'-Methylphenyl)-2,3-diphenyl-9-chloro-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13m**).

This compound was obtained as solid with mp 217-218 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.55-7.42 (m, 6H), 7.25-7.00 (m, 7H), 6.89 (d, *J* = 8.0 Hz, 1H), 6.81 (d, *J* = 8.4 Hz, 1H), 6.39 (d, *J* = 7.2 Hz, 2H), 4.29 (s, 1H), 2.18 (s, 3H, CH_3); IR (KBr): 3265, 3066, 2951, 1608, 1529, 1496, 1443, 1118, 1065, 1015, 887, 815, 775, 698 cm^{-1}.

Anal. Calcd. for $C_{29}H_{22}ClN_3$: C, 77.76; H, 4.95; N, 9.38. Found: C, 77.85; H, 4.81; N, 9.25.

5-(4'-Methoxylphenyl)-2,3-diphenyl-9-chloro-5,6-dihydroimidazo[1,2-*c*]quinazoline (**13n**).

This compound was obtained as solid with mp 206-207 ºC; ^{1}HNMR (400 MHz, $CDCl_3$): δ = 7.58-7.49 (m, 6H), 7.41-7.32 (m, 7H), 7.08 (d, *J* = 8.4 Hz, 2H), 6.73 (d, *J* = 8.0 Hz, 2H), 4.43 (s, 1H), 3.84 (s, 3H, CH_3O); IR (KBr): 3455, 3057, 2925, 1612, 1500, 1442, 1323, 1250, 1155, 1072, 1028, 971, 916, 860, 813, 769, 697 cm^{-1}.

Anal. Calcd. for $C_{29}H_{22}ClN_3O$: C, 75.07; H, 4.78; N, 9.06. Found: C, 75.26; H, 4.59; N, 9.13.

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