5. EXPERIMENTAL

The experimental has been subcategorized into three parts:

5.1.1 Chemical work

5.1.2 Biological screening

5.1.3 Computational studies

5.1 Chemical work

All chemical reagents and solvents employed in the synthesis of the target compounds were purified following established laboratory procedures before use. The progress of reactions was monitored using thin-layer chromatography (TLC) on aluminum-backed silica gel 60G plates, with visualization carried out under UV light at 254 nm, iodine vapor exposure, and ninhydrin staining where applicable. Melting points were recorded using a Veego oil bath apparatus with the open capillary method, and the values are uncorrected. Purification of the synthesized compounds was achieved through column chromatography utilizing silica gel (100–200mesh) and neutral alumina as stationary phases. Infrared (IR) spectra were collected using a Bruker FT-IR ALPHA-II spectrophotometer (Germany), and the absorption bands are reported in cm^{-1}. Proton (^{1}H) and carbon (^{13}C) NMR spectra were recorded on a Bruker Avance-II 400 MHz spectrometer in $CDCl_3$ or DMSO-d_6, with tetramethylsilane (TMS) serving as the internal standard. The ^{1}H NMR data include multiplicity annotations such as singlet (s), doublet (d), doublet of doublets (dd), triplet (t), multiplet (m), and broad singlet (bs), with chemical shifts expressed in δ (ppm) and coupling constants (J) in Hz. Mass spectral data were obtained using an ABI MSD Sciex API-3000 instrument operating in electrospray ionization (ESI) mode.

5.1.1 3.4-Dimethoxybenzaldoxime (120)

In 50ml RBF, 3,4-dimethoxybenzaldehyde (**105**, 0.5gm, 3.60mM) was dissolved in methanol (10ml). Sodium acetate trihydrate (1.8gm, 1.32mM) and hydroxylamine hydrochloride (0.91gm, 1.32mM) was added to the reaction mixture and refluxed for 3-4hrs on water bath. Completion of reaction was monitored using TLC. After completion, excess methanol was removed under vacuum and the reaction mixture was poured on ice cold water. The obtain precipitates were filtered, dried and crystallized using methanol to obtain brown solid (0.43gm, 87%); m.p. 93-95^{o}C (Lit. 93-94^{o}C)[1-2].

Analysis

TLC : R_f 0.27 (*n*-Hexane: ethyl acetate 9:1)

IR (KBr, cm^{-1}) : 3440, 1610, 1265, 758

5.1.2 3-Hydroxybenzaldoxime (121)

Compound (**121)** was synthesized from 4-hydroxybenzaldehyde (**106,** 0.5gm, 3.00mM) in methanol (10ml) following same conditions as discussed for compound **(120)** to obtain title compound as white solid (0.43gm, 87%); m.p. 90-92^oC (91-93^oC)[1-2].

Analysis

TLC : R_f 0.42 (*n* -Hexane: ethyl acetate 9:1)

IR (KBr, cm^{-1}) : 3600, 1620, 1398, 1187

5.1.3 4-Methoxybenzaldoxime (122)

Compound (**122)** was synthesized using 4-methoxybenzaldehyde (**107**,0.5gm, 3.60mM) and sodium acetate trihydrate (1.6gm, 1.02mM) following same conditions as discussed for compound (**120)** to obtain title compound as white solid (0.47gm, 93%); m.p. 86-61^oC (Lit. 60^oC)[1-2].

Analysis

TLC : R_f 0.50 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) : 3300, 1607, 1457, 1251

5.1.4 3-Chlorobenzaldoxime (123)

Compound (**123)** was synthesized using 3-chlorobenzaldehyde (**108**,0.5gm, 3.50mM) in methanol following the same procedure as discussed for compound (**120)** to obtain final compound as white solid (0.48gm, 92%);m.p.149-151^oC (Lit. 150^oC[1-2]).

Analysis

TLC : R_f 0.43 (*n*-Hexane: ethyl acetate, 9:1)

IR (KBr, cm^{-1}) : 3195, 1629, 1596, 1209, 782

5.1.5 4-Bromobenzaldoxime (124)

Compound (**124)** was synthesized using 4-bromobenzaldehyde (**109**, 0.5gm, 2.70mM) dissolved in methanol (10ml) by following same procedure as discussed for compound (**120)** to obtain white solid (0.47gm, 94%); m.p. 106-108^oC (Lit. 106^oC)[1-2].

Analysis

TLC	: R_f 0.50 (*n*-Hexane: ethyl acetate; 9:1)
IR(KBr, cm^{-1})	: 3299, 1646, 1487, 1209

5.1.6 3-Nitrobenzaldoxime (125)

Compound (**125)** was synthesized using 3-nitrobenzaldehyde (**110**, 0.5gm, 3.33mM) dissolved in methanol (10ml) by following same procedure as discussed for compound (**120)** to get title compound as yellow solid (0.46gm, 92%); m.p. 119-12 ^oC (Lit. 121-122 ^oC)[1-2].

Analysis

TLC	: R_f 0.40 (*n* -Hexane: ethyl acetate; 9:1)
IR (KBr, cm^{-1})	: 3298, 1617, 1350, 1209.

5.1.7 4-Methylbenzaldoxime (126)

Compound (**126)** was synthesized using 4-methylbenzaldehyde (**111**, 0.5gm, 4.12mM) dissolved in methanol (10ml) by following same procedure as discussed for compound (**120)** to obtain desired compound as off white solid (0.45gm, 90%); m.p. 75-77^oC (Lit. 76-78^oC)[1-2].

Analysis

TLC	: R_f 0.52 (*n* -Hexane: ethyl acetate; 9:1)
IR (KBr, cm^{-1})	: 3279, 1605, 1497, 1292

5.1.8 Benzaldoxime (127)

Compound (**127)** was synthesized using benzaldehyde (**112**, .5gm, 3.01mM) dissolved in methanol (10ml) by following same method as discussed for compound (**120)** to get title compound as white solid (0.48gm, 95%); m.p.79-81^oC (78-80^oC)[1-2].

Analysis

TLC	: R_f 0.40 (*n* -Hexane: ethyl acetate, 9:1)
IR (KBr, cm^{-1})	: 3248, 1601, 1480, 1276.

5.1.9 3-Methylbenzaldoxime (128)

Compound (**128)** was synthesized using 3-methylbenzaldehyde (**113**, 0.5gm, 4.01mM) dissolved in methanol (10ml) by following same procedure as discussed for compound (**120)** to get title compound as white solid (0.43gm, 87%), m.p.105-107^oC (106-108^oC)[1-2].

Analysis

TLC : R_f 0.49 (*n* -Hexane: ethyl acetate, 9:1)

IR (KBr, cm^{-1}) : 3230, 1525, 1438, 1287

5.1.10 3-Methoxybenzaldoxime (129)

Compound (**129)** was synthesized using 3-methoxybenzaldehyde (**114**, 0.5gm, 3.60mM) dissolved in methanol (10ml) by following same procedure as discussed for compound (**120)** to obtain title compound as orange solid (0.44gm, 89%); m.p.87-89^oC (Lit. 86-88^oC)[1-2].

Analysis

TLC : R_f 0.50 (*n*-Hexane: ethyl acetate; 9:1)

IR(KBr, cm^{-1}) : 3356, 1584, 1265, 1194

5.1.11 4-Aminodimethylbenzaldoxime (130)

Compound (**130)** was synthesized using 4-aminodimethylbenzaldehyde (**115**, 0.5gm, 4.02mM) dissolved in methanol (10ml) by following same procedure as discussed for compound (**120)** to obtain title compound as brown liquid (0.39gm, 82%) Lit. 36-38^oC)[1-2].

Analysis

TLC : R_f 0.38 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) : 3300, 2836, 1604, 1208, 1161

5.1.12 2-Nitrobenzaldoxime (131)

Compound (**131)** was synthesized using 2-nitrobenzaldehyde (**115**, 0.5gm, 3.33mM) dissolved in methanol (10ml) by following same procedure as discussed for compound (**120)** to obtain title compound as yellow solid (0.42gm, 89%); m.p.92-94^oC (Lit. 91-93 ^oC)[1-2].

Analysis

TLC : R_f 0.42 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) : 3309, 1605, 1425, 1209

5.1.13 3-Bromobenzaldoxime (132)

Compound (**132)** was synthesized by reacting 3-bromobenzaldehyde (**116**, 0.5gm, 2.71mM) dissolved in methanol (10ml) by following same reaction conditions as discussed for compound (**120)** to obtain title compound as white solid (0.47gm,

94%); m.p. 79-81ºC (Lit. 80ºC)[1-2].

Analysis

TLC	: R_f 0.48 (*n*-Hexane: ethyl acetate; 9:1)
IR (KBr, cm^{-1})	: 3201, 1629, 1480, 1315.

5.1.14 4-Isopropylbenzaldoxime (133)

Compound (**133)** was synthesized by reacting isopropyl benzaldehyde (**117**, 0.5gm, 3.30mM) dissolved in methanol (10ml) by following same reaction conditions as discussed for compound (**120)** to obtain product as brown solid (0.46gm, 92%); m.p. 60-63ºC (Lit. 64-66ºC)[1-2].

Analysis

TLC	: R_f 0.55 (*n*-Hexane: ethyl acetate; 9:1)
IR (KBr, cm^{-1})	: 3351, 1611, 1461, 1217

5.1.15 4-Fluorobenzaldoxime (134)

Compound (**134)** was synthesized using 4-fluorobenzaldehyde (**118**, 0.5gm, 4.00mM) by dissolving in methanol (10ml) by following same reaction conditions as discussed for compound (**120)** to get title compound as white solid (0.45gm, 90%); m.p. 82-84 ºC (Lit. 85-86 ºC)[1-2].

Analysis

TLC	: R_f 0.38 (*n*-Hexane: ethyl acetate; 9:1)
IR (KBr, cm^{-1})	: 3191, 1641, 1324,1239

5.1.16 3,4-Dimethoxybenzonitrile (135*)*

In a 50ml RBF, 3,4-dimethoxybenzaldoxime (0.7gm, 4.50mM) was dissolved in toluene (10ml) and stirred at room temperature. In the reaction mixture thionyl chloride (2.17gm or 1.33ml, 0.018M) was added dropwise with continuous stirring at room temperature. Completion of reaction was monitored using TLC, after completion of reaction excess of thionyl chloride was removed under vacuum. The resultant mixture was poured on ice cold water and washed with $NaHCO_3$ solution (5%), extracted with ethyl acetate and dried over Na_2SO_4. The organic solvent was evaporated with the aid of rotary evaporator to obtain desired compound as dark brown solid (0.62gm, 89%); m.p. 65-67 ºC (Lit. 66-67 ºC)[3–5].

Analysis

TLC : R_f 0.76 (*n*-Hexane: ethyl acetate. 8:2)

IR (KBr, cm^{-1}) : 2218, 1268, 1021

5.1.17 3-Hydroxybenzonitrile (136)

Compound (**136)** was synthesized by reacting 3-hydroxybenzaldoxime (0.7gm, 3.58mM) dissolved in toluene (10ml) under the set reaction conditions discussed for compound (**135)** to get title compound as yellow liquid (0.65gm, 91%); m.p. (Lit. 20-22^oC)[3–5].

Analysis

TLC : R_f 0.62 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2201, 1564, 1325, 1247

5.1.18 4-Methoxybenzonitrile (137)

Compound (**137)** was synthesized through dehydration of 4-methoxybenzaldoxime (0.7gm, 4.60mM) under the set reaction conditions discussed for compound (**135)** to get title compound as brown solid (0.62gm, 89%); m.p. 56-58 ^oC (Lit. 57-61 ^oC)[3–5].

Analysis

TLC : R_f 0.71 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2221, 1604, 1303, 1258

5.1.19 3-Chlorobenzonitrile (138)

Compound (**138)** was synthesized through dehydration of 3-chlorobenzaldoxime (0.7gm, 4.44mM) by following the set reaction conditions discussed for compound (**135)** to obtain the title compound as yellow liquid, (0.63gm, 91%); m.p. (Lit. 51 ^oC)[3–5].

Analysis

TLC : R_f 0.70 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2240, 1567, 1414, 1268

5.1.20 4-Bromobenzonitrile (139)

Compound (**139)** was synthesized by reacting 4-bromobenzaldoxime (0.7gm, 3.50mM) under set conditions discussed for compound (**135)** to obtain title compound as white solid (0.63gm, 91%); m.p. 110-112^oC (Lit. 114^oC) [3–5].

Analysis

TLC : R_f 0.81 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2265, 1654, 1475, 1278

5.1.21 3-Nitrobenzonitrile (140)

Compound (**140)** was synthesized by reacting 3-nitrobenzaldoxime (0.7gm, 4.20mM) under set conditions discussed for compound (**135)** to get title compound as light yellow solid (0.65gm, 93%); m.p. 117-119^oC (Lit. 116^oC) [3–5].

Analysis

TLC : R_f 0.74(*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2229, 1618, 1475, 1199

5.1.22 4-Methylbenzonitrile (141)

Compound (**141)** was synthesized using 4-methylbenzaldoxime (0.7gm, 4.20mM) dissolved in toluene under the set conditions discussed for compound (**135)** to get the title compound as dark liquid (0.60gm, 87%); m.p. (Lit. 37-39^oC)[3–5].

Analysis

TLC : R_f 0.75 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2219, 1608, 1451, 1118.

5.1.23 Benzonitrile (142)

Compound **(142)** was synthesized by reacting benzaldoxime (0.7gm, 3.68mM) under the set conditions discussed for compound (**135)** to get title compound as colorless liquid (0.68gm, 95%); m.p. (65-67^oC) [3–5].

Analysis

TLC : R_f 0.59 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2300, 1559, 1383, 1129.

5.1.24 3-Methylbenzonitrile (143)

Compound **(143)** was synthesized by reacting 3-methylbenzaldoxime (0.7gm, 5.10mM) under the set conditions discussed for compound (**135)** to obtain title compound as brown liquid (0.65gm, 91%); m.p. (Lit. 25-27^oC)[3–5].

Analysis

TLC : R_f 0.69 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2215, 1651, 1428, 1087.

5.1.25 3-Methoxybenzonitrile (144)

Compound (**144)** was synthesized using 3-methoxybenzaldoxime (0.7gm, 4.61mM) under the set conditions described for compound (**135)** to get title compound as reddish liquid (0.61gm, 88%); m.p.(Lit. 22-24ºC)[3–5].

Analysis

TLC : R_f 0.71 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2235, 1681, 1328, 1162.

5.1.26 4-Aminodimethyl benzonitrile (145)

Compound (**145)** was synthesized using 4-aminodimethylbenzaldoxime (0.7gm, 4.51mM) following the set conditions discussed for compound (**135)** to get title compound as brown liquid (0.59gm, 86%); m.p.(Lit. 31-33ºC)[6].

Analysis

TLC : R_f 0.64 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2284, 1624, 1420, 1287.

5.1.27 2-Nitrobenzonitrile (146)

Compound (**146)** was synthesized using 2-nitrobenzaldoxime (0.7gm, 4.20mM) by following same method as discussed for compound (**135)** to obtain the title compound as yellow solid (0.65%, 93%); m.p. 146-148ºC (Lit. 146-147ºC)[6].

Analysis

TLC : R_f 0.75 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2238, 1605, 1349, 1297.

5.1.28 3-Bromobenzonitrile (147)

Compound (**147)** was synthesized by using 3-bromobenzaldoxime (0.7gm, 3.50mM) under the set conditions discussed for compound (**135)** to get the title compound as pale yellow liquid (0.63gm, 90%); m.p. (Lit. 39ºC)[6,7].

Analysis

TLC : R_f 0.81 (*n*-Hexane: ethyl acetate; 8:2)

IR (KBr, cm^{-1}) : 2241, 1564, 1410,1191.

5.1.29 4-Isopropylbenzonitrile (148)

Compound (**148)** was synthesized by using 4-isopropylbenzaldoxime (0.7gm, 4.20mM) following the same conditions as discussed for compound (**135)** to obtain title

compound as colorless liquid (0.60gm, 86%); m.p. (Lit. 88-90^{o}C)[6].

Analysis

TLC	: R_f 0.75 (*n*-Hexane: ethyl acetate; 8:2)
IR (KBr, cm^{-1})	: 2237, 1652, 1484, 1255.

5.1.30 4-Fluorobenzonitrile (149)

Compound (**149)** was synthesized by using 4-fluorobenzaldoxime (0.7gm, 5.70mM) following same conditions as discussed for compound (**135)** to obtain title compound as brown liquid (0.62gm, 89%); m.p. (Lit. 32-34^{o}C)[6,7].

Analysis

TLC	: R_f 0.72 (*n*-Hexane: ethyl acetate; 8:2)
IR (KBr, cm^{-1})	: 2248, 1602, 1240, 1098.

5.1.31 5-(3,4-Dimethoxyphenyl)-2*H*-tetrazole (150)

In a 50ml RBF, 3,4-dimethoxybenzonitrile (0.5gm, 3.78mM) was dissolved in dry DMF (3ml), sodium azide (0.93gm, 14.3mM) and ammonium chloride (0.77gm, 14.3mM) was added to the reaction mixture and heated for 6-8hrs at 110^{o}C. Completion of reaction was monitored using TLC. After completion, crushed ice was added to the reaction mixture and pH adjusted to 2 using dilute HCl. The obtained precipitate was filtered under vacuum and dried to get title compound as light brown solid (0.41gm, 82%); m.p. 203-206^{o}C (Lit. 206-209^{o}C)[7–12].

Analysis

TLC	: R_f 0.31 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3415, 1290, 1153, 1030

5.1.32 5-(4-Hydroxyphenyl)-2*H*-tetrazole (151)

Compound (**151)** was synthesized by 1,3-dipolar cycloaddition reaction by using 4-hydroxybenzonitrile (0.5gm, 4.20mM) under set condition reported for compound (**150)** to obtain title compound as white solid (0.42gm, 92%); m.p.157-159 ^{o}C (161-163^{o}C) [7–12]

Analysis

TLC	: R_f 0.41 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3600, 3389, 1284, 1168, 1054

5.1.33 5-(4-Methoxyphenyl)-2*H*-tetrazole (152)

Compound (**152)** was synthesized through 1,3-dipolar cycloaddition reaction of 4-methoxybenzonitrile (0.5gm, 3.70mM) under set conditions reported for compound (**151)** to obtain title compound as off white solid (0.44gm, 93%); m.p. 228-230ºC (Lit. 231-232ºC)[7–12].

Analysis

TLC : R_f 0.37 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3428, 1258, 1195, 1068

5.1.34 5-(3-Chlorophenyl)-2*H*-tetrazole (153)

Compound (**153)** was synthesized through 1,3-dipolar cycloaddition reaction of 3-chlorobenzonitrile (0.5gm, 3.62mM) under set conditions discussed for compound (**151)** to obtain title compound as white solid (0.43gm, 93%); m.p. 132-135ºC (Lit. 134.5ºC) [7–12].

Analysis

TLC : R_f 0.28 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3449, 1238, 1149, 1094.

5.1.35 5-(4-Bromophenyl)-2*H*-tetrazole (154)

Compound (**154)** was synthesized through 1,3-dipolar cycloaddition reaction of 4-bromobenzonitrile (0.5gm, 2.73mM) under set conditions of compound (**151)** to obtain title compound as off white solid (0.44gm. 94%); m.p. > 250ºC (Lit. 260-261ºC) [7–12].

Analysis

TLC : R_f 0.26 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3109, 1267, 1136, 1102

5.1.36 5-(3-Nitrophenyl)-2*H*-tetrazole (155)

Compound (**155)** was synthesized through 1,3-dipolar cycloaddition reaction of 3-nitrobenzonitrile (0.5gm, 3.33mM) under set conditions discussed for compound (**151)** to get title compound as light yellow solid (0.46gm, 95%); m.p. 108-109 ºC (Lit. 109-110ºC)[7–12].

Analysis

TLC : R_f 0.30 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3379, 1264, 1158, 1060, 1567.

5.1.37 5-(4-Methylphenyl)-2*H*-tetrazole (156)

Compound (**156)** was synthesized through 1,3-dipolar cycloaddition reaction of 4-methylbenzonitrile (0.5gm, 4.20mM) under the set conditions reported for compound (**151)** to get title compound as off white solid (0.42gm, 92%); m.p. 246-248ºC (Lit. 248ºC)[7–12].

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3439, 1269, 1171, 1069

5.1.38 5-Phenyl-2*H*-tetrazole (157)

Compound (**157)** was synthesized through 1,3-dipolar cycloaddition reaction of benzonitrile (0.5gm, 4.80mM) under set reaction conditions discussed for compound (**151)** to obtain title compound as white solid (0.47gm, 95%); m.p. 216-218ºC (Lit. 215-217ºC) [7–12].

Analysis

TLC : R_f 0.42 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3440, 1254, 1109, 1025

5.1.39 5-(3-Methylphenyl)-2*H*-tetrazole (158)

Compound (**158)** was synthesized through 1,3-dipolar cycloaddition reaction of 3-methylbenzonitrile (0.5gm, 4.20mM) under set conditions of compound **(151)** to get title compound as white solid (0.41gm, 89%); m.p.134-136ºC (136-138ºC) [7–12].

Analysis

TLC : R_f 0.38 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3429, 1298, 1138, 1023

5.1.40 5-(3-Methoxyphenyl)-2*H*-tetrazole (159)

Compound (**159)** was synthesized by 1,3-dipolar cycloaddition reaction of 3-methoxybenzonitrile (0.5gm, 3.71mM) under set conditions discussed for compound (**151)** to obtain title compound as white solid (0.41gm 87%); m.p. 155-157ºC (Lit. 156-158ºC)[7–12].

Analysis

TLC : R_f 0.36 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3451, 1247, 1159, 1032

5.1.41 5-(4-Aminodimethylphenyl)-2*H*-tetrazole (160)

Compound (**160)** was synthesized by 1,3-dipolar cycloaddition reaction of 4-aminodimethyl benzonitrile (0.5gm, 4.15mM) under the set conditions of compound (**151)** to obtain final compound as brown solid (0.47gm, 97%); m.p148-150^{o}C (149-151^{o}C)[7–12].

Analysis

TLC : R_f 0.38 (*n* -Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3321, 1648, 1254, 1108

5.1.42 5-(2-Nitrophenyl)-2*H*-tetrazole (161)

Compound (**161)** was synthesized by 1,3-dipolar cycloaddition reaction of 2-nitrobenzonitrile (0.5gm, 3.33mM) under the set conditions reported for compound (**151)** to obtain final compound as yellow solid (0.48gm, 98%); m.p.127-129^{o}C (130-132^{o}C)[7–12].

Analysis

TLC : R_f 0.35 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3465, 1239, 1143, 1009

5.1.43 5-(3-Bromophenyl)-2*H*-tetrazole (162)

Compound (**162)** was synthesized by 1,3-dipolar cycloaddition reaction of 3-bromobenzonitrile (0.5gm, 2.71mM) under the set conditions reported for compound (**151)** to obtain final compound as white solid (0.45gm, 90%); m.p. 144-146^{o}C (Lit. 145-146^{o}C)[7–12].

Analysis

TLC : R_f 0.28 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3421, 1275, 1151, 1098

5.1.44 5-(4-Isopropylphenyl)-2*H*-tetrazole (163)

Compound (**163)** was synthesized by 1,3-dipolar cycloaddition reaction of 4-isopropylbenzonitrile (0.5gm, 3.45mM) under the set conditions reported for compound (**151)** to obtain final compound as white solid (0.39gm, 79%); m.p. 188-190^{o}C (Lit. 191-192^{o}C) [7–12].

Analysis

TLC	: R_f 0.42 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3149, 1246, 1129, 1061

5.1.45 5-(4-Fluorophenyl)-2*H*-tetrazole (164)

Compound (**164)** was synthesized by 1,3-dipolar cycloaddition reaction of 4-fluorobenzonitrile (0.5gm, 4.12mM) under the set conditions reported for compound (**151)** to obtain final compound as white solid (0.40gm, 89%); m.p. 182-184ºC (Lit. 180ºC) [7–12].

Analysis

TLC	: R_f 0.32 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3431, 1256, 1125, 1087.

5.1.46 Synthesis of 1,2-bis(4-chlorophenyl)ethanone (174)

In a 50 ml RBF 2-(4-chlorophenyl)acetic acid (1gm, 5.86mM) was reacted with thionyl chloride (1.7ml, 23.45mM) and converted into acid chloride by refluxing the reaction mixture for 3hrs under anhydrous conditions. Completion of reaction was monitored using TLC. Excess of thionyl chloride was removed by vacuum. In another 100ml RBF dry DCM and anhydrous ammonium chloride (1.20gm, 9.02 mM) was taken and temperature was maintained at 0-4ºC. In the reaction mixture chlorobenzene (0.6ml, 5.86mM) was added dropwise under cooling condition. The reaction mixture was allowed to stir for 2hrs maintaining the reaction temperature between 0-5ºC. After completion of reaction the reaction mixture was poured over crushed ice containing conc. HCl and then extracted with chloroform (30ml X 3). The organic layer was washed with sodium bicarbonate (5%) solution and water. It was then dried over anhydrous Na_2SO_4, filtered and subjected to solvent recovery to obtain the desired product (**174**, 1.32gm, 85%); m.p. 111-113ºC (Lit. 112-114ºC)[13].

Analysis:

TLC	: R_f 0.89 (*n*-Hexane: ethyl acetate; 8:2).
IR (KBr, cm^{-1})	: 3092, 3039, 2897, 1675, 1585.

5.1.47 Synthesis of 1,2-bis(4-methoxyphenyl)ethenone (175)

Compound (**160)** was synthesized by treating 2-(4-methoxyphenyl)acetic acid (1gm, 6.01mM) with thionyl chloride (1.7ml, 23.45mM) following same procedure as described for compound **(174).** Following subsequent Friedel-Craft acylation reaction

with anisole as described for compound (**175)** to obtain white solid product (**175**, 1.25gm, 80%); m.p. 109-111ºC (110-112ºC)[13].

Analysis

TLC	: R_f 0.85 (*n*-Hexane: ethyl acetate; 8:2)
IR (KBr, cm^{-1})	: 3028, 2963, 1681,1596, 1455

5.1.48 Synthesis of 1,2-bisphenylethanone (176)

Compound (**176)** was synthesized using phenyl acetic acid (1gm, 5.05mM) with thionyl chloride (1.7ml, 23.45mM) following same procedure as described for compound **(174).** Following subsequent Friedel-Craft acylation reaction with benzene as discussed for compound (**176)** to obtain white solid product (**174**, 1.40gm, 85%), m.p. 120-121ºC (Lit. 122-124ºC)[13].

Analysis

TLC	: R_f 0.81 (*n*-Hexane: ethyl acetate, 8:2)
IR (KBr, $cm^{-1)}$	: 2986, 1688, 1547, 1389

5.1.49 Synthesis of 2-bromo-1,2-bis(4-chlorophenyl)ethanone (177)

In 100ml RBF 1,2-bis(4-chlorophenyl)ethanone (2.0 g, 3.77mM) **(174**) was dissolved in sufficient quantity of glacial acetic acid (10ml) and stirred at room temperature. Bromine (0.5ml) was added dropwise into the stirred solution and the completion of reaction was monitored using TLC. After completion, the reaction mixture was poured into ice cold water (200ml) containing sodium metabisulphite in order to quench excess bromine. The white precipitate so obtain was extracted with chloroform (30ml x 3). The organic layer was dried over rota evaporator and the resulting residue was crystallized in methanol to yield compound (**177)** as white crystals, (1.4gm, 72%); m.p. 86-88ºC (Lit. 84ºC)[13].

Analysis

TLC	: R_f 0.50 (*n*-Hexane: ethyl acetate, 8:2)
IR (KBr, cm^{-1})	:3093, 2982, 1664,839

5.1.50 Synthesis of 2-bromo-1,2-bis(4-methoxyphenyl)ethenone (178)

Compound (**178)** was synthesized from 1,2-bis(4-methoxyphenyl)ethanone (2.0 g,7.80 mM) **(175)** and bromine (0.5 ml) by using same procedure as reported for the synthesis of compound (**177).** The discussed compound was obtain as white solid

(1.5gm, 76%); m.p. 104-106^{o}C (Lit. 104-105 ^{o}C)[13].

Analysis

TLC	: R_f 0.48 (*n*-Hexane: ethyl acetate, 8:2)
IR (KBr, cm^{-1})	: 3067, 2936, 1677, 1598

5.1.51 Synthesis of 2-bromo-1,2-bisphenylethanone (179)

Compound (**179)** was synthesized using 1,2-bisphenylethanone (2.0 g,6.80 mM) and bromine (0.5ml) dissolved in glacial acetic acid (10ml) by following same method as compound **(177).** The title compound was obtain as white solid (1.8gm, 85%); m.p 115-117^{o}C (114-118^{o}C)[13].

Analysis

TLC	: R_f 0.50 (*n*-Hexane: ethyl acetate, 8:2)
IR (KBr, cm^{-1})	: 3098, 2945, 1683, 1580

5.1.52 Synthesis of 4,5-bis(4-chlorophenyl)thiazol-2-ylamine (180)

In 50ml RBF, 2-bromo-1,2-bis(4-chlorophenyl)ethanone (**177**) (1.0gm, 1.75mM) was dissolved in methanol (10ml) and stirred. In the reaction mixture thiourea (2.5g, 2.08mM) and 3-4 drops of water was added and refluxed for 4-6hrs. Completion of reaction was monitored using TLC. After completion of reaction, the reaction mixture was poured on ice cold water and the resulting solution was basified with ammonia. The solid precipitated was filtered, dried and crystallized in methanol to obtain the desired compound as yellow solid (0.85gm, 94%), m.p. 162-164^{o}C, (Lit. 160^{o}C)[13].

Analysis

TLC	: R_f 0.54 (*n*-Hexane: ethyl acetate, 7:3)
IR (KBr, cm^{-1})	: 3400, 3201, 1610, 1528

5.1.53 Synthesis of 4,5-bis(4-methoxyphenyl)thiazol-2-ylamine (181)

Compound (**181)** was synthesized using 2-bromo-1,2-bis(4-methoxyphenyl)ethanone (1.0 g, 2.98 mM) (**178**) and thiourea (0.35 g, 4.59 mM) following same method as discussed for compound **(180).** The synthesized compound (**181)** was obtain as white solid, (0.85gm, 87%), m.p. 210-212^{o}C (Lit. 210-212^{o}C)[13].

Analysis

TLC	: R_f 0.58 (n-Hexane: ethyl acetate, 7:3)
IR (KBr, cm^{-1})	: 3428, 3198, 1620, 833

5.1.54 Synthesis of 4,5-bisphenylthiazol-2-ylamine (182)

Compound (**182)** was synthesized using 2-bromo-1,2-bisphenylethanone (1.0gm, 2.50mM) and thiourea (0.35gm, 4.59mM) following same procedure as discussed for compound (**180)**. The synthesized compound (**182)** was obtained as pure white solid (0.90gm, 92%), m.p. 235-237ºC (236-238ºC)[13].

Analysis

TLC	: R_f 0.48 (*n*-Hexane: ethyl acetate, 7:3)
IR (KBr, cm^{-1})	:3445, 3219, 1635

5.1.55 Synthesis of *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (183)

In a 100ml RBF, 4,5-bis(4-chlorophenyl)lthiazol-2-ylamine (1.0gm, 2.50mM) **(180)** was dissolved in 10ml DCM and stirred on ice bath maintain temperature at 0-5ºC. TEA (5.06ml, 5.00mM) was added to the reaction mixture at stirred for 10min on ice bath. In the reaction mixture chloroacetyl chloride (3.39ml, 3.00mM) was added dropwise and stirred in cooling conditions in between temperature 0-5ºC for 2-3hrs. Completion of reaction was monitored through TLC. After completion of the reaction , the mixture was poured on ice cold water, solid precipitated was filtered, dried and crystallized using methanol to obtain pale yellow solid (0.87gm, 90%), m.p. 247-249ºC (246-248 ºC)[13].

Analysis

TLC	: R_f 0.38 (*n*-Hexane: ethyl acetate, 8:2)
IR (KBr, cm^{-1})	: 1618, 1247, 984

5.1.56 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (184)

Compound (**184)** was synthesized using *N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (1gm, 3.20mM) **(181),** and chloroacetyl chloride (4.34ml, 3.84mM) in DCM (10ml) using same method as followed for compound (**183)**. The desired compound was obtained as white solid (0.72gm, 80%), m.p 241-243ºC (242-244 ºC)[13].

Analysis

TLC	: R_f 0.35 (*n*-Hexane : ethyl acetate, 8:2)

IR (KBr, cm^{-1}) : 1645, 1238, 1147

5.1.57 *N*-(4,5-Bisphenylthiazol-2-yl)-2-chloroacetamide (185)

Compound (**185)** was synthesized using 4,5-bisphenylthiazol-2-ylamine (1.0gm, 3.99mM) **(182)** and chloroacetyl chloride (0.54ml. 4.79mM) in DCM (10ml) by following same procedure as discussed for compound (**183)** to obtain the desired product. The title compound was obtained as white solid (0.94gm, 97%), m.p.246-248ºC (249-251 ºC)[13].

Analysis

TLC : R_f 0.67 (*n*-Hexane: ethyl acetate, 8:2)

IR (KBr, cm^{-1}) : 1630, 1221, 984

5.1.58 2-(5-(3-Hydroxyphenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (186)

In a 25 ml RBF, 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) was dissolved in 10 ml acetonitrile. To this mixture, K_2CO_3 (0.52gm, 3.75mM) was added and allowed to stir for 5mins. 5-(-3-Hydroxyphenyl)-2*H*-tetrazole (0.36gm, 2.28mM) was added to the mixture. The reaction mixture was heated at 90°C for 7hrs and monitored using TLC. Upon completion, crushed ice was added to the reaction mixture to obtain the precipitates, filtered under vacuum to obtain crude brown solid. Further purification of the compound **(186**) was done by column chromatography using pet ether: ethyl acetate (20%) as mobile phase to afford a pure white solid (0.37gm,75%); m.p. 222-224ºC.

Analysis

TLC : R_f 0.32 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1695, 1284, 754, 688

Mass (m/z) : $455(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 7.65 (d, *J* = 7.7 Hz, 1H), 7.49 – 7.46 (m, 2H), 7.44 (s, 1H), 7.34 – 7.32 (m, 3H), 7.30 (d, *J* = 5.8 Hz, 6H), 6.92 (dd, *J* = 7.9, 2.1 Hz, 1H), 4.86 (s, 2H).

5.1.59 2-(5-(4-Methoxyphenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (187)

The compound (**187)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide(0.5gm, 1.52mM) and 5-(4-methoxyphenyl)-2*H*-tetrazole (0.39gm, 2.28mM) by following same reaction method discussed for compound (**186)** to get the title compound as white solid (0.32gm, 65%); m.p. 202-203^{0}C.

Analysis:

TLC	: R_f 0.28 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 1703, 1292, 758, 694
Mass (m/z)	: 469.4 $(M+1)^+$
^{1}H-NMR ($CDCl_3$, δ)	: δ 11.83 (s, 1H), 8.07 – 8.03 (m, 2H), 7.53 – 7.48 (m, 2H), 7.34 (dd, *J* = 4.2, 2.4 Hz, 3H), 7.32 – 7.27 (m, 5H), 7.01 – 6.97 (m, 2H), 4.76 (s, 2H), 3.86 (s, 3H).

5.1.60 2-(5-(3-Chlorophenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (188)

Compound (**188)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(3-chlorophenyl)-2*H*-tetrazole (0.409gm, 2.28mM) by following same reaction method as discussed for compound **(186)** to obtain title compound as white solid (0.39gm, 78%); m.p.227-228^{o}C.

Analysis

TLC	: R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 1697, 1278, 774, 694
Mass (m/z)	: 473$(M)^+$, 475.2 $(M+2)^+$
^{1}H-NMR ($CDCl_3$, δ)	: δ 12.21 (s, 1H), 8.12 (d, *J* = 1.8 Hz, 1H), 8.01 (dt, *J* = 7.1, 1.6 Hz, 1H), 7.53 (dd, *J* = 6.6, 3.0 Hz, 2H), 7.48 – 7.42 (m, 2H), 7.41 – 7.36 (m, 3H), 7.36 (s, 2H), 7.25 (d, *J* = 4.8 Hz, 3H), 4.65 (s, 2H).

5.1.61 2-(5-(4-Bromophenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (189)

Compound (**189)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(4-bromophenyl)-2*H*-tetrazole (0.513gm, 2.28mM) by following same reaction methods as discussed for compound (**186)** to obtain title compound as white solid (0.34gm, 68%); m.p. 214-216^{o}C.

Analysis

TLC	: R_f 0.36 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 1697, 1278, 1084. 774, 694
Mass (m/z)	: 516.9 $(M)^+$, 517.9 $(M+1)^+$
^{1}H-NMR ($CDCl_3$, δ)	: δ 8.30 (t, *J* = 1.7 Hz, 1H), 8.10 – 8.05 (m, 1H), 7.63 – 7.57 (m, 2H), 7.52 – 7.48 (m, 2H), 7.39 – 7.33 (m, 4H), 7.32 (s, 4H), 4.87 (s, 2H).

5.1.62 *N*-(4,5-Diphenylthiazol-2-yl)-2-(5-(3-nitrophenyl)-2*H*-tetrazol-2-yl) acetamide (190)

Compound (**190)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(3-nitrophenyl)-2*H*-tetrazole (0.43gm, 2.28mM) by following same reaction method as discussed for compound (**186)** to obtain title compound as white solid (0.37gm, 70%); m.p. 200-202^{o}C.

Analysis

TLC	: R_f 0.42 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3297, 1699, 1350, 724
Mass (m/z)	: 484.4$(M)^{+,}$ 485.4 $(M+1)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 8.99 – 8.93 (m, 1H), 8.47 (d, *J* = 7.8 Hz, 1H), 8.34 (dd, *J* = 8.2, 1.3 Hz, 1H), 7.69 (t, *J* = 8.0 Hz, 1H), 7.57 – 7.50 (m, 2H), 7.39-7.33 (dd, *J* = 9.2 Hz, 5H), 4.65 (s, 2H).

5.1.63 *N*-(4,5-Diphenylthiazol-2-yl)-2-(5-(*p*-tolyl)-2*H*-tetrazol-2-yl)acetamide (191)

Compound (**191)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-*p*-tolyl-2*H*-tetrazole (0.36gm, 2.28mM) by following same reaction method as discussed for compound (**186)** to obtain title compound as white solid (0.42gm, 82%); m.p. 187-189ºC.

Analysis

TLC	: R_f 0.26 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3251, 1704, 1276, 693
Mass (m/z)	:453.2 $(M)^+$
^{1}H-NMR ($CDCl_3$, δ)	: δ 8.02 (d, J = 8.1 Hz, 2H), 7.49 (dd, J = 6.5, 3.0 Hz, 2H), 7.37 0 7.27 (m, 10H), 4.92 (d, *J* = 24.1 Hz, 2H), 2.42 (s, 3H).

5.1.64 *N*-(4,5-Diphenylthiazol-2-yl)-2-(5-phenyl-2*H*-tetrazol-2-yl)acetamide (192)

Compound (**192)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-phenyl-2*H*-tetrazole (0.332gm, 2.28mM) by following same reaction method as discussed for compound (**186)** to obtain title compound as white solid (0.43gm, 86%); m.p. 187-189ºC.

Analysis

TLC	: R_f 0.31(*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3187, 1687, 1278, 830, 731
Mass (m/z)	: 437.0 $(M)^-$
^{1}H-NMR ($CDCl_3$, δ)	: δ 8.11 (dd, *J* = 6.6, 3.0 Hz, 1H), 7.56 – 7.49 (m, 3H), 7.46 (t, *J* = 5.6 Hz, 2H), 7.37 – 7.24 (m, 9H), 4.53 (m, 2H).

5.1.65 *N*-(4,5-Diphenylthiazol-2-yl)-2-(5-(*m*-tolyl)-2*H*-tetrazol-2-yl)acetamide (193)

Compound (**193)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-*m*-tolyl-2*H*-tetrazole (0.36gm, 2.28mM) by

following same reaction method as discussed for compound (**186)** to get title compound as white solid (0.32gm, 70%); m.p. 205-207^{o}C.

Analysis

TLC	: R_f 0.25 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3326, 1697, 1276, 749, 692
Mass (m/z)	: 453.4 $(M)^+$, 454.4$(M+1)^+$
^{1}H-NMR ($CDCl_3$, δ)	: δ 11.94 (s, 1H), 7.97 – 7.88 (m, 2H), 7.54 – 7.49 (m, 2H), 7.40 – 7.33 (m, 4H), 7.33 – 7.27 (m, 6H), 4.76 (d, *J* = 15.5 Hz, 2H), 2.42 (s, 3H).

5.1.66 *N*-(4,5-diphenylthiazol-2-yl)-2-(5-(3-methoxyphenyl)-2*H*-tetrazol-2-yl) acetamide (194)

Compound (**194)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(3-methoxyphenyl)-2*H*-tetrazole (0.27gm, 2.12mM) by following same reaction method as discussed for compound (**186)** to obtain title compound as white solid (0.265gm, 53%); m.p. 184-187^{o}C.

Analysis

TLC	: R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3234, 1703, 1559, 1257, 694
Mass (m/z)	: 469.5 $(M)^+$, 470.5$(M+1)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 11.39 (s, 1H), 8.11 – 8.02 (m, 2H), 7.54 – 7.46 (m, 2H), 7.38 – 7.27 (m, 8H), 7.03 – 6.95 (m, 2H), 4.90 (s, 2H), 2.42 (s, 3H).
^{13}C-NMR ($CDCl_3$, δ)	:δ 165.58, 162.40, 161.41, 157.16, 143.71, 134.29, 131.01, 129.35, 129.10, 129.05, 128.87, 128.79, 128.49, 128.19, 119.39, 114.25, 55.33, 53.37.

5.1.67 2-(5-(2-Nitrophenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (195)

Compound (**195)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(2-nitrophenyl)-2*H*-tetrazole (0.43gm, 2.28mM)

by following same reaction method as discussed for compound (**186)** to get title compound as white solid (0.36gm, 73%); m.p. 137-140ºC.

Analysis

TLC : R_f 0.30 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3197, 1701, 1544, 1270, 737

Mass (m/z) : $485.1(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 7.97 (dd, *J* = 7.6, 1.4 Hz, 1H), 7.89 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.71 (td, *J* = 7.6, 1.3 Hz, 1H), 7.65 (td, *J* = 7.8, 1.5 Hz, 1H), 7.53 (dt, *J* = 9.1, 4.2 Hz, 2H), 7.37 (dt, *J* = 5.5, 3.8 Hz, 3H), 7.35 – 7.28 (m, 5H), 4.65 (s, 2H).

5.1.68 2-(5-(3-Bromophenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (196)

Compound (**196)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(3-bromophenyl)-2*H*-tetrazole (0.51gm, 2.28mM) by following same reaction method as discussed for compound (**186)** to get title compound as white solid (0.33gm, 67%); m.p. 205-208ºC.

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3317, 1698, 1276, 774

Mass (m/z) : $517.4(M)^+$, $519.3\ (M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.29 (t, *J* = 1.7 Hz, 1H), 8.09 – 8.02 (m, 1H), 7.63 7.58 (m, 1H), 7.53 – 7.47 (m, 2H), 7.38 – 7.33 (m, 4H), 7.33 – 7.29 (m, 5H), 4.75 (s, 2H).

5.1.69 2-(5-(4-Isopropylphenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (197)

Compound (**197)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(4-isopropylphenyl)-2*H*-tetrazole (0.42gm, 2.28mM) by following same reaction method as discussed for compound **(186)** to get

title compound as white solid (0.36gm, 70%); m.p. 142-146ºC.

Analysis

TLC : R_f 0.31 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3317, 1698, 1280, 694

Mass (m/z) : 481.2 $(M)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.02 (d, *J* = 8.2 Hz, 2H), 7.56 – 7.46 (m, 3H), 7.34 (dd, *J* = 8.2, 4.6 Hz, 5H), 7.25 (d, *J* = 10.5 Hz, 4H), 4.60 (d, *J* = 27.0 Hz, 2H), 3.01 – 2.88 (m, 1H), 1.26 (dd, *J* = 11.9, 7.0 Hz, 6H).

^{13}C-NMR ($CDCl_3$, δ) :δ 165.69 162.42, 157.20, 151.61, 143.69, 134.30, 131.03, 129.46, 129.34, 129.09, 129.02, 128.85, 128.74, 128.59, 128.42, 128.19, 128.15, 127.97, 126.98, 126.94, 124.38, 53.32, 34.09, 23.79.

5.1.70 2-(5-(4-Fluorophenyl)-2*H*-tetrazol-2-yl)-*N*-(4,5-diphenylthiazol-2-yl) acetamide (198)

Compound (**198)** was synthesized using 2-chloro-*N*-(4,5-diphenylthiazol-2-yl)acetamide (0.5gm, 1.52mM) and 5-(4-fluorophenyl)-2*H*-tetrazole (0.37gm, 2.28mM) by following same reaction method as discussed for compound (**186)** to get title compound as white solid (0.36gm, 72%); m.p. 188-191ºC.

Analysis

TLC : R_f 0.39 (n-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1689, 1279, 828, 692

Mass (m/z) : 455.0 $(M-1)^-$ and 457.0 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.15 – 8.05 (m, 2H), 7.57 – 7.47 (m, 3H), 7.40 – 7.34 (m, 3H), 7.25 (d, *J* = 9.5 Hz, 4H), 7.15 (dd, *J* = 19.1, 10.4 Hz, 2H), 4.58 (s, 2H)

5.1.71 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(3,4-dimethoxyphenyl)-2*H*-tetrazol-2-yl)acetamide (199)

Compound (**199)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(3,4-dimethoxyphenyl)-2*H*-tetrazole

(0.38gm, 1.88mM) by following same reaction conditions as discussed for compound **(186)** to get title compound as pale yellow solid (0.37gm, 75%); m.p. 133-135ºC.

Analysis

TLC	: R_f 0.24 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1}	: 3208, 1711, 1249, 756
Mass (m/z)	: 569.1 $(M+2)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 10.45 (s, 1H), 7.77 (dd, *J* = 8.4, 1.9 Hz, 1H), 7.67 (d, *J* = 1.9 Hz, 1H), 7.38 – 7.34 (m, 2H), 7.30 (dd, *J* = 9.3, 2.6 Hz, 4H), 7.25 – 7.21 (m, 2H), 6.97 (d, *J* = 8.4 Hz, 1H), 5.32 (s, 2H), 3.96 (d, *J* = 10.9 Hz, 6H).

5.1.72 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(3-hydroxyphenyl)-2*H*-tetrazol-2-yl)acetamide (200)

Compound (**200)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(-3-hydroxyphenyl)-2*H*-tetrazole (0.30gm, 1.88mM) by following same reaction conditions as discussed for compound (**186)** to get title compound pale yellow solid (0.33gm, 72%); m.p. 182-184ºC.

Analysis

TLC	: R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3600, 3157, 1696, 1286, 832
Mass (m/z)	: 523.0$(M)^+$, 525.0 $(M+2)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 7.67 (d, *J* = 7.7 Hz, 1H), 7.53 (d, *J* = 6.1 Hz, 1H), 7.36 (d, *J* = 8.6 Hz, 2H), 7.34 – 7.30 (m, 2H), 7.30 – 7.26 (m, 3H), 7.24 – 7.18 (m, 2H), 6.93 (dd, *J* = 8.1, 1.9 Hz, 1H), 5.27 (s, 2H).

5.1.73 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(4-methoxyphenyl)-2-tetrazol-2-yl)acetamide (201)

Compound (**201)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(4-methoxyphenyl)-2*H*-tetrazole

(0.33gm, 1.88mM) by following same reaction conditions discussed for compound (**186)** to get title compound as pale-yellow solid (0.39gm, 78%); m.p. 208-210ºC.

Analysis:

TLC	: R_f 0.27 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 1696, 1286, 832, 760
Mass (m/z)	: 539.1 $(M+2)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 8.16 – 8.06 (m, 2H), 7.38 – 7.33 (m, 2H), 7.33 – 7.29 (m, 2H), 7.27 (d, *J* = 2.1 Hz, 1H), 7.25 (t, *J* = 2.3 Hz, 2H), 7.23 (d, *J* = 1.9 Hz, 1H), 7.05 – 7.00 (m, 2H), 5.45 (s, 2H), 3.88 (s, 3H).

5.1.74 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(3-chlorophenyl)-2*H*-tetrazol-2-yl)acetamide (202)

Compound (**202)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(3-chlorophenyl)-2*H*-tetrazole (0.5gm, 1.25mM) by following same reaction conditions as discussed for compound (**186)** to get title compound as pale yellow solid (0.37gm, 75%); m.p. 221-223ºC.

Analysis

TLC	: R_f 0.37 (n-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 3317, 1699, 1289, 836
Mass (m/z)	: 540.9$(M)^+$, 542.8 $(M+2)^{+2}$
^{1}H-NMR ($CDCl_3$, δ)	: δ 10.43 (s, 1H), 8.17 (d, *J* = 1.8 Hz, 1H), 8.06 (dt, *J* 7.2, 1.6 Hz, 1H), 7.48 (ddt, *J* = 16.6, 15.4, 5.0 Hz, 2H), 7.41 – 7.35 (m, 2H), 7.33 – 7.27 (m, 4H), 7.25 – 7.21 (m, 2H), 5.30 (d, *J* = 21.0 Hz, 2H).

5.1.75 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(4-bromophenyl)-2*H*-tetrazol-2-yl)acetamide (203)

Compound (**203)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(4-bromophenyl)-2*H*-tetrazole (0.42,

1.88mM) by following same reaction conditions as discussed for compound **(186)** to get title compound as pale-yellow solid (0.42gm, 89%); m.p. 209-211ºC.

Analysis

TLC : R_f 0.37 (n-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3163, 1698, 1288, 830

Mass (m/z) : $587.2(M+1)^+$, $589.2(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 8.39 (s, 1H), 8.12 – 8.01 (m, 2H), 7.70 – 7.61 (m, 2H), 7.39 – 7.33 (m, 2H), 7.31 (dd, *J* = 11.1, 4.5 Hz, 2H), 7.27 (t, *J* = 2.5 Hz, 1H), 7.23 (d, *J* = 2.0 Hz, 2H), 5.56 (s, 2H).

5.1.76 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(3-nitrophenyl)-2*H*-tetrazol-2-yl)acetamide (204)

Compound (**204)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(3-nitrophenyl)-2*H*-tetrazole (0.36gm, 1.88mM) by following same reaction conditions as discussed for compound (**186)** to get title compound as pale yellow solid (0.41gm, 82%); m.p. 194-197ºC.

Analysis

TLC : R_f 0.26 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3299, 1699, 1289, 830

Mass (m/z) : $554.0(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 10.55 (s, 1H), 9.05 – 8.99 (m, 1H), 8.58 – 8.47 (m, 1H), 8.37 (ddd, *J* = 8.3, 2.3, 1.0 Hz, 1H), 7.73 (t, *J* = 8.0 Hz, 1H), 7.42 – 7.36 (m, 2H), 7.35 – 7.27 (m, 4H), 7.25 – 7.21 (m, 2H), 5.31 (s, 2H).

^{13}C-NMR (CDCl3,) : 164.11, 148.65, 132.63, 132.18, 130.56, 130.14, 129.36, 129.28, 128.39, 125.29, 122.06, 54.17, 52.72

5.1.77 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-*p*-tolyl-2*H*-tetrazol-2-yl) acetamide (205)

Compound (**205)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-*p*-tolyl-2*H*-tetrazole (0.30gm, 1.88mM) by following same reaction conditions as discussed for compound (**186)** to get title compound as pale yellow solid (0.37gm, 75%); m.p. 202-204ºC.

Analysis

TLC : R_f 0.35 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1698, 1622, 1289, 826

Mass (m/z) : $523.3\ (M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.08 (d, *J* = 8.2 Hz, 2H), 7.55 – 7.48 (m, 1H), 7.41 – 7.36 (m, 2H), 7.33 (d, *J* = 10.2 Hz, 3H), 7.29 (dd, *J* = 4.9, 2.1 Hz, 2H), 7.24 (d, *J* = 3.7 Hz, 2H), 5.56 (s, 2H), 2.44 (s, 3H).

5.1.78 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-phenyl-2*H*-tetrazol-2-yl) acetamide (206)

Compound (**206)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-phenyl-2*H*-tetrazole (0.27gm, 1.88mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pale-yellow solid (0.40gm, 80%); m.p. 233-235ºC.

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1686, 1288, 830,728

Mass (m/z) : $508.9\ (M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 10.49 (s, 1H), 8.20 – 8.13 (m, 2H), 7.50 (dd, *J* = 9.3, 6.1 Hz, 3H), 7.38 (dd, *J* = 11.6, 5.0 Hz, 2H), 7.30 (dd, *J* = 8.3, 1.5 Hz, 3H), 7.27 (s, 1H), 7.24 – 7.20 (m, 2H), 5.32 (s, 2H).

^{1}C-NMR ($CDCl_3$, δ) : δ 166.12, 161.91, 155.99, 143.27, 134.61, 134.53, 132.29, 130.84, 130.63, 130.11, 129.44, 129.28, 129.06, 128.97, 127.27, 127.05, 126.52,

54.28

5.1.79 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(*m*-tolyl)-2*H*-tetrazol-2-yl) acetamide (207)

Compound (**207)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and *m*-tolyl-2*H*-tetrazole (0.30gm, 1.88mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pale-yellow solid (0.37gm, 75%); m.p. 238-240^{o}C.

Analysis:

TLC : R_f 0.21 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3317, 1700, 1288, 824

Mass (m/z) : 523.0 $(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 10.09 (s, 1H), 8.02 – 7.96 (m, 1H), 7.41 (d, *J* = 7.7 Hz, 1H), 7.38 (t, *J* = 3.0 Hz, 1H), 7.36 – 7.33 (m, 2H), 7.32 – 7.29 (m, 2H), 7.28 (dd, *J* = 4.9, 3.2 Hz, 2H), 7.25 – 7.21 (m, 2H), 7.20 – 7.15 (m, 1H), 5.44 (s, 2H), 2.45 (s, 3H).

5.1.80 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(3-methoxyphenyl)-2*H*-tetrazol-2-yl)acetamide (208)

Compound (**208)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(3-methoxyphenyl)-2*H*-tetrazole (0.33gm, 2.38mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pale-yellow solid (0.30gm, 60%); m.p. 195-197^{o}C

Analysis

TLC : R_f 0.28 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1697, 1254, 833,762

Mass (m/z) : 539.4$(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 8.11 (d, *J* = 8.8 Hz, 2H), 7.50 (d, *J* = 8.5 Hz, 1H), 7.39 – 7.34 (m, 2H), 7.31 (d, *J* = 4.3 Hz, 1H), 7.28 (d, *J* = 4.3 Hz, 2H), 7.24 – 7.21 (m,

2H), 7.02 (d, *J* = 8.8 Hz, 2H), 5.40 (s, 2H), 3.88 (s, 3H).

5.1.81 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(2-nitrophenyl)-2*H*-tetrazol-2-yl)acetamide (209)

Compound (**209)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(2-nitrophenyl)-2*H*-tetrazole (0.36gm, 1.84mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pale-yellow solid (0.30gm, 70%); m.p. 202-204^{o}C.

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3334, 1690, 1536, 826

Mass (m/z) : 554.3 $(M+2)^{+}$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 10.62 (s, 1H), 8.00 (dd, *J* = 7.6, 1.5 Hz, 1H), 7.93 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.74 (td, *J* = 7.6, 1.4 Hz, 1H), 7.68 (td, *J* = 7.8, 1.5 Hz, 1H), 7.42 – 7.37 (m, 2H), 7.33 – 7.28 (m, 4H), 7.25 – 7.21 (m, 2H), 5.28 (s, 2H).

5.1.82 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(3-bromophenyl)-2*H*-tetrazol -2-yl) acetamide (210)

Compound (**210)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(3-bromophenyl)-2*H*-tetrazole (0.47gm, 1.84mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pale-yellow solid (0.30gm, 70%); m.p. 207-209^{o}C.

Analysis

TLC : R_f 0.30 (n-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3315, 1699, 1289, 834

^{1}H-NMR ($CDCl_3$, δ) : δ 9.87 (s, 1H), 8.35 (t, *J* = 1.7 Hz, 1H), 8.12 (d, *J* = 7.8 Hz, 1H), 7.65 (d, *J* = 8.1 Hz, 1H), 7.41

(d, *J* = 7.9 Hz, 1H), 7.37 (d, *J* = 8.6 Hz, 2H), 7.34 – 7.27 (m, 4H), 7.25 – 7.21 (m, 2H), 5.47 (s, 2H).

5.1.83 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(4-isopropylphenyl)-2*H*-tetrazol-2-yl)acetamide (211)

Compound (**211)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(4-isopropylphenyl)-2*H*-tetrazole (0.35gm, 1.84mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pale-yellow solid (0.32gm, 73%); m.p. 207-209ºC.

Analysis

TLC : R_f 0.39 (n-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3225, 1702, 1281, 827

Mass (m/z) : $551.3 (M+2)^+$

^{1}H-NMR ($CDCl_3$, δ)**:** δ 10.67 (s, 1H), 8.07 (d, *J* = 8.3 Hz, 2H), 7.39–7.33 (m, 4H), 7.33 – 7.29 (m, 2H), 7.28 – 7.25 (m, 2H), 7.24 – 7.19 (m, 2H), 5.26 (s, 2H), 2.97 (dd, *J* = 13.8, 6.8 Hz, 1H), 2.95 (dd, *J* = 13.8, 6.8 Hz, 6H)

5.1.84 *N*-(4,5-Bis(4-chlorophenyl)thiazol-2-yl)-2-(5-(4-fluorophenyl)-2*H*-tetrazol-2-yl)acetamide (212)

Compound (**212)** was synthesized using *N*-(4,5-bis(4-chlorophenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.25mM) and 5-(4-fluorophenyl)-2*H*-tetrazole (0.31gm, 1.84mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pale-yellow solid (0.37gm, 75%); m.p. 197-199ºC.

Analysis

TLC : R_f 0.22 (n-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 3179, 1724, 1268

Mass (m/z) : $526.0 (M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 8.17 (dd, *J* = 8.1, 5.1, 2.5 Hz, 2H), 7.38 (dt, *J*

= 8.9, 6.5, 2.1 Hz, 2H), 7.35 – 7.27 (m, 4H), 7.23 (dd, *J* = 6.7, 1.9 Hz, 2H), 7.18 (ddd, *J* = 13.3, 6.8, 4.5 Hz, 2H), 5.35 (s, 2H)

5.1.85 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(3,4-dimethoxyphenyl)-2*H*-tetrazol-2-yl)acetamide (213)

Compound (**213)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(3,4-dimethoxyphenyl)-2*H*-tetrazole (0.39gm, 1.93mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pure white solid (0.25gm, 50%); m.p. 157-159ºC.

Analysis

TLC : R_f 0.27 (*n*-Hexane: ethyl acetate; 6:4)

IR (KBr, cm^{-1}) : 1700, 1254, 878, 759

^{1}H-NMR ($CDCl_3$, δ) : δ 7.76 – 7.72 (m, 1H), 7.66 (d, *J* = 1.8 Hz, 1H), 7.53 (t, *J* = 2.8 Hz, 1H), 7.43 – 7.39 (m, 2H), 7.21 (dd, *J* = 8.6, 2.2 Hz, 1H), 6.97 (d, *J* = 8.4 Hz, 1H), 6.84 (dt, *J* = 12.4, 8.2 Hz, 4H), 4.96 (s, 2H), 3.98 (d, *J* = 4.6 Hz, 3H), 3.95 (d, *J* = 3.3 Hz, 3H), 3.90 (d, *J* = 2.7 Hz, 3H), 3.78 (d, *J* = 5.8 Hz, 3H).

5.1.86 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(3-hydroxyphenyl)-2*H*-tetrazol-2-yl)acetamide (214)

Compound (**214)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(3-hydroxyphenyl)-2*H*-tetrazole (0.31gm, 1.93mM) by following same reaction conditions as discussed for compound **(186)**, to get title compound as pure white solid (0.38gm, 76%); m.p. 201-203ºC.

Analysis

TLC : R_f 0.28 (*n*-Hexane: ethyl acetate; 6:4)

IR (KBr, cm^{-1}) : 1698, 1285, 836

Mass (m/z) : 515.3 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 7.65 (d, *J* = 7.7 Hz, 1H), 7.56 – 7.52 (m, 1H), 7.51 (t, *J* = 3.4 Hz, 1H), 7.46 (d, *J* = 2.2 Hz, 1H), 7.44 – 7.40 (m, 3H), 7.32 (t, *J* = 8.0 Hz, 1H), 7.23 – 7.18 (m, 1H), 6.93 (dd, *J* = 8.1, 1.9 Hz, 1H), 6.87 (d, *J* = 4.9 Hz, 1H), 6.77 (d, *J* = 8.8 Hz, 1H), 4.84 (d, *J* = 15.1 Hz, 2H), 3.92 – 3.89 (m, 3H), 3.80 (d, *J* = 3.3 Hz, 3H).

5.1.87 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(4-methoxyphenyl)-2*H*-tetrazol-2-yl)acetamide (215)

Compound (**215)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(4-methoxyphenyl)-2*H*-tetrazole (0.33gm, 1.93mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pure white solid (0.28gm, 62%); m.p. 215-217ºC.

Analysis

TLC : R_f 0.29 (*n*-Hexane: ethyl acetate; 6:4)

IR (KBr, cm^{-1}) : 1699, 1282, 835

Mass (m/z) : 528.2 $(M+)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.10 – 8.04 (m, 2H), 7.52 (t, *J* = 2.8 Hz, 1H), 7.21 (dt, *J* = 12.9, 3.2 Hz, 1H), 7.03 – 6.97 (m, 3H), 6.89 – 6.85 (m, 3H), 6.84 – 6.79 (m, 2H), 4.86 (s, 2H), 3.92 – 3.88 (m, 3H), 3.87 (s, 3H), 3.78 (d, *J* = 3.8 Hz, 3H).

5.1.88 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(3-chlorophenyl)-2*H*-tetrazol-2-yl)acetamide (216)

Compound (**216)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(3-chlorophenyl)-2*H*-tetrazole (0.34gm, 1.93mM) by following same reaction conditions as discussed for compound **(186)**, to get title compound as pure white solid (0.26gm, 58%); m.p. 199-201ºC.

Analysis

TLC : R_f 0.30 (*n*-Hexane: ethyl acetate; 6:4)

IR (KBr, cm^{-1}) : 1700, 1283, 876

Mass (m/z) : 533.1$(M+)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.13 (d, *J* = 1.7 Hz, 1H), 8.02 (dt, *J* = 7.0, 1.6 Hz, 1H), 7.51 (d, *J* = 2.2 Hz, 1H), 7.47 – 7.40 (m, 4H), 7.24 – 7.19 (m, 1H), 6.88 (dd, *J* = 8.5, 5.5 Hz, 2H), 6.83 (dt, *J* = 7.5, 4.3 Hz, 2H), 4.66 (d, *J* = 14.9 Hz, 2H), 3.91 – 3.88 (m, 3H), 3.79 (d, *J* = 3.4 Hz, 3H)

5.1.89 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(4-bromophenyl)-2*H*-tetrazol-2-yl)acetamide (217)

Compound (**217)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(4-bromophenyl)-2*H*-tetrazole (0.43gm, 1.93mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pure white solid (0.23gm, 40%); m.p. 212-214ºC.

Analysis

TLC : R_f 0.24 (*n*-Hexane: ethyl acetate; 6:4)

IR (KBr, cm^{-1}) : 1706, 1278, 836

Mass (m/z) : 577.1 $(M+)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.03 – 7.98 (m, 2H), 7.65 – 7.61 (m, 2H), 7.52 (t, *J* = 2.9 Hz, 1H), 7.46 – 7.40 (m, 2H), 7.23 – 7.19 (m, 1H), 6.90 – 6.86 (m, 2H), 6.82 (dd, *J* = 11.4, 6.0 Hz, 2H), 4.78 (d, *J* = 19.1 Hz, 2H), 3.91 – 3.88 (m, 3H), 3.78 (d, *J* = 3.9 Hz, 3H)

^{13}C-NMR ($CDCl_3$, δ) :δ164.76 162.41, 160.10, 157.25, 155.77, 143.43, 133.85, 132.11, 130.48, 130.28, 129.50, 128.43, 126.10, 125.85, 125.20, 124.95, 124.64, 114.66, 114.35, 111.99, 56.25, 55.34, 53.36.

5.1.90 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(3-nitrophenyl)-2*H*-tetrazol-2-yl)acetamide (218)

Compound (**218)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-

2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(3-nitrophenyl)-2*H*-tetrazole (0.36gm, 1.93mM) by following same reaction conditions as discussed for compound **(186)**, to get title compound as pure white solid (0.32gm, 75%); m.p. 189-191°C.

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1699, 1248, 875

Mass (m/z) : 543.2 $(M+)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 9.00 (d, *J* = 1.7 Hz, 1H), 8.50 (d, *J* = 7.8 Hz, 1H), 8.38 – 8.32 (m, 1H), 7.71 (t, *J* = 8.0 Hz, 2H), 7.51 (dd, *J* = 10.0, 4.4 Hz, 1H), 7.46 – 7.40 (m, 2H), 6.92 – 6.86 (m, 2H), 6.84 – 6.80 (m, 2H), 4.88 (d, *J* = 18.8 Hz, 2H), 3.91 – 3.88 (m, 3H), 3.80 (d, *J* = 3.1 Hz, 3H).

5.1.91 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(*p*-tolyl)-2*H*-tetrazol-2-yl) acetamide (219)

Compound (**219)** was synthesized using *N* *N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-*p*-tolyl-2*H*-tetrazole (0.30gm, 1.93mM) by following same reaction conditions as discussed for compound **186**, to get title compound as pure white solid (0.30gm, 75%); m.p. 211-213°C.

Analysis

TLC : R_f 0.21 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) **:** 1701, 1283, 875

Mass (m/z) : 511.3 $(M-1)^-$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.03 (d, *J* = 8.2 Hz, 2H), 7.52 (d, *J* = 2.2 Hz, 1H), 7.40 (d, *J* = 8.8 Hz, 2H), 7.30 (d, *J* = 8.0 Hz, 2H), 7.21 (dd, *J* = 8.5, 2.2 Hz, 1H), 6.86 (d, *J* = 8.8 Hz, 2H), 6.81 (dd, *J* = 15.1, 5.9 Hz, 2H), 5.03 (d, *J* = 20.3 Hz, 2H), 3.91 (d, *J* = 5.4 Hz, 3H), 3.79 (s, 3H), 2.42 (s, 3H).

^{13}C NMR ($CDCl_3$, δ) : δ 165.68 162.50, 160.03, 157.09, 155.70, 143.49, 140.71, 133.87, 130.26, 129.52, 126.85, 126.14, 125.08, 124.77, 124.05, 114.59, 111.93. 56.23, 55.33, 53.40, 21.50

5.1.92 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-phenyl-2*H*-tetrazol-2-yl) acetamide (220)

Compound (**220)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-phenyl-2*H*-tetrazole (0.28gm, 1.93mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pure white solid (0.37gm, 78%); m.p. 187-189ºC.

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1702, 1283, 837

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.18 – 8.09 (m, 2H), 7.50 (ddd, *J* = 6.7, 5.2, 3.2 Hz, 4H), 7.43 – 7.40 (m, 2H), 7.21 (dd, *J* = 8.5, 2.2 Hz, 1H), 6.90 – 6.86 (m, 2H), 6.80 (dd, *J* = 18.3, 8.6 Hz, 2H), 4.90 (s, 2H), 3.92 – 3.87 (m, 3H), 3.79 (s, 3H).

5.1.93 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(*m*-tolyl)-2*H*-tetrazol-2-yl) acetamide (221)

Compound (**221)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-*m*-tolyl-2*H*-tetrazole (0.30gm, 1.93mM) by following same reaction conditions as discussed for compound (**186)**, to get title compound as pure white solid (0.33gm, 73%); m.p. 175-177ºC.

Analysis

TLC : R_f 0.25 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1700, 1283, 837

Mass (m/z) : 513.4 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 7.98 – 7.91 (m, 2H), 7.52 (t, *J* = 2.7 Hz, 1H), 7.44 – 7.38 (m, 2H), 7.37 (d, *J* = 7.6 Hz, 1H),

7.32 – 7.26 (m, 1H), 7.21 (dd, *J* = 8.5, 2.2 Hz, 1H), 6.90 – 6.85 (m, 2H), 6.85 – 6.73 (m, 2H), 4.88 (d, *J* = 20.7 Hz, 2H), 3.92 – 3.87 (m, 3H), 3.82 – 3.77 (m, 3H), 2.44 (d, *J* = 5.2 Hz, 3H).

5.1.94 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(3-methoxyphenyl)-2*H*-tetrazol-2-yl)acetamide (222)

Compound (**222)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol -2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(3-methoxyphenyl)-2*H*-tetrazole (0.33gm, 1.93mM) by following same reaction conditions as discussed for compound **186**, to get title compound as pure white solid (0.28gm, 66%); m.p. 195-197ºC.

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1724, 1277, 1125, 835

Mass (m/z) : 528.2 $(M+)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.21 (d, *J* = 1.8 Hz, 1H), 7.93 – 7.90 (m, 1H), 7.75 – 7.69 (m, 2H), 7.52 (d, *J* = 2.2 Hz, 1H), 7.42 – 7.40 (m, 2H), 7.22 – 7.20 (m, 1H), 6.96 (d, *J* = 4.4 Hz, 1H), 6.86 (d, *J* = 1.2 Hz, 1H), 6.85 – 6.80 (m, 2H), 5.01 (s, 2H), 3.99 (s, 3H), 3.90 (d, *J* = 2.5 Hz, 3H), 3.79 (s, 3H).

5.1.95 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(2-nitrophenyl)-2*H*-tetrazol -2-yl)acetamide (223)

Compound (**223)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(2-nitrophenyl)-2*H*-tetrazole (0.37gm, 1.93mM) by following same reaction conditions as discussed for compound **(186)** to get title compound as pure white solid (0.25gm, 50%); m.p. 201-202ºC.

Analysis

TLC : R_f 0.32 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1798, 1284, 1029, 834

Mass (m/z) : 543.3 $(M+)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 7.96 (dt, *J* = 6.4, 3.2 Hz, 1H), 7.90 (dd, *J* = 8.0, 1.4 Hz, 1H), 7.76 – 7.69 (m, 1H), 7.69 – 7.62 (m, 1H), 7.51 (dq, *J* = 6.6, 3.2 Hz, 1H), 7.44 (dd, *J* = 8.8, 2.0 Hz, 2H), 7.22 (dd, *J* = 9.1, 2.7 Hz, 1H), 6.92 – 6.86 (m, 2H), 6.85 – 6.80 (m, 2H), 4.79 (d, *J* = 13.7 Hz, 2H), 3.92 – 3.88 (m, 2H), 3.80 (t, *J* = 4.9 Hz, 3H).

5.1.96 *N*-(4,5-Bis(4-methoxyphenyl)thiazol-2-yl)-2-(5-(4-fluorophenyl)-2*H*-tetrazol-2-yl)acetamide (224)

Compound **(224)** was synthesized using *N N*-(4,5-bis(4-methoxyphenyl)thiazol-2-yl)-2-chloroacetamide (0.5gm, 1.28mM) and 5-(4-fluorophenyl)-2*H*-tetrazole (0.31gm, 1.93mM) by following same reaction conditions as discussed for compound **(186),** to get title compound as pure white solid (0.35gm, 75%); m.p. 189-191°C.

Analysis

TLC : R_f 0.22 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 1731, 1305, 1124, 987

Mass (m/z) : 516.2 $(M+)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.16 – 8.10 (m, 2H), 7.52 (d, *J* = 2.2 Hz, 1H), 7.45 – 7.38 (m, 2H), 7.20 (t, *J* = 4.2 Hz, 1H), 7.19 – 7.13 (m, 2H), 6.91 – 6.86 (m, 2H), 6.84 (dd, *J* = 8.9, 5.8 Hz, 2H), 4.81 (d, *J* = 19.2 Hz, 2H), 3.92 – 3.88 (m, 3H), 3.80 – 3.76 (m, 3H).

^{13}C NMR ($CDCl_3$, δ) **:** δ 165.36 164.78, 162.87, 162.46, 160.09, 159.93, 159.50, 157.20, 155.76, 143.45, 142.67, 133.86, 130.49, 130.27, 129.51, 129.03, 128.95, 126.11, 125.17, 124.67, 123.16, 116.11, 115.89, 114.64, 114.34, 111.98. 56.25, 55.32, 53.36.

5.1.97 Synthesis of (*Z*)-1-(4-fluorophenyl)-3-phenylprop-2-en-1-one (241*)*

In a 25 ml RBF, 4-fluoroacetophenone (**234**, 0.62gm,0.40mM) dissolved in 50% w/v of NaOH (15ml) solution under ice-cold condition and allowed to stir for 15

minutes. To the reaction mixture benzaldehyde (**225**, 0.5ml, 0.47mM) was added and allowed to stir for 3hrs under ice-cold condition. The reaction was monitored by TLC. Upon completion of the reaction, crushed ice was added to the reaction mixture to obtain the precipitate, filtered under vacuum to obtain titled compound as white solid (0.45gm, 93%), m.p. 110-113ºC (Lit. 112-114ºC)[13]

Analysis

TLC : R_f 0.27 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3051, 2985, 1659, 1589, 1245

5.1.98 Synthesis of (*Z*)-1-(4-nitrophenyl)-3-phenylprop-2-en-1-one (242)

Compound (**242)** was synthesized by reacting 4-nitroacetophenone (**235**, 0.54ml, 0.42mM) with benzaldehyde (**225**, 0.5ml, 0.47mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as yellow solid (0.39, 85%), m.p.89-91ºC (Lit 87-89ºC)[13].

Analysis

TLC : R_f 0.30 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3028, 2987, 1625, 1571.

5.1.99 Synthesis of (*Z*)-3-phenyl-1-(*p*-tolyl)prop-2-en-1-one (243*)*

Compound (**243)** was synthesized by reacting 4-methylacetophenone (**236**, 0.71ml, 0.39mM) with benzaldehyde (**225**, 0.5ml, 0.47mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as brown solid (0.41, 89%) m.p.85-87 ºC (Lit 85-87 ºC)[13].

Analysis

TLC : R_f 0.32 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3001, 2968, 1615, 1564.

5.1.100 (*Z*)-1-(4-Hydroxyphenyl)-3-phenylprop-2-en-1-one (244)

Compound (**244)** was synthesized by reacting 4-hydroxyacetophenone (**237**, 0.54ml, 0.42mM) with benzaldehyde (**225**, 0.5ml, 0.47mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as off-white solid (0.48, 96%), m.p. 99-100ºC (Lit. 98-99ºC)[13].

Analysis

TLC : R_f 0.27 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3567, 3054, 1637, 1587

5.1.101 (*Z*)-1-(4-Aminophenyl)-3-phenylprop-2-en-1-one (245)

Compound (**245)** was synthesized by reacting 4-aminoacetophenone (**238**, 0.61ml, 0.40mM) with benzaldehyde (**225**, 0.5ml, 0.47mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as yellow solid (0.43, 92%), m.p.148-150ºC (Lit.146-148ºC)[13].

Analysis

TLC : R_f 0.31 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3347, 2984, 1650, 1519

5.1.102 (*Z*)-1-Phenyl-3-(*p*-tolyl)prop-2-en-1-one (246)

Compound (**246)** was synthesized by reacting 4-methylbenzaldehyde (**226**, 0.53ml, 0.39mM) with acetophenone (**239**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as colorless liquid (0.46, 94%), m.p. (Lit. 46- 48ºC)[13].

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3084, 2915, 1618, 1584

5.1.103 (*Z*)-3-(4-Hydroxyphenyl)-1-phenylprop-2-en-1-one (247)

Compound (**247)** was synthesized by reacting 4-hydroxybenzaldehyde (**227**, 0.48ml, 0.41mM) with acetophenone (**239**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white solid (0.49, 98%), m.p 152-154ºC (Lit.155-157ºC)[13].

Analysis

TLC : R_f 0.27 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3587, 3018, 1629, 1567

5.1.104 (*Z*)-3-(3-Bromophenyl)-1-(4-fluorophenyl)prop-2-en-1-one (248)

Compound (**248)** was synthesized by reacting 3-bromobenzaldehyde (**228**, 0.59ml, 0.43mM) with 4-fluoroacetophenone (**234**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white solid (0.47, 96%), m.p. 134-136ºC (Lit.135ºC)[13].

Analysis

TLC : R_f 0.29 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3018, 1687, 1503, 1298

5.1.105 ***(Z)*-1-(4-Fluorophenyl)-3-(4-hydroxyphenyl)prop-2-en-1-one (249)**

Compound (**249)** was synthesized by reacting 4-hydroxybenzaldehyde **(227**, 0.48ml, 0.41mM) with 4-fluoroacetophenone (**234**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white solid (0.39, 87%), m.p.119-121^oC (Lit.120-122^oC)[13].

Analysis

TLC : R_f 0.33 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3569, 1624, 1574, 1286

5.1.106 (*Z*)-1-(4-Fluorophenyl)-3-(4-methoxyphenyl)prop-2-en-1-one (250)

Compound (**250)** was synthesized by reacting 4-methoxybenzaldehyde (**229**, 0.50ml, 0.44mM) with 4-fluoroacetophenone (**234**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white solid (0.39, 87%), m.p. 177-179^oC (Lit.180-181^oC) [13].

Analysis

TLC : R_f 0.30 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3104, 1633, 1569, 1257

5.1.107 (*Z*)-1,3-Bis(4-fluorophenyl)prop-2-en-1-one (251)

Compound (**251)** was synthesized by reacting 4-fluorobenzaldehyde (**230**, 0.48ml, 0.49mM) with 4-fluoroacetophenone (**234**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white solid (0.44, 94%), m.p. 121-123^oC (Lit.122-124^oC) [13].

Analysis

TLC : R_f 0.25 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3098, 1619, 1574, 1214

5.1.108 (*Z*)-1-(4-Hydroxyphenyl)-3-(*p*-tolyl)prop-2-en-1-one (252)

Compound (**252)** was synthesized by reacting 4-methylbenzaldehyde (**226**, 0.58ml, 0.46mM) with 4-hydroxyacetophenone (**223**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white

solid (0.37, 84%), m.p.97-99ºC (Lit.95-97ºC)[13].

Analysis

TLC : R_f 0.29 (*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3341, 1697, 1545, 1234

5.1.109 (*Z*)-3-(3-Bromophenyl)-1-(4-hydroxyphenyl)prop-2-en-1-one (253)

Compound (**253)** was synthesized by reacting 3-bromobenzaldehyde (**228,** 0.49ml, 0.43mM) with 4-hydroxyacetophenone (**238**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as brown solid (0.41, 92%), m.p 153-155ºC (Lit.156-158ºC)[13].

Analysis

TLC : R_f 0.33(*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3587, 1703, 1587, 1294

5.1.110 (*Z*)-1-(4-Chlorophenyl)-3-(3-nitrophenyl)prop-2-en-1-one (254)

Compound (**254)** was synthesized by reacting 3-nitrobenzaldehyde (**231**, 0.39ml, 0.47mM) with 4-chloroacetophenone (**240**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as brown solid (0.41, 92%), m.p.187-189ºC (Lit.191-192ºC)[13].

Analysis

TLC : R_f 0.34(*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3025, 1625, 1514, 1209

5.1.111 (*Z)*-3-(4-Bromophenyl)-1-(4-chlorophenyl)prop-2-en-1-one (255)

Compound (**255)** was synthesized by reacting 4-bromobenzaldehyde (**232**, 0.51ml, 0.48mM) with 4-chloroacetophenone (**240**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as brown solid (0.48, 97%), m.p. 165-167ºC (Lit.166-167ºC)[13].

Analysis

TLC : R_f 0.37(*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3054, 1634, 1519, 1234

5.1.112 (Z)-3-(4-Fluorophenyl)-1-(*p*-tolyl)prop-2-en-1-one (256)

Compound (**256)** was synthesized by reacting 4-fluorobenzaldehyde (**229**,

0.57ml, 0.49mM) with 4-methylacetophenone (**222**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as brown solid (0.41, 90%), m.p.89-91ºC (Lit.91-93ºC)[13].

Analysis

TLC : R_f 0.31(*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :2997, 1664, 1527, 1249

5.1.113 (*Z*)-3-(4-Chlorophenyl)-1-(4-nitrophenyl)prop-2-en-1-one (257)

Compound (**257)** was synthesized by reacting 4-chlorobenzaldehyde (**233**, 0.39ml, 0.42mM) with 4-nitroacetophenone (**221**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as brown solid (0.38, 81%), m.p.104-106ºC (Lit.107- 109ºC)[13].

Analysis

TLC : R_f 0.25(*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :2984, 1704, 1567, 1298

5.1.114 (*Z*)-3-(4-Hydroxyphenyl)-1-(4-nitrophenyl)prop-2-en-1-one (258)

Compound (**258)** was synthesized by reacting 4-hydroxybenzaldehyde (**227,** 0.48ml, 0.49mM) with 4-nitroacetophenone (**221**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as brown solid (0.46, 92%), m.p. 117-120ºC (Lit.119-121ºC)[13].

Analysis

TLC : R_f 0.31(*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3574, 1694, 1524, 1219

5.1.115 (*Z*)-3-(4-Bromophenyl)-1-(4-nitrophenyl)prop-2-en-1-one (259)

Compound (**259)** was synthesized by reacting 4-bromobenzaldehyde (**231**, 0.64ml, 0.47mM) with 4-nitroacetophenone (**221**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white solid (0.45, 91%), m.p. 126-128ºC (Lit.125ºC)[13].

Analysis

TLC : R_f 0.30(*n*-Hexane: ethyl acetate; 9:1)

IR (KBr, cm^{-1}) :3094, 1634, 1567, 1284

5.1.116 (*Z*)-1-(4-Nitrophenyl)-3-(*p*-tolyl)prop-2-en-1-one (260)

Compound (**260)** was synthesized by reacting 4-methylbenzaldehyde (**226**, 0.55ml, 0.46mM) with 4-nitroacetophenone (**221**, 0.5ml, 0.49mM) under same reaction conditions as discussed for compound (**241)** to obtain final compound as white solid (0.40, 86%), m.p.134-136ºC (Lit.137-139ºC)[13].

Analysis

TLC	: R_f 0.27(*n*-Hexane: ethyl acetate; 9:1)
IR (KBr, cm^{-1})	:3034, 1654, 1584, 1212

5.1.117 Synthesis of 2-(2-aminoethyl)isoindoline-1,3-dione (262)

In a 25ml RBF, 2-(2-bromoethyl)-1*H*-indene-1,3(2*H*)-dione (**261**, 0.5gm, 0.39mM) dissolved in ethyl acetate (10ml) and stirred at room temp. for 10min. 30, % v/v ammonia solution was added to the reaction at room temp. with continuous stirring for 3hrs. completion of reaction was monitored using TLC. Upon completion of reaction crushed ice was added to the reaction mixture and extracted using ethyl acetate to yield titled compound as white solid. The obtained compound was purified using column chromatography by using pet ether: ethyl acetate (6:4) as a mobile phase. The purified compound was obtained as white crystalline solid (0.49gm, 98%), m.p. 98-101ºC (Lit.100-102ºC)[13].

Analysis

TLC	: R_f 0.41 (*n*-Hexane: ethyl acetate; 5:5)
IR (KBr, cm^{-1})	:3124, 2874, 1731, 1549, 1188

5.1.118 Synthesis of (*Z*)-2-(2-((3-(4-fluorophenyl)-3-oxo-1-phenylprop-1-en-1-yl) amino)ethyl)isoindoline-1,3-dione (263)

In a 25 ml RBF, 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) was dissolved in 10 ml DMF and NaOH (0.085gm, 0.0021mM) was added and allowed to stir for 5mins. To this mixture (*Z*)-1-(4-fluorophenyl)-3-phenylprop-2-en-1-one (0.41gm, 0.0018mM) was added. The reaction mixture was heated at 80-100°C for 3hrs and monitored by TLC. Upon completion, crushed ice was added to the reaction mixture to obtain the precipitates, filtered under vacuum to obtain crude solid. The obtained compound was purified by column chromatography using pet ether: ethyl acetate (30%) as mobile phase to afford a pure pale-yellow solid (0.33gm, 72%), m.p.129-131ºC.

Analysis

TLC : R_f 0.34 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 2987, 1736, 1233, 1043

Mass (m/z) : $415.27(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.02 (d, J = 9.0 Hz, 2H), 7.79 (d, J = 15.6 Hz, 1H), 7.67 – 7.53 (m, 3H), 7.40 (d, J = 5.6 Hz, 2H), 7.26 (s, 3H), 6.71 (d, J = 9.0 Hz, 2H), 3.09 (s, 2H), 1.56 (s, 2H), 1.25 (s, 1H).

5.1.119 (*Z*)-2-(2-((3-Oxo-3-phenyl-1-(*p*-tolyl)prop-1-en-1-yl)amino)ethyl)isoindoline-1,3-dione (264)

Compound (**264)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-1-phenyl-3-(*p*-tolyl)prop-2-en-1-one (0.57g, 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound (**249)** to obtain final compound as brown solid. The obtained compound was purified by column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as white solid (0.31gm , 71%), m.p.141-143 ^oC.

Analysis

TLC : R_f 0.26 (*n*-Hexane: ethyl acetate; 7:3)

IR (KBr, cm^{-1}) : 2955, 1730, 1521, 1149

Mass (m/z) : $409.00\ (M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 8.00 (d, J = 6.9 Hz, 6H), 7.27 (d, J = 9.9 Hz, 7H), 3.50 (s, 1H), 2.44 (s, 4H), 1.25 (s, 1H), 0.88 (s, 3H).

5.1.120 (*Z*)-2-(2-((1-(4-Hydroxyphenyl)-3-oxo-3-phenylprop-1-en-1-yl)amino) ethyl)isoindoline-1,3-dione (265)

Compound (**265)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-3-(4-hydroxyphenyl)-1-phenylprop-2-en-1-one (0.58g, 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to

yield final compound as yellow liquid (0.34gm, 72%).

Analysis

TLC	: R_f 0.39 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 2984, 1736, 1232, 1043
Mass (m/z)	: 413.06 $(M+1)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 9.86 (s, 1H), 8.02 (d, J = 7.3 Hz, 2H), 7.81 (s, 1H), 7.77 (s, 1H), 7.53 (d, J = 17.3 Hz, 3H), 7.42 (d, J = 15.6 Hz, 1H), 7.26 (s, 1H), 6.99 (s, 2H), 6.90 (d, J = 8.6 Hz, 2H), 3.52 (s, 1H), 1.73 (s, 4H), 1.25 (s, 1H).

5.1.121 (*Z*)-2-(2-((3-(4-Hydroxyphenyl)-3-oxo-1-phenylprop-1-en-1-yl)amino) ethyl)isoindoline-1,3-dione (266)

Compound (**266)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-1-(4-hydroxyphenyl)-3-phenylprop-2-en-1-one (0.58g, 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as yellow liquid (0.41gm, 84%).

Analysis

TLC	: R_f 0.28 (*n*-Hexane: ethyl acetate; 7:3)
IR (KBr, cm^{-1})	: 2956, 1734, 1603, 1280
Mass (m/z)	: 413.33 $(M+1)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 7.98 (dd, J = 19.7, 8.7 Hz, 1H), 7.94 – 7.86 (m, 2H), 7.82 (d, J = 15.7 Hz, 1H), 7.69 – 7.55 (m, 1H), 7.55 – 7.46 (m, 1H), 7.44 – 7.35 (m, 2H), 7.26 (s, 1H), 7.04 – 6.99 (m, 1H), 6.98 – 6.92 (m, 1H), 6.90 (d, J = 8.7 Hz, 1H), 3.73 (s, 1H), 2.57 (s, 4H).

5.1.122 (*Z*)-2-(2-((3-(4-Aminophenyl)-3-oxo-1-phenylprop-1-en-1-yl)amino)ethyl) isoindoline-1,3-dione (267)

Compound (**267)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-1-(4-aminophenyl)-3-phenylprop-2-en-1-one (0.58g, 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as yellow liquid (0.32gm, 71%).

Analysis

TLC : R_f 0.34(*n*-Hexane: ethyl acetate; 7:3)

IR : 2983, 1737, 1234,1043

Mass (m/z) : 411.25 $(M)^+$, 413.31 $(M+2)^{+2}$

^{1}H-NMR ($CDCl_3$, δ) **:** 8.15 – 7.56 (m, 6H), 7.48 – 7.04 (m, 2H), 6.66 (t, J = 11.4 Hz, 5H), 4.12 (s, 4H), 1.62 (s, 1H).

5.1.123 (*Z*)-2-(2-((3-(4-Hydroxyphenyl)-3-oxo-1-(*p*-tolyl)prop-1-en-1-yl)amino) ethyl)isoindoline-1,3-dione (268)

Compound (**268)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z)*-1-(4-hydroxyphenyl)-3-(*p*-tolyl)prop-2-en-1-one (0.57g, 0.0025mM) in Anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether : ethyl acetate (30%) as mobile phase to yield final compound as white solid (0.39gm, 80%) m.p. 167-169ºC.

Analysis

TLC : R_f 0.32(*n*-Hexane: ethyl acetate; 7:3)

IR : 2983, 1736, 1233, 1043

Mass (m/z) : 426.43 $(M)^+$

^{1}H-NMR ($CDCl_3$, δ) : 7.93 (d, J = 8.9 Hz, 2H), 7.80 – 7.65 (m, 1H), 7.61 – 7.46 (m, 1H), 7.42 (d, J = 8.0 Hz, 2H), 7.25 – 7.10 (m, 3H), 7.03 (d, J = 8.9 Hz, 2H), 6.88 – 6.74 (m, 1H), 5.94 (s, 1H), 2.99 (dd, J =

17.4, 10.7 Hz, 4H), 2.55 (s, 1H), 1.25 (s, 3H).

5.1.124 (*Z*)-2-(2-((1-(3-Bromophenyl)-3-(4-hydroxyphenyl)-3-oxoprop-1-en-1-yl) amino)ethyl)isoindoline-1,3-dione (269)

Compound (**269)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-3-(3-bromophenyl)-1-(4-hydroxyphenyl)prop-2-en-1-on, e 303.5(0.57g 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound (**249)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as yellow liquid (0.35gm, 74%).

Analysis

TLC : R_f 0.28(*n*-Hexane: ethyl acetate; 7:3)

IR : 2984, 1736, 1232, 1043

Mass (m/z) : 493.01 $(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.05 – 7.71 (m, 3H), 7.26 (s, 7H), 7.04 – 6.71 (m, 2H), 4.69 (s, 1H), 2.56 (s, 4H).

5.1.125 (*Z*)-2-(2-((3-(4-Chlorophenyl)-1-(3-nitrophenyl)-3-oxoprop-1-en-1-yl) amino)ethyl)isoindoline-1,3-dione (270)

Compound (**270)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-1-(4-chlorophenyl)-3-(3-nitrophenyl)prop-2-en-1-one (0.70g, 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as yellow liquid (0.29gm, 69%).

Analysis

TLC : R_f 0.32(*n*-Hexane: ethyl acetate; 7:3)

IR : 2922, 1736, 1373, 1043

Mass (m/z) : 475.86 (M+1)

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.52 (t, J = 1.9 Hz, 1H), 8.28 (dd, J = 8.2, 2.1, 0.9 Hz, 1H), 8.06 – 7.98 (m, 2H), 7.93 (d, J = 7.7

Hz, 1H), 7.85 (d, J = 15.7 Hz, 1H), 7.62 (d, J = 15.6 Hz, 2H), 7.52 (d, J = 8.6 Hz, 2H), 7.46 – 7.32 (m, 1H), 7.00 (s, 1H), 3.49 (d, J = 5.3 Hz, 1H), 1.56 (s, 3H), 1.25 (s, 2H), 0.88 (s, 2H).

5.1.126 (*Z*)-2-(2-((1-(4-Bromophenyl)-3-(4-chlorophenyl)-3-oxoprop-1-en-1-yl) amino)ethyl)isoindoline-1,3-dione (271)

Compound (**271)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-3-(4-bromophenyl)-1-(4-chlorophenyl)prop-2-en-1-one (0.83g, 0.0025mM)) in anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as yellow semisolid (0.37gm, 79%).

Analysis

TLC : R_f 0.43(*n*-Hexane: ethyl acetate; 7:3)

IR : 2985, 1735, 1372, 1234, 1043

Mass (m/z) : 510.94 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 7.90 – 7.82 (m, 3H), 7.52 (d, J = 4.5 Hz, 1H), 7.45 – 7.37 (m, 5H), 7.14 (dd, J = 11.4, 4.9 Hz, 3H), 6.98 (d, J = 11.3 Hz, 1H), 2.17 (t, J = 5.5 Hz, 1H), 1.25 (s, 4H).

5.1.127 (*Z*)-2-(2-((1,3-Bis(4-fluorophenyl)-3-oxoprop-1-en-1-yl)amino)ethyl)isoin -doline-1,3-dione (272)

Compound (**272)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-1,3-bis(4-fluorophenyl)prop-2-en-1-one (0.63g, 0.0025mM)) in Anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether : ethyl acetate (30%) as mobile phase to yield final compound as yellow liquid (0.34gm , 75%).

Analysis

TLC : R_f 0.43(*n*-Hexane: ethyl acetate; 7:3)

IR : 2983, 1736, 1234, 1043

Mass (m/z) : 430.73 (M-2), 432.57 (M^+)

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.01 – 7.99 (m, 2H), 7.75 (d, J = 15.6 Hz, 1H), 7.65 – 7.61 (m, 2H), 7.53 (d, J = 5.4 Hz, 1H), 7.49 (s, 1H), 7.11 – 7.07 (m, 2H), 6.73 – 6.67 (m, 3H), 3.06 (d, J = 2.7 Hz, 1H), 1.59 (s, 2H), 1.28 (dd, J = 26.6, 14.1 Hz, 2H).

5.1.128 (*Z*)-2-(2-((1-(4-Fluorophenyl)-3-oxo-3-(*p*-tolyl)prop-1-en-1-yl)amino)ethyl) isoindoline-1,3-dione (273)

Compound (**273)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-3-(4-fluorophenyl)-1-(*p*-tolyl)prop-2-en-1-one (0.62g, 0.0025mM)) in anhyd. DMF under same reaction conditions as discussed for compound (**263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as colorless liquid (0.34gm, 75%).

Analysis

TLC : R_f 0.27(*n*-Hexane: ethyl acetate; 7:3)

IR : 2956, 1732, 1604, 1178

Mass (m/z) : 427.3(M-1)

^{1}H-NMR ($CDCl_3$, δ) **:** 8.02 – 7.99 (m, 3H), 7.77 (d, J = 15.6 Hz, 2H), 7.54 (d, J = 7.1 Hz, 3H), 7.20 (s, 2H), 6.71 – 6.69 (m, 2H), 5.30 (s, 1H), 3.06 (d, J = 2.2 Hz, 1H), 2.39 (s, 3H), 1.28 (d, J = 5.3 Hz, 4H).

5.1.129 (*Z*)-2-(2-((1-(4-Chlorophenyl)-3-(4-nitrophenyl)-3-oxoprop-1-en-1-yl) amino)ethyl)isoindoline-1,3-dione (274)

Compound (**274)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-3-(4-chlorophenyl)-1-(4-nitrophenyl)prop-2-en-1-one (0.75g, 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound **(263)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile

phase to yield final compound as yellow liquid (0.23gm, 69%).

Analysis

TLC : R_f 0.44(*n*-Hexane: ethyl acetate; 7:3)

IR : 2984, 1736, 1233, 1043

Mass (m/z) : 474.96 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) : δ 8.43 – 8.22 (m, 2H), 8.23 – 7.99 (m, 2H), 7.90 (dd, J = 28.5, 8.8 Hz, 2H), 7.67 (dd, J = 19.1, 7.6 Hz, 1H), 7.53 (dd, J = 15.8, 7.7 Hz, 1H), 7.40 – 7.31 (m, 2H), 6.99 (d, J = 7.7 Hz, 1H), 6.68 (dd, J = 22.7, 8.4 Hz, 1H), 5.39 – 5.22 (m, 1H), 2.51 (s, 1H), 1.29 (t, J =14.8 Hz, 4H).

5.1.130 Synthesis of (*Z*)-2-(2-((3-(4-nitrophenyl)-3-oxo-1-(*p*-tolyl)prop-1-en-1-yl) amino)ethyl)isoindoline-1,3-dione (275)

Compound (**275)** was synthesized using 2-(2-aminoethyl)isoindoline-1,3-dione (0.5gm, 0.0026mM) and (*Z*)-1-(4-nitrophenyl)-3-(*p*-tolyl)prop-2-en-1-one (0.75g, 0.0025mM) in anhyd. DMF under same reaction conditions as discussed for compound **(249)** to obtain final compound as brown solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (30%) as mobile phase to yield final compound as yellow liquid (0.33gm, 82%).

Analysis

TLC : R_f 0.39(*n*-Hexane: ethyl acetate; 7:3)

IR : 2956, 1599, 1464, 1344

Mass (m/z) : 456.34 (M+1)

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.06 (dd, J = 11.1, 5.2 Hz, 1H), 7.99 (dd, J = 19.8, 10.1 Hz, 1H), 7.95 – 7.89 (m, 1H), 7.89 – 7.80 (m, 2H), 7.61 – 7.48 (m, 3H), 7.02 – 6.98 (m, 1H), 6.77 – 6.64 (m, 2H), 6.60 (d, J = 7.7 Hz, 1H), 4.24 – 3.97 (m, 1H), 3.01 – 2.83 (m, 2H), 2.44 – 2.31 (m, 3H), 2.09 – 1.93 (m, 2H)

5.1.131 Synthesis of 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxami -ide (277)

In a 25 ml RBF, piperidine-4-carboxamide (**276**, 0.5gm, 0.0034mM) was dissolved in 10 ml DMF and K_2CO_3 (0.085gm, 0.0021mM) was added and allowed to stir for 5mins. To this mixture, 2-(2-bromoethyl)isoindoline-1,3-dione (0.37gm, 0.0029mM) was added. The reaction mixture was heated at 80-100°C for 3hrs and monitored by TLC. Upon completion, crushed ice was added to the reaction mixture to obtain the precipitates, filtered under vacuum to obtain crude solid. The obtained compound was purified by column chromatography using pet ether: ethyl acetate (40%) as mobile phase to afford a pure white solid (0.47gm, 94%), m.p. 89-91°C (92-94°C)[14].

Analysis

TLC : R_f 0.29(n-Hexane: ethyl acetate; 7:3)

5.1.132 Synthesis of *N*-1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)-*N*-(3-nitrobenzyl) piperidine-4-carboxamide (289)

Compound (**289)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-(bromomethyl)-3-nitrobenzene (**279**, 0.322gm, 1.49mM) in DMF under same reaction conditions as discussed for compound (**288**) to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.37gm, 77%).

Analysis

TLC : R_f 0.29(*n*-Hexane: ethyl acetate; 7:3)

IR : 1734, 1628.1265, 1051

Mass (m/z) : 437.35 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.19 (s, 2H), 8.11 (d, J = 8.1 Hz, 2H), 7.77 (d, J = 7.6 Hz, 2H), 7.63 (t, J = 7.9 Hz, 2H), 6.55 (s, 1H), 5.54 (t, J = 5.7 Hz, 2H), 4.64 (d, J = 5.4 Hz, 4H), 3.33 (s, 2H), 2.70 (s, 1H), 2.51 (s, 1H), 2.24 – 2.08 (m, 2H), 1.36 – 1.15 (m, 2H).

5.1.134 1-(2-(1,3-Dioxoisoindolin-2-yl)ethyl)-*N*-(2-(trifluoromethyl)benzyl) piperidine-4-carboxamide (290)

Compound (**290)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-(bromomethyl)-2-(trifluoromethyl)benzene (**280**, 0.243ml, 0.79mM) in DMF under same reaction conditions as discussed for compound (**288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.37gm, 77%).

Analysis

TLC	: R_f 0.32(*n*-Hexane: ethyl acetate; 7:3)
IR	: 1660, 1311, 1110
Mass (m/z)	:461.78 $(M+2)^+$
^{1}H-NMR ($CDCl_3$, δ)	**:** δ 8.02 (s, 1H), 7.73 (d, J = 7.7 Hz, 1H), 7.65 (d, J = 7.8 Hz, 1H), 7.59 (t, J = 7.6 Hz, 1H), 7.40 (t, J = 7.6 Hz, 1H), 7.26 (s, 3H), 4.90 (s, 2H), 3.49 (s, 1H), 2.92 (d, J = 29.6 Hz, 5H), 2.09 (m, 4H), 1.26 (t, J = 9.3 Hz, 2H).

5.1.135 1-(2-(1,3-Dioxoisoindolin-2-yl)ethyl)-*N*-(4-methylbenzyl)piperidine-4-carboxamide (291)

Compound (**291)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-(bromomethyl)-4-methylbenzene (**281**, 0.245gm, 1.32mM) in DMF under same reaction conditions as discussed for compound (**288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.31gm, 74%).

Analysis

TLC	: R_f 0.41(*n*-Hexane: ethyl acetate; 7:3)
IR	: 1654, 1386, 1254
Mass (m/z)	: 407.66 $(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.01 (s, 2H), 7.28 (d, *J* = 9.5 Hz, 3H), 7.25 – 7.13 (m, 3H), 4.64 (d, *J* = 11.5 Hz, 2H), 2.96 (s, 4H), 2.89 (s, 4H), 2.72 (d, *J* = 5.0 Hz, 2H), 2.41 – 2.31 (m, 3H), 2.08 (d, *J* = 7.3 Hz, 2H).

5.1.136 1-(2-(1,3-Dioxoisoindolin-2-yl)ethyl)-*N*-(4-nitrobenzyl)piperidine-4-carboxamide (292)

Compound (**292)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-(bromomethyl)-4-nitrobenzene (**282**, 0.322gm, 1.49mM) in DMF under same reaction conditions as discussed for compound (**288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.37gm, 77%).

Analysis

TLC : R_f 0.30(*n*-Hexane: ethyl acetate; 7:3)

IR : 1710, 1657, 1342

Mass (m/z) : 438.68 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.23 (d, *J* = 8.7 Hz, 2H), 7.54 (d, *J* = 8.7 Hz, 2H), 7.26 (s, 4H), 5.20 (s, 1H), 4.85 (s, 2H), 3.49 (s, 1H), 2.99 (d, *J* = 24.3 Hz, 2H), 2.89 (s, 2H), 2.16 -2.10 (s, 2H), 1.93 (s, 4H).

5.1.137 1-(2-(1,3-Dioxoisoindolin-2-yl)ethyl)-*N*-(4-methoxybenzyl)piperidine-4-carboxamide (293)

Compound (**293)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-(bromomethyl)-3-methoxybenzene (**283**, 0.216ml, 1.37mM) in DMF under same reaction conditions as discussed for compound (**288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.38gm, 79%).

Analysis

TLC : R_f 0.37(*n*-Hexane: ethyl acetate; 7:3)

IR : 1659, 1258, 1036

Mass (m/z) : 422.64 $(M+1)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.20 – 7.81 (m, 1H), 7.35 – 7.10 (m, 2H), 7.06 – 6.86 (m, 3H), 6.87 – 6.49 (m, 2H), 5.22 – 4.92 (m, 1H), 4.81 – 4.51 (m, 2H), 4.07 – 3.87 (m, 1H), 3.89 – 3.63 (m, 6H), 3.59 – 3.36 (m, 2H), 3.03 – 2.81 (m, 4H), 2.20 – 1.95 (m, 3H).

5.1.138 *N*-(3-Chlorobenzyl)-1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (294)

Compound (**294)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-(bromomethyl)-3-chlorobenzene **(284**, 0.195ml, 0.94mM) in DMF under same reaction conditions as discussed for compound (**288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.39, 84%).

Analysis

TLC : R_f 0.28(*n*-Hexane: ethyl acetate; 7:3)

IR : 1717, 1386, 777

Mass (m/z) : 427.61 $(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.01 (s, 1H), 7.49 – 7.14 (m, 7H), 5.08 (s, 1H), 4.69 (s, 2H), 3.60 (d, J = 4.2 Hz, 2H), 2.96 (d, J = 4.1 Hz, 2H), 2.88 (s, 2H), 2.70 (s, 2H), 2.32 (d, J = 23.4 Hz, 2H), 2.10 (d, J = 16.5 Hz, 2H).

5.1.139 *N*-(2,5-Difluorobenzyl)-1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (295*)*

Compound (**295)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 2-(bromomethyl)-1,4-difluorobenzene (**285**, 0.192ml, 0.92mM) in DMF under same reaction conditions as discussed for compound **(288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate

(20%) as mobile phase to yield final compound as yellow liquid (0.37gm, 77%).

Analysis

TLC : R_f 0.30 (*n*-Hexane: ethyl acetate; 7:3)

IR : 1712, 1490, 1184, 1044

Mass (m/z) : 429.47 $(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.15 – 7.87 (m, 1H), 7.37 – 7.06 (m, 3H), 7.12 – 6.78 (m, 3H), 5.30 (dd, *J* = 26.2, 15.0 Hz, 1H), 4.70 (d, *J* = 39.0 Hz, 2H), 4.00 – 3.74 (m, 1H), 3.74 – 3.44 (m, 1H), 2.95 (t, *J* = 25.2 Hz, 4H), 2.84 – 2.54 (m, 2H), 2.60 – 2.21 (m, 2H), 2.18 – 1.90 (m, 2H).

5.1.140 1-(2-(1,3-Dioxoisoindolin-2-yl)ethyl)-*N*-(4-fluorobenzyl)piperidine-4-carboxamide (296)

Compound (**296)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-(bromomethyl)-4-fluorobenzene (**286**, 0.186ml, 0.98mM) in DMF under same reaction conditions as discussed for compound (**288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.42gm, 88%).

Analysis

TLC : R_f 0.38(*n*-Hexane: ethyl acetate; 7:3)

IR : 1711, 1509, 1217

Mass (m/z) : 411.56 $(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.13 – 7.92 (m, 1H), 7.40 – 7.30 (m, 2H), 7.26 (s, 3H), 7.11 – 6.98 (m, 2H), 4.69 (d, J = 17.5 Hz, 2H), 3.94 – 3.84 (m, 1H), 3.64 – 3.45 (m, 2H), 2.95 (dd, J = 28.9, 19.7 Hz, 4H), 2.18 – 2.05 (m, 2H), 1.93 (s, 4H)

5.1.141 *N*-(4-Chlorobenzyl)-1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (297)

Compound (**297)** was synthesized using 1-(2-(1,3-dioxoisoindolin-2-yl)ethyl)piperidine-4-carboxamide (0.5gm, 1.66mM) and 1-bromo-4-chlorobenzene (**287**, 0.192ml, 1.19mM) in DMF under same reaction conditions as discussed for compound (**288)** to obtain final compound as yellow solid. The obtained compound was purified using column chromatography using pet ether: ethyl acetate (20%) as mobile phase to yield final compound as yellow liquid (0.39gm, 80%).

Analysis

TLC : R_f 0.47 (*n*-Hexane: ethyl acetate; 7:3)

IR : 1713, 1491, 1012

Mass (m/z) : 427.52 $(M+2)^+$

^{1}H-NMR ($CDCl_3$, δ) **:** δ 8.07 – 7.81 (m, 1H), 7.40 – 7.20 (m, 7H), 4.68 (s, 2H), 3.98 – 3.76 (m, 1H), 3.60 – 3.38 (m, 2H), 2.96 (dd, J = 41.3, 30.7 Hz, 4H), 2.23 – 1.96 (m, 6H).

5.2 Biological screening

For antimalarial activity, *P. falciparum* 3D7 culture was maintained regularly in human O^+ RBCs supplemented with RPMI-1640 (invitrogen, USA) media containing 0.5 % alumax I (Invitrogen, USA), 25 mM Na_2CO_3 (SIGMA, USA), 25 mM HEPES (SRL Pvt. Ltd.), 0.1 mM hypoxanthine (Invitrogen, USA), 10 ug/ml gentamicin (invitrogen, USA) in a mixed gas environment (5 % O_2, 5 % CO_2, and 90 % N_2) at 37^{o}C. The culture was regularly monitored by preparing thin smears and staining with GIEMSA.

The culture was treated with 5% d-sorbitol twice to achieve a tightly synchronized culture at ring stage. Pre-warmed 5% d-sorbitol was added to the pelleted culture in a fixed ratio 1:5, incubated at 37^{o}C for 10 minutes. The sorbitol was removed by pelleting it down at 1500 rpm for 5 min and then washed twice with incomplete RPMI-1640 to achieve synchronized culture at ring stage. The supernatant was discarded, and the culture pellet was resuspended in fresh complete culture media. At 1% parasitemia and 2% hematocrit parasite culture was seeded into a 96-well micro

titre plate. Primary screening of the compounds with three concentrations was done to analyse the inhibitory effect of the compounds. The wells were incubated with 50 nM, 500 nM and 10 µM for 72 hours[19].

5.3 Computational studies

5.3.1 Preparation of protein

The X-ray crystallographic structure (PDB ID 2GHU) of malaria targeting *pf*DHFR-TS site was extracted from RCSB protein data bank. The retrieved protein was synthesized using protein preparation wizard of maestro (Schrodinger Suite version 2022-04). In this wizard the protein was synthesized by rectifying the errors present in protein like missing of hydrogen atoms, along with this some unnecessary things were also removed like water molecules, unwanted similar protein chains. In protein preparation wizard bond order is assigned and missing hydrogens were added to the retrieved protein. The protein is preprocessed by keeping some factors such as disulfide bond between two sulfur atoms as default. The force filed used in the energy optimization and preprocessing of protein was OPLS4 and the RMSD was set at 0.3Å[16].

5.3.2 Preparation of ligand

For performing docking studies ligands were synthesized using chemdraw and saved in SDF (Structure data File) format for processing in maestro. In the LigPrep wizard tautomer's and ionization states were generated and force field geometry was optimized. The force filed used to prepare ligands in maestro is OPLS_2005 force field[16].

5.3.3 Receptor grid generation

The grid box was generated in maestro after preparing ligand and protein using receptor grid generation wizard. Grid generation was done in already synthesized protein from which ligand is excluded. The binding site was selected from the site tab of grid generation menu. From grid generation a purple box showing protein volume was generated by taking receptor, site, constraints and rotatable groups under consideration. In receptor wizard partial charge cut-off value, van der waals radius were considered as important parameters. In the site tab site points set were consider to specify the grid generation area. Similarly, constraints and rotatable group were used to define the flexibility of receptor for docking[16].

5.3.4 Physiochemical and pharmacokinetic properties

The pharmacokinetic and drug-likeness profiles of the synthesized compounds were evaluated in silico using the Swiss ADME tool provided by the Swiss Institute of Bioinformatics. The canonical SMILES representations of the compounds were submitted to the Swiss ADME online platform, which computes a range of relevant descriptors. These include physicochemical properties, lipophilicity, aqueous solubility, pharmacokinetics, drug-likeness criteria, and medicinal chemistry filters. This predictive analysis enabled early assessment of the compounds' potential oral bioavailability and drug-like behavior[15].

5.3.5 Toxicity predication

To evaluate the potential toxicological properties of the synthesized compounds, in silico toxicity assessments were conducted using two expert systems: DEREK Nexus and Sarah Nexus 2.5 (Lhasa Limited, UK). These software tools are widely utilized for early-stage toxicity screening in drug discovery to reduce the likelihood of late-stage failures.

DEREK Nexus (version 2.5) operates as a knowledge-based system that identifies toxicity risks based on established structure–activity relationships and expert-curated alerts. It predicts a wide range of endpoints, including mutagenicity, carcinogenicity, hepatotoxicity, skin sensitization, and reproductive toxicity. Each prediction is accompanied by a confidence level—ranging from certain to improbable—based on the strength of supporting evidence and mechanistic reasoning[17,18].

In parallel, Sarah Nexus, a statistical machine learning model, was employed specifically for mutagenicity prediction (Ames test). Unlike DEREK, Sarah uses a large dataset of known mutagens and non-mutagens to train its algorithm, providing predictions with associated confidence scores and applicability domain indicators[17]. This dual-software approach combining rule-based and statistical models-ensures a more comprehensive evaluation by balancing expert knowledge with data-driven insights.

The structural files of the compounds were synthesized in standard formats and analysed through both platforms. Compounds flagged with significant toxicity

concerns, especially with high-confidence alerts in DEREK or positive mutagenicity predictions in Sarah, were noted for further investigation or structural optimization. Together, the integrated use of DEREK and Sarah Nexus provided a reliable and efficient method for preliminary toxicity screening, supporting the rational design of safer compounds in the early phases of development.

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