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Oxone Catalyzed Amination of 2-naphthol/substituted 2-naphthol Analogous as Bio-active Compounds *via* C-O Activation and C-N Bond Formation

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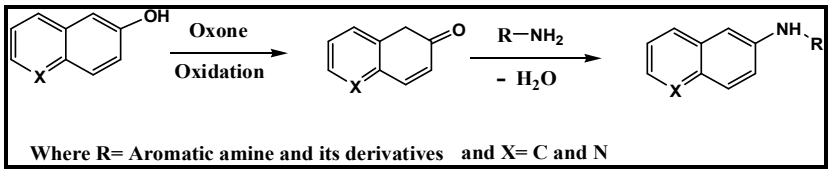
ABSTRACT

The hydroxyl groups of 2-naphthol/ substituted 2-naphthol analogous are replaced by arylamine derivatives via oxone catalyzed coupling reaction. Oxone exhibits important catalytic activity in the reaction and products of reaction generated in good yields. The reaction proceeds by the intermediary of the keto tautomer of naphthol and nucleophilic addition to the carbonyl group followed by elimination of water and give the desired product. The present methodology provides the aminated product, can be further transformed to pharmaceutically important.

Graphical Abstract



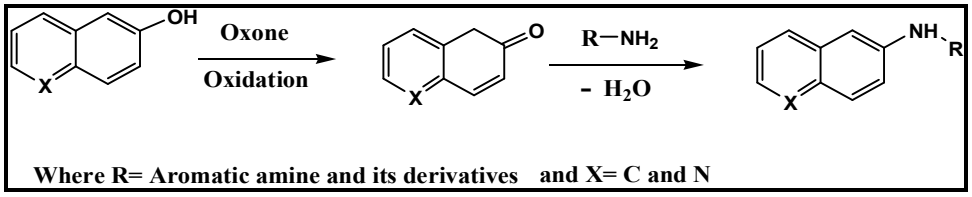
Keywords: Bio-active, Oxone, Aryl amine, 2-naphthol/substituted 2-naphtholanalogous.

INTRODUCTION

Diarylamines are crucial structural motif in organic synthesis due to their wide applications in agrochemicals, natural products, advanced materials and special pharmacological activities [1-5]. This study focuses on the development of facile and reliable method for the synthesis of diarylamine derivatives. Till now, there are various methods for aryl-aryl coupling reactions using catalyst and different conditions. There is a need for development of method involving synthesis of these important compounds which are important to the pharmaceutical industry. Various reactions like *N*-arylation, *O*-arylation and *S*-arylation are there but here *N*-arylation process is focussed [6-9]. There have been various methods for the synthesis of aryl amines. Some of them are transition-metal-catalyzed amination reactions, such as Chan–Lam Amination [10-12], intermolecular hydroamination

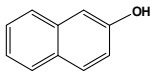
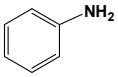
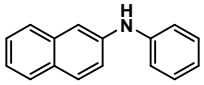
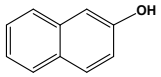
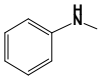
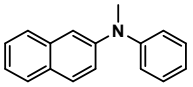
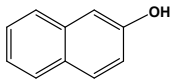
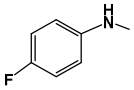
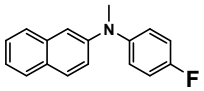
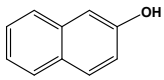
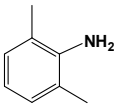
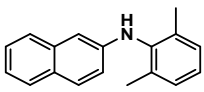
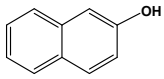
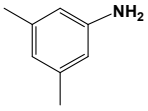
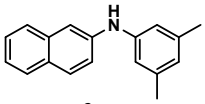
[13-15] and oxidative aromatization [16-21]. The most prominent reactions are the Buchwald-Hartwig coupling [22-27] and Ullmann-type aminations [28-31], in which aryl halides are frequently used as electrophiles and coupled with amines. But this method has certain drawbacks like, the need of pre-synthesizing the aryl halides and the generation of unwanted halide waste.

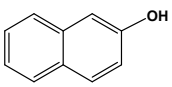
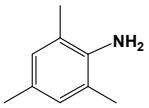
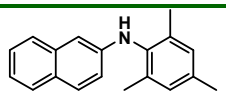
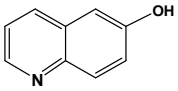
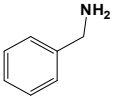
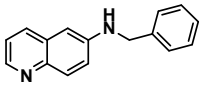
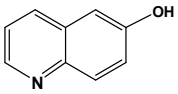
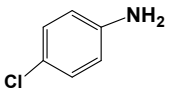
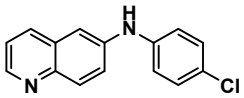
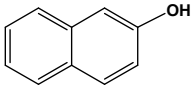
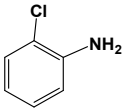
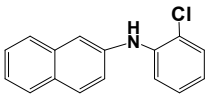
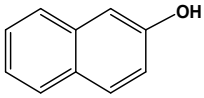
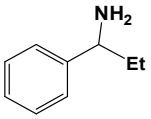
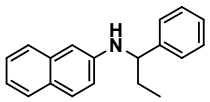
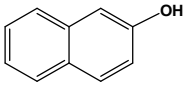
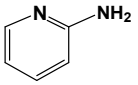
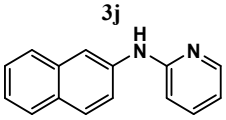
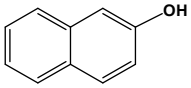
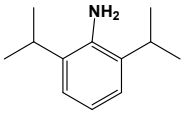
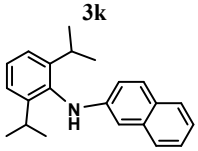
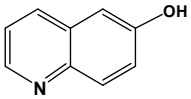
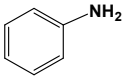
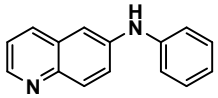
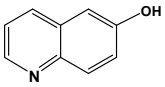
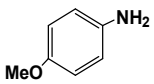
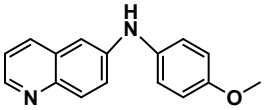
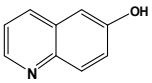
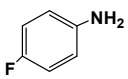
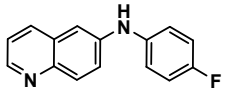
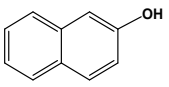
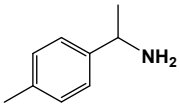
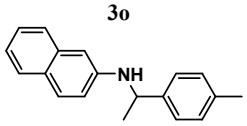
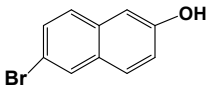
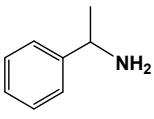
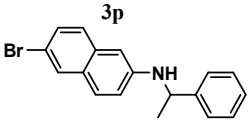
A wide variety of aryl bromides and chlorides, bearing either electron-donating or electron-withdrawing substituents, were efficiently coupled with aniline partners. Here we propose an alternative method that allows the direct substitution of the hydroxyl group from arylamine derivatives by activation of substrates with oxone. Here in, we report our results on the synthesis of substituted aromatic amine derivatives by nucleophilic substitution reaction using 2-naphthol/ substituted 2-naphthol analogous as starting substrates. This method includes preparation of C-N bonds from 2-naphthol/substituted 2-naphthol analogous and its related derivatives which makes symmetrical and unsymmetrical diarylamines via nucleophilic substitution from arylamine derivatives followed by oxidation of hydroxyl group by oxone. The beauty of present work is that reaction takes place in dry toluene and eliminates the problem of side products, as applied in many similar syntheses. 2-naphthol/substituted 2-naphthol analogous contains either electron releasing groups or electron withdrawing group, in both the cases reaction proceeds at appropriate temperature.

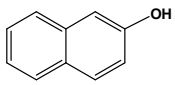
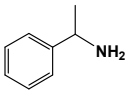
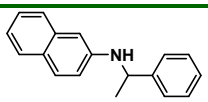
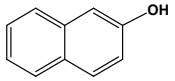
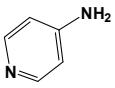
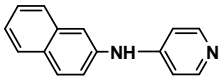
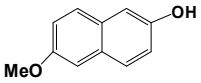
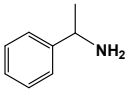
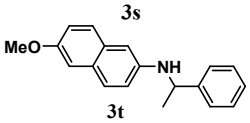
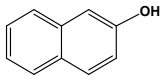
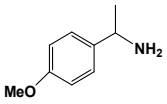
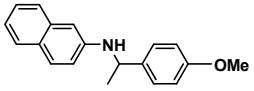


Scheme 1.

Table 1. Synthesized compounds and their physical analysis

Entry	2-Naphthol and its analogous	Amines (R)	Products	Physical state	M.P. (°C)
1			 **3a**	White- gray solid	106-108
2			 **3b**	Colourless Liquid	–
3			 **3c**	Light brown	129-130
4			 **3d**	Light-yellow solid	118-120
5			 **3e**	Brown oil	–

6			 **3f**	Dark red oil	–
7			 **3g**	White solid	125-126
8			 **3h**	Light-yellow Solid	189-191
9			 **3i**	White crystals	88-90
10			 **3j**	Colourless crystals	75-76
11			 **3k**	Slightly yellow solid	84– 86
12			 **3l**	Yellowish solid	110-112
13			 **3m**	Light-yellow solid,	177-179
14			 **3n**	Light-yellow solid,	126-128
15			 **3o**	Brownsolid	70–72
16			 **3p**	Slightly yellow solid	76-77
17			 **3q**	Pale brown	108–109

18			 **3r**	Slightly tanned solid	73–75
19			 **3s**	White solid	222-224
20			 **3t**	Colourless solid.	103-105
21			 **3u**	Slightly yellow oil	–

MATERIALS AND METHODS

General procedure for synthesis: Catalyst oxone (20 mol%), 2-naphthol/substituted 2-naphthol,and its analogous (1.0 mmol), aryl amines/alkyl amine derivatives (1.0 mmol) and 2 mL of dry toluene were taken in a 5 mL reaction vial under argon atmosphere and reaction was stirred at reflux for 12 h, after completion of reaction monitored with TLC and the crude product was purified with silica gel (100-200 mess size) column chromatography using ethyl acetate in hexane, solution offered the desired products over all yield 79-85%.

Table 2: Optimization table of experiments

Entry	Solvent	Catalyst	Temperature	Yield
1	DCM	10 mol%	39°C	10%
2	DCE	10 mol%	83°C	15%
3	Chloroform	10 mol%	61°C	40%
4	Benzene	10 mol%	80°C	50%
5	Toluene	10 mol%	110°C	75%
6	Toluene	20 mol%	110°C	85%
7	Toluene	30 mol%	110°C	85%
8	Toluene	50 mol%	110°C	80%

Supporting Information

N-phenylnaphthalen-2-amine (3a): Yield 65% ^{1}H NMR (400 MHz,DMSO-d6) δ =8.43 (s, 1H), 7.78 (d, *J* = 8.8 Hz, 1H),7.71 (d, *J* = 8.0 Hz, 1H), 7.66 (d, *J* = 8.3 Hz, 1H), 7.49 (d, *J* = 2.3 Hz, 1H), 7.34 (td, *J* = 7.4 Hz, *J* = 1.2 Hz, 1H), 7.30(m, 4H), 7.24 (dd, *J* = 8.4 Hz, *J* = 1.2 Hz, 2H), 6.85 (m, 1H). ^{13}C NMR (101 MHz, DMSO-d6) δ = 143.08, 141.24, 134.14, 129.25, 128.80, 128.18, 127.44, 126.18, 126.16, 122.74, 120.18, 119.86, 117.34, 108.88.

N-methyl-N-phenylnaphthalen-2-amine (3b): Yield 60% ^{1}H NMR (400 MHz, DMSO-d6) δ = 7.65 –7.65 (m, 3 H), 7.40–7.35 (m, 1 H), 7.35–7.30 (m, 4 H), 7.254 (dd, *J* = 9.0, 7.5 Hz, 1 H), 7.16 (d, *J* = 7.5Hz, 2 H), 7.04 (t, *J* = 7.5 Hz, 1 H), 3.46 (s,3H). ^{13}C NMR (101 MHz, DMSO-d6) δ =148.82, 146.43, 134.64, 129.34, 129.10, 128.50, 127.50, 126.70, 126.20, 123.85, 122.10, 121.70, 121.46, 114.55, 40.76.

N-(4-fluorophenyl) naphthalen-2-amine (3c): Yield 58% ^{1}H NMR (400 MHz, DMSO-d6) δ = 8.28 (d, J = 3.1Hz, 1H), 7.94 – 7.65 (m, 4H), 7.64 –7.34 (m, 5H), 7.11 (d, J = 8.4 Hz, 1H), 6.84 – 6.65 (m, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ =156.05, 148.50, 138.24, 137.78, 134.44, 130.102, 129.13, 127.63, 127.10, 126.44, 124.34, 121.45, 115.60, 115.25, 108.64.

N-(2, 6-dimethylphenyl) naphthalen-2-amine (3d): Yield 58% ^{1}H NMR (400 MHz, DMSO-d6) δ = 7.67 (m, 2H), 7.48 (d, *J* = 8.25 Hz, 1H), 7.35 (dd, *J* = , 7.50 Hz, 1H), 7.18 (m, 4H), 6.98 (m,1H), 6.57 (d, *J* = 1.8 Hz, 1H), 5.24 (s, 1H), 2.29 (s, 6H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 144.15, 138.10, 136.34, 135.28, 129.46, 128.95, 128.24, 127.92, 126.52, 126.30 (2C), 122.48, 117.82, 106.56, 18.64.

N-(3, 5-dimethylphenyl) naphthalen-2-amine (3e): Yield 56% ^{1}H NMR (400 MHz,DMSO-d6) δ = 7.84 (d, *J* = 5.6Hz, 1H) 7.82 (d, *J* = 8.5 Hz, 1H), 7.74 (d, *J* = 8.3 Hz, 1H), 7.48-7.40 (m, 2H), 7.36 (dd, *J* = 8.0,8.0 Hz, 1H), 7.31 (dd, *J* = 8.8, 2.2 Hz, 1H), 6.86 (s, 2H), 6.76 (s, 1H), 5.82 (s, 1H), 2.44 (s,6H); ^{13C} NMR (101 MHz, DMSO-d6) δ = 143.15, 141.48, 139.36, 135.12, 129.20 (2C), 128.18, 126.85, 126.74, 123.71, 123.64, 120.50, 116.50, 11.20, 21.84.

Naphthalen-2-yl-(2, 4, 6-trimethyl-phenyl)-amine (3f): Yield 55% ^{1}H NMR (400 MHz,DMSO-d6) δ =7.64 (m, 2H), 7.48 (d, *J* = 8.2 Hz, 1H), 7.34 (dd, *J* = 7.0, 7.0 Hz, 1H),7.20 (m, 1H), 6.95 (s, 2H), 6.96 (m, 1H), 6.57 (m, 1H), 5.29 (s, 1H), 2.34 (s, 3H), 2.24 (s, 6H) ^{13}C NMR (101 MHz, DMSO-d6) δ =144.50, 136.33, 135.08, 135.50, 135.30, 129.65, 129.38, 128.18, 128.08,126.48, 126.26, 122.48, 117.75, 106.15, 21.30, 18.59.

N-Benzylquinolin-6-amine (3g): Yield 54% ^{1}H NMR (400 MHz,DMSO-d6) δ =8.58 (d, J = 4.0Hz, 1H), 7.87 (d, J = 8.8 Hz, 1H), 7.88 (d, J = 8.0 Hz, 1H),7.28-7.38 (m, 4H), 7.36 (t, J = 7.2 Hz, 1H), 7.24 (dd, J = 8.0,4.0 Hz, 1H), 7.10 (dd, J = 2.8, 8.8 Hz, 1H), 6.74 (d, J = 2.8Hz, 1H), 4.47 (s, 1H), 4.45 (d, J= 4.8 Hz, 2H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 146.26, 146.12, 143.45, 138.95, 133.85,130.38, 130.14, 128.72, 127.54, 127.40, 121.28,103.46, 48.35.

N-(4-Chlorophenyl) quinolin-6-amine (3h): Yield 50% ^{1}H NMR (400 MHz, DMSO-d6) δ = 8.75 (dd, J = 4.2, 1.6 Hz, 1H), 8.12 (d, J = 9.0 Hz, 1H), 7.88 (d, J=7.5 Hz, 1H), 7.421 (dd, J = 9.0, 2.6 Hz, 1H), 7.20-7.30 (m,4H), 7.15 (m, 2H), 6.05 (s,1H); ^{13}C NMR (101 MHz, DMSO-d6) δ =147.92, 144.65, 141.420, 141.06, 134.44, 130.82,129.58, 129.58, 127.16, 123.10, 121.62, 120.35, 110.15.

N-(2-chlorophenyl) naphthalen-2-amine (3i): Yield 52% ^{1}H NMR (400 MHz,DMSO-d6) δ = 6.28 (1H, s), 6.84 (1H, td, 1*J)* 7.7 Hz, 2*J)* 1.5 Hz), 7.20 (1H, td,1*J*) 7.49 Hz, 2*J*) 1.5 Hz), 7.33 (1H, dd, 1*J*) 8.71 Hz, 2*J*) 2.32 Hz), 7.46 (3H, m), 7.44 (1H, m),7.53 (1H, d, *J*) 2.3 Hz), 7.74 (1H, *J*) 8.3 Hz), 7.82 (2H, t, *J*) 8.6 Hz). ^{13}C NMR (101 MHz, DMSO-d6) δ = 114.94, 116.15, 120.76, 121.33, 121.85, 124.24, 126.48, 126.82, 127.44, 127.63, 129.29, 129.84, 129.98, 134.34, 139.16, 140.00.

N-(1-phenylpropyl) naphthalen-2-amine (3j): Yield 51% ^{1}H NMR (400 MHz, DMSO-d6) δ = 0.95 (t, J = 7.3 Hz, 3H), 1.64–1.88(m, 2H), 4.44 (q, J = 7.2 Hz; 1H), 6.48 (d, J = 7.6 Hz, 1H), 6.56 (d, J = 2.2 Hz, 1H), 7.10(m, 2H), 7.18 (m, 2H), 7.29 (m, 2H), 7.43 (m, 3H), 7.51 (d,J = 9.0 Hz, 1H),7.57 (dd, J = 8.2, 1.2 Hz, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 11.25, 30.88, 58.24, 103.49, 118.46, 120.84, 125.35, 125.86, 126.28, 126.54, 126.59, 127.34, 128.19, 128.25, 134.89, 145.63, 146.15.

N-(naphthalen-6-yl) pyridin-2-amine (3k): Yield 54% ^{1}H NMR (400 MHz, DMSO-d6) δ = 1.55 (d, J = 6.7 Hz, 3H), 4.76 (p,J = 6.7 Hz, 1H), 6.58 (d, J = 2.2 Hz, 1H), 6.61 (d, J = 6.9 Hz, 1H,), 7.14 (ddd, J = 8.2, 6.8, 1.2Hz, 1H), 7.10 (dd, J = 9.0, 2.2 Hz, 1H), 7.23 (ddd, J = 8.2, 6.8, 1.2 Hz, 1H), 7.32 (dd, J = 8.2,1.1 Hz, 1H), 7.46 (m, 2H), 7.54 (d, J = 9.0 Hz, 1H), 7.58 (d, J = 7.9 Hz, 1H), 7.64 (dd,J = 8.5, 1.7 Hz, 1H), 7.84 (m, 3H), 7.88 (d, J = 1.6 Hz, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ =24.44, 52.24, 103.85, 118.45, 121.14, 124.08, 124.59, 125.28, 125.42, 125.82, 126.10, 126.32, 127.30, 127.45, 127.55, 128.18, 128.27, 132.15, 133.12, 134.75, 143.36, 145.70.

N-(2, 6-diisopropylphenyl) naphthalen-2-amine (3l): Yield 50% ^{1}H NMR (400 MHz, DMSO-d6) δ =7.70 (m, 2H), 7.56 (d, *J* = 8.2 Hz, 1H), 7.35 (m, 4H), 7.22 (m, 1H), 6.70 (m, 1H), 6.64 (s, 1H), 5.35 (s, 1H), 3.39 (m, 2H), 1.24 (d, *J* =6.8 Hz, 12H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 147.75, 146.15,

135.32, 135.25, 129.35, 128.12, 126.90, 127.80, 126.50, 126.10, 124.35, 122.18, 117.40, 106.25, 28.05, 24.25.

N-phenylquinolin-6-amine (3m): Yield 48% ^{1}H NMR (400 MHz, DMSO-d6) δ =8.75 (dd, J = 1.5,4.2 Hz, 1H), 7.96 (d, J = 9.0 Hz, 1H), 7.95 (d, J = 8.2 Hz,1H), 7.44 (dd, J = 2.6, 9.0 Hz, 1H), 7.35 (m, 3H), 7.33 (dd, J = 4.2, 8.3 Hz, 1H), 7.24 (d, J = 7.6 Hz, 2H), 7.12 (t, J= 7.3 Hz, 1H), 6.20 (s, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 147.67, 144.54, 142.35, 141.88, 134.35, 130.70, 129.68,129.58, 123.15, 122.35, 121.54, 119.35, 109.75.

N-(4-methoxyphenyl) quinolin-6-amine (3n): Yield 45% ^{1}H NMR(400 MHz, DMSO-d6 δ = 8.65(dd, J = 4.2, 1.6 Hz, 1H), 7.89 (d, J = 9.0 Hz, 1H), 7.86 (d, J= 8.3 Hz, 1H), 7.33 (dd, J = 9.0, 2.6 Hz, 1H), 7.29 (dd, J =8.4, 4.2 Hz, 1H), 7.22 (m, 2H), 7.14 (d, J = 2.6 Hz, 1H),6.96 (m, 2H), 5.75 (s, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ = δ 156.15, 146.90, 144.10, 143.80, 134.94, 134.06, 130.55, 129.88, 123.48, 122.12, 121.45, 114.80, 107.15, 55.50.

N-(4-fluorophenyl) quinolin-6-amine (3o): Yield 52% ^{1}H NMR (400 MHz, DMSO-d6) *δ* = 6.17 (br. s., 1 H), 7.10 (m, 2 H), 7.22 (m, 3 H), 7.34 (m, 2 H), 7.85 (m, 2 H), 8.76 (m, 1 H) ppm; ^{13}C NMR (101 MHz, DMSO-d6) δ = 107.83, 116.15, 116.25, 121.40, 122.15, 122.20, 122.57, 129.55, 130.14, 134.54, 137.88, 137.50, 142.52, 143.40, 146.78, 157.62, 160.00.

N-(1-p-tolylethyl) naphthalen-2-amine (3p): Yield 50% ^{1}H NMR (400 MHz,DMSO-d6) δ =1.44 (d, J = 6.8 Hz, 3H), 2.24 (s, 3H),4.56 (m, 1H), 6.45 (d,J= 7.1 Hz, 1H), 6.50 (d, J = 2.2 Hz, 1H), 7.08 (m, 2H),7.08 (m, 2H), 7.25 (m, 1H), 7.34 (m, 2H), 7.40 (dd, J = 8.2, 1.1 Hz, 1H), 7.50(d, J = 8.8 Hz, 1H), 7.58 (dd, J = 8.2, 1.1 Hz, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ =21.08, 25.05, 52.15, 104.24, 118.85, 121.44, 125.70, 126.75, 127.88, 128.69, 129.38, 135.24, 135.86,143.24, 146.20.

6-bromo-N-(1-phenylethyl) naphthalen-2-amine (3q): Yield 52% ^{1}H NMR (400 MHz,DMSO-d6) δ = 1.48 (d, 6.8 Hz, 3H), 4.63 (m, 1H), 6.54 (d,J = 2.2 Hz, 1H), 6.63 (bs, 1H), 7.11 (dd, J = 8.9, 2.2 Hz, 1H), 7.18 (m, 1H), 7.27 (m,4H), 7.43 (m, 2H), 7.55 (d, J = 8.9 Hz, 1H), 7.84 (d, J = 2.0 Hz, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 24.34, 52.15, 102.88, 113.15, 119.48, 125.95, 126.56, 127.42, 127.40, 127.54,128.34, 128.54, 129.06, 133.36, 144.92, 146.10.

N-(1-phenylethyl) naphthalen-2-amine (3r): Yield 56% ^{1}H NMR (400 MHz,DMSO-d6) δ = 1.45 (d, J = 6.8 Hz, 3H), 4.57 (m, 1H), 6.49 (d, J = 7.1 Hz, 1H), 6.52 (d, J = 2.2Hz, 1H), 7.08 (m, 2H), 7.20 (m, 2H), 7.28 (m, 2H), 7.35 (m, 1H), 7.42–7.45(m, 2H), 7.58 (m, 2H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 24.53, 52.10, 103.74, 118.47,120.90, 125.38, 125.85, 125.88, 126.35, 126.45, 127.34, 128.20, 128.40, 134.85, 145.742, 145.84.

N-(naphthalen-6-yl) pyridin-4-amine (3s): Yield 52% ^{1}H NMR (400 MHz, DMSO-d6) δ = 1.54 (d, J = 6.7 Hz, 3H), 4.76 (p,J = 6.7 Hz, 1H), 6.56 (d, J = 2.2 Hz, 1H), 6.61 (d, J = 6.9 Hz, 1H,), 7.06 (ddd, J = 8.2, 6.8, 1.2Hz, 1H), 7.04 (dd, J = 9.0, 2.2 Hz, 1H), 7.20 (ddd, J = 8.2, 6.8, 1.2 Hz, 1H), 7.37 (dd, J = 8.2,1.1 Hz, 1H), 7.44 (m, 2H), 7.54 (d, J = 9.0 Hz, 1H), 7.56 (d, J = 7.9 Hz, 1H), 7.60 (dd,J = 8.5, 1.7 Hz, 1H), 7.84 (m, 3H), 7.96 (d, J = 1.6 Hz, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 24.42, 52.25, 103.84, 118.45, 121.08, 124.04, 124.70, 125.30, 125.40, 125.85, 126.08, 126.35, 127.36, 127.45, 127.55, 128.15, 128.20, 132.15, 133.08, 134.88, 143.35,145.74.

6-methoxy-N-(1-phenylethyl) naphthalen-2-amine (3t): Yield 55% ^{1}H NMR (400 MHz, DMSO-d6) δ = 1.40 (d, *J* = 6.8 Hz, 3H), 3.74 (s, 3H),4.48 (m, 1H), 6.25 (d, *J* = 7.1 Hz, 1H), 6.50 (d, *J* = 2.2 Hz, 1H), 6.73 (dd, *J* = 8.9, 2.6 Hz,1H), 7.05 (dd, *J* = 8.9,2.2 Hz, 1H), 7.10 (d, *J*=2.6Hz, 1H), 7.20 (m,1H), 7.36 (m,3H), 7.44 (m,2H),7.48 (d, *J* = 8.9 Hz, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 24.48, 52.25, 54.88, 104.40, 106.22, 118.10, 118.70, 125.92, 126.40, 126.80, 126.94, 127.11, 128.35, 130.10, 144.15, 146.0, 154.18.

N-(1-(4-methoxyphenyl) ethyl) naphthalen-2-amine (3u): Yield 53% ^{1}H NMR (400 MHz, DMSO-

d6) δ = 1.40 (d, J = 6.7 Hz, 3H), 3.72 (s, 3H), 4.50 (m, 1H), 6.44 (d, J = 7.2 Hz, 1H), 6.55 (d, J = 2.2 Hz, 1H), 6.75 (m, 1H), 7.08 (m, 4H), 7.24 (m, 2H), 7.39 (dd, J = 8.3, 1.0 Hz, 1H), 7.55 (d, J = 9.0 Hz, 1H), 7.58 (dd, J = 8.3, 1.2 Hz, 1H); ^{13}C NMR (101 MHz, DMSO-d6) δ = 24.48, 51.70, 54.84, 103.75, 111.00, 111.80, 118.22 ,118.40, 120.88, 125.30, 125.80, 126.30, 127.34, 128.10, 129.40, 134.85, 145.77, 147.60, 159.44.

RESULTS AND DISCUSSION

A general, efficient method for C-N bond formation by using various solvent and temperature mentioned in optimisation table. The synthesis was conducted using 2-naphthol/substituted 2-naphthol analogous, substituted aryl amines and catalyst oxone, in dry toluene which results desired products in good yields. The toluene as solvent and 110°C temperature in 20 mol% catalyst give best results in comparison to other solvent used in reaction that was Chloroform, DCM, DCE, and Benzene. On increasing the mol % of catalyst at same temperature from 20 mol% to 30 mol% and 50 mol% the observed results were same and give similar yields.

APPLICATION

The catalyst oxone used in reaction is easily available, simple handling and less hazardous in nature. Diarylamines synthesized in experiment have wide applications in agrochemicals, natural products, advanced materials and special pharmacological activities. This study focuses on the development of facile and reliable method for the synthesis of diarylamine derivatives via C-O activation and C-N bond formation. This methods includes preparation of C-N bonds from 2-naphthol/substituted 2-naphthol analogous which makes symmetrical and unsymmetrical aromatic nitrogen substituted via nucleophilic substitution from aromatic amines followed by oxidation of hydroxyl group by oxone and provide expected yields.

CONCLUSIONS

Efficient method established for amination of 2-naphthol/substituted 2-naphthol analogous via nucleophilic substitution of hydroxyl group with aromatic arylamines. Experiment includes oxone as activating agent as well as catalyst and play efficient role for the generation of new C–N bonds. This methodology offers an efficient alternative approach for the synthesis of bio-active products. In this recent and new methodology we use variety of substituted, aromatic arylamines and 2-naphthol /substituted 2-naphthol analogous. The work is valuable method of C-N bond formation in laboratory due to its atom-economy, simplicity, readily available chemicals, nontoxic reaction condition and better yields of reaction.

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