Supporting Information
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Pd-Catalyzed Oxidation of Imines to Amides

Supporting Information

Contents

1. General Information...........................................................................................................................................S2
2. General Procedure for the Oxidation Reaction..............................................................................................S2
3. Characterization Data.........................................................................................................................................S3
4. References.........................................................................................................................................................S8
5. Copies of $^1$H NMR and $^{13}$C NMR Spectra.................................................................................................S9
1. **General Information.**

Unless otherwise stated, all reagents were purchased from commercial suppliers and used without further purification. All reactions were carried out in air without any precautions to exclude moisture unless otherwise noted. Reactions were monitored by thin-layer chromatography (TLC) on silica gel GF-254 pre-coated glass plates. Chromatograms were visualized by fluorescence quenching with UV light at 254 nm. $^1$H NMR spectra, recorded at 400 MHz, are referenced to the residual solvent peak at 7.26 ppm (CDCl$_3$) and 3.33 ppm (DMSO-d$_6$). $^{13}$C NMR spectra, recorded at 101 MHz, are referenced to the residual solvent peak at 77.0 ppm (CDCl$_3$) and 39.52 ppm (DMSO-d$_6$).

2. **General procedure for the oxidation of imines to amides.**

Pd(OAc)$_2$ (0.01 mmol), imine (0.2 mmol), TBHP (70 % solution in H$_2$O, 6.0 equiv, 1.2 mmol) and DCE (1.5 mL) were added to a vial. The reaction mixture was stirred under 120 °C for 5 h. After that time, the reaction mixture was quenched with saturated Na$_2$SO$_3$ solution (consumption of residual TBHP) and extracted with EtOAc. The organic layer was separated and dried with Na$_2$SO$_4$. Removal of solvent followed by flash column chromatographic purification (Ethyl acetate/Petroleum ether) afforded amide products.
3. Characterization Data

\(N\)-phenylbenzamide (2a)

Following the general procedure with \(N\)-diphenylmethanimine (0.2 mmol, 36.2 mg) to obtain 2a as a white solid (33.5 mg, yield 85%). \(^1\)H NMR (400 MHz, CDCl\(_3\)) \(\delta\) 7.94 (bs, 1H), 7.86 (d, \(J = 7.3\) Hz, 2H), 7.65 (d, \(J = 7.9\) Hz, 2H), 7.54 (t, \(J = 7.3\) Hz, 1H), 7.47 (t, \(J = 7.4\) Hz, 2H), 7.36 (t, \(J = 7.8\) Hz, 2H), 7.15 (t, \(J = 7.4\) Hz, 1H) ppm. \(^{13}\)C NMR (101 MHz, CDCl\(_3\)) \(\delta\) 165.7, 137.9, 135.0, 131.9, 129.1, 128.8, 127.0, 124.6, 120.2 ppm. These data are consistent with those previously reported.\(^[1]\)

\(N\)-(4-(Trifluoromethoxy)phenyl)benzamide (2b)

Following the general procedure with 1-phenyl-\(N\)-(4-(trifluoromethoxy)phenyl)methanimine (0.2 mmol, 53.0 mg) to obtain 2b as a white solid (33.7 mg, yield 60%). \(^1\)H NMR (400 MHz, DMSO-d\(_6\)) \(\delta\) 10.47 (s, 1H), 7.97 (d, \(J = 7.6\) Hz, 2H), 7.92 (d, \(J = 8.6\) Hz, 2H), 7.62 (t, \(J = 7.3\) Hz, 1H), 7.55 (t, \(J = 7.5\) Hz, 2H), 7.38 (d, \(J = 8.5\) Hz, 2H) ppm. \(^{13}\)C NMR (101 MHz, DMSO-d\(_6\)) \(\delta\) 166.2, 144.3, 138.9, 135.1, 132.2, 128.9, 128.2, 122.1, 121.9, 120.6 (q, \(J = 205.0\) Hz) ppm. These data are consistent with those previously reported.\(^[2]\)

\(N\)-p-tolylbenzamide (2c)

Following the general procedure with 1-phenyl-\(N\)-(p-tolyl)methanimine (0.2 mmol, 39 mg) to obtain 2c as a white solid (21.9 mg, yield 52%). \(^1\)H NMR (400 MHz, CDCl\(_3\)) \(\delta\) 7.78 – 7.73 (m, 3H), 7.45 – 7.39 (m, 5H), 7.10 – 7.08 (m, 2H), 2.26 (s, 3H) ppm. \(^{13}\)C NMR (101 MHz, CDCl\(_3\)) \(\delta\) 165.7, 135.4, 135.1, 134.3, 131.8, 129.6, 128.8, 127.0, 120.3, 20.9 ppm. These data are consistent with those previously reported.\(^[3]\)

\(N\)-(4-(tert-butyl)phenyl)benzamide (2d)

Following the general procedure with \(N\)-(4-(tert-butyl)phenyl)-1-phenylmethanimine (0.2 mmol, 47.4 mg) to obtain 2d as a white solid (22.8 mg, yield 45%). \(^1\)H NMR (400 MHz, CDCl\(_3\)) \(\delta\) 7.86 (d, \(J = 7.5\) Hz, 2H), 7.84 (s, 1H), 7.57 – 7.46 (m, 5H), 7.39 (d, \(J = 8.5\) Hz, 2H), 1.33 (s, 9H) ppm. \(^{13}\)C NMR (101 MHz, CDCl\(_3\)) \(\delta\) 165.7, 147.6, 135.3, 135.1, 131.8, 128.8, 127.0, 125.9, 120.0, 34.4, 31.4 ppm. These data are consistent with those previously reported.\(^[4]\)

\(N\)-(p-fluoro)phenylbenzamide (2e)
Following the general procedure with N-(4-fluorophenyl)-1-phenylmethanamine (0.2 mmol, 39.8 mg) to obtain 2e as a white solid (32.3 mg, yield 75%). $^1$H NMR (400 MHz, DMSO-$d_6$) δ 10.31 (s, 1H), 7.96 – 7.93 (m, 2H), 7.81 – 7.78 (m, 2H), 7.62 – 7.52 (m, 3H), 7.22 – 7.18 (m, 2H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) δ 165.9, 158.7 (d, $J$ = 240.2 Hz), 136.0, 135.3, 132.1, 128.9, 128.1, 122.6 (d, $J$ = 7.8 Hz), 115.6 (d, $J$ = 22.2 Hz) ppm. These data are consistent with those previously reported. [5]

**N-(4-acetylphenyl)benzamide (2f)**

Following the general procedure with 1-(4-(benzylideneamino)phenyl)ethan-1-one (0.2 mmol, 44.6 mg) to obtain 2f as a brown solid (23.9 mg, yield 50%). $^1$H NMR (400 MHz, DMSO-$d_6$) δ 10.57 (s, 1H), 7.99 – 7.94 (m, 6H), 7.62 (t, $J$ = 7.2 Hz, 1H), 7.56 (t, $J$ = 7.4 Hz, 2H), 2.50 (s, 3H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) δ 197.1, 166.5, 144.1, 135.0, 132.5, 132.4, 129.8, 128.9, 128.3, 119.9, 27.0 ppm. These data are consistent with those previously reported. [6]

**N-(4-chlorophenyl)benzamide (2g)**

Following the general procedure with N-(4-chlorophenyl)-1-phenylmethanamine (0.2 mmol, 43.0 mg) to obtain 2g as a brown solid (30.0 mg, yield 65%). $^1$H NMR (400 MHz, DMSO-$d_6$) δ 10.36 (s, 1H), 7.93 (d, $J$ = 7.3 Hz, 2H), 7.80 (d, $J$ = 8.7 Hz, 2H), 7.58 – 7.50 (m, 3H), 7.39 (d, $J$ = 8.7 Hz, 2H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) δ 170.9, 143.4, 139.9, 136.9, 133.8, 133.7, 132.9, 132.5, 127.0 ppm. These data are consistent with those previously reported. [3]

**N-(4-bromophenyl)benzamide (2h)**

Following the general procedure with N-(4-bromophenyl)-1-phenylmethanamine (0.2 mmol, 51.8 mg) to obtain 2h as a white solid (31.9 mg, yield 58%). $^1$H NMR (400 MHz, DMSO-$d_6$) δ 10.38 (s, 1H), 7.95 (d, $J$ = 7.4 Hz, 2H), 7.78 (d, $J$ = 8.7 Hz, 2H), 7.62 – 7.54 (m, 5H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) δ 166.1, 139.0, 135.2, 132.2, 131.9, 128.9, 128.1, 122.7, 115.8 ppm. These data are consistent with those previously reported. [6]

**N-(4-methoxyphenyl)benzamide (2i)**

Following the general procedure with N-(4-methoxyphenyl)-1-phenylmethanamine (0.2 mmol, 42.2 mg) to obtain 2i as a brown solid (23.2 mg, yield 51%). $^1$H NMR (400 MHz, DMSO-$d_6$) δ 10.13 (s, 1H), 7.94 (d, $J$ = 7.6 Hz, 2H), 7.67 (d, $J$ = 8.5 Hz, 2H), 7.58 (t, $J$ = 7.6 Hz, 2H), 7.22 – 7.18 (m, 2H) ppm. These data are consistent with those previously reported. [5]
7.4 Hz, 1H), 7.52 (t, J = 7.5 Hz, 2H), 6.93 (d, J = 8.6 Hz, 2H), 3.75 (s, 3H) ppm. \[^{13}\text{C NMR} \text{(101 MHz, DMSO-d}_6\text{)} \delta 165.6, 156.0, 135.5, 132.7, 131.8, 128.8, 128.0, 122.5, 114.2, 55.7 \text{ ppm. These data are consistent with those previously reported.}[^7]\

### N-(4-(trifluoromethyl)phenyl)benzamide (2k)

Following the general procedure with 1-phenyl-N-(4-(trifluoromethyl)phenyl)methanimine (0.2 mmol, 49.8 mg) to obtain 2k as a white solid (26.5 mg, yield 55%). \[^{1}\text{H NMR} \text{(400 MHz, DMSO-d}_6\text{)} \delta 10.58 \text{ (s, 1H), 8.02 – 7.95 (m, 4H), 7.72 (d, J = 8.6 Hz, 2H), 7.63 – 7.53 (m, 3H) ppm.}[^{13}\text{C NMR} \text{(101 MHz, DMSO-d}_6\text{)} \delta 166.5, 143.3, 135.0, 132.4, 128.9, 128.3, 126.4 \text{ (q, J = 3.8 Hz), 124.9 (q, J = 272.7 Hz), 124.1 (q, J = 32.1 Hz), 120.6 ppm. These data are consistent with those previously reported.}[^5]\

### N-(3-Nitrophenyl)benzamide (2l)

Following the general procedure with N-(3-nitrophenyl)-1-phenylmethanimine (0.2 mmol, 45.2 mg) to obtain 2l as a yellow solid (31.5 mg, yield 65%). \[^{1}\text{H NMR} \text{(400 MHz, DMSO-d}_6\text{)} \delta 10.72 \text{ (s, 1H), 8.83 (s, 1H), 8.21 (d, J = 8.0 Hz, 1H), 8.01 \text{ (d, J = 7.6 Hz, 2H), 7.98 \text{ (d, J = 8.0 Hz, 1H), 7.68 – 7.63 (m, 2H), 7.58 (t, J = 7.4 Hz, 2H).}[^{13}\text{C NMR} \text{(101 MHz, DMSO-d}_6\text{)} \delta 166.5, 148.3, 140.8, 134.7, 132.5, 130.5, 129.0, 128.2, 126.6, 118.6, 114.8 \text{ ppm. These data are consistent with those previously reported.}[^8]\

### N-(2-chlorophenyl)benzamide (2m)

Following the general procedure with N-(2-chlorophenyl)-1-phenylmethanimine (0.2 mmol, 43 mg) to obtain 2m as a white solid (25.9 mg, yield 56%). \[^{1}\text{H NMR} \text{(400 MHz, CDCl}_3\text{)} \delta 8.58 \text{ (d, J = 8.1 Hz, 1H), 8.48 \text{ (bs, 1H), 7.93 (d, J = 7.4 Hz, 2H), 7.61 – 7.51 (m, 3H), 7.42 (d, J = 7.9 Hz, 1H), 7.35 (t, J = 7.5 Hz, 1H), 7.09 (t, J = 7.6 Hz, 1H) ppm.}[^{13}\text{C NMR} \text{(101 MHz, CDCl}_3\text{)} \delta 165.4, 134.9, 134.7, 132.3, 129.14, 129.05, 128.0, 127.2, 124.9, 123.2, 121.7 \text{ ppm. These data are consistent with those previously reported.}[^9]\

### N-(o-tolyl)benzamide (2n)

Following the general procedure with 1-phenyl-N-(o-tolyl)methanimine (0.2 mmol, 39.0 mg) to obtain 2n as a white solid (21.1 mg, yield 50%). \[^{1}\text{H NMR} \text{(400 MHz, DMSO-d}_6\text{)} \delta 9.88 \text{ (s, 1H), 7.99 (d, J = 7.5 Hz, 2H), 7.62 – 7.52 (m, 3H), 7.35 (d, J = 7.6 Hz, 1H), 7.28 (d, J = 7.4 Hz, 1H), 7.25 – 7.16 (m, 2H), 2.25 (s, 3H) ppm.}[^{13}\text{C NMR} \text{(101 MHz, DMSO-d}_6\text{)} \delta 165.7, 136.9, 135.0, 134.2, 132.0, 130.8, 128.9, 128.1, 127.1, 126.5 (2C), 18.4 ppm. These data are consistent with those previously reported.}[^7]
**N-cyclohexylbenzamide (2o)**

Following the general procedure with N-cyclohexyl-1-phenylmethanimine (0.2 mmol, 37.4 mg) to obtain 2o as a white solid (12.2 mg, yield 30%). $^1$H NMR (400 MHz, DMSO-$d_6$) $\delta$ 8.18 (d, $J = 7.6$ Hz, 1H), 7.83 (d, $J = 7.6$ Hz, 2H), 7.52 – 7.42 (m, 3H), 3.77 (s, 1H) 1.81 – 1.73 (m, 5H), 1.33 – 1.28 (m, 5H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) $\delta$ 165.8, 135.4, 131.4, 128.6, 127.7, 48.8, 32.9, 25.7, 25.4 ppm. These data are consistent with those previously reported. $^{[10]}$

**4-bromo-N-phenylbenzamide (2p)**

Following the general procedure with 1-(4-bromophenyl)-N-phenylmethanimine (0.2 mmol, 51.8 mg) to obtain 2p as a white solid (23.1 mg, yield 42%). $^1$H NMR (400 MHz, DMSO-$d_6$) $\delta$ 10.29 (s, 1H), 7.88 – 7.73 (m, 6H), 7.33 – 7.08 (m, 3H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) $\delta$ 165.0, 139.4, 134.5, 131.9, 130.3, 129.1, 125.8, 124.3, 120.9 ppm. These data are consistent with those previously reported. $^{[6]}$

**4-fluoro-N-phenylbenzamide (2q)**

Following the general procedure with 1-(4-chlorophenyl)-N-phenylmethanimine (0.2 mmol, 39.8 mg) to obtain 2q as a white solid (26.8 mg, yield 66%). $^1$H NMR (400 MHz, DMSO-$d_6$) $\delta$ 10.27 (s, 1H), 8.06 – 8.02 (m, 2H), 7.76 (d, $J = 7.8$ Hz, 2H), 7.40 – 7.34 (m, 4H), 7.11 (t, $J = 7.4$ Hz, 1H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) $\delta$ 164.9, 164.5 (d, $J = 249.0$ Hz), 139.5, 131.9, 130.9 (d, $J = 9.1$ Hz), 129.1, 124.2, 120.9, 115.8 (d, $J = 21.8$ Hz) ppm. These data are consistent with those previously reported. $^{[5]}$

**4-methyl-N-phenylbenzamide (2r)**

Following the general procedure with N-phenyl-1-(p-tolyl)methanimine (0.2 mmol, 39.1 mg) to obtain 2r as a white solid (25.4 mg, yield 60%). $^1$H NMR (400 MHz, DMSO-$d_6$) $\delta$ 10.18 (s, 1H), 7.90 – 7.80 (m, 4H), 7.34 – 7.10 (m, 5H), 2.39 (s, 3H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) $\delta$ 165.8, 142.0, 139.7, 132.6, 129.4, 129.0, 128.2, 124.0, 120.8, 21.5 ppm. These data are consistent with those previously reported. $^{[7]}$

**4-chloro-N-phenylbenzamide (2s)**
Following the general procedure with 1-(4-chlorophenyl)-N-phenylmethanimine (0.2 mmol, 43.0 mg) to obtain 2s as a white solid (26.8 mg, yield 58%). $^1$H NMR (400 MHz, DMSO-$d_6$) δ 10.33 (s, 1H), 8.00 (d, $J = 8.0$ Hz, 2H), 7.78 (d, $J = 7.6$ Hz, 2H), 7.62 (d, $J = 8.0$ Hz, 2H), 7.37 (t, $J = 7.4$ Hz, 2H), 7.12 (s, 1H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) δ 164.9, 139.4, 136.8, 134.1, 130.1, 129.1, 128.9, 124.3, 120.9 ppm. These data are consistent with those previously reported.\textsuperscript{[11]}

4-nitro-N-phenylbenzamide (2t)

Following the general procedure with 1-(4-nitrophenyl)-N-phenylmethanimine (0.2 mmol, 45.2 mg) to obtain 2t as a white solid (28.1 mg, yield 58%). $^1$H NMR (400 MHz, DMSO-$d_6$) δ 10.55 (s, 1H), 8.35 (d, $J = 8.6$ Hz, 2H), 8.17 (d, $J = 8.5$ Hz, 2H), 7.76 (d, $J = 7.9$ Hz, 2H), 7.36 (t, $J = 7.7$ Hz, 2H), 7.12 (t, $J = 7.3$ Hz, 1H) ppm. $^{13}$C NMR (101 MHz, DMSO-$d_6$) δ 164.3, 149.6, 141.1, 139.2, 129.7, 129.2, 124.6, 124.0, 120.9 ppm. These data are consistent with those previously reported.\textsuperscript{[3]}
5. References


6. Copies of $^1$H NMR and $^{13}$C NMR Spectra