



Supporting Information

for

Direct C–H amination reactions of arenes with N-hydroxyphthalimides catalyzed by cuprous bromide

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**Synthetic schemes for products, characterization data, and
copies of ^1H , ^{13}C , and ^{19}F NMR spectra**

1. General information

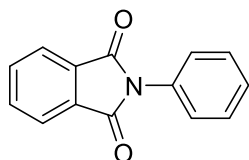
All new compounds were fully characterized. ^1H NMR and ^{13}C NMR spectra were obtained with Agilent Technologies AVANCE-400MHz or 600MHz spectrometers in CDCl_3 as the solvent and with TMS as an internal standard. Mass spectra were obtained on a Bruker Dalton maXis instrument. All reactions were carried out under air. Unless otherwise noted, materials were obtained from commercial suppliers and were used without further purification. All reactions under standard conditions were monitored by thin-layer chromatography (TLC) on gel F254 plates. Flash column chromatograph was carried out using 300–400 mesh silica gel at medium pressure.

2. Arylamines general procedure

N-hydroxyphthalimide (0.1 mmol), CuBr (40 mol %, 0.04 mmol), triethyl phosphite (6.0 equiv, 0.6 mmol) and (hetero)arene (2 mL) were added to a 15 mL sealed tube. The resulting mixture was stirred at 100 °C under air for 12 h and the progress monitored by TLC. The solution was then cooled to room temperature and the solvent was removed under vacuum. The crude residue was purified by column chromatography on silica gel (ethyl acetate/petroleum ether = 1:10) to afford the desired products **3a–u**.

3. Characterization of products

2-Phenylisoindoline-1,3-dione (**3a**)^[1,2]



3a

Yield: 17.4 mg, (78%); white solid.

¹H NMR (400 MHz, CDCl₃): δ 7.96–7.94 (m, 2H), 7.82–7.75 (m, 2H), 7.53–7.49 (m, 2H), 7.47–7.35 (m, 3H).

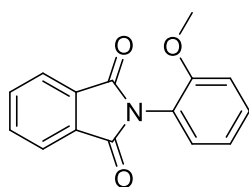
¹³C NMR (101 MHz, CDCl₃): δ 167.4, 134.5, 131.9, 131.8, 129.3, 128.3, 126.8, 123.9.

HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₄H₉NNaO₂: 246.0525; found: 246.0523.

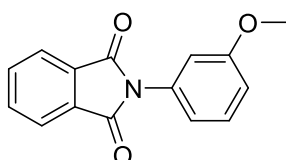
2-(2-Methoxyphenyl)isoindoline-1,3-dione (**3ba**),

2-(3-methoxyphenyl)isoindoline-1,3-dione (**3bb**),

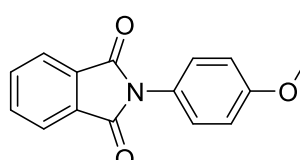
2-(4-methoxyphenyl)isoindoline-1,3-dione (**3bc**)^[1,2]



3ba



3bb



3bc

Yield: 18.9 mg, (75%); (**3ba**:**3bb**:**3bc** = 20:1:20); white solid. The ratio was determined by ¹H NMR spectroscopy.

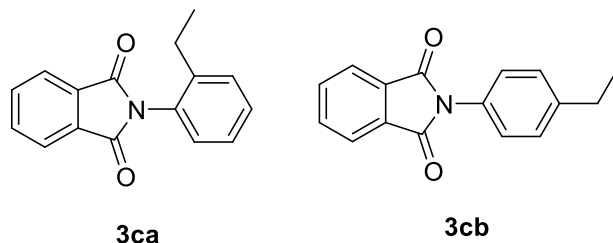
¹H NMR (400 MHz, CDCl₃): δ 7.91–7.85 (m, 2H), 7.75–7.67 (m, 2H), 7.38 (td, *J* = 1.7 Hz, 1H [**3ba**], 1H [**3bb**]), 7.30–7.26 (m, 2H [**3bc**]), 7.22–7.19 (m, 1H [**3ba**]), 7.04–6.94 (m, 2H [**3ba**], 3H [**3bb**], 2H [**3bc**]), 3.78 (s, 3H [**3bc**]), 3.77 (s, 3H [**3bb**]), 3.74 (s, 3H [**3ba**]).

¹³C NMR (101 MHz, CDCl₃): δ 167.7, 167.5, 159.3, 155.5, 134.4, 134.4 (2C), 134.2, 132.3, 131.9, 130.8, 130.1, 128.1, 123.8, 121.0, 114.6, 112.2, 55.9, 55.6.

HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₅H₁₁NNaO₃: 276.0631; found 276.0631.

2-(2-Ethylphenyl)isoindoline-1,3-dione (3ca),

2-(4-ethylphenyl)isoindoline-1,3-dione (3cb)^[1,2]



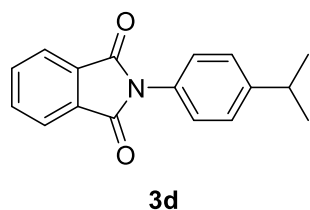
Yield: 20.6 mg, (82%); (**3ca**:**3cb** = 1:2); white solid. The isomer ratio was determined by ¹H NMR spectroscopy.

¹H NMR (400 MHz, CDCl₃): δ 7.96–7.91 (m, 2H), 7.80–7.74 (m, 2H), 7.42 (t, 2H [**3ca**], 1H [**3cb**]), 7.32 (s, 1H [**3ca**]), 7.26–7.20 (m, 3H [**3cb**]), 7.17 (d, *J* = 7.6 Hz, 1H [**3ca**]), 2.76–2.67 (m, 2H [**3cb**]), 2.52 (d, *J* = 7.6 Hz, 2H [**3ca**]), 1.26 (t, *J* = 7.6 Hz, 3H [**3cb**]), 1.16 (t, *J* = 7.6 Hz, 3H [**3ca**]).

¹³C NMR (101 MHz, CDCl₃): δ 167.8, 145.5, 144.5, 134.5, 134.4, 132.1, 131.9 (2C), 129.9, 129.4, 129.1, 128.7, 127.9, 127.0, 126.6, 126.3, 124.1, 123.9, 123.8, 28.8, 24.5, 15.5, 14.4.

HRMS (ESI): *m/z* [M + Na]⁺ calcd for C₁₆H₁₃NNaO₂: 274.0838; found: 274.0840.

2-(4-isopropylphenyl)isoindoline-1,3-dione (3d)^[1,3]



Yield: 14.6 mg, (55%); white solid.

¹H NMR (400 MHz, CDCl₃) δ 7.98–7.93 (m, 2H), 7.82–7.76 (m, 2H), 7.39–7.32 (m, 4H), 2.97 (t, 1H), 1.29 (dd, *J* = 6.9, 1.5 Hz, 6H).

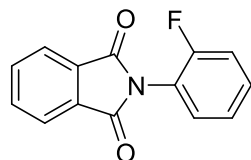
¹³C NMR (101 MHz, CDCl₃) δ 167.6, 149.1, 134.5, 132.0, 129.3, 127.4, 126.6, 123.9, 34.1, 24.1.

HRMS (ESI): *m/z* [M + Na]⁺ calcd for C₁₇H₁₅NNaO₂: 288.0995; found: 288.0997.

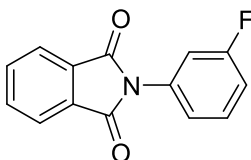
2-(2-Fluorophenyl)isoindoline-1,3-dione (3ea),

2-(3-fluorophenyl)isoindoline-1,3-dione (3eb),

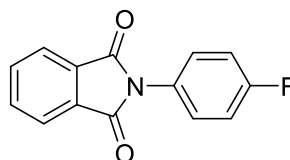
2-(4-fluorophenyl)isoindoline-1,3-dione (3ec)^[1,2]



3ea



3eb



3ec

Yield: 13.2 mg, (54%); (**3ea**:**3eb**:**3ec** = 1:4:1); white solid. The isomer ratio was determined by ¹⁹F NMR spectroscopy.

¹H NMR (400 MHz, CDCl₃): δ 8.00–7.94 (m, 2H), 7.84–7.79 (m, 2H), 7.50–7.35 (m, 1H [**3ea**], 1H [**3eb**]), 7.32–7.18 (m, 3H), 7.14–7.09 (m, 1H [**3ec**]).

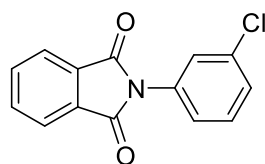
¹³C NMR (101 MHz, CDCl₃): δ 164.8, 167.0, 166.7, 164.0, 163.4, 161.6, 160.9, 159.3, 156.8, 134.8, 134.7, 134.6, 131.7, 130.4, 130.3, 130.0, 128.6, 124.1 (2C), 122.2 (2C), 119.6, 119.5, 116.4, 116.2, 115.3, 115.1, 114.2, 114.0.

¹⁹F NMR (471 MHz, CDCl₃): δ -111.17 [**3eb**], -113.06 [**3ec**], -118.68 [**3ea**].

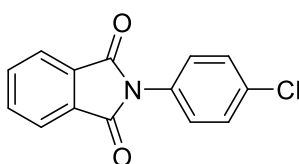
HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₄H₈FNNaO₂: 264.0431; found: 264.0429.

2-(3-Chlorophenyl)isoindoline-1,3-dione (3fb),

2-(4-chlorophenyl)isoindoline-1,3-dione (3fc)^[1,2]



3fb



3fc

Yield: 13.4 mg, (52%); (**3fb**:**3fc** = 2:1); white solid. The isomer ratio was determined by ¹H NMR spectroscopy.

¹H NMR (400 MHz, CDCl₃): δ 7.98–7.92 (m, 2H), 7.83–7.76 (m, 2H), 7.49 (dd, *J* = 4.0, 2.1 Hz, 1H [**3fb**]), 7.45 (d, *J* = 2.5 Hz, 2H [**3fc**]), 7.44–7.35 (m, 2H [**3fb**] + 2H [**3fc**]).

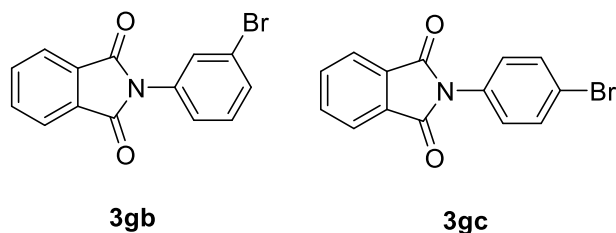
¹³C NMR (101 MHz, CDCl₃): δ 167.1, 167.0, 134.8, 134.7, 134.0, 132.9, 131.8,

131.7, 130.3, 130.2, 129.5, 128.4, 127.8, 126.8, 124.7, 124.1, 124.0.

HRMS (ESI): m/z $[M + Na]^+$ calcd for $C_{14}H_8ClNNaO_2$: 280.0136 (100.0%), 282.0106 (32.0%); found: 280.0132 (100.0%), 282.0103 (32.0%).

2-(3-Bromophenyl)isoindoline-1,3-dione (3gb),

2-(4-bromophenyl)isoindoline-1,3-dione (3gc)^[1,2]



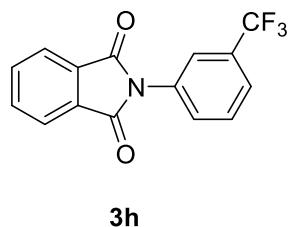
Yield: 16.9 mg, (56%); (**3gb**:**3gc** = 1:2); white solid. The isomer ratio was determined by 1H NMR spectroscopy.

1H NMR (400 MHz, $CDCl_3$): δ 7.99–7.93 (m, 2H), 7.84–7.78 (m, 2H), 7.66–7.61 (m, 2H [**3gb**]), 7.54 (dt, J = 7.6, 1.6 Hz, 2H [**3gc**]), 7.44–7.39 (m, 2H [**3gb**]), 7.39–7.33 (m, 2H [**3gc**]).

^{13}C NMR (101 MHz, $CDCl_3$): δ 167.1, 134.8, 134.7, 133.1, 132.4, 131.8, 131.7, 131.3, 130.4, 129.7, 128.1, 125.2, 124.1, 124.0, 122.6, 122.0.

HRMS (ESI): m/z $[M + Na]^+$ calcd for $C_{14}H_8BrNNaO_2$: 323.9631 (100.0%), 325.9610 (97.3%); found: 323.9628 (100.0%), 325.9608 (97.3%).

2-(3-(Trifluoromethyl)phenyl)isoindoline-1,3-dione (3h)^[1,2]



Yield: 20.3 mg, (70%); white solid.

1H NMR (400 MHz, $CDCl_3$): δ 8.01–7.94 (m, 2H), 7.84–7.79 (m, 2H), 7.79–7.60 (m, 4H).

^{13}C NMR (101 MHz, $CDCl_3$): δ 166.9, 134.9, 132.4, 131.6 (q, J = 33 Hz), 131.5,

129.8, 129.7, 126.6, 126.3, 124.8 (q, $J = 4$ Hz), 124.1, 123.6 (q, $J = 273$ Hz), 123.4 (q, $J = 4$ Hz).

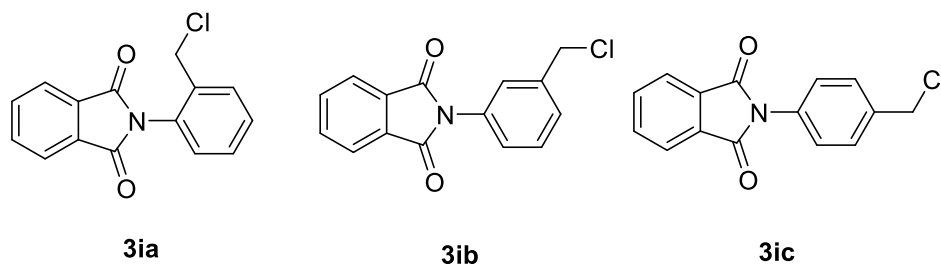
^{19}F NMR (376 MHz, CDCl_3): δ -62.64.

HRMS (ESI): m/z $[\text{M} + \text{Na}]^+$ calcd for $\text{C}_{15}\text{H}_8\text{F}_3\text{NNaO}_2$: 314.0402; found: 314.0397.

2-(2-(Chloromethyl)phenyl)isoindoline-1,3-dione (3ia),

2-(3-(chloromethyl)phenyl)isoindoline-1,3-dione (3ib),

2-(4-(chloromethyl)phenyl)isoindoline-1,3-dione (3ic)^[1,4]



Yield: 10.8 mg, (40%); (**3ia:3ib:3ic** = 1:2:1); white solid. The isomer ratio was determined by ^1H NMR spectroscopy.

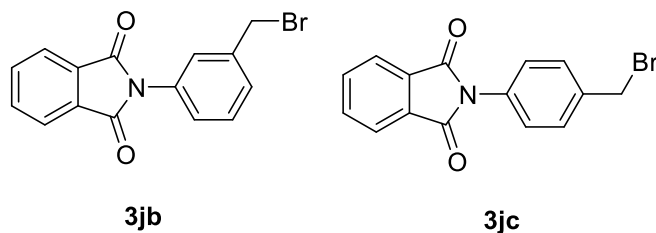
^1H NMR (400 MHz, CDCl_3) δ 8.01 – 7.92 (m, 2H), 7.91 – 7.73 (m, 2H), 7.61 – 7.27 (m, 4H), 4.64 (s, 2H [**3ib**]), 4.63 (s, 2H [**3ia**]), 4.54 (s, 2H [**3ic**]).

^{13}C NMR (101 MHz, CDCl_3) δ 168.0, 167.3, 138.7, 134.7, 134.5, 132.8, 132.0, 131.8, 130.9, 129.9, 129.6, 129.5, 128.3, 126.8, 126.7, 126.5, 124.1, 124.0, 123.7, 45.7, 43.0.

HRMS (ESI): m/z $[\text{M} + \text{Na}]^+$ calcd for $\text{C}_{15}\text{H}_{10}\text{ClNNaO}_2$: 294.0292 (100.0%), 296.0263 (32.0%); found 294.0292 (100.0%), 296.0263 (32.0%).

2-(3-(Bromomethyl)phenyl)isoindoline-1,3-dione (3jb),

2-(4-(bromomethyl)phenyl)isoindoline-1,3-dione (3jc)^[5-7]



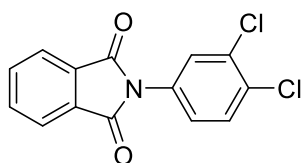
Yield: 13.2 mg, (42%); (**3jb:3jc** = 10:1); white solid. The isomer ratio was determined by ^1H NMR spectroscopy.

¹H NMR (400 MHz, CDCl₃): δ 7.99–7.93 (m, 2H), 7.84–7.78 (m, 2H), 7.56–7.36 (m, 2H), 4.54 (s, 2H [3jb]), 4.43 (s, 2H [3jc]).

¹³C NMR (101 MHz, CDCl₃): δ 167.2, 139.0, 134.7, 134.6, 132.2, 131.8, 130.0 (2C), 129.7, 129.5, 128.8, 128.7, 127.1, 126.5, 124.1, 124.0, 123.6, 32.7, 29.6.

HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₅H₁₀BrNNaO₂: 337.9787 (100.0%), 339.9767 (97.3%); found: 337.9788 (100.0%), 339.9768 (97.3%).

2-(3,4-Dichlorophenyl)isoindoline-1,3-dione (3k)^[1]



3k

Yield: 8.7 mg, (30%); white solid.

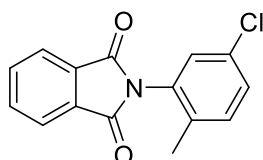
¹H NMR (400 MHz, CDCl₃): δ 7.99–7.93 (m, 2H), 7.84–7.79 (m, 2H), 7.63 (dd, *J* = 2.4, 0.9 Hz, 1H), 7.57 (dd, *J* = 8.6, 0.9 Hz, 1H), 7.36 (ddd, *J* = 8.6, 2.4, 0.9 Hz, 1H).

¹³C NMR (101 MHz, CDCl₃): δ 166.8, 134.9, 133.2, 132.3, 131.6, 131.3, 130.8, 129.0, 128.3, 125.7, 124.1, 117.7.

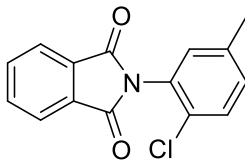
HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₄H₇Cl₂NaO₂: 313.9752 (100.0%), 315.9722(63.9%); found: 313.9791 (100.0%), 315.9896 (63.9%).

2-(5-Chloro-2-methylphenyl)isoindoline-1,3-dione (3la),

2-(2-chloro-5-methylphenyl)isoindoline-1,3-dione (3lb)^[1,8]



3la



3lb

Yield: 14.9 mg, (56%); (**3la**:**3lb** = 3:1); white solid. The isomer ratio was determined by ¹H NMR spectroscopy.

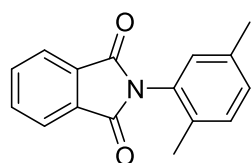
¹H NMR (400 MHz, CDCl₃): δ 8.00–7.92 (m, 2H), 7.85–7.77 (m, 2H), 7.44 (d, *J* =

8.2 Hz, 1H [**3lb**]), 7.35 (dd, $J = 8.3, 2.1$ Hz, 1H [**3la**]), 7.30 (d, $J = 8.3$ Hz, 1H [**3la**]), 7.24 (d, $J = 2.1$ Hz, 1H [**3lb**]), 7.23 (d, $J = 2.2$ Hz, 1H [**3la**]), 7.16 (d, $J = 2.1$ Hz, 1H [**3lb**]), 2.39 (s, 3H [**3lb**]), 2.17 (s, 3H [**3la**]).

^{13}C NMR (101 MHz, CDCl_3): δ 167.0, 166.9, 138.2, 135.3, 134.7, 134.6, 132.2, 132.1, 132.0 (2C), 131.7, 131.6, 131.2, 130.1, 129.7, 129.0, 124.0, 20.9, 17.8.

HRMS (ESI): m/z $[\text{M} + \text{Na}]^+$ calcd for $\text{C}_{15}\text{H}_{10}\text{ClNNaO}_2$: 294.0292 (100.0%), 296.0263 (32.0%); found: 294.0290 (100.0%), 296.0264 (32.0%).

2-(2,5-Dimethylphenyl)isoindoline-1,3-dione (**3m**)^[1,2]



3m

Yield: 20.1 mg, (80%); white solid.

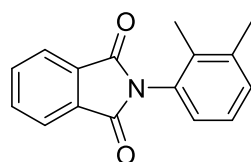
^1H NMR (600 MHz, CDCl_3): δ 7.97–7.94 (m, 2H), 7.81–7.77 (m, 2H), 7.25 (d, $J = 7.6$ Hz, 1H), 7.19 (dd, $J = 8.0, 1.8$ Hz, 1H), 7.03 – 7.02 (m, 1H), 2.36 (s, 3H), 2.16 (s, 3H).

^{13}C NMR (101 MHz, CDCl_3): δ 167.5, 136.7, 134.4, 133.3, 132.1, 131.0, 130.4 (2C), 129.2, 123.8, 20.9, 17.6.

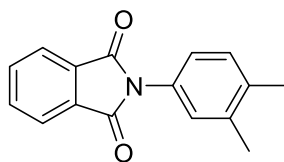
HRMS (ESI): m/z $[\text{M} + \text{Na}]^+$ calcd for $\text{C}_{16}\text{H}_{13}\text{NNaO}_2$: 274.0838; found: 274.0836.

2-(2,3-Dimethylphenyl)isoindoline-1,3-dione (**3na**),

2-(3,4-dimethylphenyl)isoindoline-1,3-dione (**3nb**)^[1,2]



3na



3nb

Yield: 15.5 mg, (62%); (**3na**:**3nb** = 1:1); white solid. The isomer ratio was determined by ^1H NMR spectroscopy.

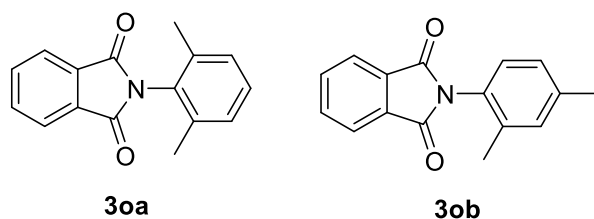
¹H NMR (400 MHz, CDCl₃): δ 7.96–7.89 (m, 2H), 7.80–7.73 (m, 2H), 7.27–7.17 (m, 2H [3na] + 1H [3nb]), 7.16 (d, *J* = 2.2 Hz, 1H [3nb]), 7.13–7.09 (m, 1H [3nb]), 7.03 (d, *J* = 1.6 Hz, 1H [3na]), 2.33 (s, 3H [3na]), 2.29 (d, *J* = 2.9 Hz, 6H [3nb]), 2.06 (s, 3H [3na]).

¹³C NMR (101 MHz, CDCl₃): δ 167.7 (2C), 138.5, 137.8, 137.2, 135.2, 134.4 (2C), 132.2, 132.0, 131.1, 130.6, 130.4, 129.2, 127.9, 126.4 (2C), 124.3, 123.9, 123.8, 20.6, 20.0, 19.7, 14.8.

HRMS (ESI): *m/z* [M + Na]⁺ calcd for C₁₆H₁₃NNaO₂: 274.0838; found: 274.0832.

2-(2,6-Dimethylphenyl)isoindoline-1,3-dione (3oa),

2-(2,4-dimethylphenyl)isoindoline-1,3-dione (3ob)^[1,2]



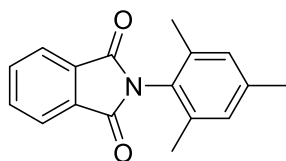
Yield: 16.3 mg, (65%); (**3oa**:**3ob** = 1:8); white solid. The isomer ratio was determined by ¹H NMR spectroscopy.

¹H NMR (400 MHz, CDCl₃): δ 7.98–7.93 (m, 2H), 7.83–7.76 (m, 2H), 7.30–7.28 (m, 1H [3oa]), 7.21–7.17 (m, 2H [3oa] + 1H [3ob]), 7.14 (dd, *J* = 7.9 Hz, 1H [3ob]), 7.09 (d, *J* = 8.0 Hz, 1H [3ob]), 2.38 (s, 3H [3ob]), 2.17 (d, *J* = 1.4 Hz, 6H [3oa], 3H [3ob]).

¹³C NMR (101 MHz, CDCl₃): δ 167.7, 139.6, 137.0, 136.3, 134.5, 134.4, 132.2, 132.0, 129.6, 128.6, 128.0, 127.8, 123.9, 123.8, 21.3, 18.2, 18.0.

HRMS (ESI): *m/z* [M + Na]⁺ calcd for C₁₆H₁₃NNaO₂: 274.0838; found: 274.0840.

2-Mesitylisoindoline-1,3-dione (3p) ^[1,2]



3p

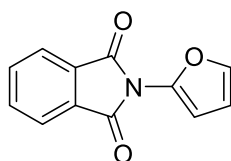
Yield: 15.4 mg, (58%); white solid.

¹H NMR (400 MHz, CDCl₃): δ 7.99–7.94 (m, 2H), 7.83–7.77 (m, 2H), 7.01 (s, 2H), 2.33 (s, 3H), 2.12 (s, 6H).

¹³C NMR (101 MHz, CDCl₃): δ 167.6, 139.5, 136.6, 134.4, 132.2, 129.4, 127.2, 123.9, 21.3, 18.1.

HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₇H₁₅NNaO₂: 288.0995; found: 288.0995.

2-(Furan-2-yl)isoindoline-1,3-dione (3q) ^[1]



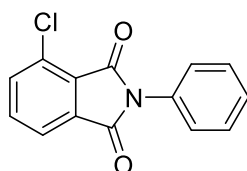
3q

Yield: 7.1 mg, (33%); light yellow solid.

¹H NMR (600 MHz, CDCl₃): δ 8.00–7.95 (m, 2H), 7.85–7.80 (m, 2H), 7.47 (dd, *J* = 2.1, 1.0 Hz, 1H), 6.55 (dd, *J* = 3.3, 2.1 Hz, 1H), 6.46 (dd, *J* = 3.4, 1.0 Hz, 1H).

¹³C NMR (101 MHz, CDCl₃): δ 166.3, 141.8, 138.0, 134.9, 131.8, 131.3, 129.0, 124.3, 111.6, 106.8.

HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₂H₇NNaO₃: 236.0318; found: 236.0316.



3r

4-Chloro-2-phenylisoindoline-1,3-dione (3r) ^[1]

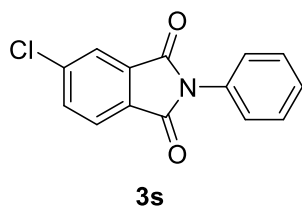
Yield: 20.8 mg, (81%); white solid.

¹H NMR(400 MHz, CDCl₃): δ 7.91–7.84 (m, 1H), 7.75–7.68 (m, 2H), 7.51 (dd, *J* = 8.5, 6.9 Hz, 2H), 7.43 (dd, *J* = 8.1, 2.4 Hz, 3H).

¹³C NMR (101 MHz, CDCl₃): δ 166.0, 165.0, 136.3, 135.4, 134.0, 132.0, 131.4, 129.3, 128.4, 127.5, 126.7, 122.4.

HRMS (ESI): *m/z* [M + Na]⁺ calcd for C₁₄H₈ClNNaO₂: 280.0136 (100.0%), 282.0106 (32.0%); found: 280.0132 (100.0%), 282.0103 (32.0%).

5-Chloro-2-phenylisoindoline-1,3-dione (3s) ^[1,9]



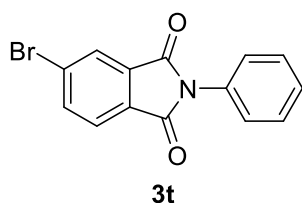
Yield: 19.2 mg, (75%); white solid.

¹H NMR(400 MHz, CDCl₃): δ 7.94–7.87 (m, 2H), 7.75 (dd, *J* = 8.0, 1.8 Hz, 1H), 7.55–7.48 (m, 2H), 7.45–7.39 (m, 3H).

¹³C NMR (101 MHz, CDCl₃): δ 166.4, 166.1, 141.3, 134.6, 133.5, 131.5, 129.9, 129.3, 128.5, 126.6, 125.2, 124.3.

HRMS (ESI): *m/z* [M + Na]⁺ calcd for C₁₄H₈ClNNaO₂: 280.0136 (100.0%), 282.0106 (32.0%); found: 280.0133 (100.0%), 282.0105 (32.0%).

5-Bromo-2-phenylisoindoline-1,3-dione (3t) ^[1,10]



Yield: 25.1 mg, (83%); white solid.

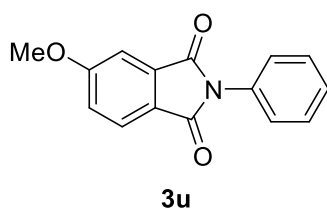
¹H NMR(400 MHz, CDCl₃): δ 8.10 (d, *J* = 1.7 Hz, 1H), 7.93 (dd, *J* = 7.9, 1.7 Hz, 1H), 7.82 (d, *J* = 7.9 Hz, 1H), 7.52 (t, *J* = 7.7 Hz, 2H), 7.46–7.39 (m, 3H). 7.40 (d, *J* =

7.8 Hz, 3H).

¹³C NMR (101 MHz, CDCl₃): δ 166.6, 137.6, 133.5, 131.5, 130.4, 129.5, 129.3, 128.5, 127.3, 126.6, 125.3.

HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₄H₈BrNNaO₂: 323.9631 (100.0%), 325.9610 (97.3%); found: 323.9629 (100.0%), 325.9608 (97.3%).

5-Methoxy-2-phenylisoindoline-1,3-dione (3u) ^[11]



Yield: 9.9 mg, (39%); white solid.

¹H NMR(400 MHz, CDCl₃): δ 7.85 (dt, *J* = 8.3, 2.6 Hz, 1H), 7.55–7.46 (m, 2H), 7.46–7.35 (m, 4H), 7.27–7.20 (m, 1H), 3.99–3.92 (m, 3H).

¹³C NMR (101 MHz, CDCl₃): δ 165.1, 134.6, 132.0, 129.2, 128.1, 126.7, 125.6, 123.8, 120.6, 108.3, 56.3.

HRMS (ESI): m/z [M + Na]⁺ calcd for C₁₅H₁₁NNaO₃: 276.0631; found: 276.0625.

4. References

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5. Copies of ^1H NMR, ^{13}C NMR and ^{19}F NMR spectra

