Supporting Information

Cross-coupling reactions of aryl and vinyl chlorides catalyzed by a palladium complex derived from an air-stable *H*-phosphonate

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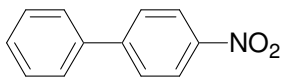
General remarks:

Catalytic reactions were carried out on a 1 mmol scale under a N_2 atmosphere using pre-dried glassware. Chemicals were obtained from commercial sources, and were used without further purification. Dioxane was dried over sodium and freshly distilled under N_2. Yields refer to isolated compounds, estimated to be > 95 % pure as determined by ^{1}H-NMR and GC analysis. Flash chromatography: Merck silica gel 60 (230-400 mesh). NMR: Spectra were recorded on a Bruker ARX 300 instrument in the solvent indicated; chemical shifts (δ) are given in ppm.

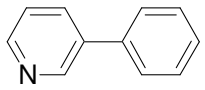
Representative procedure for palladium-catalyzed cross-coupling reactions of aryl chlorides with organosilicium-reagents (Table 2, entry 4):

A solution of [Pd(dba)$_2$] (29 mg, 0.05 mmol, 5 mol%) and **8** (51 mg, 0.10 mmol, 10 mol%), 4-chloronitrobenzene (0.158 g, 1.00 mmol), phenyltrimethoxysilane (**2a**) (0.397 g, 2.00 mmol) and TBAF × 3 H_2O (0.631 g, 2.00 mmol) in dry dioxane (2 mL) was stirred for 17 h at 80 °C. Et_2O (50 mL) and H_2O (50 mL) were added to the reaction mixture. The separated aqueous phase was extracted with Et_2O (2 × 50 mL). The combined organic layers were dried over $MgSO_4$ and concentrated in vacuo. The remaining residue was purified by column chromatography on silica gel (*n*-pentane/Et_2O = 50/1→30/1) to yield **3d** (0.157 g, 79 %) as a light yellow solid (MP: 114.0–114.2 °C). The spectral data were in accordance with those reported in the literature.[1]



^{1}H-NMR (300 MHz, $CDCl_3$): δ = 8.30 (md, J = 9.0 Hz, 2H), 7.74 (md, J = 8.8 Hz, 2H), 7.63 (md, J = 8.3 Hz, 2H), 7.53–7.43 (m, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 147.6, 147.1, 138.7, 129.1, 128.9, 127.7, 127.3, 124.1. IR (KBr): 2961, 1593, 1575, 1509, 1477, 1448, 1337, 1101, 851, 773, 737 cm^{-1}. MS (EI) *m/z* (relative intensity) 200 (11), 199 ([M$^+$] 100), 169 (24), 153 (29), 152 (79), 151 (18), 150 (5), 141 (15), 127 (6), 126 (5),

115 (6), 77 (4), 76 (8), 75 (4), 63 (4). HR-MS (EI) *m/z* calcd for $C_{12}H_9NO_2$ 199.0633, found 199.0619.

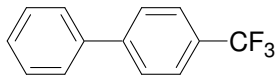


3-Phenylpyridine (3a) (Table 2, entry 1): The representative procedure was followed, using 3-chloropyridine (**1a**) (0.113 g, 1.00 mmol) and phenyltrimethoxysilane (**2a**) (0.397 g, 2.00 mmol). After 17 h, purification by chromatography (*n*-pentane/Et_2O = 5/1→2/1→1/1) yielded **3a** (0.098 g, 63 %) as a yellow liquid. The spectral data were in accordance with those reported in the literature.[2]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 8.85 (dd, *J* = 2.3, 0.8 Hz, 1H), 8.58 (dd, *J* = 4.9, 1.7 Hz, 1H), 7.86 (ddd, *J* = 7.8, 2.3, 1.7 Hz, 1H), 7.59-7.55 (m, 2H), 7.51-7.32 (m, 4H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 148.4, 148.2, 137.8, 136.6 , 134.3, 129.0, 128.0, 127.1, 123.5. IR (KBr): 3400, 3055, 1528, 1473, 1450, 1407, 1277, 1076, 1024, 1006, 913 cm^{-1}. MS (EI) *m/z* (relative intensity) 155 ([M^+] 100), 127 (7), 102 (5), 77 (3). HR-MS (EI) *m/z* calcd for $C_{11}H_9N$ 155.0735, found 155.0739.

Biphenyl-4-carboxylic acid methyl ester (3b) (Table 2, entry 2): The representative procedure was followed, using 4-chloro-benzoic acid methyl ester (**1b**) (0.170 g, 1.00 mmol), phenyltrimethoxysilane (**2a**) (0.397 g, 2.00 mmol). After 17 h, purification by chromatography (*n*-pentane/Et_2O = 50/1) yielded **3b** (0.145 g, 68 %) as a colourless solid (MP: 117.0–117.3 °C). The spectral data were in accordance with those reported in the literature.[3]

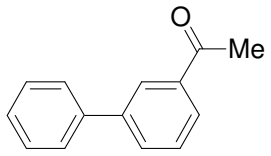
^{1}H-NMR (300 MHz, $CDCl_3$): δ = 8.12 (md, J = 8.6 Hz, 2H), 7.68-7.61 (m, 4H), 7.50-7.37 (m, 3H), 3.95 (s,3H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 193.7, 167.0, 145.6, 140.0, 130.1, 128.9, 128.1, 127.2, 127.0, 52.1. IR (KBr): 2945, 1708, 1605, 1436, 1403, 1286, 1267, 1207, 1111, 856, 748, 699 cm^{-1}. MS (EI) *m/z* (relative intensity) 212 ([M^+] 67), 182 (12), 181 (100), 153 (24), 152 (37), 127 (4), 126 (3), 102 (2), 76 (13), 63 (2). HR-MS (EI) *m/z* calcd for $C_{14}H_{12}O_2$ 212.0837, found 212.0816.



1-Phenyl-4-trifluoromethylbenzene (3c) (Table 2, entry 3): The representative procedure was followed, using 4-chloro-(trifluoromethyl)benzene (**1c**) (0.181 g, 1.00 mmol) and phenyltrimethoxysilane (**2a**) (0.397 g, 2.00 mmol). After

17 h, purification by chromatography (*n*-pentane/Et_2O = 50/1) yielded **3c** (0.138 g, 62 %) as a colourless solid (MP: 69.0–69.3 °C). The spectral data were in accordance with those reported in the literature.[1]

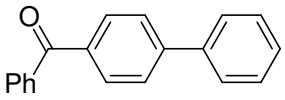
^{1}H-NMR (300 MHz, $CDCl_3$): δ = 7.71–7.70 (m, 4H), 7.63–7.59 (m, 2H), 7.52–7.41 (m, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 144.7, 139.8, 129.0, 128.9, 128.2, 127.4, 127.3, 125.7, 124.3. ^{19}F-NMR (375 MHz, $CDCl_3$): δ = –60.7 (s). IR (KBr): 3083, 3037, 2929, 2854, 1326, 1111, 1072, 1014, 1005, 842, 765, 726 cm^{-1}. MS (EI) *m/z* (relative intensity) 222 ([M^+] 100), 221 (2), 203 (6), 201 (6), 172 (2), 153 (9), 152 (11), 151 (3), 111 (2), 86 (3), 76 (2). HR-MS (EI) *m/z* calcd for $C_{13}H_9F_3$ 222.0656, found 222.0670.



3-Acetylbiphenyl (3e) (Table 2, entry 5): The representative procedure was followed, using 3-chloroacetophenone (**1e**) (0.155 g, 1.00 mmol) and phenyltrimethoxysilane (**2a**) (0.397 g, 2.00 mmol). After 17 h, purification by chromatography (*n*-pentane/Et_2O = 50/1→25/1→5/1) yielded **3e** (0.139 g, 71 %) as a colourless solid (MP: 121.7–122.3 °C). The spectral data were in accordance with those reported in the literature.[2]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 8.04 (md, J = 8.6 Hz, 2H), 7.69 (md, J = 8.6 Hz, 2H), 7.65–7.61 (m, 2H), 7.51–7.37 (m, 3H), 2.64 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 197.7, 145.7, 139.8,

135.8, 128.9, 128.9, 128.2, 127.2, 127.2, 26.6. IR (KBr): 3033, 2997, 1676, 1599, 1403, 1357, 1261, 841, 831, 762, 719, 689 cm^{-1}. MS (EI) *m/z* (relative intensity) 196 ([M^+] 43), 182 (14), 181 (100), 154 (5), 153 (32), 152 (39), 151 (10), 127 (4), 126 (4), 76 (11). HR-MS (EI) *m/z* calcd for $C_{14}H_{12}O$ 196.0888, found 196.0863.



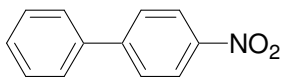
4-Phenylbenzophenone (3f) (Table 2, entry 6): The representative procedure was followed, using 4-chlorobenzophenone (**1f**) (0.217 g, 1.00 mmol) and phenyltrimethoxysilane (**2a**) (0.397 g, 2.00 mmol). After 17 h, purification by chromatography (*n*-pentane/Et_2O = 100/1) yielded **3f** (0.167 g, 65 %) as a colourless solid (MP: 103.2-106.2 °C). The spectral data were in accordance with those reported in the literature.[4]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 7.91 (md, *J* = 8.6 Hz, 2H), 7.85 (md, *J* = 8.4 Hz, 2H), 7.71 (md, *J* = 8.6 Hz, 2H), 7.66 (md, *J* = 8.1 Hz, 2H), 7.62-7.57 (m, 1H), 7.55-7.45 (m, 4H), 7.45-7.37 (m, 1H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 193.7, 145.2, 139.9, 137.7, 136.2, 132.3, 130.7, 129.9, 128.9, 128.3, 128.1, 127.2, 126.9. IR (KBr): 3052, 2037, 1644, 1602, 1578, 1401, 1318, 1291, 1275, 1150, 1005, 940, 852 cm^{-1}. MS (EI) *m/z* (relative intensity) 259 (16), 258 ([M^+] 73), 181 (100), 152 (30), 105

(20), 77 (14). HR-MS (EI) *m/z* calcd for $C_{19}H_{14}O$ 258.1045 , found 258.1056.

Representative procedure for palladium-catalyzed cross-coupling reactions of aryl chlorides with organotin-reagents (Table 2, entry 8):

A solution of [Pd(dba)$_2$] (29 mg, 0.05 mmol, 5 mol%) and **8** (51 mg, 0.10 mmol, 10 mol%), 4-chloronitrobenzene (**1d**) (0.158 g, 1.00 mmol), phenyltrimethoxytin (0.404 g, 1.10 mmol) and TBAF × 3 H_2O (0.631 g, 2.00 mmol) in dry dioxane (2 mL) was stirred for 24 h at 80 °C. Et_2O (50 mL) and H_2O (50 mL) were added to the reaction mixture. The separated aqueous phase was extracted with Et_2O (2 × 50 mL). The combined organic layers were dried over $MgSO_4$ and concentrated in vacuo. The remaining residue was purified by column chromatography on silica gel (*n*-pentane/Et_2O = 50/1) to yield **3d** (0.107 g, 54 %) as a light yellow solid (MP: 112.8-113.2 °C). The spectral data were in accordance with those reported in the literature.[1]



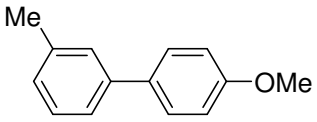
^{1}H-NMR (300 MHz, $CDCl_3$): δ = 8.30 (md, J = 9.0 Hz, 2H), 7.74 (md, J = 8.8 Hz, 2H), 7.63 (md, J = 8.3 Hz, 2H), 7.53-7.43 (m, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 147.6, 147.1, 138.7, 129.1, 128.9, 127.7, 127.3, 124.1. IR (KBr): 2961, 1593, 1575, 1509, 1477, 1448, 1337, 1101, 851, 773, 737 cm^{-1}. MS (EI) *m/z*

(relative intensity) 200 (11), 199 ([M^+] 100), 169 (24), 153 (29), 152 (79), 151 (18), 150 (5), 141 (15), 127 (6), 126 (5), 115 (6), 77 (4), 76 (8), 75 (4), 63 (4). HR-MS (EI) *m/z* calcd for $C_{12}H_9NO_2$ 199.0633, found 199.0619.

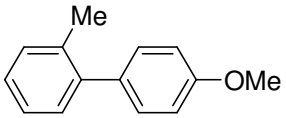
Representative procedure for palladium-catalyzed cross-coupling reactions of aryl chlorides with Grignard-reagents

4-Methoxy-3`-methylbiphenyl (3h) (Table 2, entry 9):

A solution of [$Pd(OAc)_2$] (5 mg, 0.02 mmol, 2 mol%) and **8** (21 mg, 0.04 mmol, 4 mol%) in THF (2 mL) was stirred at rt for 5 min. Thereafter, 4-methoxyphenylmagnesiumbromide (1.50 mL, 1.50 mmol) was added dropwise. The resulting dark solution was stirred for 5 min at ambient temperature and 3-chlorotoluene (**1h**) (0.127 g, 1.00 mmol) was added. Subsequently, the resulting solution was stirred for 23 h at 60 °C. Et_2O (50 mL) and H_2O (50 mL) were added to the reaction mixture. The separated aqueous phase was extracted with Et_2O (2 × 50 mL). The combined organic layers were dried over $MgSO_4$ and concentrated in vacuo. The remaining residue was purified by column chromatography on silica gel (*n*-pentane/Et_2O = 5/1→2/1) to yield **3h** (0.144 g, 73 %) as a colourless solid (MP: 48.1-49.5 °C). The spectral data were in accordance with those reported in the literature.[5]



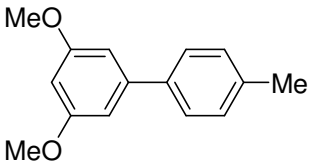
^{1}H–NMR (300 MHz, $CDCl_3$): δ = 7.55 (md, J = 8.8 Hz, 2H), 7.34–7.29 (m, 3H), 7.15 (d, J = 7.1 Hz, 1H), 7.01 (md, J = 8.8 Hz, 2H), 3.86 (s, 3H), 2.42 (s, 3H). ^{13}C–NMR (75 MHz, $CDCl_3$): δ = 159.1, 140.8, 138.3, 133.9, 129.4, 128.6, 128.1, 127.5, 123.8, 114.1, 55.3, 41.7. IR (KBr): 3033, 2956, 1607, 1517, 1486, 1252, 1030, 838, 787 cm^{-1}. MS (EI) *m/z* (relative intensity) 198 ([M^{+}] 100), 183 (42), 155 (22), 115 (4), 77 (1). HR–MS (EI) *m/z* calcd for $C_{14}H_{14}O$ 198.1045, found 198.1044.



4–Methoxy–2`–methylbiphenyl (3i) (Table 2, entry 10): The representative procedure was followed, using 4–methoxyphenylmagnesiumbromide (1.50 mL, 1.50 mmol) and 2–chlorotoluene (**1i**) (0.128 g, 1.02 mmol). After 21 h, purification by chromatography (*n*–pentane/Et_2O = 100/1) yielded **3i** (0.122 g, 61 %) as a colourless solid (MP: 51.3–52.2 °C). The spectral data were in accordance with those reported in the literature.[6]

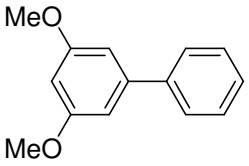
^{1}H–NMR (300 MHz, $CDCl_3$): δ = 7.25–7.20 (m, 6H), 6.98–6.92 (md, J = 8.8 Hz, 2H), 3.85 (s, 3H), 2.27 (s, 3H). ^{13}C–NMR (75 MHz, $CDCl_3$): δ = 158.5, 141.5, 135.5, 134.4, 130.3, 130.2, 129.9, 126.9, 125.7, 113.5, 55.3, 20.5. IR (KBr): 3060, 2954, 1613, 1516, 1484, 1244, 1177, 1039, 834, 762 cm^{-1}. MS (EI) *m/z*

(relative intensity) 198 ([M^+] 100), 183 (19), 155 (17), 128 (8), 55 (4). HR-MS (EI) *m/z* calcd for $C_{14}H_{14}O$ 198.1045, found 198.1028.



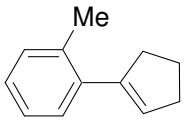
3,5-Dimethoxy-4`-methylbiphenyl (3j) (Table 2, entry 11): The representative procedure was followed, using 4-methylphenylmagnesiumbromide (1.50 mL, 1.50 mmol) and 5-chloro-1,3-dimethoxybenzene (**1j**) (0.172 g, 1.00 mmol). After 20 h, purification by chromatography (*n*-pentane/Et_2O = 200/1→50/1) yielded **3j** (0.197 g, 86 %) as a colourless liquid. The spectral data were in accordance with those reported in the literature.[7]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 7.50 (d, J = 8.1 Hz, 2H), 7.25 (d, J = 8.0 Hz, 2H), 6.75 (d, J = 2.2 Hz, 2H), 6.48 (t, J = 2.2 Hz, 1H), 3.86 (s, 6H), 2.41 (s, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 161.0, 143.4, 138.3, 137.3, 129.4, 127.0, 105.3, 99.0, 55.4, 21.1. IR (KBr): 2997, 2836, 1591, 1568, 1454, 1312, 1202, 1150, 1063, 992, 807 cm^{-1}. MS (EI) *m/z* (relative intensity) 228 ([M^+] 100), 199 (17), 184 (8), 141 (6), 115 (2). HR-MS (EI) *m/z* calcd for $C_{15}H_{16}O_2$ 228.1150, found 228.1150.



3,5-Dimethoxybiphenyl (3k) (Table 2, entry 12): The representative procedure was followed, using phenylmagnesiumchloride (0.90 mL, 1.50 mmol) and 5-chloro-1,3-dimethoxybenzene (**1j**) (0.173 g, 1.00 mmol). After 18 h, purification by chromatography (*n*-pentane/Et_2O = 200/1→100/1) yielded **3k** (0.204 g, 95 %) as a colourless liquid. The spectral data were in accordance with those reported in the literature.[8]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 7.58-7.62 (m, 5H), 7.34-7.47 (m, 2H), 6.76 (m, 1H), 3.86 (s, 6H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 161.0, 143.5, 141.2, 128.7, 127.5, 127.2, 105.5, 99.3, 55.4. IR (KBr): 3059, 2937, 2837, 1591, 1574, 1499, 1415, 1334, 1202, 1150, 1063, 914 cm^{-1}. MS (EI) *m/z* (relative intensity) 214 ([M^+] 100), 185 (21), 170 (8), 155 (4), 141 (8), 128 (13), 115 (5). HR-MS (EI) *m/z* calcd for $C_{14}H_{14}O_2$ 214.0994, found 214.0973.



1-Cyclopentenyl-2-methylbenzene (3l) (Table 2, entry 13): The representative procedure was followed, using 2-methylphenylmagnesiumbromide (1.50 mL, 1.50 mmol) and

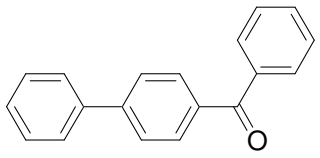
1-chlorocyclopentene (**1l**) (0.102 g, 1.00 mmol). After 18 h, purification by chromatography (*n*-pentane) yielded **3l** (0.135 g, 85 %) as a colourless liquid. The spectral data were in accordance with those reported in the literature.[9]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 7.20–7.10 (m, 4H), 5.75 (m, 1H), 2.70–2.60 (m, 2H), 2.56–2.45 (m, 2H), 2.35 (s, 3H), 2.00–1.85 (m, 2H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 143.3, 138.2, 135.5, 130.4, 129.3, 128.0, 126.5, 125.5, 36.7, 33.6, 23.8, 21.1. IR (KBr): 2949, 2843, 1487, 1457, 1035, 749, 721 cm^{-1}. MS (EI) *m/z* (relative intensity) 158 ([M^{+}] 68), 143 (100), 128 (36), 115 (21). HR-MS (EI) *m/z* calcd for $C_{12}H_{14}$ 158.1096, found 158.1079.

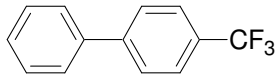
Representative procedure for palladium-catalyzed cross-coupling reactions of aryl chlorides with boronic acids (Table 2, entry 14):

A solution of [Pd(dba)$_2$] (12 mg, 0.02 mmol, 2 mol%) and **8** (21 mg, 0.04 mmol, 4 mol%), 4-chlorobenzophenone (**1f**) (0.217 g, 1.00 mmol), phenylboronic acid (0.182 g, 1.50 mmol) and KO*t*Bu (0.377 g, 3.00 mmol) in dry THF (5 mL) was stirred for 24 h at 60 °C. Et_2O (50 mL) and sat. $NaHCO_3$ (50 mL) were added to the reaction mixture. The separated aqueous phase was extracted with Et_2O (2 × 50 mL). The combined organic layers were dried over $MgSO_4$ and concentrated in vacuo. The remaining residue was purified by column chromatography on silica gel (*n*-pentane/Et_2O = 200/1→100/1→50/1→30/1) to yield **3f**

(0.192 g, 74 %) as a colourless solid (MP: 101.0–101.2 °C). The spectral data were in accordance with those reported in the literature.[4]



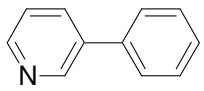
^{1}H–NMR (300 MHz, $CDCl_3$): δ = 7.91 (md, J = 8.6 Hz, 2H), 7.85 (md, J = 8.3 Hz, 2H), 7.72 (md, J = 8.6 Hz, 2H), 7.66 (md, J = 8.2 Hz, 2H), 7.62–7.58 (m, 1H), 7.54–7.46 (m, 4H), 7.44–7.39 (m, 1H). ^{13}C–NMR (75 MHz, $CDCl_3$): δ = 196.3, 145.2, 140.0, 137.7, 136.2, 132.3, 130.7, 129.9, 128.9, 128.3, 128.1, 127.3, 126.9. IR (neat, cm $^{-1}$): 3051, 1642, 1601, 1315, 1286, 1272, 938, 850, 729, 693. MS (EI) *m/z* (relative intensity) 259(12), 258 ([M^+] 66), 257 (6), 182 (13), 181 (100), 153 (17), 152 (30), 151 (7), 115 (7), 105 (16), 77 (14). HR–MS (EI) *m/z* calcd for $C_{19}H_{14}O$ 258.1045, found 258.1056.



1–Phenyl–4–(trifluoromethyl)benzene (3c) (Table 2, entry 15): The representative procedure was followed, using 4–chloro–(trifluoromethyl)benzene (**1c**) (0.181 g, 1.00 mmol) and phenylboronic acid (0.182 g, 1.50 mmol). After 24 h, purification by chromatography (*n*–pentane/Et_2O = 50/1) yielded

3c (0.204 g, 92 %) as a colourless solid. The spectral data were in accordance with those reported in the literature.[1]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 7.71–7.70 (m, 4H), 7.63–7.59 (m, 2H), 7.52–7.41 (m, 3H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 144.7, 139.8, 129.0, 128.9, 128.2, 127.4, 127.3, 125.7, 124.3. ^{19}F-NMR (375 MHz, $CDCl_3$): δ = –60.7 (s). IR (KBr): 3083, 3037, 2929, 2854, 1326, 1111, 1072, 1014, 1005, 842, 765, 726 cm^{-1}. MS (EI) *m/z* (relative intensity) 222 ([M^+] 100), 221 (2), 203 (6), 201 (6), 172 (2), 153 (9), 152 (11), 151 (3), 111 (2), 86 (3), 76 (2). HR-MS (EI) *m/z* calcd for $C_{13}H_9F_3$ 222.0656, found 222.0670.



3-Phenylpyridine (3a) (Table 2, entry 16): The representative procedure was followed, using 3-chloropyridine (**1a**) (0.113 g, 1.00 mmol) and phenylboronic acid (0.182 g, 1.50 mmol). After 24 h, purification by chromatography (*n*-pentane/Et_2O = 10/1→5/1→2/1) yielded **3a** (0.151 g, 95 %) as a yellow liquid. The spectral data were in accordance with those reported in the literature.[2]

^{1}H-NMR (300 MHz, $CDCl_3$): δ = 8.85 (dd, *J* = 2.3, 0.8 Hz, 1H), 8.58 (dd, *J* = 4.9, 1.7 Hz, 1H), 7.86 (ddd, *J* = 7.8, 2.3, 1.7 Hz, 1H), 7.59–7.55 (m, 2H), 7.51–7.32 (m, 4H). ^{13}C-NMR (75 MHz, $CDCl_3$): δ = 148.4, 148.2, 137.8, 136.6 , 134.3, 129.0, 128.0, 127.1, 123.5. IR (KBr): 3400, 3055, 1528, 1473, 1450,

1407, 1277, 1076, 1024, 1006, 913 cm^{-1}. MS (EI) *m/z* (relative intensity) 155 ([M^+] 100), 127 (7), 102 (5), 77 (3). HR-MS (EI) *m/z* calcd for $C_{11}H_9N$ 155.0735, found 155.0739.

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