Supporting Information

Experimental Section

Suzuki–coupling reactions:

4'-methoxy-2-methylbiphenyl (3b): A 10 mL microwave tube was charged with 2-bromotoluene (45 mg, 0.26 mmol), K_2CO_3 (108 mg, 0.78 mmol), 4-methoxyphenylboronic acid (59 mg, 0.39 mmol), (Fe_3O_4-CNT-Pd)@m-SiO_2 (8 mg), DMF (2.0 mL) and H_2O (1.0 mL). The resulting mixture was stirred at room temperature for 2.0 min and then heated at 150 °C for 10 min on microwave. After cooling to room temperature, the mixture was partitioned in H_2O and EtOAc. The aqueous phase was extracted with EtOAc (3x). The combined organic layers were dried (Na_2SO_4) and concentrated under reduced pressure. The residue was purified by an ISCO silica gel column to provide the title compound (48.5 mg, 94%) as a white solid. ^{1}H NMR (400 MHz, cdcl$_3$) δ 7.31 – 7.18 (m, 6H), 6.99 – 6.92 (m, 2H), 3.86 (s, 3H), 2.28 (s, 3H); ^{13}C NMR (101 MHz, cdcl$_3$) δ 158.48, 141.53, 135.46, 134.35, 130.26, 130.22, 129.87, 126.94, 125.72, 113.46, 55.27, 55.26, 20.52.

1,1'-biphenyl (3a): The title compound **3a** (37.5 mg, 90%) was prepared according to the general procedure from bromobenzene (43 mg, 0.27 mmol), (Fe_3O_4-CNT-Pd)@m-SiO_2 (9 mg), and phenylboronic acid (50 mg, 0.41 mmol) as a white solid. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.63 – 7.58 (m, 4H), 7.47 – 7.42 (m, 4H), 7.38 – 7.32 (m, 2H);); ^{13}C NMR (101 MHz, $CDCl_3$) δ 141.2, 128.7, 127.2, 127.1.

4-methoxy-1,1':2',1''-terphenyl (3c): The title compound **3c** (42.3 mg, 86%) was prepared according to the general procedure from 2-bromo-1,1'-biphenyl (45 mg, 0.19 mmol), (Fe_3O_4-CNT-Pd)@m-SiO_2 (6 mg), and phenylboronic acid (44 mg, 0.29 mmol) as a colorless oil. ^{1}H NMR (400 MHz, cdcl$_3$) δ 7.45 – 7.37 (m, 4H), 7.27 – 7.20 (m, 3H), 7.19 – 7.13 (m, 2H), 7.09 – 7.04 (m, 2H), 6.79 – 6.73 (m, 2H), 3.78 (s, 3H); ^{13}C NMR (101 MHz, cdcl$_3$) δ 158.3, 141.7, 140.5, 140.1, 133.9, 130.9, 130.6, 130.5, 129.9, 127.9, 127.5, 127.1, 126.3, 113.3, 55.2, 55.1.

2,6-dimethyl-1,1'-biphenyl (3d): The title compound **3d** (38.8 mg, 82%) was prepared according to the general procedure from 2-bromo-1,3-dimethylbenzene (48 mg, 0.26 mmol), CNT-Fe_3O_4-Pd (10 mg), and phenylboronic acid (48 mg, 0.39 mmol) as a clear oil. ^{1}H NMR (400 MHz, cdcl$_3$) δ 7.45 – 7.39 (m, 2H), 7.36 – 7.30 (m, 1H), 7.20 – 7.12 (m, 3H), 7.13 – 7.07 (m, 2H), 2.03 (s, 6H); ^{13}C NMR (101 MHz, cdcl$_3$) δ 141.8, 141.1, 136.0, 129.0, 128.4, 127.2, 127.0, 126.9, 126.6, 20.8.

2',6'-dimethyl-[1,1'-biphenyl]-4-carbaldehyde (3e): The title compound **3e** (43.4 mg, 80%) was prepared according to the general procedure from 2-bromo-1,3-dimethylbenzene (48 mg, 0.26 mmol), CNT-Fe_3O_4-Pd (10 mg), and 4-formylphenylboronic acid (59 mg, 0.39 mmol) as a white solid. ^{1}H NMR (400 MHz, cdcl$_3$) δ 10.07 (s, 1H), 7.97 (d, J = 8.2 Hz, 2H), 7.34 (d, J = 8.0 Hz, 2H), 7.23 – 7.18 (m, 1H), 7.14 (d, J = 7.5 Hz, 2H), 2.04 (s, 6H); ^{13}C NMR (101 MHz, cdcl$_3$) δ 191.9, 148.0, 140.5, 135.4, 135.1, 130.0, 129.9, 127.7, 127.7, 127.7, 127.6, 127.5, 20.7.

4'-methoxy-2,6-dimethyl-1,1'-biphenyl (3f): The title compound **3f** (51.1 mg, 93%) was prepared according to the general procedure from 2-bromo-1,3-dimethylbenzene (48 mg, 0.26 mmol), CNT-$_{Fe3O4}$-$Pd^{(0)}$ (9 mg) and 4-methoxyphenylboronic acid (59 mg, 0.39 mmol) as a white solid. ^{1}H NMR (400 MHz, $cdcl_3$) δ 7.21 – 7.16 (m, 1H), 7.16 – 7.12 (m, 2H), 7.12 – 7.07 (m, 2H), 7.03 – 6.98 (m, 2H), 3.89 (s, 3H), 2.09 (s, 6H); ^{13}C NMR (101 MHz, $cdcl_3$) δ 158.3, 141.5, 136.5, 133.3, 130.1, 127.3, 126.9, 126.9, 113.8, 55.2, 20.9.