Typical experimental procedure: To a suspension of $Pd_2dba_3CHCl_3$ (10.3 mg, 2 mol%), triphenylphosphine (21.0 mg, 16 mol%) and lithium chloride (63.5 mg, 1.5 mmol) in DMF (1 mL) was added 1-iodonaphthalene (127.0 mg, 0.5 mmol) at room temperature under a nitrogen atmosphere. After 15 min, allyl indium reagent which is generated from allyl iodide (126.0 mg, 0.75 mmol) and indium (57.0 mg, 0.5 mmol) in DMF (1 mL) was added and the mixture was stirred at 100 °C for 1h. The reaction mixture was quenched with $NaHCO_3$ (sat. aq.). The aqueous layer was extracted with ether (3×20 mL), and the combined organics were washed with water and brine, dried with $MgSO_4$, filtered and concentrated under reduced pressure. The residue was purified by silica gel column chromatography using *n*-hexane to give 1-allylnaphthalene (182 mg, 93 %). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.01 (d, *J* = 8.08 Hz, 1H), 7.83 (t, *J* = 7.76 Hz, 1H), 7.72 (d, *J* = 6.89 Hz, 1H), 7.50-7.42 (m, 2H), 7.39 (d, *J* = 7.25 Hz, 1H), 7.32 (d, *J* = 6.89 Hz, 1H), 6.16-6.65 (m, 1H), 5.11-5.06 (m, 2H), 3.82 (d, *J* = 6.30 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 135.13, 133.27, 132.01, 130.15, 126.84, 125.13, 124.44, 123.96, 123.77, 123.68, 122.19, 114.33, 35.43; IR (film) 3003, 2916, 1684, 1606, 1414, 1358 cm^{-1}; HRMS (EI) calcd for $C_{13}H_{12}$ M^+ 168.0939, found 168.0934.

1-Crotylnaphthalene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.02 (t, *J* = 7.42 Hz, 2H), 7.83 (d, *J* = 7.80, 2H), 7.78-7.74 (m, 1H), 7.30-7.50 (m, 9H), 5.49-5.70 (m, 4H), 3.82 (d, *J* = 5.78 Hz, 2H), 3.75 (d, *J* = 6.29 Hz, 2H), 1.79 (d, *J* = 5.61 Hz, 3H), 1.66 (m, *J* = 6.31 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 129.31, 129.19, 127.23, 127.19, 126.24, 126.16, 125.98, 125.51, 124.39, 36.59, 31.14, 18.45, 13.50; IR (film) 3053, 2986, 2395, 1421, 1270 cm^{-1}; HRMS (EI) calcd for $C_{14}H_{14}$ M^+ 182.1096, found 182.1092 (*cis* isomer), 182.1096 (*trans* isomer).

1-(1-Buten-3-yl)naphthalene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.11 (d, *J* = 8.27 Hz, 1H), 7.83 (d, *J* = 7.80 Hz, 1H), 7.70 (d, *J* = 8.00 Hz, 1H), 7.30-7.50 (m, 4H), 6.15 (ddd, *J* = 5.57, 10.70, 15.64 Hz, 1H), 5.11 (m, *J* = 16.08 Hz, 1H), 5.10 (m, *J* = 11.22 Hz, 1H), 4.28 (q, *J* = 6.63 Hz, 1H), 1.50 (d, *J* = 6.31 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.35, 141.91, 134.46, 131.92, 129.38, 127.28, 126.21, 126.09, 125.83, 124.15, 123.98, 114.15, 38.34, 20.69; IR (film) 3053, 2986, 2395, 1421, 1270 cm^{-1}; HRMS (EI) calcd for $C_{14}H_{14}$ M^+ 182.1096, found 182.1097.

1-Prenylnaphthalene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.03 (d, *J* = 8.04 Hz, 1H), 7.85 (d, *J* = 9.05 Hz, 1H), 7.71 (d, *J* = 8.11 Hz, 1H), 7.49 (m, 2H), 7.40 (dd, *J* = 7.91, 7.25 Hz, 1H), 7.33 (d, *J* = 6.83 Hz, 1H), 5.40 (t, *J* = 6.92 Hz, 1H), 3.77 (d, *J* = 6.92 Hz, 2H), 1.80 (s, 3H), 1.76 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 137.78, 133.85, 132.69, 132.04, 128.30, 126.56, 125.71, 125.64, 125.58, 125.44, 124.00, 122.88, 31.78, 25.74, 17.95; IR (film) 3053, 2986, 2305, 1422, 1269 cm^{-1}; HRMS (EI) calcd for $C_{15}H_{16}$ M^+ 196.1252, found 196.1251.

8-(1-Naphthyl)-2,6-dimethyl-2,6-octadiene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.02 (dd, *J* = 8.00, 1.50 Hz, 1H), 7.84 (dd, *J* = 7.42, 1.76 Hz, 1H), 7.70 (d, *J* = 8.07 Hz, 1H), 7.48 (m, 2H), 7.39 (dd, *J* = 7.21, 7.88 Hz, 1H), 7.33 (d, *J* = 6.60 Hz, 1H), 5.41 (t, *J* = 6.91 Hz, 1H), 5.19 (m, 1H), 5.10 (m, 1H), 3.78 (d, *J* = 6.87 Hz, 2H), 2.24-2.07 (m, 2H), 1.78 (s, 3H), 1.76 (s, 3H), 1.66 (s, 3H), 1.70 (s, 3H), 1.58 (s, 3H), 1.63 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 137.73, 136.35, 133.85, 132.11, 131.47, 128.66, 128.64, 126.53, 125.68, 125.63, 125.52, 125.42, 124.24, 124.21, 124.03, 124.00, 122.82, 123.48, 39.69, 32.16, 31.64, 31.42, 26.59, 26.49, 25.69, 25.76, 23.38, 17.69, 16.63; IR (film) 3054, 2986, 2305, 1674, 1422 cm^{-1}; HRMS (EI) calcd for $C_{20}H_{24}$ M^+ 264.1878, found 264.1877 (*cis* isomer), 264.1884 (*trans* isomer).

1-(*n*-Butyl)-4-(2-cyclohexenyl)benzene ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.11 (m, 4H), 5.87 (ddd, *J* = 3.31, 5.98, 10.01 Hz, 1H), 5.71 (dd, *J* = 10.05, 2.10 Hz, 1H), 3.36 (m, 1H), 2.58 (t, *J* = 7.72 Hz, 1H), 2.07 (m, 2H), 2.00 (m, 1H), 1.74 (m, 1H), 1.53-1.64 (m, 4H), 1.36 (m, 2H), 0.92 (q, *J* = 7.32 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.81, 140.49, 130.47, 128.28, 128.13, 127.57, 41.45, 35.26, 33.72, 32.63, 25.04, 22.45, 21.23, 13.97; IR (film) 3054, 2986, 2931, 1422, 1270 cm^{-1}; HRMS (EI) calcd for $C_{16}H_{22}$ M^+ 214.1721, found 214.1724.

4-Allylacetophenone ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.89 (d, *J* = 8.20 Hz, 2H), 7.28 (d, *J* = 8.15 Hz, 2H), 5.99-5.90 (m, 1H), 5.12-5.08 (m, 2H), 3.44 (d, *J* = 6.65 Hz, 2H), 2.58 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 145.78, 136.30, 135.29, 128.80, 128.59, 116.66, 40.12, 26.58; IR (film) 3046, 3005, 2910, 1638, 1597 cm^{-1}; HRMS (EI) calcd for $C_{11}H_{12}O$ M^+ 160.0888, found 160.0888.

4-Prenylacetophenone ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.87 (d, *J* = 8.22 Hz, 2H), 7.26 (d, *J* = 8.15 Hz, 2H), 5.31 (t, *J* = 7.34 Hz, 1H), 3.39 (d, *J* = 7.32 Hz, 2H), 2.58 (s, 3H), 1.76 (s, 3H), 1.72 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 197.86, 147.69, 134.99, 133.59, 128.57, 128.49, 121.99, 34.40, 26.57, 26.75, 17.88; IR (film) 3054, 2986, 1681, 1604, 1422 cm^{-1}; HRMS (EI) calcd for $C_{13}H_{16}O$ M^+ 180.1201, found 180.1206.

2-Methyl-2-[4-(2-cyclohexenyl)phenyl]-1,3-dioxolane ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.39 (d, *J* = 8.13 Hz, 2H), 7.18 (d, *J* = 8.15 Hz, 2H), 5.88 (ddd, *J* = 3.54, 6.13, 9.84 Hz, 1H), 5.70 (dd, *J* = 2.24, 10.09 Hz, 1H), 4.03 (m, 2H), 3.78 (m, 2H), 3.40 (m, 1H), 2.08 (m, 2H), 1.99 (m, 1H), 1.74 (m, 1H), 1.54-1.64 (m, 2H), 1.65 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 146.62, 141.28, 130.50, 128.78, 127.91, 125.56, 109.29, 64.84, 41.90, 32.91, 28.02, 25.41, 21.58; IR (film) 3055, 2985, 1718, 1447, 1266 cm^{-1}; HRMS (EI) calcd for $C_{15}H_{17}O_2$ M^+ 229.1228, found 229.1232.

Ethyl 2-allylbenzoate ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.87 (dd, *J* = 1.60, 8.53 Hz, 1H), 7.42 (dt, *J* = 1.30. 7.56 Hz, 1H), 7.26 (m, 2H), 6.01 (ddt, *J* = 6.40, 10.28, 16.80 Hz, 1H), 5.02 (m, *J* = 17.13 Hz, 1H), 5.00 (m, *J* = 10.02 Hz, 1H), 4.35 (q, *J* = 7.10 Hz, 2H), 3.75 (d, *J* = 6.44 Hz, 2H), 1.38 (t, *J* = 7.16 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 167.69, 141.34, 137.45, 131.89, 130.88, 130.50, 130.11, 126.15, 115.53, 60.86, 38.38, 14.29; IR (film) 3054, 2986, 1422, 1266 cm^{-1}; HRMS(EI) calcd for $C_{12}H_{14}O_2$ M^+ 190.0994, found 190.0992.

Ethyl 3-allylbenzoate ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.88 (m, 2H), 7.36 (m, 2H), 5.97 (ddt, *J* = 6.61, 9.22, 15.96, 1H), 5.09 (d, *J* = 15.62 Hz, 1H), 5.10 (d, *J* = 10.04 Hz, 1H), 4.37 (q, *J* = 7.10 Hz, 2H), 3.44 (d, *J* = 6.64 Hz, 2H), 1.39 (t, *J* = 7.20 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 167.12, 140.71, 137.22, 133.53, 131.03, 130.08, 127.85, 127.78, 116.76, 61.34, 40.34, 14.75; IR (film) 3054, 2986, 1714, 1422, 1266 cm^{-1}; HRMS (EI) calcd for $C_{12}H_{14}O_2$ M^+ 190.0994, found 190.0994.

Ethyl 4-allylbenzoate ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.97 (d, *J* = 8.25 Hz, 2H), 7.25 (d, *J* = 7.87 Hz, 2H), 5.95 (ddt, *J* = 6.68, 10.52, 16.94 Hz, 1H), 5.09 (d, *J* = 16.97 Hz, 1H), 5.07 (d, *J* = 10.34 Hz, 1H), 4.36 (q, *J* = 7.02 Hz, 2H), 3.43 (d, *J* = 6.74 Hz, 2H), 1.38 (t, *J* = 7.21 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 166.61, 145.35, 137.66, 136.46, 129.73, 128.57, 116.53, 60.81, 40.15, 14.35; IR (film) 3054, 2986, 1713, 1421, 1269 cm^{-1}; HRMS (EI) calcd for $C_{12}H_{14}O_2$ M^+ 190.0994 found 190.0991.

3-Allylnitrobenzene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.07 (d, *J* = 6.88 Hz, 1H), 8.06 (s, 1H), 7.53 (d, *J* = 7.46 Hz, 1H), 5.96 (m, 1H), 5.17 (d, *J* = 10.04 Hz, 1H), 5.13 (d, *J* = 17.00 Hz, 1H), 3.50 (d, *J* = 6.82 Hz, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.38, 142.04, 135.68, 134.89, 129.26, 123.48, 121.34, 117.40, 39.65; IR (film) 3054, 2987, 1530, 1423, 1267 cm^{-1}; HRMS (EI) calcd for $C_9H_9NO_2$ M^+ 163.0633, found 163.0632.

3-Crotylnitrobenzene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.58 (s, 1H), 8.21 (d, *J* = 7.69 Hz, 1H), 8.03 (d, *J* = 7.75 Hz, 1H), 7.46 (t, *J* = 3.95 Hz, 1H), 5.58 (m, 1H), 5.08 (m, 1H), 3.52-3.42 (m, 2H), 1.72 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.38, 142.04, 135.68, 134.89, 129.26, 123.48, 121.34, 117.40, 39.65; IR (film) 3054, 2986, 1531, 1442, 1266 cm^{-1}; HRMS (EI) calcd for $C_{10}H_{11}NO_2$ M^+ 177.0789, found 177.0798 (*cis* isomer), 177.0790 (*trans* isomer).

3-(1-Buten-3-yl)nitrobenzene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.08 (s, 1H), 8.05 (d, *J* = 6.49 Hz, 1H), 7.55 (d, *J* = 7.34 Hz, 1H), 5.29 (t, *J* = 8.11 Hz, 1H), 5.98 (m, 1H), 5.12 (m, 2H), 3.59 (t, *J* = 6.85 Hz, 1H), 1041 (d, *J* = 7.03 Hz, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.38, 142.04, 135.68, 134.89, 129.26, 123.48, 121.34, 117.40, 39.65; IR (film) 3054, 2987, 1530, 1423, 1267 cm^{-1}; HRMS (EI) calcd for $C_{12}H_{14}O_2$ M^+ 177.0789, found 177.0789.

3-Prenylnitrobenzene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.07 (d, *J* = 6.88 Hz, 1H), 8.06 (s, 1H), 7.53 (d, *J* = 7.46 Hz, 1H), 5.96 (m, 1H), 5.40 (t, *J* = 6.82 Hz, 1H), 3.76 (d, *J* = 6.82 Hz, 1H), 1.80 (s, 3H), 1.76 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.42, 142.04, 135.68, 134.89, 129.26, 123.48, 121.34, 117.40, 42.50, 39.65; IR (film) 3054, 2986, 1422, 1266 cm^{-1}; HRMS (EI) calcd for $C_{12}H_{14}O_2$ M^+ 191.0946, found 191.0948.

3-(2-Cyclohexenyl)nitrobenzene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.09 (s, 1H), 8.06 (d, *J* = 6.90 Hz, 1H), 7.56 (d, *J* = 7.59 Hz, 1H), 7.46 (t, *J* = 7.89 Hz, 1H), 5.99 (m, 1H), 5.70, 5.65 (dd, *J* = 2.19, 10.05 Hz, 1H), 3.52 (m, 1H), 2.11 (m, 2H), 2.06 (m, 1H), 1.73-1.54 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 148.12, 148.79, 134.49, 130.30, 129.51, 128.82, 123.05, 41.87, 32.80, 25.26, 21.19; IR (film) 3054, 2986, 1531, 1351, 1267 cm^{-1}; HRMS (EI) calcd for $C_{12}H_{13}NO_2$ M^+ 203.0946, found 203.0945.

8-(3-Nitrophenyl)-2,6-dimethyl-2,6-octadiene ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.09 (s, 1H), 8.06 (d, *J* = 6.90 Hz, 1H), 7.56 (d, *J* = 7.59 Hz, 1H), 7.46 (t, *J* = 7.89 Hz, 1H), 5.31 (d, *J* = 6.60 Hz, 1H), 5.44 (t, *J* = 6.91 Hz, 1H), 5.19 (m, 1H), 5.10 (m, 1H), 3.78 (d, *J* = 6.87 Hz, 2H), 2.20-2.07 (m, 2H), 1.78 (s, 3H), 1.76 (s, 3H), 1.66 (s, 3H), 1.70 (s, 3H), 1.58 (s, 3H), 1.63 (s, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ ; IR (film) 3054, 2986, 1531, 1267 cm^{-1}; HRMS (EI) calcd for $C_{12}H_{14}O_2$ M^+ 259.1572, found 259.1574 (*cis* isomer), 259.1575 (*trans* isomer).