Supporting Information

Efficient Three-component One-pot Benzylation and Allylation of Aldehydes and Amines for Synthesis of Homobenzylamines and Homoallylamines

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General Materials and Methods: All reactions were performed under nitrogen atmosphere. THF was distilled from sodium benzophenone ketyl, under nitrogen, immediately before use. Reactions were carried out in oven-dried glassware. NMR samples were run in CDCl₃ and were referenced to TMS. All chemical shift values are quoted in ppm and coupling constants quoted in Hz.

Typical procedure for the three-component one-pot reaction: A solution of R¹CHO (1 mmol) and R²NH₂ (2 mmol) in anhydrous THF (3 mL) was stirred at r.t. under N₂ for 30 min, then R³Br (3 mmol) and Zn dust (3 mmol) were added in. The resulted mixture was stirred at r.t. for 12-24 hr, then quenched with 1% HCl, extracted by DCM, dried by anhydrous Na₂SO₄, and the crude product was purified by flash column chromatography to provide the corresponding product.

N-(1,2-diphenylethyl)benzenamine 2a. ¹H NMR (300 MHz, CDCl₃) δ 2.99 (dd, *J* = 13.2, 8.4 Hz, 1H), 3.12 (dd, *J* = 13.2, 8.4 Hz, 1H), 4.10 (br, 1H), 4.56 (t, *J* = 8.4 Hz, 1H), 6.42 (d, *J* = 8.8 Hz, 2H), 6.62 (t, *J* = 8.2 Hz, 1H), 6.98-7.38 (m, 12H).

N-(1-(4-methoxyphenyl)-2-phenylethyl)benzenamine 2b. ¹H NMR (400 MHz, CDCl₃) δ 3.09 (dd, *J* = 14.1, 7.8 Hz, 1H), 3.20 (dd, *J* = 14.1, 7.8 Hz, 1H), 3.78 (s, 3H), 4.02 (br, 1H), 4.64 (t, *J* = 7.8 Hz, 1H), 6.44 (d, *J* = 8.1 Hz, 2H), 6.61 (t, *J* = 8.5 Hz, 1H), 6.82 (d, *J* = 8.7 Hz, 2H), 7.01-7.27 (m, 9H); ¹³C NMR (100 MHz, CDCl₃) δ 45.2, 55.2, 58.6, 113.8, 113.9, 117.4, 127.49, 128.4, 128.9, 129.2, 135.3, 137.7, 147.2, 158.6; IR (neat) ν 3419, 1601 cm⁻¹; MS (EI) *m/z* (rel intensity) 303 (4, M⁺·), 216 (100, M⁺-Bn); HRMS Calcd for C₂₁H₂₁NO: [M⁺] *m/z* 303.1623. Found 303.1627.

N-(2-phenyl-1-p-tolyethyl)benzenamine 2c. ¹H NMR (400 MHz, CDCl₃) δ 2.32 (s, 3H), 2.99 (dd, *J* = 14.4, 8.8 Hz, 1H), 3.13 (dd, *J* = 14.4, 8.8 Hz, 1H), 4.22 (br, 1H), 4.55 (t, *J* = 8.4 Hz, 1H), 6.44 (d, *J* = 8.1 Hz, 2H), 6.62 (t, *J* = 8.2 Hz, 1H), 7.03-7.25 (m, 11H); ¹³C NMR (100 MHz,

CDCl₃) δ 21.1, 45.1, 58.1, 113.6, 117.4, 126.3, 128.5, 128.9, 129.2, 136.5, 137.8, 140.3, 147.3; IR (neat) ν 3411, 1602 cm⁻¹; MS (EI) m/z (rel intensity) 287 (1, M⁺·). 196 (100, M⁺-Bn); HRMS Calcd for C₂₁H₂₁N: [M⁺] m/z 287.1674. Found 287.1677.

N-(1-(4-chlorophenyl)-2-phenylethyl)benzenamine 2d. ¹H NMR (400 MHz, CDCl₃) δ 3.00 (dd, J = 13.3, 8.2 Hz, 1H), 3.09 (dd, J = 13.6, 6.0 Hz, 1H), 4.11 (br, 1H), 4.56 (dd, J = 8.1, 6.0 Hz, 1H), 6.43 (dd, J = 8.1 Hz, 2H), 6.65 (t, J = 7.8 Hz, 1H), 7.04-7.12 (m, 4H), 7.27-7.31 (m, 7H); ¹³C NMR (100 MHz, CDCl₃) δ 45.0, 58.7, 113.6, 117.7, 127.8, 128.6, 128.7, 129.0, 132.6, 137.1, 141.9, 146.9; IR (neat) ν 3420, 1602 cm⁻¹; MS (EI) m/z (rel intensity) 307 (2, M⁺·), 216 (100, M⁺-Bn); HRMS Calcd for C₂₀H₁₈ClN: [M⁺] m/z 307.1128. Found 307.1123.

N-(1-(4-fluorophenyl)-2-phenylethyl)benzenamine 2e. ¹H NMR (400 MHz, CDCl₃) δ 3.04 (dd, J = 14.4, 8.0 Hz, 1H), 3.07 (dd, J = 14.4, 6.9 Hz, 1H), 4.12 (br, 1H), 4.58 (dd, J = 7.8, 6.9 Hz, 1H), 6.45 (d, J = 8.2 Hz, 2H), 6.66 (t, J = 8.1 Hz, 1H), 6.99-7.25 (m, 6H), 7.27-7.30 (m, 5H).

N-(1-(2-chlorophenyl)-2-phenylethyl)benzenamine 2f. ¹H NMR (400 MHz, CDCl₃) δ 2.79 (dd, J = 14.4, 8.0 Hz, 1H), 3.07 (dd, J = 14.4, 4.4 Hz, 1H), 3.99 (br, 1H), 5.04 (dd, J = 8.0, 4.4 Hz, 1H), 6.27 (d, J = 8.2 Hz, 2H), 6.62 (t, J = 8.1 Hz, 1H), 7.02 (t, J = 8.4 Hz, 2H), 7.15-7.22 (m, 9H); ¹³C NMR (100 MHz, CDCl₃) δ 42.6, 55.6, 113.5, 117.7, 126.8, 128.6, 129.0, 129.1, 132.6, 137.5, 140.3, 146.8; IR (neat) ν 3418, 1602 cm⁻¹; MS (EI) m/z (rel intensity) 307 (3, M⁺·), 216 (100, M⁺-Bn); HRMS Calcd for C₂₀H₁₈ClN: [M⁺] m/z 307.1128. Found 307.1126.

N-(1-(furan-2-yl)-2-phenylethyl)benzenamine 2g. ¹H NMR (400 MHz, CDCl₃) δ 3.23-3.29 (m, 2H), 4.03 (br, 1H), 4.82 (t, J = 6.4 Hz, 1H), 6.10 (d, J = 3.2 Hz, 1H), 6.32 (dd, J = 3.2, 1.8 Hz, 1H), 6.65 (d, J = 8.1 Hz, 2H), 6.77 (t, J = 7.2 Hz, 1H), 7.11-7.43 (m, 8H); ¹³C NMR (100 MHz, CDCl₃) δ 40.8, 53.0, 106.6, 110.1, 113.6, 117.9, 126.5, 128.3, 129.1, 129.2, 137.2, 141.3,

146.7, 155.1; IR (neat) ν 3414, 1602 cm^{-1} ; MS (EI) m/z (rel intensity) 263 (7, M^+), 172 (100, $\text{M}^+ - \text{Bn}$); HRMS Calcd for $\text{C}_{18}\text{H}_{17}\text{NO}$: $[\text{M}^+]$ m/z 263.1310. Found 263.1307.

N-(2-phenyl-1-(thiophen-2-yl)ethyl)benzenamine 2h. ^1H NMR (400 MHz, CDCl_3) δ 3.27 (d, $J = 6.8$ Hz, 2H), 4.19 (br, 1H), 5.00 (t, $J = 6.8$ Hz, 1H), 6.66 (d, $J = 8.1$ Hz, 2H), 6.80 (t, $J = 7.2$ Hz, 1H), 6.93-7.01 (m, 2H), 7.20-7.37 (m, 8H); ^{13}C NMR (100 MHz, CDCl_3) δ 45.0, 55.3, 113.5, 113.7, 117.4, 117.9, 123.7, 123.8, 128.4, 129.0, 129.1, 137.2, 146.8, 148.3; IR (neat) ν 3409, 1602 cm^{-1} ; MS (EI) m/z (rel intensity) 279 (6, M^+), 188(100, $\text{M}^+ - \text{Bn}$); HRMS Calcd for $\text{C}_{18}\text{H}_{17}\text{NS}$: $[\text{M}^+]$ m/z 279.1082. Found 279.1084.

N-(1,3-diphenylpropan-2-yl)benzenamine 2i. ^1H NMR (400 MHz, CDCl_3) δ 2.82 (dd, $J = 13.7, 6.4$ Hz, 2H), 2.91 (dd, $J = 13.8, 7.2$ Hz, 2H), 3.63 (br, 1H), 4.00-4.05 (m, 1H), 6.07 (d, $J = 8.2$ Hz, 2H), 6.73 (t, $J = 7.8$ Hz, 1H), 7.22-7.34 (m, 12H).

N-(1-phenyloctan-2-yl)benzenamine 2j. ^1H NMR (300 MHz, CDCl_3) δ 1.13 (t, $J = 6.6$ Hz, 3H), 1.50-1.82 (m, 10H), 3.02-3.16 (m, 2H), 3.73 (br, 1H), 3.87-3.91 (m, 1H), 6.88 (d, $J = 8.5$ Hz, 2H), 6.95 (t, $J = 8.5$ Hz, 1H), 7.42-7.58 (m, 7H); ^{13}C NMR (100 MHz, CDCl_3) δ 14.0, 22.5, 26.1, 29.2, 29.6, 31.78, 34.0, 40.1, 53.6, 113.1, 116.9, 126.1, 128.2, 129.3, 129.5, 138.6, 147.6; IR (neat) ν 3421, 1601 cm^{-1} ; MS (EI) m/z (rel intensity) 281 (5, M^+), 190 (100, $\text{M}^+ - \text{Bn}$); HRMS Calcd for $\text{C}_{20}\text{H}_{27}\text{N}$: $[\text{M}^+]$ m/z 281.2143. Found 281.2147.

N-(4-methyl-1-phenylpentan-2-yl)benzenamine 2k. ^1H NMR (400 MHz, CDCl_3) δ 0.90 (d, $J = 6.4$ Hz, 3H), 0.98 (d, $J = 6.4$ Hz, 3H), 1.35-1.38 (m, 2H), 1.83-1.87 (m, 1H), 2.87-2.90 (m, 2H), 3.47 (br, 1H), 3.77-3.81 (m, 1H), 6.67 (d, $J = 8.3$ Hz, 2H), 6.74 (t, $J = 6.8$ Hz, 1H), 7.21-7.36 (m, 7H); ^{13}C NMR (100 MHz, CDCl_3) δ 22.1, 23.1, 24.7, 40.2, 43.5, 51.3, 113.0, 116.8, 126.0, 128.1, 129.3, 129.6, 138.4, 147.5; IR (neat) ν 3347, 1601 cm^{-1} ; MS (EI) m/z (rel intensity)

253 (14, M^+), 162 (100, M^+-Bn); HRMS Calcd for $C_{18}H_{23}N$: $[M^+]$ m/z 253.1830. Found 253.1832.

N-(1,2-diphenylethyl)-4-methoxybenzenamine 2l. 1H NMR (400 MHz, $CDCl_3$) δ 3.06 (dd, J = 14.2, 8.2 Hz, 1H), 3.19 (dd, J = 14.2, 6.2 Hz, 1H), 3.72 (s, 3H), 3.95 (br, 1H), 4.58 (dd, J = 8.2, 6.2 Hz, 1H), 6.48 (d, J = 8.7 Hz, 2H), 6.71 (d, J = 8.7 Hz, 2H), 7.19 (d, J = 7.3 Hz, 2H), 7.25-7.41 (m, 8H).

N-(1,2-diphenylethyl)-4-fluorobenzenamine 2m. 1H NMR (400 MHz, $CDCl_3$) δ 3.02 (dd, J = 13.8, 8.1 Hz, 1H), 3.17 (dd, J = 13.8, 6.0 Hz, 1H), 4.06 (br, 1H), 4.56 (dd, J = 8.1, 6.0 Hz, 1H), 6.29-6.43 (m, 2H), 6.76-6.81 (m, 2H), 7.16 (d, J = 6.4 Hz, 2H), 7.17-7.36 (m, 8H).

N-benzyl-1,2-diphenylethanamine 2n. 1H NMR (400 MHz, $CDCl_3$) δ 2.88-2.94 (m, 2H), 3.44 (d, J = 13.6 Hz, 1H), 3.65 (d, J = 13.6 Hz, 1H), 3.87 (dd, J = 8.2, 2.8 Hz, 1H), 7.05-7.37 (m, 15H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 45.2, 51.3, 63.6, 125.2, 125.7, 126.3, 127.3, 128.2, 128.3, 129.2, 138.7, 140.4, 143.6; IR (neat) ν 3386, 1594 cm^{-1} ; MS (EI) m/z (rel intensity) 287 (1, M^+), 196 (100, M^+-Bn); HRMS Calcd for $C_{21}H_{21}N$: $[M^+]$ m/z 287.1674. Found 287.1677.

N-(1,2-diphenylethyl)hexan-1-amine 2o. 1H NMR (400 MHz, $CDCl_3$) δ 0.85 (t, J = 7.2 Hz, 3H), 1.16-1.30 (m, 8H), 2.38-2.41 (m, 2H), 2.91-2.94 (m, 2H), 3.86 (dd, J = 8.2, 6.1 Hz, 1H), 7.14-7.37 (m, 10H).

N-(1-phenylbut-3-enyl)benzenamine 4a. 1H NMR (400 MHz, $CDCl_3$) δ 2.49-2.55 (m, 1H), 2.59-2.63 (m, 1H), 4.17 (br, 1H), 4.39 (dd, J = 7.8, 4.8 Hz, 1H), 5.15-5.22 (m, 2H), 5.74-5.81 (m, 1H), 6.50 (d, J = 8.2 Hz, 2H), 6.65 (t, J = 7.2 Hz, 1H), 7.09 (t, J = 8.2 Hz, 2H), 7.22-7.26 (m, 1H), 7.31-7.39 (m, 4H).

N-(1-(4-methoxyphenyl)but-3-enyl)benzenamine 4b. 1H NMR (300 MHz, $CDCl_3$) δ 2.38-2.58 (m, 2H), 3.74 (s, 3H), 4.07 (br, 1H), 4.30 (dd, J = 7.5, 5.4 Hz, 1H), 5.08-5.16 (m, 2H),

5.65-5.78 (m, 1H), 6.45 (d, $J = 8.1$ Hz, 2H), 6.59 (t, $J = 7.8$ Hz, 1H), 6.80 (d, $J = 8.9$ Hz, 2H), 7.03 (dd, $J = 8.9, 7.8$ Hz, 2H), 7.22 (d, $J = 9.0$ Hz, 2H).

N-(1-*p*-tolylbut-3-enyl)benzenamine 4c. ^1H NMR (400 MHz, CDCl_3) δ 2.32 (s, 3H), 2.40-2.59 (m, 2H), 4.15 (br, 1H), 4.35 (dd, $J = 7.8, 6.1$ Hz, 1H), 5.14-5.20 (m, 2H), 5.72-5.77 (m, 1H), 6.50 (d, $J = 7.8$ Hz, 2H), 6.63 (t, $J = 7.2$ Hz, 1H), 7.06 (dd, $J = 7.9, 7.6$ Hz, 2H), 7.12 (d, $J = 7.8$ Hz, 2H), 7.24 (d, $J = 7.6$ Hz, 2H).

N-(1-(4-chlorophenyl)but-3-enyl)benzenamine 4d. ^1H NMR (400 MHz, CDCl_3) δ 2.44-2.57 (m, 2H), 4.10 (br, 1H), 4.34 (dd, $J = 7.8, 5.0$ Hz, 1H), 5.14-5.20 (m, 2H), 5.69-5.76 (m, 1H), 6.45 (d, $J = 8.2$ Hz, 2H), 6.66 (t, $J = 7.4$ Hz, 1H), 7.07 (t, $J = 7.5$ Hz, 2H), 7.24-7.28 (m, 4H).

N-(1-(4-fluorophenyl)but-3-enyl)benzenamine 4e. ^1H NMR (400 MHz, CDCl_3) δ 2.44-2.56 (m, 2H), 4.13 (br, 1H), 4.35 (dd, $J = 7.8, 4.8$ Hz, 1H), 5.13-5.20 (m, 2H), 5.70-5.77 (m, 1H), 6.46 (d, $J = 8.2$ Hz, 2H), 6.65 (t, $J = 6.8$ Hz, 1H), 7.00 (t, $J = 8.0$ Hz, 2H), 7.05 (t, $J = 7.2$ Hz, 2H), 7.32 (dd, $J = 8.2, 6.8$ Hz, 2H).

N-(1-(2-chlorophenyl)but-3-enyl)benzenamine 4f. ^1H NMR (400 MHz, CDCl_3) δ 2.36-2.44 (m, 1H), 2.67-2.72 (m, 1H), 4.19 (br, 1H), 4.83 (dd, $J = 8.3, 4.4$ Hz, 1H), 5.16-5.23 (m, 2H), 5.75-5.80 (m, 1H), 6.42 (d, $J = 7.3$ Hz, 2H), 6.66 (t, $J = 7.2$ Hz, 1H), 7.07 (t, $J = 7.2$ Hz, 2H), 7.15-7.19 (m, 2H), 7.36-7.43 (m, 2H).

N-(1-(furan-2-yl)but-3-enyl)benzenamine 4g. ^1H NMR (400 MHz, CDCl_3) δ 2.65-2.70 (m, 2H), 3.99 (br, 1H), 4.54-4.58 (m, 1H), 5.12-5.20 (m, 2H), 5.72-5.80 (m, 1H), 6.16 (d, $J = 3.2$ Hz, 1H), 6.28-6.29 (m, 1H), 6.60 (d, $J = 8.1$ Hz, 2H), 6.71 (t, $J = 7.3$ Hz, 1H), 7.15 (t, $J = 7.3$ Hz, 2H), 7.34-7.36 (m, 1H).

N-(1-(pyridin-2-yl)but-3-enyl)benzenamine 4h. ^1H NMR (400 MHz, CDCl_3) δ 2.57-2.62 (m, 1H), 2.74-2.78 (m, 1H), 4.48 (br, 1H), 4.57 (dd, $J = 7.8, 5.5$ Hz, 1H), 5.14-5.19 (m, 2H),

5.74-5.82 (m, 1H), 6.56 (d, $J = 7.8$ Hz, 2H), 6.68 (t, $J = 7.4$ Hz, 1H), 7.10-7.16 (m, 3H), 7.34 (d, $J = 7.8$ Hz, 1H), 7.58 (dt, $J = 7.8, 6.0$ Hz, 1H), 8.61 (d, $J = 4.4$ Hz, 1H); ^{13}C NMR (100 MHz, CDCl_3) δ 41.2, 58.4, 113.46, 117.4, 118.2, 120.9, 121.9, 129.0, 129.1, 134.3, 136.5, 147.0, 149.3, 162.3; IR (neat) ν 3416, 1603, 1501cm^{-1} ; MS (EI) m/z (rel intensity) 224 (31, M^+), 183 ($\text{M}^+ - \text{C}_3\text{H}_5$); HRMS Calcd for $\text{C}_{15}\text{H}_{16}\text{N}_2$: $[\text{M}^+]$ m/z 224.1313. Found 224.1316.

N-(hept-1-en-4-yl)benzenamine 4i. ^1H NMR (400 MHz, CDCl_3) δ 0.91 (t, $J = 7.3$ Hz, 3H), 1.32-1.62 (m, 4H), 2.27-2.30 (m, 2H), 9.83 (t, $J = 6.4$ Hz, 1H), 5.05-5.09 (m, 2H), 5.77-5.85 (m, 1H), 6.57 (d, $J = 8.2$ Hz, 2H), 6.65 (t, $J = 6.6$ Hz, 1H), 7.15 (t, $J = 7.6$ Hz, 2H).

N-(6-methylhept-1-en-4-yl)benzenamine 4j. ^1H NMR (400 MHz, CDCl_3) δ 0.93 (d, $J = 6.4$ Hz, 3H), 0.98 (d, $J = 6.4$ Hz, 3H), 1.36-1.43 (m, 2H), 1.77-1.84 (m, 1H), 2.27-2.33 (m, 2H), 3.47 (br, 1H), 3.54 (t, $J = 6.4$ Hz, 1H), 5.08-5.12 (m, 2H), 5.81-5.86 (m, 1H), 6.61 (d, $J = 7.8$ Hz, 2H), 6.69 (t, $J = 7.3$ Hz, 1H), 7.19 (dd, $J = 7.8, 7.3$ Hz, 2H); ^{13}C NMR (100 MHz, CDCl_3) δ 22.5, 23.0, 24.8, 38.7, 43.9, 50.3, 113.0, 116.8, 117.5, 129.2, 134.8, 147.7; IR (neat) ν 3409, 1599cm^{-1} ; MS (EI) m/z (rel intensity) 203 (10, M^+), 162 ($\text{M}^+ - \text{C}_3\text{H}_5$); HRMS Calcd for $\text{C}_{14}\text{H}_{21}\text{N}$: $[\text{M}^+]$ m/z 203.1674. Found 203.1676.

4-methoxy-N-(1-phenylbut-3-enyl)benzenamine 4k. ^1H NMR (400 MHz, CDCl_3) δ 2.47-2.53 (m, 1H), 2.57-2.63 (m, 1H), 3.70 (s, 3H), 4.33 (dd, $J = 8.2, 5.5$ Hz, 1H), 5.14-5.22 (m, 2H), 5.74-5.82 (m, 1H), 6.47 (d, $J = 8.8$ Hz, 2H), 6.68 (d, $J = 8.8$ Hz, 2H), 7.22-7.26 (m, 1H), 7.31-7.39 (m, 4H).

4-fluoro-N-(1-phenylbut-3-enyl)benzenamine 4l. ^1H NMR (400 MHz, CDCl_3) δ 2.45-2.53 (m, 1H), 2.59-2.63 (m, 1H), 4.09 (br, 1H), 4.32 (dd, $J = 8.1, 5.6$ Hz, 1H), 5.15-5.22 (m, 2H), 5.74-5.79 (m, 1H), 6.42-6.45 (m, 2H), 6.79 (t, $J = 8.4$ Hz, 2H), 7.25-7.36 (m, 5H).

N-(1-phenylbut-3-enyl)-4-(trifluoromethyl)benzenamine 4m. ^1H NMR (400 MHz, CDCl_3) δ 2.50-2.56 (m, 1H), 2.60-2.64 (m, 1H), 4.37 (br, 1H), 4.39-4.44 (m, 1H), 5.16-5.23 (m, 2H), 5.71-5.80 (m, 1H), 6.59 (d, $J = 8.2$ Hz, 1H), 6.76-6.78 (m, 1H), 6.87 (d, $J = 7.8$ Hz, 1H), 7.14 (t, $J = 7.8$ Hz, 1H), 7.24-7.28 (m, 1H), 7.32-7.37 (m, 4H).

N-benzyl-1-phenylbut-3-en-1-amine 4n. ^1H NMR (400 MHz, CDCl_3) δ 2.32-2.48 (m, 2H), 3.52 (d, $J = 13.3$ Hz, 1H), 3.65-3.72 (m, 2H), 5.01-5.09 (m, 2H), 5.66-5.71 (m, 1H), 7.20-7.35 (m, 10H). ^{13}C NMR (100 MHz, CDCl_3) δ 43.1, 51.4, 61.6, 117.5, 126.1, 126.5, 127.3, 128.1, 128.3, 128.4, 135.4, 140.6, 143.8; IR (neat) ν 3399, 1448 cm^{-1} ; MS (EI) m/z (rel intensity) 237 (1, M^+), 196 ($\text{M}^+ - \text{C}_3\text{H}_5$); HRMS Calcd for $\text{C}_{17}\text{H}_{19}\text{N}$: $[\text{M}^+]$ m/z 237.1517. Found 237.1519.

N-(1-phenylbut-3-enyl)hexan-1-amine 4o. ^1H NMR (400 MHz, CDCl_3) δ 0.88 (t, $J = 6.6$ Hz, 3H), 1.18-1.32 (m, 6H), 1.40-1.48 (m, 2H), 1.71 (br, 1H), 2.38-2.45 (m, 4H), 3.62 (t, $J = 6.0$ Hz, 1H), 5.03-5.11 (m, 2H), 5.68-5.75 (m, 1H), 7.21-7.32 (m, 5H); ^{13}C NMR (100 MHz, CDCl_3) δ 13.9, 22.5, 26.9, 30.1, 31.7, 42.9, 47.7, 62.6, 117.3, 126.8, 127.1, 128.2, 135.5, 144.1; IR (neat) ν 3324, 1637 cm^{-1} ; MS (EI) m/z (rel intensity) 231 (1, M^+), 190 (100, $\text{M}^+ - \text{C}_3\text{H}_5$); HRMS Calcd for $\text{C}_{16}\text{H}_{25}\text{N}$: $[\text{M}^+]$ m/z 231.1987. Found 231.1990.

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N-(1-(4-chlorophenyl)but-3-enyl)benzenamine 4d

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N-(1-(4-fluorophenyl)but-3-enyl)benzenamine 4e

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N-(1-(2-chlorophenyl)but-3-enyl)benzenamine 4f

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N-(1-(furan-2-yl)but-3-enyl)benzenamine 4g

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N-(hept-1-en-4-yl)benzenamine 4i

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4-methoxy-N-(1-phenylbut-3-enyl)benzenamine 4k

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4-fluoro-N-(1-phenylbut-3-enyl)benzenamine 4l

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N-(1-phenylbut-3-enyl)-4-(trifluoromethyl)benzenamine 4m

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P10CHHPPH012PH-cdc13-05-04-06
Data Collected on: Inova300-2-Inova300
Archive directory: /nfs/inova300-2/dz/wei/rfan/vnmr sys/data
Sample directory:
File: PROTON
Pulse sequence: zgpg30

STANDARD 1H OBSERVE

Data Collected on: /nova300-1-nova300
Archive directory: /nfs/nova300-1/ds/vel/rfan/vnmr-sys/data
Sample directory:
File: PROTON
Pulse Sequence: zgpg30

a11y-ph-CH3OPH-cd13-05-09-06
Data Collected on: Inova300-1-Inova300
Archive directory: /nfs/inova300-1/d2/we1/rfan/vnmr/sy/data
Sample directory:
File: PROTON
Pulse Sequence: szpu1