Supporting Information

Efficient synthesis of homoallylic alcohols/amines from allyltributylstannane and carbonyl compounds/imines using iodine as catalyst under acetic acid-water medium

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Experimental data

1-Phenyl-but-3-en-1-ol,¹ (3a).

IR (ν/cm^{-1}): 3372, 3073, 2907, 1641, 1493, 1445, 1043; ^1H NMR (300 MHz, CDCl_3): δ 7.43-7.23 (m, 5H), 5.91-5.72 (m, 1H), 5.24-5.11 (m, 2H), 4.80-4.70 (m, 1H), 2.60-2.45 (m, 2H), 2.00 (s, 1H); ^{13}C NMR (75 MHz, CDCl_3): δ 143.8, 134.4, 128.4, 127.5, 125.8, 118.5, 73.3, 43.8; ESIMS (m/z) 149 $[\text{M}+\text{H}]^+$.

1-(4-Chlorophenyl)but-3-en-1-ol,^{5,9} (3b).

IR (ν/cm^{-1}): 3374, 3077, 2980, 2908, 1642, 1597, 1490, 1411, 1091; ^1H NMR (300 MHz, CDCl_3): δ 7.47-7.14 (m, 4H), 5.87-5.61 (m, 1H), 5.25-4.99 (m, 2H), 4.63 (t, $J = 6.42$ Hz, 1H), 2.75 (s, 1H), 2.58-2.32 (m, 2H); ^{13}C NMR (75 MHz, CDCl_3): δ 142.2, 133.9, 132.9, 128.3, 127.1, 118.4, 72.5, 43.6; ESIMS (m/z) 183 $[\text{M}+\text{H}]^+$.

1-(4-Methoxyphenyl)but-3-en-1-ol,⁵ (3c).

IR (ν/cm^{-1}): 3398, 3072, 2932, 1886, 1611, 1512, 1456, 1247, 1036; ^1H NMR (300 MHz, CDCl_3): δ 7.20 (d, $J = 8.69$ Hz, 2H), 6.82 (d, $J = 8.69$ Hz, 2H), 5.81-5.65 (m, 1H), 5.12-5.00 (m, 2H), 4.56 (t, $J = 6.42$ Hz, 1H), 3.72 (s, 3H), 3.41 (s, 1H), 2.53-2.34 (m, 2H); ^{13}C NMR (75 MHz, CDCl_3): δ 158.6, 136.1, 134.6, 127.0, 117.4, 113.4, 72.9, 54.9, 43.4; ESIMS (m/z) 179 $[\text{M}+\text{H}]^+$.

1-(2-Methoxyphenyl)but-3-en-1-ol,⁸ (3d).

IR (ν/cm^{-1}): 3412, 3072, 2938, 2837, 1640, 1596, 1462, 1240, 1045; ^1H NMR (300 MHz, CDCl_3): δ 7.37 (d, $J = 7.55$ Hz, 1H), 7.31-7.21 (m, 1H), 6.98 (t, $J = 7.18$ Hz, 1H), 5.97-5.78 (m, 1H), 5.20-5.07 (m, 2H), 5.05-4.94 (m, 1H), 3.83 (s, 3H), 2.98 (s, 1H), 2.66-2.44 (m, 2H); ^{13}C NMR (75 MHz, CDCl_3): δ 156.1, 135.1, 131.7, 128.1, 126.6, 120.5, 117.2, 110.2, 69.2, 55.0, 41.7; ESIMS (m/z) 179 $[\text{M}+\text{H}]^+$.

1-(4-Nitrophenyl)but-3-en-1-ol,⁵ (3e).

IR (ν/cm^{-1}): 3551, 3389, 3055, 2931, 1631, 1523, 1429, 1169, 1048; ^1H NMR (300 MHz, CDCl_3): δ 8.13 (d, $J = 8.65$ Hz, 2H), 7.46 (d, $J = 8.39$ Hz, 2H), 5.80-5.62 (m, 1H), 5.19-5.05 (m,

2H), 4.84-4.74 (m, 1H), 2.53-2.33 (m, 2H), 2.11 (s, 1H); ^{13}C NMR (75 MHz, CDCl_3): δ 151.5, 147.6, 133.6, 126.9, 124.0, 120.1, 72.5, 44.3; ESIMS (m/z) 194 $[\text{M}+\text{H}]^+$.

1-(2-Nitrophenyl)but-3-en-1-ol,¹⁰ (3f).

IR (v/cm^{-1}): 3554, 3382, 3053, 2939, 1624, 1540, 1430, 1173, 1043; ^1H NMR (300 MHz, CDCl_3): δ 7.95 (d, $J = 8.31$ Hz, 1H), 7.84 (d, $J = 7.55$ Hz, 1H), 7.66 (t, $J = 7.18$ Hz, 1H), 7.44 (t, $J = 7.18$ Hz, 1H), 6.04-5.80 (m, 1H), 5.42-5.13 (m, 3H), 2.58-2.27 (m, 2H), 1.62 (s, 1H); ^{13}C NMR (75 MHz, CDCl_3): δ 150.1, 139.0, 133.8, 133.3, 128.0, 127.9, 124.3, 119.0, 68.2, 42.7; ESIMS (m/z) 194 $[\text{M}+\text{H}]^+$.

1-(4-Methylphenyl)but-3-en-1-ol,¹² (3g).

IR (v/cm^{-1}): 3542, 3381, 3062, 2938, 1633, 1519, 1436, 1164, 1051; ^1H NMR (300 MHz, CDCl_3): δ 7.26 (d, $J = 7.93$ Hz, 2H), 7.19 (d, $J = 7.93$ Hz, 2H), 5.92-5.71 (m, 1H), 5.27-5.07 (m, 2H), 4.67 (t, $J = 6.42$ Hz, 1H), 2.84 (s, 1H), 2.58-2.47 (m, 2H), 2.40 (s, 3H); ^{13}C NMR (75 MHz, CDCl_3): δ 140.9, 136.9, 134.6, 128.9, 125.7, 117.8, 73.1, 43.5, 20.9; ESIMS (m/z) 163 $[\text{M}+\text{H}]^+$.

1-(3-Chlorophenyl)but-3-en-1-ol,⁵ (3h).

IR (ν/cm^{-1}): 3377, 3075, 2927, 1709, 1641, 1574, 1429, 1196; ^1H NMR (300 MHz, CDCl_3): δ 7.31-7.28 (m, 1H), 7.24-7.12 (m, 3H), 5.78-5.65 (m, 1H), 5.14-5.06 (m, 2H), 4.64 (dd, $J_1 = 4.83$ Hz, $J_2 = 7.88$ Hz, 1H), 2.49-2.33 (m, 2H), 1.91 (s, 1H); ^{13}C NMR (75 MHz, CDCl_3): δ 145.9, 134.3, 133.8, 129.6, 127.6, 126.0, 123.9, 119.0, 72.5, 43.8; ESIMS (m/z) 183 $[\text{M}+\text{H}]^+$.

1-(2-Chlorophenyl)but-3-en-1-ol,⁵ (3i).

IR (ν/cm^{-1}): 3419, 3074, 2927, 1709, 1641, 1574, 1429, 1196; ^1H NMR (300 MHz, CDCl_3): δ 7.57 (d, $J = 7.18$ Hz, 1H), 7.48-7.15 (m, 3H), 6.02-5.76 (m, 1H), 5.35-5.07 (m, 3H), 2.76-2.54 (m, 1H), 2.51-2.31 (m, 1H), 2.26 (s, 1H); ^{13}C NMR (75 MHz, CDCl_3): δ 141.1, 134.3, 131.6, 129.4, 128.4, 127.0, 118.8, 69.6, 42.0; ESIMS (m/z) 183 $[\text{M}+\text{H}]^+$.

1-(4-Bromophenyl)but-3-en-1-ol,⁵ (3j).

IR (ν/cm^{-1}): 3376, 3076, 2926, 2906, 1642, 1486, 1405, 1062, 1005; ^1H NMR (300 MHz, CDCl_3): δ 7.42 (d, $J = 8.31$ Hz, 2H), 7.14 (d, $J = 8.31$ Hz, 2H), 5.81-5.61 (m, 1H), 5.21-5.01 (m,

2H), 4.58 (t, $J = 6.04$ Hz, 1H), 3.18 (s, 1H), 2.40 (t, $J = 6.80$ Hz, 2H); ^{13}C NMR (75 MHz, CDCl_3): δ 142.7, 133.8, 131.2, 127.5, 121.0, 118.4, 72.5, 43.4; ESIMS (m/z) 228 $[\text{M}+\text{H}]^+$.

Undec-1-en-4-ol,¹⁰ (3k).

IR (v/cm^{-1}): 3363, 3074, 2927, 2857, 1828, 1641, 1458, 1377; ^1H NMR (300 MHz, CDCl_3): δ 5.96-5.66 (m, 1H), 5.24–5.03 (m, 2H), 3.96-3.73 (m, 1H), 3.17(s, 1H, OH), 2.41-2.14 (m, 2H), 1.55-1.09 (m, 15 H); ^{13}C NMR (75 MHz, CDCl_3): δ 134.9, 117.8, 45.9, 31.6, 31.5, 30.9, 29.8, 29.4, 29.1, 26.1, 22.5, 21.2, 13.9; ESIMS (m/z) 171 $[\text{M}+\text{H}]^+$.

1-Phenylhex-5-en-3-ol,⁹ (3l).

IR (v/cm^{-1}): 3367, 3064, 2931, 1632, 1517, 1432, 1162, 1051; ^1H NMR (300 MHz, CDCl_3): δ 7.51-7.12 (m, 5H), 6.00-5.76 (m, 1H), 5.33-5.08 (m, 2H), 3.87-3.64 (m, 1H), 2.99-2.61 (m, 2H), 2.55-2.16 (m, 3H), 2.01-1.71 (m, 2H); ^{13}C NMR (75 MHz, CDCl_3): δ 141.9, 134.5, 128.3, 128.2, 125.6, 117.9, 69.8, 41.8, 38.2, 31.8; ESIMS (m/z) 177 $[\text{M}+\text{H}]^+$.

1-phenyl-1-methylbut-3-en-1-ol,² (3m).

IR (ν/cm^{-1}): 3440, 3069, 2977, 1641, 1444, 1371, 1068; ^1H NMR (300 MHz, CDCl_3): δ 7.47-7.23 (m, 5H), 5.72-5.62 (m, 1H), 5.18-5.12 (m, 2H), 2.71 (dd, $J_1 = 13.6$ Hz, $J_2 = 6.42$ Hz, 1H), 2.55-2.48 (m, 1H), 1.57 (s, 3H, CH_3); ^{13}C NMR (75 MHz, CDCl_3): δ 147.5, 133.5, 128.0, 126.6, 125.0, 119.3, 73.5, 48.3, 29.7; ESIMS (m/z) 163 $[\text{M}+\text{H}]^+$.

1-(p-Fluorophenyl)-1-methylbut-3-en-ol,² (3n).

IR (ν/cm^{-1}): 3445, 3062, 2971, 1639, 1440, 1372, 1062; ^1H NMR (300 MHz, CDCl_3): δ 7.43-7.38 (m, 2H, ArH), 7.12-6.99 (m, 2H, ArH), 5.66-5.57 (m, 1H), 5.16-5.11 (m, 2H), 2.66 (dd, $J_1 = 13.6$ Hz, $J_2 = 6.42$ Hz, 1H), 2.52-2.45 (m, 1H), 1.54 (s, 3H, CH_3); ^{13}C NMR (75 MHz, CDCl_3): δ 163.2, 159.9, 143.3, 133.3, 126.4, 119.7, 114.6, 73.3, 48.4, 29.9; ESIMS (m/z) 181 $[\text{M}+\text{H}]^+$.

1-(4-MethylCyclohexyl)but-3-en-1-ol,⁵ (3o).

IR (ν/cm^{-1}): 3381, 3065, 2942, 1621, 1510, 1432, 1181, 1056; ^1H NMR (300 MHz, CDCl_3): δ 5.14-5.07 (m, 2H), 2.37-2.34 (m, 2H), 1.38-1.25 (m, 12H); ^{13}C NMR (75 MHz, CDCl_3): δ 133.7, 118.6, 70.2, 48.4, 40.8, 34.7, 32.2, 31.1, 30.2, 22.3, 20.1; ESIMS (m/z) 155 $[\text{M}+\text{H}]^+$.

1-Cyclohexylbut-3-en-1-ol,⁹ (3p).

IR (ν/cm^{-1}): 3362, 3067, 2926, 2856, 1828, 1640, 1452, 1376; ^1H NMR (300 MHz, CDCl_3): δ 5.95-5.81 (m, 1H), 5.16-5.13 (m, 2H), 2.23-2.20 (m, 2H), 1.70-1.38 (m, 10H); ^{13}C NMR (75 MHz, CDCl_3): δ 138.8, 133.7, 122.7, 118.7, 70.9, 46.6, 37.3, 29.7, 25.5, 22.1; ESIMS (m/z) 141 $[\text{M}+\text{H}]^+$.

4-Methyl-oct-1-en-4-ol,⁴ (3q).

IR (ν/cm^{-1}): 3542, 3072, 2940, 1620, 1510, 1431; ^1H NMR (300 MHz, CDCl_3): δ 5.84-5.73 (m, 1H), 5.03-4.97 (m, 2H), 2.33 (t, $J = 7.18$ Hz, 2H), 2.13 (d, $J = 7.18$ Hz, 2H), 2.04 (s, 1H, OH), 1.51-1.43 (m, 4H), 1.41-1.21 (m, 3H), 1.06-0.95 (m, 3H); ^{13}C NMR (75 MHz, CDCl_3): δ 134.2, 118.1, 72.1, 46.2, 43.4, 41.4, 26.5, 25.9, 23.2, 22.2; ESIMS (m/z) 143 $[\text{M}+\text{H}]^+$.

4-Methyl-hept-1-en-4-ol,² (3r).

IR (ν/cm^{-1}): 3542, 3067, 2932, 1508, 1183, 1056; ^1H NMR (300 MHz, CDCl_3): δ 5.87-5.78 (m, 1H), 5.10-5.04 (m, 2H), 2.18 (d, $J = 7.18$ Hz, 2H), 1.41-0.91 (m, 10H); ^{13}C NMR (75 MHz, CDCl_3): δ 134.2, 118.4, 72.2, 46.3, 44.1, 26.6, 17.2, 17.1; ESIMS (m/z) 129 $[\text{M}+\text{H}]^+$.

Benzyl-(1-phenyl-but-3-enyl)-amine¹⁴ (6a).

IR (ν/cm^{-1}): 3460, 3058, 2921, 1489; ^1H NMR (300 MHz, CDCl_3): δ 7.97-7.01 (m, 9H), 5.80-5.60 (m, 1H), 5.18-4.92 (m, 2H), 4.22-4.10 (m, 1H), 3.46 (d, $J = 12$ Hz, 1H), 3.40 (d, $J = 12$ Hz, 1H), 2.60 (s, 1H, NH), 2.40-2.10 (m, 2H); ESIMS (m/z) 238 $[\text{M}+\text{H}]^+$.

Benzyl-[1-(4-nitro-phenyl)-but-3-enyl]-amine¹⁴ (6b).

IR (ν/cm^{-1}): 3458, 3061, 1487; ^1H NMR (300 MHz, CDCl_3): δ 8.13 (d, $J = 10$ Hz, 2H), 7.48 (d, $J = 8.4$ Hz, 2H), 7.26-7.15 (m, 5H), 5.63-5.57 (m, 1H), 5.02-4.97 (m, 2H), 3.74 (t, $J = 6.4$ Hz, 1H), 3.57 (d, $J = 13.2$ Hz, 1H), 3.44 (d, $J = 13.2$ Hz, 1H), 2.34-2.27 (m, 2H), 1.77 (s, 1H, NH); ESIMS (m/z) 283 $[\text{M}+\text{H}]^+$.

Benzyl-[1-(4-methyl-phenyl)-but-3-enyl]-amine¹⁴ (6c).

IR (ν/cm^{-1}): 3448, 3023, 1483; ^1H NMR (300 MHz, CDCl_3): δ 7.56-6.97 (m, 8H), 5.81-5.62 (m, 1H), 5.16-4.90 (m, 2H), 4.18-4.08 (m, 1H), 3.44 (d, $J = 12$ Hz, 1H), 3.38 (d, $J = 12$ Hz, 1H), 2.60 (s, 1H, NH), 2.40-2.10 (m, 2H), 1.94 (s, 3H); ESIMS (m/z) 252 $[\text{M}+\text{H}]^+$.

Benzyl-[1-(2-chloro-phenyl)-but-3-enyl]-amine¹⁴ (6d).

IR (ν/cm^{-1}): 3454, 3055, 2925, 1482; ^1H NMR (300 MHz, CDCl_3): δ 7.50-7.21 (m, 9H), 5.81-5.60 (m, 1H), 5.10-4.92 (m, 2H), 4.35 (t, $J = 5\text{ Hz}$, 1H), 3.70 (d, $J = 10\text{ Hz}$, 1H), 3.50 (d, $J = 10\text{ Hz}$, 1H), 2.61-2.32 (m, 2H); ESIMS (m/z) 272 $[\text{M}+\text{H}]^+$.

Benzyl-(1-phenethyl-but-3-enyl)-amine¹⁴ (6e).

IR (ν/cm^{-1}): 3452, 3050, 2925, 1483; ^1H NMR (300 MHz, CDCl_3): δ 7.77-7.15 (m, 10H), 5.85-5.71 (m, 1H), 5.14-5.08 (m, 2H), 3.84-3.77 (m, 2H), 2.87-2.17 (m, 5H), 1.80-1.75 (m, 2H); ESIMS (m/z) 266 $[\text{M}+\text{H}]^+$.

Benzyl-[1-(2-Chloro-quinoline-3-yl)-but-3-enyl]-amine¹⁴ (6f).

IR (ν/cm^{-1}): 3462, 3056, 2926, 1487; ^1H NMR (300 MHz, CDCl_3): δ 8.55 (s, 1H), 8.06 (d, $J = 8.4\text{ Hz}$, 1H), 7.90 (d, $J = 8\text{ Hz}$, 1H), 7.73-7.27 (m, 7H), 5.86-5.77 (m, 1H), 5.16-5.12 (m, 2H), 3.77 (d, $J = 13.2\text{ Hz}$, 1H), 3.65 (d, $J = 13.2\text{ Hz}$, 1H), 2.39 (s, 1H, NH), 1.43-1.24 (m, 3H); ESIMS (m/z) 323 $[\text{M}+\text{H}]^+$.

Benzyl-[1-(2-nitro-phenyl)-but-3-enyl]-amine¹⁴ (6g).

IR (ν/cm^{-1}): 3459, 3053, 2928, 1487; ^1H NMR (300 MHz, CDCl_3): 7.85-7.17 (m, 9H), 5.78-5.60 (m, 1H), 5.17-4.92 (m, 2H), 3.42 (dd, $J_1 = 4$ Hz, $J_2 = 12$ Hz, 2H), 2.60-2.45 (m, 1H), 2.32-2.20 (m, 2H); ESIMS (m/z) 283 $[\text{M}+\text{H}]^+$.

Benzyl-[1-(2-chloro-phenyl)-but-3-enyl]-amine¹⁴ (6h).

IR (ν/cm^{-1}): 3454, 3055, 2925, 1482; ^1H NMR (300 MHz, CDCl_3): 7.50-7.21 (m, 9H), 5.81-5.60 (m, 1H), 5.10-4.92 (m, 2H), 4.35 (t, $J = 5$ Hz, 1H), 3.70 (d, $J = 10$ Hz, 1H), 3.50 (d, $J = 10$ Hz, 1H), 2.61-2.32 (m, 2H).

(1-Allyl-octyl)-benzyl-amine¹⁴ (6i).

IR (ν/cm^{-1}): 3450, 3059, 2924, 1450; ^1H NMR (300 MHz, CDCl_3): 7.61-7.26 (m, 5H), 5.84-5.75 (m, 1H), 5.17-5.11 (m, 2H), 3.93-3.83 (m, 1H), 2.38-2.31 (m, 2H), 2.28 (s, 3H), 1.76 (s, 1H, NH), 1.39-1.25 (m, 17H); ESIMS (m/z) 260 $[\text{M}+\text{H}]^+$.

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Entry **3a**: 1-Phenyl-but-3-en-1-ol

Entry **3b**: 1-(4-Chlorophenyl)but3-en-1-ol

Entry 3c: 1-(4-Methoxyphenyl)but-3-en-1-ol

Entry **3d**: 1-(2-Methoxyphenyl)but-3-en-1-ol

Entry **3e**: 1-(4-Nitrophenyl)but-3-en-1-ol

Entry 3g: 1-(4-Methylphenyl)but-3-en-1-ol

Entry *3h*; 1-(3-Chlorophenyl)but-3-en-1-ol

Entry 3i; . 1-(2-Chlorophenyl)but-3-en-1-ol

Entry 3j; 1-(4-Bromophenyl)but-3-en-1-ol

Entry **3I**, **1-Phenylhex-5-en-3-ol**

Entry 3*m*: **1-phenyl-1-methylbut-3-en-1-ol**

Entry 3n: 1-(p-Fluorophenyl)-1-methylbut-3-en-ol

Entry *3o*: 1-(4-MethylCyclohexyl)but-3-en-1-ol

Entry **3p**: 1-Cyclohexylbut-3-en-1-ol

Entry *3q*; **4-Methyl-oct-1-en-4-ol**

Entry 3r: **4-Methyl-hept-1-en-4-ol**

Entry 6a: **Benzyl-(1-phenyl-but-3-enyl)-amine**

Entry 6b: **Benzyl-[1-(4-methoxy-phenyl)-but-3-enyl]-amine**

Entry 6d: **Benzyl-[1-(2-chloro-phenyl)-but-3-enyl]-amine**

Entry 6f: Benzyl-[1-(2-Chloro-quinoline-3-yl)-but-3-enyl]-amine