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Volume 55, 2002
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Dr Alison Green
*Australian Journal of Chemistry –
an International Journal for Chemical Science*



CSIRO PUBLISHING
PO Box 1139 (150 Oxford St)
Collingwood, Vic. 3066, Australia

Telephone: +61 3 9662 7630
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Supporting Information

4-Diethylamino-5-(tetrahydropyran-2-yloxy)pent-3-en-2-one (**4b**)

^1H NMR (200MHz, CDCl_3) : δ 5.10 (d, 1H, $J = 11.3\text{Hz}$), 4.94 (s, 1H), 4.67 (m, 1H), 4.58 (d, 1H, $J = 11.3\text{Hz}$), 3.75 (m, 1H), 3.40 (m, 1H), 3.21 (quartet, 4H, $J = 7.4\text{Hz}$), 1.93 (s, 3H), 1.72 - 1.28 (m, 6H), 1.05 (t, 6H, $J = 7.0\text{Hz}$)

^{13}C NMR (200MHz, CDCl_3) : δ 194.1, 157.4, 99.5, 95.2, 62.6, 60.7, 43.8, 31.8, 30.5, 25.2, 19.6, 12.7

MS m/z (relative intensity) 255 (M^+ 7.7), 226 (3.8), 212 (3.8), 196 (10.8), 172 (10.8), 171 (100), 170 (57.7), 157 (2.3), 156 (27.7), 155 (26.9), 154 (41.5), 153 (12.3), 152 (2.3), 143 (7.7), 142 (99.0), 140 (16.9), 139 (3.8), 138 (32.3), 136 (9.2), 129 (7.7), 128 (90.8), 127 (3.1), 126 (29.2), 125 (4.6), 124 (13.1), 114 (4.6), 113 (9.2), 112 (99.0), 111 (9.2), 110 (36.9), 98 (12.3), 97 (16.9), 96 (15.4), 86 (6.2), 85 (53.8), 84 (28.5), 83 (15.4), 82 (13.8), 81 (4.6), 80 (2.3), 74 (4.6), 72 (23.8), 71 (3.8), 70 (18.5), 69 (6.2), 68 (10.8), 67 (15.4), 58 (6.2), 57 (12.3), 56 (13.8), 55 (13.8), 54 (6.9), 53 (3.1), 44 (6.9), 43 (32.3), 42 (16.2), 41 (19.2)

N,N-Diethyl-5-methylfuran-3-amine (**5b**)

IR (neat) 3142 (w), 2972 (s), 2933 (s), 2872 (m), 2825 (m), 1755 (m), 1622 (s), 1553 (m), 1447 (s), 1376 (s), 1283 (m), 1183 (m) and 1111 cm^{-1} (s)

^1H NMR (200MHz, CDCl_3) : δ 6.75 (s, 1H), 5.83 (s, 1H), 3.03 (quartet, 4H, $J = 7.2\text{Hz}$), 2.22 (s, 3H), 1.08 (t, 6H, $J = 7.2\text{Hz}$)

^{13}C NMR (200MHz, CDCl_3) : δ 151.9, 139.5, 123.5, 100.8, 45.1, 14.0, 11.7

MS m/z (relative intensity) 154 (7.7), 153 (M^+ 72.3), 139 (9.2), 138 (100), 124 (5.4), 111 (3.8), 110 (41.5), 109 (7.7), 108 (6.9), 96 (3.8), 95 (2.3), 83 (4.6), 82 (6.9), 81

(3.8), 80 (5.4), 68 (7.7), 67 (4.6), 66 (4.6), 56 (4.6), 55 (3.1), 54 (2.3), 53 (3.8), 43 (6.9), 41 (4.6).; HRMS calcd for C₉H₁₆NO 154.1232, found 154.1229.

4-(Diisopropylamino)-5-(tetrahydropyran-2-yloxy)pent-3-en-2-one (**4c**)

¹H NMR (200MHz, CDCl₃) : δ 5.30 (d, 1H, J = 11.5Hz), 5.20 (s, 1H), 4.74 (m, 1H), 4.61 (d, 1H, J = 11.5Hz), 3.95 (septet, 2H, J = 6.9Hz), 3.81 (m, 1H), 3.49 (m, 1H), 2.01 (s, 3H), 1.82 – 1.35 (m, 6H), 1.25 (d, 6H, J = 7.0Hz), 1.23 (d, 6H, 7.0Hz)

¹³C NMR (200MHz, CDCl₃) : δ 193.7, 156.7, 99.7, 98.3, 63.0, 61.7, 48.1, 32.3, 30.8, 25.4, 20.4, 19.8.

MS *m/z* (relative intensity) 283 (M⁺ 2.8), 254 (1.0), 241 (2.3), 240 (15.9), 244 (1.0), 210 (1.0), 200 (3.3), 199 (27.6), 198 (5.6), 184 (15.9), 183 (3.7), 182 (9.3), 181 (3.3), 170 (3.3), 168 (4.7), 166 (4.2), 157 (9.8), 156 (100), 142 (4.2), 141 (2.3), 140 (21.0), 139 (1.9), 138 (7.9), 126 (7.5), 125 (2.3), 124 (9.3), 115 (2.8), 114 (40.2), 112 (2.3), 110 (2.3), 100 (5.1), 99 (2.8), 98 (25.7), 97 (8.4), 96 (9.3), 86 (4.2), 85 (53.3), 84 (25.2), 83 (4.7), 82 (4.7), 81 (2.3), 72 (9.8), 71 (3.7), 70 (3.7), 68 (4.2), 67 (8.4), 58 (3.7), 57 (8.4), 56 (2.8), 55 (8.4), 54 (2.3), 44 (3.7), 43 (30.8), 42 (8.4), 41 (15.9).

N,N-Diisopropyl-5-methylfuran-3-amine (**5c**)

IR (neat) 2971 (s), 2932 (m), 2873 (m), 1750 (w), 1619 (s), 1546 (m), 1513 (w), 1456 (m), 1381 (m), 1364 (m), 1328 (w), 1305 (m), 1271 (m), 1181 (m) and 1115 cm⁻¹(s)

¹H NMR (200MHz, CDCl₃) : δ 6.88 (s, 1H), 5.88 (s, 1H), 3.40 (septet, 2H, J = 6.6Hz), 2.22 (s, 3H), 1.11 (d, 12H, J = 6.8Hz)

¹³C NMR (200MHz, CDCl₃) : δ 150.8, 134.9, 129.0, 104.5, 48.6, 21.1, 14.0

MS *m/z* (relative intensity) 182 (7.7), 181 (M⁺ 45.4), 167 (10.0), 166 (61.5), 139 (1.5), 138 (9.2), 125 (12.3), 124 (100), 123 (7.7), 122 (10.8), 110 (2.3), 109 (2.3), 108

(7.7), 106 (3.8), 97 (2.3), 96 (10.0), 95 (2.3), 94 (4.6), 84 (2.3), 83 (3.8), 82 (10.8), 81 (6.9), 80 (4.6), 79 (4.6), 69 (1.5), 68 (8.4), 67 (2.3), 66 (4.6), 55 (3.8), 54 (2.3), 53 (5.4), 44 (3.8), 43 (13.1), 42 (5.4).; HRMS calcd for C₁₁H₂₀NO 182.1545, found 182.1541.

4-(Pyrrolidin-1-yl)-5-(tetrahydropyran-2-yloxy)pent-3-en-2-one (**4d**)

¹H NMR (200MHz, CDCl₃) : δ 5.14 (d, 1H, J = 10.9Hz), 4.93 (s, 1H), 4.76 (m, 1H), 4.75 (d, 1H, J = 10.9Hz), 3.89 (m, 1H), 3.58 (m, 2H), 3.53 (m, 1H), 3.18 (m, 2H), 2.04 (s, 3H), 1.90 (m, 4H), 1.80 – 1.39 (m, 6H).

¹³C NMR (200MHz, CDCl₃) : δ 194.5, 156.8, 100.1, 96.5, 63.1, 62.8, 48.2, 31.9, 30.8, 25.6, 24.9, 20.0

MS *m/z* (relative intensity) 254 (2.3), 253 (M⁺ 15.4), 224 (6.2), 210 (2.3), 194 (10.0), 170 (10.0), 169 (100), 168 (97.7), 154 (30), 153 (33.8), 152 (45.4), 151 (50.0), 150 (30.8), 141 (6.2), 140 (70.0), 138 (14.6), 136 (17.7), 134 (6.2), 127 (6.2), 126 (61.5), 124 (12.3), 123 (16.9), 122 (6.2), 112 (6.2), 111 (33.1), 110 (70.8), 109 (6.2), 108 (6.2), 85 (16.9), 84 (16.2), 83 (19.2), 82 (6.2), 81 (6.9), 80 (6.2), 72 (5.4), 71 (7.7), 70 (53.8), 69 (5.4), 68 (10.8), 67 (10.8), 57 (6.9), 56 (3.8), 55 (16.9), 54 (6.9), 53 (4.6), 43 (23.8), 42 (5.4), 41 (17.7)

1-(5-Methylfuran-3-yl)pyrrolidine (**5d**)

IR (neat) 3139 (w), 3106 (w), 2967 (s), 2919 (s), 2875 (s), 2814 (s), 1625 (s), 1557 (m), 1459 (m), 1402 (s), 1358 (m), 1327 (m), 1168 (m), 1152 (m) and 1106 cm⁻¹(s)

¹H NMR (200MHz, CDCl₃) : δ 6.72 (s, 1H), 5.80 (s, 1H), 3.01 (m, 4H), 2.22 (s, 3H), 1.93 (m, 4H)

¹³C NMR (200MHz, CDCl₃) : δ 152.0, 139.7, 121.6, 100.6, 50.5, 24.9, 14.0

MS *m/z* (relative intensity) 152 (10.8), 151 (M^+ 100), 150 (89.2), 149 (3.1), 148 (3.1), 136 (7.7), 123 (10.8), 122 (20.0), 120 (2.3), 110 (2.3), 109 (6.2), 108 (33.8), 106 (2.3), 96 (4.6), 95 (16.2), 94 (13.1), 93 (2.3), 82 (2.3), 81 (8.5), 80 (10.8), 79 (2.3), 70 (3.1), 68 (9.2), 67 (7.7), 66 (4.6), 65 (2.3), 55 (4.6), 54 (3.1), 53 (8.5), 52 (3.1), 51 (3.1), 43 (6.2), 41 (12.3).; HRMS calcd for $C_9H_{14}NO$ 152.1075, found 152.1070.

N,N-Dibenzyl-5-methylfuran-3-amine (**5e**)

IR (neat) 3057 (m), 3026 (m), 2937 (m), 2920 (m), 2882 (m), 2844 (m), 1623 (s), 1493 (s), 1454 (s), 1395 (m), 1371 (m), 1352 (m), 1224 (m), 1161 (m), 1134 (m), 1101 (m) and 1080 cm^{-1} (m).

1H NMR (200MHz, $CDCl_3$) : δ 7.50 – 7.10, (m, 10H), 6.68 (s, 1H), 5.87 (s, 1H), 4.20 (s, 4H), 2.21, (s, 3H).

^{13}C NMR (200MHz, $CDCl_3$) :

δ 151.8, 140.9, 138.9, 128.6, 127.9, 127.2, 123.5, 100.8, 56.1, 14.1

MS *m/z* (relative intensity) 278 (15.4), 277 (M^+ 71.5), 276 (20.0), 186 (50.8), 185 (2.3), 184 (3.8), 170 (3.8), 168 (1.5), 167 (6.9), 159 (5.4), 158 (33.8), 157 (3.1), 156 (3.1), 144 (14.6), 143 (9.2), 142 (2.3), 130 (2.3), 129 (3.8), 128 (2.3), 117 (3.1), 116 (3.1), 115 (4.6), 108 (3.1), 104 (2.3), 92 (8.5), 91 (100), 90 (3.8), 89 (5.4), 77 (2.3), 65 (14.6), 53 (1.5), 51 (1.5), 43 (5.4).; HRMS calcd for $C_{19}H_{20}NO$ 278.1545, found 278.1538.

4,4'-Ethylenediiminobis[5-(tetrahydropyran-2-yloxy)pent-3-en-2-one] (**4f**)

^1H NMR (200MHz, CDCl_3) : δ 5.12 (s, 2H), 4.58 (m, 2H), 4.23 (d, 2H, $J = 13.2\text{Hz}$), 3.92 (d, 2H, $J = 13.2\text{Hz}$), 3.75 (m, 2H), 3.47 (m, 2H), 3.41 (m, 4H), 1.97 (s, 6H), 1.85–1.35 (m, 12H)

^{13}C NMR (200MHz, CDCl_3):

δ 196.9, 160.1, 97.9, 95.2, 65.0, 62.3, 43.7, 30.3, 29.3, 25.2, 19.2

MS m/z (relative intensity) 424 (M^+ 1), 381 (1.5), 340 (2.3), 323 (2.3), 322 (3.5), 267 (2.3), 257 (1.5), 256 (11.5), 255 (1.5), 240 (2.3), 239 (6.9), 238 (3.8), 226 (4.6), 225 (33.1), 221 (2.3), 220 (2.3), 213 (6.9), 212 (5.4), 209 (6.2), 207 (10.8), 201 (2.3), 200 (16.9), 197 (3.8), 196 (1.5), 195 (6.2), 183 (2.3), 182 (4.6), 181 (3.1), 179 (1.5), 165 (3.1), 152 (2.3), 151 (1.5), 142 (15.4), 141 (59.2), 140 (3.8), 130 (3.1), 129 (41.5), 128 (79.2), 127 (4.6), 126 (13.1), 125 (42.3), 124 (4.6), 123 (8.5), 117 (3.8), 116 (66.9), 115 (4.6), 114 (3.8), 113 (4.6), 112 (9.2), 111 (12.3), 110 (12.3), 100 (11.5), 99 (3.8), 98 (16.2), 97 (3.8), 96 (6.2), 86 (12.3), 85 (100), 84 (9.2), 83 (6.9), 82 (16.9), 71 (3.1), 70 (4.6), 69 (3.1), 68 (6.2), 67 (20.0), 57 (17.7), 56 (3.8), 55 (11.5), 43 (23.1), 41 (14.6)

N,N'-Bis(5-methylfuran-3-yl)ethylenediamine (**5f**)

MS m/z (relative intensity) 221 (13.1), 220 (M^+ 77.7), 191 (10.7), 190 (56.9), 182 (2.3), 178 (3.4), 177 (17.7), 176 (3.8), 175 (6.2), 174 (10.7), 172 (3.1), 162 (6.9), 161 (3.1), 160 (3.8), 149 (9.2), 148 (60.0), 147 (100), 146 (7.7), 134 (5.4), 133 (5.4), 132 (6.2), 124 (3.1), 120 (5.4), 119 (5.4), 118 (8.5), 117 (3.1), 111 (13.1), 110 (25.4), 109 (6.2), 108 (7.7), 106 (3.1), 105 (2.3), 103 (2.3), 98 (3.1), 96 (3.1), 91 (5.4), 89 (4.6), 85 (2.3), 83 (3.8), 81 (3.8), 80 (4.6), 79 (3.8), 78 (2.3), 77 (4.6), 69 (2.3), 68 (5.4), 67 (2.3), 66 (4.6), 65 (4.6), 63 (3.1), 53 (7.7), 52 (2.1), 51 (3.8), 44 (14.6), 43 (20.8), 42 (3.8), 41 (5.4)

N,N'-Ethylenebis[*N*-(5-methylfuran-3-yl)acetamide] (**6f**)

IR (neat) 3414 (w), 3167 (w), 3127 (s), 3104 (s), 2985 (m), 2947 (s), 2915 (s), 2853 (w), 1667 (s), 1613 (s), 1556 (m), 1431 (s), 1397 (s), 1296 (s), 1263 (m), 1237 (s), 1203 (m), 1186 (m) and 1128 cm⁻¹(s).

¹H NMR (200MHz, CDCl₃) : δ 7.41 (s, 2H), 5.98 (s, 2H), 3.69 (s, 4H), 2.28 (s, 6H), 1.91 (s, 6H)

¹³C NMR (200MHz, CDCl₃) : δ 171.7, 153.0, 137.5, 130.3, 105.8, 46.7, 22.5, 14.0

MS *m/z* (relative intensity) 305 (1.5), 304 (M⁺ 10.0), 262 (3.1), 246 (1.5), 245 (13.8), 219 (3.1), 166 (15.4), 165 (40.0), 153 (2.3), 140 (3.1), 139 (33.8), 124 (12.3), 123 (46.9), 122 (3.8), 111 (10.8), 110 (100), 109 (8.5), 108 (10.8), 98 (1.5), 97 (22.3), 82 (3.1), 81 (2.3), 80 (9.2), 68 (3.1), 67 (2.3), 66 (2.3), 55 (2.3), 53 (2.3), 43 (25.4), 41 (3.1).; HRMS calcd for C₁₆H₂₀N₂O₄Na 327.1321, found 327.1317.

4-*n*-Butylamino-5-(tetrahydropyran-2-yloxy)pent-3-en-2-one (**4g**)

¹H NMR (200MHz, CDCl₃) : δ 5.15 (s, 1H), 4.65 (m, 1H), 4.30 (d, 1H, J = 13.4Hz), 4.00 (d, 1H, J = 13.4Hz), 3.80 (m, 1H), 3.52 (m, 1H), 3.25 (AB quartet, 2H, J = 6.4Hz), 2.05 (s, 1H), 1.87-1.49 (m, 8H), 1.40 (sextet, 2H, J = 7.3Hz), 0.91 (t, 3H, J = 7.1Hz)

¹³C NMR (200MHz, CDCl₃) :

δ 196.4, 161.1, 98.1, 93.6, 64.9, 62.3, 42.7, 32.5, 30.5, 29.3, 25.5, 20.1, 19.2, 13.9

MS *m/z* (relative intensity) 255 (M⁺ 5.7), 212 (2.5), 198 (2.0), 182 (9.3), 172 (10.6), 171 (100), 170 (39.0), 156 (29.3), 155 (15.4), 154 (26.0), 142 (27.6), 141 (6.5), 140 (77.2), 138 (7.7), 129 (7.3), 128 (51.2), 126 (12.2), 124 (14.6), 115 (4.9), 114 (52.0), 113 (91.9), 112 (30.1), 111 (9.8), 110 (23.6), 100 (8.9), 99 (9.8), 98 (88.6), 97 (20.3),

96, (12.2), 86 (8.1), 85 (81.3), 84 (69.1), 83 (8.9), 82 (10.6), 81 (4.1), 80 (2.8), 72 (8.1), 71 (11.4), 70 (50.0), 69 (7.0), 68 (10.6), 67 (22.4), 58 (13.0), 57 (33.0), 56 (7.3), 55 (17.1), 54 (5.7), 44 (4.1), 43 (38.2), 42 (9.8), 41 (31.9)

N-(*n*-Butyl)-5-methylfuran-3-amine (**5g**)

MS *m/z* (relative intensity) 154 (4.8), 153 (M^+ 43.7), 138 (4.0), 124 (4.8), 111(42.1), 110 (100), 97 (17.5), 96 (7.1), 84 (3.2), 83 (7.9), 82 (7.1), 81 (3.2), 80 (5.6), 70 (3.2), 69 (3.2), 68 (14.3), 67 (4.8), 66 (3.2), 55 (6.3), 54 (2.4), 53 (4.8), 43 (11.1), 42 (3.2), 41 (11.1)

N-(*n*-Butyl)-*N*-(5-methylfuran-3-yl)acetamide (**6g**)

IR (neat) 3322 (w), 3109 (w), 2959 (s), 2932 (s), 2873 (m), 1722 (w), 1666 (s), 1615 (s), 1548 (w), 1408 (s), 1367 (s), 1302 (s), 1228 (s), 1180 (w) and 1133 cm^{-1} (m).

^1H NMR (200MHz, CDCl_3) : δ 7.17 (s, 1H), 5.85 (s, 1H), 3.49 (t, 2H, $J = 7.7\text{Hz}$), 2.23 (s, 3H), 1.89 (s, 3H), 1.40 (m, 2H,), 1.25 (sextet, 2H, $J = 7.3\text{Hz}$), 0.83 (t, 3H, $J = 7.3\text{Hz}$)

^{13}C NMR (200MHz, CDCl_3) : δ 171.0, 153.0, 136.6, 130.4, 106.0, 48.4, 30.10, 22.5, 20.0, 13.92, 13.84.

MS *m/z* (relative intensity) 196 (4.0), 195 (M^+ 33.3), 180 (6.3), 152 (61.1), 151 (11.1), 139 (4.8), 138 (7.9), 136 (5.5), 125 (3.2), 124 (20.6), 123 (4.8), 111 (44.4), 110 (100), 98 (5.6), 97 (53.2), 83 (4.0), 82 (4.0), 80 (6.3), 68 (6.3), 55 (3.2), 54 (4.0), 43 (23.0).;

HRMS calcd for $\text{C}_{11}\text{H}_{18}\text{NO}_2$ 196.1337, found 196.1334.

4-Cyclohexylamino-5-(tetrahydropyran-2-yloxy)pent-3-en-2-one(**4h**)

^1H NMR (200MHz, CDCl_3) : δ 5.15 (s, 1H), 4.68 (m, 1H), 4.35 (d, 1H, $J = 13.2\text{Hz}$), 4.02 (d, 1H, $J = 13.2\text{Hz}$), 3.85 (m, 1H), 3.55 (m, 1H), 3.45 (m, 1H), 2.04 (s, 1H), 1.95 – 1.15 (m, 16H)

^{13}C NMR (200MHz, CDCl_3) : δ 196.1, 159.9, 98.1, 93.4, 64.8, 62.2, 51.6, 34.4, 34.3, 30.5, 29.3, 25.4, 24.6, 19.1

MS m/z (relative intensity) 282 (1.0), 281 (M^+ 5.4), 238 (1.5), 208 (3.8), 198 (9.2), 197 (56.9), 196 (16.2), 182 (16.2), 181 (48.5), 180 (12.3), 179 (8.5), 168 (6.9), 167 (3.8), 166 (28.5), 164 (6.9), 162 (3.1), 154 (12.3), 152 (1.5), 150 (2.3), 139 (6.2), 138 (50.8), 137 (6.9), 136 (45.4), 126 (6.2), 124 (13.8), 123 (2.3), 122 (3.1), 116 (9.5), 115 (14.6), 114 (77.7), 110 (4.6), 108 (4.6), 102 (2.3), 101 (6.2), 100 (100), 99 (6.2), 98 (26.9), 97 (12.3), 96 (6.2), 95 (1.5), 94 (6.2), 86 (3.8), 85 (46.2), 84 (43.1), 83 (14.6), 82 (8.5), 81 (7.7), 80 (4.6), 79 (3.8), 74 (3.1), 72 (3.8), 71 (6.2), 70 (4.6), 68 (5.4), 67 (18.5), 58 (18.5), 57 (12.3), 56 (6.2), 55 (29.2), 54 (4.6), 53 (3.8), 43 (20.0), 42 (3.8), 41 (21.5)

N-Cyclohexyl-5-methylfuran-3-amine (**5h**)

MS m/z (relative intensity) 180 (11.5), 179 (M^+ 100), 178 (5.4), 164 (6.9), 151 (1.5), 150 (15.4), 138 (4.6), 137 (10.0), 136 (56.9), 134 (3.1), 124 (9.2), 123 (6.9), 122 (5.4), 120 (2.3), 118 (3.1), 117 (3.1), 110 (15.4), 109 (1.5), 108 (21.5), 107 (1.5), 106 (3.1), 98 (45.4), 97 (69.2), 96 (4.6), 95 (2.3), 94 (19.2), 93 (12.3), 91 (2.3), 83 (3.1), 82 (4.6), 81 (4.6), 80 (11.5), 79 (3.1), 70 (3.1), 69 (6.9), 68 (15.4), 67 (5.4), 66 (3.1), 56 (2.3), 55 (13.1), 54 (3.8), 53 (6.2), 43 (13.1), 41 (14.6)

N-Cyclohexyl-*N*-(5-methylfuran-2-yl)acetamide (**6h**)

IR (neat) 3105 (w), 2930 (s), 2856 (s), 1726 (w), 1660 (s), 1614 (s), 1544 (m), 1451 (m), 1399 (s), 1375 (s), 1345 (m), 1313 (s), 1283 (m), 1245 (m) and 1132 cm⁻¹(m).

¹H NMR (200MHz, CDCl₃) : δ 7.10 (s, 1H), 5.78 (s, 1H), 4.43 (tt, 1H, J = 11.9Hz, J = 3.8Hz), 2.26 (s, 3H), 1.85 (s, 3H), 1.80 – 0.75 (m, 10H)

¹³C NMR (200MHz, CDCl₃) : δ 170.9, 152.7, 138.1, 126.6, 108.1, 52.9, 31.3, 25.7, 25.5, 23.1, 13.9

MS *m/z* (relative intensity) 222 (3.1), 221 (M⁺ 20.8), 206 (2.3), 179 (4.6), 178 (20.0), 164 (1.5), 150 (3.8), 141 (4.6), 140 (55.4), 139 (22.3), 137 (3.1), 136 (16.9), 134 (2.3), 124 (10.0), 123 (2.3), 122 (1.5), 110 (2.3), 108 (6.9), 98 (23.8), 97 (100), 96 (2.3), 94 (4.6), 93 (2.3), 83 (2.3), 82 (1.5), 81 (3.1), 80 (4.6), 79 (2.3), 69 (3.1), 68 (4.6), 67 (3.8), 66 (1.5), 55 (10.0), 54 (2.3), 53 (4.6), 43 (16.9), 41 (8.5).; HRMS calcd for C₁₃H₁₉NO₂Na 244.1314, found 244.1311.

5-Morpholino-6-(tetrahydropyran-2-yloxy)hex-4-en-3-one (**4i**).

¹H NMR (200MHz, CDCl₃) : δ 5.33 (d, 1H, J = 12.1Hz), 5.19 (s, 1H), 4.71 (m, 1H), 4.66 (d, 1H, J = 12.1Hz), 3.85 (m, 1H), 3.73 (t, 4H, J = 4.9Hz), 3.50 (m, 1H), 3.34 (m, 4H), 2.35 (quartet, 2H, 7.3Hz), 1.90 – 1.35 (m, 6H), 1.05 (t, 3H, 7.3Hz)

¹³C NMR (200MHz, CDCl₃) : δ 199.2, 158.5, 100.1, 97.8, 66.6, 63.5, 61.1, 47.0, 37.8, 31.0, 25.5, 20.2, 9.5

MS *m/z* (relative intensity) 283 (M⁺ 2.3), 254 (2.3), 224 (3.1), 200 (9.2), 199 (82.3), 198 (36.2), 183 (8.5), 182 (15.4), 181 (6.9), 171 (9.2), 170 (100), 168 (5.4), 166 (5.4), 154 (8.5), 152 (12.3), 143 (8.5), 142 (90.8), 140 (6.2), 127 (12.3), 126 (25.4), 124 (8.5), 123 (4.6), 114 (8.5), 112 (10.0), 98 (2.3), 97 (3.8), 96 (4.6), 95 (3.8), 94 (3.8), 86 (11.5), 85 (36.2), 84 (7.7), 83 (5.4), 82 (3.8), 70 (3.8), 69 (3.1), 68 (3.8), 67 (14.6), 57 (29.2), 56 (6.9), 55 (13.1), 54 (3.8), 43 (8.5), 41 (13.8)

4-(5-Ethylfuran-3-yl)morpholine (**5i**).

IR (neat) 3136 (w), 2968 (s), 2855 (s), 2821 (m), 1703 (w), 1618 (s), 1551 (w), 1451 (m), 1399 (m), 1378 (m), 1359 (w), 1257 (s), 1161 (m) and 1117 cm^{-1} (s).

^1H NMR (200MHz, CDCl_3) : δ 6.83 (s, 1H), 5.86 (s, 1H), 3.80 (m, 4H), 2.89 (m, 4H), 2.56 (quartet, 2H, $J = 7.5\text{Hz}$), 1.19 (t, 3H, $J = 7.5\text{Hz}$)

^{13}C NMR (200MHz, CDCl_3) : δ 158.1, 141.5, 123.8, 98.7, 66.7, 50.8, 21.8, 12.1

MS m/z (relative intensity) 182 (12.3), 181 (M^+ 97.7), 180 (4.2), 166 (19.2), 152 (13.1), 150 (9.2), 138 (3.8), 136 (3.1), 125 (6.2), 124 (34.6), 123 (100), 122 (20.0), 109 (6.2), 108 (52.3), 96 (4.6), 95 (7.7), 94 (14.6), 81 (3.8), 80 (9.2), 79 (3.1), 67 (6.2), 66 (4.6), 65 (4.6), 57 (3.8), 55 (3.1), 54 (3.8), 53 (7.7), 42 (2.3), 41 (7.7).;

HRMS calcd for $\text{C}_{10}\text{H}_{16}\text{NO}_2$ 182.1181, found 182.1176.

5-Diethylamino-6-(tetrahydro-2-yloxy)hex-4-ene-3-one (**4j**)

^1H NMR (200MHz, CDCl_3) : δ 5.31 (d, 1H, $J = 11.2\text{Hz}$), 5.07 (s, 1H), 4.81 (m, 1H), 4.68 (d, 1H, $J = 11.2\text{Hz}$), 3.85 (m, 1H), 3.55 (m, 1H), 3.34 (quartet, 4H, $J = 7.3\text{Hz}$), 2.34 (quartet, 2H, $J = 7.3\text{Hz}$), 1.90 – 1.40 (m, 6H), 1.18 (t, 6H, 7.3Hz), 1.07 (t, 3H, $J = 7.3\text{Hz}$)

^{13}C NMR (200MHz, CDCl_3) : δ 198.2, 157.5, 100.2, 95.1, 63.3, 61.5, 44.1, 37.8, 30.9, 25.6, 20.1, 13.1, 10.0

MS m/z (relative intensity) 269 (M^+ 3.1), 240 (2.3), 210 (4.6), 186 (6.2), 185 (56.2), 184 (31.5), 170 (3.8), 169 (10.0), 168 (16.2), 167 (6.9), 157 (9.2), 156 (100), 154 (5.4), 152 (10.0), 150 (2.3), 140 (20.0), 138 (11.5), 129 (2.9), 128 (83.1), 126 (6.9), 124 (6.9), 113 (6.9), 112 (31.5), 111 (6.9), 110 (13.8), 100 (9.2), 98 (6.9), 97 (3.1), 96 (6.9), 86 (3.8), 85 (32.3), 84 (7.7), 83 (5.4), 82 (5.4), 72 (11.5), 70 (7.7), 69 (2.3), 68

(5.4), 67 (10.0), 58 (3.8), 57 (26.2), 56 (8.5), 55 (8.5), 54 (3.8), 44 (3.1), 43 (6.2), 42 (8.5), 41 (11.5)

N,N,5-Triethylfuran-3-amine (**5j**)

IR (neat) 3142 (w), 2971 (s), 2935 (s), 2874 (s), 1755 (m), 1702 (w), 1618 (s), 1550 (m), 1519 (w), 1462 (s), 1402 (s), 1374 (s), 1277 (m), 1179 (s) and 1113 cm^{-1} (s).

^1H NMR (200MHz, CDCl_3) : δ 6.76 (s, 1H), 5.83 (s, 1H), 3.03 (quartet, 4H, $J = 7.1\text{Hz}$), 2.57 (quartet, 2H, $J = 7.5\text{Hz}$), 1.21 (t, 3H, 7.5Hz), 1.08 (t, 6H, $J = 7.1\text{Hz}$)

^{13}C NMR (200MHz, CDCl_3) : δ 157.6, 138.3, 123.4, 99.1, 45.1, 21.9, 12.1, 11.7

MS m/z (relative intensity) 168 (6.9), 167 (M^+ 52.3), 153 (12.3), 152 (100), 138 (5.4), 125 (3.1), 124 (31.5), 123 (3.8), 122 (3.8), 110 (2.3), 109 (2.3), 108 (6.9), 96 (4.6), 95 (5.4), 94 (3.8), 82 (6.2), 81 (4.6), 80 (6.2), 79 (2.3), 68 (2.3), 67 (4.6), 66 (2.3), 57 (4.6), 56 (5.4), 55 (3.8), 54 (2.3), 53 (5.4), 43 (2.3), 41 (4.6).; HRMS calcd for $\text{C}_{10}\text{H}_{18}\text{NO}$ 168.1388, found 168.1385.

5-(*n*-Butylamino)-6-(tetrahydropyran-2-yloxy)hex-4-en-3-one (**4k**)

^1H NMR (200MHz, CDCl_3) : δ 5.16 (s, 1H), 4.65 (m, 1H), 4.31 (d, 1H, $J = 13.4\text{Hz}$), 4.01 (d, 1H, $J = 13.4\text{Hz}$), 3.80 (m, 1H), 3.50 (m, 1H), 3.24 (quartet, 2H, $J = 6.6\text{Hz}$), 2.28 (quartet, 2H, $J = 7.5\text{Hz}$), 1.90 – 1.50 (m, 8H), 1.40 (septet, 2H, $J = 8.1\text{Hz}$), 1.07 (t, 3H, $J = 7.5\text{Hz}$), 0.90 (t, 3H, 7.3Hz)

^{13}C NMR (200MHz, CDCl_3) : δ 200.1, 161.1, 98.1, 92.6, 65.0, 62.8, 42.7, 35.2, 32.4, 30.5, 25.4, 20.1, 19.2, 13.8, 10.0

MS m/z (relative intensity) 269 (M^+ 1.9), 212 (1.9), 196 (3.3), 186 (6.1), 185 (46.7), 184 (23.4), 169 (7.0), 168 (12.6), 167 (4.7), 157 (10.3), 156 (100), 155 (4.2), 154 (35.5), 142 (7.9), 140 (14.0), 138 (10.7), 129 (4.7), 128 (45.8), 127 (37.4), 126 (4.7),

125 (5.6), 124 (12.6), 114 (3.7), 113 (4.7), 112 (17.8), 111 (7.9), 110 (8.4), 100 (4.2), 99 (5.6), 98 (72.9), 97 (5.6), 96 (9.3), 95 (3.7), 86 (4.7), 85 (49.5), 84 (21.0), 83 (9.3), 82 (8.4), 81 (2.3), 72 (7.5), 71 (7.5), 70 (28.5), 69 (7.0), 68 (7.5), 67 (17.8), 58 (3.7), 57 (39.3), 56 (7.9), 55 (22.4), 54 (6.1), 53 (4.2), 43 (11.2), 42 (6.1), 41 (23.4)

N-(*n*-Butyl)-5-ethylfuran-3-amine (**5k**)

MS *m/z* (relative intensity) 168 (6.2), 167 (M^+ 52.3), 152 (6.2), 138 (6.2), 126 (3.1), 125 (41.5), 124 (100), 111 (13.1), 110 (6.9), 108 (6.9), 97 (3.1), 96 (18.5), 95 (2.3), 83 (3.1), 82 (11.5), 81 (6.2), 80 (7.7), 68 (5.4), 67 (5.4), 66 (2.3), 57 (6.2), 55 (4.6), 53 (4.6), 41 (7.7)

N-(*n*-Butyl)-*N*-(5-ethylfuran-3-yl)acetamide (**6k**).

IR (neat) 3109 (w), 2960 (s), 2933 (s), 2874 (s), 1761 (w), 1664 (s), 1611 (s), 1543 (w), 1406 (s), 1301 (m), 1227 (m) and 1136 cm^{-1} (m).

^1H NMR (200MHz, CDCl_3) : δ 7.20 (s, 1H), 5.86 (s, 1H), 3.51 (t, 2H, $J = 7.1\text{Hz}$), 2.60 (quartet, 2H, $J = 7.5\text{Hz}$), 1.92 (s, 3H), 1.43 (quintet, 2H, $J = 7.5\text{Hz}$), 1.24 (septet, 2H, $J = 7.0\text{Hz}$), 1.20 (t, 3H, 7.5Hz), 0.86 (t, 3H, 7.1Hz).

^{13}C NMR (200MHz, CDCl_3) :

δ 171.0, 158.7, 136.6, 130.3, 104.4, 48.4, 30.2, 22.5, 21.7, 20.0, 14.0, 11.9

MS *m/z* (relative intensity) 210 (4.6), 209 (M^+ 30.8), 194 (5.4), 180 (7.7), 167 (3.8), 166 (6.2), 153 (10.0), 152 (52.3), 150 (4.6), 139 (3.8), 138 (23.1), 137 (5.4), 125 (35.4), 124 (100), 112 (3.8), 111 (30.8), 110 (6.2), 108 (6.9), 97 (23.1), 96 (10.0), 94 (3.8), 82 (6.2), 81 (3.8), 80 (6.2), 68 (3.1), 67 (3.1), 57 (9.2), 55 (3.8), 53 (3.8), 43 (16.9), 41 (7.7).; HRMS calcd for $\text{C}_{12}\text{H}_{19}\text{NO}_2\text{Na}$ 232.1313, found 132.1310.

3-Morpholino-4-(tetrahydropyran-2-yloxy)but-2-enal (**4I**).

^1H NMR (200MHz, CDCl_3) : δ 9.70 (d, 1H, $J = 8.1\text{Hz}$), 5.28 (d, 1H, $J = 8.1\text{Hz}$), 4.64 (m, 1H), 4.62 (AB quartet, 2H, 7.0Hz), 3.80 (m, 1H), 3.71 (m, 4H), 3.50 (m, 4H), 1.95 – 1.6 (m, 9H).

^{13}C NMR (200MHz, CDCl_3) :

δ 188.2, 160.6, 104.5, 98.2, 66.5, 63.1, 59.6, 47.1, 30.6, 25.3, 19.7.

MS m/z (relative intensity) 255 (M^+ 2.3), 226 (2.3), 196 (3.1), 172 (7.7), 171 (100), 170 (43.8), 156 (2.3), 155 (26.2), 154 (45.4), 153 (16.2), 152 (6.2), 143 (3.1), 142 (25.4), 140 (7.7), 138 (22.3), 136 (9.2), 127 (15.4), 126 (45.4), 125 (3.1), 124 (16.2), 123 (2.3), 122 (3.8), 114 (3.8), 113 (9.2), 112 (23.8), 111 (3.1), 110 (8.5), 108 (5.4), 106 (1.5), 100 (1.5), 99 (2.3), 98 (6.2), 97 (11.5), 96 (18.5), 95 (26.2), 94 (12.3), 87 (4.6), 86 (16.9), 85 (45.4), 84 (12.3), 83 (9.2), 82 (11.5), 81 (4.6), 80 (3.8), 72 (3.1), 71 (3.8), 70 (10.0), 69 (15.4), 68 (13.1), 67 (26.2), 66 (2.3), 65 (1.5), 58 (3.8), 57 (21.5), 56 (16.9), 55 (30.0), 54 (12.3), 53 (6.2), 52 (2.3), 45 (6.2), 44 (4.6), 43 (19.2), 42 (19.2), 41 (42.3).

4-(Furan-3-yl)morpholine (**5I**)

IR (neat) 3454 (w), 3145 (w), 2960 (m), 2915 (m), 2895 (m), 2856 (m), 2823 (m), 1596 (s), 1508 (w), 1452 (m), 1393 (m), 1381 (m), 1359 (w), 1330 (m), 1303 (w), 1272 (m), 1251 (s), 1211 (w), 1182 (w), 1160 (m) and 1119 cm^{-1} (s).

^1H NMR (200MHz, CDCl_3) : δ 7.32 (m, 1H), 7.00 (m, 1H), 6.28 (m, 1H), 3.84 (m, 4H), 2.94 (m, 4H).

^{13}C NMR (200MHz, CDCl_3) : δ 143.4, 141.3, 126.1, 104.0, 66.5, 50.7.

MS m/z (relative intensity) 154 (3.1), 153 (M^+ 40.0), 138 (6.2), 124 (5.4), 122 (9.2), 97 (2.3), 96 (10.8), 95 (100), 94 (28.5), 69 (2.3), 68 (5.4), 67 (14.6), 66 (5.4), 65 (2.3), 55 (2.3), 54 (6.1), 53 (6.1), 52 (6.1), 45 (2.3), 44 (1.5), 43 (5.4), 42 (7.7), 41 (21.5).; EIMS: Calc $C_8H_{11}NO_2$ 153.0790, Found 153.0786.

N,N-Diethylfuran-3-amine (**5m**)

IR (neat) 3148 (w), 2972 (s), 2934 (m), 2873 (m), 2831 (m), 1599 (s), 1508 (w), 1450 (m), 1378 (m), 1341 (m), 1274 (m), 1194 (w), 1165 (s), 1118 (w) and 1066 cm^{-1} (m).

^1H NMR (200MHz, CDCl_3) : δ 7.25 (m, 1H), 6.90 (m, 1H), 6.20 (m, 1H), 3.05 (quartet, 4H, $J = 7.0\text{Hz}$), 1.08 (t, 6H, $J = 7.1\text{Hz}$)

^{13}C NMR (200MHz, CDCl_3) : δ 142.6, 138.8, 125.5, 104.4, 45.2, 11.6.

MS m/z (relative intensity) 140 (3.8), 139 (M^+ 43.8), 125 (7.7), 124 (100), 110 (3.1), 109 (2.3), 108 (3.1), 97 (3.1), 96 (53.8), 95 (9.2), 94 (14.6), 82 (6.2), 81 (4.6), 80 (4.6), 70 (2.3), 69 (4.6), 68 (14.6), 67 (8.5), 66 (4.6), 65 (3.1), 56 (7.7), 55 (7.7), 54 (18.5), 53 (13.1), 52 (12.3), 51 (1.5), 43 (2.1), 42 (13.8), 41 (30.0).;EIMS: Calc $C_8H_{13}NO$ 139.0997, Found 139.0994.

3-(*n*-Butylamino)-4-(tetrahydropyran-2-ylloxy)but-2-enal (**4n**)

^1H NMR (200MHz, CDCl_3) : *E*) δ 9.37 (d, 1H, $J = 6.8\text{Hz}$), 5.01 (d, 1H, $J = 6.8$), 4.81 (AB quartet, 2H, $J = 4.2\text{Hz}$), 4.63 (m, 1H), 3.10 (AB quartet, 2H, $J = 5.3\text{Hz}$), 0.92 (m, 3H) ; *Z*) 9.03 (d, 1H, $J = 2.6\text{Hz}$), 5.15 (d, 1H, $J = 2.6\text{Hz}$), 4.66 (m, 1H), 4.34 (d, 1H, $J = 13.9\text{Hz}$), 4.07 (d, 1H, $J = 13.9\text{Hz}$) ; *E + Z*) 3.81 (m, 1H), 3.56 (m, 1H), 1.9 – 1.5 (m, 8H), 1.41 (quintet, 2H, $J = 7.1\text{Hz}$).

^{13}C NMR (200MHz, CDCl_3) :

δ 186.9, 185.4, 162.9, 161.6, 99.7, 98.2, 94.5, 64.3, 63.4, 62.3, 43.0, 42.8, 32.3, 30.6, 30.4, 30.3, 25.4, 25.2, 20.3, 20.1, 20.0, 19.1.

MS m/z (relative intensity) 241 (M^+ 1.0), 168 (1.5), 158 (3.1), 151 (26.9), 156 (13.1), 141 (6.2), 140 (10.0), 128 (3.8), 127 (1.5), 126 (22.3), 124 (3.1), 115 (3.8), 114 (7.7), 113 (10.8), 112 (10.8), 111 (1.5), 110 (8.5), 101 (2.3), 100 (31.5), 99 (31.5), 98 (38.5), 97 (7.7), 96 (9.2), 87 (2.3), 86 (11.5), 85 (87.7), 84 (28.5), 83 (11.5), 82 (9.2), 73 (3.1), 72 (6.9), 71 (33.1), 70 (73.8), 69 (13.8), 68 (13.1), 67 (28.5), 58 (8.5), 57 (58.5), 56 (23.1), 55 (27.7), 54 (15.4), 53 (5.4), 52 (1.5), 51 (1.5), 49 (3.1), 44 (9.2), 43 (40), 42 (13.1), 41 (100).

N-(*n*-Butyl)furan-3-amine (**5n**)

MS m/z (relative intensity) 140 (3.1), 139 (M^+ 27.7), 124 (1.5), 110 (4.6), 97 (18.5), 96 (100), 94 (2.3), 83 (4.6), 80 (3.1), 69 (4.6), 68 (5.4), 67 (2.3), 55 (3.1), 54 (7.7), 53 (2.3), 52 (3.1), 42 (3.8), 41 (13.8).

N-(*n*-Butyl)-*N*-(furan-3-yl)acetamide (**6n**)

IR (neat) 3482 (w), 3317 (w), 3131 (w), 2959 (m), 2933 (m), 2873 (m), 1751 (w), 1722 (w), 1663 (s), 1592 (m), 1509 (w), 1439 (m), 1403 (s), 1378 (m), 1368 (m), 1303 (m), 1256 (w), 1223 (m), 1115(w).

^1H NMR (200MHz, CDCl_3) : δ 7.37 (m, 1H), 7.35 (m, 1H), 6.26 (m, 1H), 3.51 (t, 2H, $J = 7.1\text{Hz}$), 1.88 (s, 3H), 1.43 (quintet, 2H, $J = 8.1\text{Hz}$), 1.25 (sextet, 2H, $J = 7.1\text{Hz}$), 0.87 (t, 3H, 7.1Hz).

^{13}C NMR (200MHz, CDCl_3) : δ 170.9, 143.5, 138.5, 129.9, 110.1, 48.4, 30.0, 22.4, 19.9, 13.9.

MS *m/z* (relative intensity) 182 (1.0), 181 (M^+ 10), 166 (3.1), 153 (3.8), 152 (26.2), 139 (4.6), 138 (5.4), 125 (3.1), 124 (3.1), 111 (5.4), 110 (8.5), 98 (2.3), 97 (32.3), 96 (100), 95 (3.1), 94 (3.8), 83 (12.3), 80 (1.5), 69 (2.3), 68 (3.1), 67 (3.8), 55 (3.1), 54 (3.8), 53 (2.3), 52 (1.5), 43 (31.5), 42 (3.8), 41 (12.3).; ESMS: Calc $C_{10}H_{15}NO_2Na$ 204.1001, Found 204.0991.