Supplementary Information

Direct synthesis of tetrahydropyran-4-ones via O_3ReOH-catalyzed Prins cyclization of 3-chlorohomoallylic alcohols

Kwanruthai Tadpetch [a*], Pongsit Vijitphan [a,b], Sasiwan Kaewsen [a], Aticha Thiraporn [a], Vatcharin Rukachaisirikul [a*]

[a] *Division of Physical Science and Center of Excellence for Innovation in Chemistry, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla 90110, Thailand*

[b] *Current address: Department of Chemistry, Laboratory of Organic Synthesis, Chulabhorn Research Institute, Bangkok 10210, Thailand*

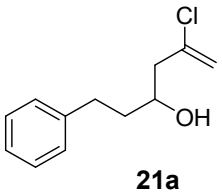
* Corresponding author. Tel.: +66 74 288437; fax: +66 74 558403.
Email address: kwanruthai.t@psu.ac.th (K. Tadpetch).

List of supplementary information

1. General Experimental Details

Unless otherwise stated, all reactions were conducted under a nitrogen or argon atmosphere in oven- or flamed-dried glassware. Solvents were used as received from suppliers or distilled prior to use using standard procedures. Perrhenic acid solution (75-80 wt. % in H_2O) was purchased from Sigma-Aldrich. All other reagents were obtained from commercial sources and used without further purification. Chlorohomoallylic alcohols **21a**, **21b** and **21c** were prepared following Li's protocol[1] using 2-chloro-2-propene and dihydrocinnamaldehyde, cyclohexanecarboxaldehyde and benzaldehyde respectively. Column chromatography was performed on Silica gel 60 (0.063-0.200 mm, Merck). Thin-layer chromatography (TLC) was performed on Silica gel 60 F_{254} (Merck). ^{1}H and ^{13}C NMR spectroscopic data were recorded at ambient temperature on 300 or 500 MHz Bruker FTNMR Ultra Shield spectrometers. ^{1}H NMR spectra are reported in ppm on the δ scale and referenced to the internal tetramethylsilane. The data are presented as follows: chemical shift, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, br = broad, app = apparent), coupling constant(s) in hertz (Hz), and integration. ^{13}C NMR spectra were reported in ppm relative to $CDCl_3$ (77.16 ppm). Infrared (IR) spectra were recorded on a Perkin Elmer 783 FTS165 FT-IR spectrometer. High-resolution mass spectra were obtained on a Ultra-Performance Liquid Chromatography–High Resolution Mass Spectrometer (Agilent LC-QTOF 6500 system), Mae Fah Luang University or a High-Performance Liquid Chromatograph–Mass Spectrometer (Shimadzu LCMS-IT-TOF Model LC-20ADXR), Thammasat University. Melting points were measured using an Electrothermal IA9200 melting point apparatus and are uncorrected.

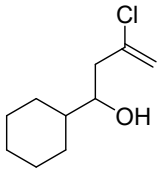
2. Characterization Data



21a

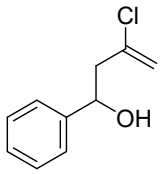
5-Chloro-1-phenylhex-5-en-3-ol (21a). Light yellow oil: R_f = 0.50 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.38–7.24 (m, 2H), 7.24–7.12 (m, 3H), 5.28 (d, *J* = 0.9 Hz, 1H), 5.24 (app s, 1H), 3.97 (tt, *J* = 6.6, 6.0 Hz, 1H), 2.90–2.60 (m, 2H), 1.92–1.76 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 141.8, 139.3, 128.47, 128.45,

126.0, 115.1, 68.2, 47.3, 38.2, 32.0. ^{1}H and ^{13}C NMR data matched those previously reported by Leighton et al.[2]



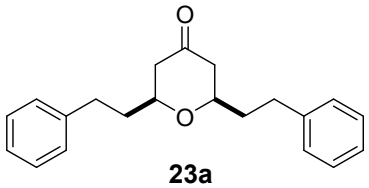
21b

3-Chloro-1-cyclohexylbut-3-en-1-ol (21b). Light yellow oil: R_f = 0.55 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 5.28 (s, 1H), 5.26 (s, 1H), 3.71 (ddd, *J* = 9.0, 5.4, 3.6 Hz, 1H) 2.51 (ddd, *J* = 14.4, 3.3, 0.9 Hz, 1H), 2.41 (dd, *J* = 14.4, 9.0 Hz, 1H), 1.92–1.66 (m, 5H), 1.45–1.33 (m, 1H), 1.32–0.98 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 140.2, 115.0, 72.5, 44.4, 43.1, 29.2, 27.9, 26.5, 26.3, 26.2; IR (thin film): 3384, 2926, 2853, 1636, 1449, 881 cm^{-1}.



21c

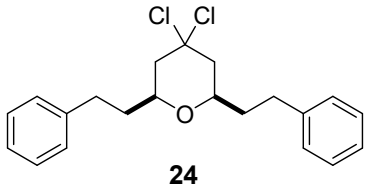
3-Chloro-1-phenylbut-3-en-1-ol (21c). Light yellow oil: R_f = 0.65 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.36–7.22 (m, 5H), 5.24 (d, *J* = 1.2 Hz, 1H), 5.18 (app s, 1H), 4.98 (dd, *J* = 8.7, 4.5 Hz, 1H), 2.73 (dd, *J* = 14.4, 8.7 Hz, 1H), 2.61 (ddd, *J* = 14.4, 4.5, 0.6 Hz, 1H), 2.38 (br s, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 143.1, 138.9, 128.6, 127.9, 125.9, 115.5, 71.2, 49.2. ^{1}H and ^{13}C NMR data matched those previously reported by Antilla et al.[3]



23a

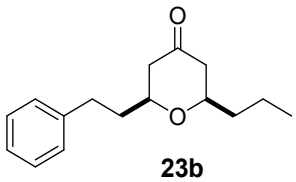
2,6-Diphenethyltetrahydropyran-4-one (23a). Light yellow oil: R_f = 0.42 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.36–7.27 (m, 4H), 7.27–7.18 (m, 6H), 3.62–3.49 (m, 2H), 2.99–2.85 (m, 2H), 2.85–2.71 (m, 2H), 2.42–2.22 (m, 2H), 2.13–

1.95 (m, 2H), 1.92–1.70 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 207.3, 141.5, 128.6, 128.5, 126.1, 75.9, 48.0, 38.1, 31.7. ^{1}H and ^{13}C NMR data matched those previously reported by Scheidt et al.[4]



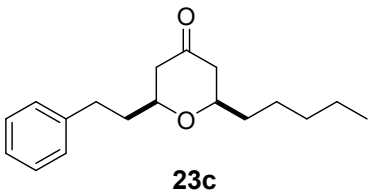
24

4,4-Dichloro-2,6-diphenethyltetrahydropyran (24). Light yellow oil: R_f = 0.65 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.33–7.25 (m, 4H), 7.25–7.16 (m, 6H), 3.70–3.60 (m, 2H), 2.92–2.79 (m, 2H), 2.78–2.65 (m, 2H), 2.47 (d, *J* = 13.8 Hz, 2H), 2.06 (dd, *J* = 13.8, 11.1 Hz, 2H), 1.97–1.82 (m, 2H), 1.81–1.68 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 141.8, 128.5, 126.0, 87.9, 73.5, 51.5, 37.0, 31.8; IR (thin film): 3026, 2925, 1456, 1093, 750, 698 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{21}H_{25}Cl_2O$ $(M + H)^+$ 363.1282, found 363.1184.



23b

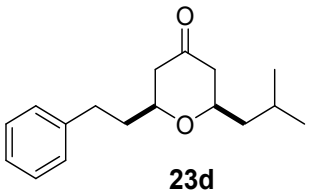
2-Phenethyl-6-propyltetrahydropyran-4-one (23b). Light yellow oil: R_f = 0.44 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.33–7.24 (m, 2H), 7.23–7.15 (m, 3H), 3.62–3.45 (m, 2H), 2.90–2.66 (m, 2H), 2.41–2.16 (m, 4H), 2.06–1.91 (m, 1H), 1.86–1.35 (m, 5H), 0.97 (d, *J* = 6.9 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 207.7, 141.5, 128.6, 128.5, 126.0, 76.8, 75.7, 48.1, 48.0, 38.7, 38.0, 31.6, 18.8, 14.0; IR (thin film): 3026, 2958, 1718, 1456, 750, 700 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{16}H_{22}NaO_2$ $(M + Na)^+$ 269.1517, found 269.1514.



23c

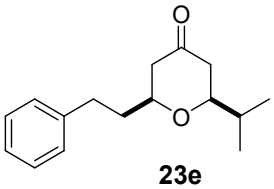
2-Pentyl-6-phenethyltetrahydropyran-4-one (23c). Light yellow oil: R_f = 0.48 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.32–7.23 (m, 2H), 7.22–7.14 (m, 3H),

3.57–3.40 (m, 2H), 2.90–2.67 (m, 2H), 2.39–2.12 (m, 4H), 2.05–1.90 (m, 1H), 1.85–1.63 (m, 2H), 1.60–1.25 (m, 7H), 0.92 (d, J = 6.9 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 207.6, 141.5, 128.5, 126.0, 77.0, 75.7, 48.1, 48.0, 38.0, 36.5, 31.7, 31.6, 25.2, 22.6, 14.1; IR (thin film): 2930, 2859, 1719, 1456, 1055, 700 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{18}H_{26}NaO_2$ $(M + Na)^+$ 297.1830, found 297.1794.



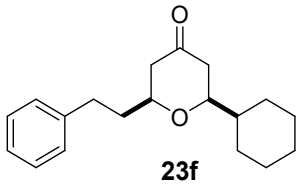
23d

2-Isobutyl-6-phenethyltetrahydropyran-4-one (23d). Light yellow oil: R_f = 0.46 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.32–7.23 (m, 2H), 7.22–7.14 (m, 3H), 3.67–3.56 (m, 1H), 3.55–3.45 (m, 1H), 2.92–2.79 (m, 1H), 2.79–2.65 (m, 1H), 2.38–2.15 (m, 4H), 2.15–1.85 (m, 2H), 1.85–1.72 (m, 2H), 1.34–1.22 (m, 2H), 0.95 (t, J = 6.6 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 207.5, 141.5, 128.5, 126.0, 75.9, 75.3, 48.4, 48.1, 45.7, 38.1, 31.7, 24.6, 23.3, 22.2; IR (thin film): 2956, 2927, 1720, 1368, 1055, 700 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{17}H_{24}NaO_2$ $(M + Na)^+$ 283.1674, found 283.1641.



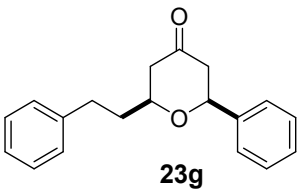
23e

2-Isopropyl-6-phenethyltetrahydropyran-4-one (23e). Light yellow oil: R_f = 0.46 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.32–7.23 (m, 2H), 7.22–7.14 (m, 3H), 3.54–3.43 (m, 1H), 3.23 (ddd, J = 11.4, 6.6, 2.4 Hz, 1H), 2.91–2.79 (m, 1H), 2.79–2.66 (m, 1H), 2.43–2.32 (m, 1H), 2.31–2.16 (m, 3H), 2.05–1.90 (m, 1H), 1.88–1.71 (m, 2H), 1.05 (d, J = 6.6 Hz, 3H), 0.94 (d, J = 6.9 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.1, 141.6, 128.5, 126.0, 81.9, 75.6, 48.0, 45.3, 38.1, 33.6, 31.6, 18.5, 18.3; IR (thin film): 3026, 2961, 1719, 1456, 1062, 700 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{16}H_{23}O_2$ $(M + H)^+$ 247.1698, found 247.1630.



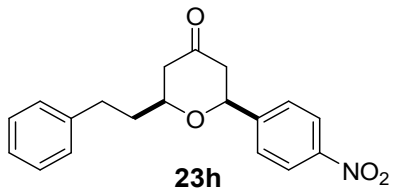
23f

2-Cyclohexyl-6-phenethyltetrahydropyran-4-one (23f). Light yellow oil: R_f = 0.48 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.34–7.24 (m, 2H), 7.24–7.15 (m, 3H), 3.53–3.41 (m, 1H), 3.26 (ddd, *J* = 11.4, 6.9, 2.4 Hz, 1H), 2.91–2.67 (m, 2H), 2.46–2.33 (m, 1H), 2.32–2.17 (m, 3H), 2.14–1.90 (m, 2H), 1.85–1.65 (m, 5H), 1.59–1.39 (m, 1H), 1.38–0.95 (m, 5H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.2, 141.6, 128.6, 128.5, 126.0, 81.2, 75.6, 48.2, 45.3, 43.4, 38.1, 31.6, 29.0, 28.6, 26.5, 26.1, 26.0; IR (thin film): 2925, 2852, 1718, 1451, 1059, 700 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{19}H_{26}NaO_2$ $(M + Na)^+$ 309.1830, found 309.1814.



23g

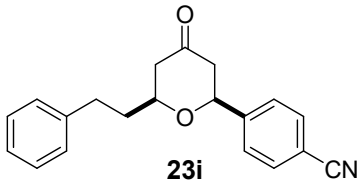
2-Phenethyl-6-phenyltetrahydropyran-4-one (23g). Light yellow oil: R_f = 0.40 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.38 (d, *J* = 4.2 Hz, 4H); 7.36–7.23 (m, 3H), 7.22–7.14 (m, 3H), 4.60(dd, *J* = 11.4, 3.0 Hz, 1H), 3.78–3.67 (m, 1H), 2.92–2.70 (m, 2H), 2.68–2.51 (m, 2H), 2.50–2.35 (m, 2H), 2.16–2.01 (m, 1H), 1.96–1.81 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.6, 141.4, 141.0, 128.6, 128.5, 128.0, 126.0, 125.6, 78.4, 76.2, 49.5, 47.7, 37.9, 31.5; IR (thin film): 3027, 2927, 1718, 1454, 1058, 699 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{19}H_{20}NaO_2$ $(M + Na)^+$ 303.1361, found 303.1329.



23h

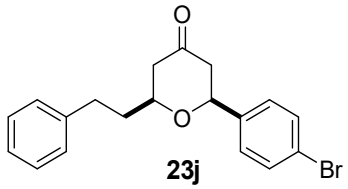
2-(4-Nitrophenyl)-6-phenethyltetrahydropyran-4-one (23h). Light yellow oil: R_f = 0.30 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.25 (app d, *J* = 8.7 Hz, 2H); 7.55 (d, *J* = 8.7 Hz, 2H); 7.32–7.25 (m, 2H), 7.24–7.16 (m, 3H), 4.73 (dd, *J* = 11.7, 2.7 Hz, 1H), 3.83–3.72 (m, 1H), 2.94–2.73 (m, 2H), 2.72–2.63 (m, 1H), 2.54–2.40 (m,

3H), 2.20–2.06 (m, 1H), 2.02–1.88 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 205.2, 148.1, 147.7, 141.2, 128.6, 128.5, 126.3, 126.2, 124.0, 77.4, 76.5, 49.2, 47.6, 37.8, 31.6; IR (thin film): 2927, 1719, 1519, 1345, 749, 697 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{19}H_{20}NO_4$ $(M + H)^+$ 326.1392, found 326.1295.



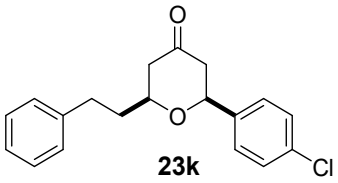
23i

2-(4-Cyanophenyl)-6-phenethyltetrahydropyran-4-one (23i). Light yellow oil: R_f = 0.20 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.68 (d, *J* = 5.1 Hz, 2H); 7.49 (d, *J* = 5.1 Hz, 2H); 7.30–7.26 (m, 2H), 7.21–7.17 (m, 3H), 4.67 (dd, *J* = 7.2, 1.5 Hz, 1H), 3.78–3.73 (m, 1H), 2.89–2.83 (m, 1H), 2.81–2.75 (m, 1H), 2.66–2.63 (m, 1H), 2.49–2.39 (m, 3H), 2.15–2.07 (m, 1H), 1.96–1.89 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 205.5, 146.1, 141.2, 132.5, 128.5, 128.4, 126.2, 126.1, 118.7, 111.8, 77.4, 76.3, 49.1, 47.5, 37.8, 31.5; IR (thin film): 3026, 2926, 2228, 1721, 1344, 701 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{20}H_{19}NNaO_2$ $(M + Na)^+$ 328.1313, found 328.1311.



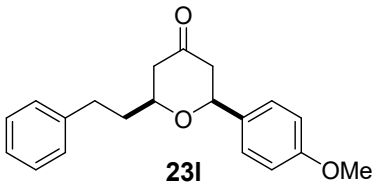
23j

2-(4-Bromophenyl)-6-phenethyltetrahydropyran-4-one (23j). Light yellow oil: R_f = 0.40 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.52 (d, *J* = 8.7 Hz, 2H), 7.32–7.23 (m, 4H), 7.23–7.14 (m, 3H), 4.58 (dd, *J* = 11.4, 2.7 Hz, 1H), 3.78–3.67 (m, 1H), 2.92–2.71 (m, 2H), 2.66–2.57 (m, 1H), 2.54–2.37 (m, 3H), 2.16–2.02 (m, 1H), 1.97–1.83 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.3, 141.3, 140.0, 131.8, 128.6, 128.5, 127.4, 126.1, 121.9, 77.8, 76.3, 49.4, 47.7, 37.9, 31.5; IR (thin film): 3026, 2927, 1718, 1489, 1070, 700 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{19}H_{20}BrO_2$ $(M + H)^+$ 359.0647, found 359.0468.



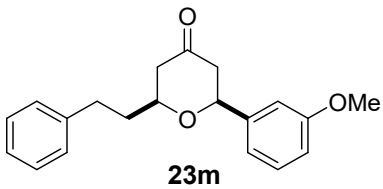
23k

2-(4-Chlorophenyl)-6-phenethyltetrahydropyran-4-one (23k). Light yellow oil: R_f = 0.40 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.39–7.24 (m, 6H), 7.23–7.15 (m, 3H), 4.59 (dd, *J* = 11.7, 3.0 Hz, 1H), 3.78–3.67 (m, 1H), 2.91–2.71 (m, 2H), 2.66–2.57 (m, 1H), 2.55–2.37 (m, 3H), 2.17–2.02 (m, 1H), 1.98–1.83 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.4, 141.3, 139.5, 133.8, 128.8, 128.6, 128.5, 127.0, 126.1, 77.8, 76.3, 49.4, 47.7, 37.9, 31.5; IR (thin film): 3026, 2927, 1717, 1490, 1088, 700 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{19}H_{19}ClNaO_2$ $(M + Na)^+$ 337.0971, found 337.0925.



23l

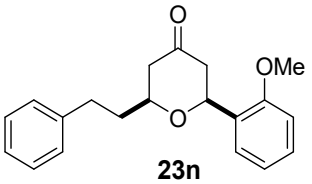
2-(4-Methoxyphenyl)-6-phenethyltetrahydropyran-4-one (23l). Light yellow oil: R_f = 0.32 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.36–7.24 (m, 4H), 7.23–7.15 (m, 3H), 6.93 (d, *J* = 8.7 Hz, 2H), 4.57 (dd, *J* = 9.6, 4.5 Hz, 1H), 3.82 (s, 3H), 3.77–3.67 (m, 1H), 2.91–2.70 (m, 2H), 2.67–2.53 (m, 2H), 2.50–2.33 (m, 2H), 2.16–2.00 (m, 1H), 1.96–1.82 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.9, 159.4, 141.5, 133.2, 128.5, 127.1, 126.1, 114.1, 78.3, 76.2, 55.4, 49.5, 47.8, 38.0, 31.6; IR (thin film): 3026, 2931, 1717, 1493, 1052, 697 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{20}H_{22}NaO_3$ $(M + Na)^+$ 333.1467, found 333.1442.



23m

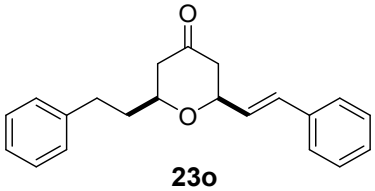
2-(3-Methoxyphenyl)-6-phenethyltetrahydropyran-4-one (23m). Light yellow oil: R_f = 0.34 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.35–7.23 (m, 3H), 7.23–7.14 (m, 3H), 7.00–6.92 (m, 2H), 6.90–6.82 (m, 1H), 4.60 (dd, *J* = 11.1, 3.0 Hz, 1H), 3.83 (s, 3H), 3.78–3.67 (m, 1H), 2.93–2.71 (m, 2H), 2.69–2.37 (m, 4H), 2.18–2.01

(m, 1H), 1.97–1.81 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.7, 159.9, 142.6, 141.4, 129.7, 128.5, 126.0, 117.9, 113.2, 111.5, 78.3, 76.2, 55.3, 49.5, 47.7, 37.9, 31.5; IR (thin film): 2933, 2859, 1718, 1490, 1046, 698 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{20}H_{22}NaO_3$ $(M + Na)^+$ 333.1467, found 333.1430.



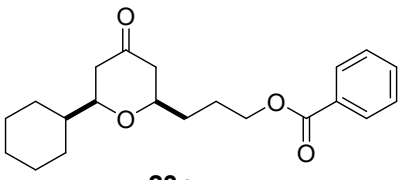
23n

2-(2-Methoxyphenyl)-6-phenethyltetrahydropyran-4-one (23n). Light yellow oil: R_f = 0.37 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.58 (d, *J* = 7.5 Hz, 1H), 7.32–7.22 (m, 3H), 7.22–7.13 (m, 3H), 7.03 (t, *J* = 7.5 Hz, 1H), 6.87 (d, *J* = 8.1 Hz, 1H), 4.96 (dd, *J* = 11.4, 2.1 Hz, 1H), 3.81 (s, 3H), 3.80–3.70 (m, 1H), 2.91–2.69 (m, 3H), 2.48–2.28 (m, 3H), 2.16–2.01 (m, 1H), 1.96–1.82 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 207.5, 155.5, 141.6, 129.7, 128.7, 128.6, 128.5, 126.0, 120.9, 110.3, 76.1, 73.3, 55.3, 48.3, 47.8, 38.1, 31.5; IR (thin film): 3026, 2928, 1717, 1494, 1246, 754 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{20}H_{22}NaO_3$ $(M + Na)^+$ 333.1467, found 333.1435.



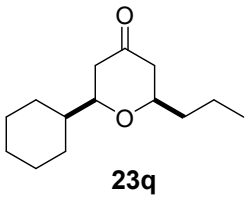
23o

2-Phenethyl-6-styryltetrahydropyran-4-one (23o). Light yellow oil: R_f = 0.38 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.43–7.33 (m, 4H), 7.31–7.19 (m, 6H), 6.65 (d, *J* = 15.9 Hz, 1H), 6.26 (d, *J* = 15.9, 5.7 Hz, 1H), 4.26–4.20 (m, 1H), 3.69–3.61 (m, 1H), 2.90–2.71 (m, 2H), 2.54–2.28 (m, 4H), 2.12–2.00 (m, 1H), 1.91–1.79 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.5, 141.1, 136.4, 131.3, 128.7, 128.5, 128.4, 128.1, 126.7, 126.1, 77.3, 76.0, 47.9, 47.8, 37.9, 31.6 ; IR (thin film): 3026, 2927, 1718, 1495, 1054, 747 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{21}H_{22}NaO_2$ $(M + Na)^+$ 329.1517, found 329.1511.



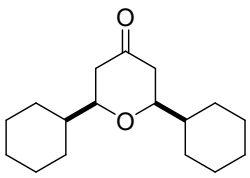
23p

2-(3-Benzoyloxy)propyl-6-cyclohexyltetrahydropyran-4-one (23p). Colorless oil: R_f = 0.44 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.08–8.01 (m, 2H), 7.57 (app t, *J* = 7.2 Hz, 1H), 7.45 (app t, *J* = 7.2 Hz, 2H), 4.44–4.39 (m, 2H), 3.63–3.52 (m, 1H), 3.29 (ddd, *J* = 11.4, 6.6, 2.4 Hz, 1H), 2.45–2.33 (m, 2H), 2.31–2.18 (m, 2H), 2.10–1.59 (m, 10H), 1.56–1.41 (m, 1H), 1.33–1.10 (m, 2H), 1.10–0.93 (m, 2H); ^{13}C NMR (75 MHz, $CDCl_3$) 208.1, 166.7, 133.0, 130.5, 129.7, 128.5, 81.4, 76.6, 64.8, 48.3, 45.4, 43.3, 33.1, 28.9, 28.6, 26.5, 26.1, 26.0, 25.1 ; IR (thin film): 2926, 2852, 1718, 1451, 1274, 1113 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{21}H_{28}NaO_4$ $(M + Na)^+$ 367.1885, found 367.1877.



23q

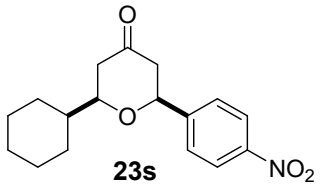
2-Cyclohexyl-6-propyltetrahydropyran-4-one (23q). Colorless oil: R_f = 0.53 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 3.52–3.48 (m, 1H), 3.26 (ddd, *J* = 6.9, 4.5, 1.5 Hz, 1H), 2.36 (dd, *J* = 15.3, 8.4 Hz, 2H), 2.21 (dd, *J* = 15.3, 2.7 Hz, 2H), 2.01–1.98 (m, 1H), 1.76–1.63 (m, 5H), 1.53–1.38 (m, 5H), 1.25–1.14 (m, 2H), 1.04–0.98 (m, 2H), 0.93 (t, *J* = 4.5 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.7, 81.3, 76.8, 48.4, 45.6, 43.3, 38.6, 29.0, 28.5, 26.5, 26.1, 26.0, 18.8, 14.0; IR (thin film): 2927, 2853, 1720, 1450, 1158, 846 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{14}H_{24}NaO_2$ $(M + Na)^+$ 247.1674, found 247.1677.



23r

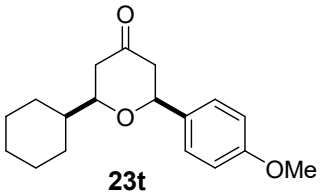
2,6-Dicyclohexyltetrahydropyran-4-one (23r). Light yellow solid: R_f = 0.55 (20% EtOAc/hexanes); mp 69.5–70.6 °C; ^{1}H NMR (300 MHz, $CDCl_3$) δ 3.22 (ddd, *J* = 11.4,

6.9, 2.1 Hz, 2H), 2.39 (dd, *J* = 14.4, 1.5 Hz, 2H), 2.28–2.15 (m, 2H), 2.06–1.93 (m, 2H), 1.84–1.58 (m, 8H), 1.54–1.39 (m, 2H), 1.34–1.10 (m, 6H), 1.10–0.92 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 209.3, 81.3, 45.7, 43.4, 28.9, 28.6, 26.5, 26.1, 26.0; IR (thin film): 2925, 2852, 1719, 1450, 1271, 1066 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{17}H_{28}NaO_2$ $(M + Na)^+$ 287.1987, found 287.1947.



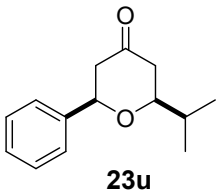
23s

2-Cyclohexyl-6-(4-nitrophenyl)tetrahydropyran-4-one (23s). Light yellow solid: R_f = 0.36 (20% EtOAc/hexanes); mp 118.2–119.8 °C; ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.24 (d, *J* = 5.1 Hz, 2H), 7.55 (d, *J* = 5.1 Hz, 2H), 4.72, *J* = 6.9, 1.2 Hz, 1H), 3.58–3.54 (m, 1H), 2.69–2.67 (m, 1H), 2.52–2.40 (m, 3H), 1.99–1.97 (m, 1H), 1.80–1.62 (m, 5H), 1.33–1.06 (m, 5H); ^{13}C NMR (125 MHz, $CDCl_3$) δ 206.3, 148.4, 147.5, 126.3, 123.9, 81.6, 77.4, 49.5, 45.0, 43.2, 28.7, 28.5, 26.5, 26.1, 26.0; IR (thin film): 2927, 2853, 1721, 1520, 1346, 853 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{17}H_{22}NO_4$ $(M + H)^+$ 304.1549, found 304.1450.



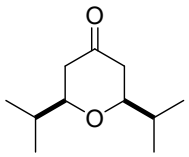
23t

2-Cyclohexyl-6-(4-methoxyphenyl)tetrahydropyran-4-one (**23t).** Colorless oil: R_f = 0.47 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.29 (d, *J* = 5.1 Hz, 2H), 6.90 (d, *J* = 5.1 Hz, 2H), 4.55, *J* = 6.9, 1.5 Hz, 1H), 3.80 (s, 3H), 3.52–3.48 (m, 1H), 2.62–2.50 (m, 2H), 2.46–2.35 (m, 2H), 1.97–1.95 (m, 1H), 1.77–1.56 (m, 5H), 1.27–1.04 (m, 5H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.0, 159.3, 133.4, 126.9, 114.0, 81.5, 78.2, 55.4, 49.8, 45.1, 43.2, 28.8, 28.4, 26.5, 26.1; IR (thin film): 2926, 2852, 1719, 1514, 1249, 827 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{18}H_{25}O_3$ $(M + H)^+$ 289.1804, found 289.1800.



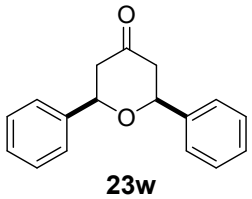
23u

2-Isopropyl-6-phenyltetrahydropyran-4-one (23u). Light yellow oil: R_f = 0.53 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.40–7.27 (m, 5H), 4.63 (dd, *J* = 11.4, 2.7 Hz, 1H), 3.52 (ddd, *J* = 10.8, 5.7, 3.0 Hz, 1H), 2.69–2.60 (m, 1H), 2.58–2.33 (m, 3H), 2.00–1.87 (m, 1H), 1.04 (d, *J* = 6.9 Hz, 3H), 1.00 (d, *J* = 6.9 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 207.6, 141.4, 128.6, 127.9, 125.6, 82.1, 78.5, 49.9, 44.8, 33.4, 18.3, 18.1; IR (thin film): 3032, 2963, 1717, 1252, 1066, 753 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{14}H_{18}NaO_2$ $(M + Na)^+$ 241.1204, found 241.1202.



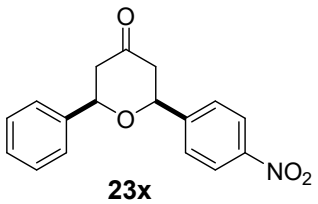
23v

2,6-Diisopropyltetrahydropyran-4-one (23v). Light yellow oil: R_f = 0.62 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 3.22 (ddd, *J* = 11.4, 6.6, 2.1 Hz, 2H), 2.38 (dd, *J* = 14.1, 1.5 Hz, 2H), 2.25–2.16 (m, 2H), 1.83–1.72 (m, 2H), 0.99 (d, *J* = 6.6 Hz, 6H), 0.91 (d, *J* = 6.6 Hz, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 209.1, 81.9, 45.4, 33.6, 18.4, 18.3; IR (thin film): 2963, 1723, 1470, 1256, 1068, 887 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{11}H_{20}NaO_2$ $(M + Na)^+$ 207.1361, found 207.1359.



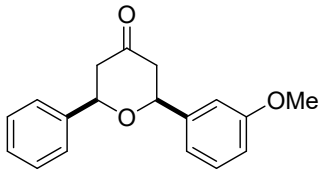
23w

2,6-Diphenyltetrahydropyran-4-one (23w). Light yellow oil: R_f = 0.45 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.50–7.30 (m, 10H), 4.84 (dd, *J* = 10.2, 4.2 Hz, 2H), 2.80–2.68 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.2, 140.8, 128.7, 128.2, 125.7, 79.0, 49.8; IR (thin film): 3032, 1720, 1452, 1245, 1054, 698 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{17}H_{16}NaO_2$ $(M + Na)^+$ 275.1048, found 275.1007.



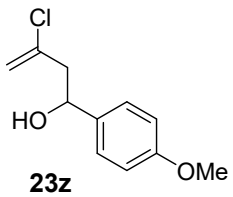
23x

2-(4-Nitrophenyl)-6-phenyltetrahydropyran-4-one (23x). Light yellow oil: R_f = 0.30 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 8.26 (d, *J* = 8.7 Hz, 2H), 7.64 (d, *J* = 8.7 Hz, 2H), 7.50–7.30 (m, 5H), 4.97 (dd, *J* = 11.7, 2.7 Hz, 1H), 4.88 (dd, *J* = 10.2, 4.2 Hz, 1H), 2.85–2.60 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 204.6, 147.8, 140.3, 128.9, 128.5, 126.5, 125.7, 124.0, 79.3, 77.9, 49.5, 49.3; IR (thin film): 3026, 2968, 1720, 1519, 1347, 697 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{17}H_{15}NNaO_4$ $(M + Na)^+$ 320.0899, found 320.0895.



23y

2-(3-Methoxyphenyl)-6-phenyltetrahydropyran-4-one (23y). Light yellow oil: R_f = 0.38 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.47–7.36 (m, 4H), 7.34–7.25 (m, 2H), 7.03–7.01 (m, 2H), 6.86 (dd, *J* = 8.1, 2.4 Hz, 1H), 4.86–4.79 (m, 2H), 3.82 (s, 3H), 2.76–2.64 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 206.1, 160.0, 142.5, 140.8, 129.8, 128.7, 128.2, 125.8, 118.0, 113.3, 111.7, 79.1, 79.0, 55.4, 49.8; IR (thin film): 2962, 2836, 1717, 1267, 1041, 697 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{18}H_{18}NaO_3$ $(M + Na)^+$ 305.1154, found 305.1150.



23z

3-Chloro-1-(3-methoxyphenyl)but-3-en-1-ol (23z). Colorless oil: R_f = 0.35 (20% EtOAc/hexanes); ^{1}H NMR (300 MHz, $CDCl_3$) 7.28–7.24 (m, 1H), 6.96–6.94 (m, 2H), 6.85–6.81 (m, 1H), 5.29 (d, *J* = 1.2 Hz, 1H), 5.24 (d, *J* = 1.2 Hz, 1H), 5.01 (dd, *J* = 8.7, 4.5 Hz, 1H), 3.81 (s, 3H), 2.76 (dd, *J* = 14.4, 8.7 Hz, 1H), 2.65 (dd, *J* = 14.4, 4.5 Hz,

1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 159.8, 144.8, 138.9, 129.7, 118.1, 115.5, 113.4, 111.3, 71.1, 55.3, 49.2; IR (thin film): 3411, 2942, 1600, 1263, 1042, 882 cm^{-1}; HRMS (ES/MeOH): *m/z* calcd for $C_{11}H_{13}ClNaO_2$ $(M + Na)^+$ 235.0502, found 235.0500.

3. ^{1}H and ^{13}C NMR Spectra

Figure SI1. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 5-chloro-1-phenylhex-5-en-3-ol (**21a**).

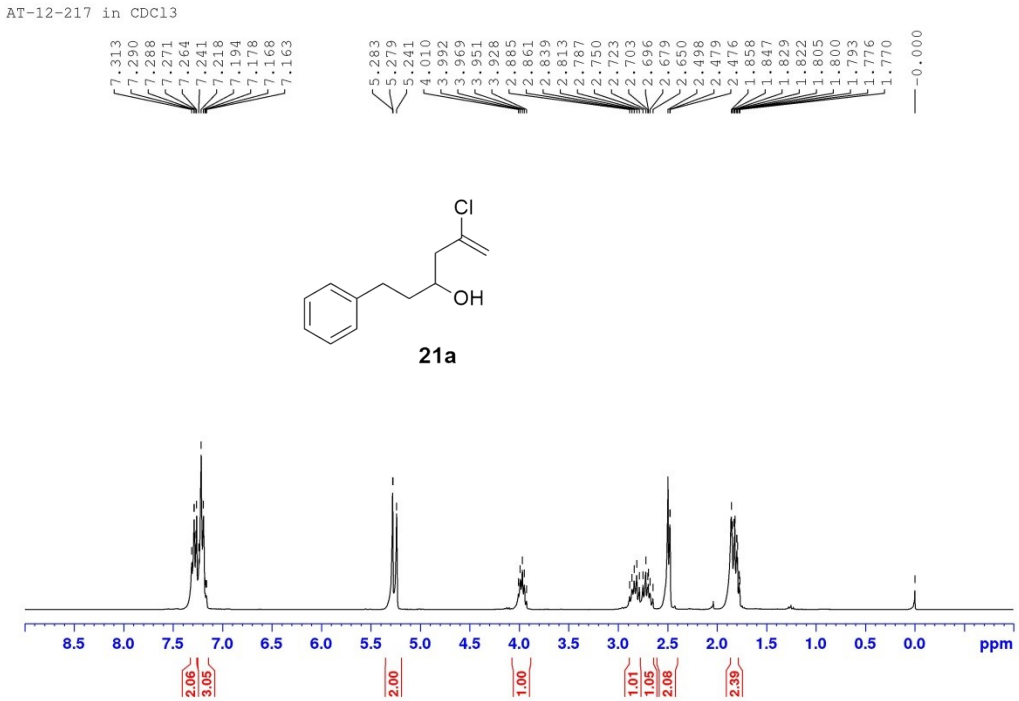


Figure SI2. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 5-chloro-1-phenylhex-5-en-3-ol (**21a**).

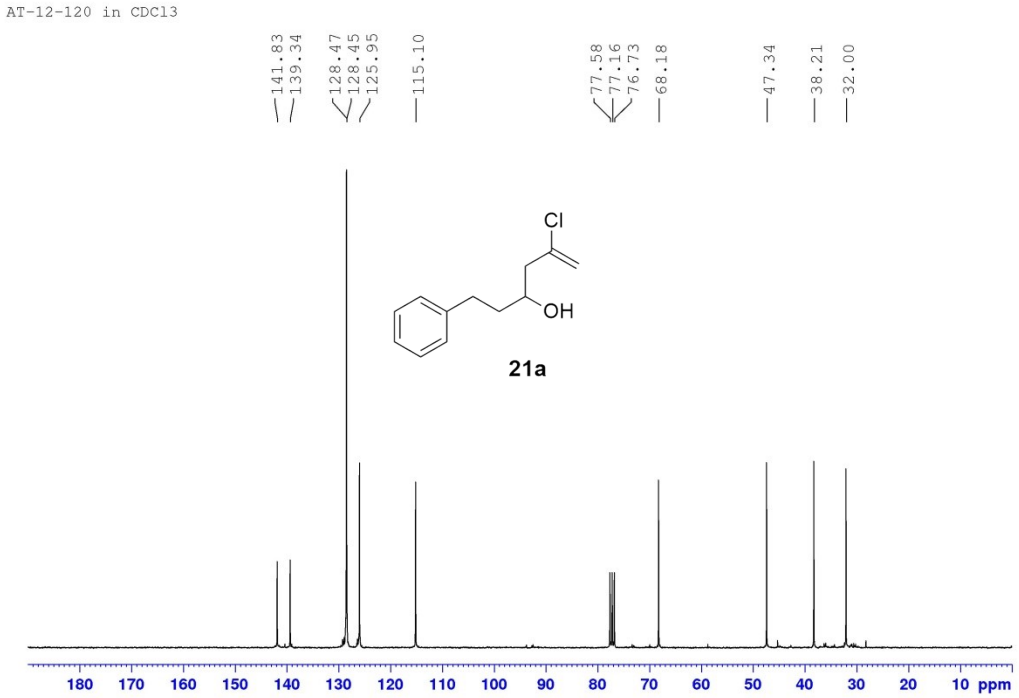


Figure SI3. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 3-chloro-1-cyclohexyl-3-en-1-ol (**21b**).

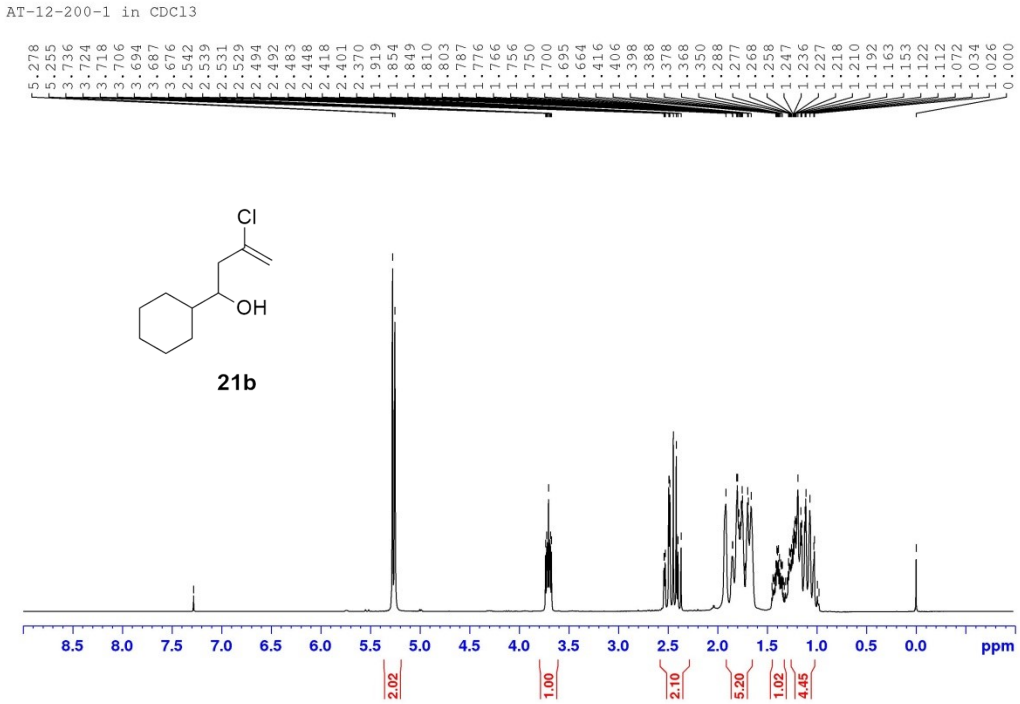


Figure SI4. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 3-chloro-1-cyclohexyl-3-en-1-ol (**21b**).

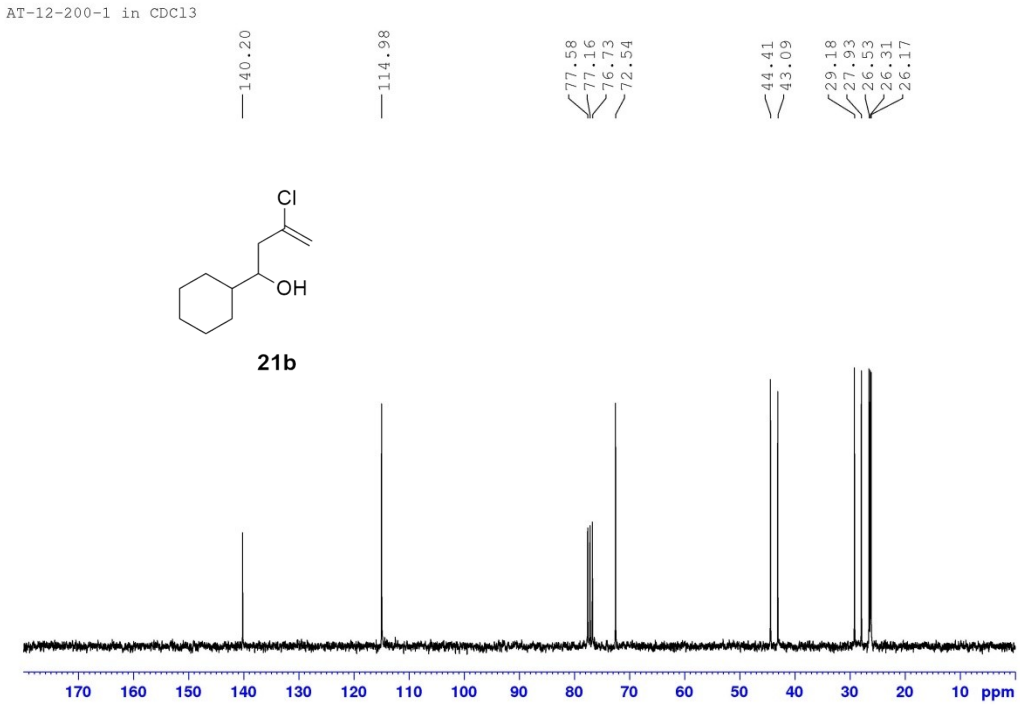


Figure SI5. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 3-chloro-1-phenyl-3-en-1-ol (**21c**).

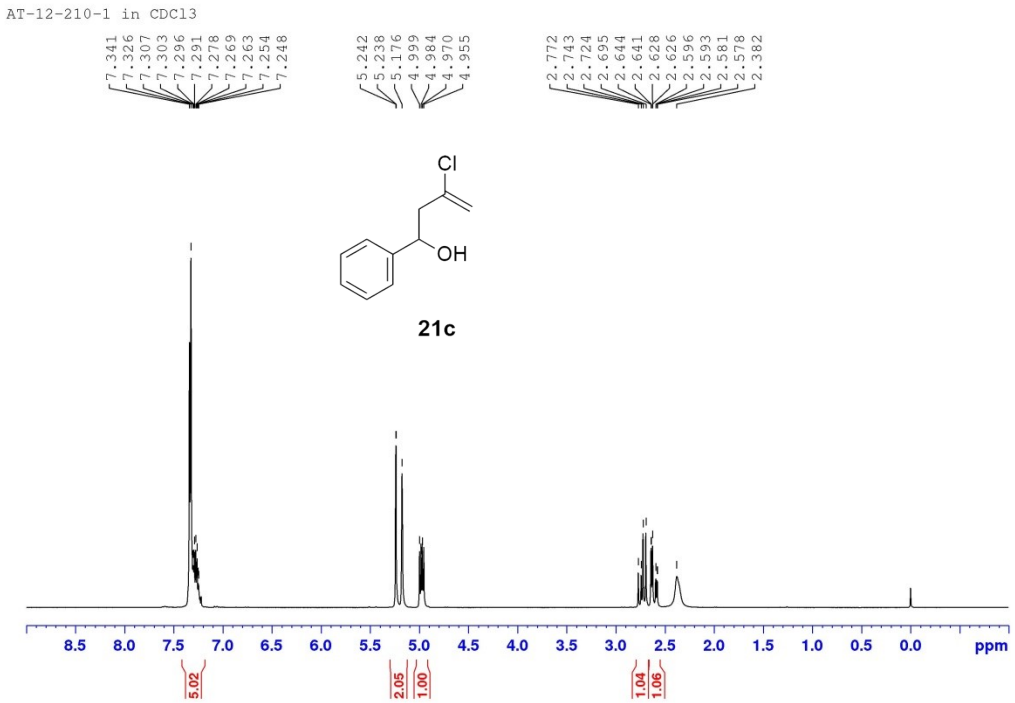


Figure SI6. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 3-chloro-1-phenyl-3-en-1-ol (**21**c).

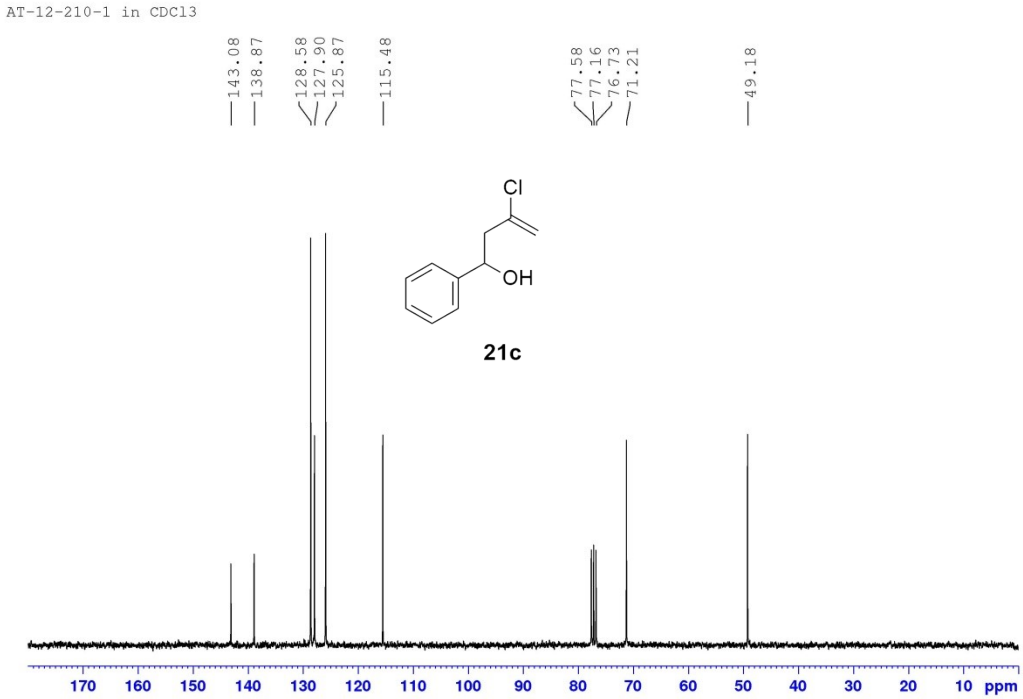


Figure SI7. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2,6-diphenethyltetrahydropyran-4-one (**23a**)

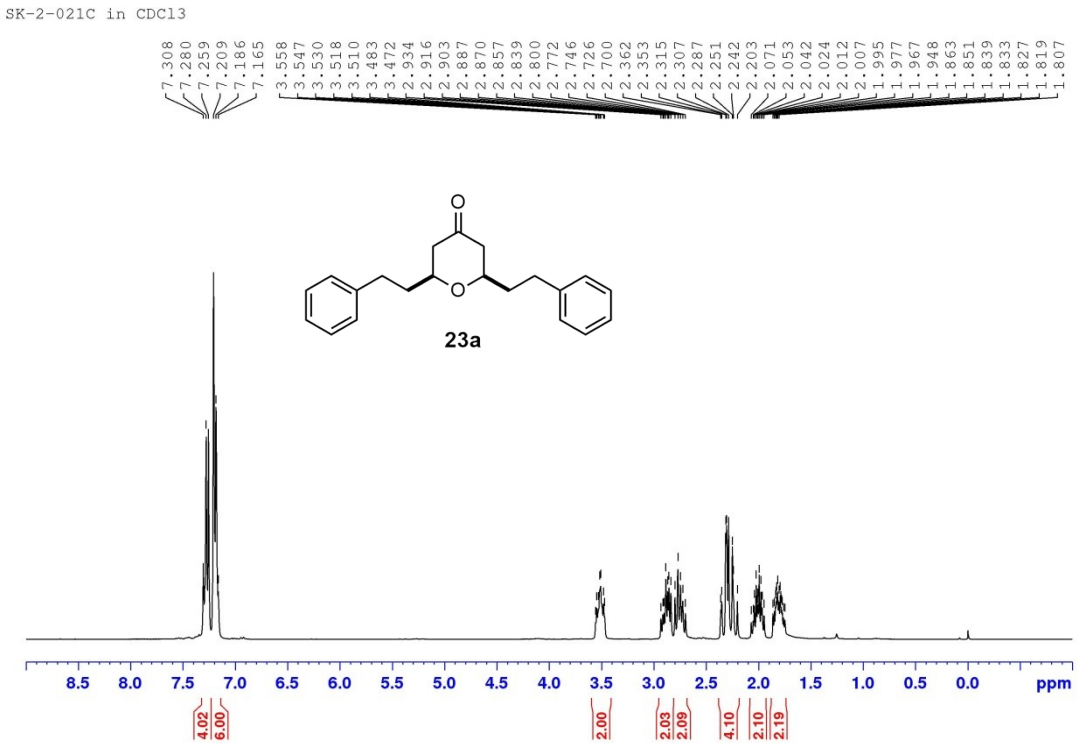


Figure SI8. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2,6-diphenethyltetrahydropyran-4-one (**23a**)

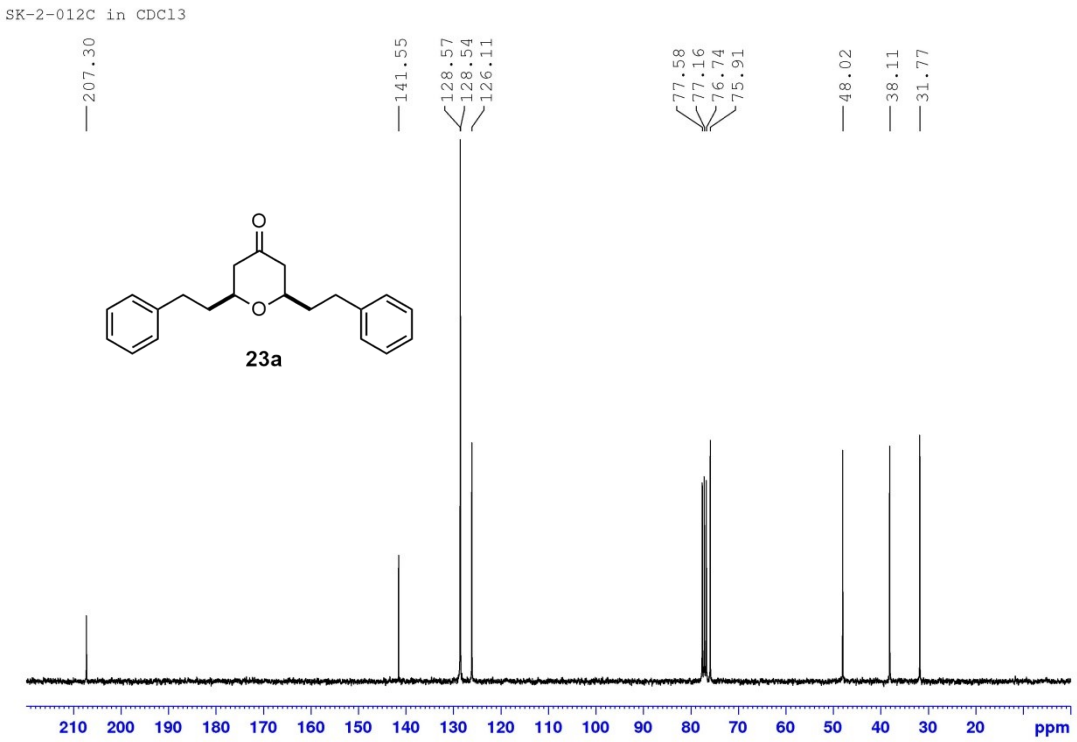


Figure SI9. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 4,4-dichloro-2,6-diphenethyltetrahydropyran (**24**)

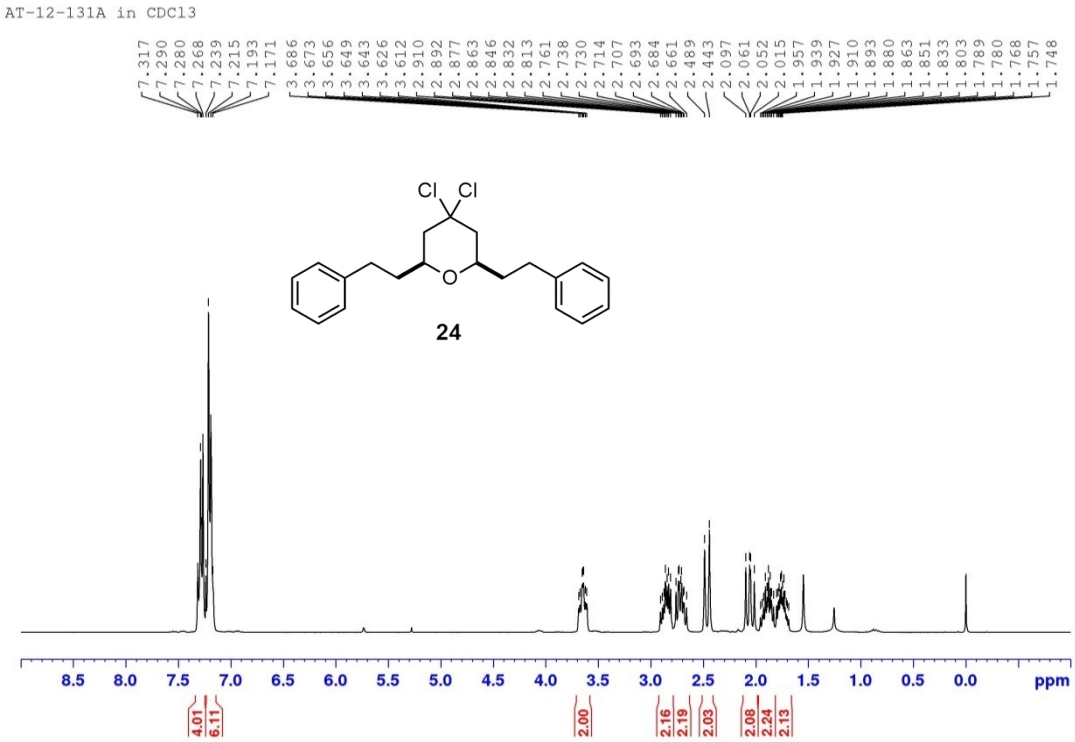


Figure SI10. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 4,4-dichloro-2,6-diphenethyltetrahydropyran (**24**)

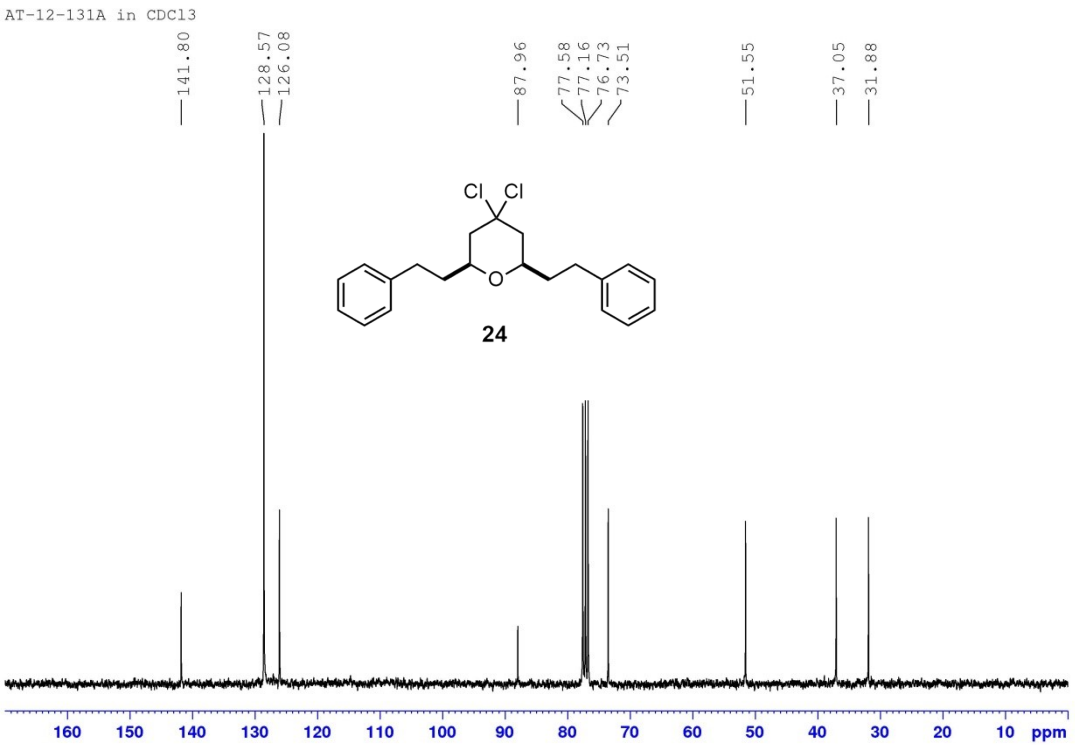


Figure SI11. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-phenethyl-6-propyltetrahydropyran-4-one (**23b**)

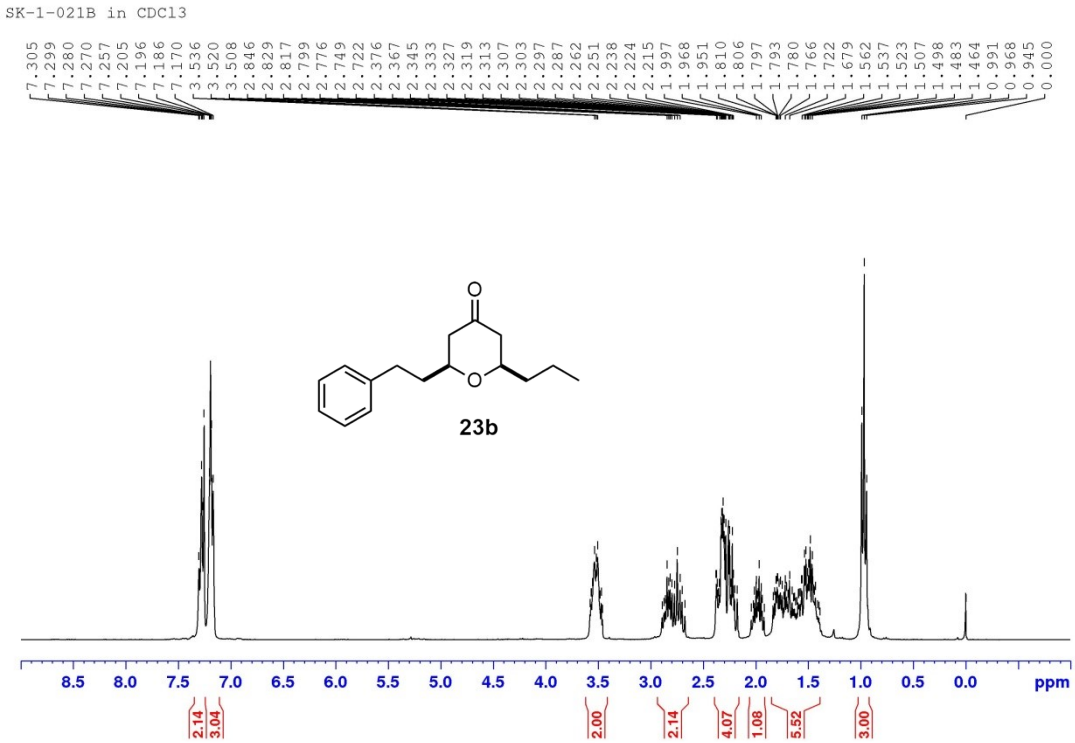


Figure SI12. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-phenethyl-6-propyltetrahydro-pyran-4-one (**23b**)

Figure SI13. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-pentyl-6-phenethyltetrahydro-pyran-4-one (**23c**)

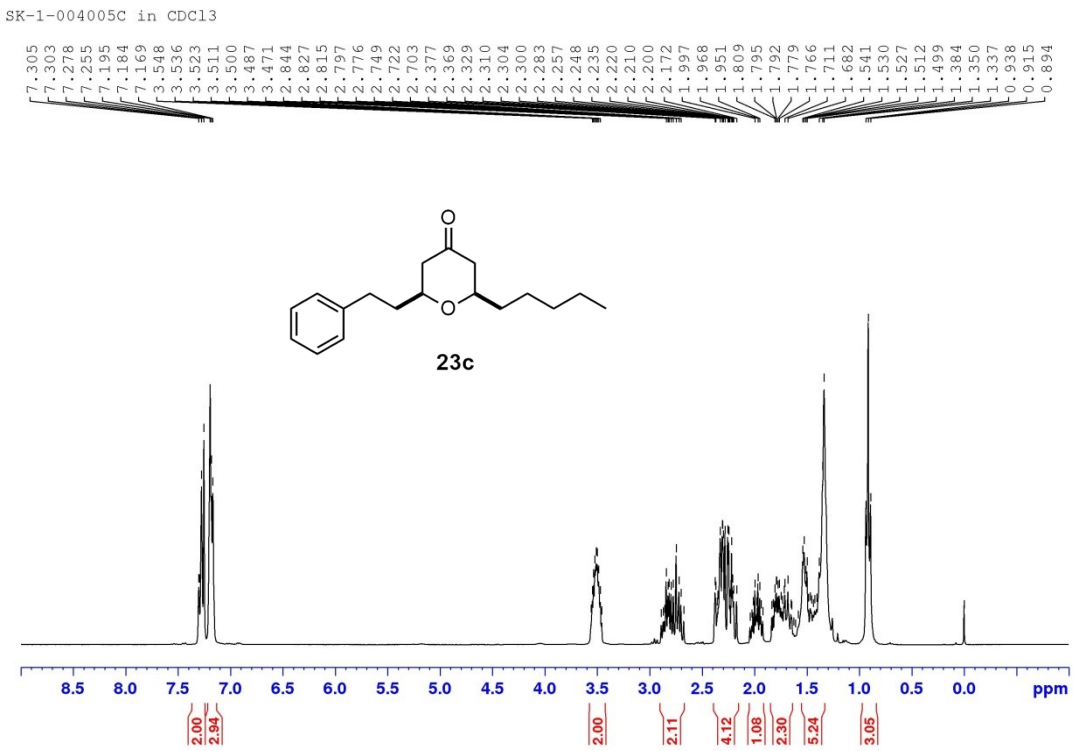


Figure SI14. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-pentyl-6-phenethyltetrahydro-pyran-4-one (**23c**)

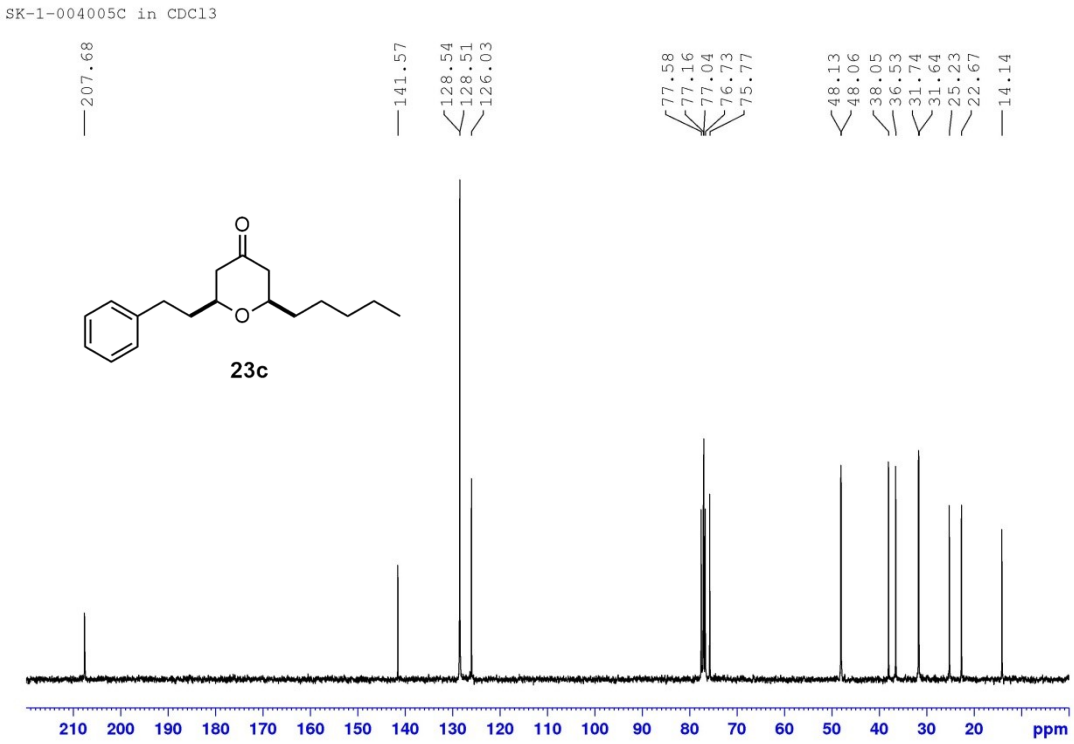


Figure SI15. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-isobutyl-6-phenethyltetrahydro-pyran-4-one (**23d**)

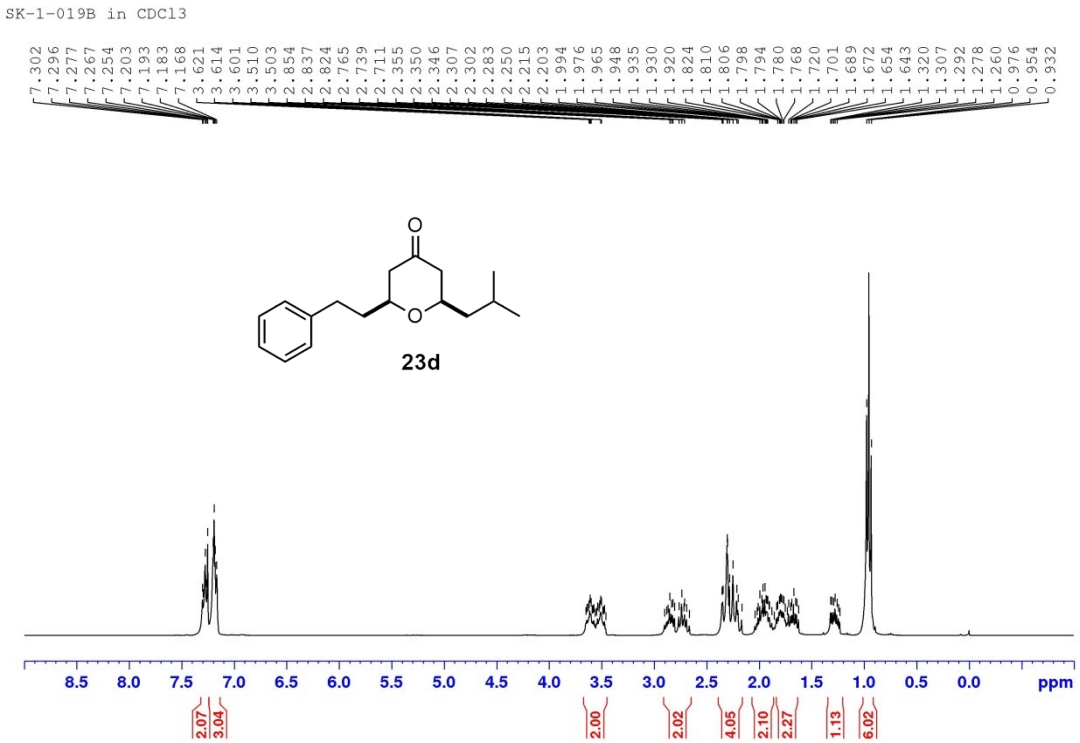


Figure SI16. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-isobutyl-6-phenethyltetrahydropyran-4-one (**23d**)

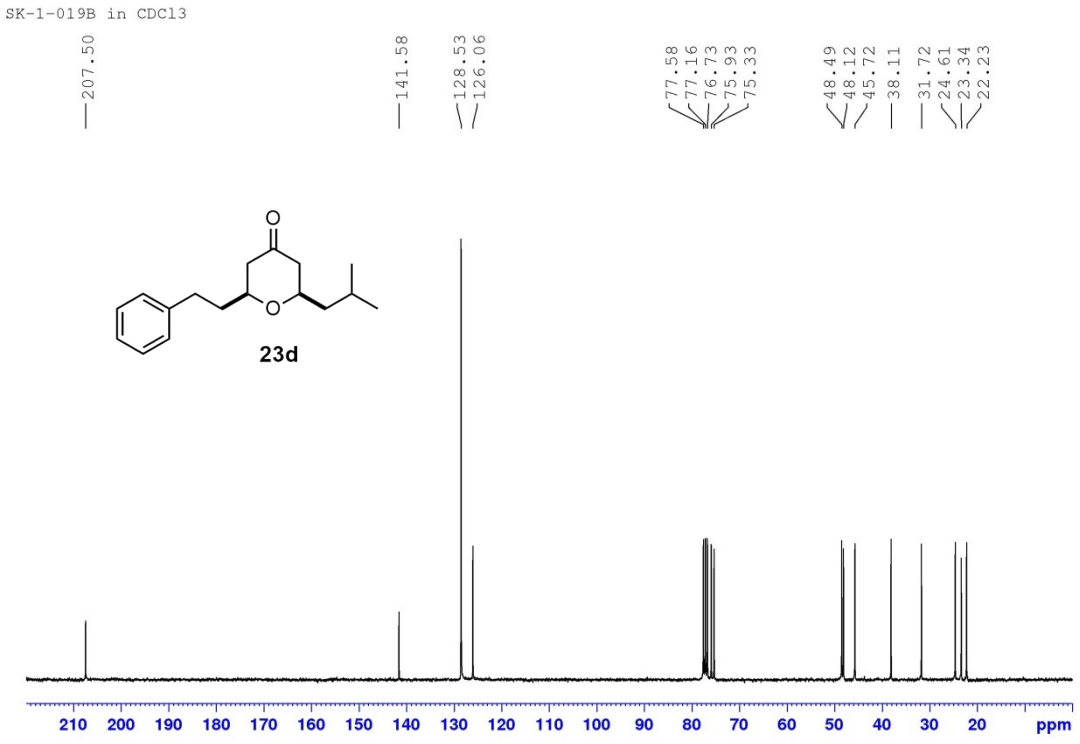


Figure SI17. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-isopropyl-6-phenethyltetrahydropyran-4-one (**23e**)

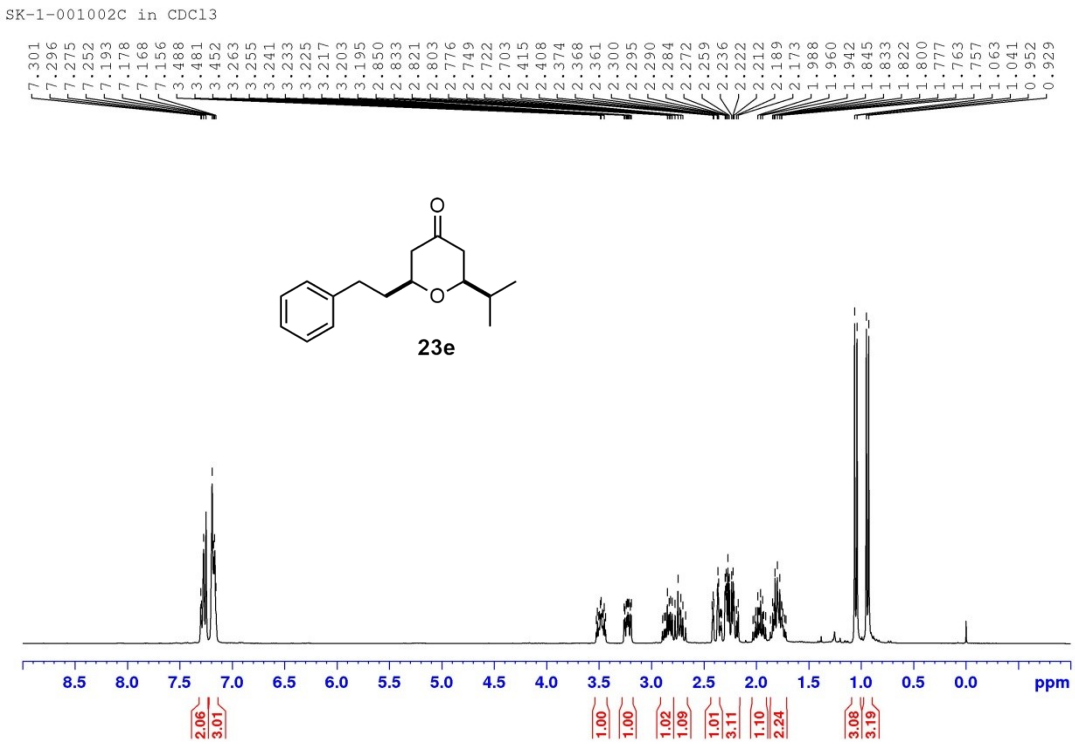


Figure SI18. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-isopropyl-6-phenethyltetrahydro-pyran-4-one (**23e**)

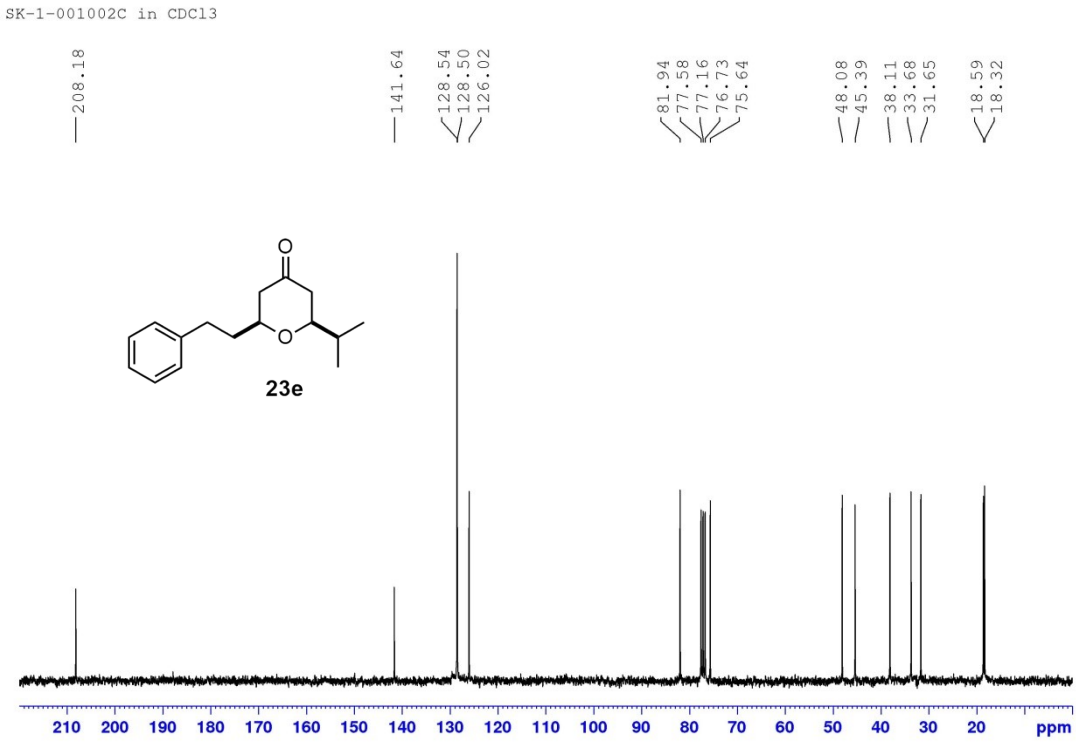


Figure SI19. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-cyclohexyl-6-phenethyltetra-hydropyran-4-one (**23f**)

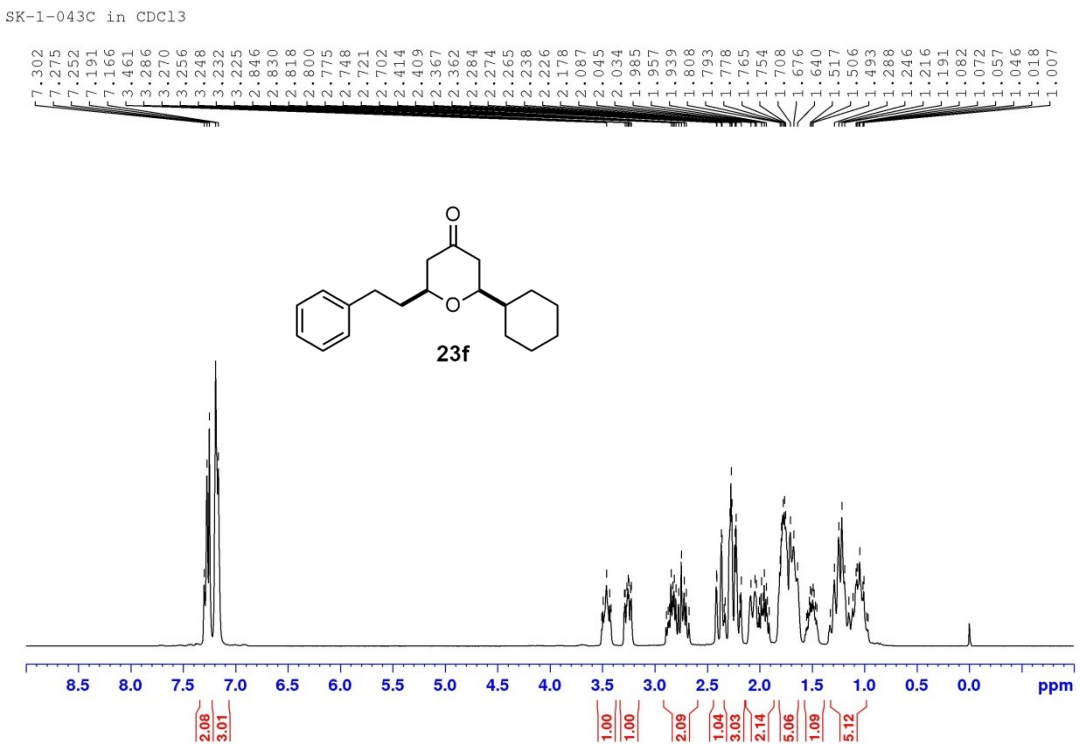


Figure SI20. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-cyclohexyl-6-phenethyltetra-hydropyran-4-one (**23f**)

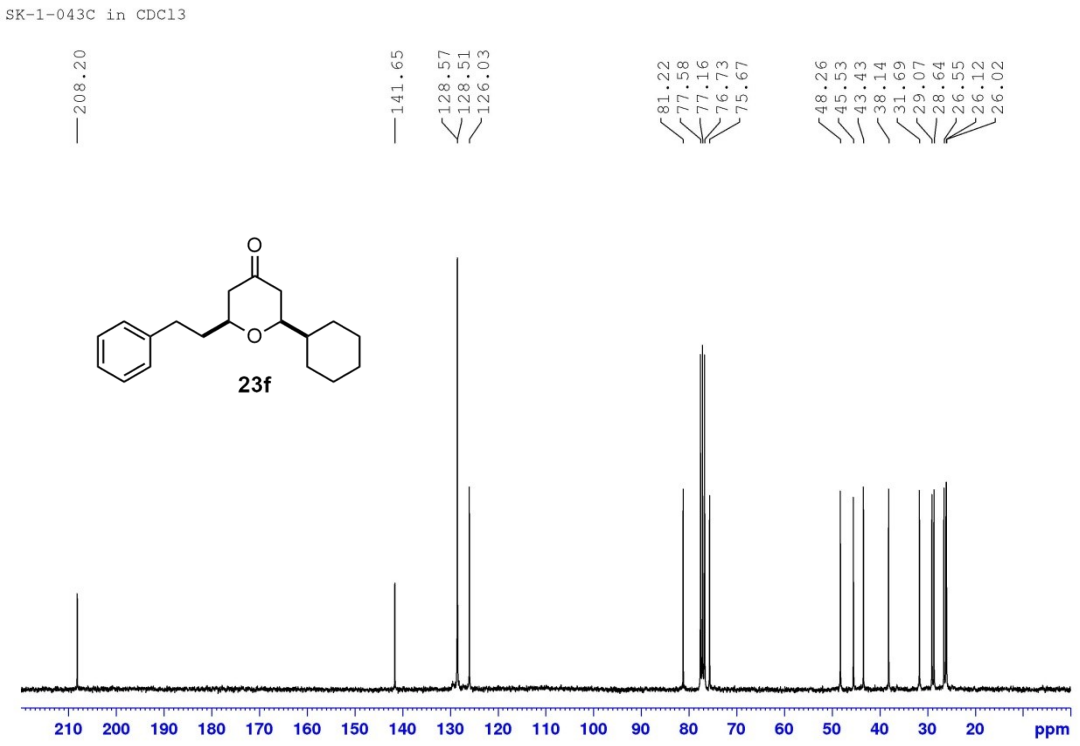


Figure SI21. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-phenethyl-6-phenyltetrahydro-pyran-4-one (**23g**)

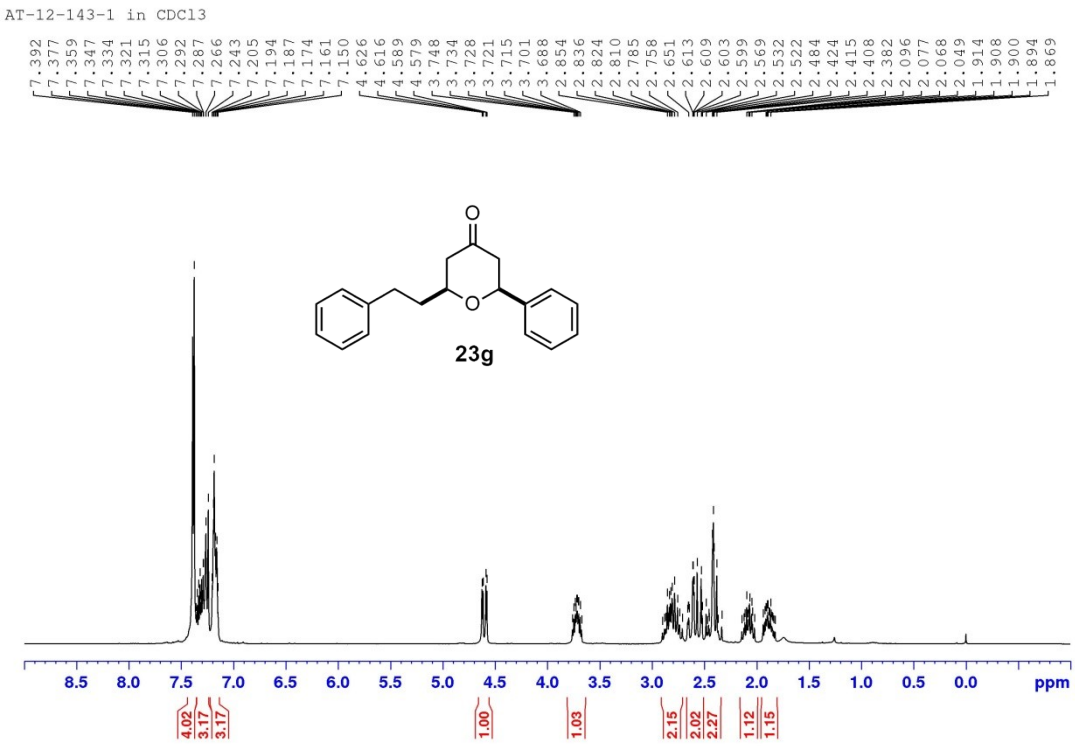


Figure SI22. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-phenethyl-6-phenyltetrahydro-pyran-4-one (**23g**)

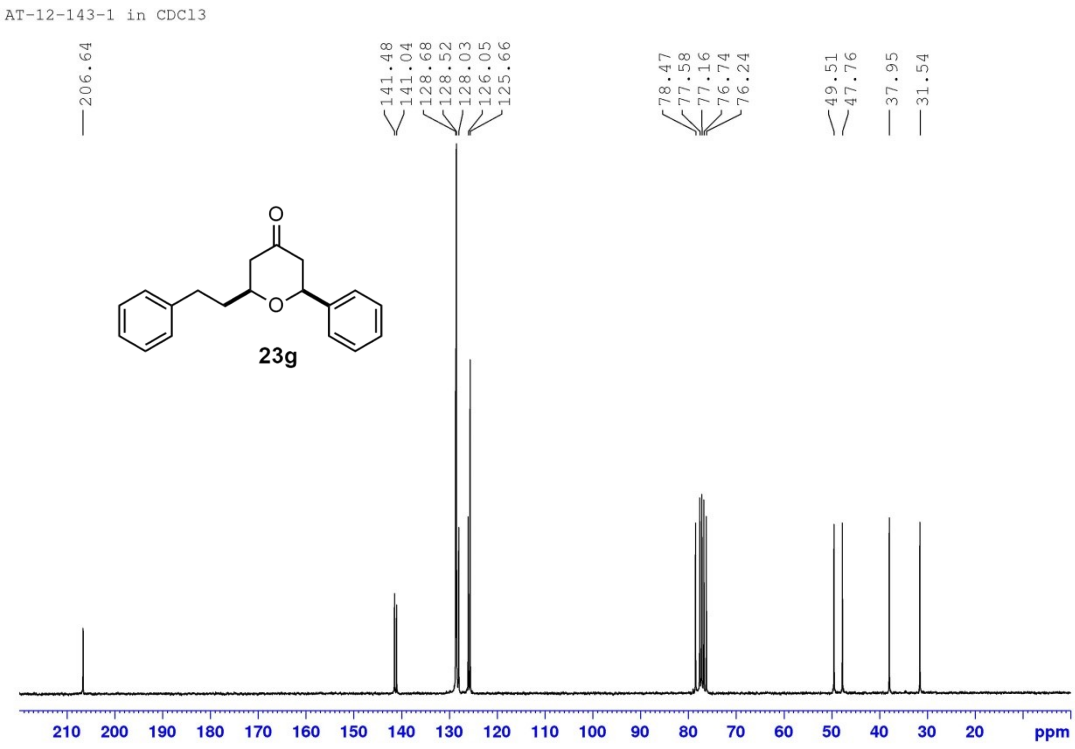


Figure SI23. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(4-nitrophenyl)-6-phenethyl-tetrahydropyran-4-one (**23h**)

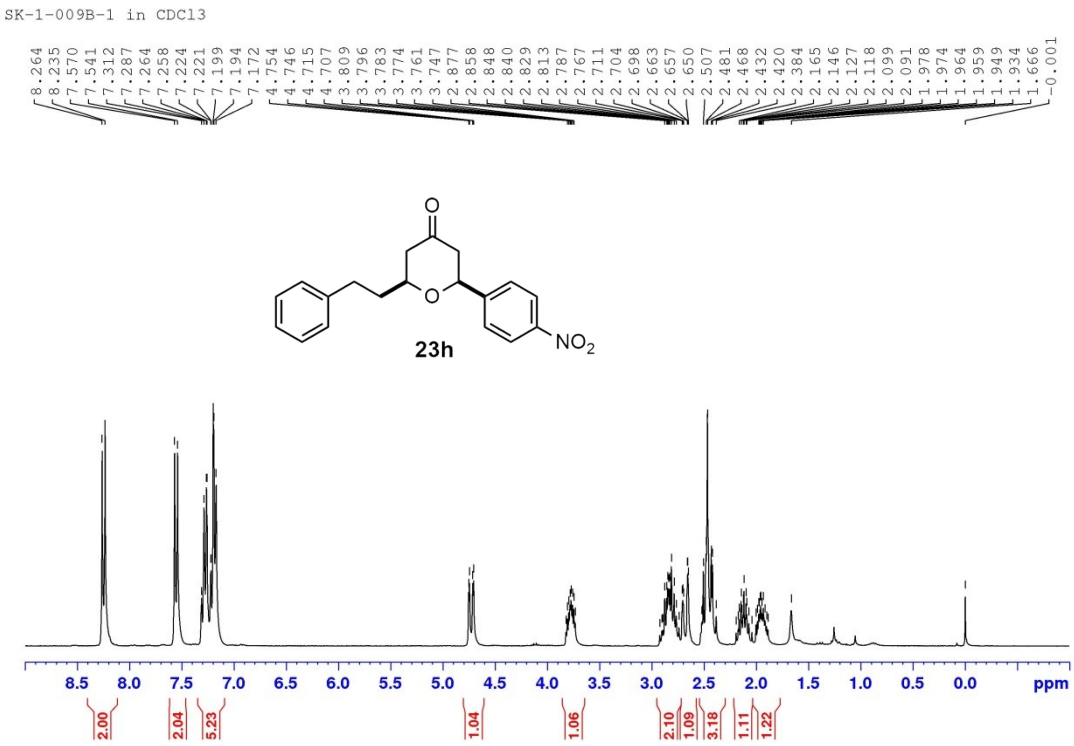


Figure SI24. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(4-nitrophenyl)-6-phenethyl-tetrahydropyran-4-one (**23h**)

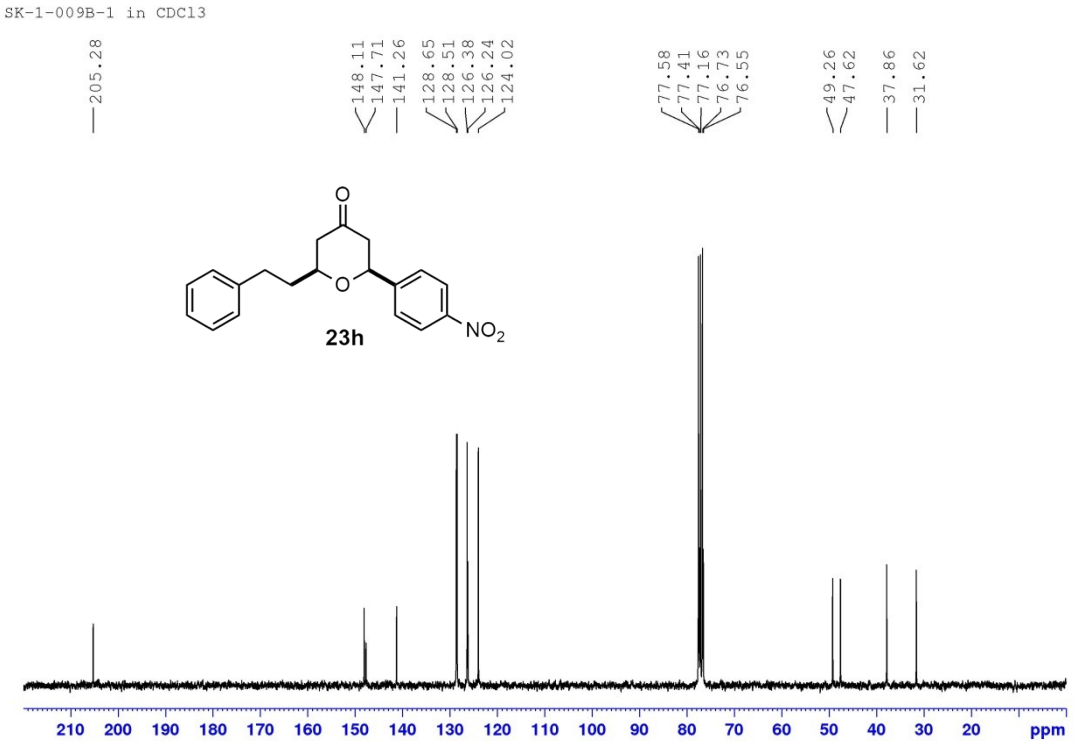


Figure SI25. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(4-cyanophenyl)-6-phenethyl-tetrahydropyran-4-one (**23i**)

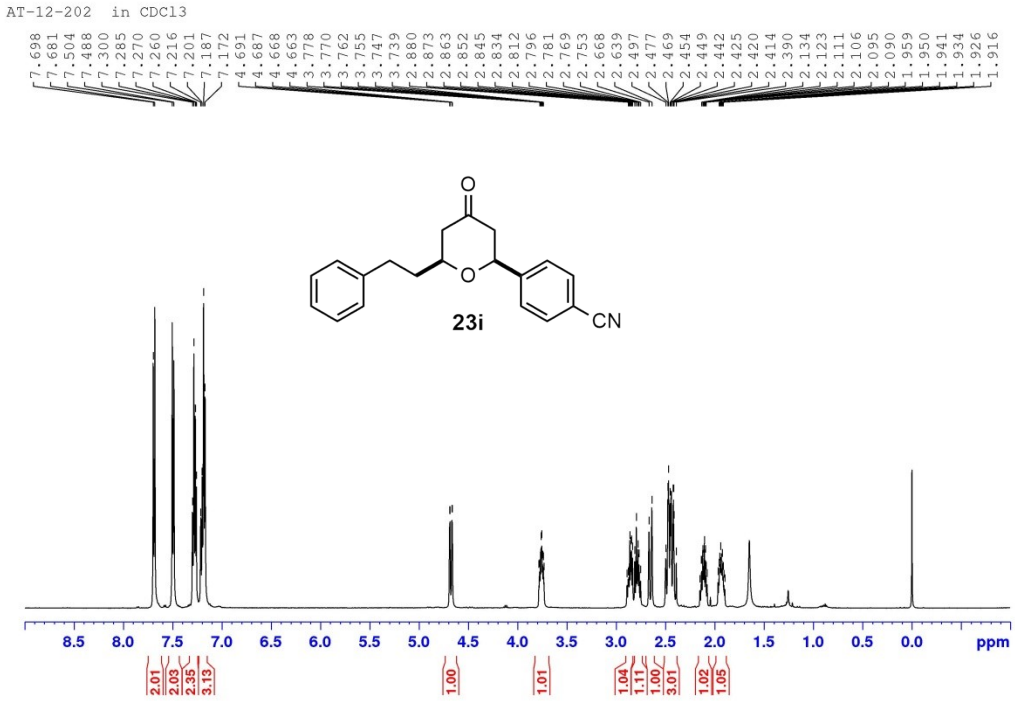


Figure SI26. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(4-Cyanophenyl)-6-phenethyl-tetrahydropyran-4-one (**23i**)

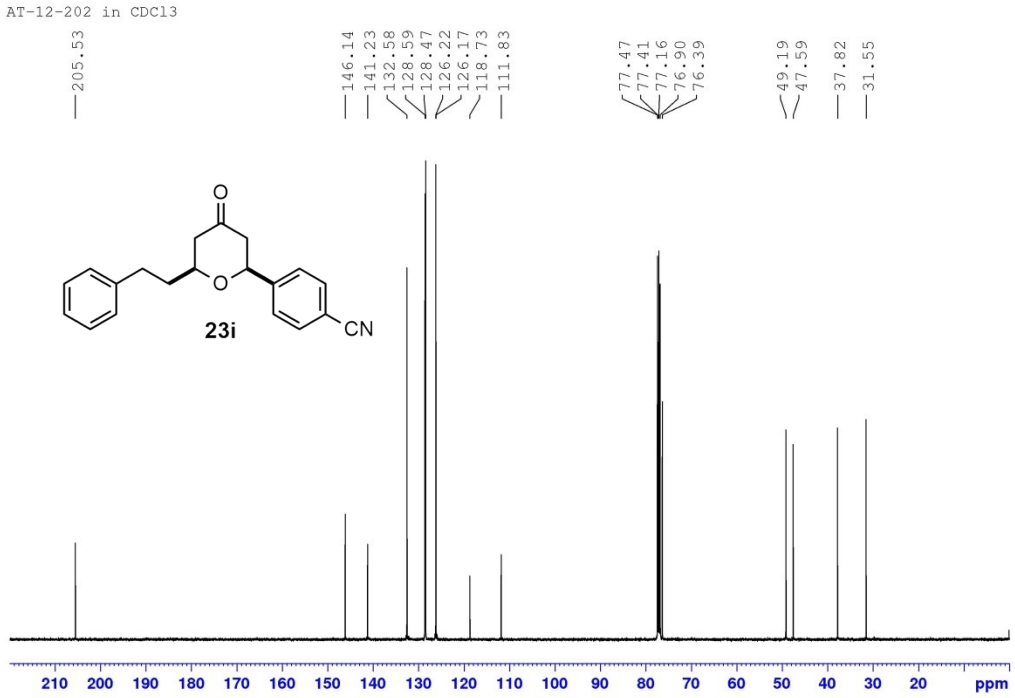


Figure SI27. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(4-bromophenyl)-6-phenethyl-tetrahydropyran-4-one (**23j**)

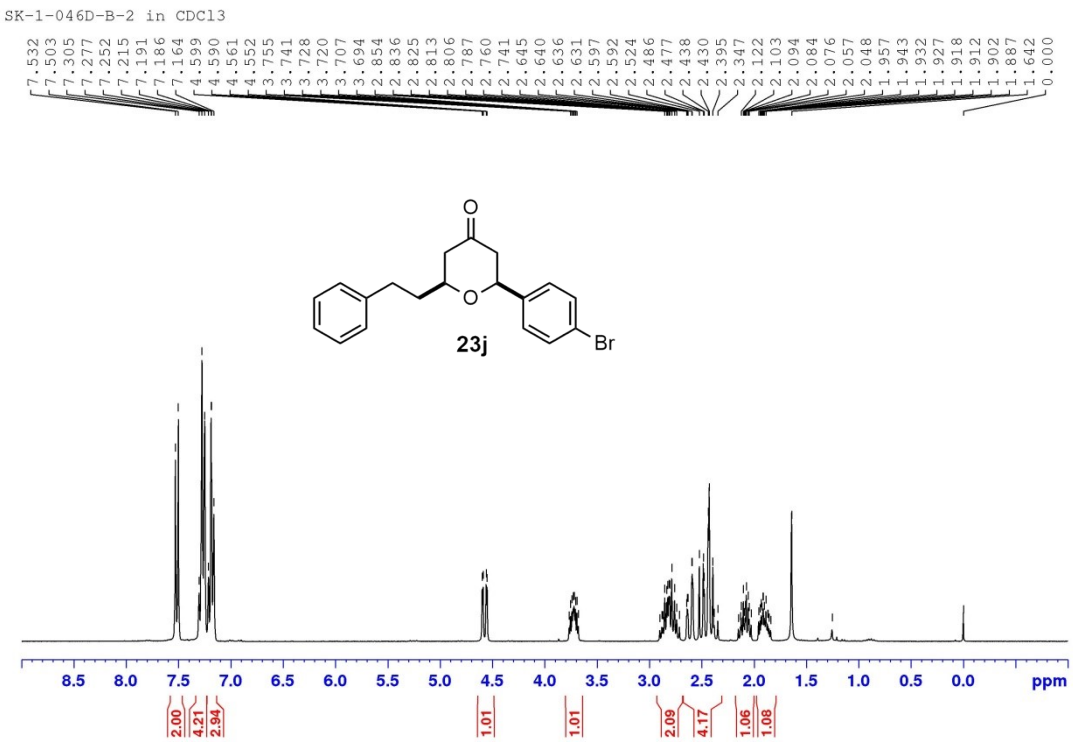


Figure SI28. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(4-bromophenyl)-6-phenethyl-tetrahydropyran-4-one (**23j**)

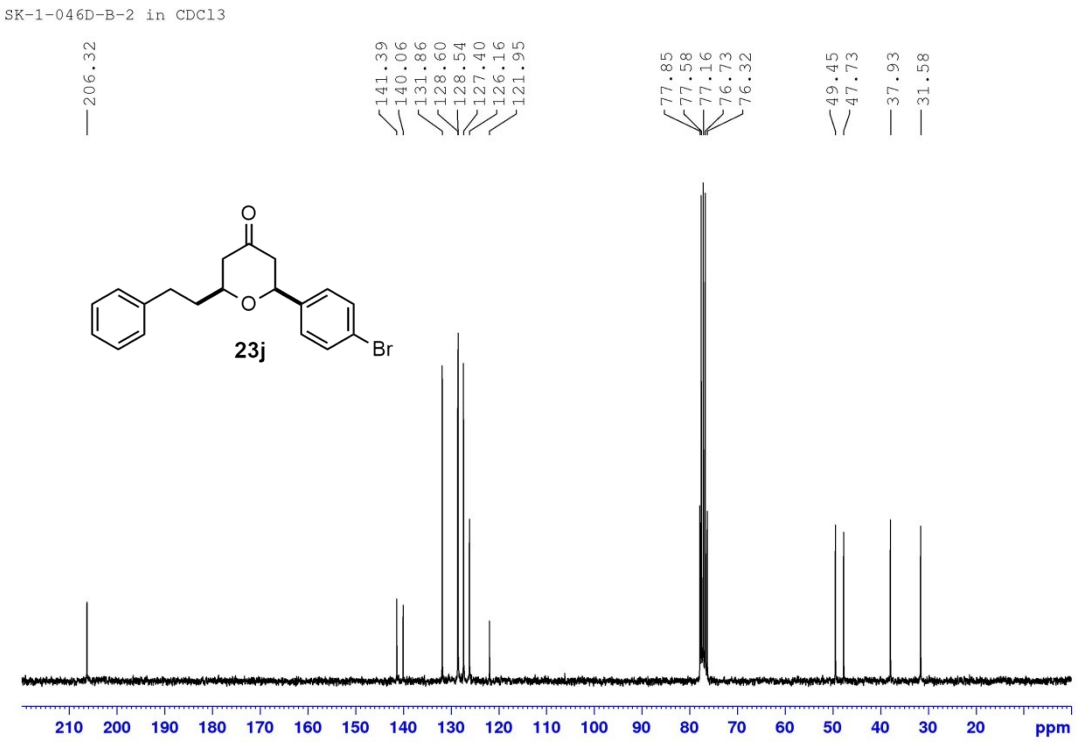


Figure SI29. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(4-chlorophenyl)-6-phenethyl-tetrahydropyran-4-one (**23k**)

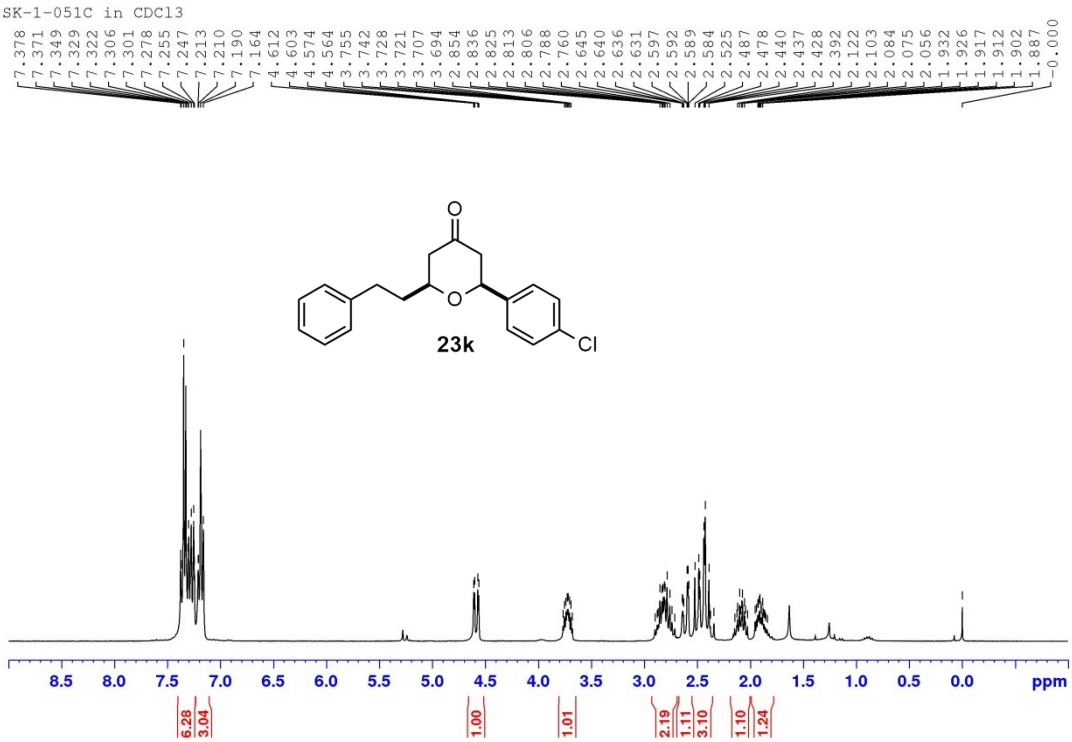


Figure SI30. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(4-bromophenyl)-6-phenethyl-tetrahydropyran-4-one (**23k**)

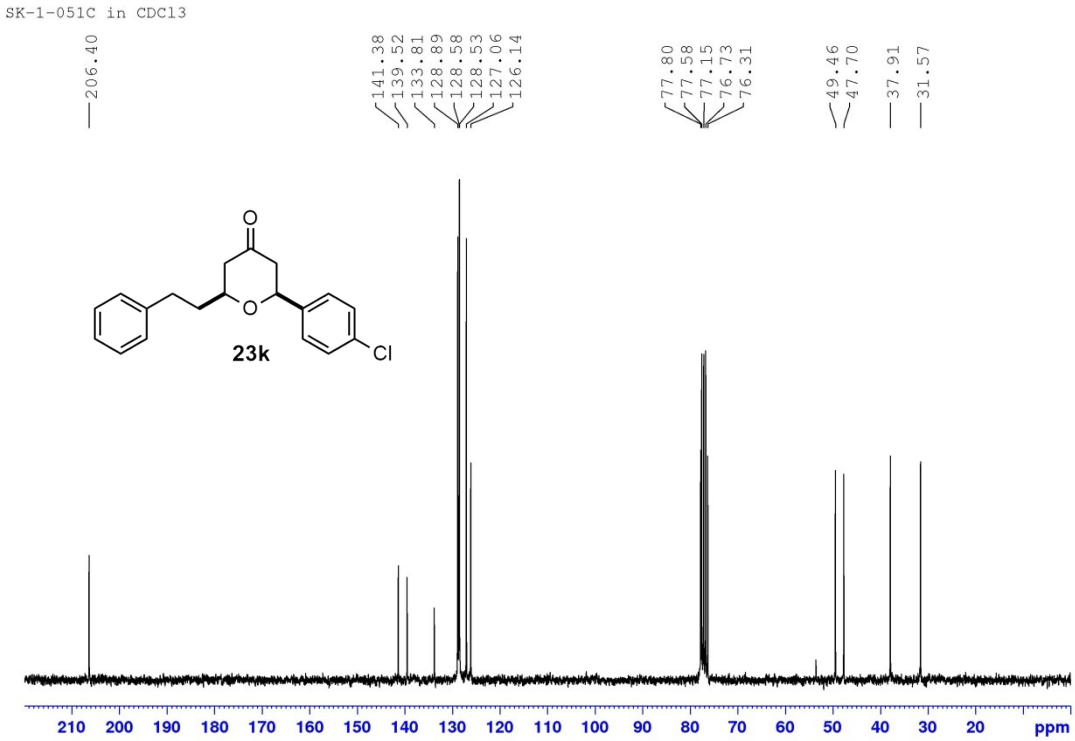


Figure SI31. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(4-methoxyphenyl)-6-phenethyltetrahydropyran-4-one (**23l**)

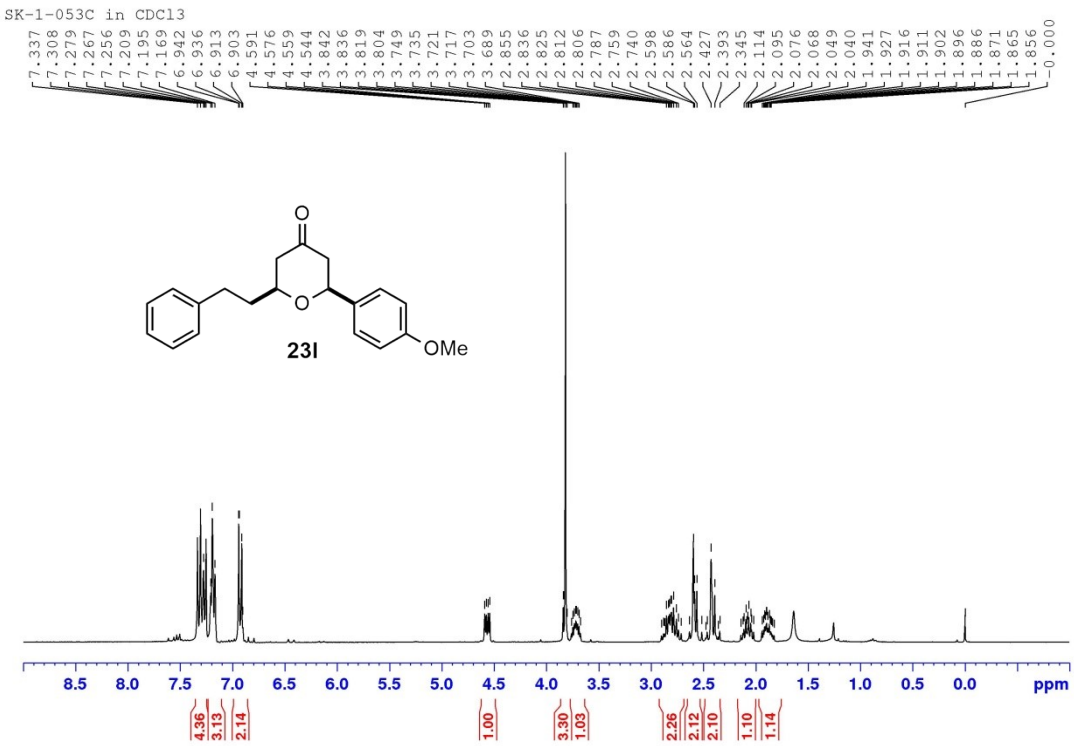


Figure SI32. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(4-methoxyphenyl)-6-phenethyltetrahydropyran-4-one (**23l**)

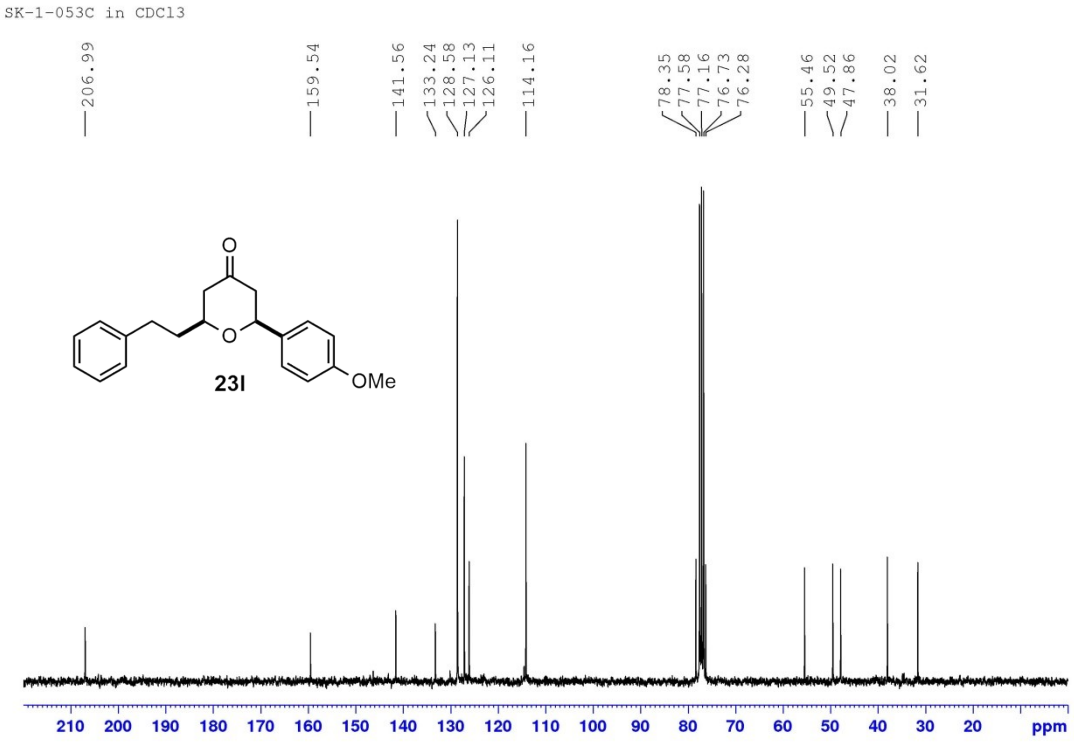


Figure SI33. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(3-methoxyphenyl)-6-phenethyltetrahydropyran-4-one (**23m**)

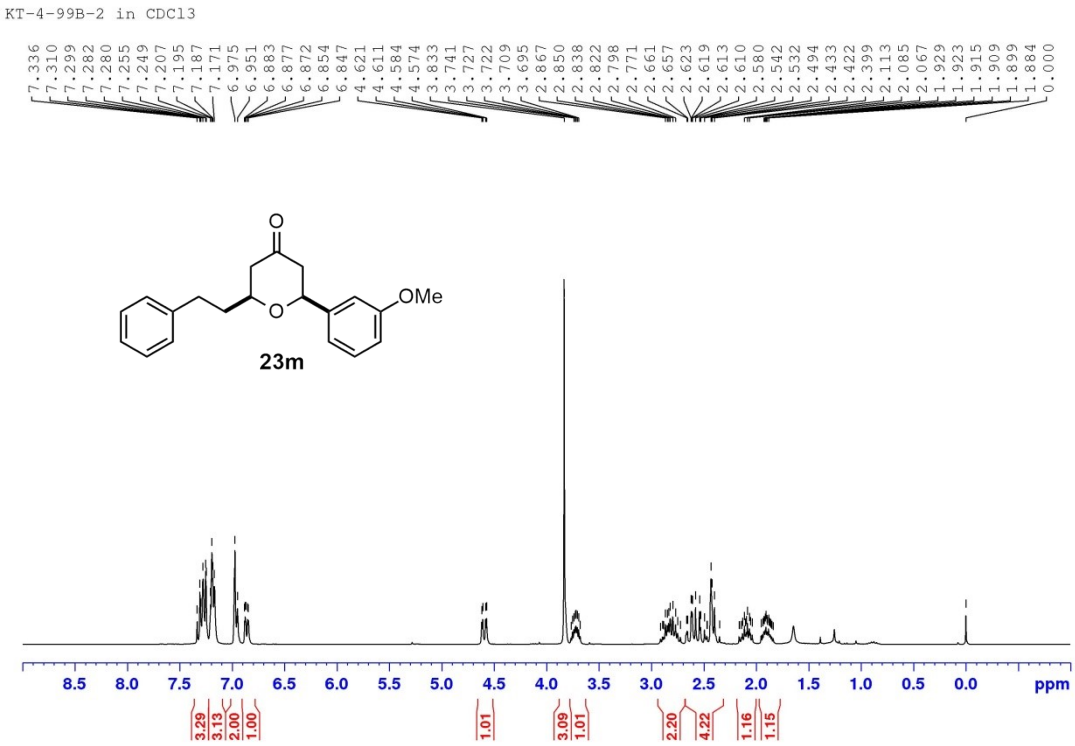


Figure SI34. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(3-methoxyphenyl)-6-phenethyltetrahydropyran-4-one (**23m**)

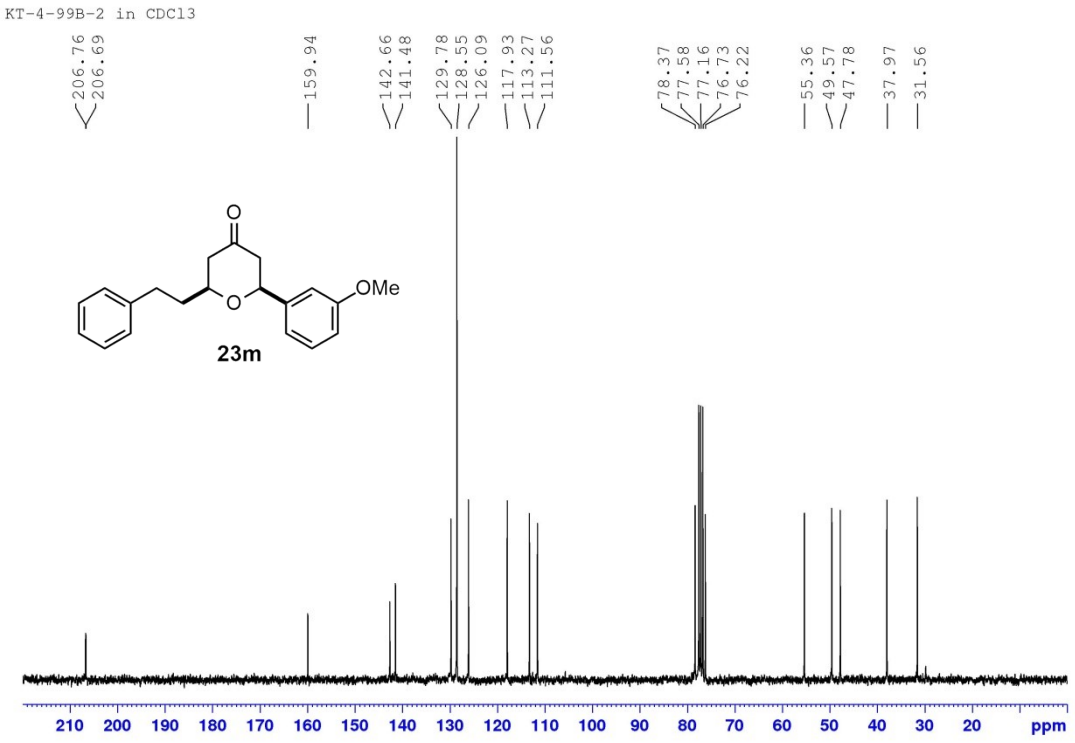


Figure SI35. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(2-methoxyphenyl)-6-phenethyltetrahydropyran-4-one (**23n**)

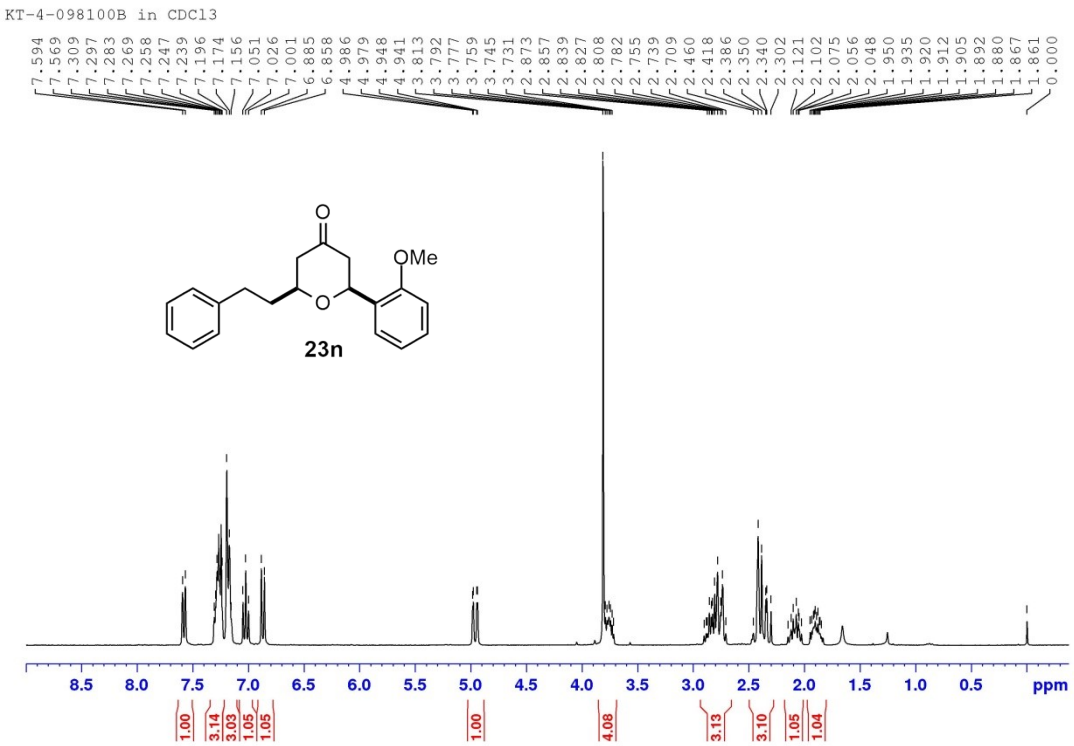


Figure SI36. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(3-methoxyphenyl)-6-phenethyltetrahydropyran-4-one (**23n**)

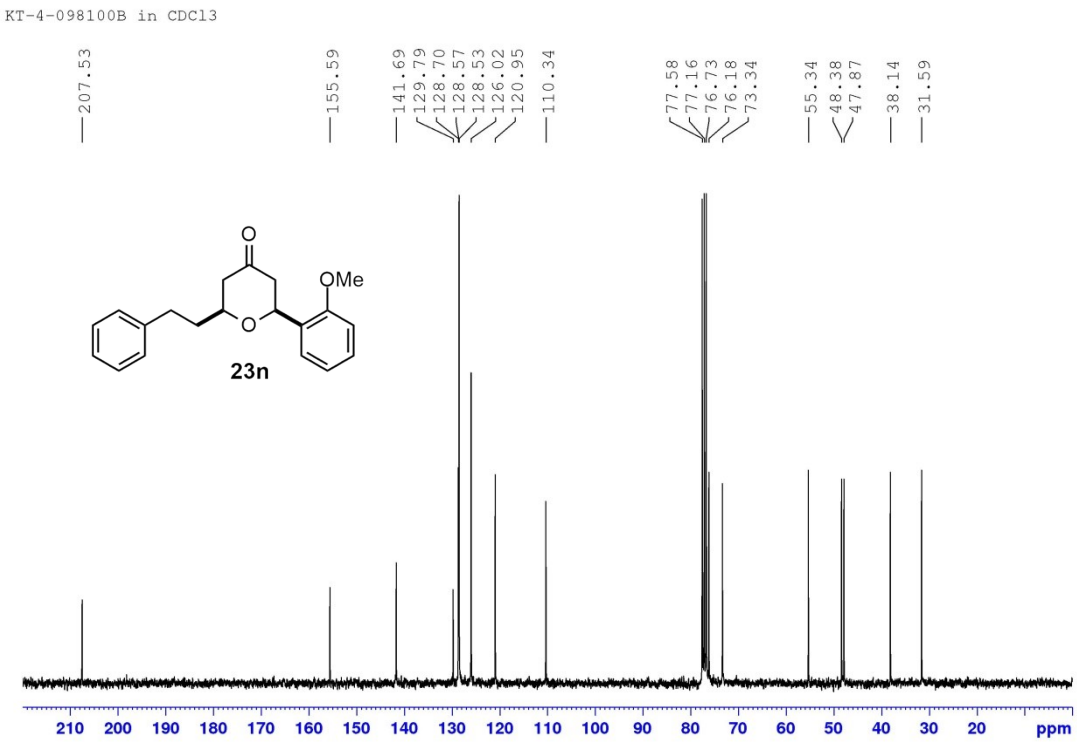


Figure SI37. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-phenethyl-6-styryltetrahydro-pyran-4-one (**23o**)

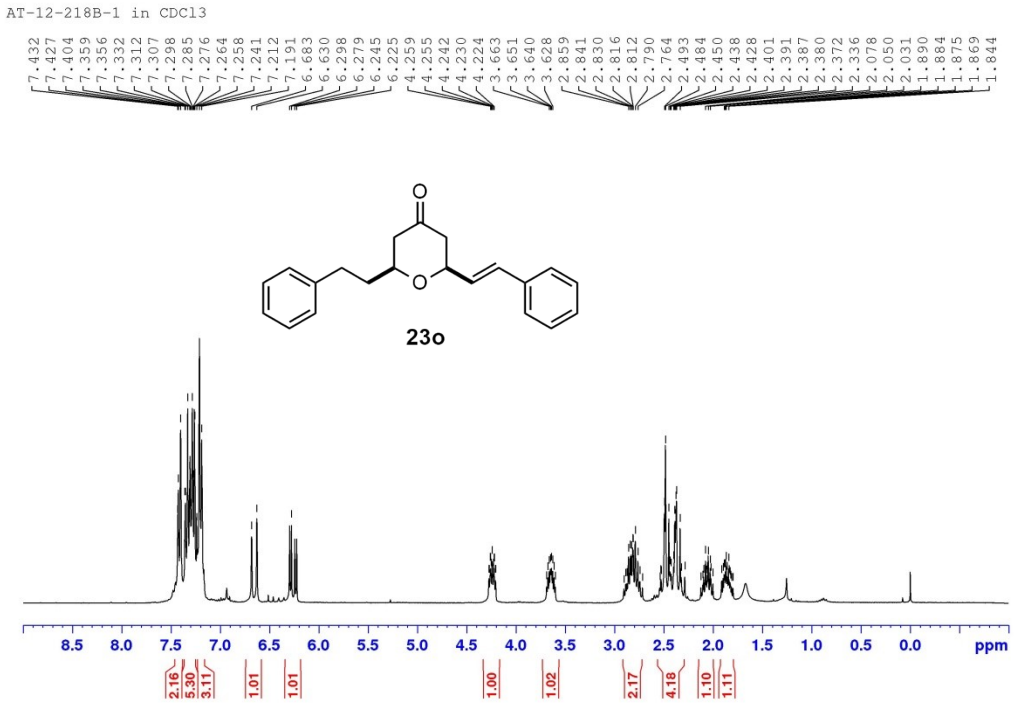


Figure SI38. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-phenethyl-6-styryltetrahydro-pyran-4-one (**23o**)

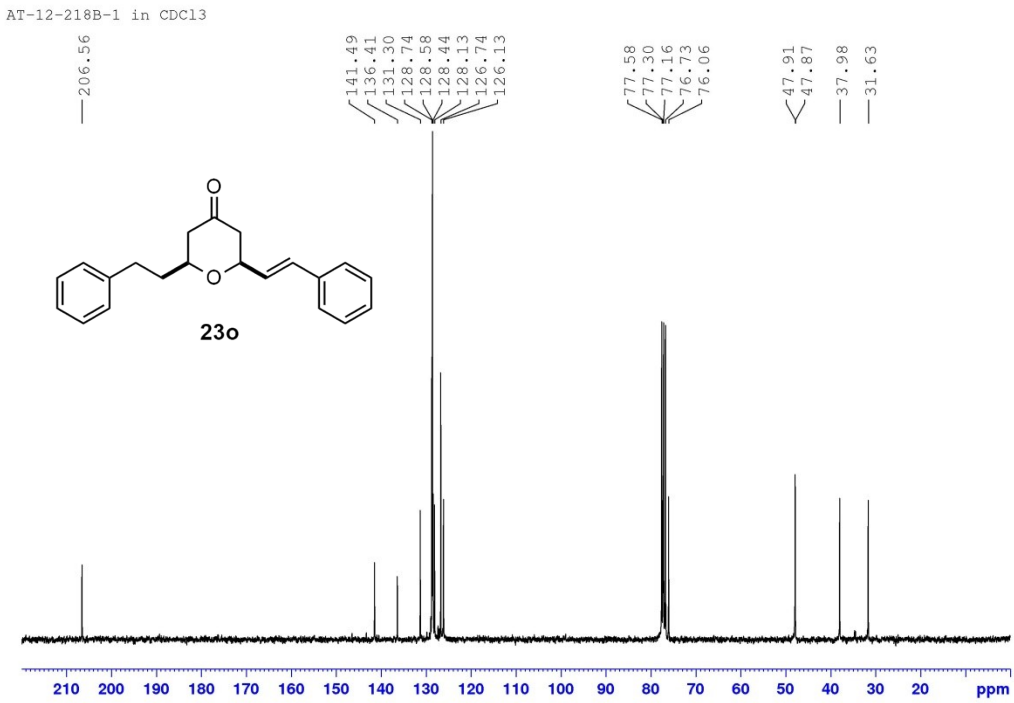


Figure SI39. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(3-benzoyloxypropyl)-6-cyclohexyltetrahydropyran-4-one (**23p**)

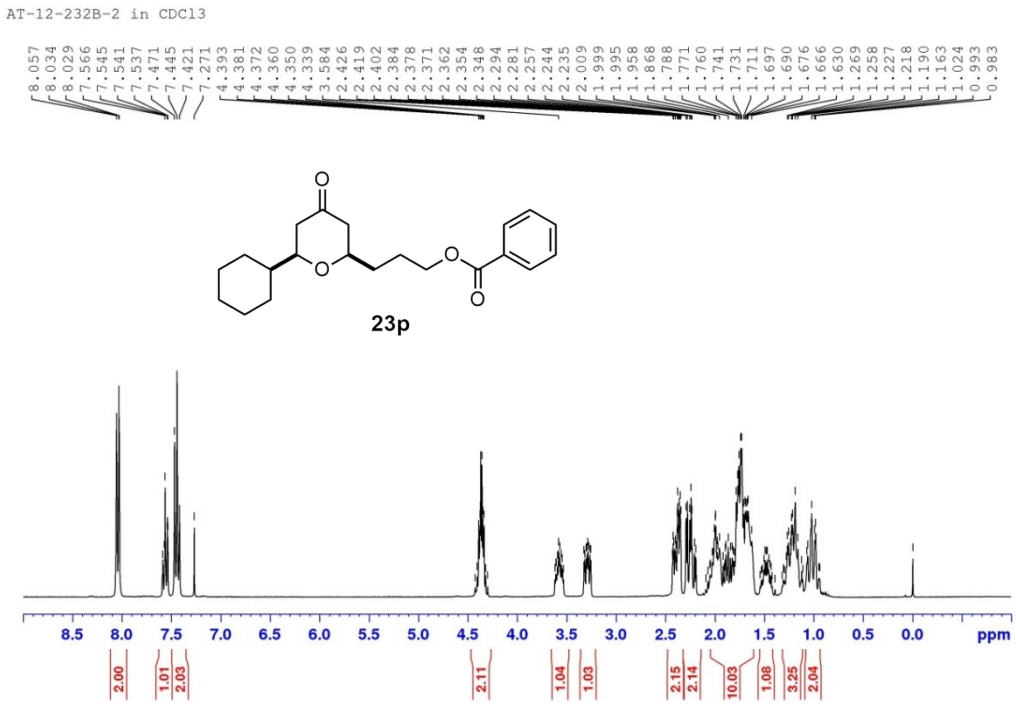


Figure SI40. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(3-benzoyloxypropyl)-6-cyclohexyltetrahydropyran-4-one (**23p**)

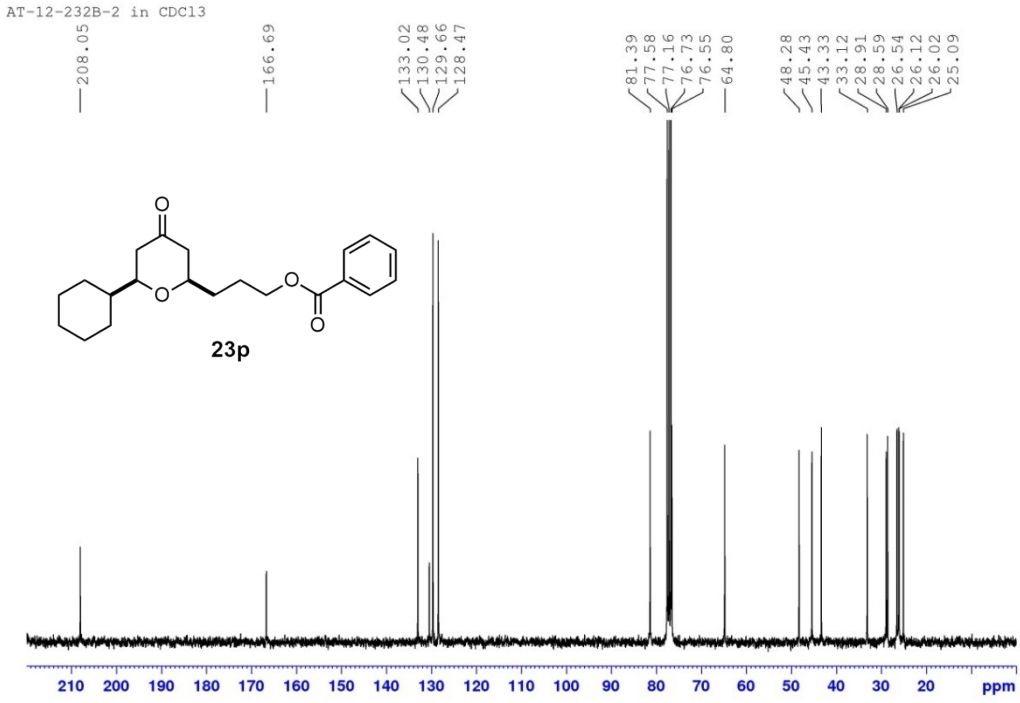


Figure SI41. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-cyclohexyl-6-propyltetrahydro-pyran-4-one (**23q**)

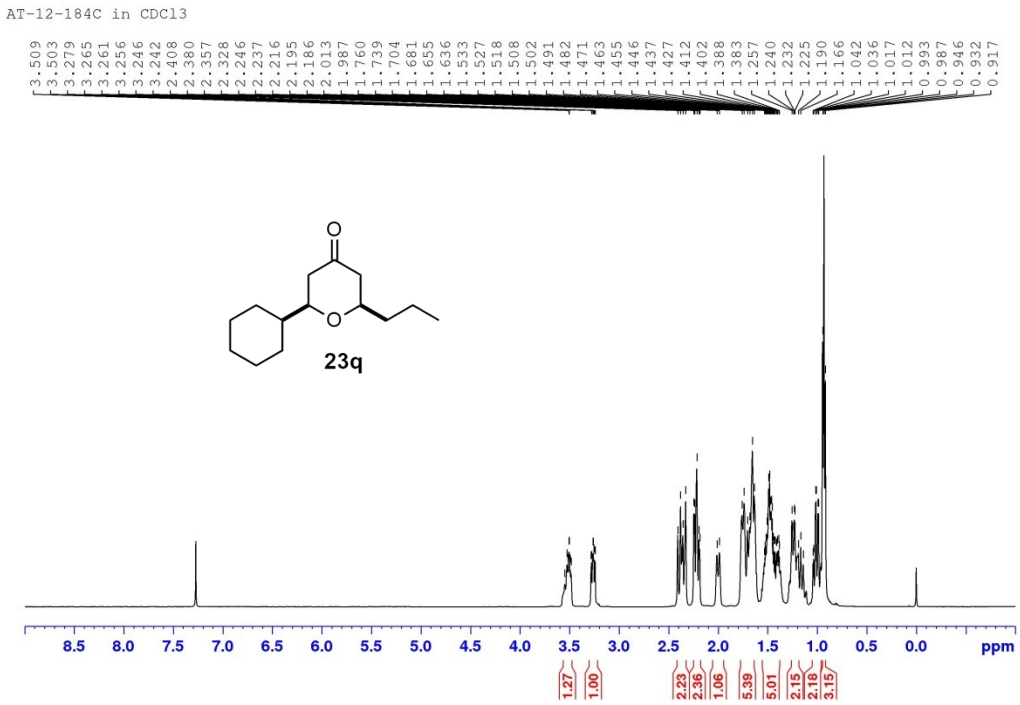


Figure SI42. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-cyclohexyl-6-propyltetrahydro-pyran-4-one (**23q**)

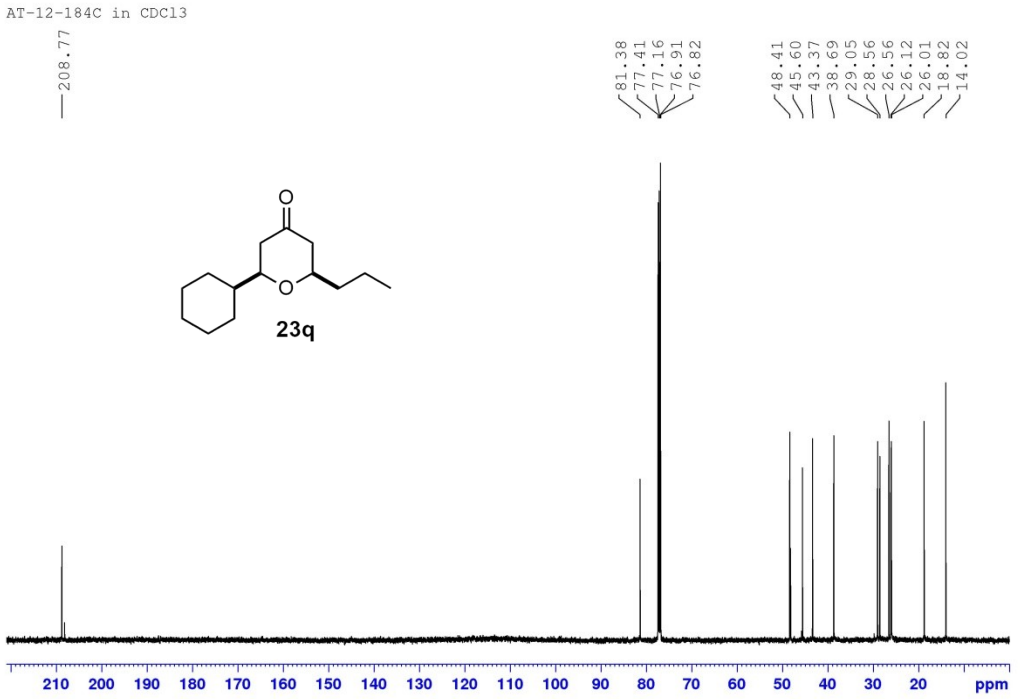


Figure SI43. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2,6-dicyclohexyltetrahydropyran-4-one (**23r**)

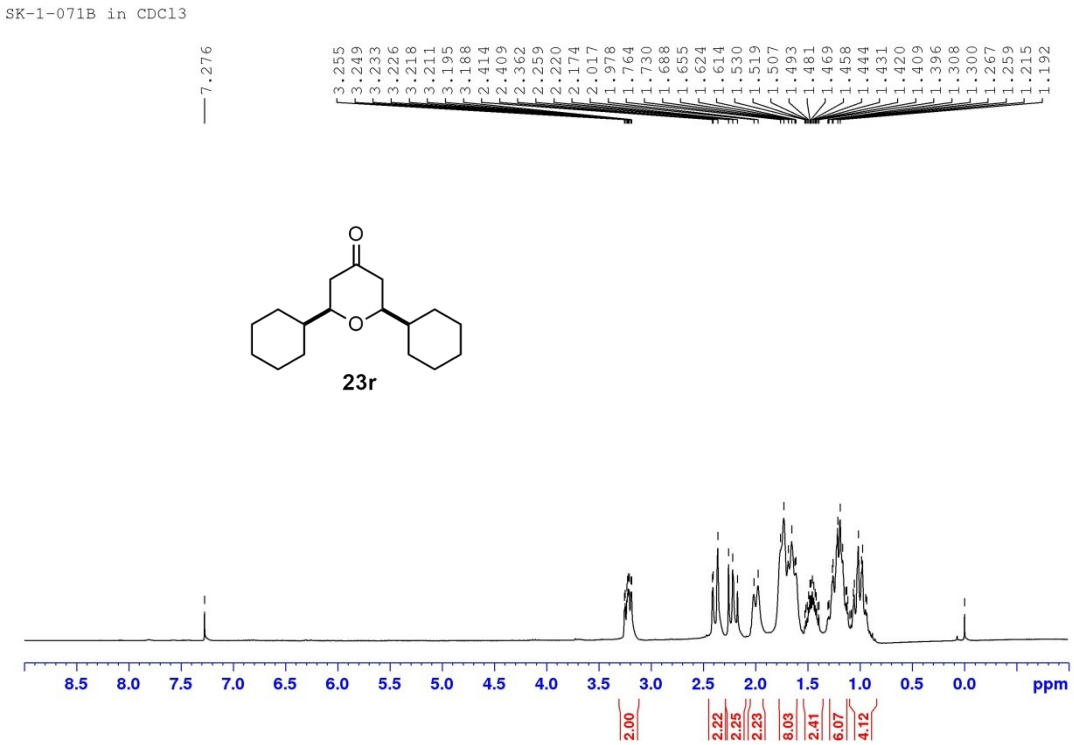


Figure SI44. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2,6-dicyclohexyltetrahydropyran-4-one (**23r**)

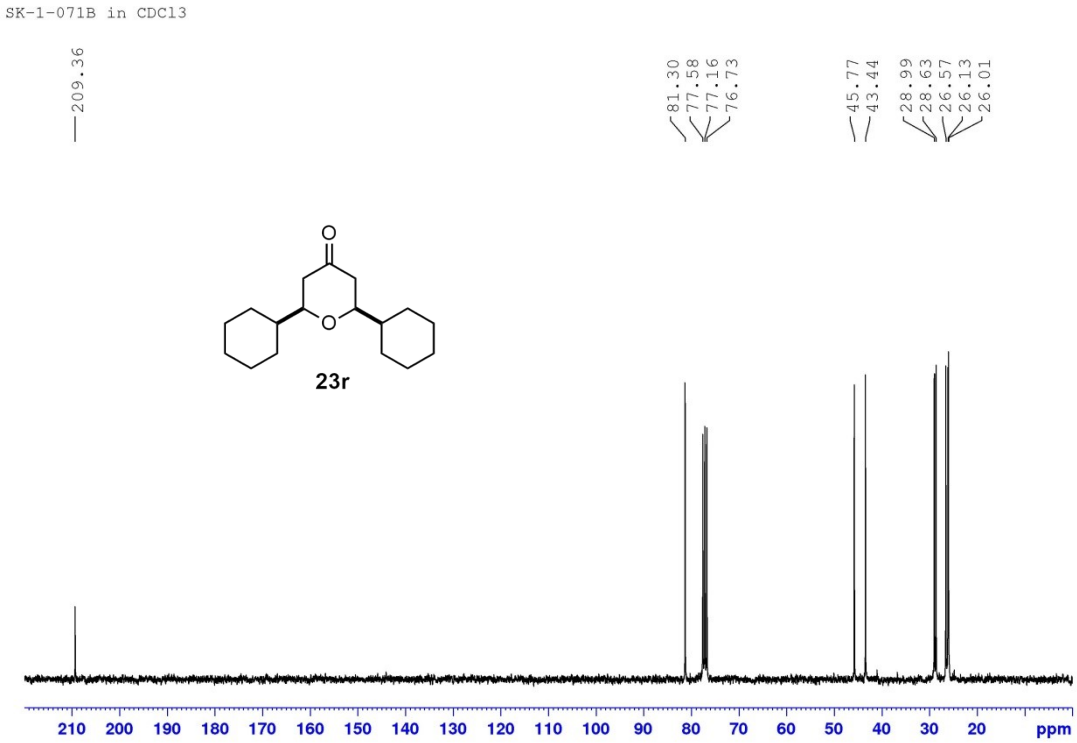


Figure SI45. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of 2-cyclohexyl-6-(4-nitrophenyl) tetrahydropyran-4-one (**23s**)

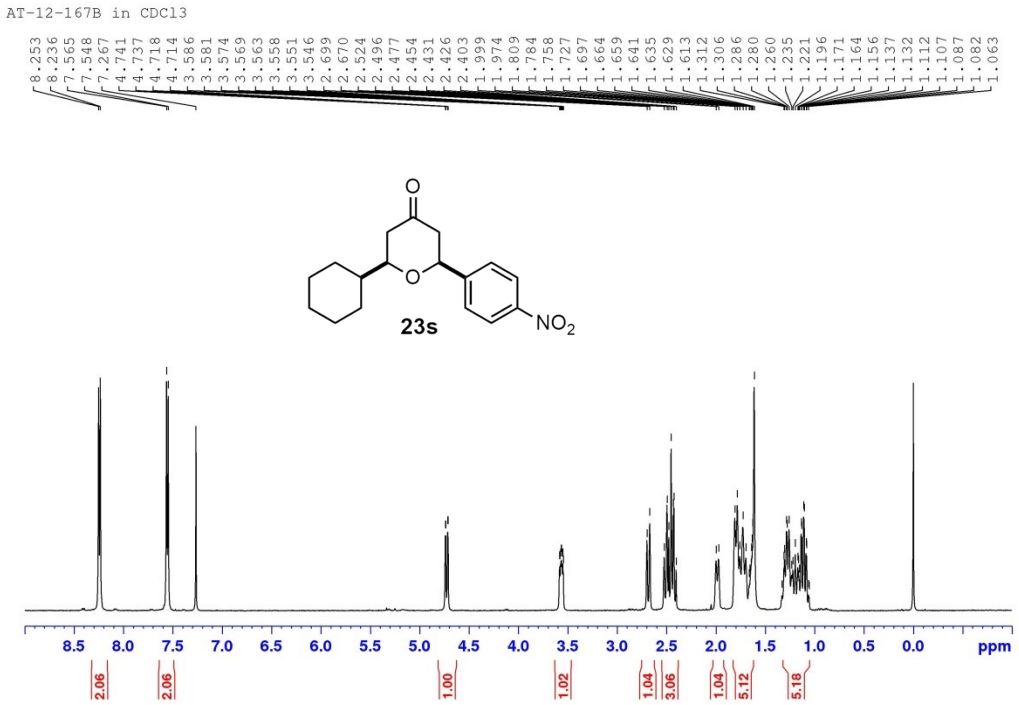


Figure SI46. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of 2-cyclohexyl-6-(4-nitrophenyl) tetrahydropyran-4-one (**23s**)

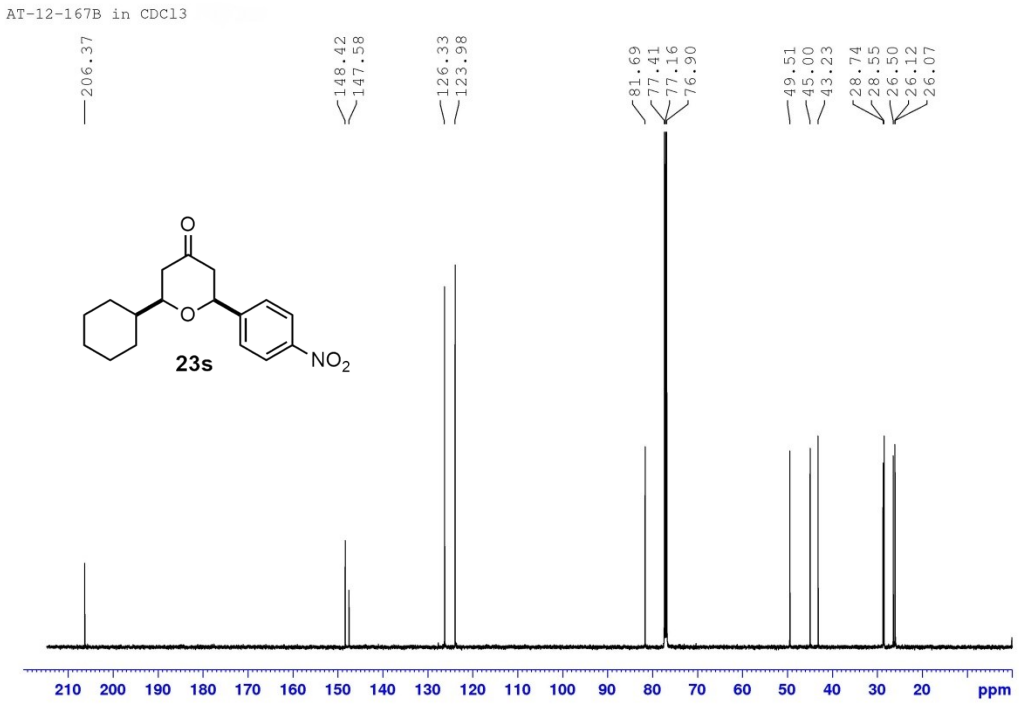


Figure SI47. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-Cyclohexyl-6-(4-methoxy-phenyl)tetrahydropyran-4-one (**23t**)

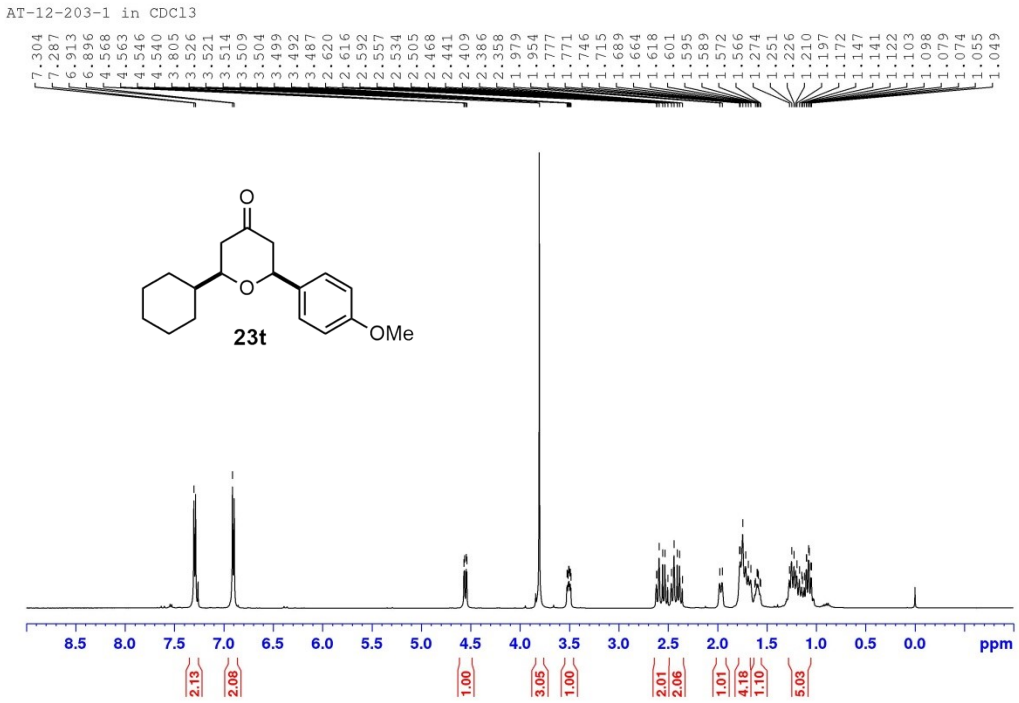


Figure SI48. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-cyclohexyl-6-(4-methoxy phenyl)tetrahydropyran-4-one (**23t**)

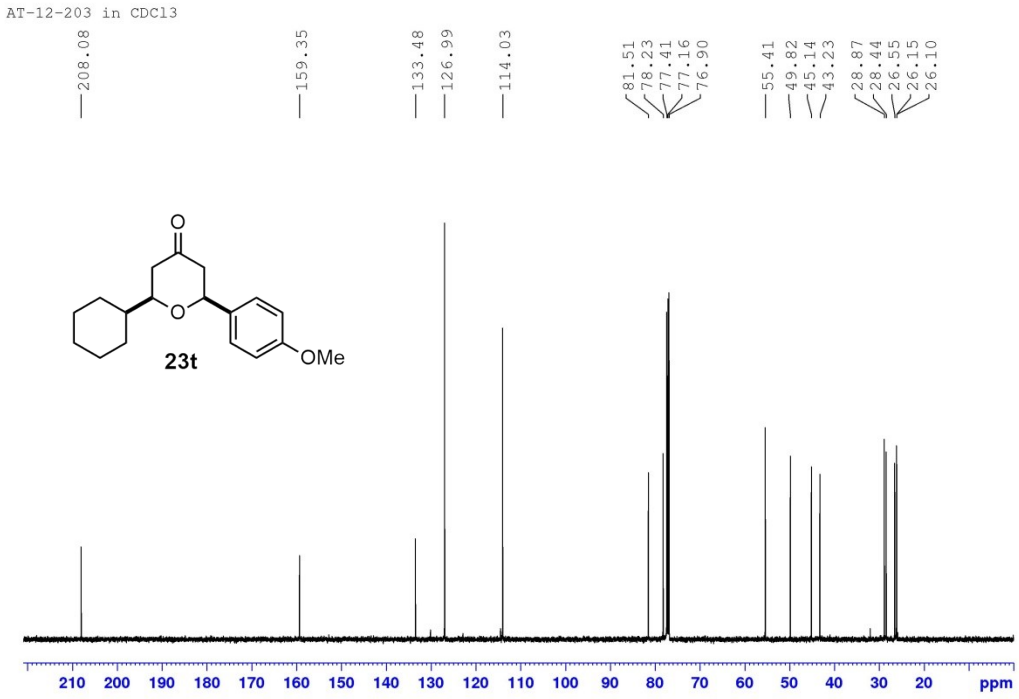


Figure SI49. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-isopropyl-6-phenyltetrahydro-pyran-4-one (**23u**)

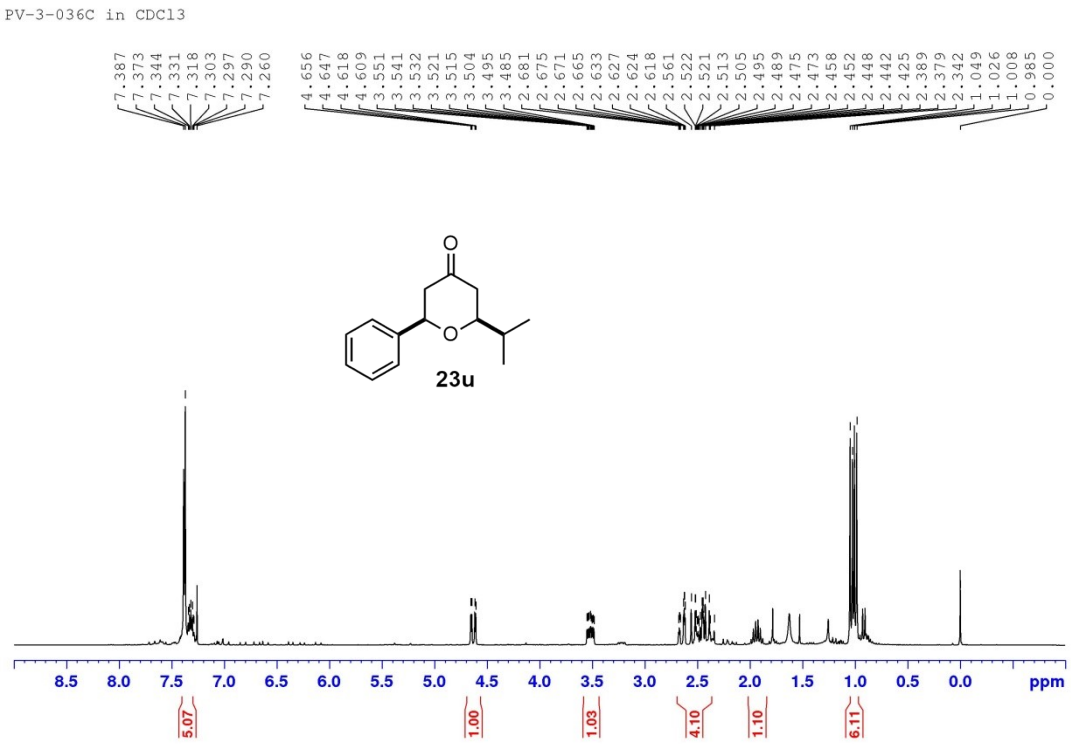


Figure SI50. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-isopropyl-6-phenyltetrahydro-pyran-4-one (**23u**)

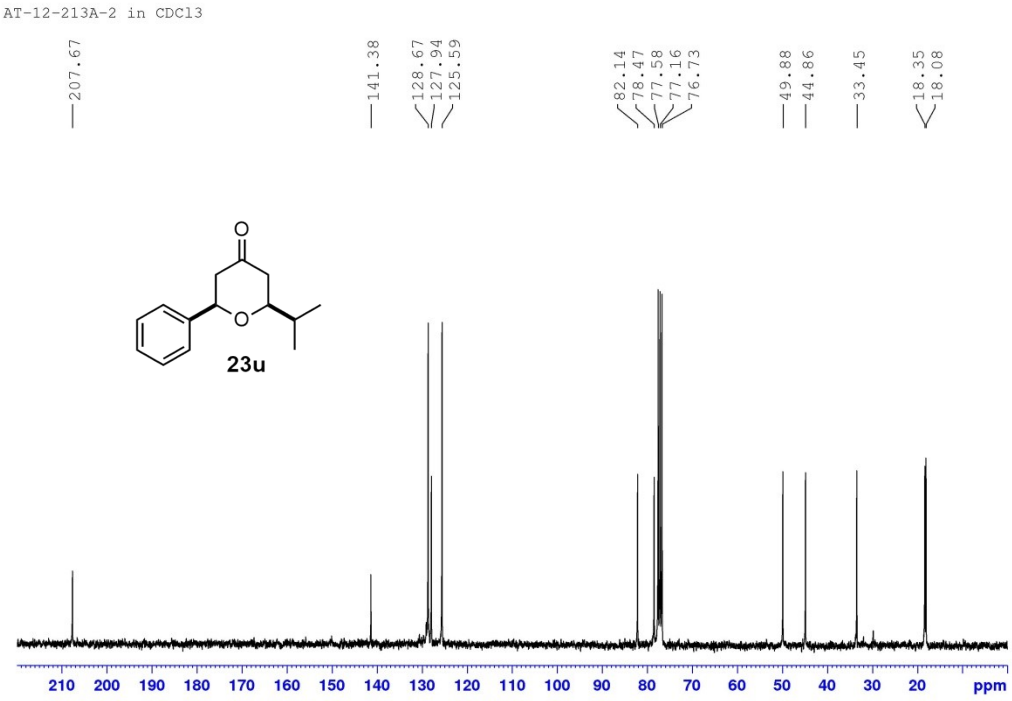


Figure SI51. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2,6-diisopropyltetrahydropyran-4-one (**23v**)

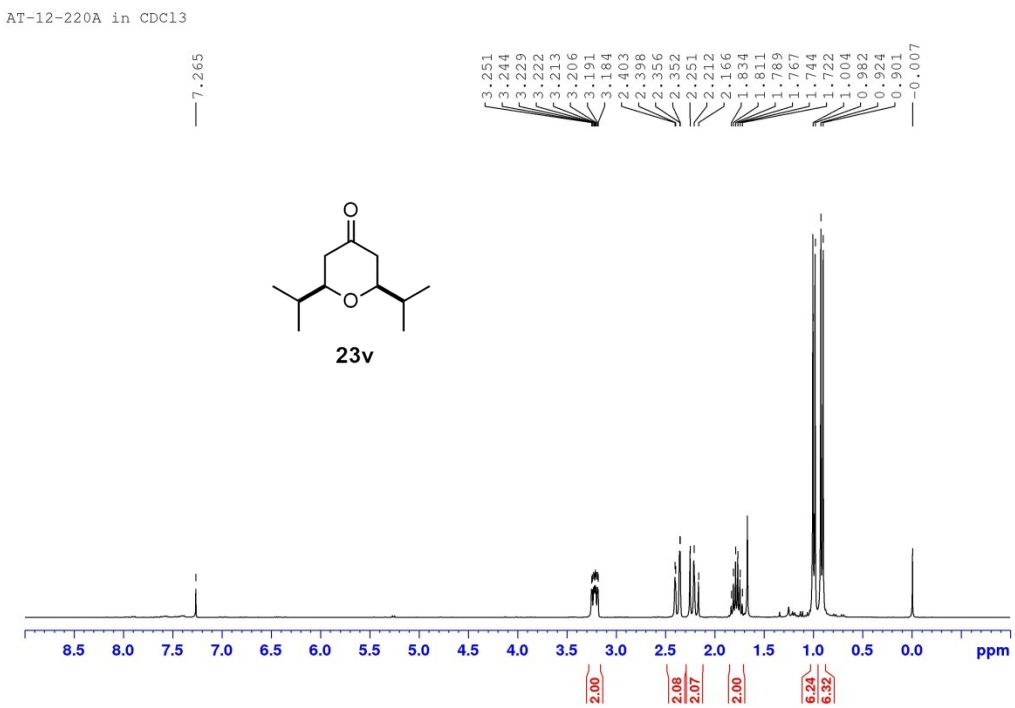


Figure SI52. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2,6-diisopropyltetrahydropyran-4-one (**23v**)

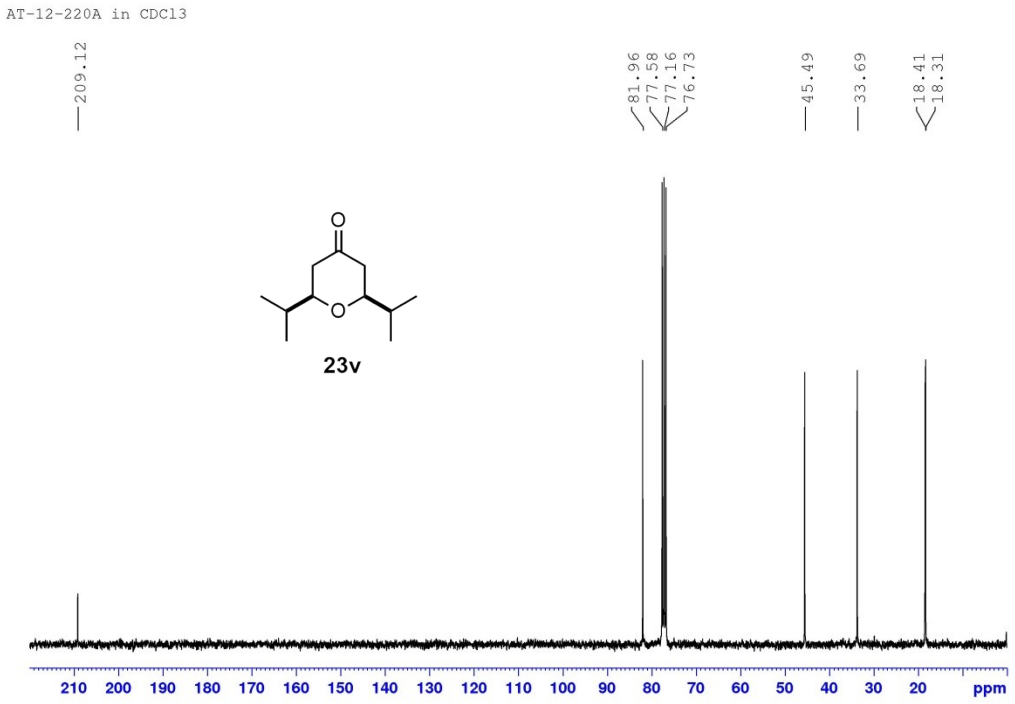


Figure SI53. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2,6-diphenyltetrahydropyran-4-one (**23w**)

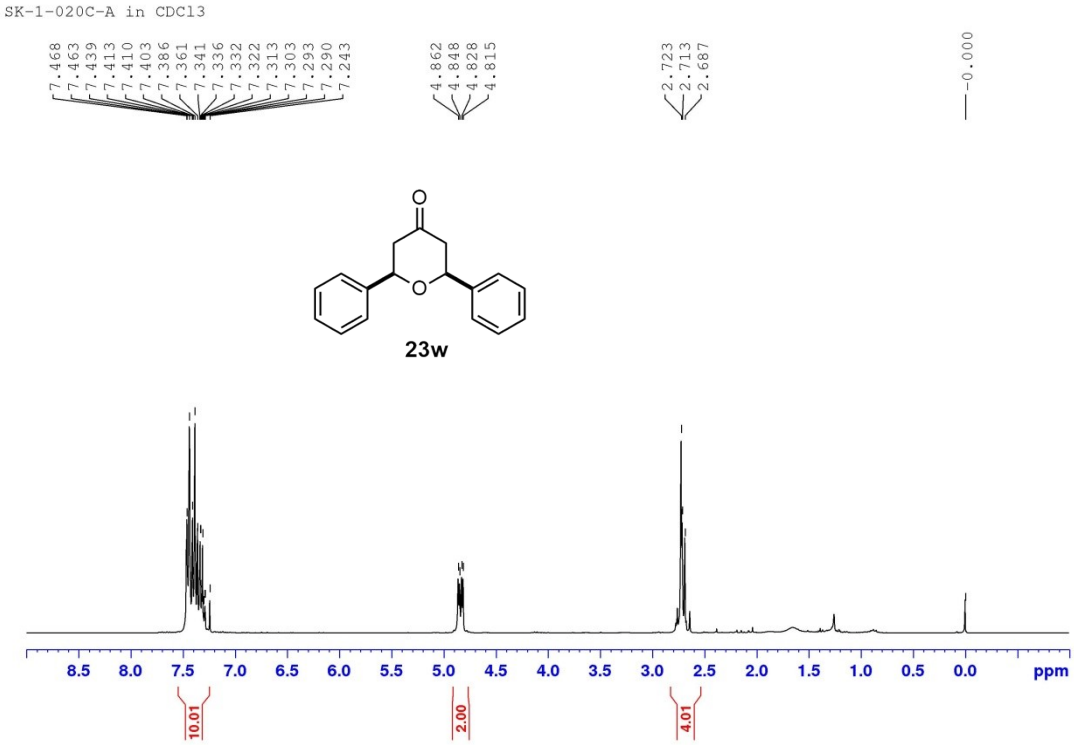


Figure SI54. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2,6-diphenyltetrahydropyran-4-one (**23w**)

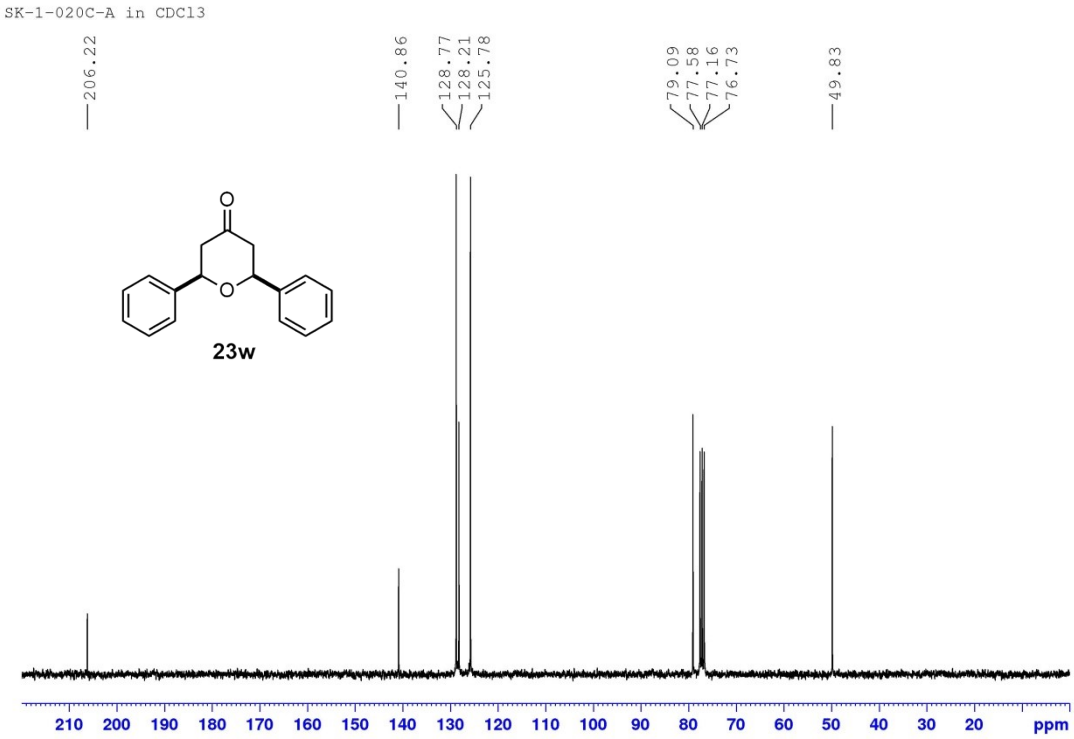


Figure SI55. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(4-nitrophenyl)-6-phenyltetrahydropyran-4-one (**23x**)

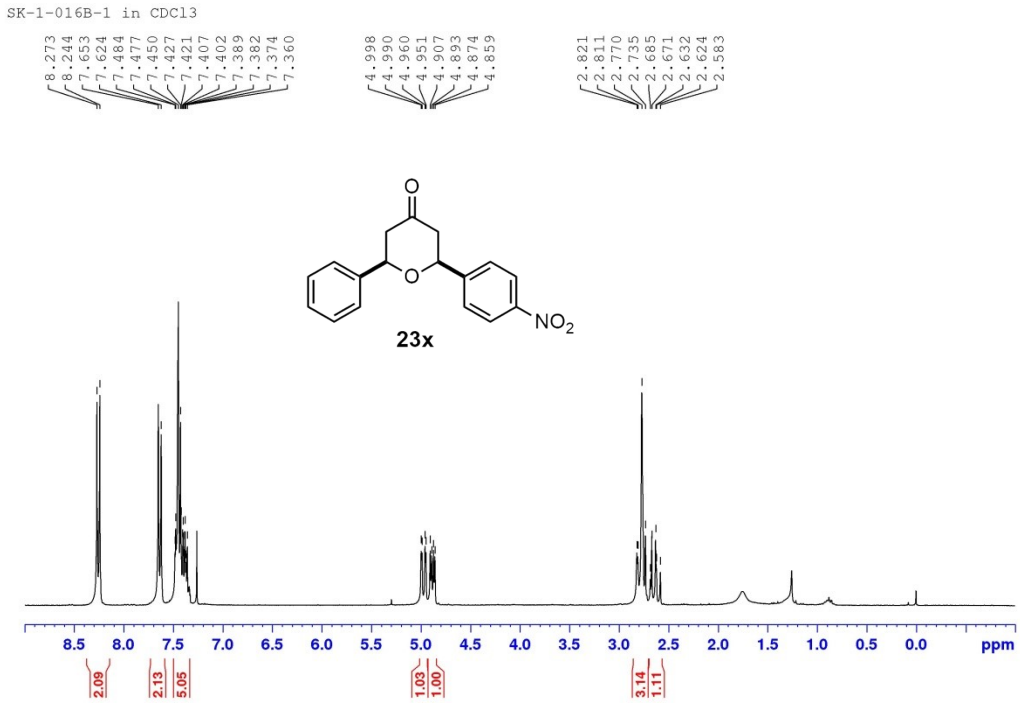


Figure SI56. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(4-nitrophenyl)-6-phenyltetra-hydropyran-4-one (**23x**)

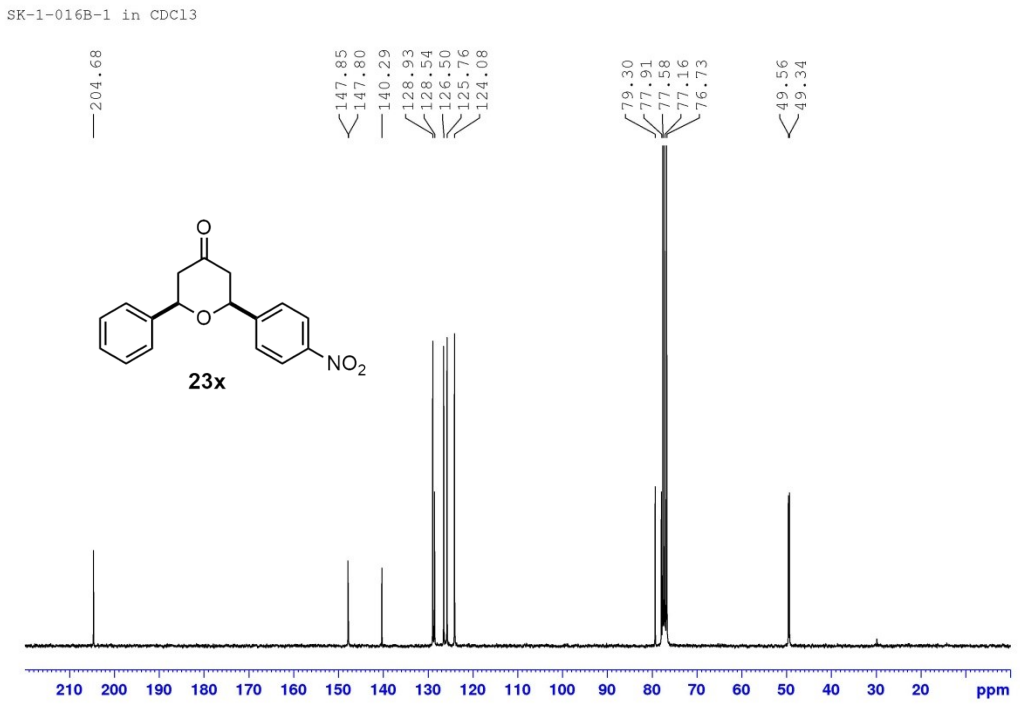


Figure SI57. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 2-(3-methoxyphenyl)-6-phenyl-tetrahydropyran-4-one (**23y**)

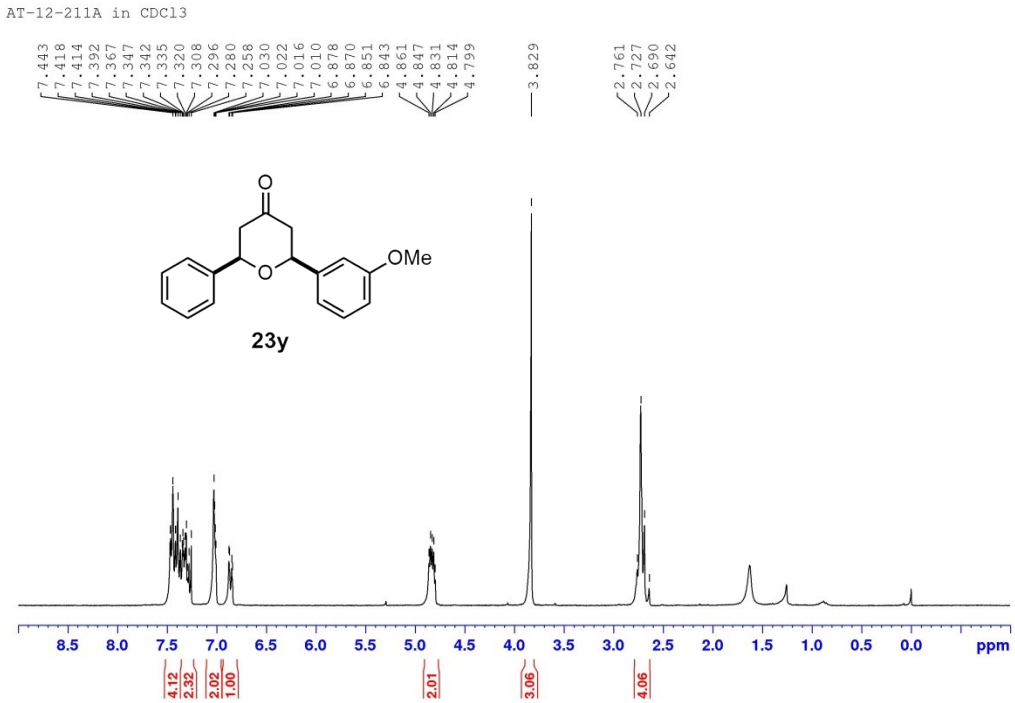


Figure SI58. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 2-(3-methoxyphenyl)-6-phenyl-tetrahydropyran-4-one (**23y**)

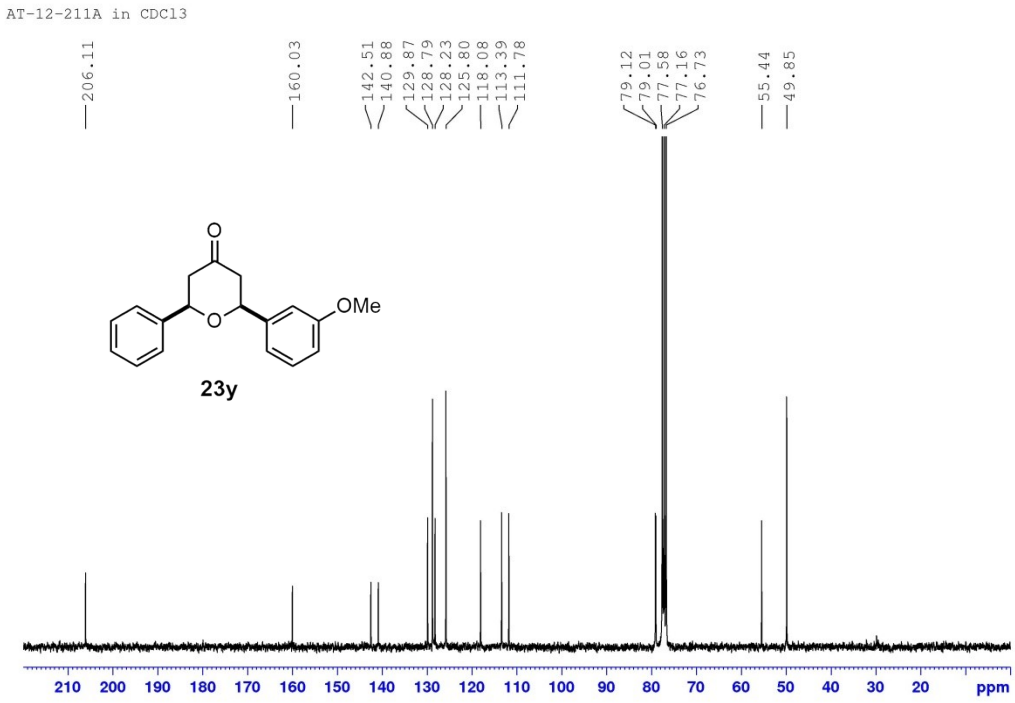


Figure SI59. ^{1}H NMR (300 MHz, $CDCl_3$) spectrum of 3-chloro-1-(3-methoxyphenyl) but-3-en-1-ol (**23z**)

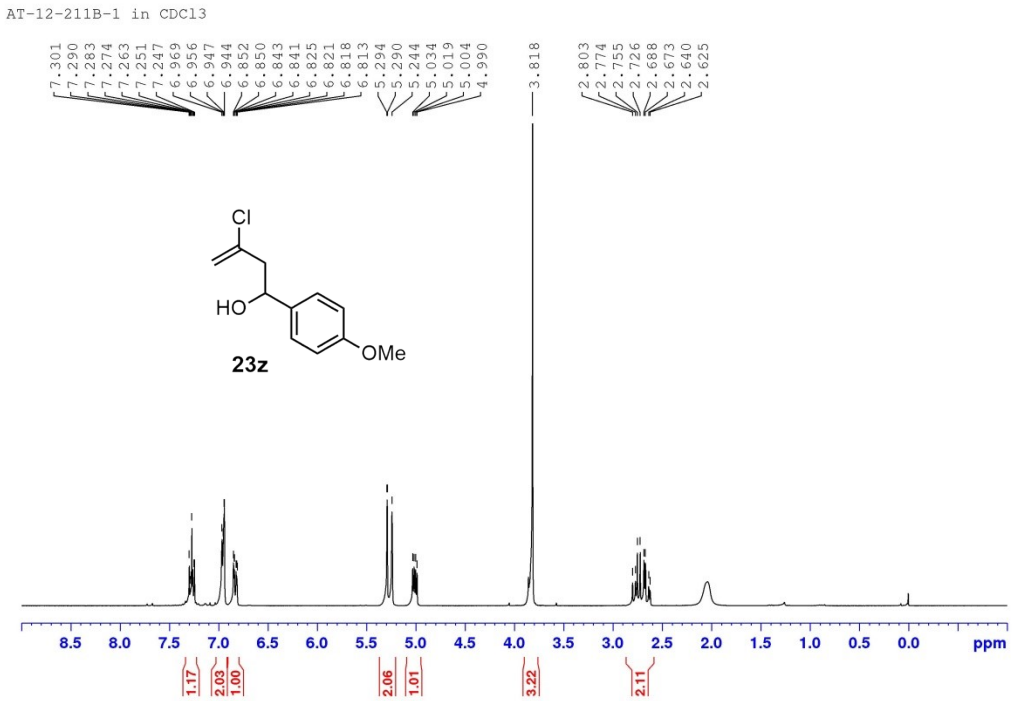
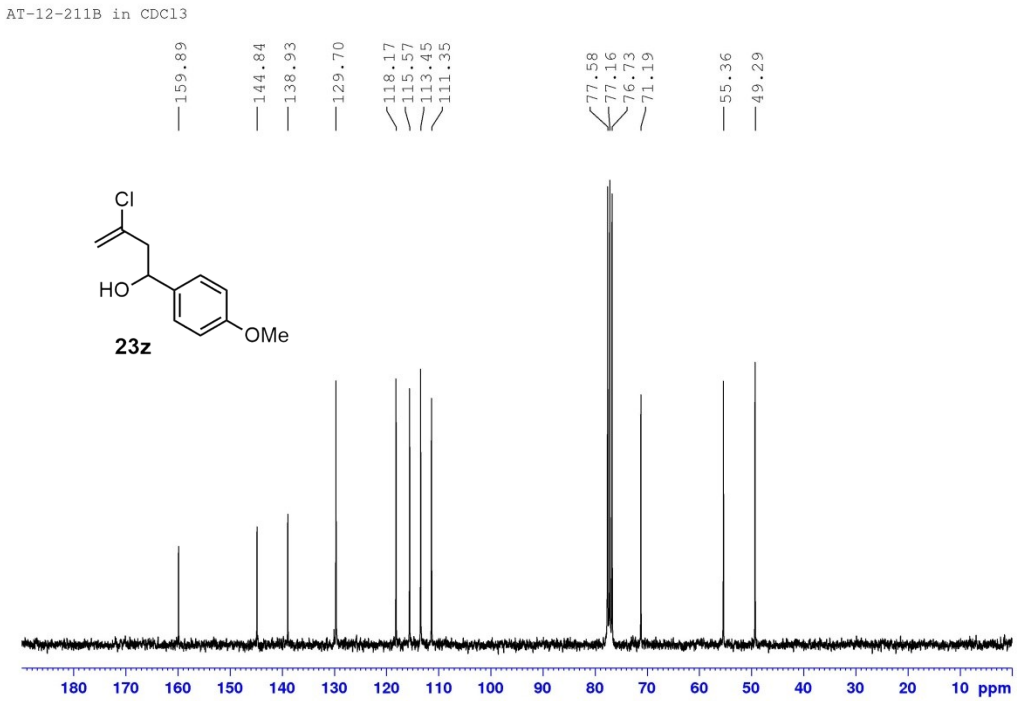


Figure SI60. ^{13}C NMR (75 MHz, $CDCl_3$) spectrum of 3-chloro-1-(3-methoxyphenyl)but-3-en-1-ol (**23z**)



4. NOE Spectra of Selected Compounds

Figure SI61. NOE spectra (A) irradiation of ^{1}H at 3.23 ppm B) irradiation of ^{1}H at 3.49 ppm) of 2-isopropyl-6-phenethyltetra hydropyran-4-one (**23e**)

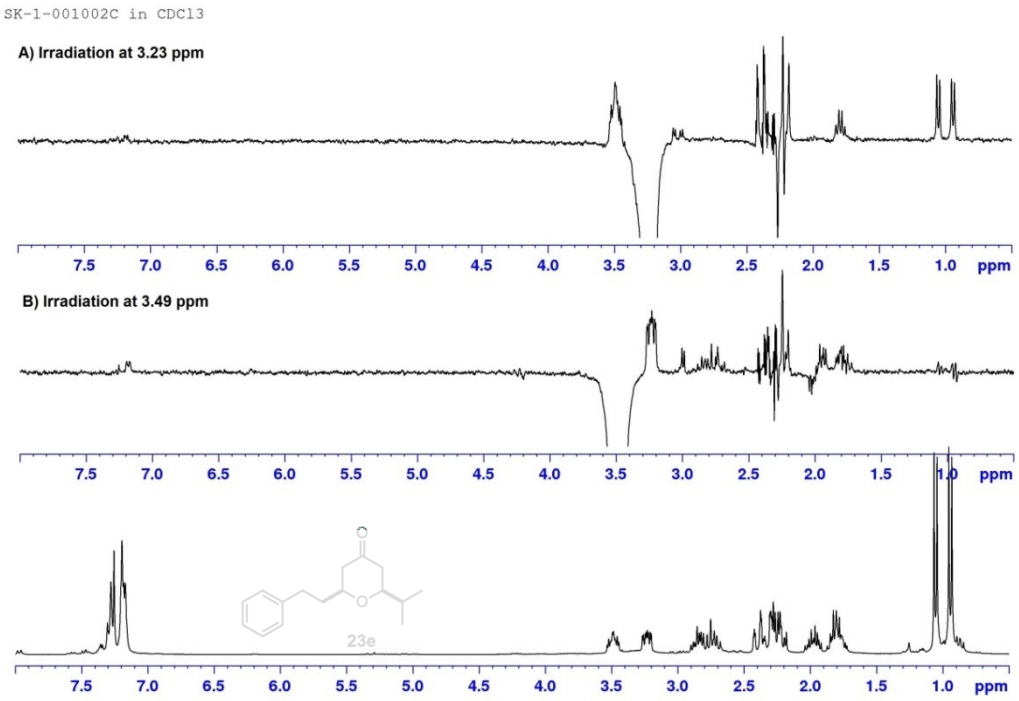
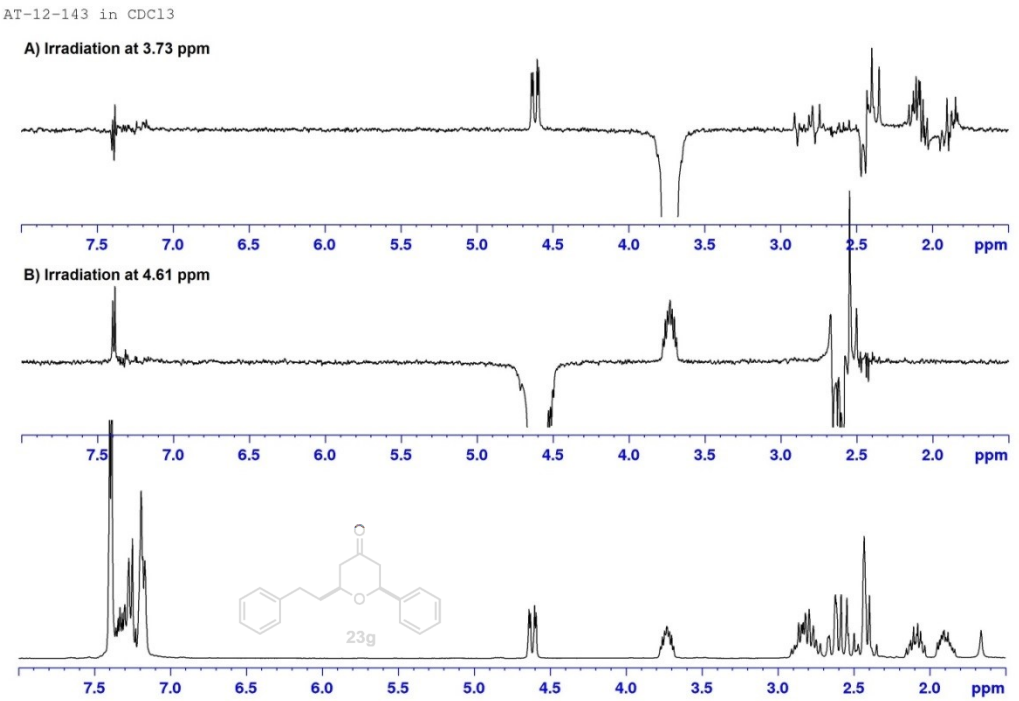


Figure SI62. NOE spectra (A) irradiation of ^{1}H at 3.73 ppm B) irradiation of ^{1}H at 4.61 ppm) of 2-phenethyl-6-phenyltetrahydropyran-4-one (**23g**)



5. References

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2. M. A. Tekle-Smith, K. S. Williamson, I. F. Hughes and J. L. Leighton, *Org. Lett.*, 2017, **19**, 6024–6027.
3. J. Yuan, P. Jain and J. C. Antilla, *J. Org. Chem.*, 2022, **87**, 8256–8266.