Supporting Information

Weinreb Amide Based Building Block for Convenient Access to Vinyl Ketones

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1. General information: (S2)
2. General procedure for the preparation of compounds and spectra data: (S2-S6)
3. Spectra of $^1$H, $^{13}$C, and HRMS of compounds: (S7-S38)
General information: All reactions were carried out in oven dried glassware. Solvents used for column chromatography were LR grade. Thin layer chromatography was performed on aluminium plates coated with silica gel 60. Visualization was observed by U.V. light or by dipping into a solution of cerium (IV) sulphate (2.5 g) and ammonium molybdate (6.25 g) in 10% sulphuric acid (250 ml) followed by charring on a hot plate. Melting points were determined in capillaries and are uncorrected. $^1$H NMR (400 MHz/500MHz) and $^{13}$C NMR (100MHz/125MHz) spectra were recorded in chloroform-d (CDCl$_3$) and chemical shifts are given in part per million (ppm). $^1$H NMR spectra were referenced to CDCl$_3$ (7.26 ppm) whereas $^{13}$C NMR spectra were referenced to the central line of CDCl$_3$ (77.16 ppm). The multiplicity are given as, s = singlet, d = doublet, t = triplet, dd = doublet of doublet, m = multiplet and coupling constants $J$ are reported in Hz. IR was determined by JASCO-FT/IR-4100 Spectrometer using NaCl cell. Elemental analysis was determined by Perkin Elmer Instruments series II CHNS/O analyser. HRMS were recorded on a MICRO-QTOF mass spectrometer by using the ESI technique at 10 eV.

3-bromo-N-methoxy-N-methylpropanamide (12)$^1$

A solution of N,O-dimethylhydroxylamine hydrochloride (4.27 g, 43.7 mmol) and 3-bromopropionyl chloride (6.8 g, 39.8 mmol) in 100 ml dry CH$_2$Cl$_2$ was vigorously stirred at 0 °C. To this solution, triethylamine (12.2 ml, 87.5 mmol) was added drop wise over a period of 15 min and resulting solution was stirred at room temperature for 3 hours. After completion of reaction the additional 50 ml of CH$_2$Cl$_2$ added to reaction mixture and water washed (3 x 30ml) followed by one brine wash. The organic layer was dried over Na$_2$SO$_4$, evaporated under reduced pressure and purified through silica gel column chromatography by 30% ethyl acetate in hexane which afforded 5.43 g of pure compound 12 as pale yellow oil with a mixture of amide rotamers (~ 50-50%).

Yield 70% (5.43 g), $R_f$ = 0.15 (hexane-EtOAc = 9:1), yellow liquid. $^1$H NMR (400 MHz, CDCl$_3$): $\delta$ = 2.90 (t, $J$ = 6.8 Hz, 2H), 3.02 (t, $J$ = 6.8 Hz, 2H), 3.19 (s, 6H), 3.62 (t, $J$ = 6.8 Hz, 2H), 3.69 (s, 6H), 3.79 (t, $J$ = 6.8 Hz, 2H). $^{13}$C NMR (125 MHz, CDCl$_3$): $\delta$ = 26.5, 32.0, 35.0, 35.2, 39.2, 61.3, 128.9, 170.8, 171.1. IR (CHCl$_3$): 1659, 1463, 1442, 1390, 1180, 994, 824, 772, 758 cm$^{-1}$. ESI-HRMS: m/z calcd for C$_5$H$_{10}$NO$_2$NaBr [M + Na]$^+$: 217.9793; found: 217.9784.

1-(phenylselanyl)-7-((tetrahydro-2H-pyran-2-yl)oxy)heptan-3-one (9k)$^2$
Yield 54\%, (0.37 g). \( R_f = 0.26 \) (hexane-EtOAc = 9:1), yellow liquid. \(^1\)H NMR (400 MHz, CDCl\(_3\)): \( \delta = 1.48-1.60 \) (m, 6H), 1.61-1.83 (s, 4H), 2.42 (t, \( J = 7.2 \) Hz, 2H, CH\(_2\)), 2.82 (t, \( J = 7.2 \) Hz, 2H, CH\(_2\)), 3.07 (t, \( J = 7.2 \) Hz, 2H, CH\(_2\)), 3.34-3.39 (m, 1H), 3.46-3.51 (m, 1H), 3.70-3.75 (m, 1H), 3.81-3.87 (m, 1H), 4.55 (t, \( J = 4.4 \) Hz, OCH\(_2\)), 7.24-7.28 (m, 3H, ArH), 7.47-7.50 (m, 2H, ArH). \(^{13}\)C NMR (100MHz, CDCl\(_3\)): \( \delta = 19.7 \) (CH\(_2\)), 20.6 (CH\(_2\)), 20.7 (CH\(_2\)), 25.5 (CH\(_2\)), 29.2 (CH\(_2\)), 30.8 (CH\(_2\)), 42.8 (CH\(_2\)), 43.2 (CH\(_2\)), 62.5 (CH\(_2\)), 67.2 (CH\(_2\)), 99.0 (OCH), 127.2 (ArCH), 129.2 (ArCH), 129.8 (ArC), 132.9 (ArCH), 209.4 (CH\(_2\)CO). IR (CHCl\(_3\)): 2947, 2870, 2401, 1713, 1581, 1523, 1477, 1435, 1350 cm\(^{-1}\).

3-(phenylselanyl)-1-(4-((tetrahydro-2H-pyran-2-yl)oxy)phenyl)propan-1-one (9l)

Yield 65\%, (0.47 g). \( R_f = 0.26 \) (hexane-EtOAc = 9:1), colourless solid. mp = 70-72 °C. \(^1\)H NMR (500 MHz, CDCl\(_3\)): \( \delta = 1.59-1.72 \) (m, 3H), 1.86-1.89 (m, 2H), 1.97-2.02 (m, 1H), 3.23 (t, \( J = 8 \) Hz, 2H, CH\(_2\)), 3.34 (t, \( J = 7.5 \) Hz, 2H, CH\(_2\)), 3.60-3.63 (m, 1H), 3.81-3.86 (m, 1H), 5.50 (t, \( J = 3.5 \) Hz, OCH\(_2\)), 7.05-7.07 (m, 2H, ArH), 7.24-7.29 (m, 3H, ArH), 7.51-7.53 (m, 2H, ArH), 7.85-7.87 (m, 2H, ArH). \(^{13}\)C NMR (125 MHz, CDCl\(_3\)): \( \delta = 18.5 \) (CH\(_2\)), 21.5 (CH\(_2\)), 25.1 (CH\(_2\)), 30.2 (CH\(_2\)), 39.2 (CH\(_2\)), 62.1 (CH\(_2\)), 96.1 (OCH), 116.1 (ArCH), 127.1 (ArCH), 129.2 (ArCH), 130.0 (ArC), 130.3 (ArCH), 132.9 (ArCH), 161.2 (ArC), 197.4 (CH\(_2\)CO). IR (KBr): 3076, 3051, 2936, 2867, 1675, 1597, 1503, 1474, 1434, 1415 cm\(^{-1}\).

1-phenylprop-2-en-1-one (1c)

Yield 70\% (320 mg), \( R_f = 0.68 \) (hexane-EtOAc = 9.5:0.5), yellow liquid. \(^1\)H NMR (500 MHz, CDCl\(_3\)): \( \delta = 5.93 \) (dd, \( J = 1.5, 10.5 \) Hz, 1H, =CH\(_3\)H\(_c\)), 6.44 (dd, \( J = 1.5, 17 \) Hz, 1H, =CH\(_3\)H\(_c\)), 7.16 (dd, \( J = 10.5, 17 \) Hz, 1H, COCH\(_3\)), 7.46-7.49 (m, 2H, ArH), 7.56-7.59 (m, 1H, ArH), 7.93-7.95 (m, 2H, ArH). \(^{13}\)C NMR (125 MHz, CDCl\(_3\)): \( \delta = 128.7 \) (CH), 128.8, 130.3 (=CH2), 132.5 (CH), 133.1 (CH), 137.4 (C), 191.2 (CO). IR (CHCl\(_3\)): 2979, 2931, 2404, 1715, 1684, 1590, 1525, 1443 cm\(^{-1}\).

1-(p-tolyl)prop-2-en-1-one (1d)
Yield 76% (92 mg), Rf = 0.68 (hexane-EtOAc = 9.5:0.5), yellow liquid. $^1$H NMR (400 MHz, CDCl$_3$): δ = 5.90 (dd, J = 1.6, 10.4 Hz, 1H, =CH$_b$H$_c$), 6.42 (dd, J = 1.6, 17.2 Hz, 1H, =CH$_b$H$_c$), 7.16 (dd, J = 10.8, 17.2 Hz, 1H, COCH$_a$). 7.26-7.28 (m, 2H, ArH). $^1$C NMR (100 MHz, CDCl$_3$): δ = 21.8 (CH$_3$), 128.9 (CH), 129.4 (CH), 129.9 (=CH$_2$), 132.4 (CH), 134.8 (ArC), 144.0 (ArC), 190.7 (CO). IR (CHCl$_3$): 2927, 2403, 1674, 1606, 1481, 1473, 1429 cm$^{-1}$.

1-(4-methoxyphenyl)prop-2-en-1-one (1e)

Yield 89% (180 mg), Rf = 0.68 (hexane-EtOAc = 9.5:0.5), yellow liquid. $^1$H NMR (400 MHz, CDCl$_3$): δ = 3.88 (s, 3H, CH$_3$), 5.86 (dd, J = 1.6, 10.4 Hz, 1H, =CH$_b$H$_c$), 6.41 (dd, J = 2.0, 17.2 Hz, 1H, =CH$_b$H$_c$), 6.94-6.96 (m, 2H, ArH), 7.16 (dd, J = 10.4, 17.2 Hz, 1H, COCH$_a$). 7.93-7.97 (m, 2H, ArH). $^1$C NMR (100 MHz, CDCl$_3$): δ = 55.6 (OCH$_3$), 113.9 (CH), 129.3 (=CH$_2$), 130.3 (ArC), 131.1 (CH), 132.3 (CH), 163.7 (ArC), 189.3 (CO). IR (CHCl$_3$): 2399, 1663, 1599, 1510, 1413, 1402 cm$^{-1}$.

1-(4-fluorophenyl)prop-2-en-1-one (1f)

Yield 89%, (86 mg). Rf = 0.68 (hexane-EtOAc = 9.5:0.5), yellow liquid. $^1$H NMR (400 MHz, CDCl$_3$): δ = 5.93 (dd, J = 1.6, 10.4 Hz, 1H, =CH$_b$H$_c$), 6.43 (dd, J = 1.6, 17.2 Hz, 1H, =CH$_b$H$_c$), 7.09-7.17 (m, 3H), 7.95-8.00 (m, 2H, ArH). $^1$C NMR (100 MHz, CDCl$_3$): δ = 115.9 (d, J = 21.9 Hz, ArCH), 130.4 (=CH$_2$), 131.4 (d, J = 9.3 Hz, ArCH), 132.1 (CH), 133.7 (ArC), 165.8 (d, J = 253.3 Hz, ArCF), 189.5 (CO). IR (CHCl$_3$): 2971, 2403, 1678, 1601, 1516, 1419, 1217, 1164, 1101 cm$^{-1}$.

1-(4-chlorophenyl)prop-2-en-1-one (1g)

Yield 86% (88 mg), Rf = 0.68 (hexane-EtOAc = 9.5:0.5), yellow liquid. $^1$H NMR (400 MHz, CDCl$_3$): δ = 5.95 (dd, J = 1.6, 10.4 Hz, 1H, =CH$_b$H$_c$), 6.44 (dd, J = 1.6, 17.2 Hz, 1H, =CH$_b$H$_c$), 7.11 (dd, J = 10.4, 17.2 Hz, 1H, COCH$_a$), 7.43-7.46 (m, 2H, ArH). 7.87-7.90 (m, 2H, ArH). $^1$C NMR (100 MHz, CDCl$_3$): δ = 115.9 (d, J = 25.3 Hz, ArCH), 130.4 (=CH$_2$), 131.4 (d, J = 9.3 Hz, ArCH), 132.1 (CH), 133.7 (ArC), 165.8 (d, J = 253.3 Hz, ArCF), 189.5 (CO). IR (CHCl$_3$): 2971, 2403, 1678, 1601, 1516, 1419, 1217, 1164, 1101 cm$^{-1}$.
CDCl₃): δ = 129.0 (CH), 130.2 (CH), 130.7 (=CH₂), 132.0 (CH), 135.6 (ArC), 139.6 (ArC), 189.8 (CO). IR (CHCl₃): 2400, 1664, 1600, 1520, 1420, 1213, 930 cm⁻¹.

1-(thiophen-2-yl)prop-2-en-1-one (1h)

Yield 79% (87 mg), Rf = 0.68 (hexane-EtOAc = 9.5:0.5), yellow liquid. ¹H NMR (400 MHz, CDCl₃): δ = 5.87 (dd, J = 1.6, 10.4 Hz, 1H, =C=H), 6.50 (dd, J = 1.6, 17.2 Hz, 1H, =CH₂), 7.07 (dd, J = 10.4, 17.2 Hz, 1H, COCH₃), 7.15 (dd, J = 4.0, 4.8 Hz, 1H, ArH), 7.67 (dd, J = 1.2, 5.2 Hz, 1H, ArH), 7.77 (dd, J = 1.2, 4.0 Hz, 1H, ArH). ¹³C NMR (100 MHz, CDCl₃): δ = 128.3 (CH), 129.5 (=CH₂), 132.0 (CH), 132.5 (CH), 134.4 (CH), 144.7 (ArC), 182.5 (CO). IR (CHCl₃): 2401, 1649, 1608, 1515, 1418, 1214 cm⁻¹.

1-(3,4-dichlorophenyl)prop-2-en-1-one (1i)

Yield 88% (99 mg), Rf = 0.68 (hexane-EtOAc = 9.5:0.5), yellow liquid. ¹H NMR (400 MHz, CDCl₃): δ = 5.98 (dd, J = 1.6, 10.4 Hz, 1H, =C=H), 6.46 (dd, J = 1.6, 17.2 Hz, 1H, =CH₂), 7.08 (dd, J = 10.4, 17.2 Hz, 1H, COCH₃), 7.56 (d, J = 8.4 Hz, 1H, ArH), 7.76 (dd, J = 2.0, 8.4 Hz, 1H, ArH), 8.08 (d, J = 2 Hz, 1H, ArH). ¹³C NMR (100 MHz, CDCl₃): δ = 127.8 (CH), 130.8 (CH), 130.9 (CH), 131.5 (=CH₂), 131.6 (CH), 133.4 (ArC), 136.9 (ArC), 137.7 (ArC), 188.7 (CO). IR (CHCl₃): 2400, 1673, 1610, 1585, 1557, 1521, 1475 cm⁻¹.

1-(3,4,5-trimethoxyphenyl)prop-2-en-1-one (1j)

Yield 69% (76 mg), Rf = 0.35 (hexane-EtOAc = 9.5:0.5), yellow liquid. ¹H NMR (400 MHz, CDCl₃): δ = 3.92 (s, 9H), 5.92 (dd, J = 1.6, 10.4 Hz, 1H, =C=H), 6.44 (dd, J = 1.6, 17.2 Hz, 1H, =CH₂), 7.15 (dd, J = 10.4, 17.2 Hz, 1H, COCH₃), 7.22 (s, 2H, ArH). ¹³C NMR (100 MHz, CDCl₃): δ = 56.4 (2 x OCH₃), 61.0 (OCH₃), 106.4 (ArCH), 130.0 (=CH₂), 132.2 (ArCH), 132.6 (ArC), 142.8 (ArC), 148.7 (ArC).
153.2 (ArC), 189.8 (CO). IR (CHCl₃): 2941, 2839, 2400, 1672, 1585, 1505, 1463, 1416, 1333, 1217 cm⁻¹.

7-((tetrahydro-2H-pyran-2-yl)oxy)hept-1-en-3-one (1k)

Yield 75%, (144 mg). Rf = 0.41 (hexane-EtOAc = 9:1), yellow liquid, ¹H NMR (400 MHz, CDCl₃): δ = 1.48-1.64 (m, 6H), 1.66-1.81 (m, 4H), 2.62 (t, J = 7.6 Hz, 2H, CH₂), 3.37-3.41 (m, 1H), 3.45-3.50 (m, 1H), 3.71-3.77 (m, 1H), 3.81-3.86 (m, 1H), 4.55 (t, J = 4.4 Hz, 1H, OCH), 5.80 (dd, J = 1.2, 10.4 Hz, 1H, =CHb), 6.20 (dd, J = 1.2, 17.6 Hz, 1H, =CHb), 6.33 (dd, J = 10.4, 17.6 Hz, 1H, COC₆H₄). ¹³C NMR (100MHz, CDCl₃): δ = 19.7 (C₆H₂), 20.9 (C₆H₂), 25.5 (C₆H₂), 29.3 (CH₃), 30.8 (CH₂), 39.4 (CH₂), 62.4 (CH₂), 67.2 (CH₂), 98.9 (OCH), 128.1 (=CH), 136.6 (=CH₂), 200.9 (CH₂CO). IR (CHCl₃): 2948, 2868, 2402, 1681, 1615, 1523, 1448, 1406, 1350 cm⁻¹.

1-(4-((tetrahydro-2H-pyran-2-yl)oxy)phenyl)prop-2-en-1-one (1l)

Yield 76%, (118 mg). Rf = 0.31 (hexane-EtOAc = 9:1), yellow liquid, ¹H NMR (400 MHz, CDCl₃): δ = 1.59-1.76 (m, 3H), 1.86-1.90 (m, 2H), 1.96-2.07 (m, 1H), 3.60-3.65 (m, 1H), 3.82-3.88 (m, 1H), 5.53 (t, J = 3.2 Hz, 1H, OCH), 5.87 (dd, J = 1.2, 10.4 Hz, 1H, =CH₆H₄), 6.42 (dd, J = 1.2, 16.8 Hz, 1H, =CH₆H₄), 7.11 (d, J = 8.8 Hz, 2H, ArH), 7.17 (dd, J = 10.4, 17.2 Hz, 1H, COC₆H₄), 7.94 (d, J = 8.4 Hz, 2H, ArH). ¹³C NMR (100MHz, CDCl₃): δ = 18.5 (CH₃), 25.1 (CH₂), 30.2 (CH₂), 62.1 (CH₂), 96.1 (OCH), 116.2, 129.4 (=CH₂), 130.8 (ArC), 131.0, 132.3, 161.2, 189.6 (CO). IR (CHCl₃): 2950, 2855, 2401, 1663, 1601, 1510, 1422, 1404, 1357 cm⁻¹.

References:

3-bromo-N-methoxy-N-methylpropanamide (12)
**Elemental Composition Report**

**Single Mass Analysis**

Tolerance = 200.0 mDa / DBE; min = -1.5, max = 50.0

Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
24 formula(e) evaluated with 1 results within limits (all results up to 1000 for each mass)

**N-methoxy-N-methyl-3-(phenylselanyl)propanamide (8)**
Elemental Composition Report

Single Mass Analysis
Tolerance = 200.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0  Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
22 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

QTOF MICRO
IPS-PKT-A-87 79 (1.476) AM (Cen.2, 80.00, H15000.0,000.001.00), Sm (Mn, 244.00), Cm (74.82)
296.0171

%

0 294.6835 295.0380 295.3940 295.6617 295.75 295.805 295.8617 296.0217 296.5323 296.8341 297.4277

Minimum: 294.6835 294.75
Maximum: 297.4277

Mass  Calc. Mass  mDa  PPM  DBE  Score  Formula
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Page 1

21-Nov-2012 14:17:35
TOF-MS ES:
1.31e3
1-(phenylselanyl)undecan-3-one (9a)
1-(phenylselanyl)tetradecan-3-one (9b)
1-phenyl-3-(phenylselanyl)propan-1-one (9c)
Elemental Composition Report

Single Mass Analysis
Tolerance = 200.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0  Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
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Minimum: -1.0
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3-(phenylselanyl)-1-(p-tolyl)propan-1-one (9d)
1-(4-methoxyphenyl)-3-(phenylselanyl)propan-1-one (9e)
Elemental Composition Report

Single Mass Analysis
Tolerance = 200.0 mDa  /  DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0  Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
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09-Oct-2012 14:24
TOPMS E3+ 73.1
1-(4-fluorophenyl)-3-(phenylselenyl)propan-1-one (9f)
**Elemental Composition Report**

**Single Mass Analysis**
Tolerance = 200.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0 Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
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1-(4-chlorophenyl)-3-(phenylselanyl)propan-1-one (9g)
Elemental Composition Report

Single Mass Analysis
Tolerance = 200.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0  Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
14 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

Minimum: 346.9728  Mass: 346.9718  mDa: 1.0  PPM: 3.0  DBE: 9.5  Score: 1  Formula: C15 H13 O Na Se Cl
3-(phenylselanyl)-1-(thiophen-2-yl)propan-1-one (9h)
Single Mass Analysis
Tolerance = 200.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0  Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
14 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

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1-(3,4-dichlorophenyl)-3-(phenylselanyl)propan-1-one (9i)
Elemental Composition Report

Single Mass Analysis
Tolerance = 200.0 mDa / DBE: min = -1.5, max = 50.0
Isotope cluster parameters: Separation = 1.0  Abundance = 1.0%

Monoisotopic Mass, Odd and Even Electron Ions
22 formula(e) evaluated with 1 results within limits (all results (up to 1000) for each mass)

Minimum: 200.0  5.0  55.0
Maximum: 380.9316  380.9328  -1.2  -3.1  9.5  1  C15 H12 O Na Se C12
3-(phenylselanyl)-1-(3,4,5-trimethoxyphenyl)propan-1-one (9j)
1-(phenylselanyl)-7-((tetrahydro-2H-pyran-2-yl)oxy)heptan-3-one (9k)
3-(phenylselanyl)-1-((tetrahydro-2H-pyran-2-yl)oxy)phenyl)propan-1-one (9l)

\[ \text{Se} \] 


99.031 127.240 129.285 129.875 132.965 209.403 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

S25
undec-1-en-3-one (1a)

\[
\text{H} \quad 5.784, \quad 5.811, \quad 6.179, \quad 6.223, \quad 6.309, \quad 6.336, \quad 6.354, \quad 6.380
\]

\[
\text{H} \quad 1.590, \quad 1.608, \quad 1.625, \quad 1.642, \quad 2.546, \quad 2.564, \quad 2.583
\]

\[
\text{H} \quad 0.910, \quad 0.908, \quad 0.853
\]

\[
\text{C} \quad 210.9, 210.9, 251.7, 251.7, 279.8, 279.8
\]

\[
\text{C} \quad 132.944, 130.098, 130.305, 129.289, 127.193, 116.141, 96.167
\]

\[
\text{O} \quad 77.414, 77.160, 76.906, 62.175, 59.167, 51.857
\]

\[
\text{O} \quad 8.0, 7.5, 7.0, 6.5, 6.0, 5.5, 5.0
\]
tetradec-1-en-3-one (1b)
1-phenylprop-2-en-1-one (1c)

[Diagram of 1-phenylprop-2-en-1-one (1c)]
1-(p-tolyl)prop-2-en-1-one (1d)
1-(4-methoxyphenyl)prop-2-en-1-one (1e)

O

\[\text{OCH}_3\]
1-(4-fluorophenyl)prop-2-en-1-one (1f)
1-(4-chlorophenyl)prop-2-en-1-one (1g)
1-(thiophen-2-yl)prop-2-en-1-one (1h)
1-(3,4-dichlorophenyl)prop-2-en-1-one (1i)
1-(3,4,5-trimethoxyphenyl)prop-2-en-1-one (1j)
7-((tetrahydro-2H-pyran-2-yl)oxy)hept-1-en-3-one (1k)
1-(4-((tetrahydro-2H-pyran-2-yl)oxy)phenyl)prop-2-en-1-one (1l)