

Supporting Information

Regio- and Stereoselective Electrochemical Alkylation of Morita-Baylis-Hillman Adducts.

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General Methods.

¹H-NMR spectra were recorded on Varian 400 (400 MHz) spectrometer. Chemical shifts are reported in ppm from TMS with the solvent resonance as the internal standard (deuteriochloroform: 7.24 ppm). Data are reported as follows: chemical shift, multiplicity (s = singlet, d = doublet, dd = doublet doublet, t = triplet, td = triple doublet, dt = double triplet, q = quartet, sext = sextet, sept = septet, p = pseudo, b = broad, m = multiplet), coupling constants (Hz). ¹³C-NMR spectra were recorded on a Varian 400 (100 MHz) spectrometer with complete proton decoupling. Chemical shifts are reported in ppm from TMS with the solvent as the internal standard (deuteriochloroform: 77.0 ppm).

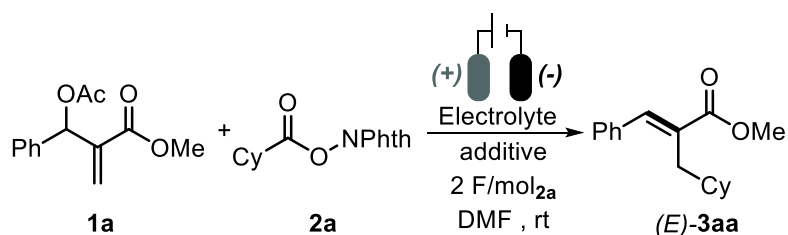
HRMS spectra were obtained with a G2XS QToF mass spectrometer using either ESI or APCI ionization techniques, as specified case by case.

Chromatographic purification was done with 240-400 mesh silica gel. Other anhydrous solvents were supplied by Sigma Aldrich in Sureseal® bottles and used without any further purification. Commercially available chemicals were purchased from Sigma Aldrich, Stream and TCI and used without any further purification. Melting points were determined with Bibby Stuart Scientific Melting Point Apparatus SMP 3 and are not corrected.

Anhydrous DMF was purchased from Merck and used as received. All other commercially available starting materials and (non-anhydrous) solvents were purchased from Merck, TCI chemicals, Fluorochem or Alfa Aesar and were used as such without further purification.

MBH acetates **1** are known compounds and were synthesized according to literature procedures.¹

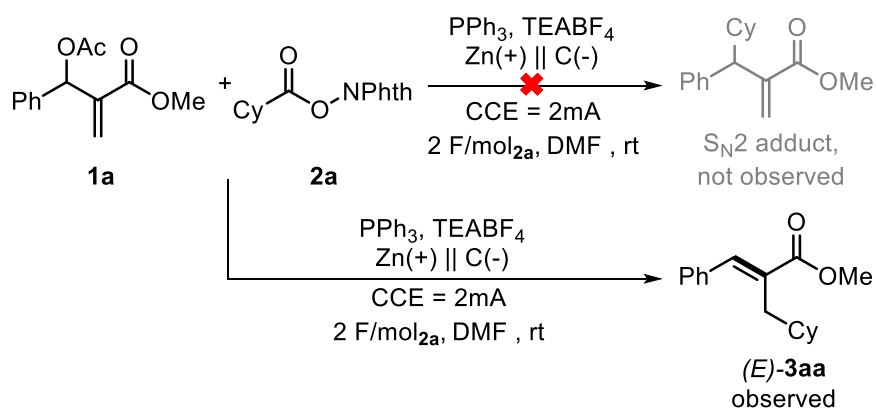
RAEs **2** are known compounds and were synthesized according to literature procedures.² For characterization see: **2a**,² **2b**,³ **2c**,² **2d**,² **2e**,⁴ **2f**,³ **2g**,⁴ **2h**,⁵ **2i**,² **2j**.²

Table S1. Optimization of reaction conditions, additional data.

Entry	Electrolyte (equiv)	Anode (+) Cathode (-)	Solvent	Additive (equiv)	I [mA]	Yield [%]
1	TEABF ₄ (2)	Zn(+) C(-)	ACN	none	4	45
2	TEABF ₄ (2)	Zn(+) C(-)	DMA	none	4	63
3	LiPF ₆ (2)	Zn(+) C(-)	DMF	none	4	59
4	TBAI (2)	Zn(+) C(-)	DMF	none	4	58
5	TBABF ₄ (2)	Zn(+) C(-)	DMF	none	4	67
6	TEABF ₄ (2)	Zn(+) C(-)	DMF	PPh ₃ (1)	4	23
7	TEABF ₄ (2)	Zn(+) C (-)	DMF	PPh ₃ (0.2)	4	70
8	TEABF ₄ (2)	Zn(+) C(-)	DMF	PPh ₃ (0.2)	2	78
9	TEABF ₄ (2)	Zn(+) Pt(-)	DMF	none	4	50
10	TEABF ₄ (2)	Zn(+) RVC foam(-)	DMF	none	4	63

Reaction conditions: **1a** (0.15 mmol), **2a** (0.30 mmol), electrolyte (0.30 mmol), dry DMF (3 mL). CCE (10, 4 or 2 mA; 2 F/mol_{2a}), rt.

In entries 6, 7, and 8 the use of PPh₃ as an additive was explored. Unfortunately, this did not result in a regioselectivity switch (S_N2 instead of S_N2' adduct, see **Scheme S1**) as it was postulated. The use of PPh₃ in stoichiometric amount resulted in a lower yield of isolated product **3aa** due to decomposition of **1a** (entry 6). Nonetheless, its presence, in catalytic amount, improved the yield slightly when the reaction was carried out at 4 mA, with complete consumption of **1a** (compare entry 7 with entry 4 of Table 1, main text). However, when the reaction was repeated at 2 mA, a slightly lower yield was recorded if compared to the reaction run in the absence of PPh₃ (compare entry 8 with entry 5 of Table 1, main text).



Scheme S1. Possible product distribution when PPh₃ is employed as an additive in the eChem alkylation of MBH adducts.

Limitation of the methodology: unsuccessful substrates.

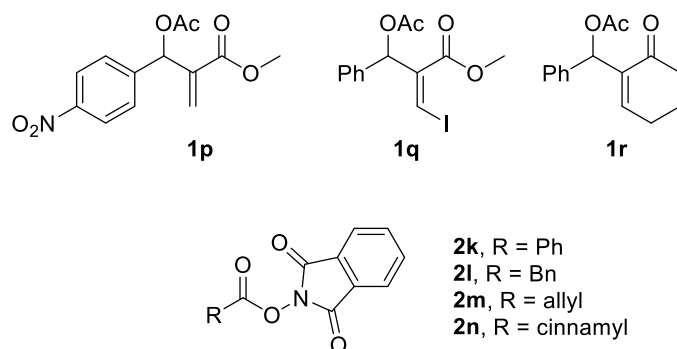


Figure S1. Unsuccessful substrates.

MBH acetates **1p-1r** were tested under the optimal reaction conditions (RAE **2a**) but failed to give the desired products. A complex reaction mixture was observed by ^1H NMR spectroscopy when compound **1p** was employed. Successive de-iodination, reduction, radical alkylation sequences were observed when **1q** was subjected to the reaction mixture (compounds **1a**, **3aa** and **1a'** were observed). No reaction occurred with cyclohexanone-derived compound **1r**. RAEs **2k-2n** were tested under the optimal reaction conditions (MBH acetate **1a**) but failed to give the desired products. In all cases, decomposition of RAE **2** was observed but no productive trapping of the radical by **1a** occurred. Substantial amounts of **1a'** and recovered **1a** were observed.

Cyclovoltammetry experiments

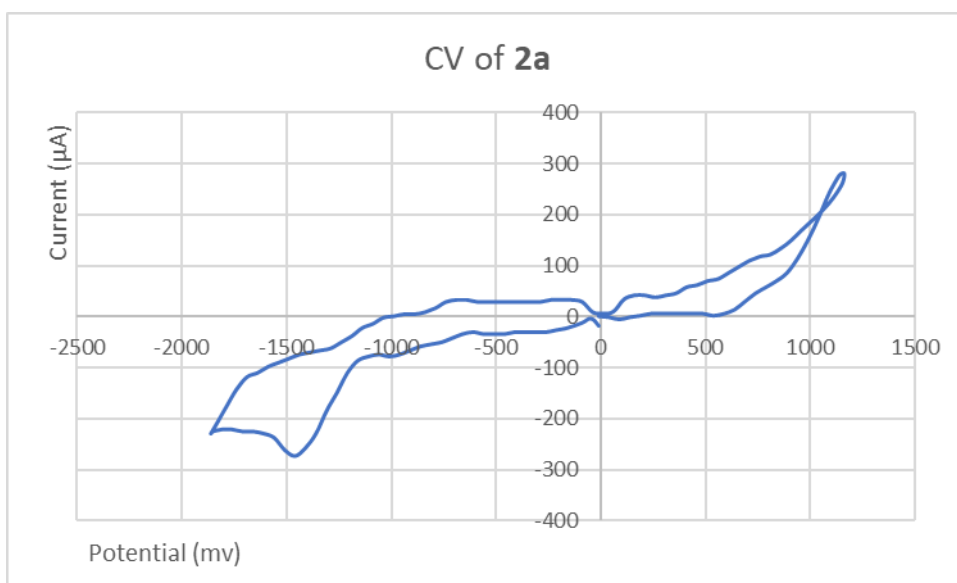


Figure S2. Cyclovoltammetry of RAE **2a**.

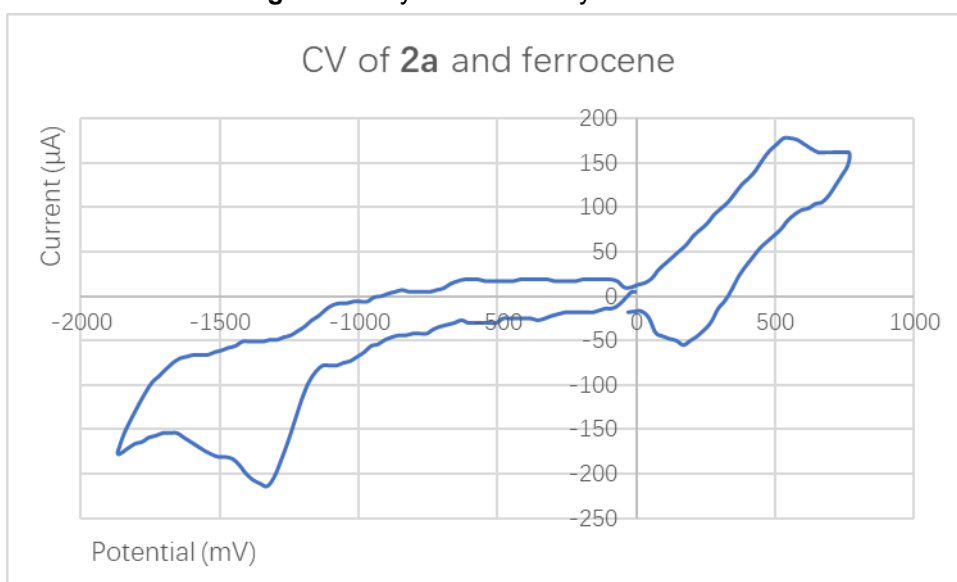


Figure S3. Cyclovoltammetry of RAE **2a** and ferrocene.

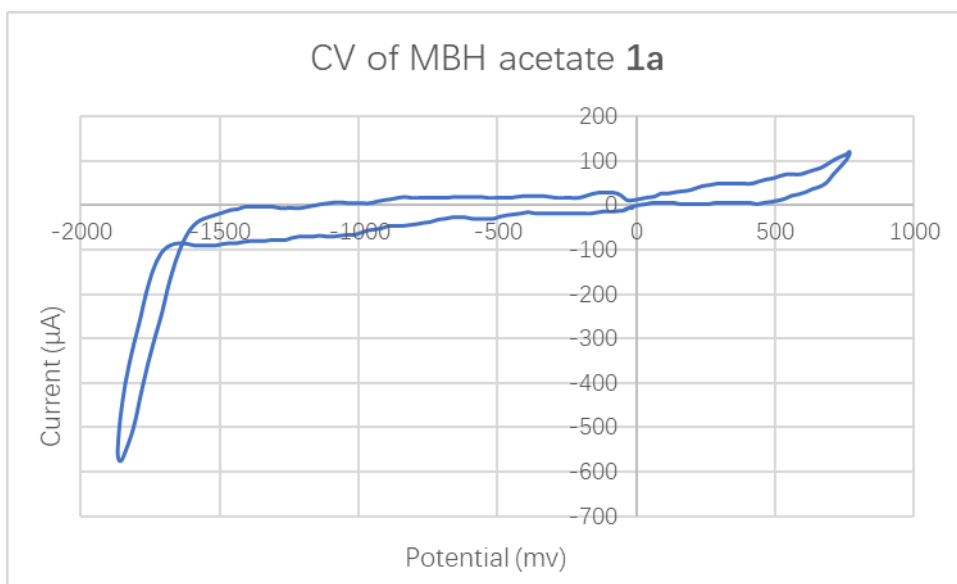


Figure S4. Cyclic voltammetry of MBH acetate **1a**.

Cyclic voltammetry experiments were carried out using the ElectroSyn 2.0 apparatus with a Pt counter electrode, an RVC working electrode and an Ag/Ag⁺ reference electrode (Ag wire in a 10 mM AgNO₃ and 0.1 M TBAClO₄ acetonitrile solution).

For **2a**: 4.8 mg of **2a** and 100 mg TBAPF₆ were dissolved in 3 mL of anhydrous DMF, stirred while purging with N₂ (balloon) and then subjected to the CV experiment at 350 mV·s⁻¹ (**Figure S2**). Then, 3.0 mg of ferrocene were added and the CV experiment was repeated (**Figure S3**). An irreversible peak between -1.27 and -1.49 V is observed. This is then calculated to be -1.57 V vs ferrocene (reversible peak between 0.072 and 0.325 V).

For **1a**: 3.7 mg of **2a** and 100 mg TBAPF₆ were dissolved in 3 mL of anhydrous DMF, stirred while purging with N₂ (balloon) and then subjected to the CV experiment at 350 mV·s⁻¹ (**Figure S4**) No cathodic event is observed apart from reduction of the solvent occurring below -1.50 V.

Photoisomerization of *E*-3aa

In a flame-dried Schlenk tube equipped with a magnetic stirring bar, ***E*-3aa** (0.10 mmol, 25.8 mg) and Ir[dF(CF₃)ppy]₂(dtbppy)PF₆ (1 mg) were dissolved in dry NMP (1 mL) under N₂ atmosphere. The Schlenk flask was then sealed, and the content was stirred vigorously for 18 h under blue-light irradiation (20 W Kessil lamp, 427 nm, at a distance of approximately 6 cm). Then, EtOAc (5 mL) and HCl_(aq) (1M, 5 mL) were added and the biphasic crude mixture was placed in a separatory funnel. The organic layer was separated, the aqueous layer was extracted with EtOAc (2 x 10 mL) and the combined organic layers were washed with HCl_(aq) (0.1 M, 3 x 10 mL), dried over Na₂SO₄ and concentrated *in vacuo*. ¹H NMR of the crude mixture revealed that isomerization of the double bond occurred showing a ***Z*-3aa:*E*-3aa** ratio = 1.7:1.

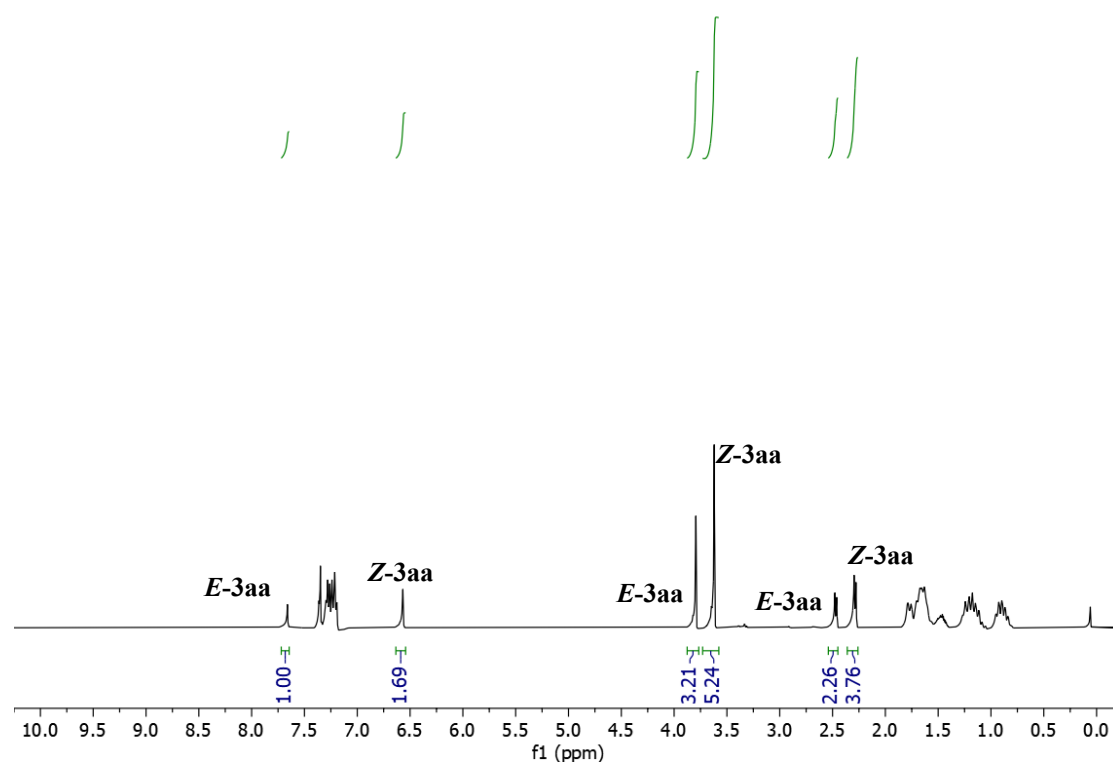
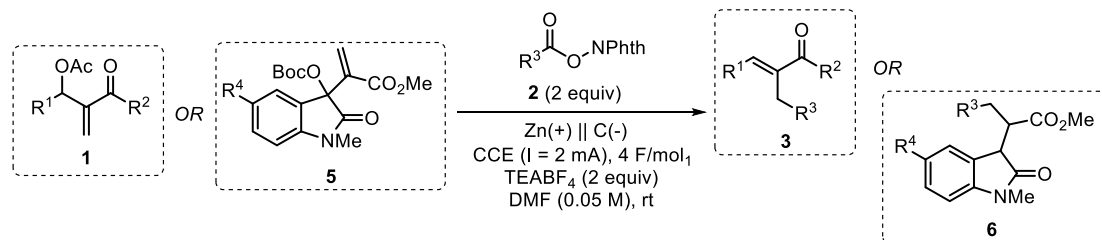
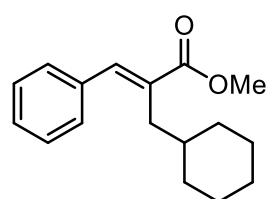


Figure S5. ¹H NMR of *E*-3aa and *Z*-3aa (1:1.7 mixture)

Optimized general procedure for the eChem alkylation of MBH adducts.



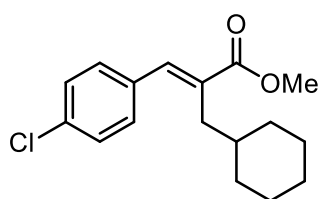
The ElectraSyn vial (5 mL), equipped with a stir bar, was charged with MBH acetate **1** or **5** (0.15 mmol), RAE **2** (0.30 mmol) and TEABF₄ (65.1 mg, 0.30 mmol). The ElectraSyn vial cap, equipped with anode (Zn) and cathode (graphite) was inserted into the mixture and closed with a rubber septum. The vessel was evacuated and backfilled with N₂ three times, then dry DMF (3 mL) was added, and the solution bubbled with N₂ (balloon) under stirring for 1 min. The reaction mixture was electrolyzed (under N₂, balloon) at a constant current of 2 mA, until a total charge of 0.60 F (4 F/mol₁) was reached (ca. 8 h). The ElectraSyn vial cap was removed, and the electrodes and vial were rinsed with EtOAc (10 mL) and HCl_(aq) (1M, 10 mL), which were combined with the crude mixture in a separatory funnel. Then, the organic layer was separated, the aqueous layer was extracted with EtOAc (2 x 10 mL) and the combined organic layers were washed with HCl_(aq) (0.1 M, 3 x 10 mL), dried over Na₂SO₄ and concentrated *in vacuo*. The crude product was finally purified by flash chromatography (*n*Hex/Et₂O mixtures) to afford pure products **3** or **6**.



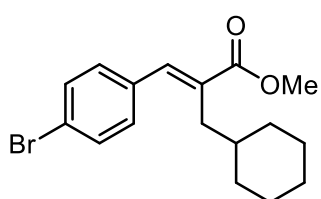
3aa. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 79%, (0.119 mmol, 30.6 mg), *E/Z* ratio: >20:1. ¹H NMR (400 MHz, CDCl₃) δ = 7.66 (s, 1H), 7.41 – 7.33 (m, 4H), 7.32 – 7.26 (m, 1H), 3.80 (s, 3H), 2.47 (d, *J* = 7.1 Hz, 2H), 1.71 – 1.42 (m, 6H), 1.28 – 1.00 (m, 3H), 0.93 – 0.78 (m, 2H); ¹³C NMR (100 MHz, CDCl₃) δ = 169.4, 139.4, 136.0, 132.7, 129.3 (2C), 128.4 (2C), 128.1, 52.0, 37.8, 34.4, 33.2 (2C), 26.4, 26.3 (2C); HRMSI (APCI) *m/z*: [M+H]⁺ calcd. for C₁₇H₂₃O₂ 259.1693; found 259.1698.

Example of mmol scale synthesis of 3aa. The ElectraSyn vial (10 mL), equipped with a stir bar, was charged with MBH acetate **1a** (234 mg, 1.0 mmol), RAE **2a** (546 mg, 2.0 mmol) and TEABF₄ (434 mg, 2.0 mmol). The ElectraSyn vial cap, equipped with anode (Zn) and cathode (graphite) was inserted into the mixture and closed with a rubber septum. The vessel was evacuated and backfilled with N₂ three times, then dry DMF (9 mL) was added, and the solution bubbled with N₂ (balloon) under stirring for 1 min. The reaction mixture was electrolyzed (under N₂, balloon) at a constant current of 3 mA, until a total charge of 4.0 F (4 F/mol_{1a}) was reached (ca. 36 h). The ElectraSyn vial cap was removed, and the electrodes and vial were rinsed with EtOAc (25 mL) and HCl_(aq) (1M, 25 mL), which were combined with the crude mixture in a separatory funnel. Then, the organic layer was separated, the aqueous layer was extracted with EtOAc (2 x 25 mL) and the combined organic layers were washed with HCl_(aq) (0.1 M, 3 x 25 mL), dried over Na₂SO₄ and concentrated *in vacuo*. The crude product was finally purified by flash chromatography (*n*Hex/Et₂O mixtures) to afford pure products **3aa** in 83% yield (0.83 mmol, 244 mg).

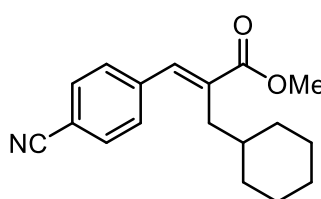
3aa is a known compound and the reported spectroscopic data match with the ones reported in the literature (*E/Z* ratio: 1:1.7).⁶



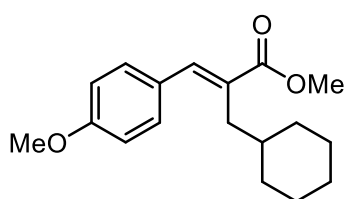
3ba. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 76%, (0.114 mmol, 33.3 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.59 (s, 1H), 7.35 – 7.30 (m, 2H), 7.29 – 7.25 (m, 2H), 3.79 (s, 3H), 2.43 (d, *J* = 7.1 Hz, 2H), 1.71 – 1.41 (m, 6H), 1.25 – 0.99 (m, 3H), 0.92 – 0.74 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.1, 138.0, 134.4, 134.0, 133.3, 130.5 (2C), 128.6 (2C), 52.0, 37.8, 34.4, 33.2 (2C), 26.3, 26.2 (2C); **HRMS (ESI)** *m/z*: [M+H]⁺ calcd. for C₁₇H₂₂³⁵ClO₂ 293.1303; found 293.1303; calcd. for C₁₇H₂₂³⁷ClO₂, 295.1274; found 295.1275.



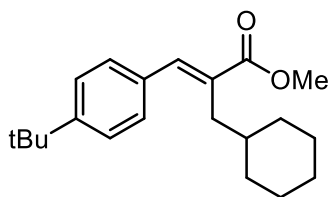
3ca. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 70%, (0.105 mmol, 35.4 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.57 (s, 1H), 7.52 – 7.40 (m, 2H), 7.21 – 7.15 (m, 2H), 3.79 (s, 3H), 2.42 (d, *J* = 7.1 Hz, 2H), 1.66 – 1.41 (m, 6H), 1.19 – 1.02 (m, 3H), 0.90 – 0.74 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.1, 138.1, 137.5, 134.9, 133.4, 131.6 (2C), 130.8 (2C), 52.0, 37.8, 34.4, 33.2 (2C), 26.3, 26.2 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₇H₂₂⁷⁹BrO₂ 337.0798; found 337.0792; calcd. for C₁₇H₂₂⁸¹BrO₂ 339.0778; found 339.0783.



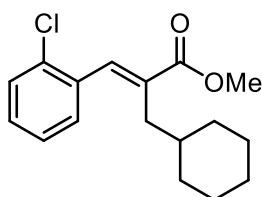
3da. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 10:1. Yield = 61%, (0.092 mmol, 25.9 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.69 – 7.63 (m, 2H), 7.61 (s, 1H), 7.43 – 7.37 (m, 2H), 3.81 (s, 3H), 2.40 (d, *J* = 7.1 Hz, 2H), 1.67 – 1.52 (m, 5H), 1.53 – 1.39 (m, 1H), 1.27 – 0.98 (m, 3H), 0.86 – 0.71 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 168.6, 140.8, 137.1, 135.6, 132.2 (2C), 129.6 (2C), 118.6, 111.5, 52.2, 37.7, 34.6, 33.2 (2C), 26.2, 26.2 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₈H₂₂NO₂ 284.1645; found 284.1653.



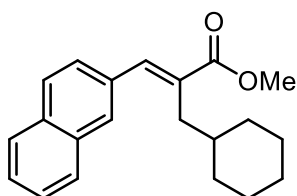
3ea. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 15:1. Yield = 67%, (0.101 mmol, 28.9 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.60 (s, 1H), 7.39 – 7.30 (m, 2H), 6.94 – 6.85 (m, 2H), 3.82 (s, 3H), 3.78 (s, 3H), 2.49 (d, *J* = 7.1 Hz, 2H), 1.72 – 1.45 (m, 6H), 1.26 – 1.05 (m, 3H), 0.98 – 0.85 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.7, 159.6, 139.0, 131.1 (2C), 130.6, 128.4, 113.9 (2C), 55.2, 51.8, 37.9, 34.4, 33.3 (2C), 26.4, 26.3 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₈H₂₅O₃ 289.1798; found 289.1805.



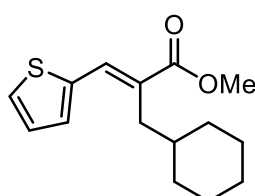
3fa. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 30:1. Yield = 61%, (0.092 mmol, 28.7 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.63 (s, 1H), 7.42 – 7.37 (m, 2H), 7.36 – 7.30 (m, 2H), 3.79 (s, 3H), 2.51 (d, *J* = 7.1 Hz, 2H), 1.72 – 1.47 (m, 6H), 1.32 (s, 9H), 1.23 – 1.07 (m, 3H), 1.01 – 0.86 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.6, 151.5, 139.2, 133.0, 131.8, 129.4 (2C), 125.4 (2C), 51.9, 37.9, 34.7, 34.5, 33.3 (2C), 31.2 (3C), 26.4, 26.3 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₂₁H₃₁O₂ 315.2319; found 315.2326.



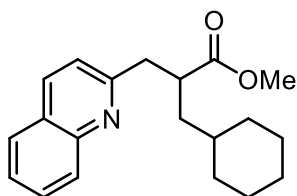
3ga. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 77%, (0.115 mmol, 33.9 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.68 (s, 1H), 7.43 – 7.35 (m, 1H), 7.28 – 7.23 (m, 3H), 3.81 (s, 3H), 2.30 (d, *J* = 7.1 Hz, 2H), 1.65 – 1.51 (m, 5H), 1.50 – 1.37 (m, 1H), 1.19 – 0.93 (m, 3H), 0.76 – 0.62 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 168.6, 136.9, 134.9, 134.3, 133.8, 130.1, 129.5, 129.1, 126.4, 52.0, 37.3, 34.6, 33.0 (2C), 26.3, 26.2 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₇H₂₂³⁵ClO₂ 293.1303; found, 293.1309; calcd. for C₁₇H₂₂³⁷ClO₂ 295.1274; found 295.1286.



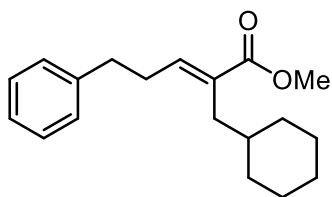
3ha. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 70%, (0.105 mmol, 32.4 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.87 – 7.80 (m, 5H), 7.53 – 7.46 (m, 3H), 3.83 (s, 3H), 2.57 (d, *J* = 7.1 Hz, 2H), 1.74 – 1.50 (m, 6H), 1.27 – 1.02 (m, 3H), 0.94 – 0.80 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.4, 139.4, 133.5, 133.1, 132.9, 132.8, 129.0, 128.3, 128.0, 127.6, 126.8, 126.6, 126.4, 52.0, 37.9, 34.6, 33.3 (2C), 26.4, 26.3 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₂₁H₂₅O₂ 309.1849; found 309.1849.



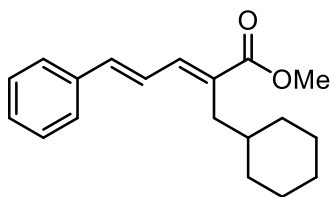
3ia. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 71%, (0.107 mmol, 28.1 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.83 (s, 1H), 7.43 (dt, *J* = 5.1, 1.1 Hz, 1H), 7.27 – 7.21 (m, 1H), 7.06 (dd, *J* = 5.2, 3.7 Hz, 1H), 3.78 (s, 3H), 2.61 (d, *J* = 7.2 Hz, 2H), 1.77 – 1.52 (m, 7H), 1.27 – 0.96 (m, 4H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.3, 138.7, 132.5, 132.0, 128.8, 128.8, 127.1, 51.9, 37.8, 35.2, 33.3 (2C), 26.4, 26.4 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₅H₂₁O₂S 265.1257; found 265.1260.



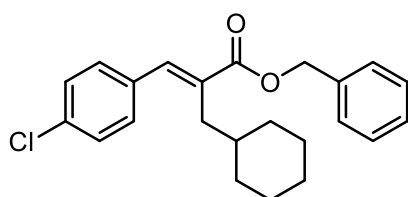
3ja'. Viscous colorless oil. FC eluent: *n*Hex/EtOAc: 10:1. Yield = 64%, (0.096 mmol, 29.9 mg), clean reduction of the double bond occurred, **3ia** not detected. **¹H NMR** (400 MHz, CDCl₃) δ = 8.05 – 7.95 (m, 2H), 7.75 (dd, *J* = 8.0, 1.4 Hz, 1H), 7.65 (ddd, *J* = 8.5, 6.9, 1.5 Hz, 1H), 7.46 (ddd, *J* = 8.1, 6.9, 1.2 Hz, 1H), 7.23 (d, *J* = 8.7 Hz, 1H), 3.59 (s, 3H), 3.27 (dd, *J* = 13.5, 8.8 Hz, 1H), 3.19 (tt, *J* = 8.9, 5.2 Hz, 1H), 3.06 (dd, *J* = 13.5, 5.4 Hz, 1H), 1.85 – 1.76 (m, 1H), 1.74 – 1.56 (m, 5H), 1.39 (ddd, *J* = 13.5, 8.3, 5.2 Hz, 1H), 1.32 – 1.03 (m, 3H), 0.94 – 0.74 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 176.6, 159.9, 147.9, 136.1, 129.3, 129.0, 127.4, 126.8, 125.8, 121.6, 51.4, 42.8, 41.6, 40.2, 35.6, 33.6, 32.8, 26.5, 26.2, 26.2; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₂₀H₂₆NO₂ 312.1958; found 312.1963.



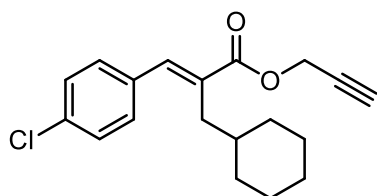
3ka. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 62%, (0.093 mmol, 28.8 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.32 – 7.26 (m, 2H), 7.22 – 7.14 (m, 3H), 6.82 (t, *J* = 7.4 Hz, 1H), 3.71 (s, 3H), 2.73 (dd, *J* = 9.0, 6.7 Hz, 2H), 2.48 (q, *J* = 7.6 Hz, 2H), 2.16 (d, *J* = 7.1 Hz, 2H), 1.70 – 1.57 (m, 5H), 1.43 – 1.27 (m, 1H), 1.27 – 1.02 (m, 3H), 0.93 – 0.79 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 168.6, 142.0, 141.2, 131.5, 128.4 (2C), 128.3 (2C), 126.1, 51.6, 37.7, 35.0, 34.3, 33.2 (2C), 30.9, 26.4, 26.3 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₉H₂₇O₂ 287.2006; found: 287.2014.



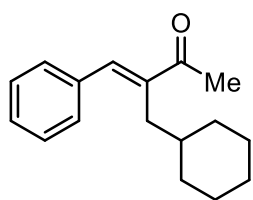
3la. Pale yellow solid. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 57%, (0.086 mmol, 24.3 mg), *E/Z* ratio: >20:1. **MP**: 106 - 108 °C. **¹H NMR** (400 MHz, CDCl₃) δ = 7.47 – 7.43 (m, 2H), 7.40 (d, *J* = 11.3 Hz, 1H), 7.37 – 7.32 (m, 2H), 7.31 – 7.25 (m, 1H), 7.03 (dd, *J* = 15.4, 11.3 Hz, 1H), 6.85 (d, *J* = 15.4 Hz, 1H), 3.76 (s, 3H), 2.39 (d, *J* = 7.0 Hz, 2H), 1.67 (ddd, *J* = 21.5, 16.4, 9.7 Hz, 5H), 1.55 – 1.38 (m, 1H), 1.27 – 1.09 (m, 3H), 1.02 – 0.88 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 168.8, 139.3, 139.1, 136.6, 130.9, 128.8 (2C), 128.6, 127.0 (2C), 124.2, 51.7, 38.3, 34.7, 33.4 (2C), 26.5, 26.3 (2C); **HRMS (ESI)** *m/z*: [M+H]⁺ calcd. for C₁₉H₂₅O₂ 285.1849; found 285.1852.



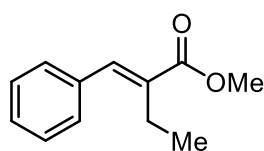
3ma. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 76%, (0.114 mmol, 42.0 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.63 (s, 1H), 7.43 – 7.36 (m, 4H), 7.36 – 7.30 (m, 3H), 7.29 – 7.25 (m, 2H), 5.24 (s, 2H), 2.45 (d, *J* = 7.1 Hz, 2H), 1.70 – 1.54 (m, 5H), 1.54 – 1.44 (m, 1H), 1.19 – 1.01 (m, 3H), 0.90 – 0.76 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 168.4, 138.2, 136.1, 134.4, 134.0, 133.4, 130.5 (2C), 128.6 (2C), 128.5 (2C), 128.2, 128.1 (2C), 66.6, 37.8, 34.5, 33.2 (2C), 26.3, 26.2 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₂₃H₂₆³⁵ClO₂ 369.1616; found 369.1617; calcd. for C₂₃H₂₆³⁷ClO₂ 371.1587; found 371.1596.



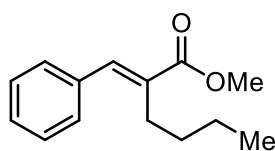
3na. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 74%, (0.111 mmol, 35.1 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.64 (s, 1H), 7.37 – 7.32 (m, 2H), 7.30 – 7.26 (m, 2H), 4.80 (d, *J* = 2.4 Hz, 2H), 2.48 (t, *J* = 2.4 Hz, 1H), 2.45 (d, *J* = 7.1 Hz, 2H), 1.68 – 1.54 (m, 5H), 1.54 – 1.44 (m, 1H), 1.22 – 1.02 (m, 3H), 0.91 – 0.77 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 167.7, 139.0, 134.2, 134.2, 132.7, 130.6 (2C), 128.7 (2C), 77.8, 74.8, 52.3, 37.8, 34.4, 33.2 (2C), 26.3, 26.2 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₉H₂₂³⁵ClO₂ 317.1303; found 317.1309; calcd. for C₁₉H₂₂³⁷ClO₂ 319.1274; found 319.1285.



30a. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 15:1. Yield = 73%, (0.110 mmol, 26.5 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.47 (s, 1H), 7.42 – 7.35 (m, 4H), 7.34 – 7.28 (m, 1H), 2.46 (d, *J* = 7.1 Hz, 2H), 2.43 (s, 3H), 1.66 – 1.52 (m, 5H), 1.50 – 1.35 (m, 1H), 1.20 – 0.99 (m, 3H), 0.91 – 0.76 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 200.8, 142.3, 139.7, 136.0, 129.2 (2C), 128.5 (2C), 128.3, 37.6, 33.3 (2C), 33.2, 26.3, 26.3, 26.3 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₇H₂₃O 243.1743; found 243.1743.

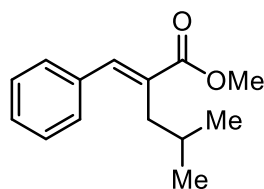


30b. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 49%, (0.074 mmol, 14.0 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.64 (s, 1H), 7.41 – 7.27 (m, 5H), 3.81 (s, 3H), 2.53 (q, *J* = 7.4 Hz, 2H), 1.16 (t, *J* = 7.4 Hz, 3H); **¹³C NMR** (100 MHz, CDCl₃) δ = 168.8, 138.6, 135.7, 134.7, 129.2 (2C), 128.4 (2C), 128.3, 51.9, 20.8, 13.9; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₂H₁₅O₂ 191.1067; found 191.1073.



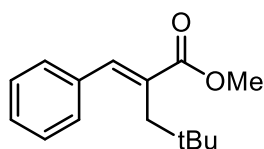
30c. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 55%, (0.083 mmol, 18.0 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.64 (s, 1H), 7.41 – 7.28 (m, 5H), 3.80 (s, 3H), 2.55 – 2.46 (m, 2H), 1.55 – 1.46 (m, 2H), 1.42 – 1.31 (m, 2H), 0.90 (t, *J* = 7.3 Hz, 3H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.0, 138.7, 135.8, 133.6, 129.2 (2C), 128.4 (2C), 128.3, 51.9, 31.4, 27.3, 22.8, 13.8; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₄H₁₉O₂ 219.1380; found: 219.1379.

30c is a known compound and the reported spectroscopic data match with the ones reported in the literature (*E/Z* ratio: 1:1.7).⁶

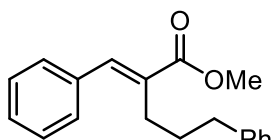


30d. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 69%, (0.104 mmol, 18.0 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.67 (s, 1H), 7.36 (d, *J* = 5.0 Hz, 4H), 7.31 – 7.25 (m, 1H), 3.79 (s, 3H), 2.47 (d, *J* = 7.2 Hz, 2H), 1.85 (sept, *J* = 6.9 Hz, 1H), 0.84 (d, *J* = 6.7 Hz, 6H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.3, 139.4, 136.0, 133.1, 129.2 (2C), 128.4 (2C), 128.1, 51.9, 35.6, 28.2, 22.4 (2C); **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₄H₁₉O₂ 219.1380; found 219.1389.

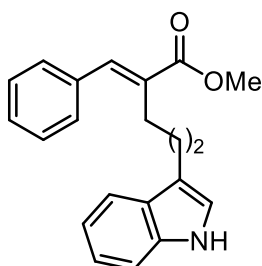
30d is a known compound and the reported spectroscopic data match with the ones reported in the literature (*E/Z* ratio: 1:1.7).⁶



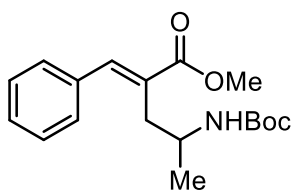
30e. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 80%, (0.120 mmol, 27.9 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.66 (s, 1H), 7.39 – 7.31 (m, 4H), 7.29 – 7.25 (m, 1H), 3.78 (s, 3H), 2.63 (s, 2H), 0.73 (s, 9H); **¹³C NMR** (100 MHz, CDCl₃) δ = 170.3, 139.9, 136.6, 132.6, 128.9 (2C), 128.3 (2C), 127.7, 51.9, 38.2, 33.4, 29.5 (3C); **HRMSI (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₅H₂₁O₂ 233.1536; found 233.1545.



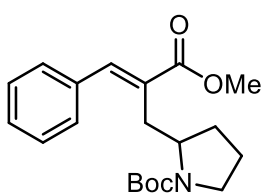
3af. Viscous colorless oil. FC eluent: *n*Hex/Et₂O: 25:1. Yield = 69%, (0.104 mmol, 29.2 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.65 (s, 1H), 7.29 (dt, *J* = 4.4, 1.9 Hz, 4H), 7.27 – 7.22 (m, 2H), 7.22 – 7.15 (m, 4H), 3.81 (s, 3H), 2.68 (t, *J* = 7.4 Hz, 2H), 2.61 – 2.52 (m, 2H), 1.95 – 1.83 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 168.9, 141.9, 139.1, 135.6, 133.0, 129.2 (2C), 128.5 (2C), 128.4 (2C), 128.3, 128.3 (2C), 125.8, 52.0, 35.8, 30.6, 27.1; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₉H₂₁O₂ 281.1536; found 281.1544.



3ag. White solid. FC eluent: *n*Hex/EtOAc: 5:1. Yield = 61%, (0.092 mmol, 29.2 mg), *E/Z* ratio: >20:1. **MP**: 95 - 98 °C. **¹H NMR** (400 MHz, CDCl₃) δ = 7.89 (bs, 1H), 7.62 (s, 1H), 7.60 (dd, *J* = 7.8, 1.2 Hz, 1H), 7.36 (dt, *J* = 8.1, 1.0 Hz, 1H), 7.23 – 7.08 (m, 7H), 6.93 (d, *J* = 2.3 Hz, 1H), 3.79 (d, *J* = 1.3 Hz, 3H), 2.84 (t, *J* = 7.3 Hz, 2H), 2.64 – 2.55 (m, 2H), 2.06 – 1.92 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.0, 138.9, 136.4, 135.6, 133.2, 129.2 (2C), 128.3 (2C), 128.2, 127.5, 121.9, 121.5, 119.2, 119.0, 116.0, 111.0, 51.9, 29.1, 27.3, 25.1; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₂₁H₂₂NO₂ 320.1645; found 320.1651.

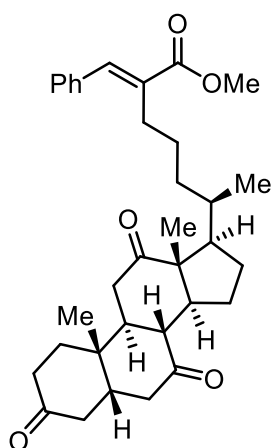


3ah. Viscous colorless oil. FC eluent: *n*Hex/EtOAc: 10:1. Yield = 67%, (0.101 mmol, 32.1 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.75 (s, 1H), 7.41 – 7.26 (m, 5H), 4.50 (bs, 1H), 3.92 (bs, 1H), 3.82 (s, 3H), 2.73 – 2.56 (m, 2H), 1.38 (s, 9H), 1.09 (d, *J* = 6.6 Hz, 3H); **¹³C NMR** (100 MHz, CDCl₃) δ = 169.1, 155.2, 141.2, 135.6, 130.4, 129.1 (2C), 128.5 (2C), 128.4, 78.8, 52.1, 46.8, 34.4, 28.3 (3C), 21.6; **HRMS (ESI)** *m/z*: [M+H]⁺ calcd. for C₁₈H₂₆NO₄ 320.1856; found: 320.1852.

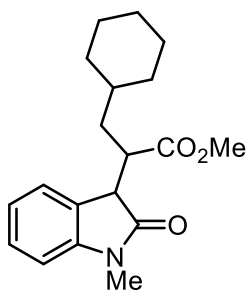


3ai. Pale yellow oil. FC eluent: *n*Hex/EtOAc: 10:1. Yield = 75%, (0.113 mmol, 38.9 mg), *E/Z* ratio: >20:1. **¹H NMR** (400 MHz, CD₃OD) δ = 7.77 (s, 1H), 7.44 – 7.35 (m, 3H), 7.35 – 7.26 (m, 2H), 4.20 (dddd, *J* = 8.8, 7.1, 5.6, 1.3 Hz, 1H), 3.79 (s, 3H), 3.19 (q, *J* = 9.1 Hz, 1H), 2.93 – 2.80 (m, 2H), 2.53 (td, *J* = 16.8, 13.4, 7.2 Hz, 1H), 1.88 – 1.51 (m, 4H), 1.39 (s, 9H) some signals appear doubled due to the slow rotation of the C-N bond of the Boc moiety; **¹³C NMR** (100 MHz, CD₃OD) δ = 172.5, 159.0, 145.1, 139.6, 134.4, 132.4, 132.2 (2C), 132.0 (2C), 83.6, 60.3, 55.0, 49.2, 35.4, 34.4, 31.2 (3C), 25.8 some signals appear doubled due to the slow rotation of the C-N bond of the Boc moiety; **HRMS (ESI)** *m/z*: [M+H]⁺ calcd. for C₂₀H₂₈NO₄ 346.2013; found 346.2009.

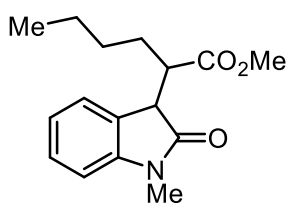
3ai is a known compound and the reported spectroscopic data match with the ones reported in the literature (*E/Z* ratio: 1:1).⁶



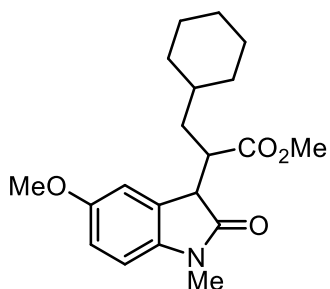
3aj. White solid. FC eluent: *n*Hex/EtOAc: 1:1. Yield = 66%, (0.099 mmol, 52.7 mg), *E/Z* ratio: >20:1. **MP:** 186 - 188 °C. **¹H NMR** (400 MHz, CDCl₃) δ = 7.62 (s, 1H), 7.40 – 7.26 (m, 5H), 3.78 (s, 3H), 2.93 – 2.76 (m, 3H), 2.57 – 2.36 (m, 2H), 2.37 – 2.04 (m, 7H), 2.04 – 1.87 (m, 4H), 1.81 (td, *J* = 11.1, 7.1 Hz, 1H), 1.73 – 1.53 (m, 3H), 1.51 – 1.38 (m, 1H), 1.37 (s, 3H), 1.35 – 1.08 (m, 5H), 1.02 (s, 3H), 0.81 (d, *J* = 6.4 Hz, 3H); **¹³C NMR** (100 MHz, CDCl₃) δ = 212.0, 209.0, 208.7, 168.9, 138.7, 135.8, 133.6, 129.1 (2C), 128.4 (2C), 128.3, 56.9, 51.9, 51.8, 49.0, 46.8, 45.8, 45.5, 45.0, 42.8, 38.6, 36.5, 36.0, 35.7, 35.3, 35.2, 27.8, 27.7, 26.2, 25.2, 21.9, 18.9, 11.8; **HRMS (ESI)** *m/z*: [M+H]⁺ calcd. for C₃₄H₄₅O₅ 533.3262; found 533.3257.



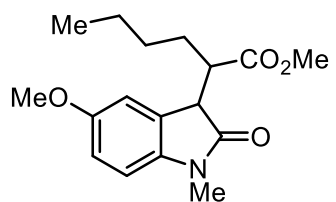
6aa. Colourless sticky foam. FC eluent: *n*Hex/EtOAc: 3:1. Yield = 57%, (0.086 mmol, 26.9 mg), *dr*: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = ¹H NMR (401 MHz, cdcl₃) δ 7.31 – 7.20 (m, 2H), 7.01 (td, *J* = 7.5, 1.0 Hz, 1H), 6.80 (d, *J* = 7.8 Hz, 1H), 3.74 (d, *J* = 3.7 Hz, 1H), 3.71 (s, 3H), 3.29 (ddd, *J* = 9.6, 5.0, 3.7 Hz, 1H), 3.19 (s, 3H), 1.82 – 1.48 (m, 7H), 1.30 – 0.97 (m, 4H), 0.86 – 0.66 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 171.7, 170.5, 140.2, 123.9, 121.7, 120.4, 118.0, 103.6, 47.6, 42.7, 38.5, 31.2, 30.8, 29.1, 28.3, 26.7, 25.6, 22.1, 21.9; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₉H₂₆NO₃ 316.1907; found 316.1915.



6ac. Pale yellow sticky foam. FC eluent: *n*Hex/EtOAc: 3:1. Yield = 51%, (0.077 mmol, 21.0 mg), *dr*: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 7.31 – 7.21 (m, 2H), 7.01 (t, *J* = 7.5 Hz, 1H), 6.81 (d, *J* = 7.7 Hz, 1H), 3.77 (d, *J* = 3.8 Hz, 1H), 3.72 (s, 3H), 3.20 (s, 3H), 3.18 – 3.12 (m, 1H), 1.32 – 1.13 (m, 6H), 0.78 (t, *J* = 6.8 Hz, 3H); **¹³C NMR** (100 MHz, CDCl₃) δ = 176.1, 174.6, 144.5, 128.2, 126.1, 124.8, 122.3, 108.0, 51.9, 46.9, 45.6, 29.8, 27.6, 26.2, 22.4, 13.8; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₆H₂₂NO₃ 276.1594; found 276.1595.



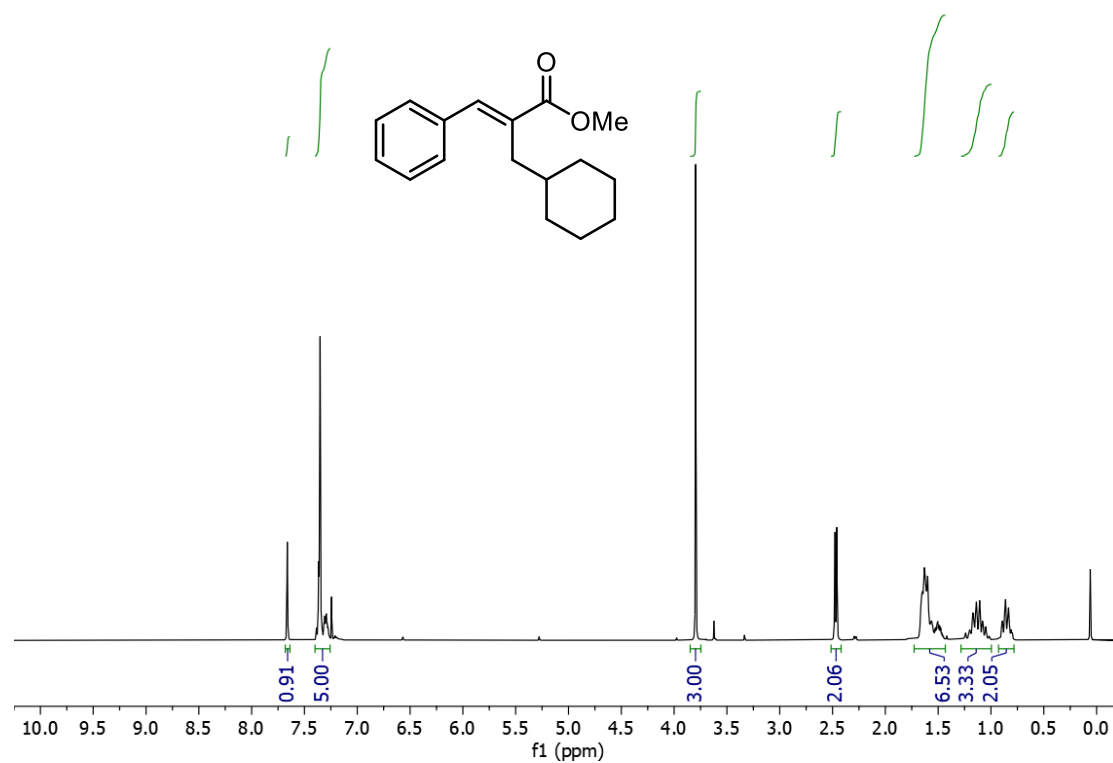
6ba. Pale yellow sticky foam. FC eluent: *n*Hex/EtOAc: 2:1. Yield = 62%, (0.093 mmol, 32.1 mg), *dr*: >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 6.89 (dd, *J* = 2.5, 1.2 Hz, 1H), 6.79 (ddd, *J* = 8.4, 2.6, 0.8 Hz, 1H), 6.70 (d, *J* = 8.4 Hz, 1H), 3.77 (s, 3H), 3.71 (s, 3H) overlapped with 3.73 – 3.65 (m, 1H), 3.29 (ddd, *J* = 9.3, 5.0, 3.6 Hz, 1H), 3.17 (s, 3H), 1.73 – 1.51 (m, 7H), 1.21 – 0.95 (m, 4H), 0.88 – 0.66 (m, 2H); **¹³C NMR** (100 MHz, CDCl₃) δ = 171.7, 170.5, 140.2, 123.9, 121.7, 120.4, 118.0, 103.6, 47.6, 42.7, 38.5, 31.2, 30.8, 29.1, 28.3, 26.7, 25.6, 22.1, 21.9; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₂₀H₂₈NO₄ 346.2013; found 346.2018.



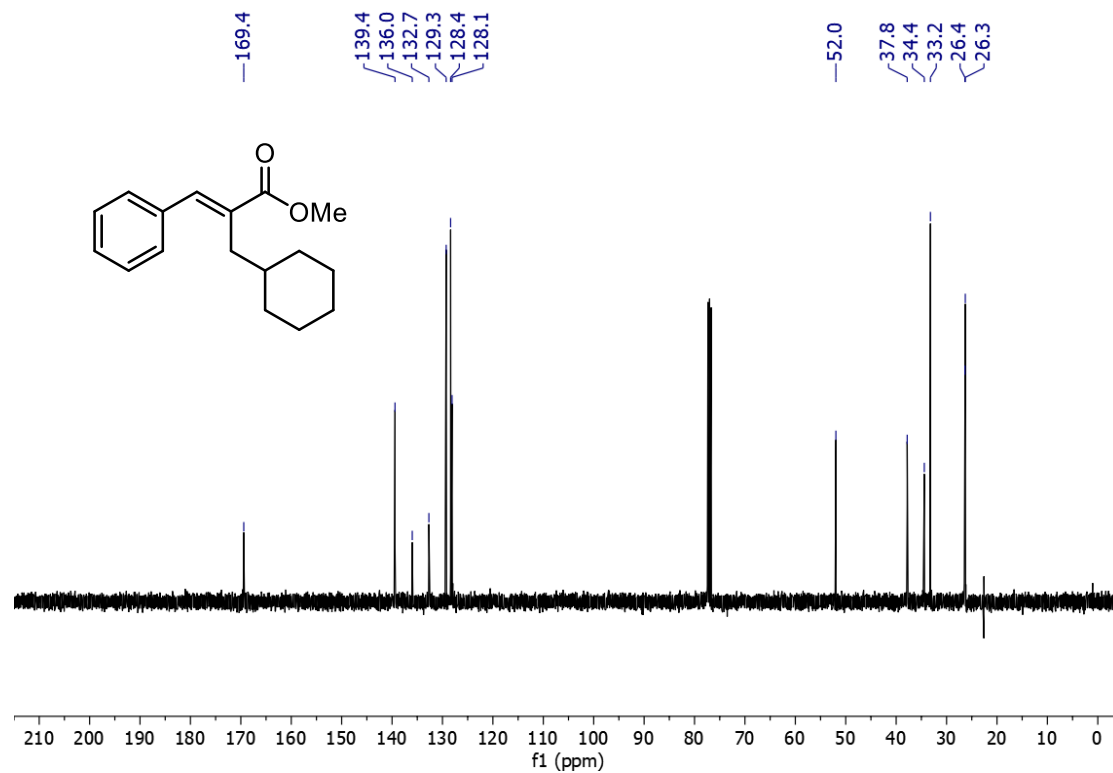
6bc. Pale yellow sticky foam. FC eluent: *n*Hex/EtOAc: 3:1. Yield = 66%, (0.099 mmol, 30.2 mg), *dr.* >20:1. **¹H NMR** (400 MHz, CDCl₃) δ = 6.91 (dd, *J* = 2.7, 1.3 Hz, 1H), 6.79 (dd, *J* = 8.5, 2.6 Hz, 1H), 6.70 (d, *J* = 8.3 Hz, 1H), 3.81 – 3.74 (m, 4H), 3.72 (s, 3H), 3.20 – 3.10 (m, 4H), 1.27 – 1.11 (m, 5H), 0.95 – 0.82 (m, 1H), 0.78 (t, *J* = 6.8 Hz, 3H); **¹³C NMR** (100 MHz, CDCl₃) δ = **¹³C NMR** (101 MHz, cdcl₃) δ 175.8, 174.6, 155.7, 138.1, 127.4, 112.6, 112.4, 108.1, 55.8, 51.9, 47.3, 45.5, 29.8, 27.6, 26.3, 22.4, 13.8; **HRMS (APCI)** *m/z*: [M+H]⁺ calcd. for C₁₇H₂₄NO₄ 306.1700; found 306.1699.

¹H and ¹³C NMR spectra

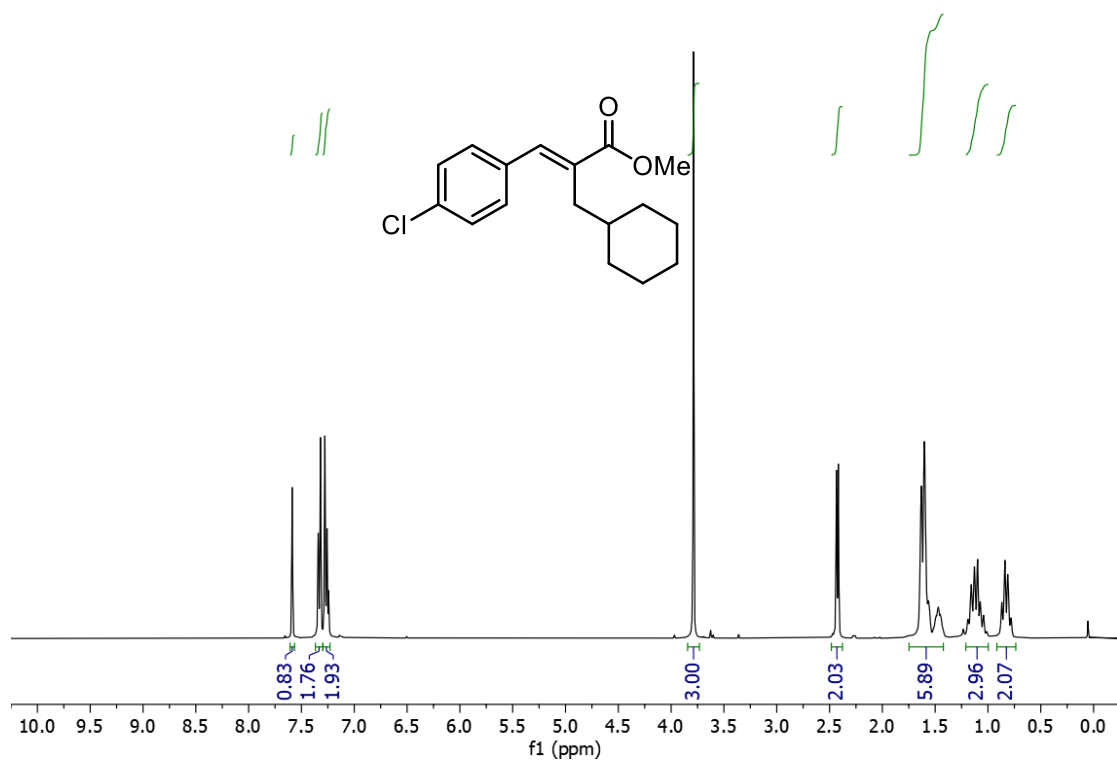
3aa ¹H NMR (400 MHz, CDCl₃)



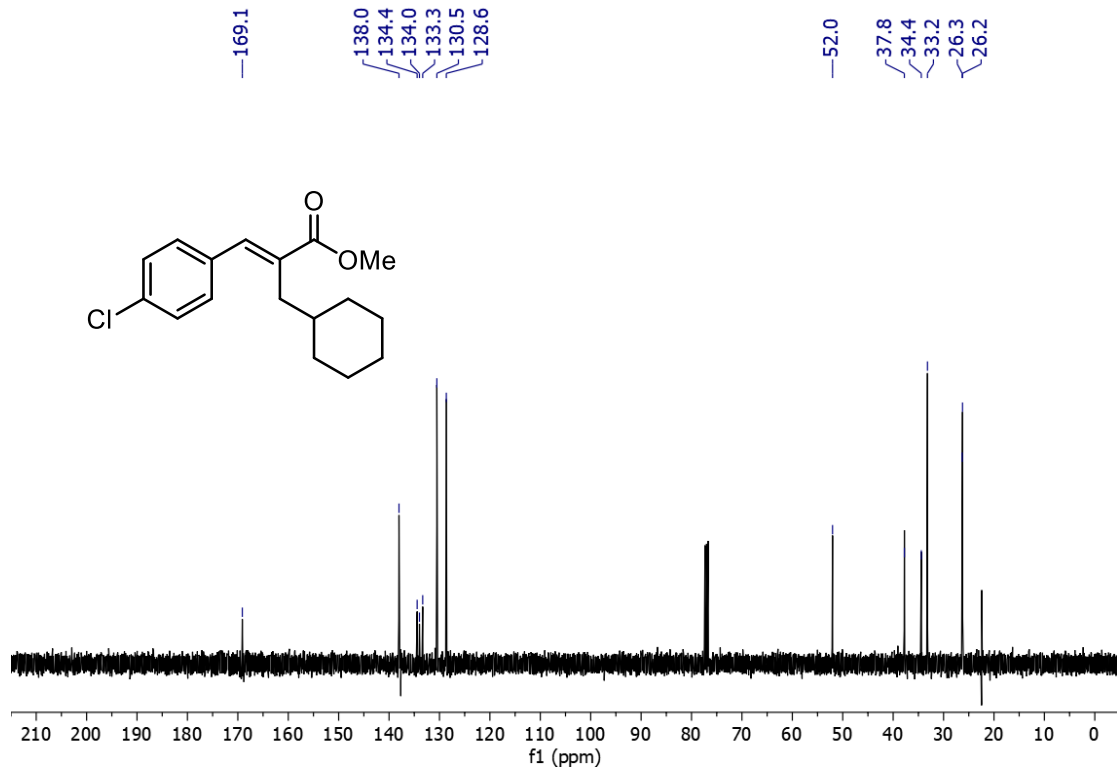
3aa ¹³C NMR (100 MHz, CDCl₃)



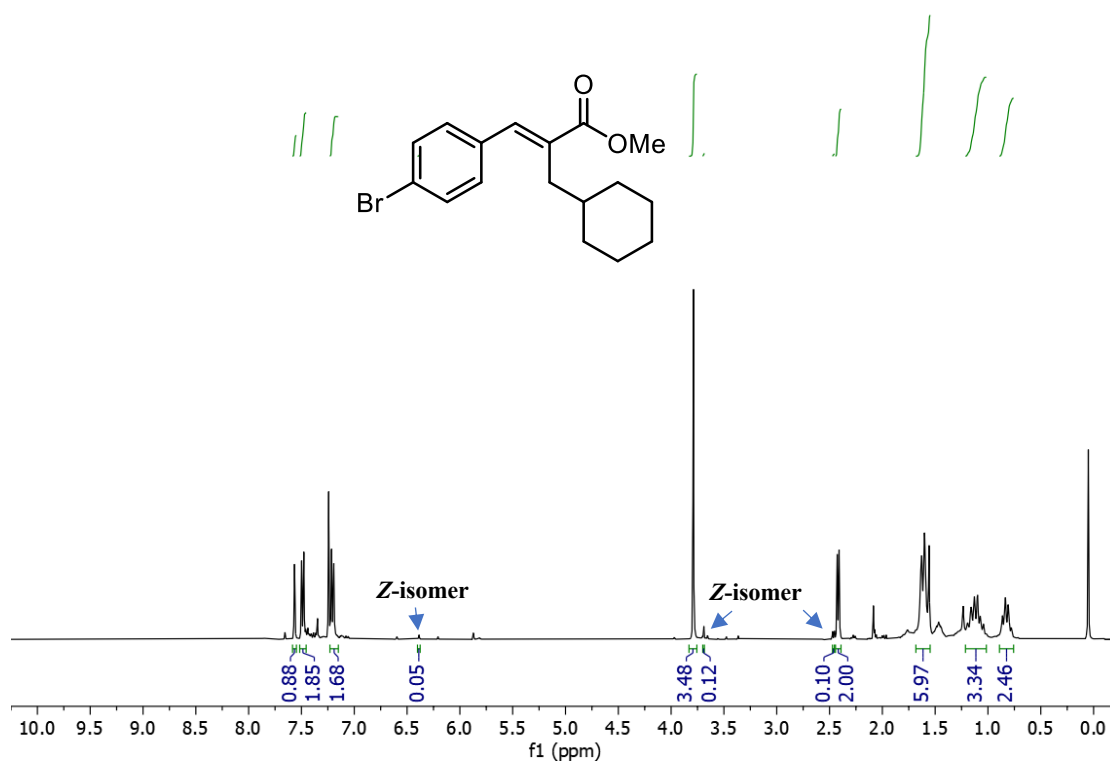
3ba ¹H NMR (400 MHz, CDCl₃)



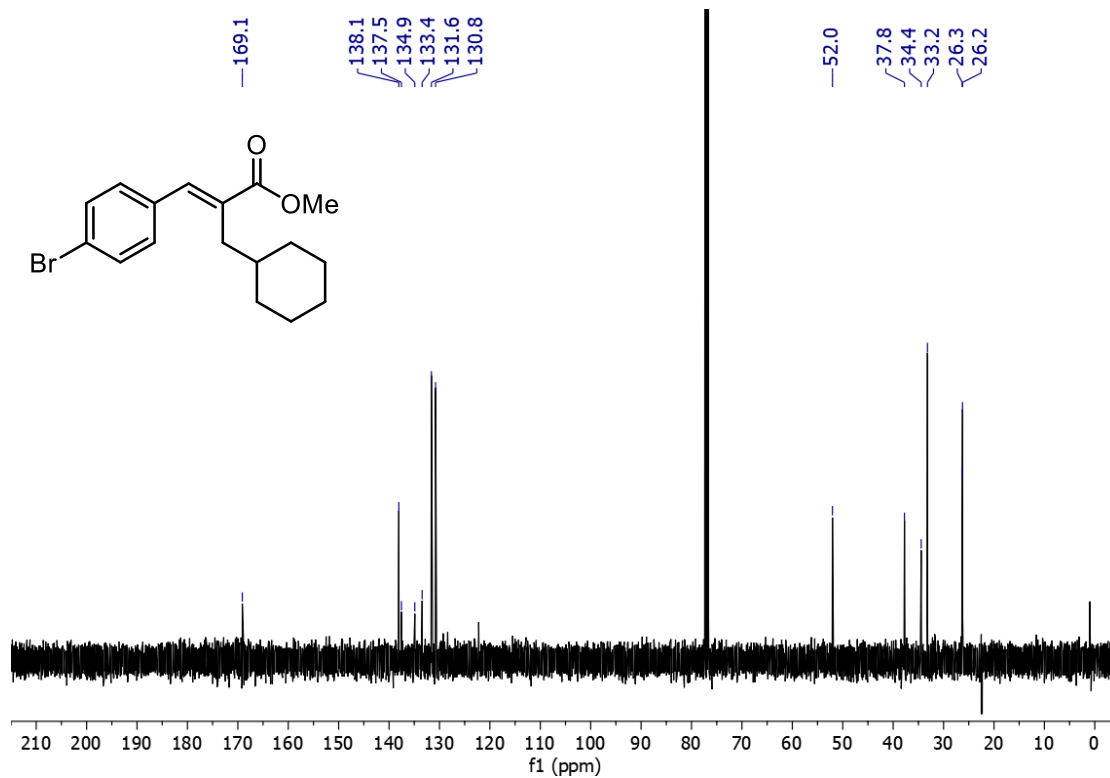
3ba ¹³C NMR (100 MHz, CDCl₃)



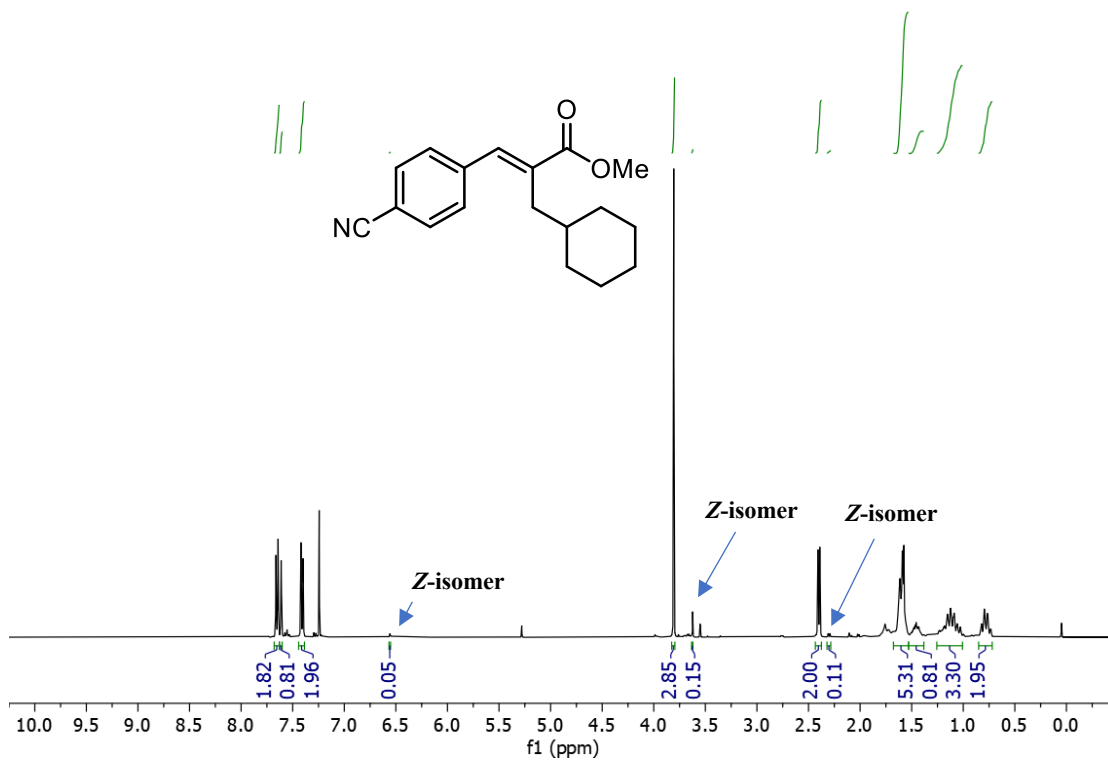
3ca ¹H NMR (400 MHz, CDCl₃)



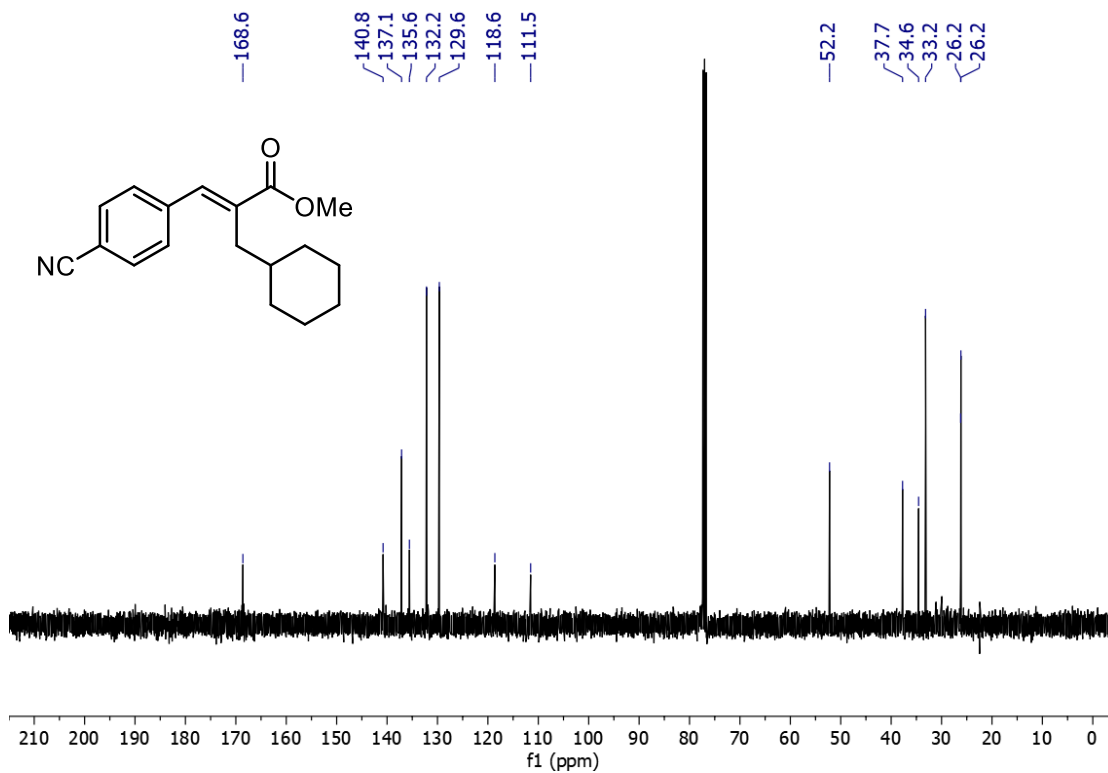
3ca ¹³C NMR (100 MHz, CDCl₃)



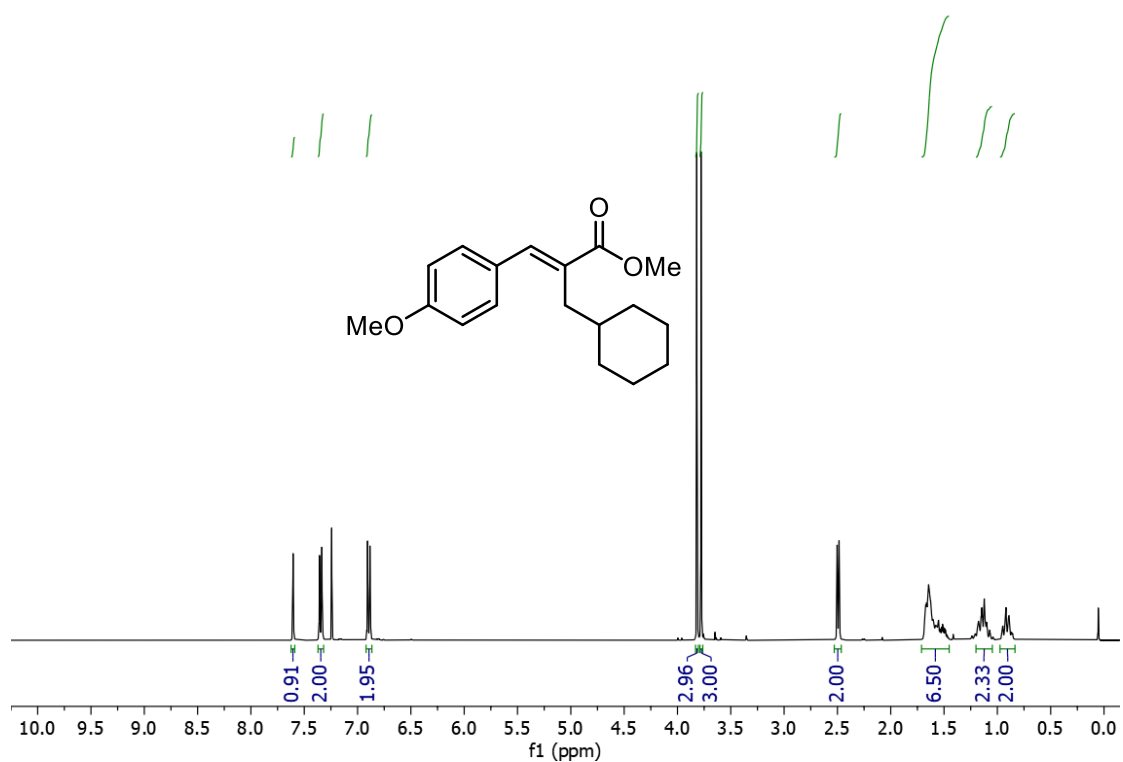
3da ¹H NMR (400 MHz, CDCl₃)



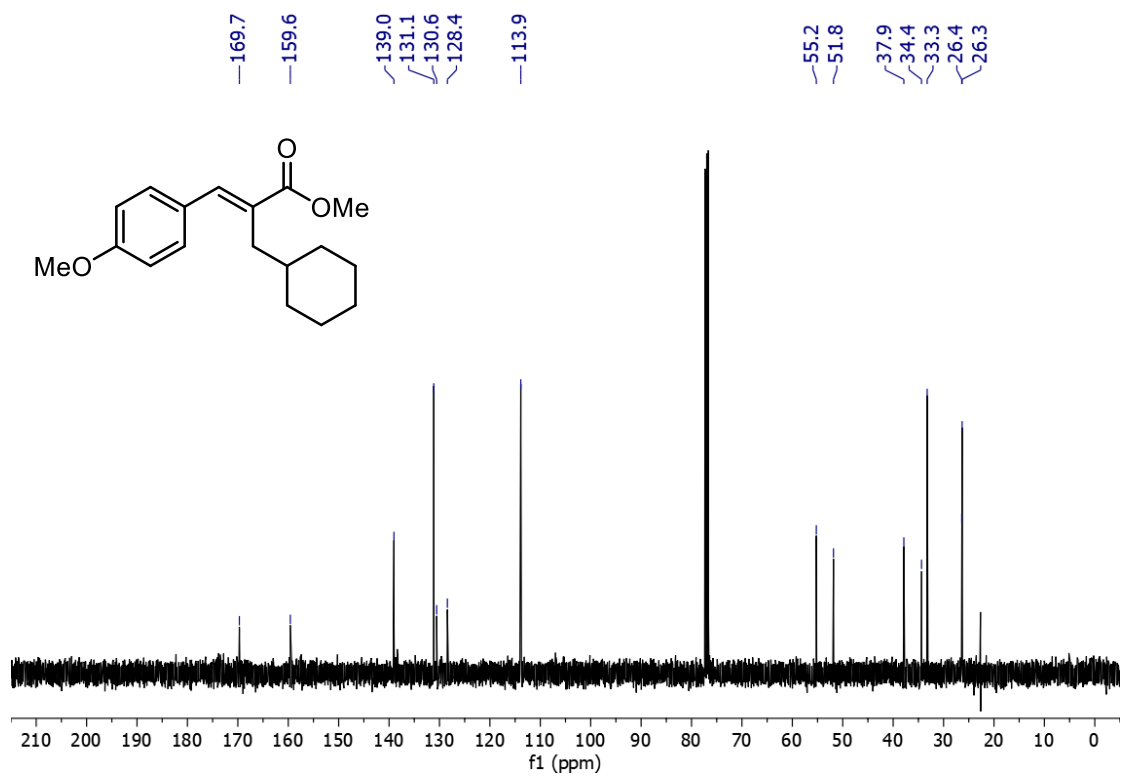
3da ¹³C NMR (100 MHz, CDCl₃)



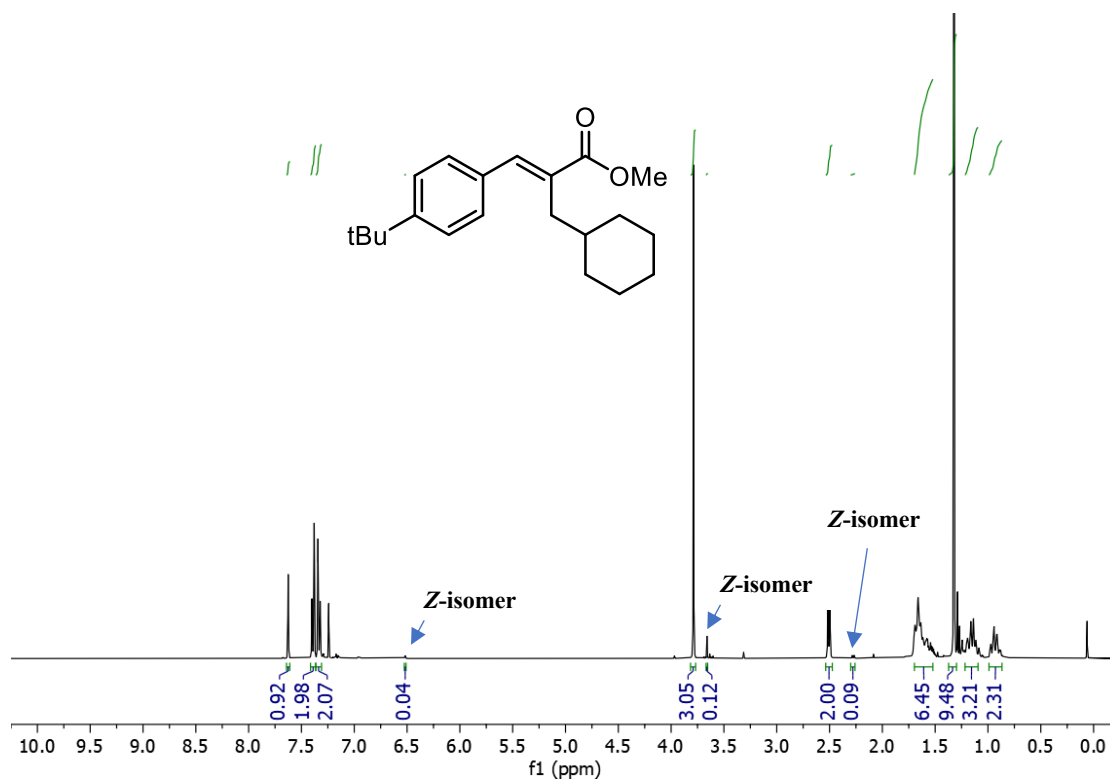
3ea ¹H NMR (400 MHz, CDCl₃)



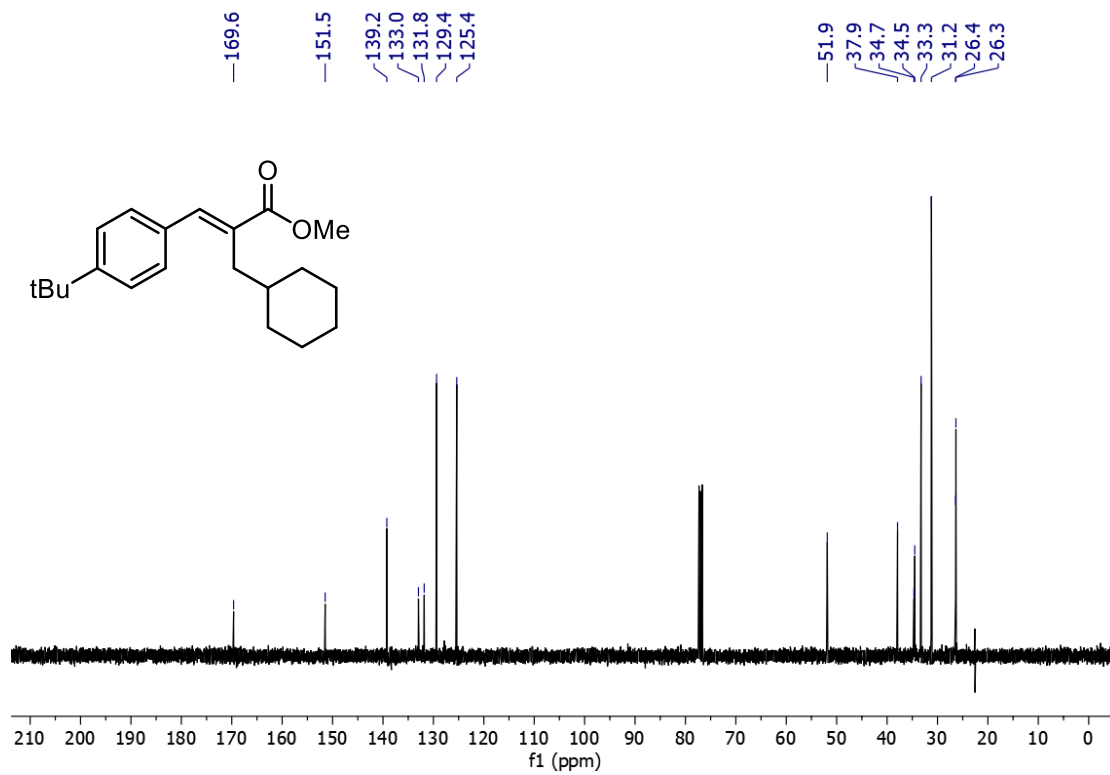
3ea ¹³C NMR (100 MHz, CDCl₃)



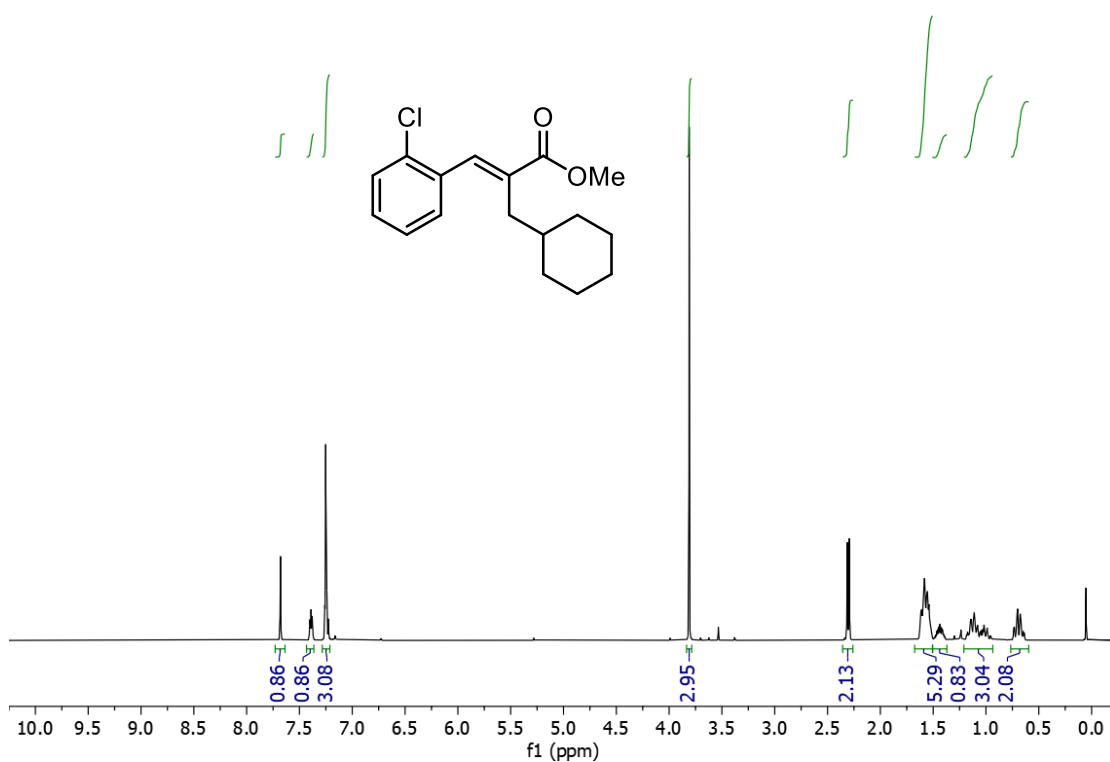
3fa ¹H NMR (400 MHz, CDCl₃)



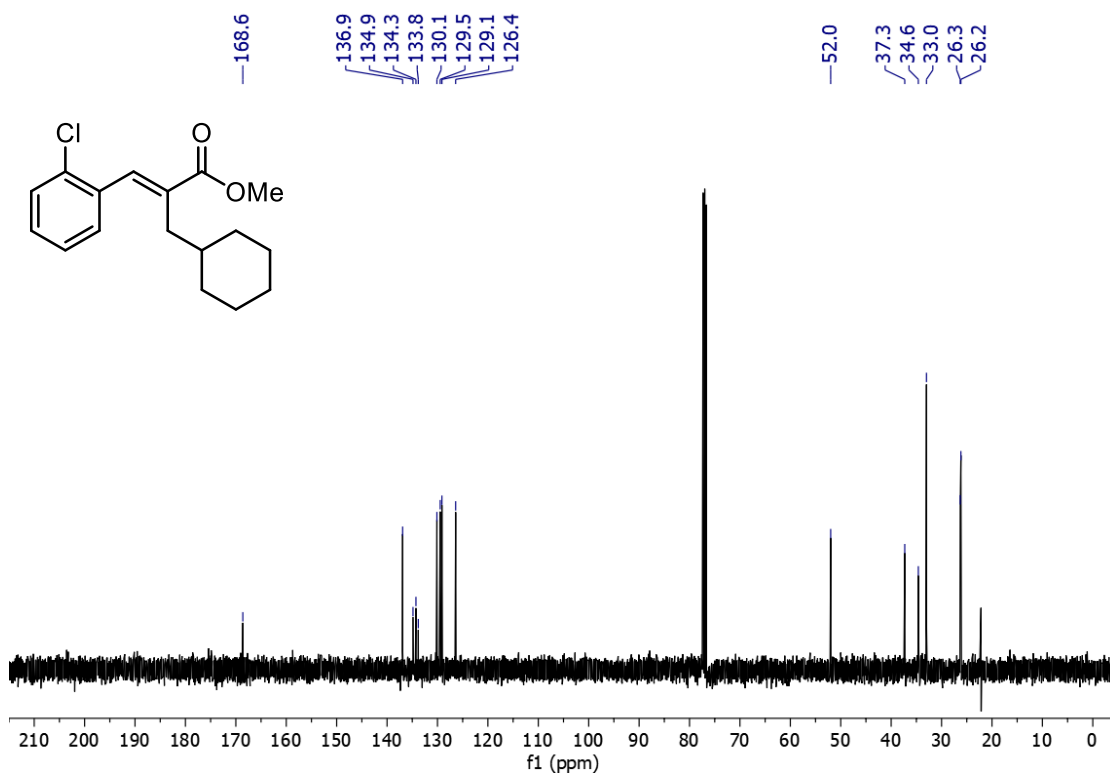
3fa ¹³C NMR (100 MHz, CDCl₃)



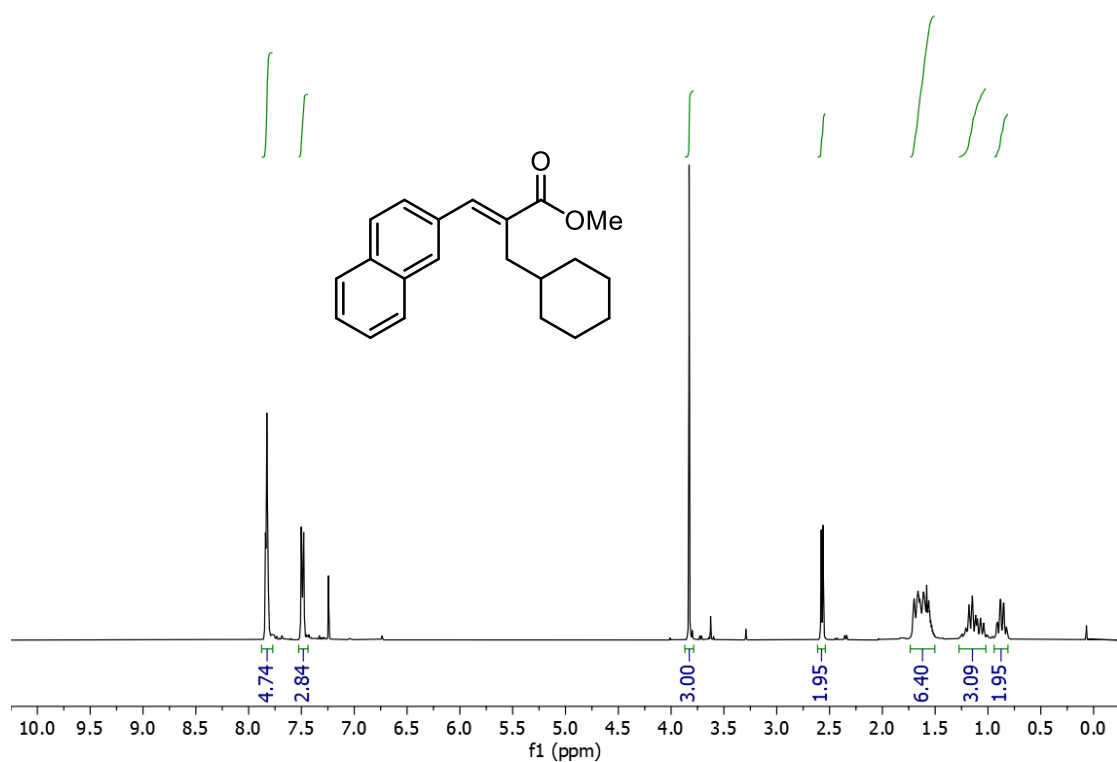
3ga ¹H NMR (400 MHz, CDCl₃)



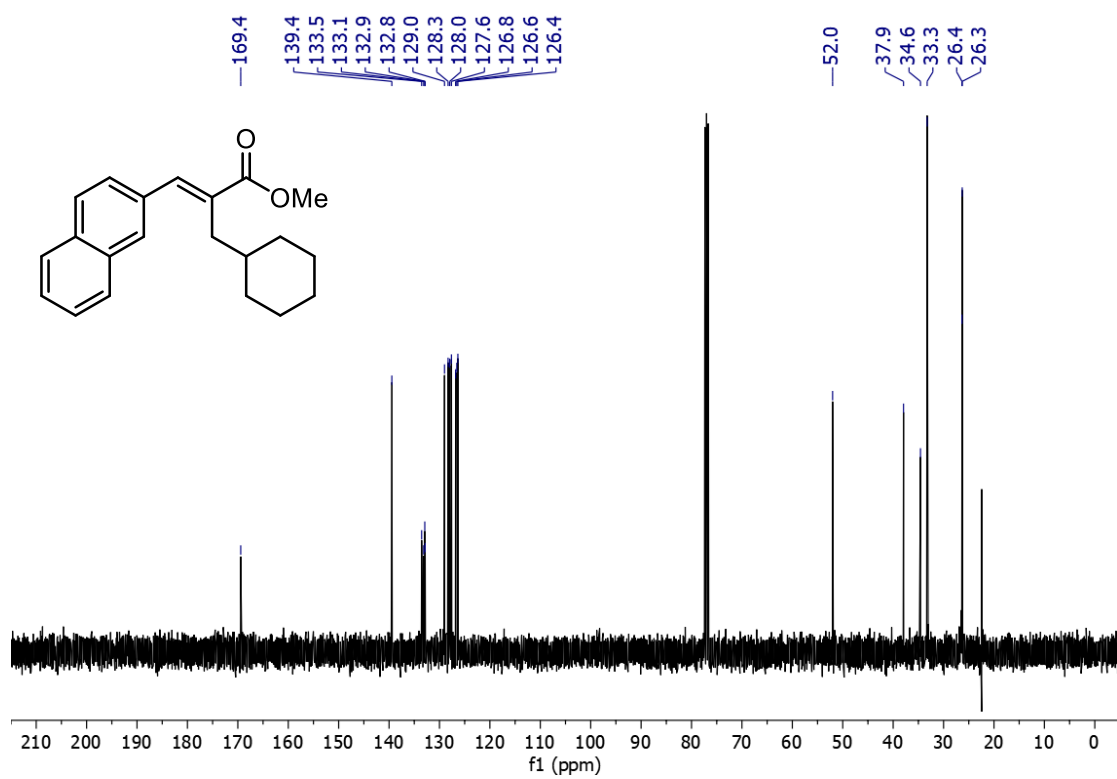
3ga ¹³C NMR (100 MHz, CDCl₃)



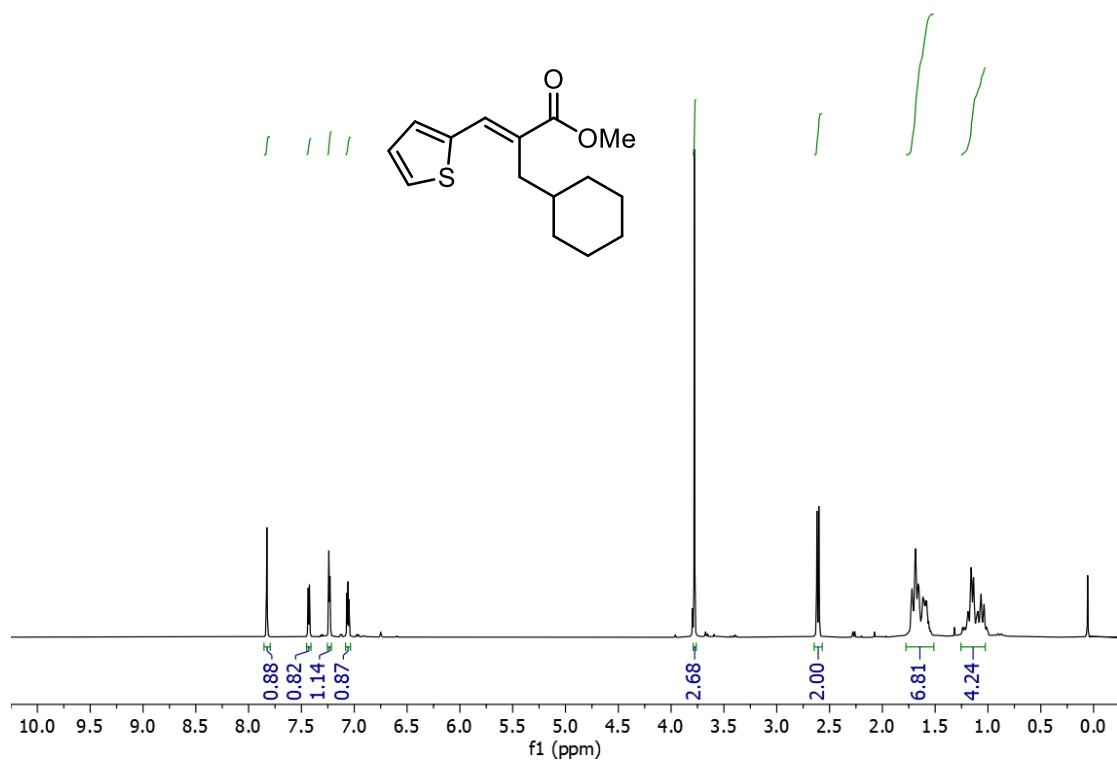
3ha ¹H NMR (400 MHz, CDCl₃)



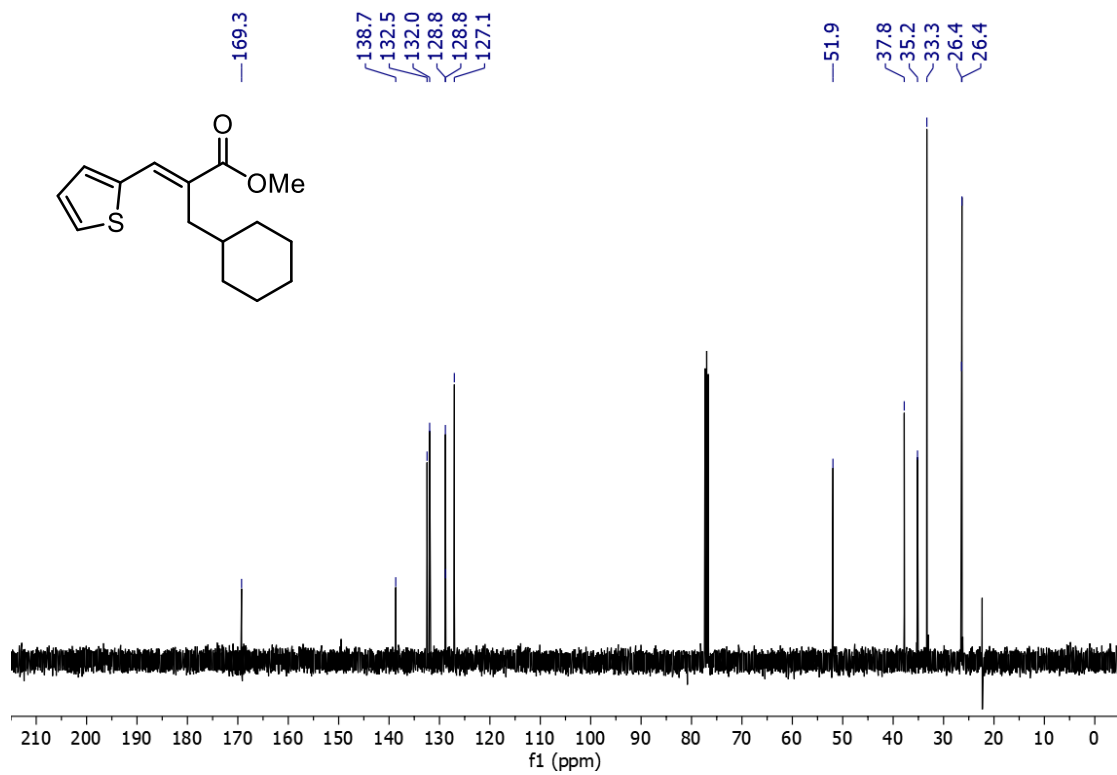
3ha ¹³C NMR (100 MHz, CDCl₃)



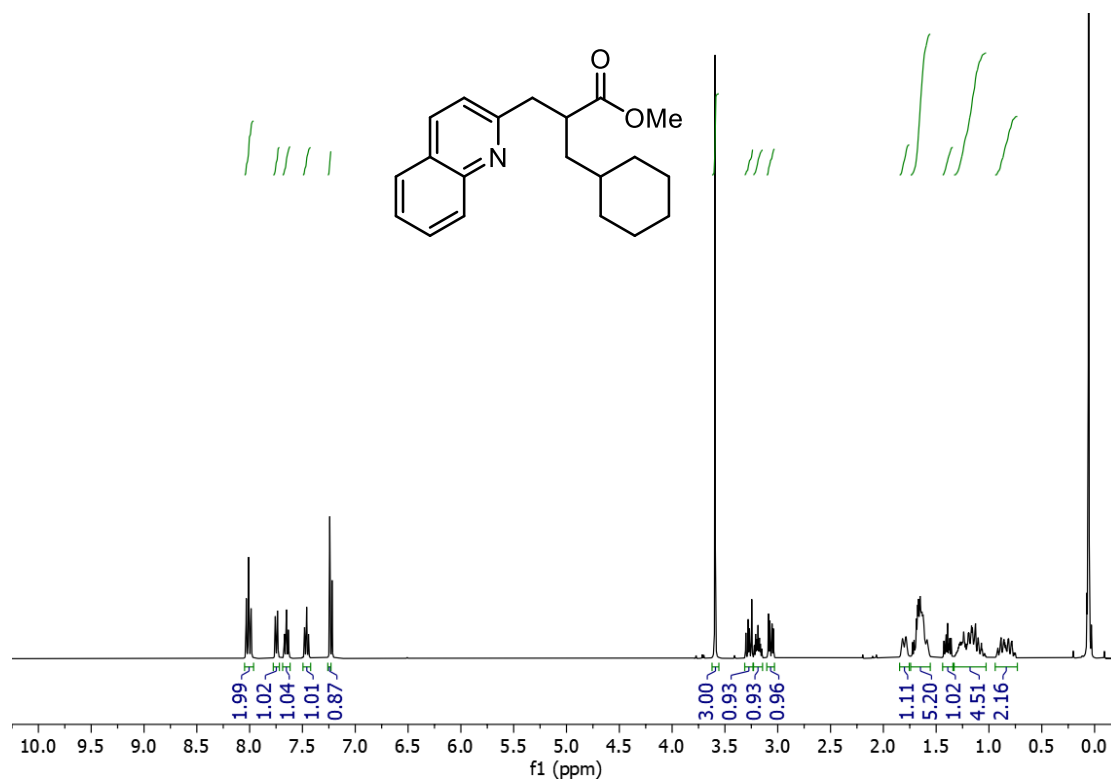
3ia ¹H NMR (400 MHz, CDCl₃)



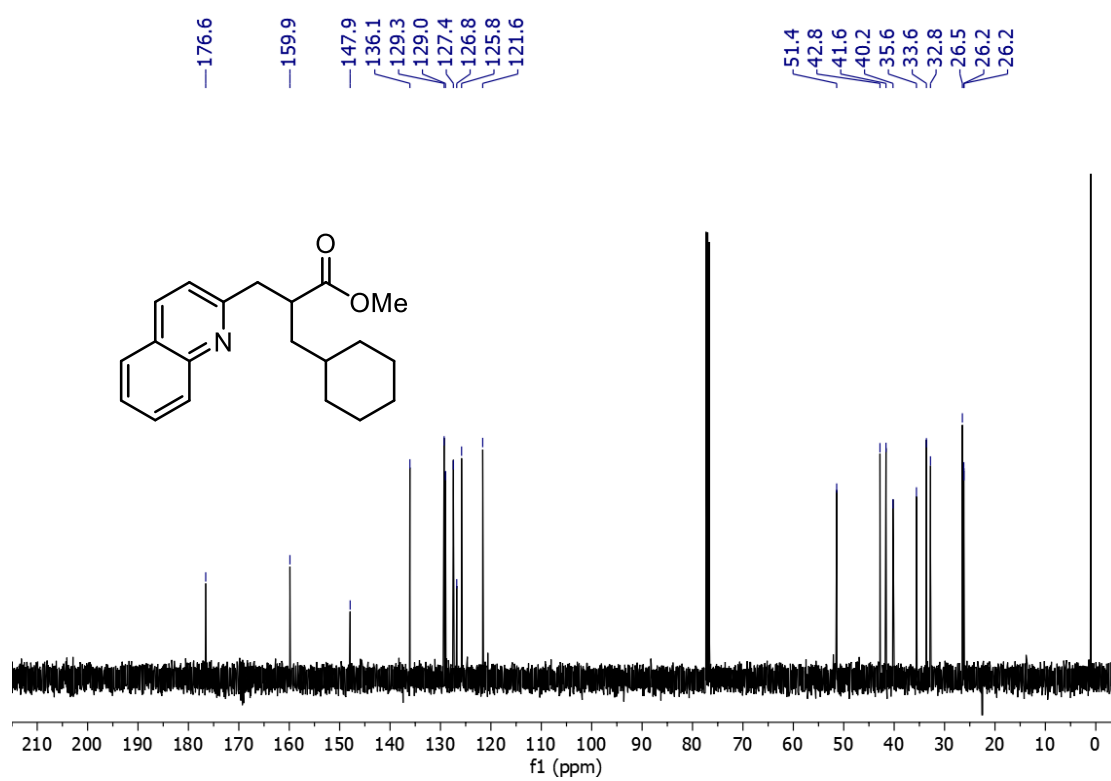
3ia ¹³C NMR (100 MHz, CDCl₃)



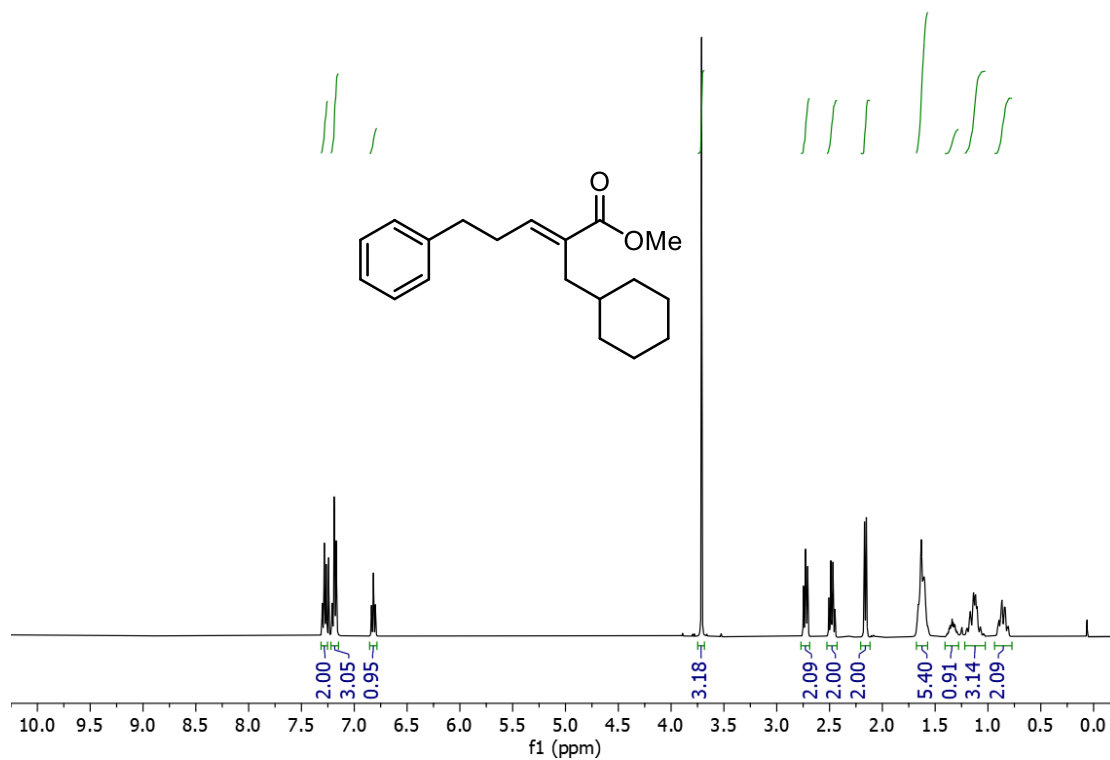
3ja' ¹H NMR (400 MHz, CDCl₃)



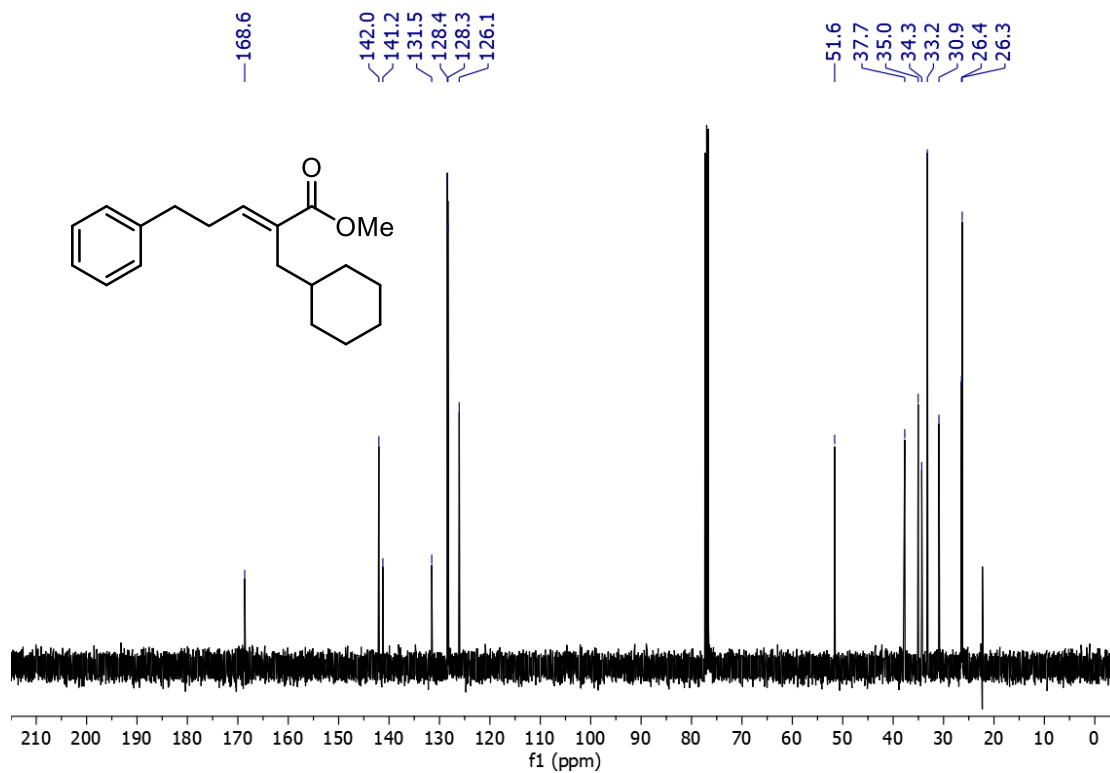
3ja' ¹³C NMR (100 MHz, CDCl₃)



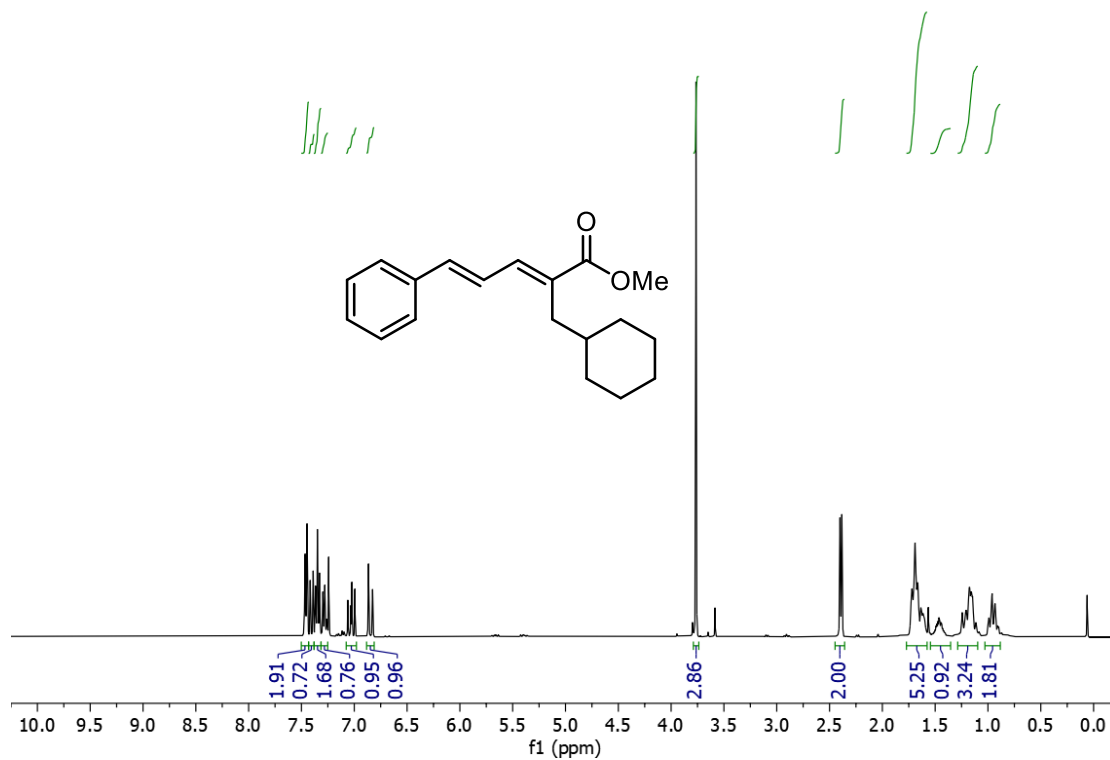
3ka ¹H NMR (400 MHz, CDCl₃)



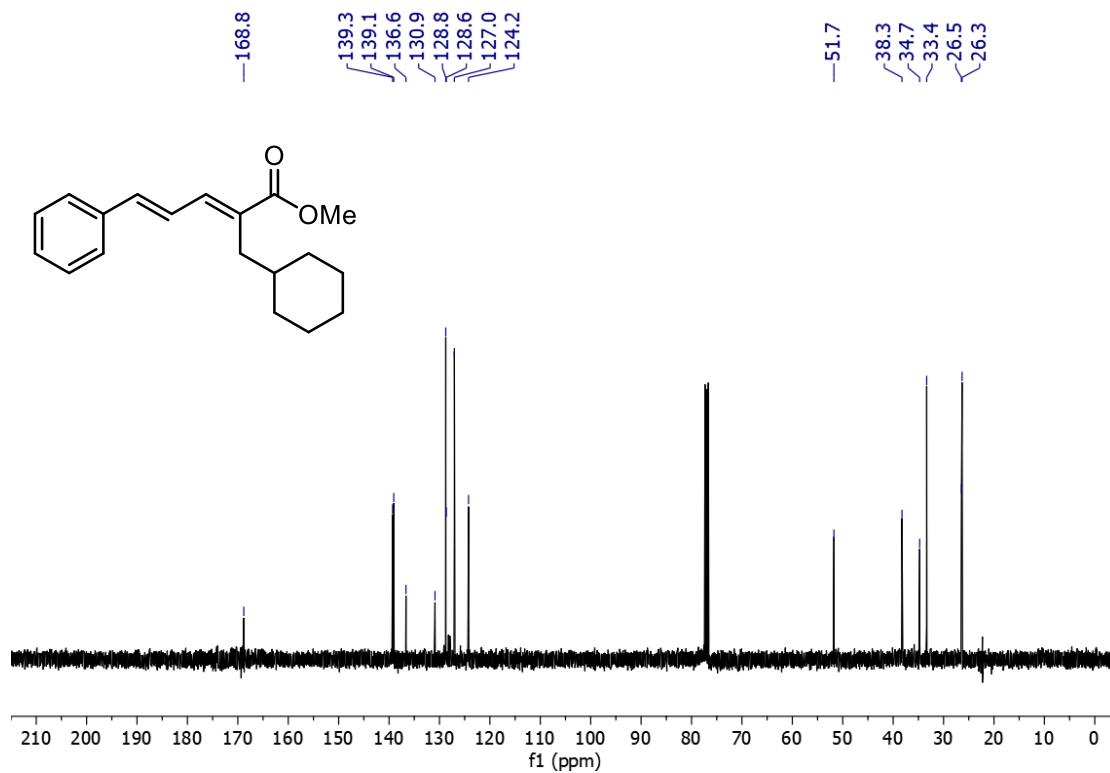
3ka ¹³C NMR (100 MHz, CDCl₃)



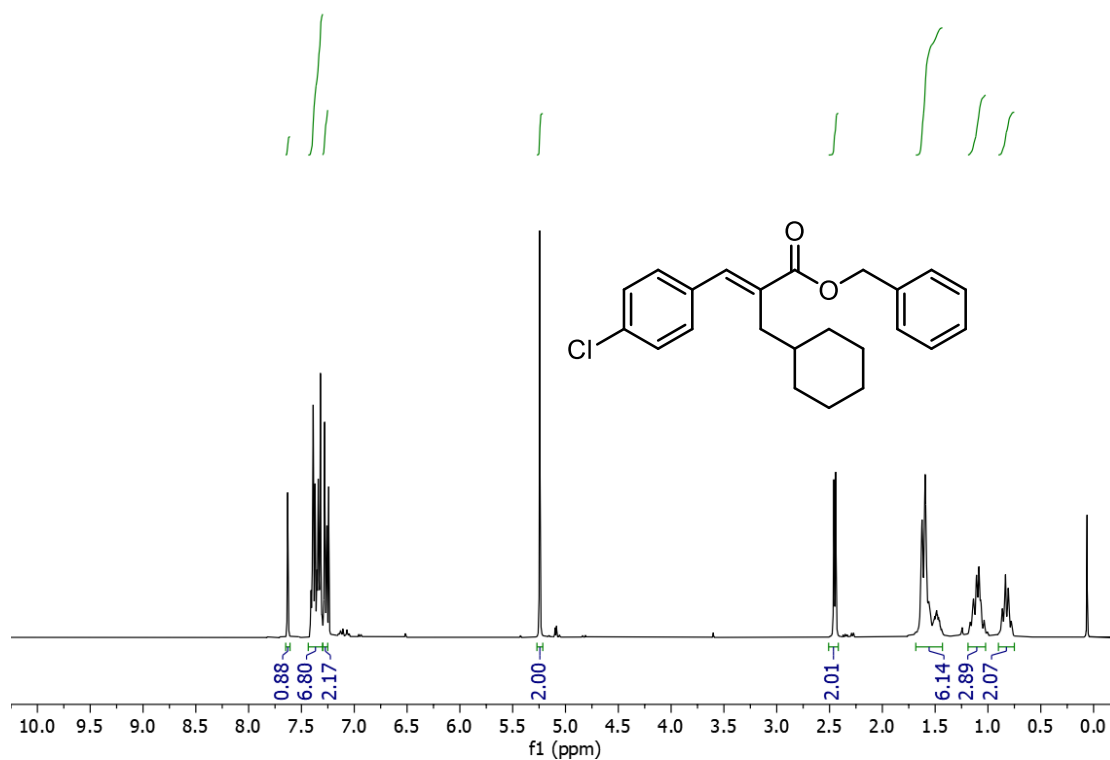
3la ¹H NMR (400 MHz, CDCl₃)



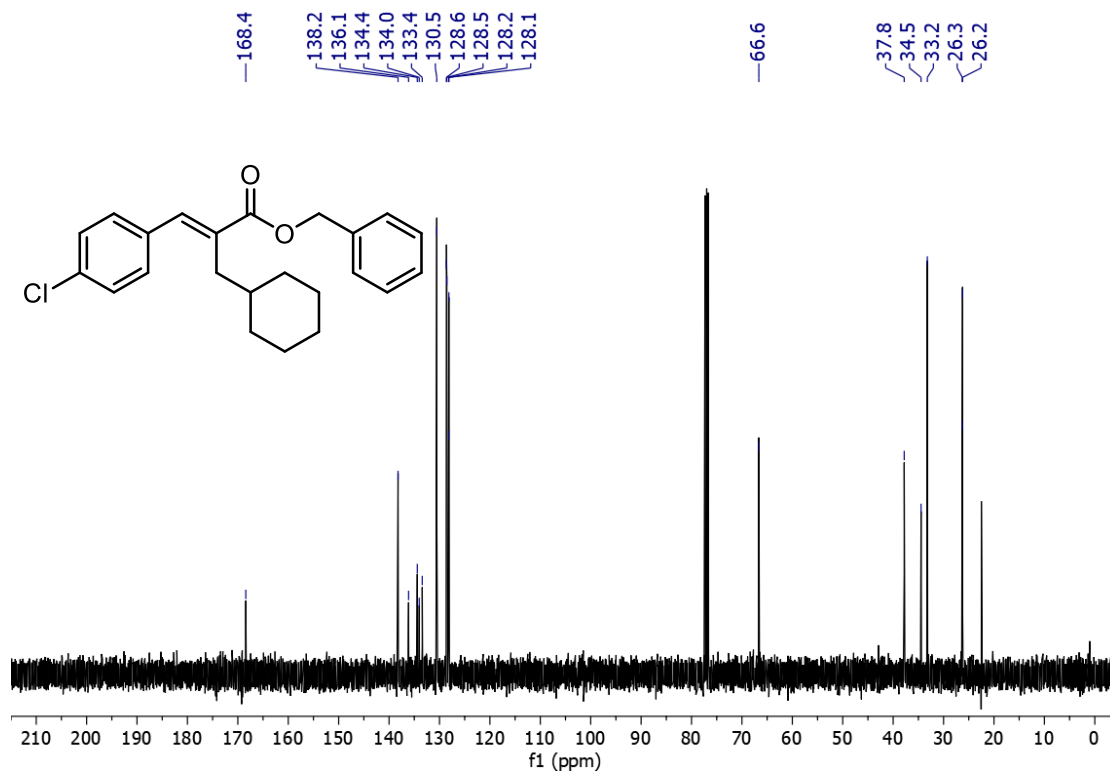
3la ¹³C NMR (100 MHz, CDCl₃)



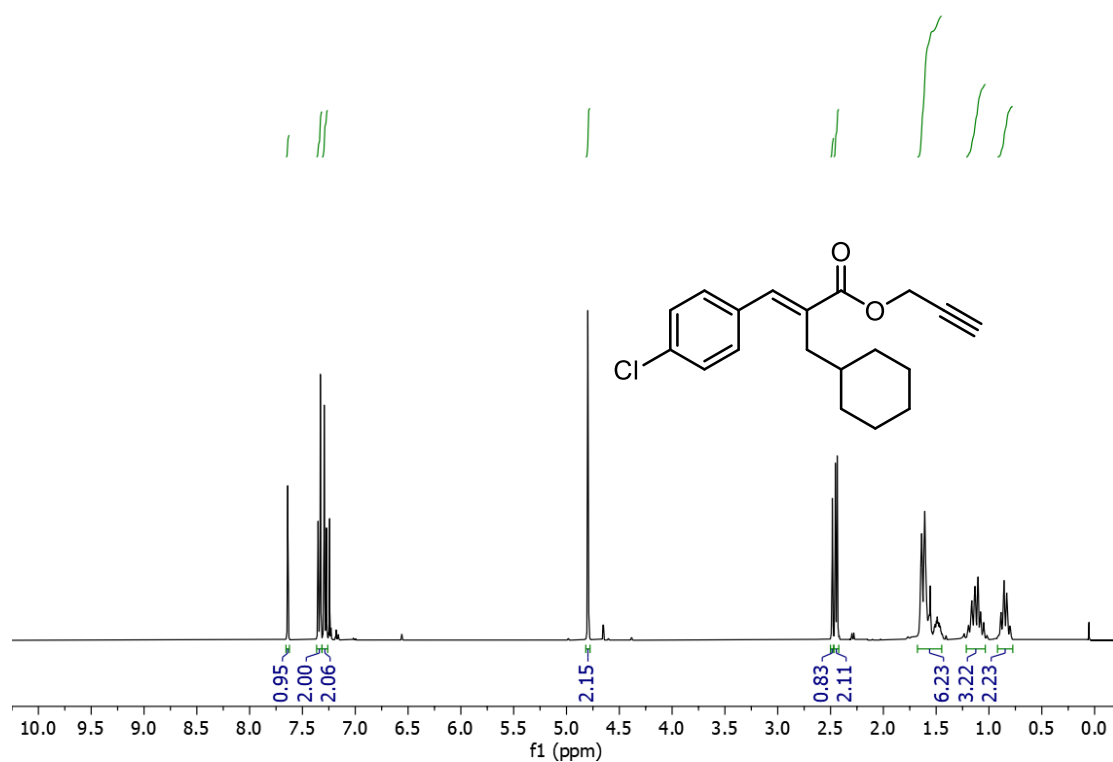
3ma ¹H NMR (400 MHz, CDCl₃)



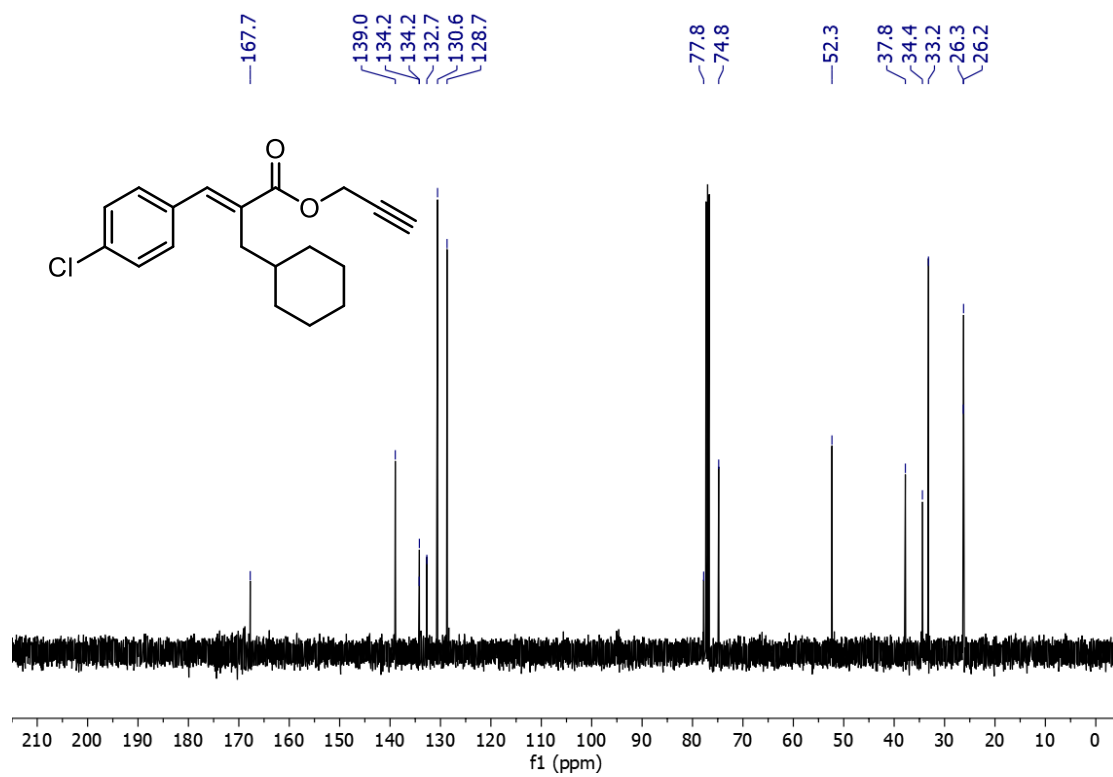
3ma ¹³C NMR (100 MHz, CDCl₃)



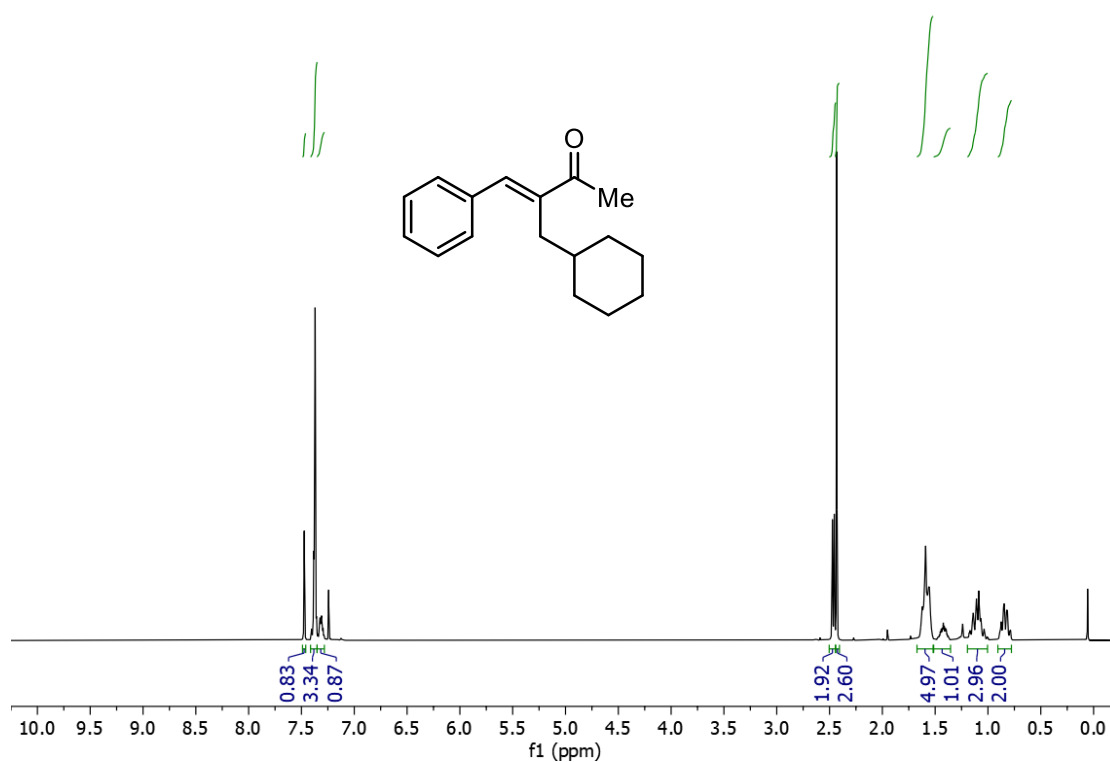
3na ¹H NMR (400 MHz, CDCl₃)



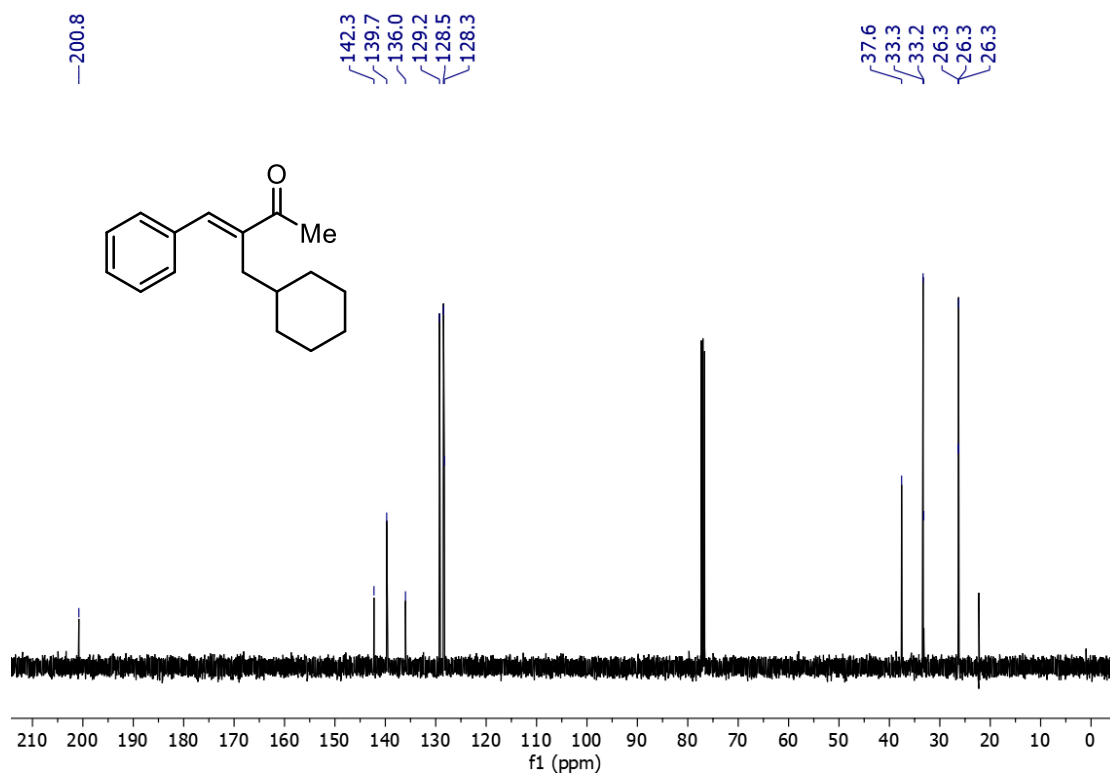
3na ¹³C NMR (100 MHz, CDCl₃)



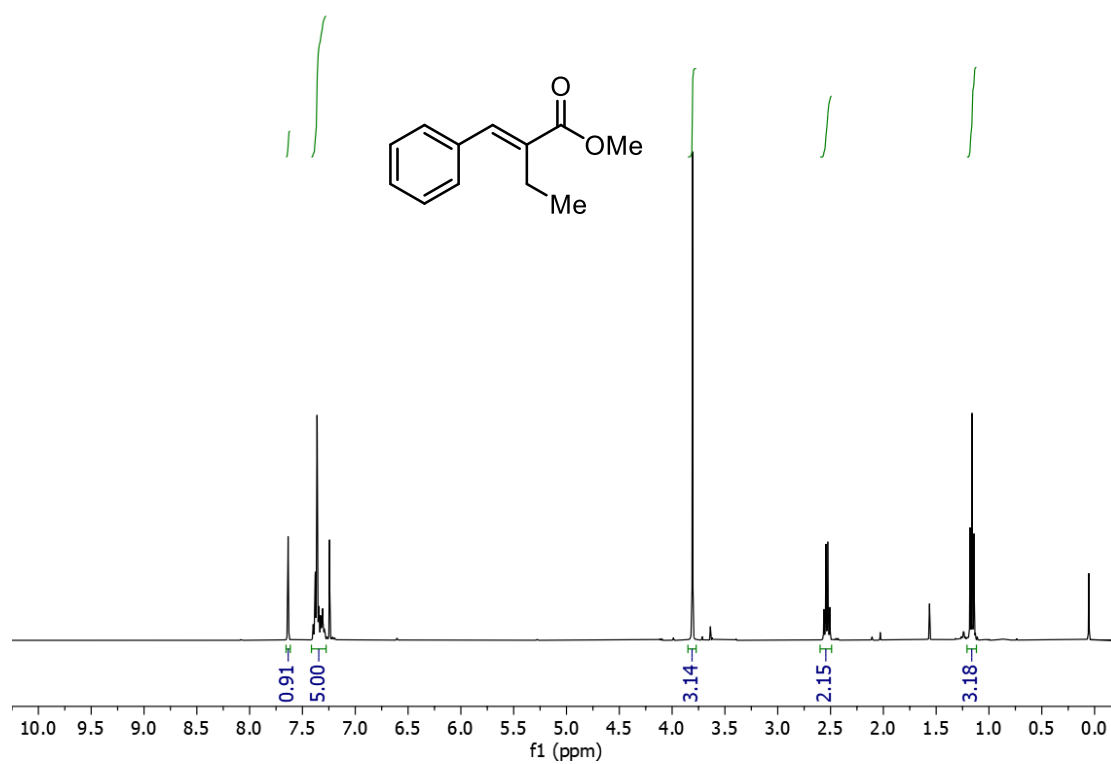
3oa ¹H NMR (400 MHz, CDCl₃)



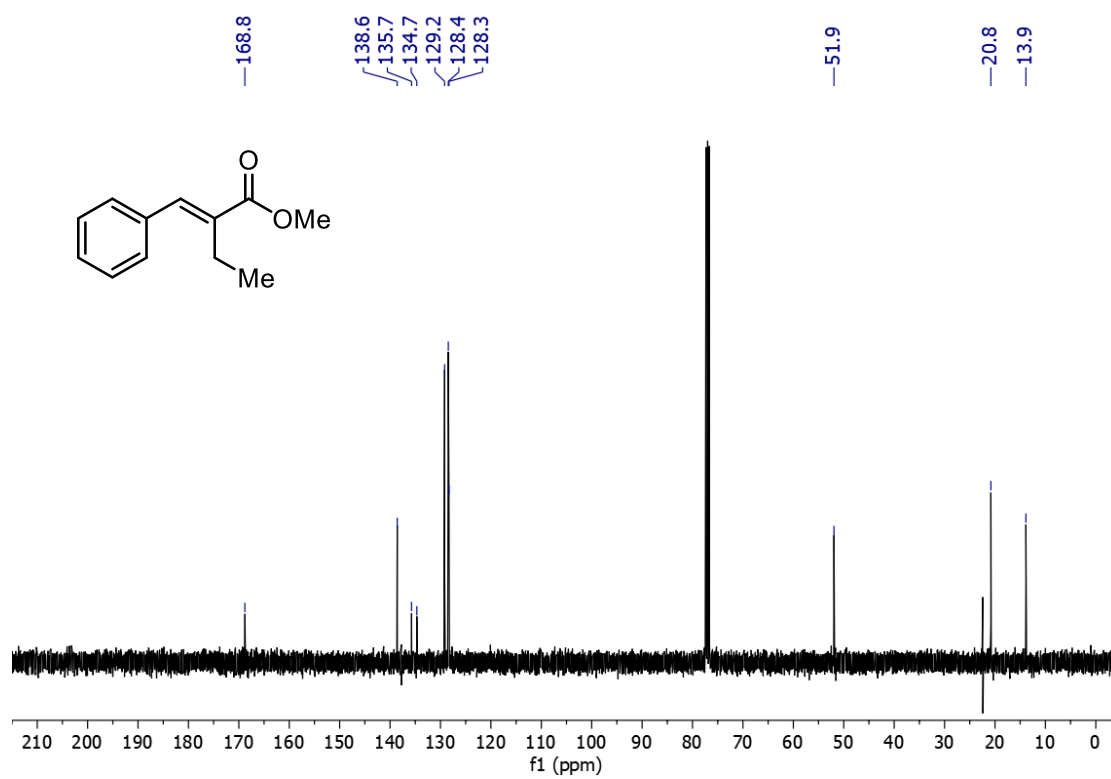
3oa ¹³C NMR (100 MHz, CDCl₃)



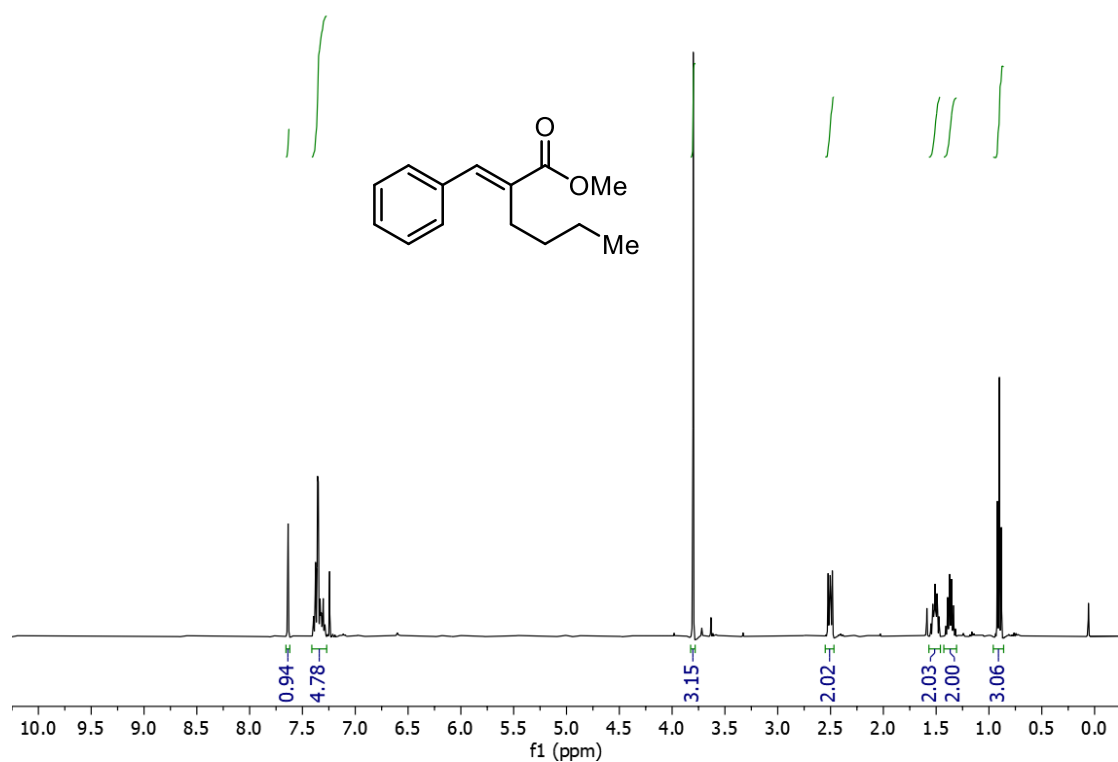
3ab ¹H NMR (400 MHz, CDCl₃)



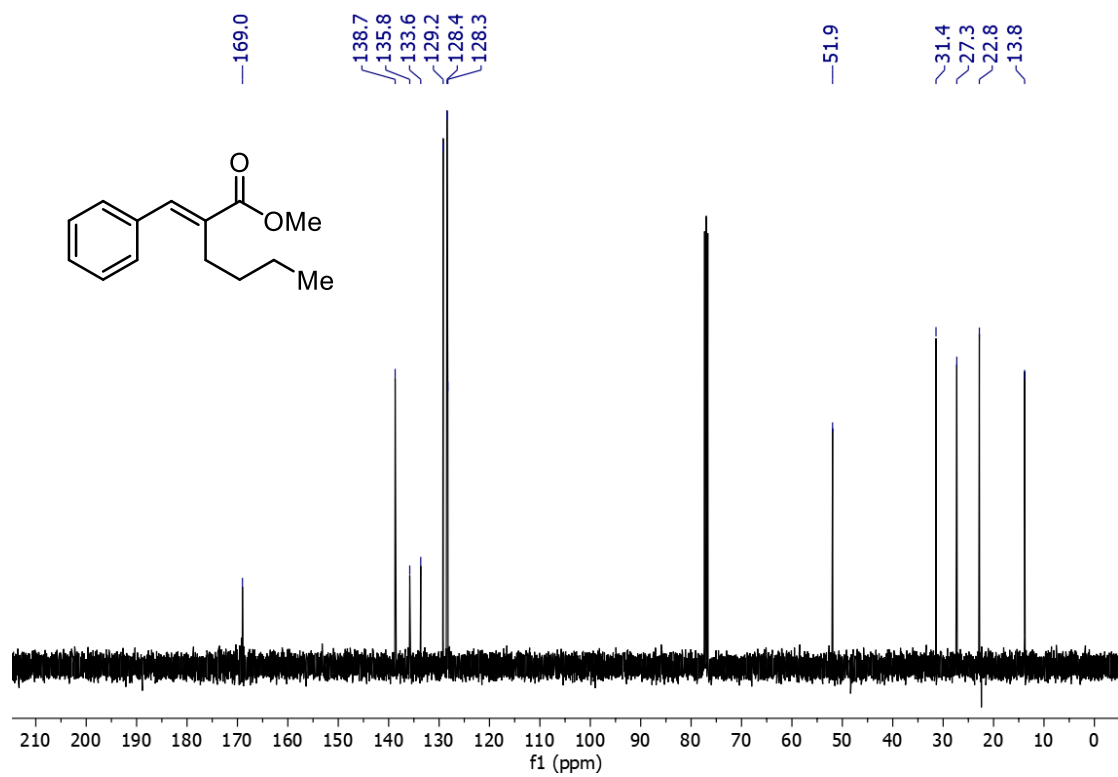
3ab ¹³C NMR (100 MHz, CDCl₃)



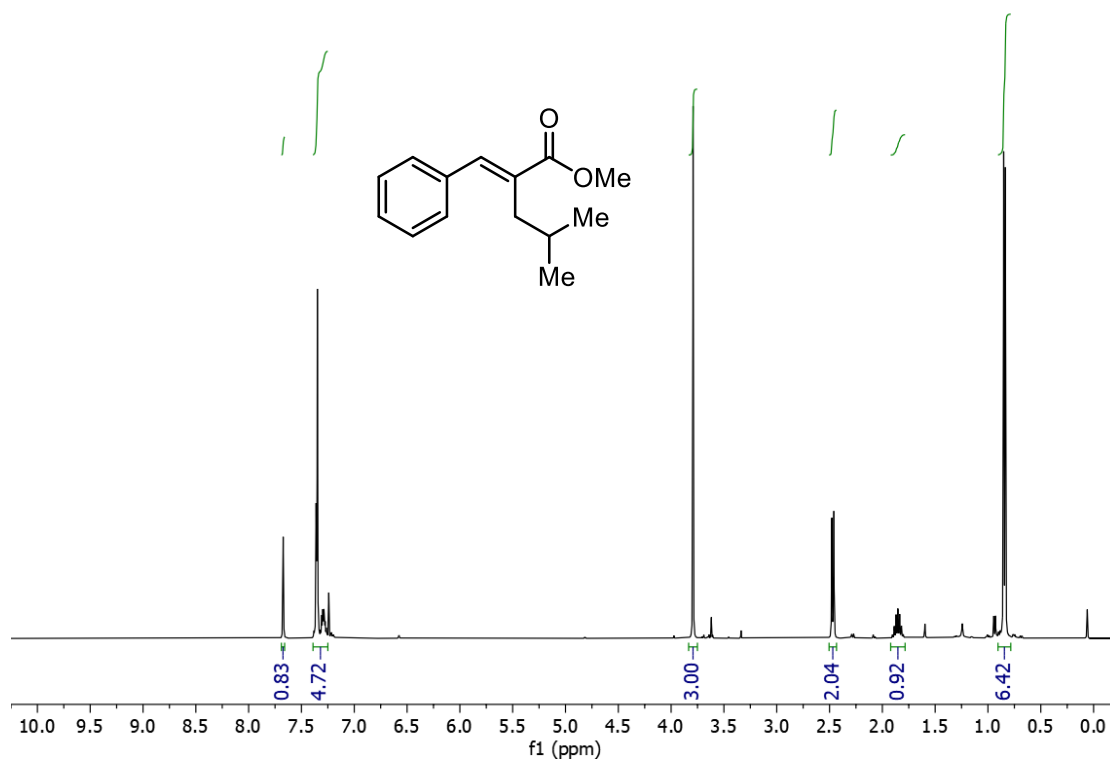
3ac ¹H NMR (400 MHz, CDCl₃)



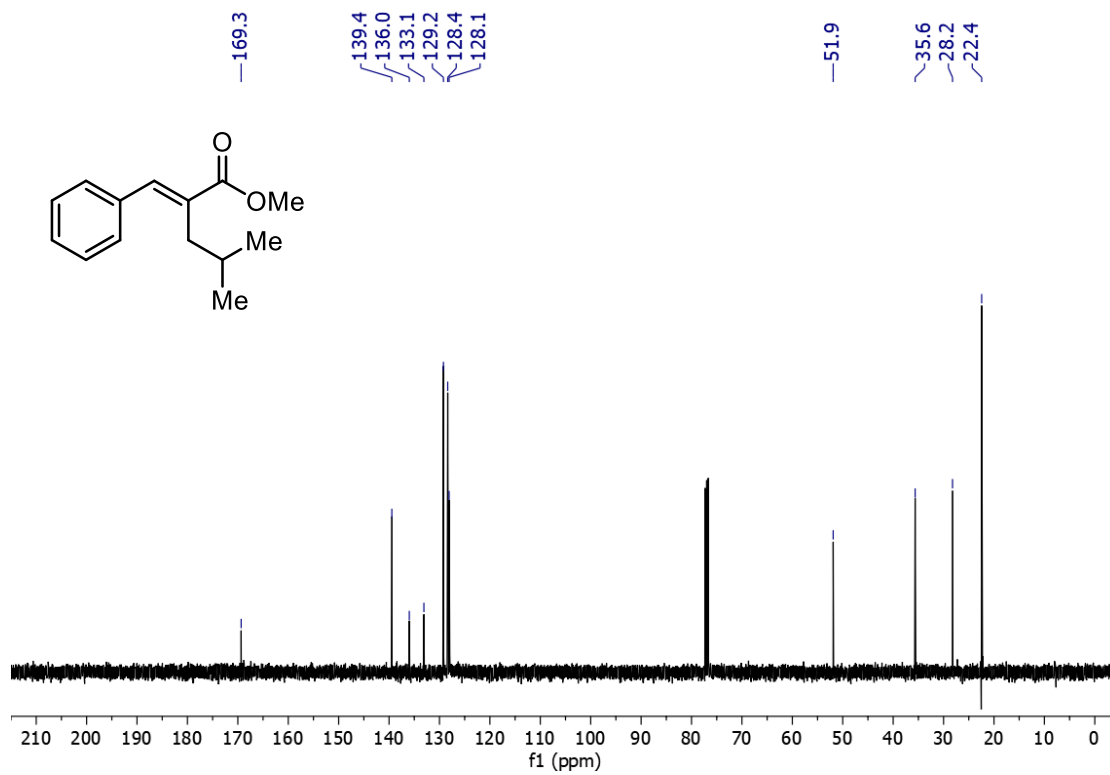
3ac ¹³C NMR (100 MHz, CDCl₃)



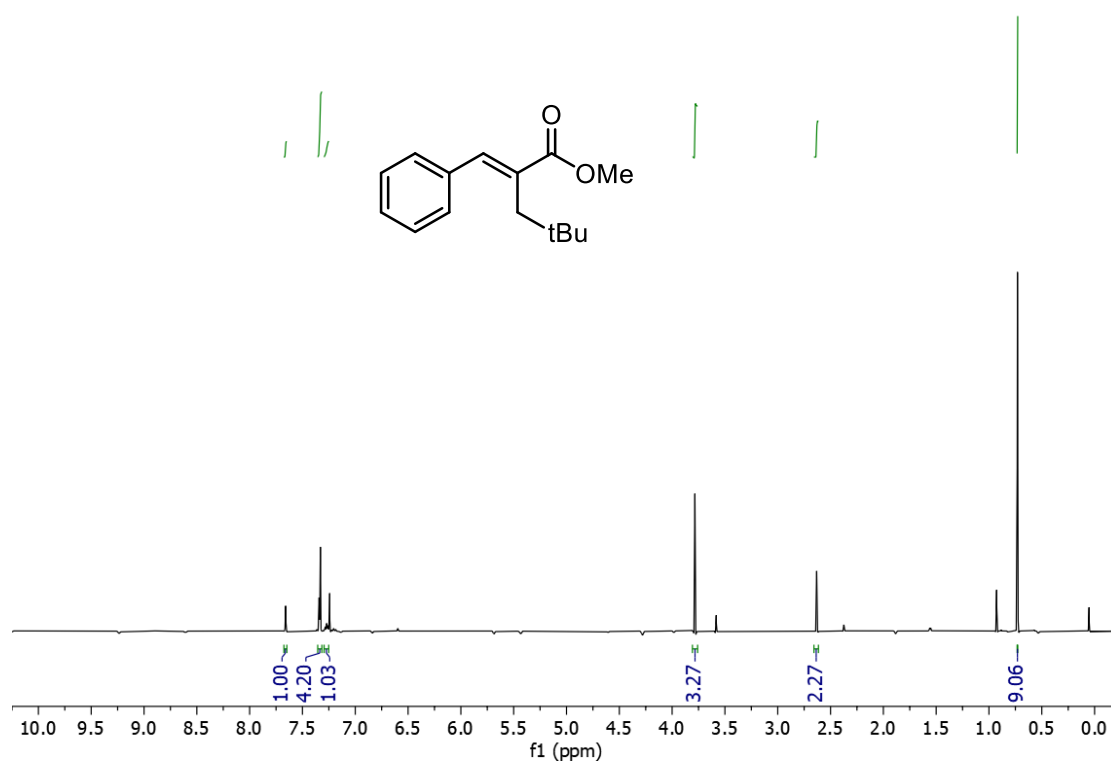
3ad ¹H NMR (400 MHz, CDCl₃)



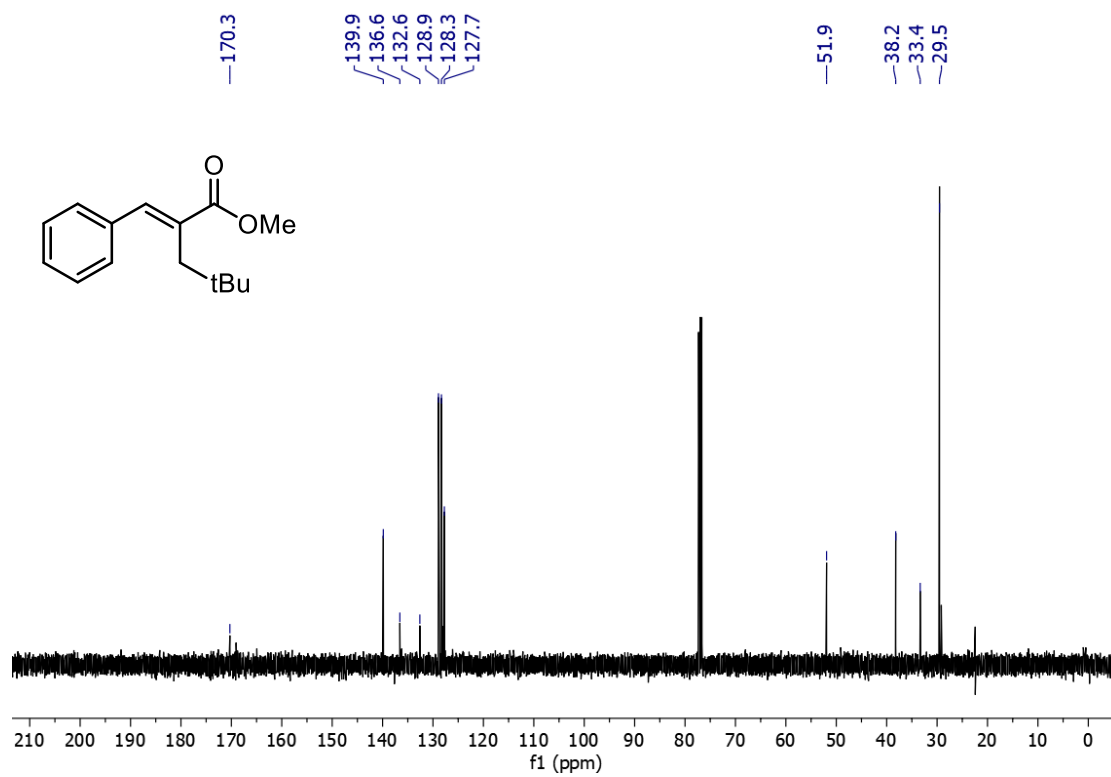
3ad ¹³C NMR (100 MHz, CDCl₃)



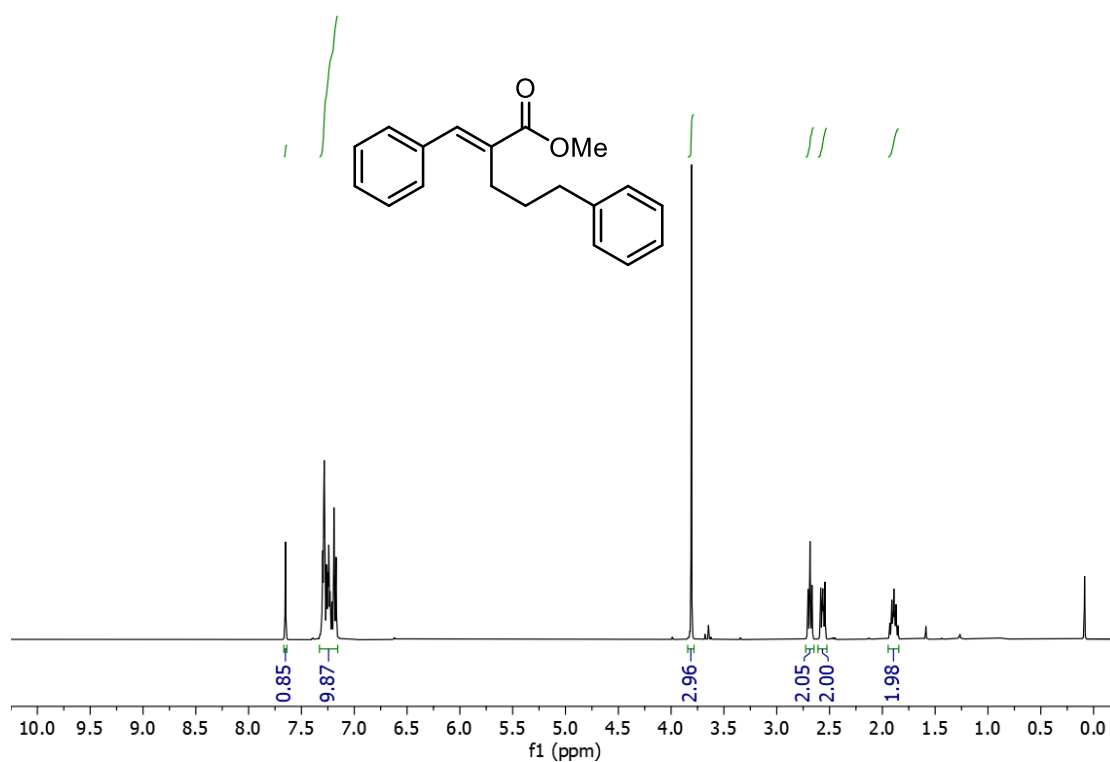
3ae ¹H NMR (400 MHz, CDCl₃)



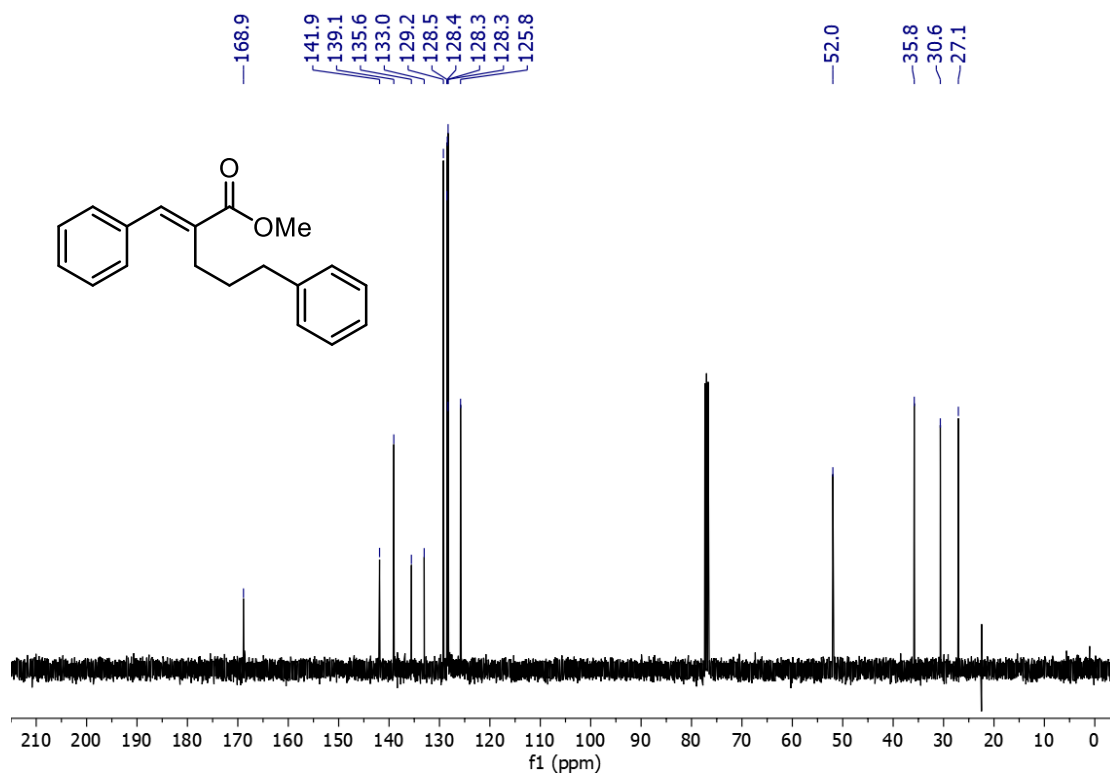
3ae ¹³C NMR (100 MHz, CDCl₃)



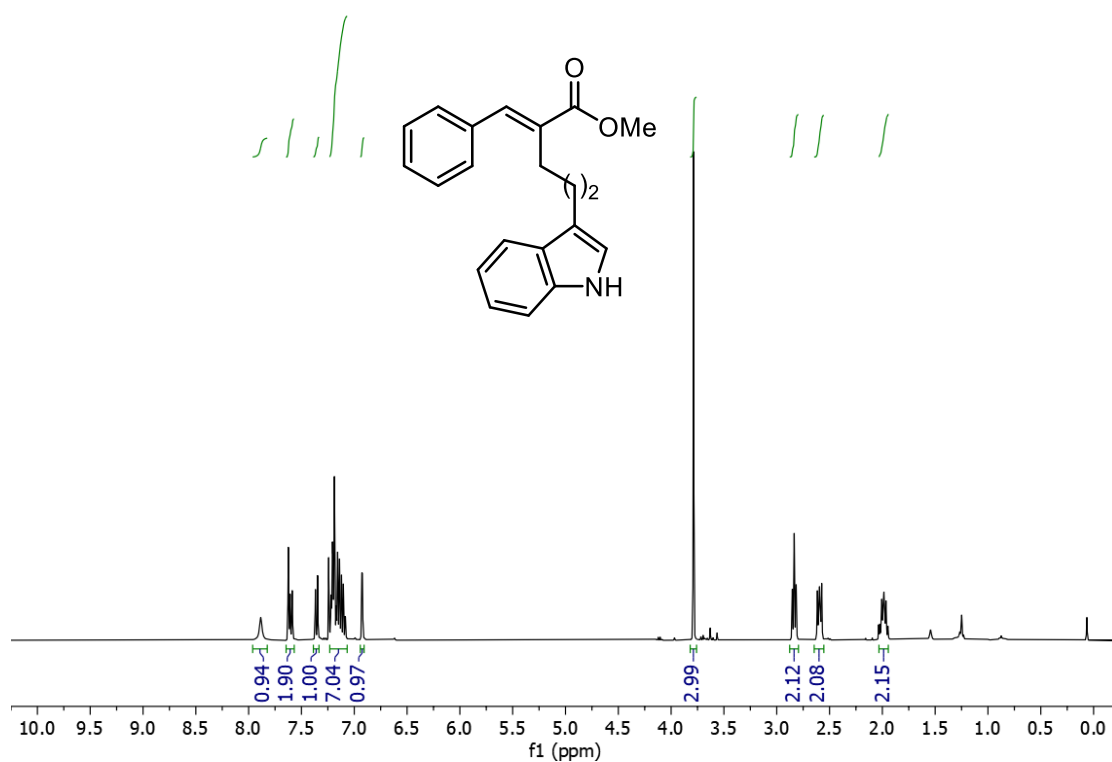
3af ¹H NMR (400 MHz, CDCl₃)



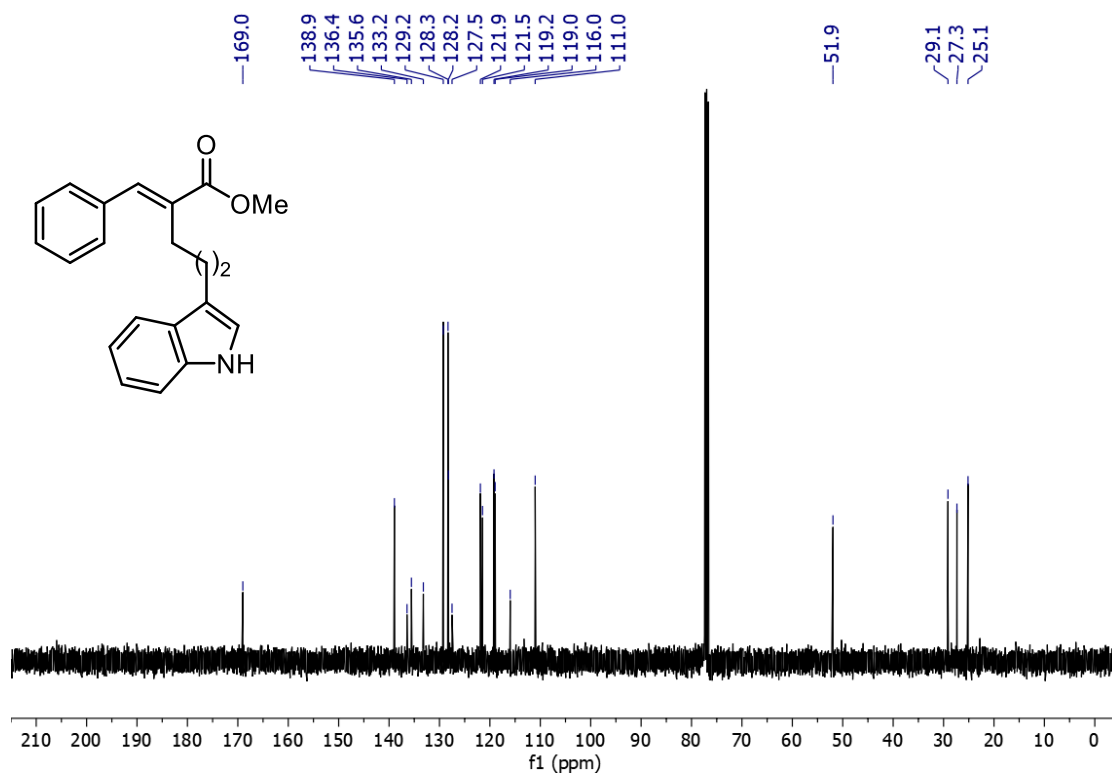
3af ¹³C NMR (100 MHz, CDCl₃)



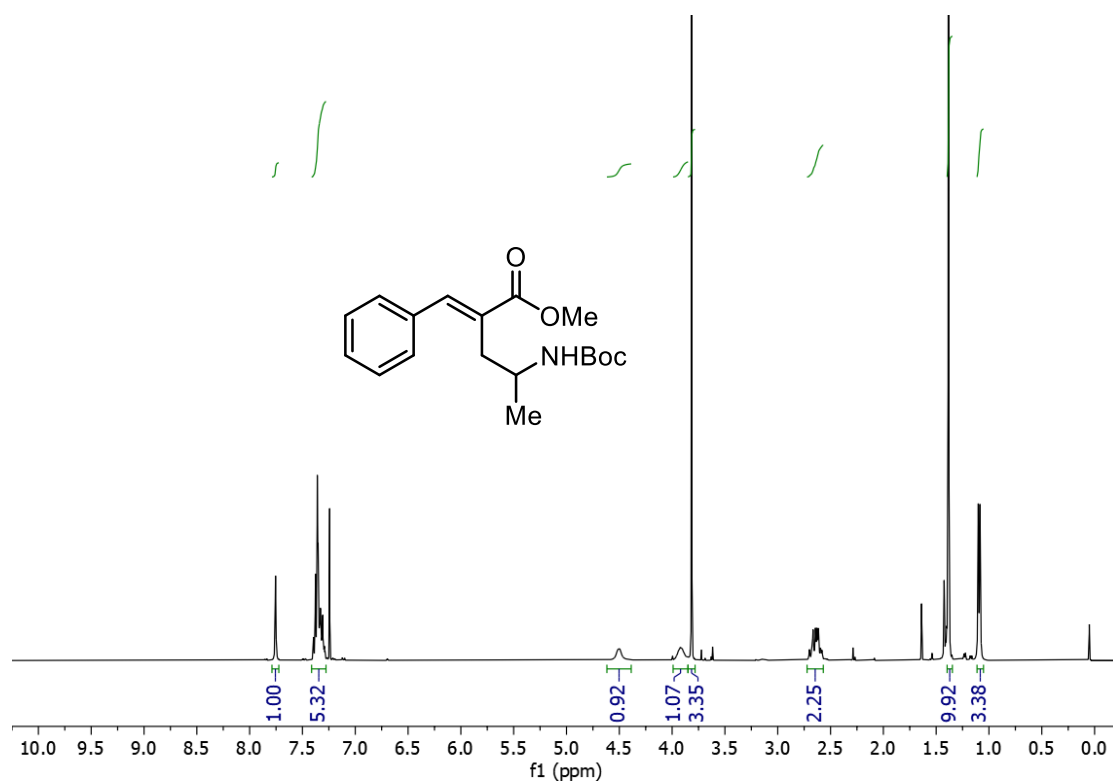
3ag ¹H NMR (400 MHz, CDCl₃)



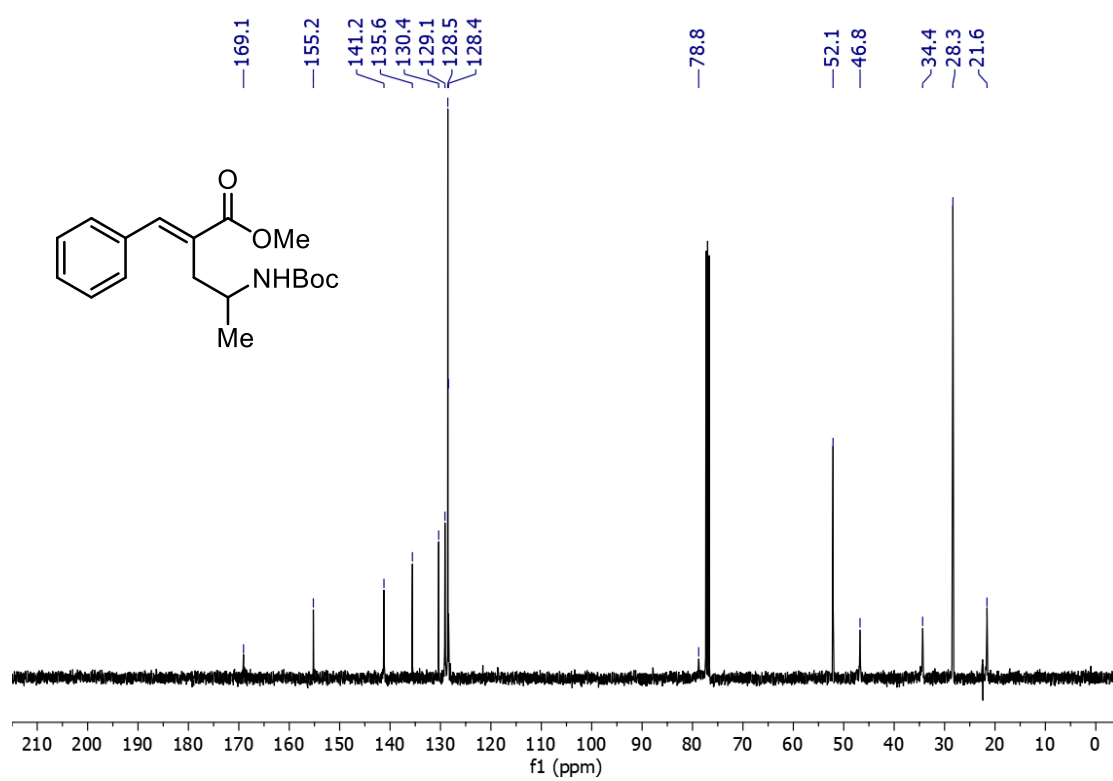
3ag ¹³C NMR (100 MHz, CDCl₃)



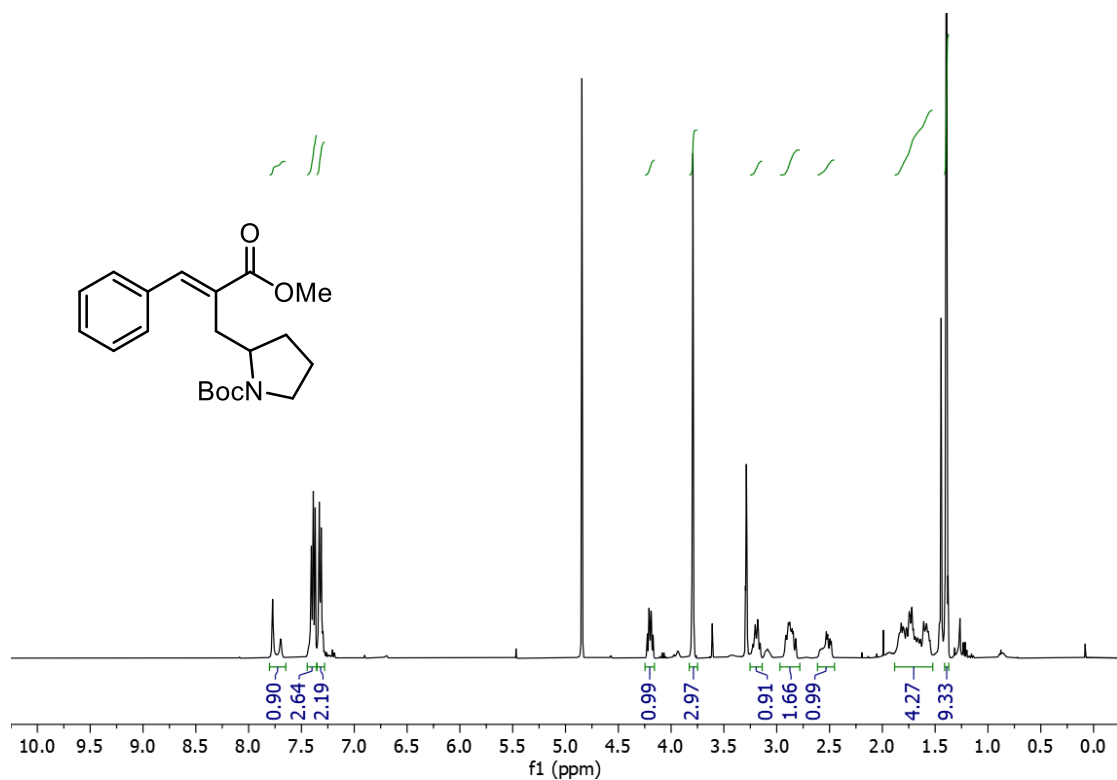
3ah ¹H NMR (400 MHz, CDCl₃)



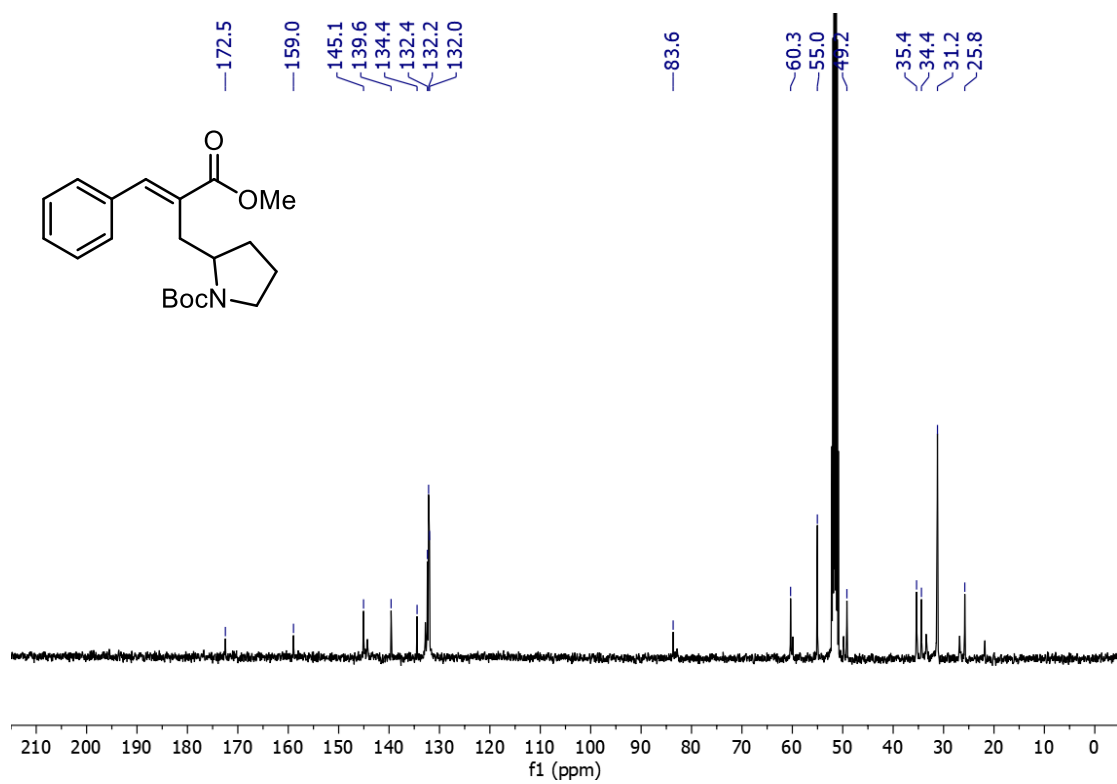
3ah ¹³C NMR (100 MHz, CDCl₃)



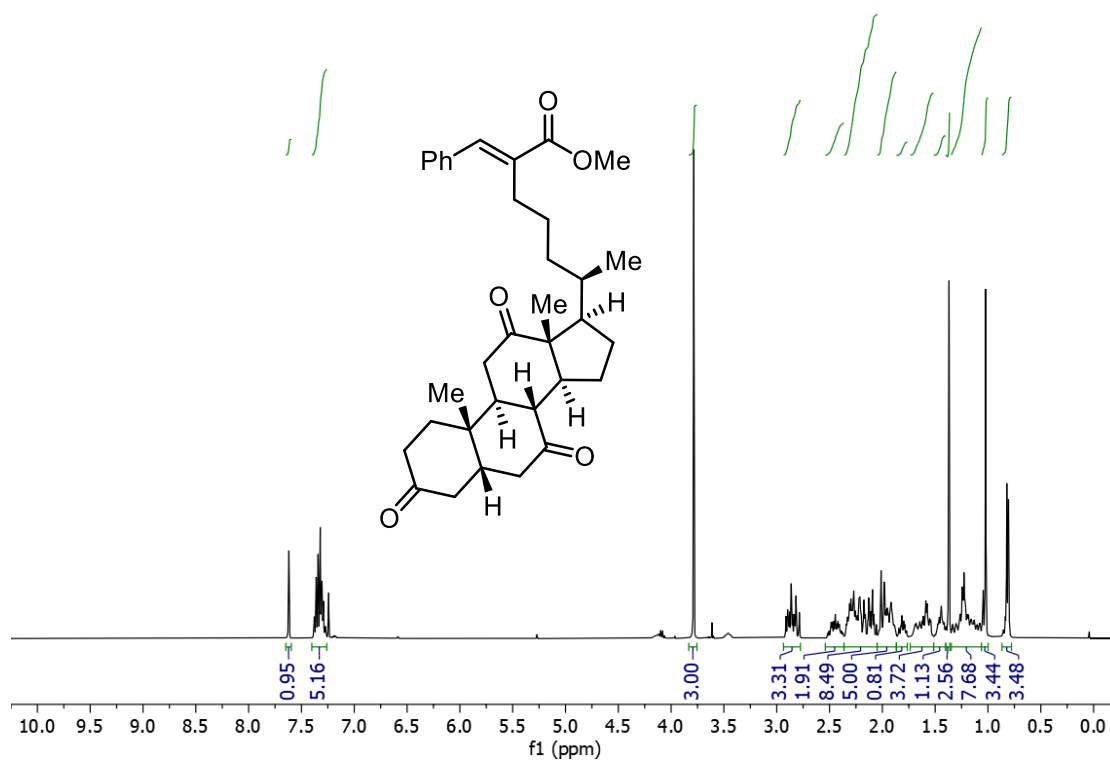
3ai ¹H NMR (400 MHz, CDCl₃)



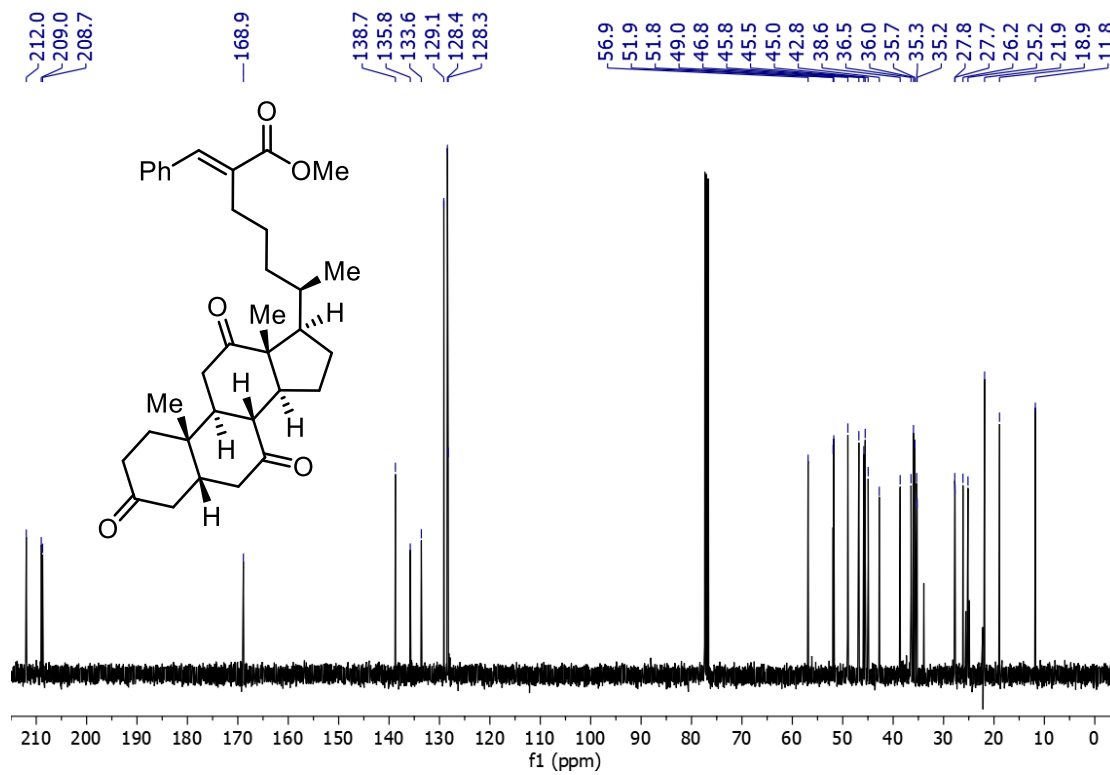
3ai ¹³C NMR (100 MHz, CDCl₃)



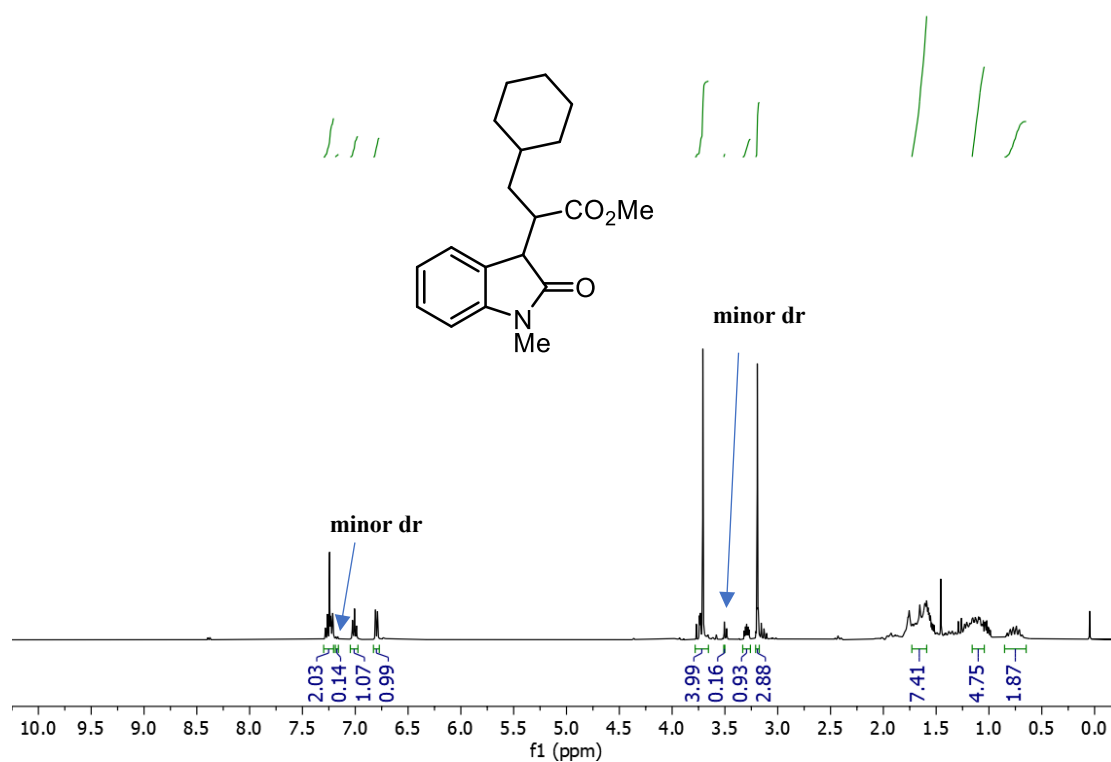
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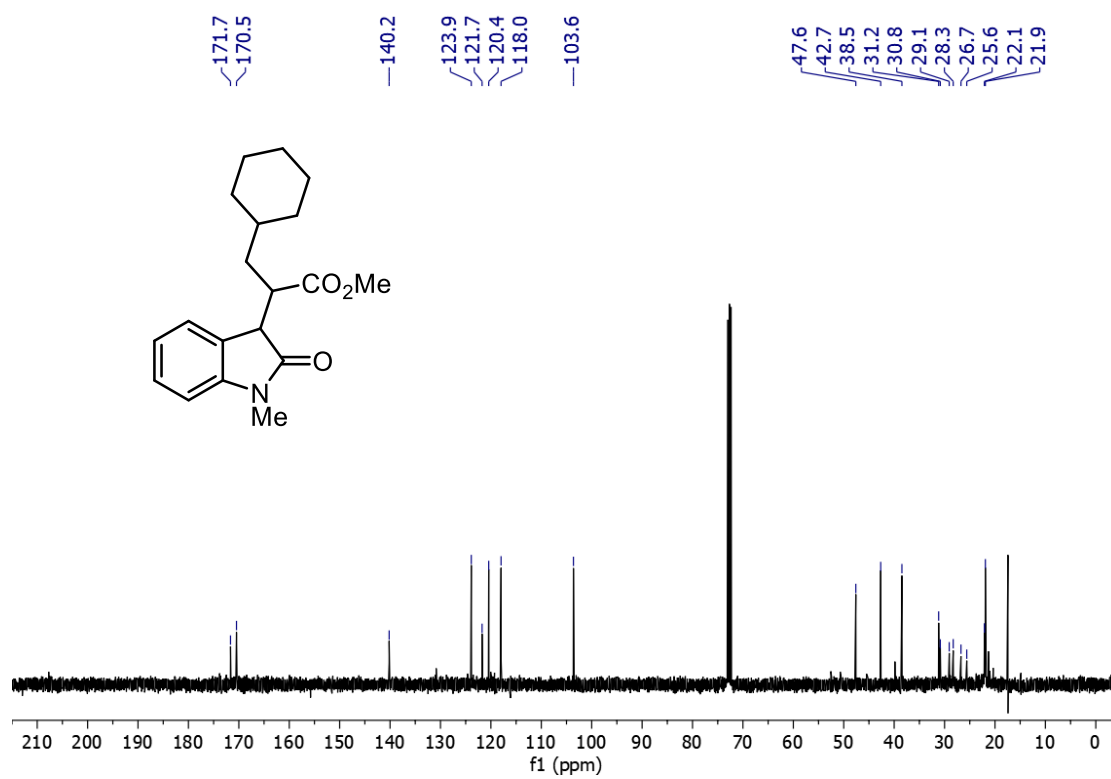
3aj ¹³C NMR (100 MHz, CDCl₃)



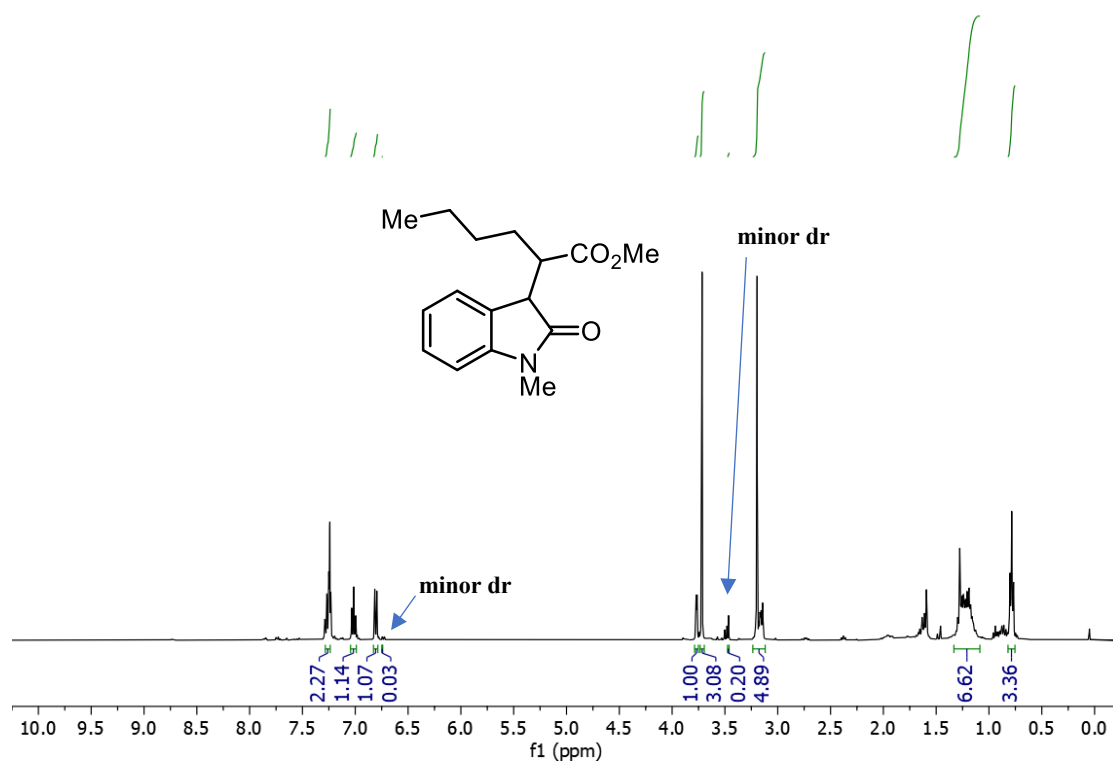
6aa ¹H NMR (400 MHz, CDCl₃)



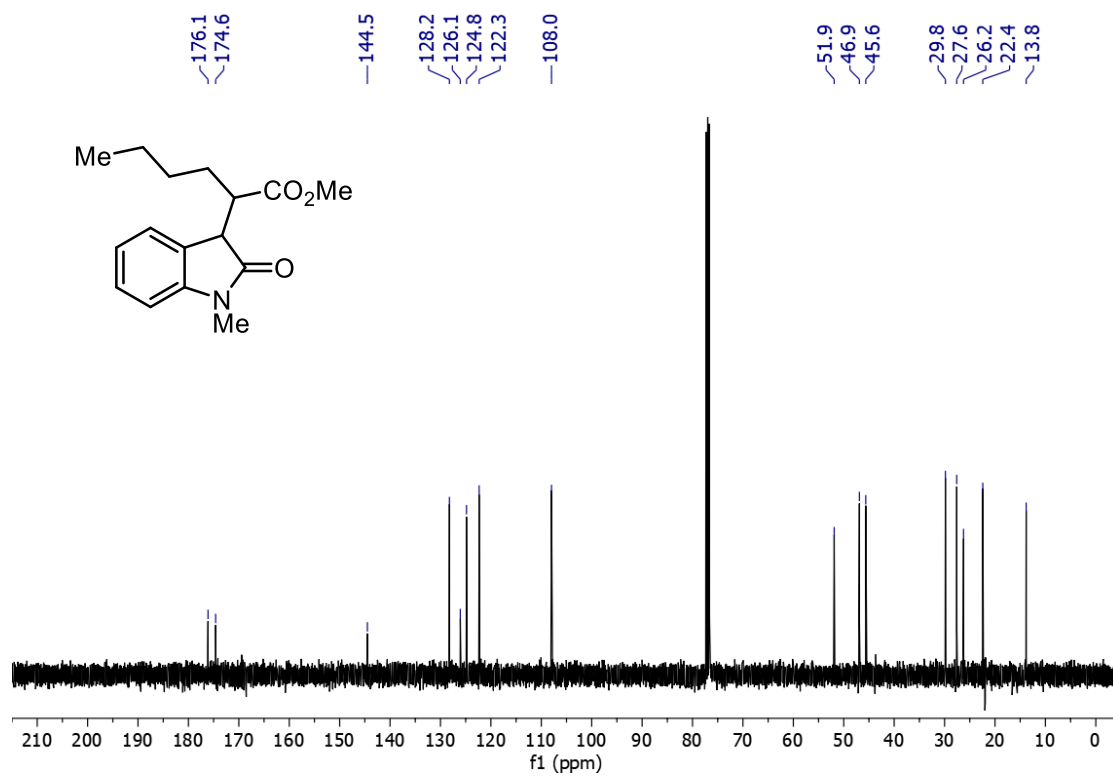
6aa ¹³C NMR (100 MHz, CDCl₃)



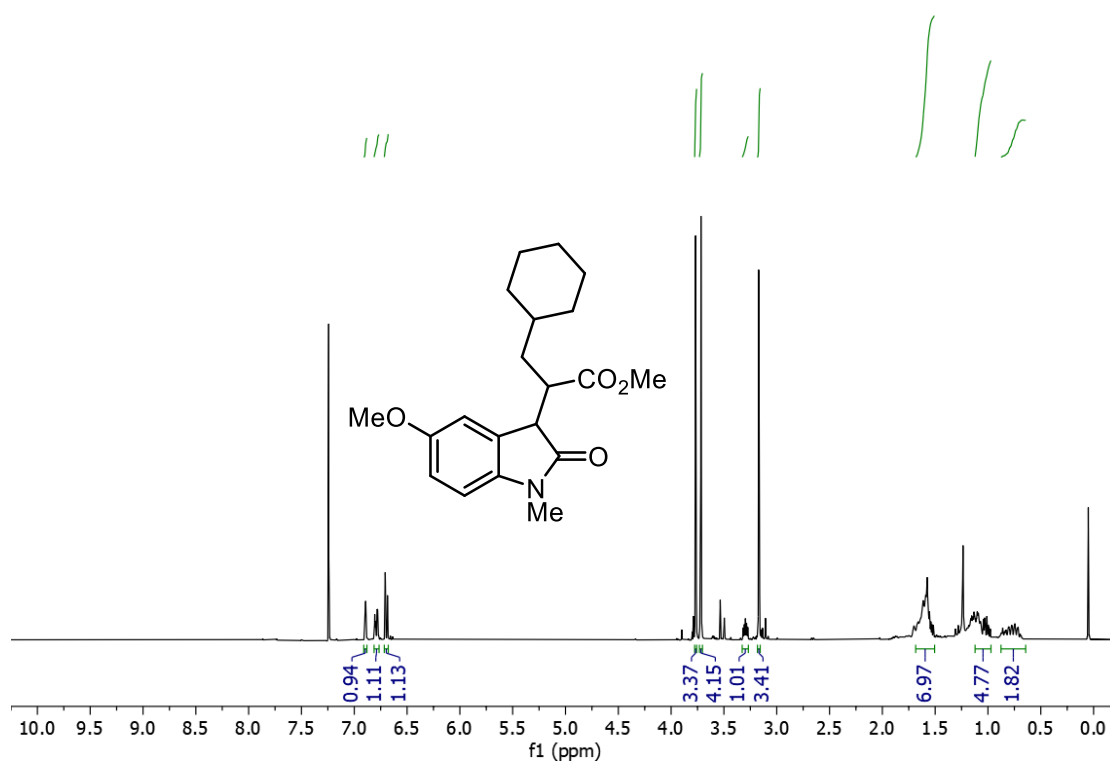
6ac ¹H NMR (400 MHz, CDCl₃)



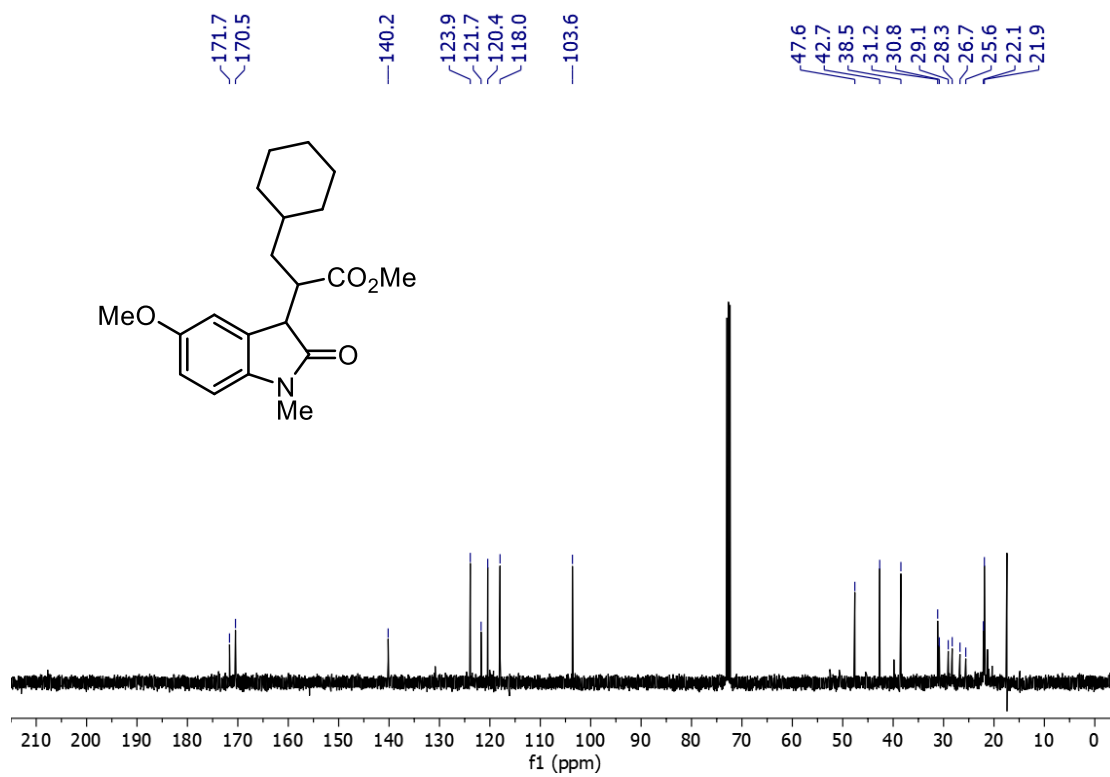
6ac ¹³C NMR (100 MHz, CDCl₃)



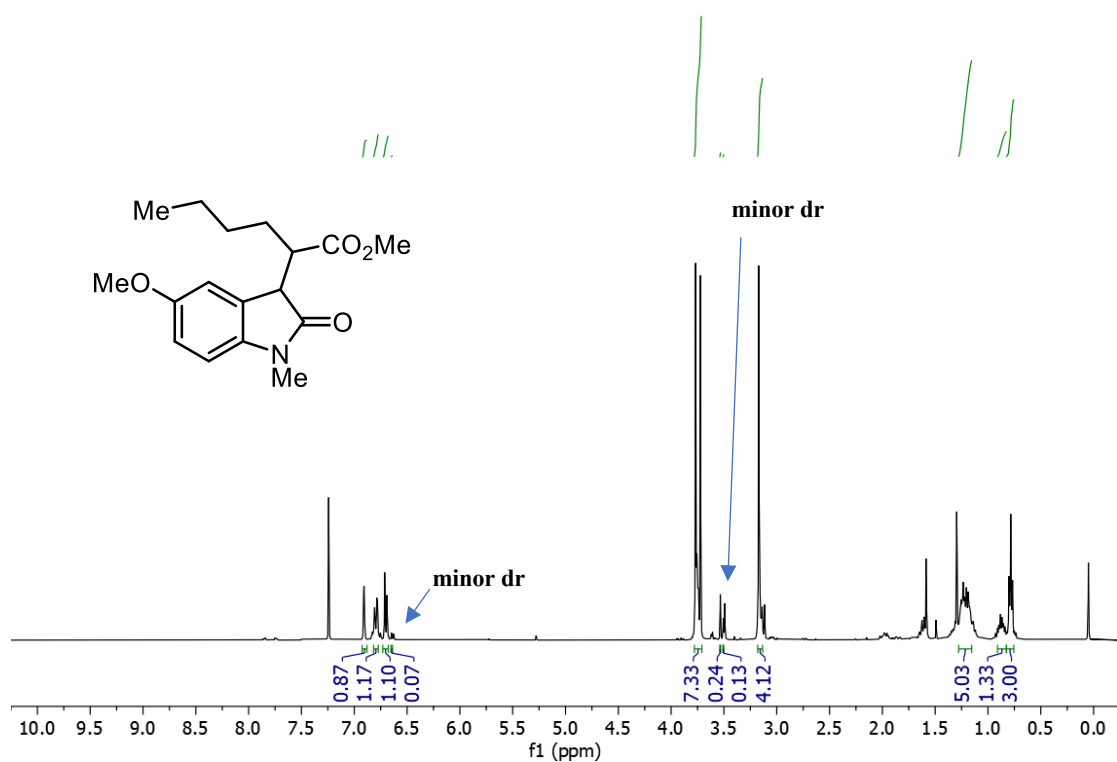
6ba ¹H NMR (400 MHz, CDCl₃)



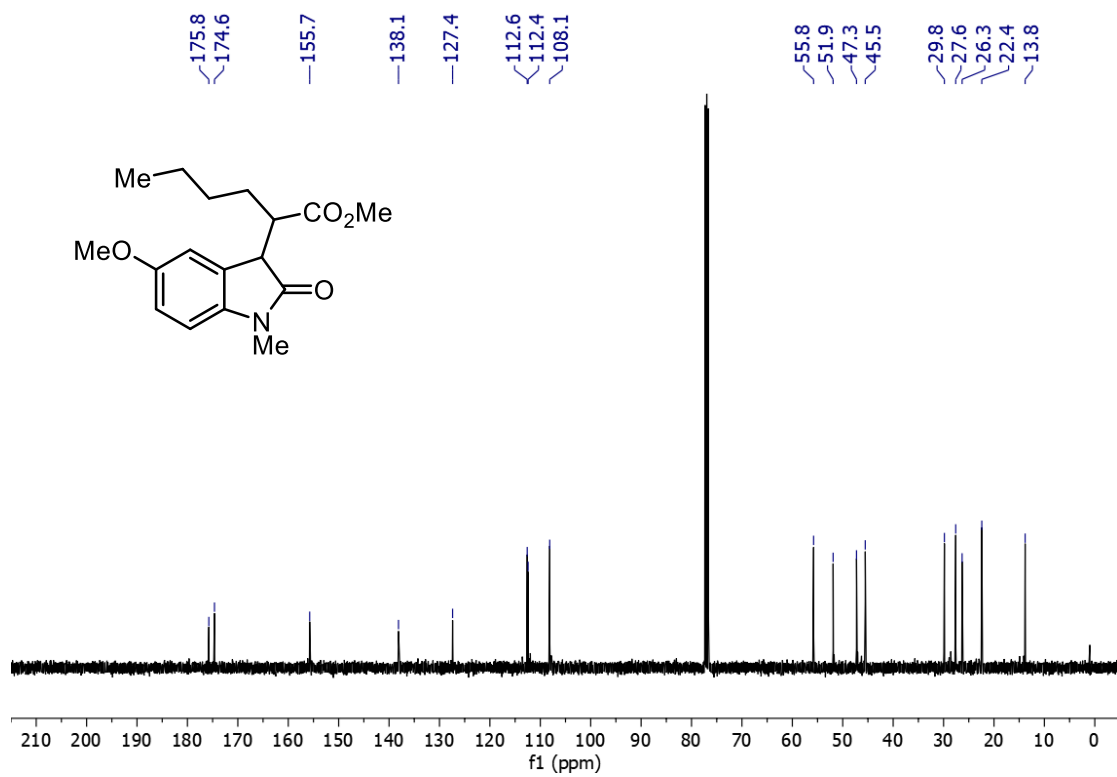
6ba ¹³C NMR (100 MHz, CDCl₃)



6bc ¹H NMR (400 MHz, CDCl₃)



6bc ¹³C NMR (100 MHz, CDCl₃)



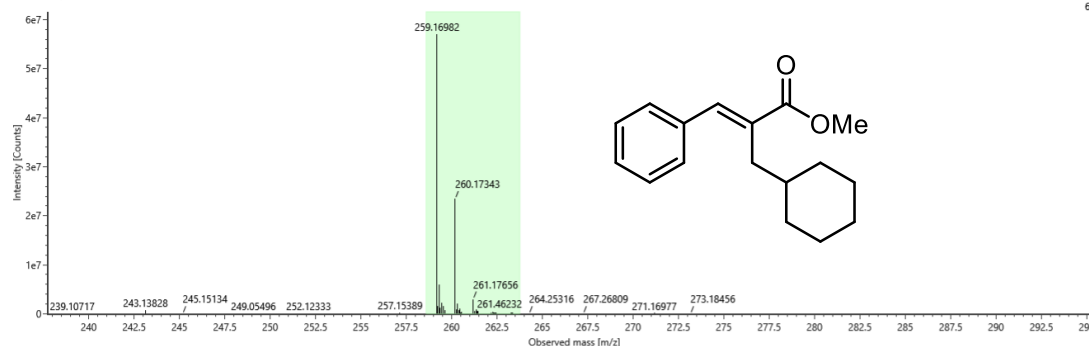
Copies of selected HRMS spectra

HRMS (APCI) of 3aa

Item name: Sample APCI
Item description:

Channel name: Time 0.0645 +/- 0.0223 minutes

6.16e7

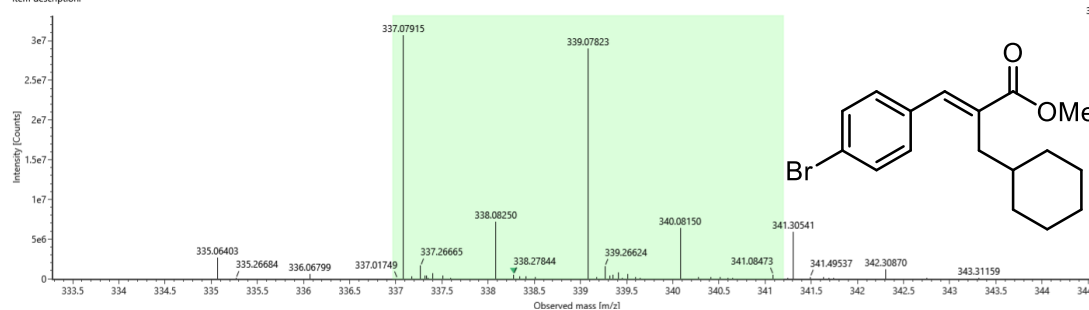


HRMS (APCI) of 3ca

Item name: Sample APCI
Item description:

Channel name: Time 0.0646 +/- 0.0269 minutes

3.32e7

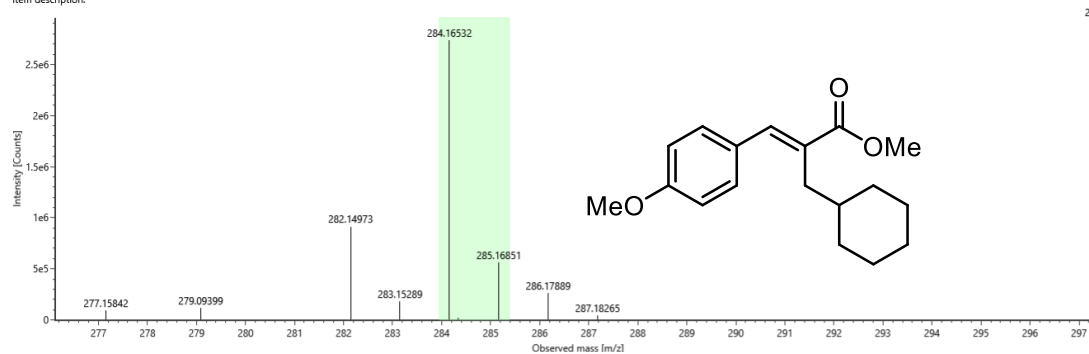


HRMS (APCI) of 3da

Item name: Sample
Item description:

Channel name: Time 0.0618 +/- 0.0055 minutes

2.96e6

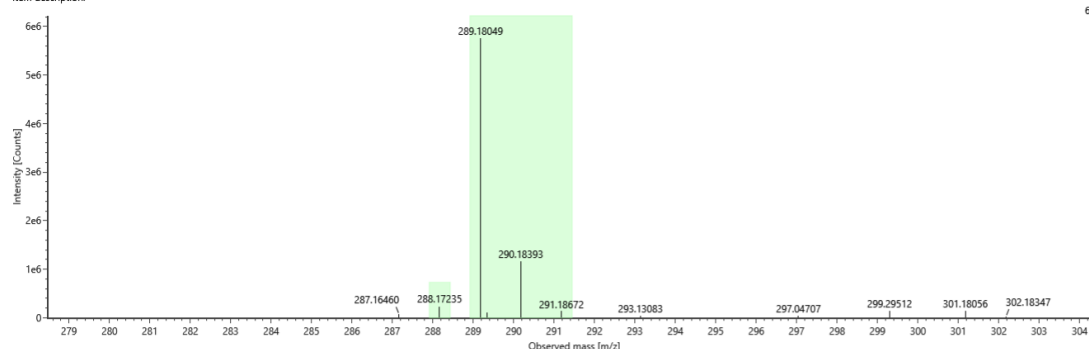


HRMS (APCI) of 3ea

Item name: Sample
Item description:

Channel name: Time 0.0631 +/- 0.0082 minutes

6.22e6

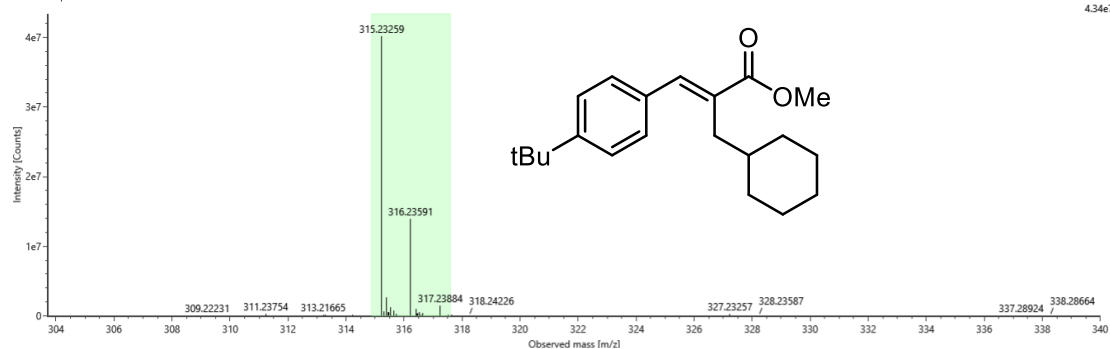


HRMS (APCI) of 3fa

Item name: Sample
Item description:

Channel name: Time 0.0630 +/- 0.0214 minutes

4.34e7

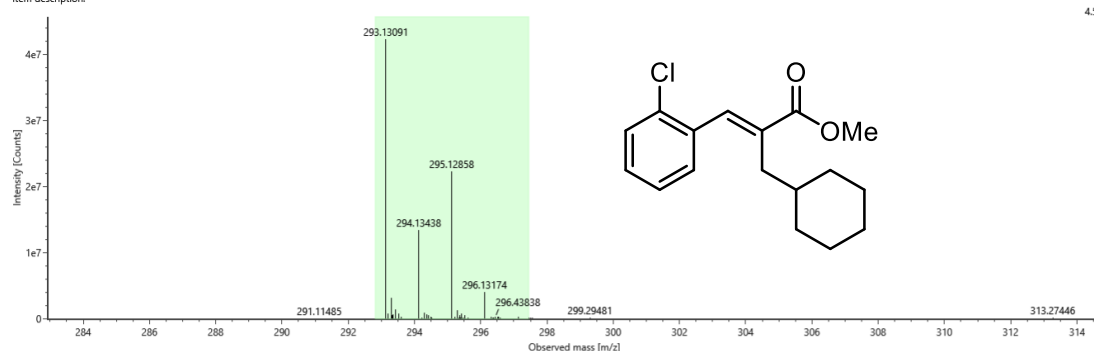


HRMS (APCI) of 3ga

Item name: Sample
Item description:

Channel name: Time 0.0620 +/- 0.0162 minutes

4.57e7

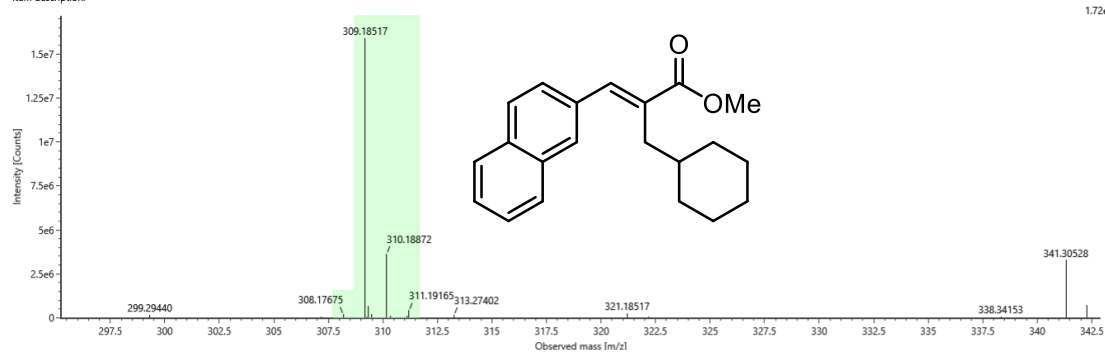


HRMS (APCI) of 3ha

Item name: Sample APCI
Item description:

Channel name: Time 0.0628 +/- 0.0179 minutes

1.72e7

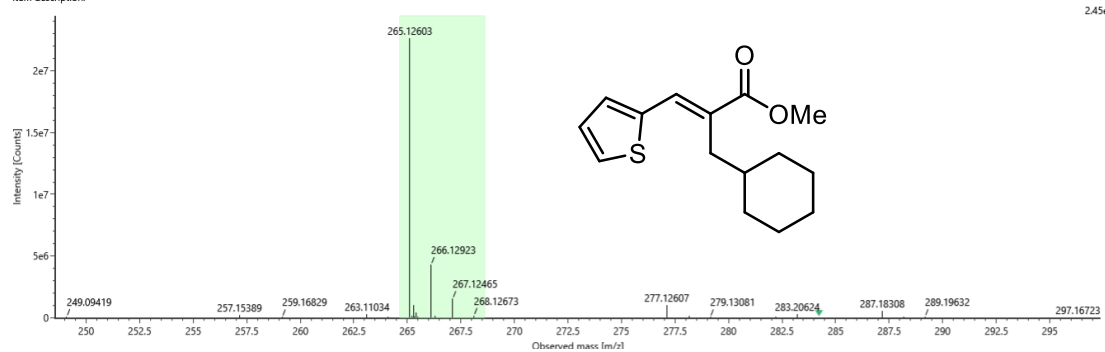


HRMS (APCI) of 3ia

Item name: Sample APCI
Item description:

Channel name: Time 0.0636 +/- 0.0199 minutes

2.45e7

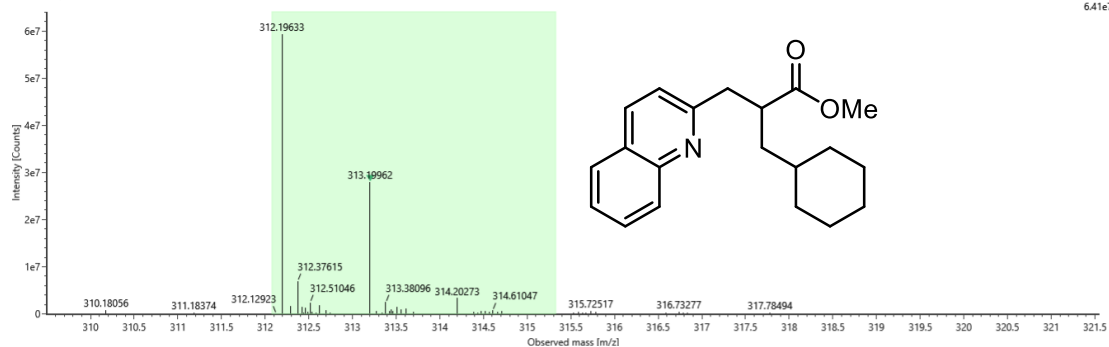


HRMS (APCI) of 3ja'

Item name: Sample APCI
Item description:

Channel name: Time 0.0634 +/- 0.0211 minutes

6.41e7

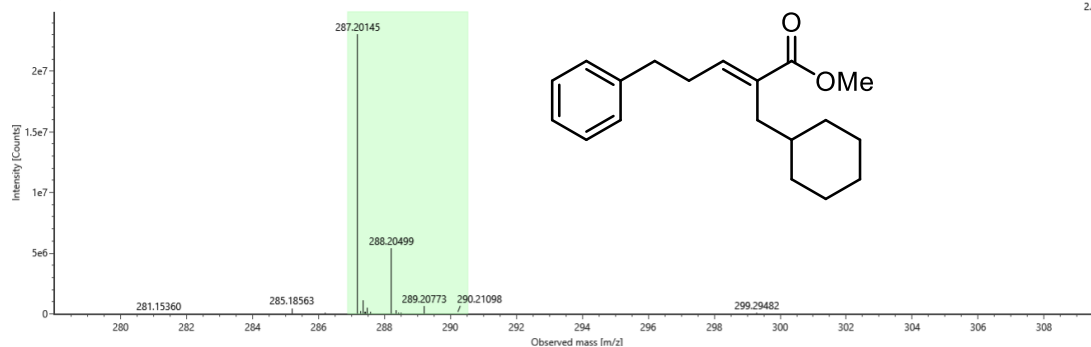


HRMS (APCI) of 3ka

Item name: Sample
Item description:

Channel name: Time 0.0630 +/- 0.0163 minutes

2.49e7

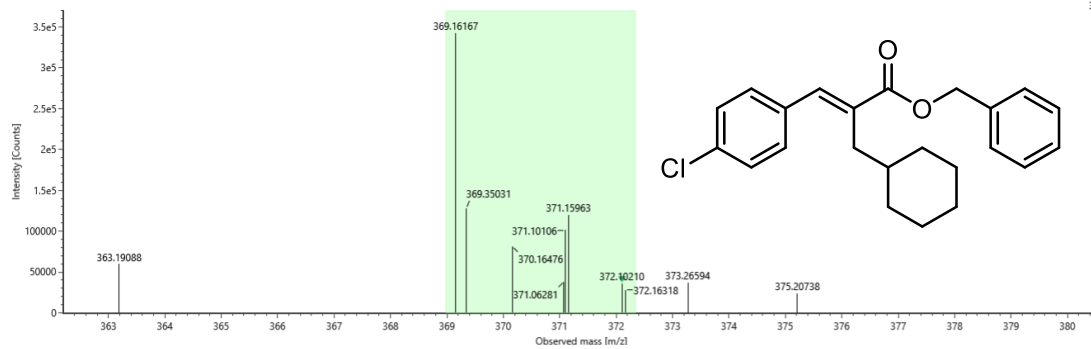


HRMS (APCI) of 3ma

Item name: Sample
Item description:

Channel name: Time 0.0624 +/- 0.0058 minutes

3.7e5

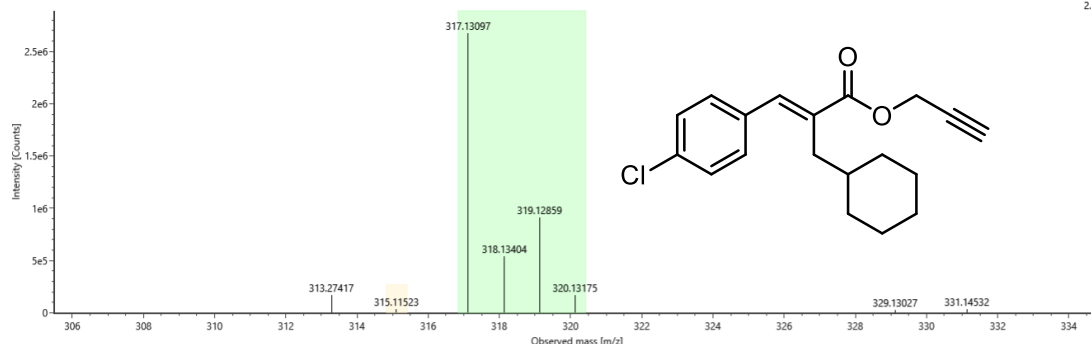


HRMS (APCI) of 3na

Item name: Sample
Item description:

Channel name: Time 0.0630 +/- 0.0071 minutes

2.89e6

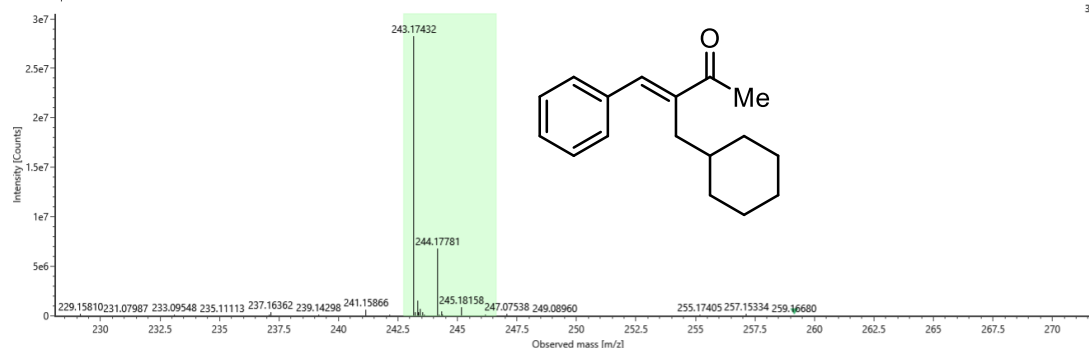


HRMS (APCI) of 30a

Item name: Sample APCI
Item description:

Channel name: Time 0.0628 +/- 0.0163 minutes

3.05e7

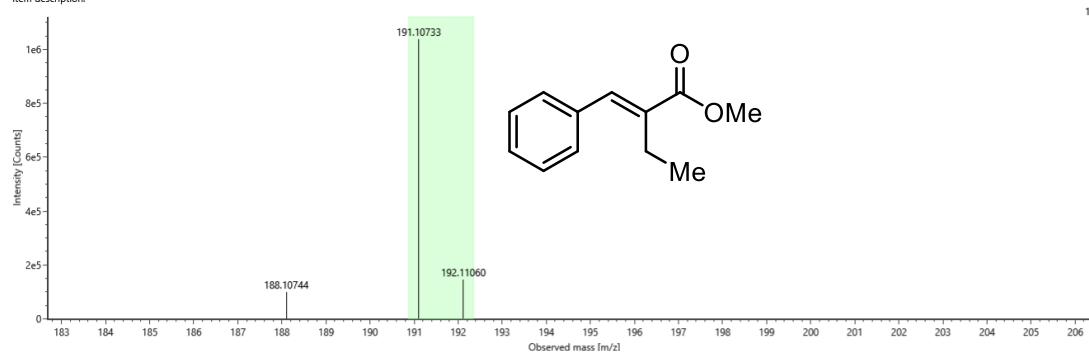


HRMS (APCI) of 3ab

Item name: Sample
Item description:

Channel name: Time 0.0633 +/- 0.0051 minutes

1.12e6

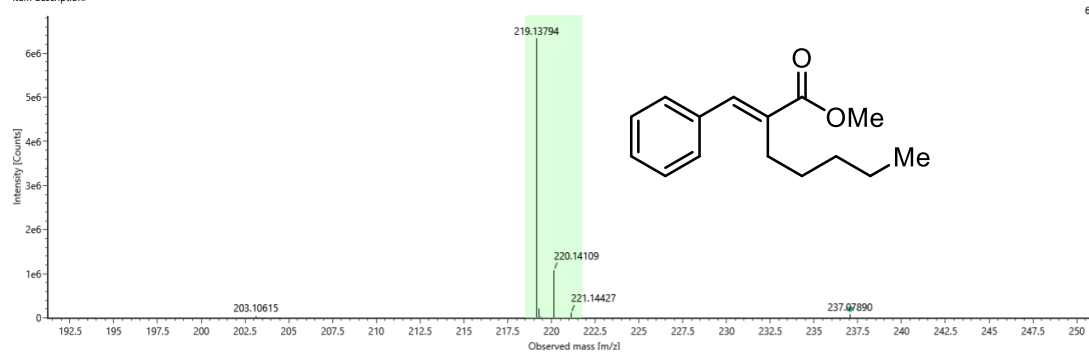


HRMS (APCI) of 3ac

Item name: Sample APCI
Item description:

Channel name: Time 0.0628 +/- 0.0056 minutes

6.85e6

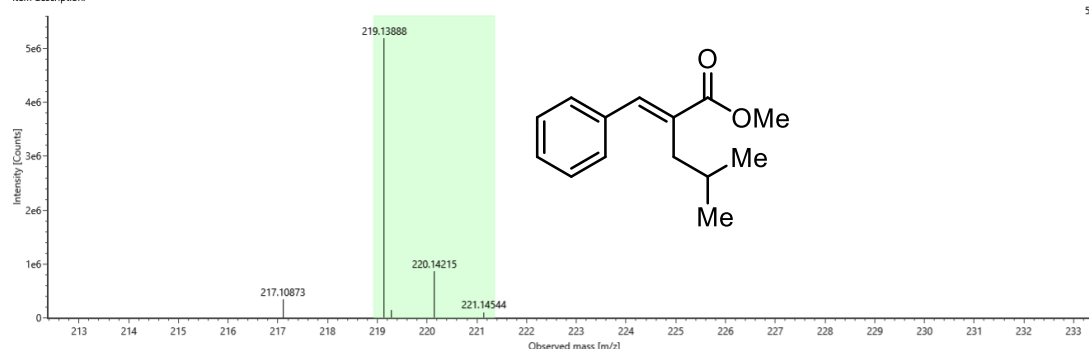


HRMS (APCI) of 3ad

Item name: Sample
Item description:

Channel name: Time 0.0621 +/- 0.0046 minutes

5.61e6

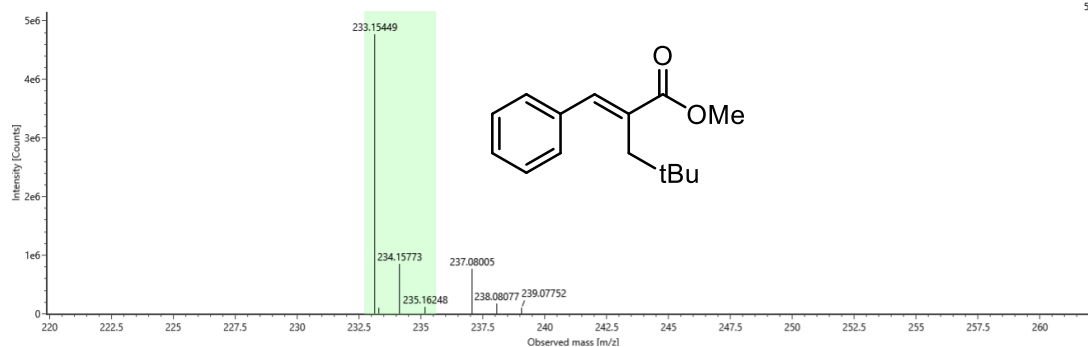


HRMS (APCI) of 3ae

Item name: Sample
Item description:

Channel name: Time 0.0625 +/- 0.0054 minutes

5.16e6

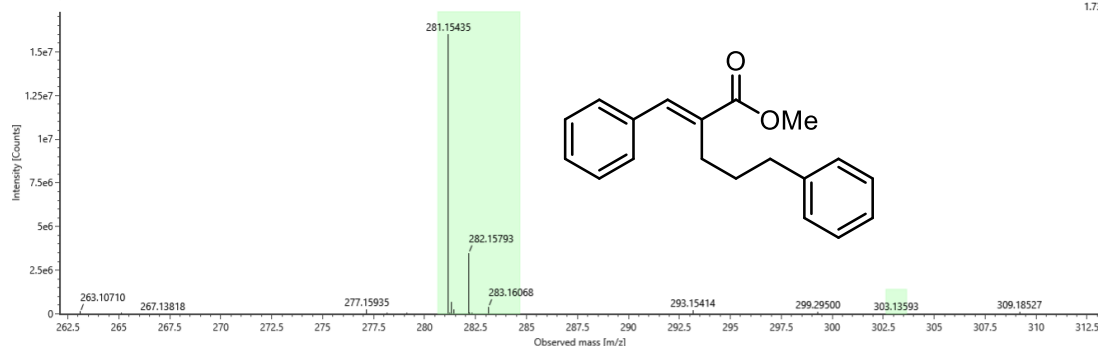


HRMS (APCI) of 3af

Item name: Sample
Item description:

Channel name: Time 0.0640 +/- 0.0227 minutes

1.73e7

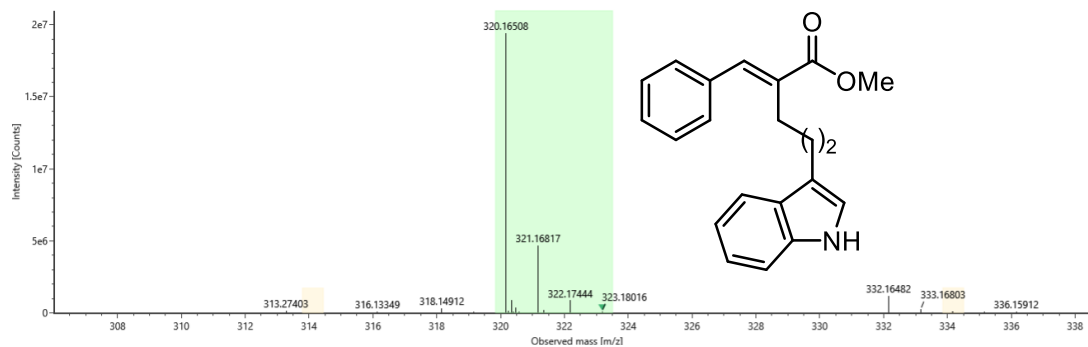


HRMS (APCI) of 3ag

Item name: Sample
Item description:

Channel name: Time 0.0621 +/- 0.0156 minutes

2.1e7

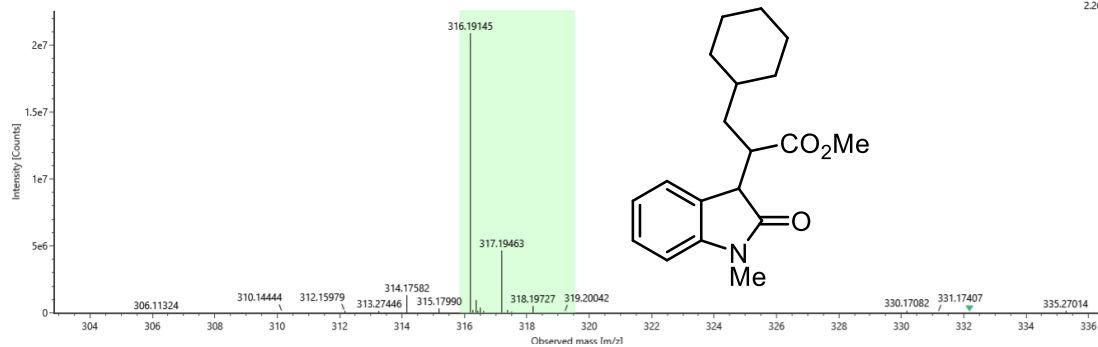


HRMS (APCI) of 6aa

Item name: Sample
Item description:

Channel name: Time 0.0624 +/- 0.0191 minutes

2.26e7

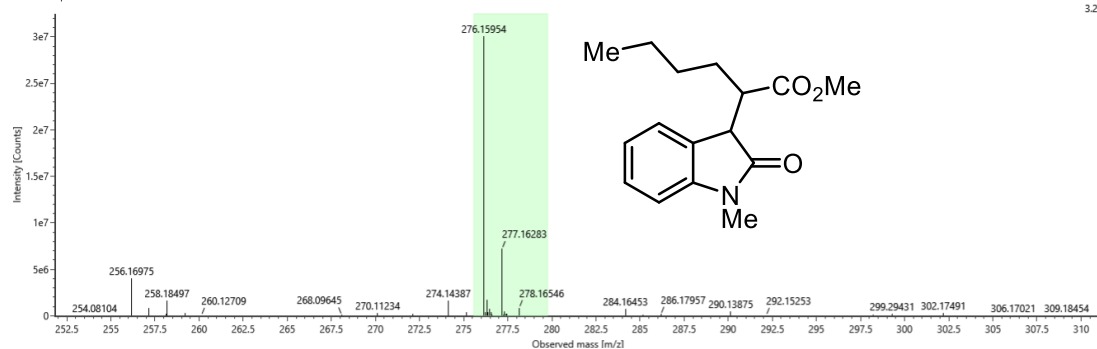


HRMS (APCI) of 6ac

Item name: Sample APCI
Item description:

Channel name: Time 0.0626 +/- 0.0165 minutes

3.25e7

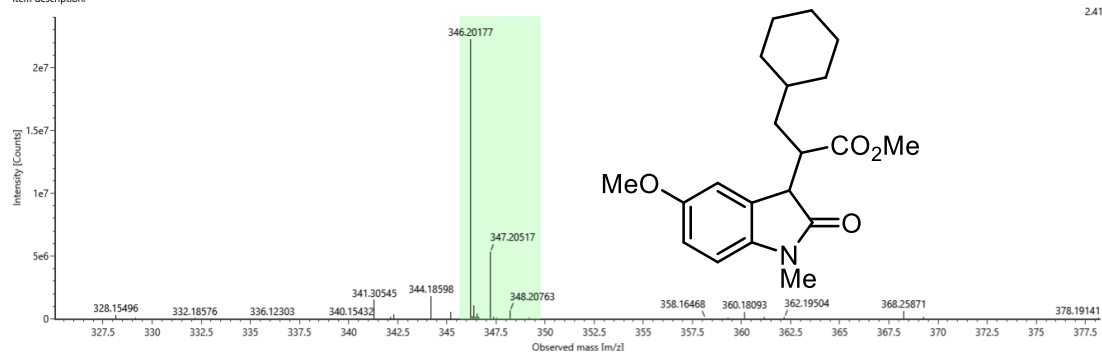


HRMS (APCI) of 6ba

Item name: Sample
Item description:

Channel name: Time 0.0624 +/- 0.0179 minutes

2.41e7

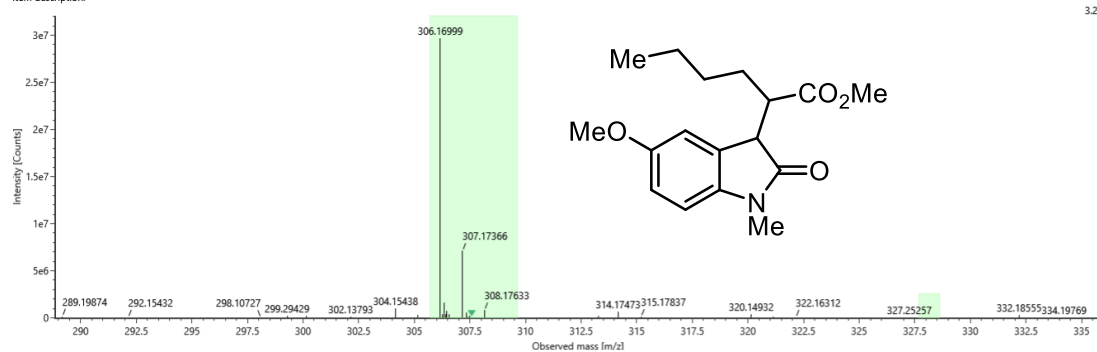


HRMS (APCI) of 6bc

Item name: Sample APCI
Item description:

Channel name: Time 0.0629 +/- 0.0193 minutes

3.21e7



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