



Supporting Information

Chiral Carbon Nanodots Can Act as Molecular Catalysts in Chemical and Photochemical Reactions

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1. General information

Microwave. MW synthesis was performed on a CEM Discover-SP, using 10 mL glass microwave vials. **Nuclear magnetic resonance.** ^1H , and ^{13}C -NMR spectra were obtained on Varian Inova spectrometer (500 MHz ^1H and 126 MHz ^{13}C) or Varian 400 MHz NMR spectrometer (400 MHz ^1H and 101 MHz ^{13}C). Chemical shifts were reported in ppm according to tetramethylsilane using the solvent residual signal as an internal reference (CDCl_3 : $\delta\text{H} = 7.26$ ppm, $\delta\text{C} = 77.16$ ppm). Coupling constants (J) were given in Hz and were averaged. Resonance multiplicity was described as s (singlet), d (doublet), t (triplet), m (multiplet), br (broad signal), dd (doublet of doublets), dt (doublet of triplets). Carbon spectra were acquired with a complete decoupling for the proton, unless specified. All spectra were recorded at 25 °C unless specified. **ESI-High resolution mass spectrometry.** ESI-HRMS was performed at University of Trieste Chemistry department, high resolution mass spectra (HRMS) were obtained on Bruker micrOTOF-Q (ESI-TOF). **Photophysical analysis.** All the spectra were recorded at room temperature using 10 mm path-length quartz cuvettes. Absorption spectra of compounds were recorded with an Agilent Cary 5000 UV-Vis spectrophotometer. Emission measurements were performed on an Edinburgh instruments FS5 spectrofluorometer using a 150 W CW Ozone-free xenon arc lamp as source and a Photomultiplier R928P (spectral coverage 200 nm – 900 nm, cooled and stabilised) as detector. Quantum yields were performed using the integrating sphere setup SC-30. Luminescence lifetimes were measured with an Edinburgh Instruments FS5 time-correlated single-photon counting spectrofluorimeter, exciting the sample at 375 nm with a picosecond pulsed diode laser (EPL-375 Edinburgh Instruments). Electronic Circular Dichroism (ECD) spectra were recorded using Jasco J-810 at room temperature (20 °C). Conditions were as follows: scanning rate 50 nm/min, data pitch 1 nm, Digital Integration Time (D.I.T.) 2 s, 4 accumulations. **Atomic force microscopy.** AFM images were obtained with a Nanoscope IIIa, VEECO Instruments. As a general procedure, AFM analyses were performed using tapping mode with a HQ:NSC19/ALBS probe (80 kHz; 0.6 N/m) (MikroMasch) from drop cast of samples in methanol diluted solution (concentration in the order of $\mu\text{g}/\text{mL}$) on an exfoliated mica substrate. The obtained AFM images were analyzed in S3 Gwyddion 2.58, using Profile extraction tool and Find peaks function. Statistical analysis was carried out on one hundred nanoparticles. **Chemical characterization.** ATR-Fourier-transform infrared spectroscopy was performed on a Shimadzu IRAffinity1S equipped with a QATR-10 with diamond crystal. X-Ray Photoelectron Spectroscopy experiments were performed on a Kratos Axis Ultra XPS, sample was prepared depositing the CND powder on copper support. CasaXPS software (version 2.3.16 PR1.6) was used for data analysis. Survey spectra were employed to calculate relative atomic composition of all elements present in the samples. **Cyclic voltammetry.** The electrochemical characterizations were carried out in dichloromethane (DCM)/0.1 M tetrabutylammonium hexafluorophosphate (TBAPF_6) (solution saturated with CNDs), at room temperature, on a Autolab 302 N electrochemical workstation (Metrohm, The Netherlands) in a glass cell from CH Instruments (10 mL, CHI220). A typical three-electrode cell was employed, which was composed of glassy carbon (GC) working electrode (3 mm diameter), a platinum wire as counter electrode and a saturated calomel electrode (SCE) as reference electrode (RE). RE was connected to the glass cell through a salt bridge in 0.1 M TBAPF_6 DCM solution. Oxygen was removed by purging the DCM solution with Argon. The GC electrode was polished twice before use with 0.05 and 0.1 colloidal silica polishing suspension and ultrasonically rinsed with deionized water for 15 minutes. **HPLC.** Enantiomeric excess (ee) values were determined by Agilent Infinity II, employing a Phenomenex chiral stationary phase column (specified in the individual description compound) and a detector operating at 220 and 254 nm. Racemic samples were prepared using the same reaction protocol but employing pyrrolidine (20 mol%) as the organocatalyst.

Materials. Commercial reagents and solvents were purchased from Sigma-Aldrich, Apollo scientific or VWR and used without further purification, unless otherwise stated. MilliQ water was obtained from a Millipore Milli-Q Plus 185 apparatus and presented a resistivity of 18.2 M Ω cm. MilliQ water was always used unless otherwise specified.

2. CNDs

2.1 Synthesis of CNDs

(*S*)- or (*R*)-2-(Aminomethyl)-1-Boc-pyrrolidine (100 mg, 0.5 mmol) and citric acid (192 mg, 1 mmol) were dissolved in Milli-Q water (100 μ L) and then heated at 240 $^{\circ}$ C, and 150 W for 180 seconds. In the process of microwave heating, the solution changes color from pale yellow to brown as a result of formation of CNDs. The solution was diluted with chloroform (CHCl_3) and washed with water (3 times). The organic phase was dried over Na_2SO_4 and concentrated under reduced pressure. The solid was suspended in the minimum amount of chloroform and then precipitated with diethyl ether (10 mL) to induce the CND precipitation. The precipitate was collected through centrifugation (6000 rpm, 10 min). The precipitation process was repeated twice. After drying, the final material is obtained as a brownish powder (CNDs: 60 mg).

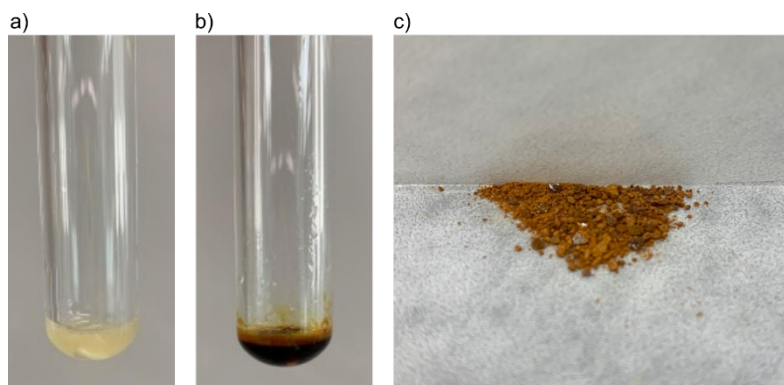


Figure S1. Photographs of the vials (a) before and (b) after microwave-heating process and (c) the final CNDs.

2.2 Characterization

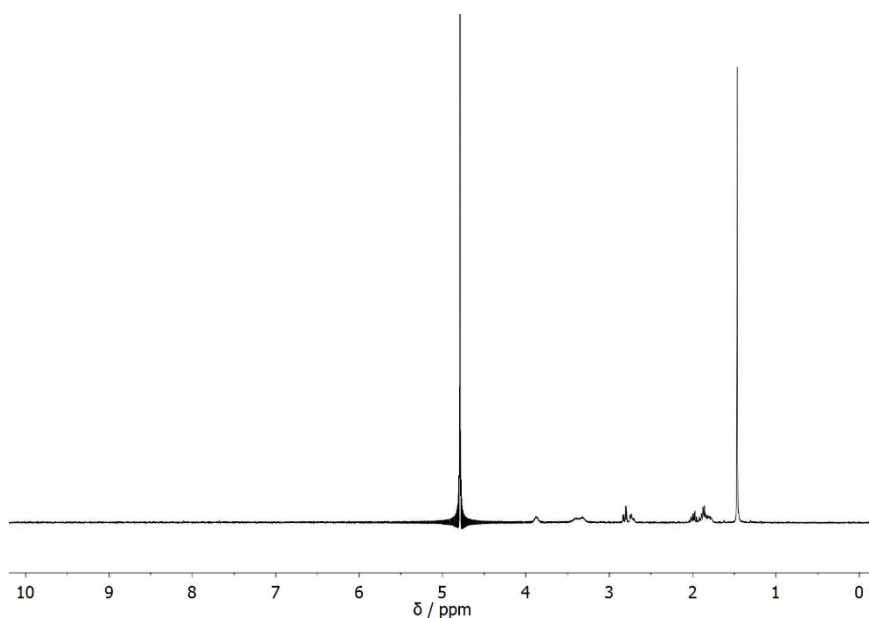


Figure S2. ^1H NMR spectrum (D_2O , 400 MHz, rt) of Pyr.

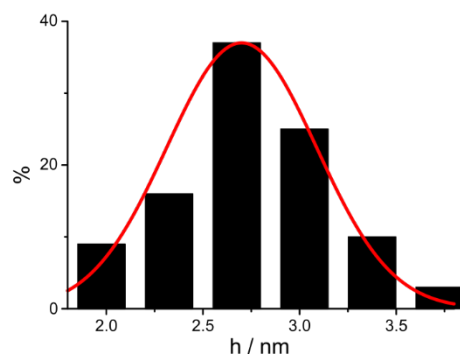


Figure S3. Size histogram of AFM height data of (S)-CNDs, with distribution fit (red curve) based on a Gaussian distribution.

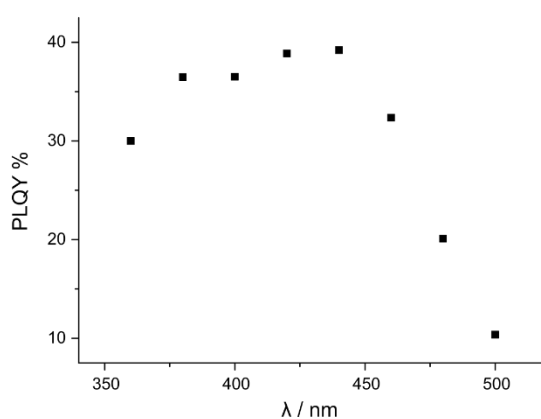


Figure S4. PLQY of (S)-CNDs in chloroform upon changing the excitation wavelength.

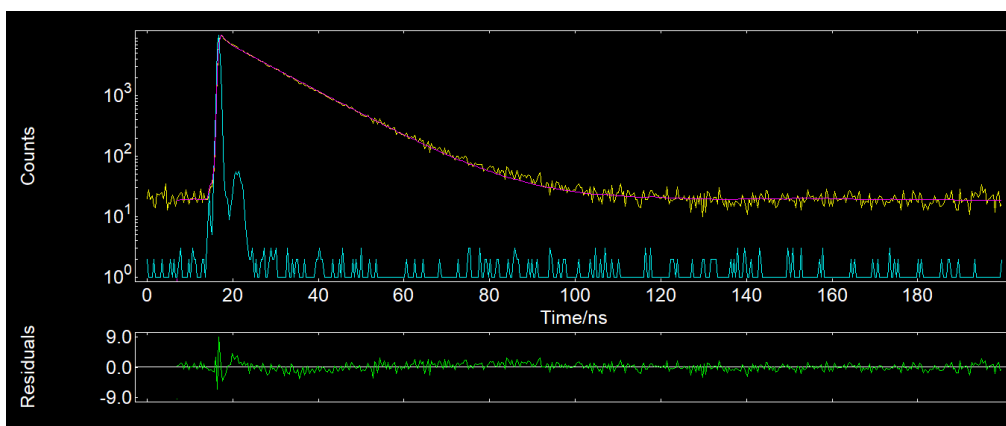


Figure S5. Fluorescence decay curve of (S)-CNDs in chloroform. The yellow curve corresponds to the sample fluorescence decay, the blue curve corresponds to the instrument response function and the magenta curve corresponds to the best fit, with their respective residuals (green line).

	A_1	$\tau_1 \pm 0.1 / \text{ns}$	A_2	$\tau_2 \pm 0.1 / \text{ns}$	$\tau_{\text{av}} / \text{ns}$
(S)-CNDs	0.22	1.1	0.41	11.6	7.9

Table S1. Fitting parameters of the fluorescence decay curve.

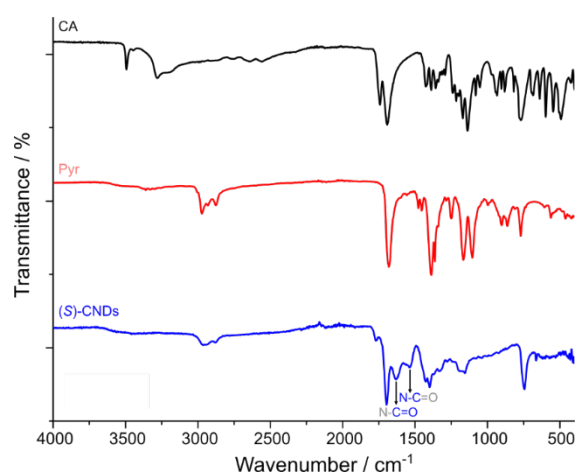


Figure S6. FT-IR spectra of CA, Pyr, and (S)-CNDs.

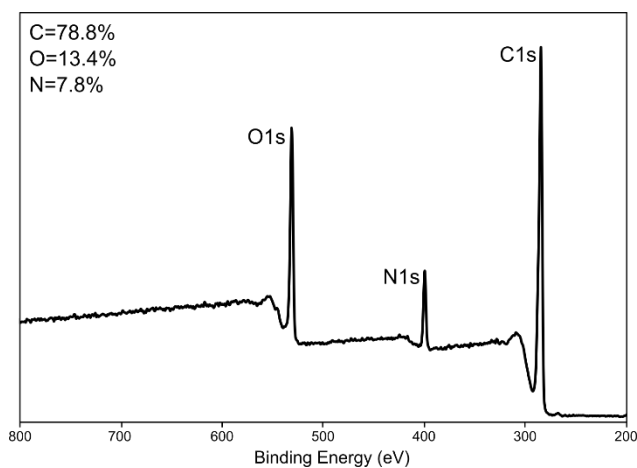


Figure S7. XPS survey of (S)-CNDs showing the C1s, N1s and O1s peaks.

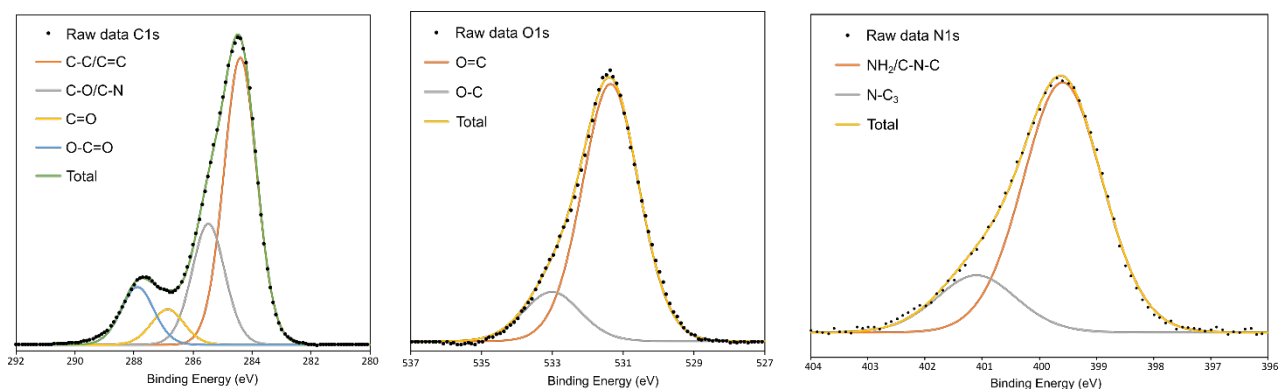


Figure S8. Deconvoluted C1s, O1s, N1s spectra of (S)-CNDs.

C%	78,8
C-C/C=C	57,2
C-O/C-N	24,2
C=O	7,1
O-C=O	11,5
O%	13,4
O=C	83,9
O-C	16,1
N%	7,8
NH ₂ /C-N-C	81,3
N-C ₃	18,7

Table S2. XPS percentage of C, O, and N atoms and their deconvoluted components.

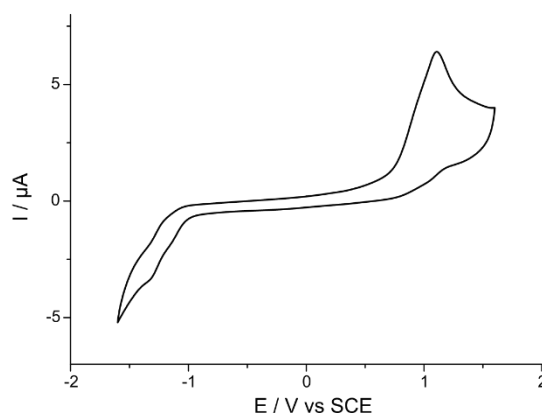


Figure S9. Cyclic voltammograms of (S)-CNDs in 0.1 M TBAPF₆ DCM solution. Scan rate: 0.025 V/s, potential referred to SCE at room temperature.

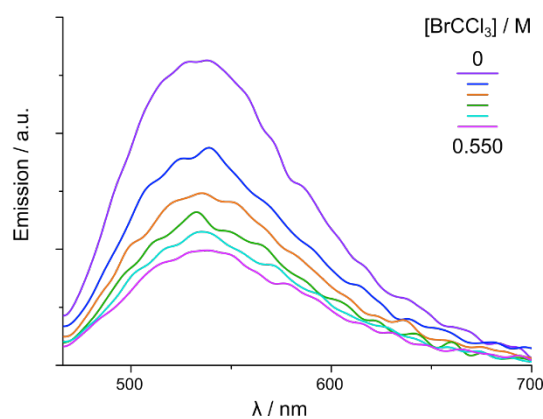


Figure S10. Emission spectra of (S)-CNDs (0.01 mg/mL in chloroform, excitation at $\lambda=456$ nm) in the presence of increasing amounts of BrCCl₃.

2.3 Reductive amination for the quantification of surface amines

A solution of NaBH₃CN (10.5 mg), (S)-CNDs (25.0 mg), 3,5-bis(trifluoromethyl)benzaldehyde (28 μL) and acetic acid (10 μL) in MeCN/MeOH (1:1 v/v, 2.0 mL) was stirred at rt, for 36 h. The resulting mixture was extracted with water and the organic phase was dried over Na₂SO₄ and concentrated under reduced pressure. The solid was suspended in the minimum amount of chloroform and then precipitated with diethyl ether (10 mL) to induce the CND precipitation. The precipitate was collected through centrifugation (6000 rpm, 10 min). The precipitation process was repeated twice. After drying, the final product is obtained (15 mg). The concentration of fluorinated moieties was quantified through ¹⁹F-NMR and using 1-fluoro-2-nitrobenzene as internal standard.

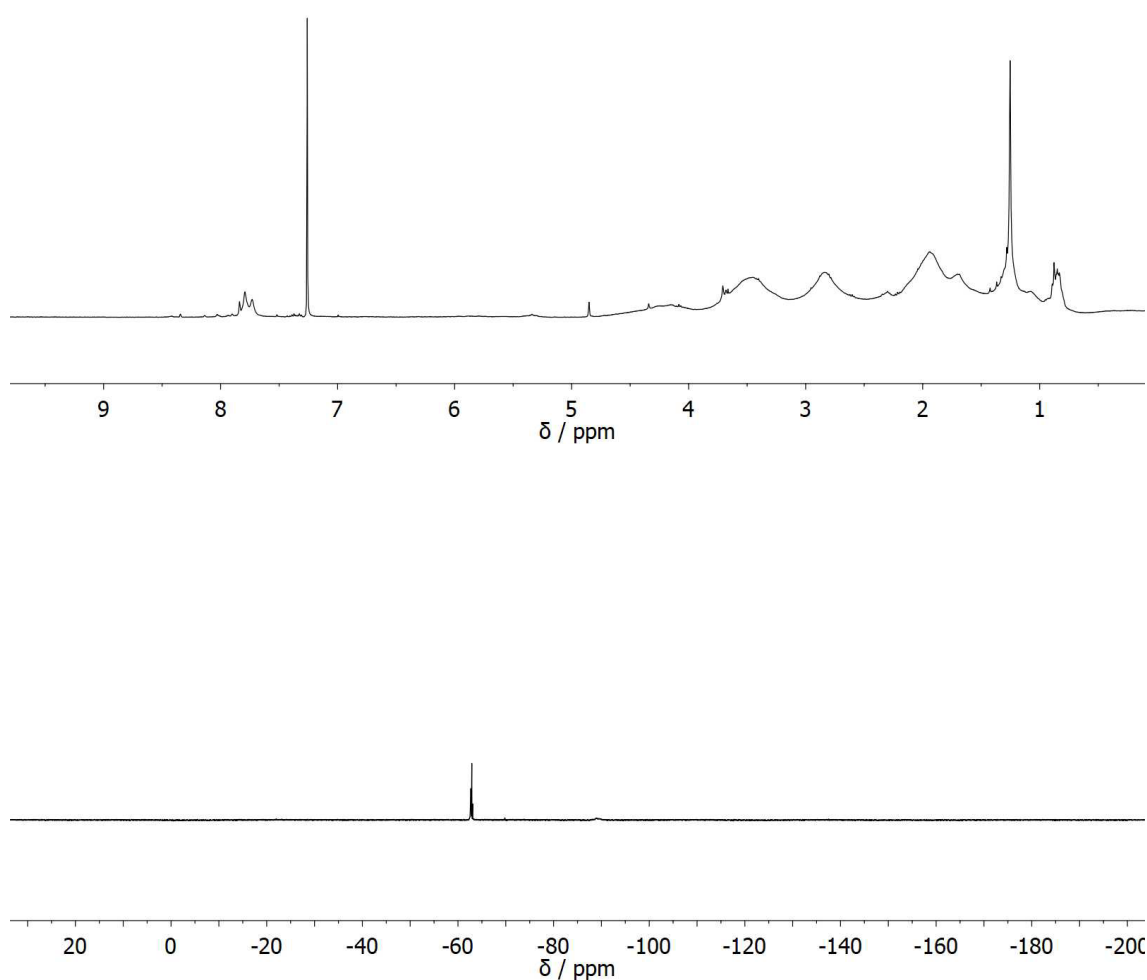


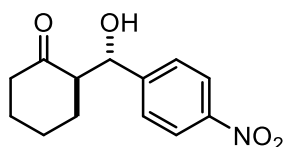
Figure S11. ¹H NMR (top) and ¹⁹F NMR (bottom) spectra (CDCl₃, 400 MHz, rt) of (S)-CNDs after the reductive amination.

3. Use of CNDs in organocatalyzed transformations

3.1 General Procedures A for the CNDs-catalyzed aldol reaction

A 2 mL vial, equipped with a magnetic stirring bar, was charged with (**S**)-CNDs (38 mg), cyclohexanone **1a** (0.25 mmol, 5 eq), 4-NO₂-benzaldehyde **2** (0.05 mmol, 1 eq), benzoic acid (20 mol%, 0.01 mmol) and 1,2-DCE (200 μL). The reaction mixture was stirred for 3 days and then quenched by dropping the organic solvent into 10 mL of cold Et₂O to precipitate the CNDs. After centrifugation (6000 rpm, 10 min), the organic phase was separated while (**S**)-CNDs were suspended in the minimum amount of CH₂Cl₂, precipitated again into 10 mL of cold Et₂O and centrifugated (6000 rpm, 10 min) to separate the organic phase from the precipitate. The combined organic phases were concentrated under reduced pressure to give the crude product. The residue was purified by flash column chromatography (mixtures of EtOAc/cyclohexane) to afford the desired product.

Anti-2-(hydroxy(4-nitrophenyl)methyl)cyclohexan-1-one, anti-3



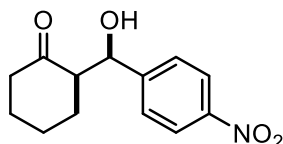
Following the General Procedure A, cyclohexanone **1a** and 4-NO₂-benzaldehyde **2** were employed and the reaction was stirred for 3d and ¹H NMR analysis on the crude mixture showed that the desired product was formed in a 3:1 d.r.. Purification by FC on silica gel (10% EtOAc in cyclohexane) afforded **3** as a white solid (10 mg, 0.041 mmol, 81% combined yield). Further purification by FC on silica gel (5 to 15% EtOAc in cyclohexane) enabled the isolation of the two separate diastereomers.

The characterization of the compound matches with the data reported in the literature.¹

¹H NMR (400 MHz, CDCl₃): δ [ppm] 8.24 – 8.18 (m, 2H), 7.54 – 7.48 (m, 2H), 4.90 (d, *J*=8.4, 1H), 2.63 – 2.55 (m, 1H), 2.53 – 2.45 (m, 1H), 2.42 – 2.32 (m, 1H), 2.18 – 2.08 (m, 1H), 1.89 – 1.79 (m, 1H), 1.75 – 1.50 (m, 3H), 1.45 – 1.32 (m, 1H).

HPLC: Phenomenex Cellulose-5; *n*-hexane/*i*PrOH, 80:20 isocratic; flow-rate 0.75 mL/min; *t*_{major} = 24.6 min; *t*_{minor} = 25.6 min.

Syn-2-(hydroxy(4-nitrophenyl)methyl)cyclohexan-1-one, syn-3



The characterization of the compound matches with the data reported in the literature.²

¹H NMR (400 MHz, CDCl₃): δ [ppm] 8.24 – 8.18 (m, 2H), 7.52 – 7.46 (m, 2H), 5.51 – 5.46 (m, 1H), 2.67 – 2.59 (m, 1H), 2.53 – 2.45 (m, 1H), 2.45 – 2.34 (m, 1H), 2.12 (ddt, *J*=12.5, 5.9, 3.0, 1H), 1.86 (d, *J*=13.5, 1H), 1.77 – 1.48 (m, 4H).

HPLC: Phenomenex Cellulose-5; *n*-hexane/*i*PrOH, 80:20 isocratic; flow-rate 0.75 mL/min; *t*_{major} = 15.2 min; *t*_{minor} = 17.2 min.

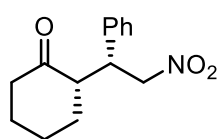
¹ Z. Tang, Z.-H. Yang, X.-H. Chen, L.-F. Cun, A.-Q. Mi, Y.-Z. Jiang, L.-Z. Gong *J. Am. Chem. Soc.* **2005**, *127*, 9285–9289.

² G.-F. Wen, R. Zhang, C.-Y. Zhang, C.-S. Da *Synthesis* **2023**, *55*, 670–682.

3.2 General Procedures B for the CNDs-catalyzed Michael addition of cyclic ketones **1** to nitroalkenes **4**

A 2 mL vial, equipped with a magnetic stirring bar, was charged with (**S**)-CNDs (38 mg), ketone **1** (0.25 mmol, 5 eq), nitroalkene **4** (0.05 mmol, 1 eq), benzoic acid (20 mol%, 0.01 mmol) and 1,2-dichloroethane (100 μ L). The reaction mixture was stirred for 3-4 days and then quenched by dropping the organic solvent into 10 mL of cold Et₂O to precipitate the (**S**)-CNDs. After centrifugation (6000 rpm, 10 min), the organic phase was separated while (**S**)-CNDs were suspended in the minimum amount of CH₂Cl₂, precipitated again into 10 mL of cold Et₂O and centrifugated (6000 rpm, 10 min) to separate the organic phase from the precipitate. The combined organic phases were concentrated under reduced pressure to give the crude product. The residue was purified by flash column chromatography (mixtures of EtOAc/cyclohexane) to afford the desired product.

(**S**)-2-((**R**)-2-Nitro-1-phenylethyl)cyclohexan-1-one, **5a**



Following the General Procedure B applying cyclohexanone **1a**, *trans*- β -nitrostyrene **4a** and (**S**)-CNDs, full conversion of **4a** was observed after 3 days. Purification by FC on silica gel (10 to 20% EtOAc in cyclohexane) afforded **5a** as a white solid (10 mg, 0.04 mmol, 81% yield, 20:1 d.r., 91% ee).

¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.35 – 7.29 (m, 2H), 7.29 – 7.24 (m, 1H), 7.19 – 7.14 (m, 2H), 4.94 (dd, $J=12.5, 4.5, 1\text{H}$), 4.63 (dd, $J=12.5, 9.9, 1\text{H}$), 3.76 (td, $J=9.9, 4.5, 1\text{H}$), 2.74 – 2.65 (m, 1H), 2.52 – 2.44 (m, 1H), 2.43 – 2.34 (m, 1H), 2.12 – 2.03 (m, 1H), 1.83 – 1.51 (m, 4H), 1.30 – 1.17 (m, 1H).

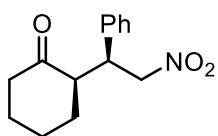
¹³C NMR (CDCl₃, 400 MHz): δ [ppm] 212.0, 137.9, 129.1, 128.3, 127.9, 79.0, 52.7, 44.1, 42.9, 33.4, 28.7, 25.2.

HRMS (ESI+): m/z calcd. for [C₁₄H₁₇NO₃+Na]⁺: 270.1101; found = 270.1102.

$[\alpha]_D^{26} = -50.4$ ($c = 0.12, \text{CHCl}_3$) for 91% ee.³

HPLC: Phenomenex Cellulose-5; *n*-hexane/*i*PrOH, gradient of *i*PrOH 0 to 30% in 20 minutes, flow-rate 0.75 mL/min; $t_{\text{minor}} = 29.8$ min; $t_{\text{major}} = 31.1$ min.

(**R**)-2-((**S**)-2-nitro-1-phenylethyl)cyclohexan-1-one, *ent*-**5a**



Following the General Procedure B applying cyclohexanone **1a**, nitroalkene **4a** and (**R**)-CNDs (38 mg), full conversion of **4a** was observed after 4 days. Purification by FC on silica gel (10 to 20% EtOAc in cyclohexane) afforded *ent*-**5a** as a white solid (11 mg, 0.044 mmol, 89% yield, 20:1 d.r., 74% ee).

¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.35 – 7.29 (m, 2H), 7.29 – 7.24 (m, 1H), 7.19 – 7.14 (m, 2H), 4.94 (dd, $J=12.5, 4.5, 1\text{H}$), 4.63 (dd, $J=12.5, 9.9, 1\text{H}$), 3.76 (td, $J=9.9, 4.5, 1\text{H}$), 2.74 – 2.65 (m, 1H), 2.52 – 2.44 (m, 1H), 2.43 – 2.34 (m, 1H), 2.12 – 2.03 (m, 1H), 1.83 – 1.51 (m, 4H), 1.30 – 1.17 (m, 1H).

¹³C NMR (CDCl₃, 400 MHz): δ [ppm] 212.0, 137.9, 129.1, 128.3, 127.9, 79.0, 52.7, 44.1, 42.9, 33.4, 28.7, 25.2.

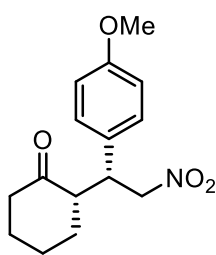
HRMS (ESI+): m/z calcd. for [C₁₄H₁₇NO₃+Na]⁺: 270.1101; found = 270.1102.

$[\alpha]_D^{26} = +41.9$ ($c = 0.25, \text{CHCl}_3$) for 74% ee.

HPLC: Phenomenex Cellulose-5; *n*-hexane/*i*PrOH, gradient of *i*PrOH 0 to 30% in 20 minutes, flow-rate 0.75 mL/min; $t_{\text{major}} = 29.7$ min; $t_{\text{minor}} = 31.3$ min.

³ H.-W. Zhao, H.-L. Li, Y.-Y. Yue, Z.-H. Sheng *Eur. J. Org. Chem.* **2013**, 1740.

(S)-2-((R)-1-(4-methoxyphenyl)-2-nitroethyl)cyclohexan-1-one, **5b**



Following the General Procedure B applying cyclohexanone **1a** and nitroalkene **4b**, full conversion of **4b** was observed after 4 days. Purification by FC on silica gel (10 to 20% EtOAc in cyclohexane) afforded **5b** as a white solid (10 mg, 0.036 mmol, 72% yield, 20:1 d.r., 91% ee).

¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.10 – 7.06 (m, 2H), 6.88 – 6.82 (m, 2H), 4.90 (dd, *J*=12.3, 4.6, 1H), 4.58 (dd, *J*=12.3, 9.9, 1H), 3.78 (s, 3H), 3.71 (td, *J*=9.9, 4.6, 1H), 2.69 – 2.60 (m, 1H), 2.51 – 2.43 (m, 1H), 2.42 – 2.32 (m, 1H), 2.13 – 2.02 (m, 1H), 1.83 – 1.50

(m, 4H), 1.29 – 1.17 (m, 1H).

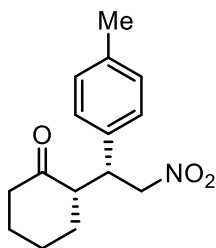
¹³C NMR (CDCl₃, 101 MHz): δ [ppm] 212.2, 159.2, 129.7, 129.3, 114.5, 79.2, 55.4, 52.8, 43.4, 42.9, 33.3, 28.7, 25.1.

HRMS (ESI+): *m/z* calcd. for [C₁₅H₁₉NO₄+Na]⁺: 300.1206; found = 300.1208.

[α]_D²⁶ = -5.4 (*c* = 0.25, CHCl₃) for 91% ee.

HPLC: Phenomenex Amylose-3; *n*-hexane/*i*PrOH, 70:30 isocratic, flow-rate 0.75 mL/min; *t*_{minor} = 14.0 min; *t*_{major} = 15.0 min.

(S)-2-((R)-2-nitro-1-(*p*-tolyl)ethyl)cyclohexan-1-one, **5c**



Following the General Procedure B applying cyclohexanone **1a** and nitroalkene **4c**, full conversion of **1a** was observed after 4 days. Purification by FC on silica gel (10 to 20% EtOAc in cyclohexane) afforded **4c** as a white solid (9.5 mg, 0.037 mmol, 73% yield, 20:1 d.r., 90% ee).

¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.15 – 7.09 (m, 2H), 7.07 – 7.02 (m, 2H), 4.91 (dd, *J*=12.4, 4.5, 1H), 4.61 (dd, *J*=12.3, 9.9, 1H), 3.72 (td, *J*=9.9, 4.6, 1H), 2.71 – 2.61 (m, 1H),

2.52 – 2.44 (m, 1H), 2.43 – 2.34 (m, 1H), 2.31 (s, 3H), 2.12 – 2.03 (m, 1H), 1.83 – 1.50 (m, 4H), 1.32 – 1.16 (m, 1H).

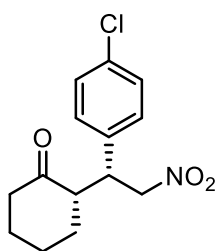
¹³C NMR (CDCl₃, 101 MHz): δ [ppm] 212.2, 137.6, 134.7, 129.8, 128.1, 79.2, 52.7, 43.7, 42.9, 33.3, 28.7, 25.2, 21.2.

HRMS (ESI+): *m/z* calcd. for [C₁₅H₁₉O₃+Na]⁺: 284.1257; found = 284.1257.

[α]_D²⁶ = -38.3 (*c* = 0.25, CHCl₃) for 90% ee.

HPLC: Phenomenex Amylose-3; *n*-hexane/*i*PrOH, 70:30 isocratic, flow-rate 0.75 mL/min; *t*_{minor} = 10.4 min; *t*_{major} = 11.4 min.

(S)-2-((R)-1-(4-chlorophenyl)-2-nitroethyl)cyclohexan-1-one, **5d**



Following the General Procedure B applying cyclohexanone **1a** and nitroalkene **4d**, full conversion of **4d** was observed after 4 days. Purification by FC on silica gel (10 to 20% EtOAc in cyclohexane) afforded **5d** as a white solid (14 mg, 0.049 mmol, 99% yield, 20:1 d.r., 93% ee).

¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.32 – 7.27 (m, 2H), 7.14 – 7.09 (m, 2H), 4.93 (dd, *J*=12.6, 4.6, 1H), 4.60 (dd, *J*=12.6, 10.0, 1H), 3.76 (td, *J*=9.8, 4.5, 1H), 2.70 – 2.60 (m, 1H), 2.53 – 2.43 (m, 1H), 2.43 – 2.31 (m, 1H), 2.15 – 2.04 (m, 1H), 1.85 – 1.51 (m, 4H), 1.31 –

1.16 (m, 1H).

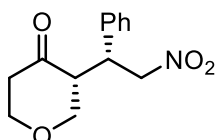
¹³C NMR (CDCl₃, 101 MHz): δ [ppm] 211.6, 136.4, 133.8, 129.7, 129.3, 78.7, 52.6, 43.5, 42.9, 33.3, 28.6, 25.2.

HRMS (ESI+): *m/z* calcd. for [C₁₄H₁₆³⁵ClNO₃+Na]⁺: 304.0711; found: 304.0710; calcd. for [C₁₄H₁₆³⁷ClNO₃+Na]⁺: 306.0682; found: 306.0681.

[α]_D²⁶ = -19.6 (*c* = 0.25, CHCl₃) for 93% ee.

HPLC: Phenomenex Cellulose-5; *n*-hexane/*i*PrOH, gradient of *i*PrOH 0 to 30% in 20 minutes, flow-rate 0.75 mL/min; *t*_{minor} = 26.3 min; *t*_{major} = 26.9 min.

(R)-3-((R)-2-nitro-1-phenylethyl)tetrahydro-4H-pyran-4-one, **5e**



Following the General Procedure B applying tetrahydro-4*H*-pyran-4-one **1b** and nitroalkene **4a**, full conversion of **4a** was observed after 4 days and ¹H NMR analysis on the crude mixture showed that the desired product was formed in a 20:1 d.r. Purification by FC on silica gel (10 to 20% EtOAc in cyclohexane) afforded **5e** as a white solid (7 mg, 0.035 mmol, 61% yield, d 5:1 d.r., 92% ee).

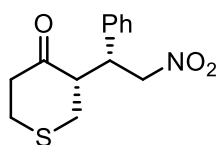
¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.37 – 7.28 (m, 3H), 7.21 – 7.16 (m, 2H), 4.93 (dd, *J*=12.7, 4.5, 1H), 4.65 (dd, *J*=12.7, 10.1, 1H), 4.18 – 4.11 (m, 1H), 3.88 – 3.74 (m, 2H), 3.70 (ddd, *J*=11.5, 5.4, 1.3, 1H), 3.27 (dd, *J*=11.5, 8.8, 1H), 2.88 (dddd, *J*=10.2, 8.8, 5.5, 1.2, 1H), 2.67 (dddd, *J*=13.8, 9.6, 6.2, 1.2, 1H), 2.61 – 2.53 (m, 1H).

¹³C NMR (CDCl₃, 101 MHz): δ [ppm] 207.5, 136.4, 129.4, 128.5, 128.1, 78.8, 71.7, 69.1, 53.4, 43.1, 41.5.

HRMS (ESI+): *m/z* calcd. for [C₁₃H₁₅NO₄+Na]⁺: 272.0893; found: 272.0894.

HPLC: Phenomenex Amylose-3; *n*-hexane/*i*PrOH, gradient of *i*PrOH 0 to 30% in 20 minutes, flow-rate 0.75 mL/min; *t*_{minor} = 13.5 min; *t*_{major} = 23.6 min.

(R)-3-((R)-2-nitro-1-phenylethyl)tetrahydro-4H-pyran-4-one, 5f



Following the General Procedure B applying tetrahydro-4H-thiopyran-4-one **1c** and nitroalkene **4a**, full conversion of **4a** was observed after 4 days and ¹H NMR analysis on the crude mixture showed that the desired product was formed in a 10:1 d.r. Purification by FC on silica gel (10 to 20% EtOAc in cyclohexane) afforded **5f** as a white solid (12 mg, 0.045 mmol, 90% yield, 10:1 d.r., 87% ee).

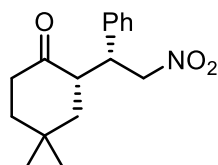
¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.38 – 7.28 (m, 3H), 7.22 – 7.17 (m, 2H), 4.74 (dd, *J*=12.6, 4.6, 1H), 4.63 (dd, *J*=12.6, 9.7, 1H), 3.98 (td, *J*=10.2, 4.6, 1H), 3.09 – 3.01 (m, 1H), 3.01 – 2.96 (m, 2H), 2.90 – 2.77 (m, 2H), 2.62 (ddd, *J*=13.9, 4.2, 1.7, 1H), 2.46 (ddd, *J*=13.8, 9.3, 0.8, 1H).

¹³C NMR (CDCl₃, 101 MHz): δ [ppm] 209.6, 136.6, 129.5, 128.5, 128.3, 78.8, 55.1, 44.7, 43.6, 35.3, 31.7.

HRMS (ESI+): *m/z* calcd. for [C₁₃H₁₅NO₃S+Na]⁺: 272.0893; found = 272.0894.

HPLC: Phenomenex Amylose-1; *n*-hexane/*i*PrOH, 70:30 isocratic, flow-rate 0.75 mL/min; *t*_{minor} = 10.4 min; *t*_{major} = 22.0 min.

(S)-4,4-dimethyl-2-((R)-2-nitro-1-phenylethyl)cyclohexan-1-one, 5g



Following the General Procedure B applying 4,4-dimethylcyclohexanone **1d** and nitroalkene **4a**, full conversion of **4a** was observed after 4 days. Purification by FC on silica gel (10% EtOAc in cyclohexane) afforded **5g** as a colorless oil (10 mg, 0.037 mmol, 73% yield, 20:1 d.r., 90% ee).

¹H NMR (CDCl₃, 400 MHz): δ [ppm] 7.35 – 7.24 (m, 4H), 7.17 – 7.11 (m, 2H), 4.99 (dd, *J*=12.3, 4.6, 1H), 4.64 (dd, *J*=12.4, 9.6, 1H), 3.70 (td, *J*=9.6, 4.6, 1H), 2.92 – 2.82 (m, 1H), 2.55 (tdd, *J*=13.7, 6.2, 1.0, 1H), 2.31 (ddd, *J*=13.5, 4.6, 2.8, 1H), 1.79 – 1.71 (m, 1H), 1.63 (td, *J*=13.7, 4.7, 1H), 1.37 (ddd, *J*=13.4, 5.1, 3.4, 1H), 1.27 – 1.17 (m, 1H), 1.13 (s, 3H), 0.88 (s, 3H).

¹³C NMR (CDCl₃, 101 MHz): δ [ppm] 212.7, 137.9, 129.1, 128.3, 127.9, 79.2, 47.8, 46.0, 44.0, 40.8, 39.2, 31.21, 31.18, 24.5.

HRMS (ESI+): *m/z* calcd. for [C₁₆H₂₁NO₃+Na]⁺: 298.1414; found = 298.1412.

[α]_D²⁶ = -58.2 (*c* = 0.27, CHCl₃) for 90% ee.

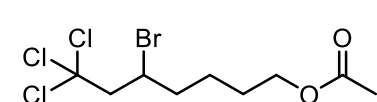
HPLC: Phenomenex Cellulose-5; *n*-hexane/*i*PrOH, 70:30 isocratic, flow-rate 0.75 mL/min; *t*_{minor} = 16.6 min; *t*_{major} = 18.9 min.

4. Use of CNDs in photoredox reactions

4.1 General Procedures C for the CNDs-promoted atom transfer radical addition between alkenes **6** and radical precursors

A Schlenk tube (10 mL), equipped with a magnetic stirring bar, was charged with (**S**)-CNDs (6 mg), olefine **6** (0.1 mmol, 1 eq), radical precursor **7** (0.3 mmol, 3 eq) and CH₂Cl₂ (400 μL). The reaction mixture was degassed via freeze pump thaw (3 cycles) and the vessel filled with argon. Then, the Schlenk tube was located 4-5 cm away from the Kessil lamp (456 nm) and stirred overnight (16 h). The reaction was quenched by dropping the organic solvent into 10 mL of cold Et₂O to precipitate the CNDs. After centrifugation (6000 rpm, 10 min), the organic phase was separated while (**S**)-CNDs were suspended in the minimum amount of CH₂Cl₂, precipitated again into 10 mL of cold Et₂O and centrifugated (6000 rpm, 10 min) to separate the organic phase from the precipitate. The combined organic phases were concentrated under reduced pressure to give the crude product. The residue was purified by flash column chromatography (mixtures of EtOAc/cyclohexane) to afford the desired product.

5-Bromo-7,7,7-trichloroheptyl acetate, **8a**



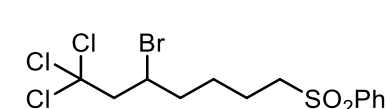
Following the General Procedure C and applying olefine **6a** and bromotrichloromethane **7a**, the reaction was stirred for 16h. Purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **8a** as a colorless oil (30.6 mg, 0.09 mmol, 90% yield).

¹H NMR (400 MHz, CDCl₃): δ [ppm] 4.37 – 4.27 (m, 1H), 4.08 (t, *J*=6.2, 2H), 3.46 (dd, *J*=15.8, 4.9, 1H), 3.22 (dd, *J*=15.8, 5.4, 1H), 2.13 – 2.02 (m, 4H), 2.02 – 1.91 (m, 1H), 1.76 – 1.52 (m, 4H).

¹³C NMR (CDCl₃, 100 MHz): δ [ppm] 171.6, 97.5, 64.5, 63.1, 49.1, 39.4, 28.2, 24.3, 21.4.

HRMS (ESI+): *m/z* calcd. for [C₉H₁₄BrCl₃O₂+Na]⁺: 360.9135, found: 360.9134.

((5-Bromo-7,7,7-trichloroheptyl)sulfonyl)benzene, **8b**



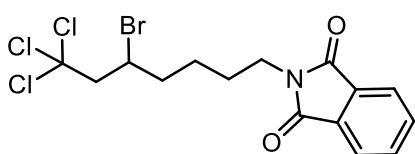
Following the General Procedure C and applying olefine **6b** and bromotrichloromethane **7a**, the reaction was stirred for 16h. Purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **8b** as a colorless oil (27.4 mg, 0.064 mmol, 64% yield).

¹H NMR (500 MHz, CDCl₃): δ [ppm] 7.95 – 7.91 (m, 2H), 7.70 – 7.66 (m, 1H), 7.62 – 7.57 (m, 2H), 4.32 – 4.23 (m, 1H), 3.44 (dd, *J*=15.8, 4.8, 1H), 3.18 (dd, *J*=15.8, 5.6, 1H), 3.15 – 3.10 (m, 2H), 2.09 – 2.01 (m, 1H), 1.97 – 1.88 (m, 1H), 1.87 – 1.54 (m, 4H).

¹³C NMR (CDCl₃, 125 MHz): δ [ppm] 139.2, 133.9, 129.5, 128.2, 97.0, 62.6, 56.1, 48.3, 38.9, 26.3, 22.1.

HRMS (ESI+): *m/z* calcd. for [C₁₃H₁₆BrCl₃O₂S+Na]⁺: 442.9013, found 442.9012.

2-(5-Bromo-7,7,7-trichloroheptyl)isoindoline-1,3-dione, **8c**



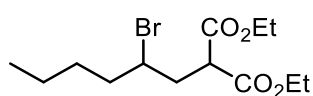
Following the General Procedure applying E olefine **6c** and bromotrchloromethane **7a**, the reaction was stirred for 16h. Purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **8c** as a colorless oil (28.2 mg, 0.066 mmol, 66% yield).

¹H NMR (500 MHz, CDCl₃): δ [ppm] 7.89 – 7.81 (m, 2H), 7.75 – 7.69 (m, 2H), 4.33 – 4.27 (m, 1H), 3.71 (t, *J*=7.1, 2H), 3.45 (dd, *J*=15.8, 5.0, 1H), 3.21 (dd, *J*=15.9, 5.3, 1H), 2.15 – 2.07 (m, 1H), 2.02 – 1.93 (m, 1H), 1.83 – 1.62 (m, 3H), 1.61 – 1.50 (m, 1H).

¹³C NMR (CDCl₃, 125 MHz): δ [ppm] 168.5, 134.1, 132.2, 123.4, 97.2, 62.8, 48.7, 39.0, 37.7, 27.8, 24.8.

HRMS (ESI+): *m/z* calcd. for [C₁₅H₂₅BrCl₃NO₂+Na]⁺: 447.9244, found 447.9250.

Diethyl 2-(2-bromohexyl)malonate, **8d**



Following the General Procedure E and applying olefine **6d** and diethyl 2-bromomalonate **7b**, the reaction was stirred for 16h. Purification by FC on silica gel (5% EtOAc in cyclohexane) afforded **8d** as a colorless oil (23.2 mg, 0.072 mmol, 72% yield). The characterization of the compound matches with

the data reported in the literature.⁴

¹H NMR (400 MHz, CDCl₃): δ [ppm] 4.15-4.22 (m, 4H), 3.95-4.0 (m, 1H), 3.75 (dd, *J*= 4.1, 10.2 Hz, 1H), 2.44 (ddd, *J*= 4.1, 10.2, 14.3 Hz, 1H), 2.22 (ddd, *J*= 4.2, 10.4, 14.7 Hz, 1H), 1.81-1.86 (m, 2H), 1.46-1.53 (m, 1H), 1.36-1.43 (m, 1H), 1.29-1.35 (m, 2H), 1.23-1.27 (m, 6H), 0.88 (t, *J*= 7.3 Hz, 3H);

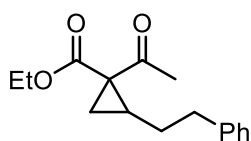
HRMS (ESI+): *m/z* calcd. for [C₁₃H₂₃BrO₄+Na]⁺: 345.0677, found 345.0672.

⁴ A. Da Lama, B. Bartolomei, C. Rosso, G. Filippini, M. Montserrat Martínez, Luis A. Sarandeses, Maurizio Prato *Eur. J. Org. Chem.* **2022**, e202200622

4.2 General Procedures D for the CNDs-promoted photochemical cyclopropanation

A Schlenk tube (10 mL), equipped with a magnetic stirring bar, was charged with (**S**)-CNDs (19 mg), 4-phenyl-1-butene **10** (1 equiv, 0.1 mmol, 15 μ L), ethyl 2-bromo-3-oxobutanoate **9** (2 equiv, 0.2 mmol, 42 mg), 2,6-lutidine (4 equiv, 0.4 mmol, 47 μ L), LiBF₄ (1 equiv, 0.1 mmol, 9.4 mg) and DMF (250 μ L). The reaction mixture was degassed via freeze pump thaw (3 cycles) and the vessel filled with argon. Then, the Schlenk tube was located 4-5 cm away from the Kessil lamp (456 nm) and stirred overnight (19 h). The reaction was quenched by dropping the organic solvent into 10 mL of cold Et₂O to precipitate the CNDs. After centrifugation (6000 rpm, 10 min), the organic phase was separated while the CNDs were suspended in the minimum amount of CH₂Cl₂, precipitated again into 10 mL of cold Et₂O and centrifugated (6000 rpm, 10 min) to separate the organic phase from the precipitate. The combined organic phases were concentrated under reduced pressure to give the crude product. The residue was purified by flash column chromatography to afford the desired product.

Ethyl 1-acetyl-2-phenethylcyclopropane-1-carboxylate, **11**



Following the General Procedure D, purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **11** as a colorless oil (9.0 mg, 0.035 mmol, 35% yield).

¹H NMR (500 MHz, CDCl₃): δ [ppm] 7.29 – 7.25 (m, 2H), 7.21 – 7.16 (m, 1H), 7.16 – 7.13 (m, 2H), 4.30 – 4.21 (m, 2H), 2.69 (t, $J=7.8$, 2H), 2.36 (s, 3H), 2.02 – 1.95 (m, 1H), 1.83 – 1.73 (m, 1H), 1.69 – 1.61 (m, 1H), 1.45 – 1.37 (m, 2H), 1.31 (t, $J=7.1$, 3H).

¹³C NMR (CDCl₃, 125 MHz): δ [ppm] 203.0, 169.8, 141.5, 128.6, 128.5, 126.1, 61.6, 41.9, 35.3, 31.1, 30.4, 29.5, 23.9, 14.4.

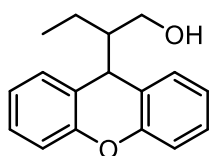
HRMS (ESI+): m/z calcd. for [C₁₆H₂₀O₃+Na]⁺: 283.1305, found 283.1306.

5. Use of CNDs in photo-organocatalyzed transformations

5.1 General Procedures E for the CNDs-promoted cross-dehydrogenative reaction

A Schlenk tube (10 mL), equipped with a magnetic stirring bar, was charged with (**S**)-CNDs (19 mg), xanthene **12** (9.1 mg, 0.05 mmol, 1 eq), Na₃PO₄ (12.3 mg, 0.075 mmol, 1.5 eq), the corresponding aldehyde or ketone (0.15 mmol, 3 eq), BrCCl₃ (7.4 μL, 0.075 mmol, 1.5 eq) and 1,2-DCE (500 μL). The reaction mixture was degassed via freeze pump thaw (3 cycles) and the vessel filled with argon. Then, the Schlenk tube was located 4-5 cm away from the Kessil lamp (456 nm) and stirred overnight (16 h). The reaction was quenched by dropping the organic solvent into 10 mL of cold Et₂O to precipitate the CNDs. After centrifugation (6000 rpm, 10 min), the organic phase was separated while the CNDs were suspended in the minimum amount of CH₂Cl₂, precipitated again into 10 mL of cold Et₂O and centrifuged (6000 rpm, 10 min) to separate the organic phase from the precipitate. The combined organic phases were concentrated under reduced pressure to give the crude product. The residue was purified by flash column chromatography (mixtures of EtOAc/cyclohexane) to afford the desired product.

2-(9*H*-Xanthen-9-yl)butan-1-ol, **14a**

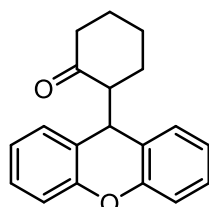


Following the General Procedure E, applying xanthene **12** and butyraldehyde **13**, the reaction was stirred for 16 h. Then, MeOH (1 mL) was then added to the reaction mixture, followed by portion-wise addition of NaBH₄ (18.5 mg, 0.5 mmol) at 0 °C. The reaction mixture was stirred at room temperature for 4 h and subsequently quenched with HCl (1 M). The organic phase was extracted three times with CH₂Cl₂, dried over Na₂SO₄ and concentrated under reduced pressure. The residue was suspended in the minimum amount of CH₂Cl₂ to follow the procedure to remove the CNDs. Purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **14a** as a colorless oil (3.3 mg, 0.013 mmol, 26% yield).

The characterization of the compound matches with the data reported in the literature.⁵

¹H NMR (400 MHz, CDCl₃): δ [ppm] 7.26 – 7.20 (m, 4H), 7.12 – 7.05 (m, 4H), 4.28 (d, *J*=4.3, 1H), 3.62 – 3.48 (m, 2H), 1.81 – 1.68 (m, 1H), 1.41 – 1.29 (m, 1H), 1.16 – 1.00 (m, 1H), 0.82 (t, *J*=7.4, 3H).

2-(9*H*-Xanthen-9-yl)cyclohexan-1-one, **14b**



Following the General Procedure E, applying xanthene **12** and cyclohexanone **1a**, the reaction was stirred for 16 h. Purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **14b** as a colorless oil (7.0 mg, 0.025 mmol, 50% yield).

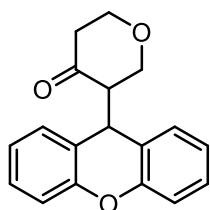
¹H NMR (400 MHz, CDCl₃): δ [ppm] 7.41 (d, *J*=7.6, 1H), 7.25 – 7.17 (m, 3H), 7.10 – 7.00 (m, 4H), 4.94 (d, *J*=3.2, 1H), 2.51 (dddd, *J*=12.9, 5.7, 3.2, 1.2, 1H), 2.46 – 2.39 (m, 1H), 2.31 – 2.20 (m, 1H), 1.98 – 1.89 (m, 1H), 1.81 – 1.67 (m, 2H), 1.54 – 1.37 (m, 2H), 1.17 – 1.05 (m, 1H).

¹³C NMR (CDCl₃, 100 MHz): δ [ppm] 210.9, 153.5, 153.2, 130.6, 128.9, 127.9, 127.8, 125.7, 123.6, 123.4, 123.0, 116.4, 116.2, 60.8, 42.2, 36.8, 27.8, 26.8, 24.9.

HRMS (ESI+): *m/z* calcd. for [C₁₉H₁₈O₂+Na]⁺: 301.1199, found 301.1197.

⁵ E. Larionov, M. M. Mastandrea, M. A. Pericàs *ACS Catal.* **2017**, *7*, 7008.

3-(9H-xanthen-9-yl)tetrahydro-4H-pyran-4-one, **14c**



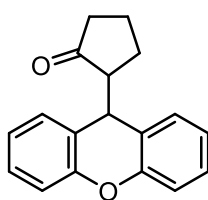
Following the General Procedure E, applying xanthene **12**, tetrahydro-4H-pyran-4-one **1b** and (**S**)-CNDs (38 mg), the reaction was stirred for 22h. Purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **14c** as a colorless oil (8.0 mg, 0.029 mmol, 57% yield).

¹H NMR (500 MHz, CDCl₃): δ [ppm] 7.40 – 7.37 (m, 1H), 7.26 – 7.20 (m, 3H), 7.12 – 7.02 (m, 4H), 4.93 (d, *J*=4.0, 1H), 4.11 – 4.04 (m, 1H), 3.89 (ddd, *J*=11.6, 6.2, 1.5, 1H), 3.57 (td, *J*=11.1, 3.6, 1H), 3.23 (dd, *J*=11.5, 10.1, 1H), 2.79 – 2.74 (m, 1H), 2.57 (dddd, *J*=15.0, 10.9, 6.9, 1.3, 1H), 2.45 (ddd, *J*=15.0, 3.6, 2.8, 1H).

¹³C NMR (CDCl₃, 125 MHz): δ [ppm] 206.4, 153.3, 153.0, 130.3, 128.6, 128.3, 128.2, 124.5, 123.9, 123.6, 122.1, 116.7, 116.6, 68.8, 68.0, 60.4, 42.5, 35.1.

HRMS (ESI+): *m/z* calcd. for [C₁₈H₁₆O₃+Na]⁺: 303.0992 ; found 303.0994.

2-(9H-xanthen-9-yl)cyclopentan-1-one, **14d**



Following the General Procedure E, applying xanthene **12** and cyclopentanone **1e**, the reaction was stirred for 22h. Purification by FC on silica gel (5 to 10% EtOAc in cyclohexane) afforded **14d** as a colorless oil (5.0 mg, 0.019 mmol, 38% yield).

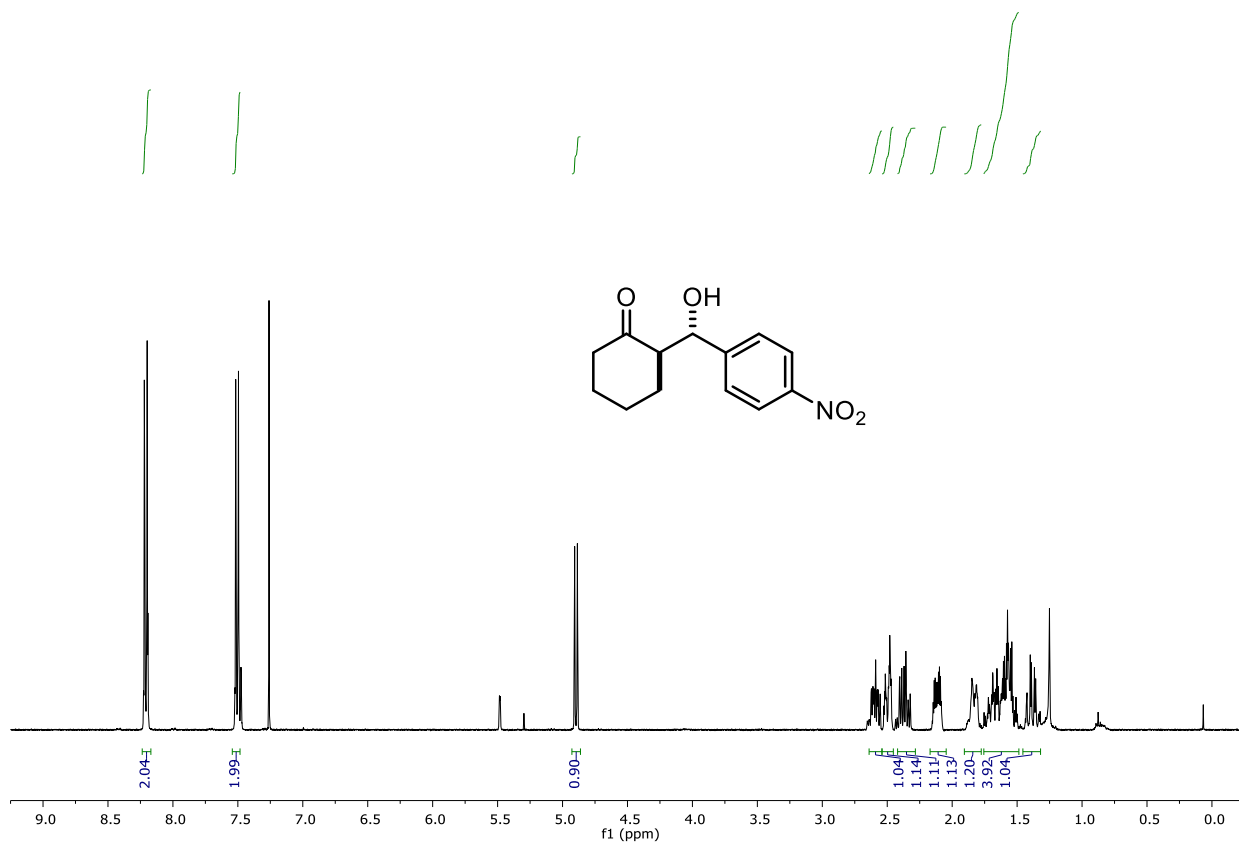
¹H NMR (500 MHz, CDCl₃): δ [ppm] = 7.26 – 7.19 (m, 3H), 7.13 – 7.07 (m, 4H), 6.99 (t, *J*=7.5, 1H), 4.77 (d, *J*=2.9, 1H), 2.48 – 2.42 (m, 1H), 2.30 – 2.22 (m, 1H), 1.82 – 1.75 (m, 2H), 1.68 – 1.61 (m, 1H), 1.59 – 1.51 (m, 1H), 1.46 – 1.36 (m, 1H).

¹³C NMR (CDCl₃, 125 MHz): δ [ppm] 219.3, 153.3, 152.6, 129.3, 128.33, 128.31, 127.9, 124.6, 123.8, 123.6, 122.0, 116.54, 116.46, 60.0, 39.4, 38.1, 24.1, 20.5.

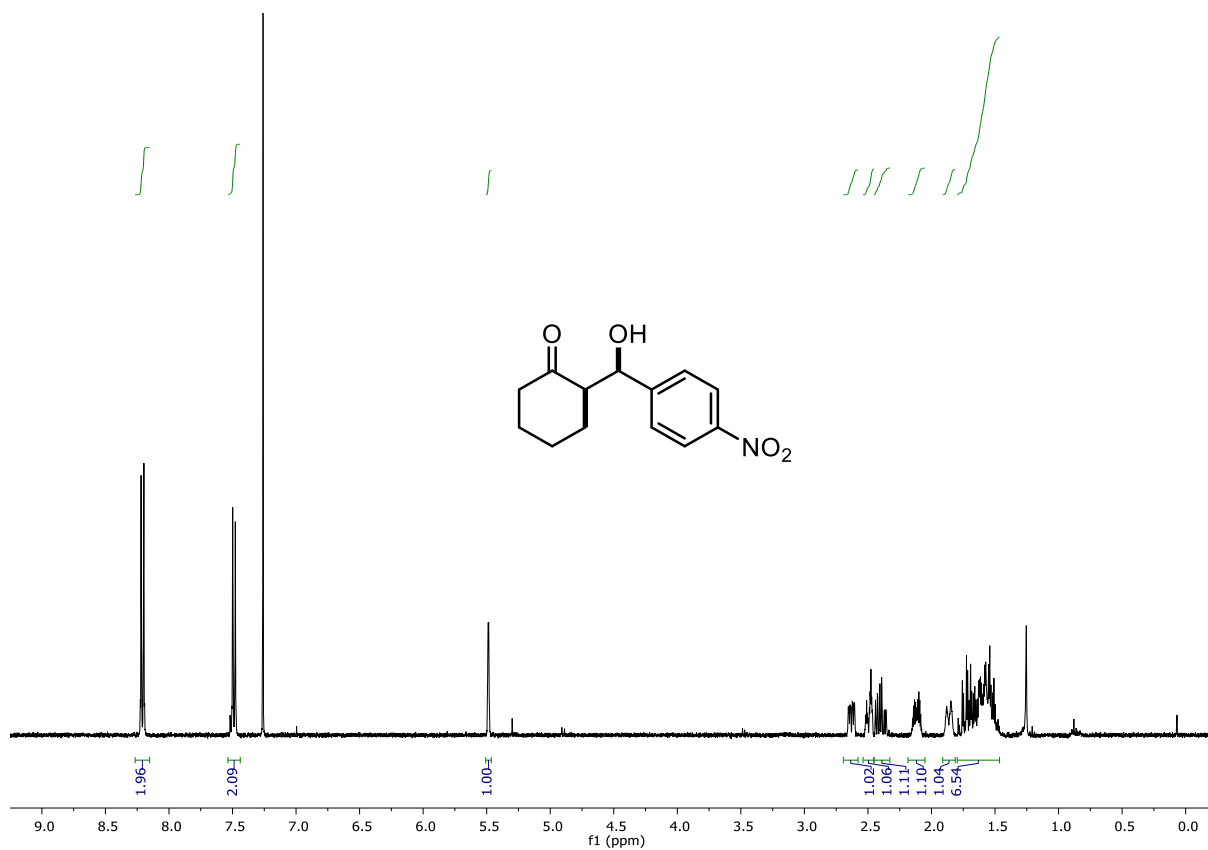
HRMS (ESI+): *m/z* calcd. for [C₁₈H₁₆O₂+Na]⁺: 287.1043, found 287.1044.

6. NMR Spectra

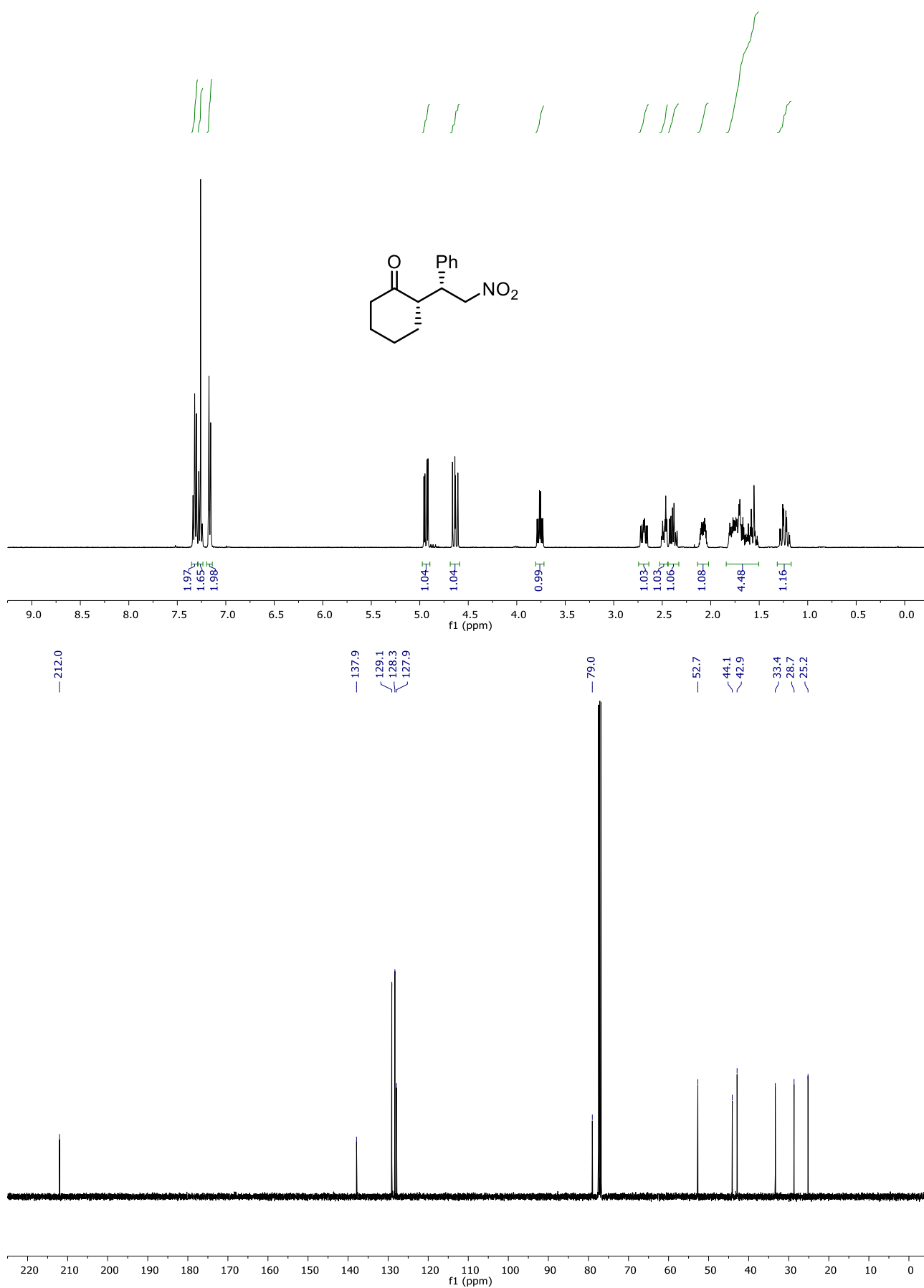
Anti-2-(hydroxy(4-nitrophenyl)methyl)cyclohexan-1-one, *anti*-3



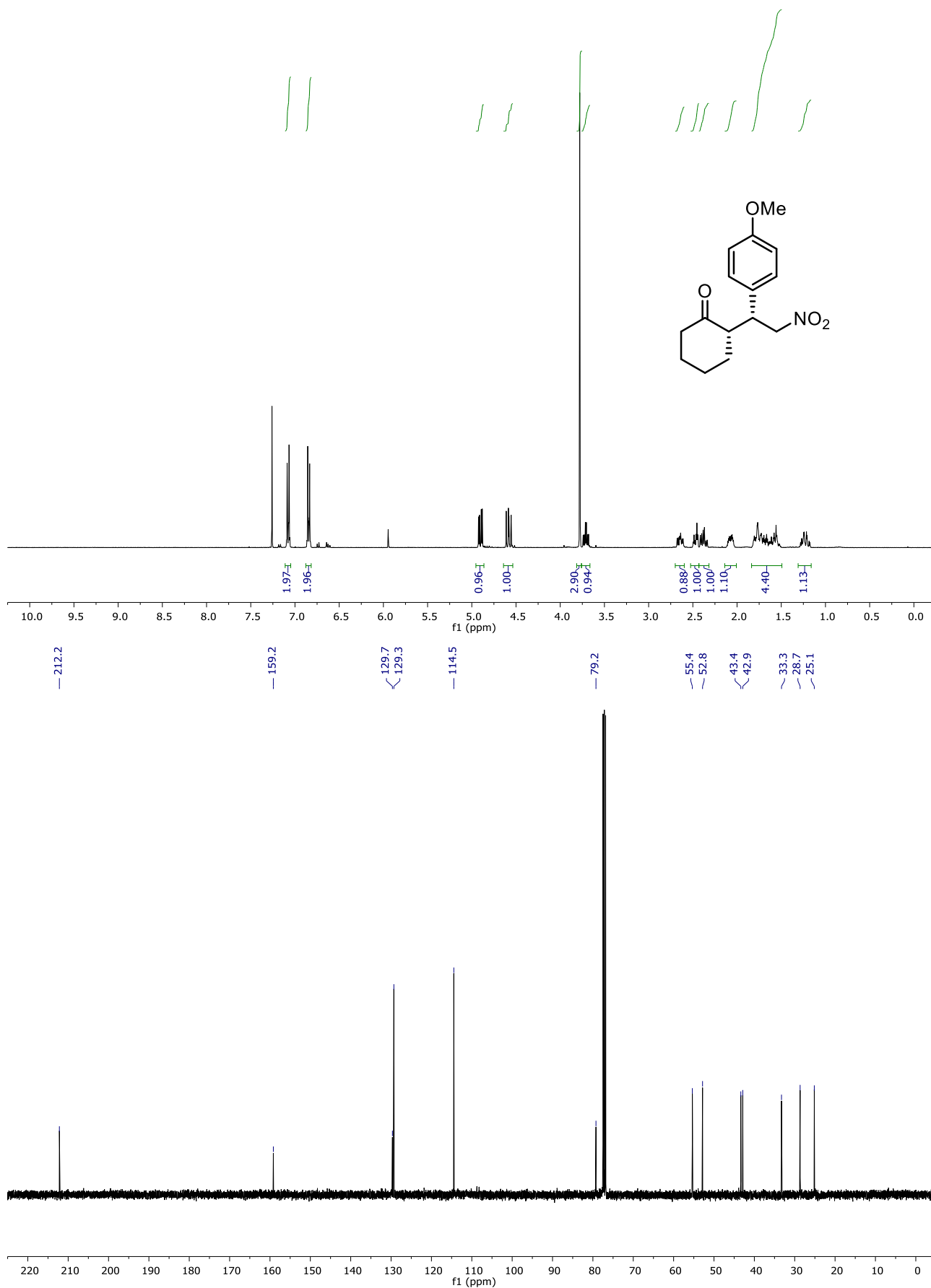
Syn-2-(hydroxy(4-nitrophenyl)methyl)cyclohexan-1-one, *syn*-3



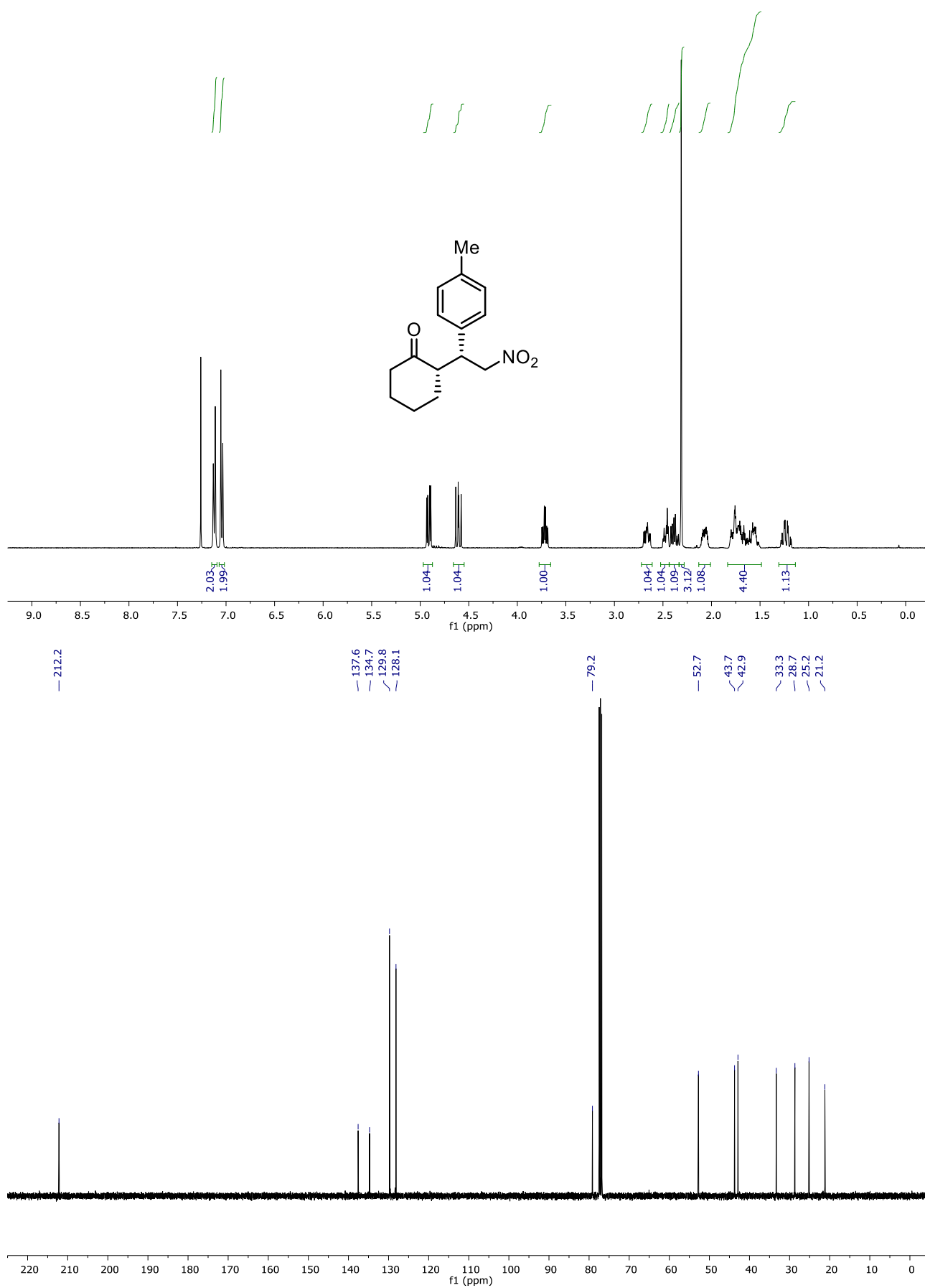
(S)-2-((R)-2-Nitro-1-phenylethyl)cyclohexan-1-one, 5a



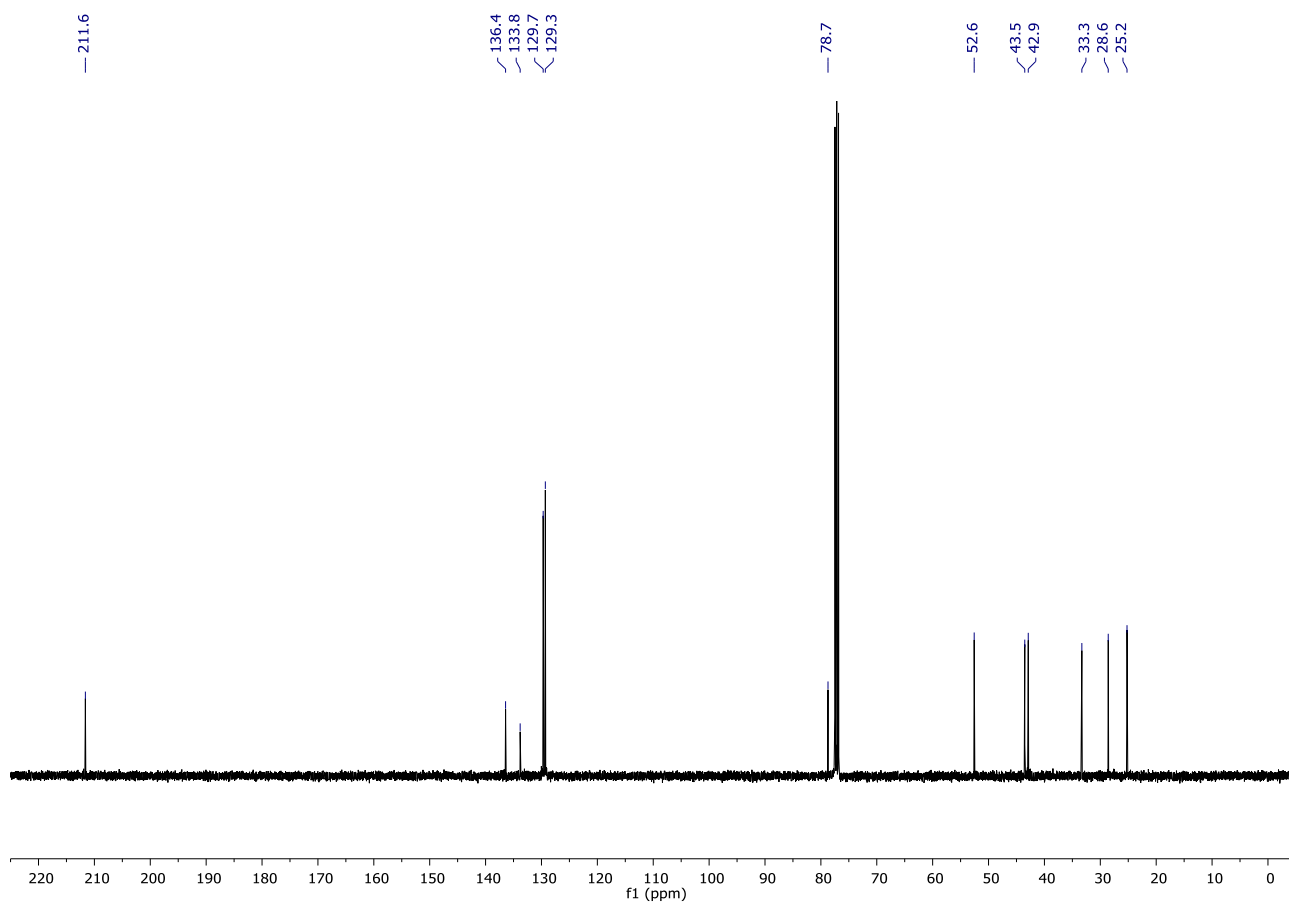
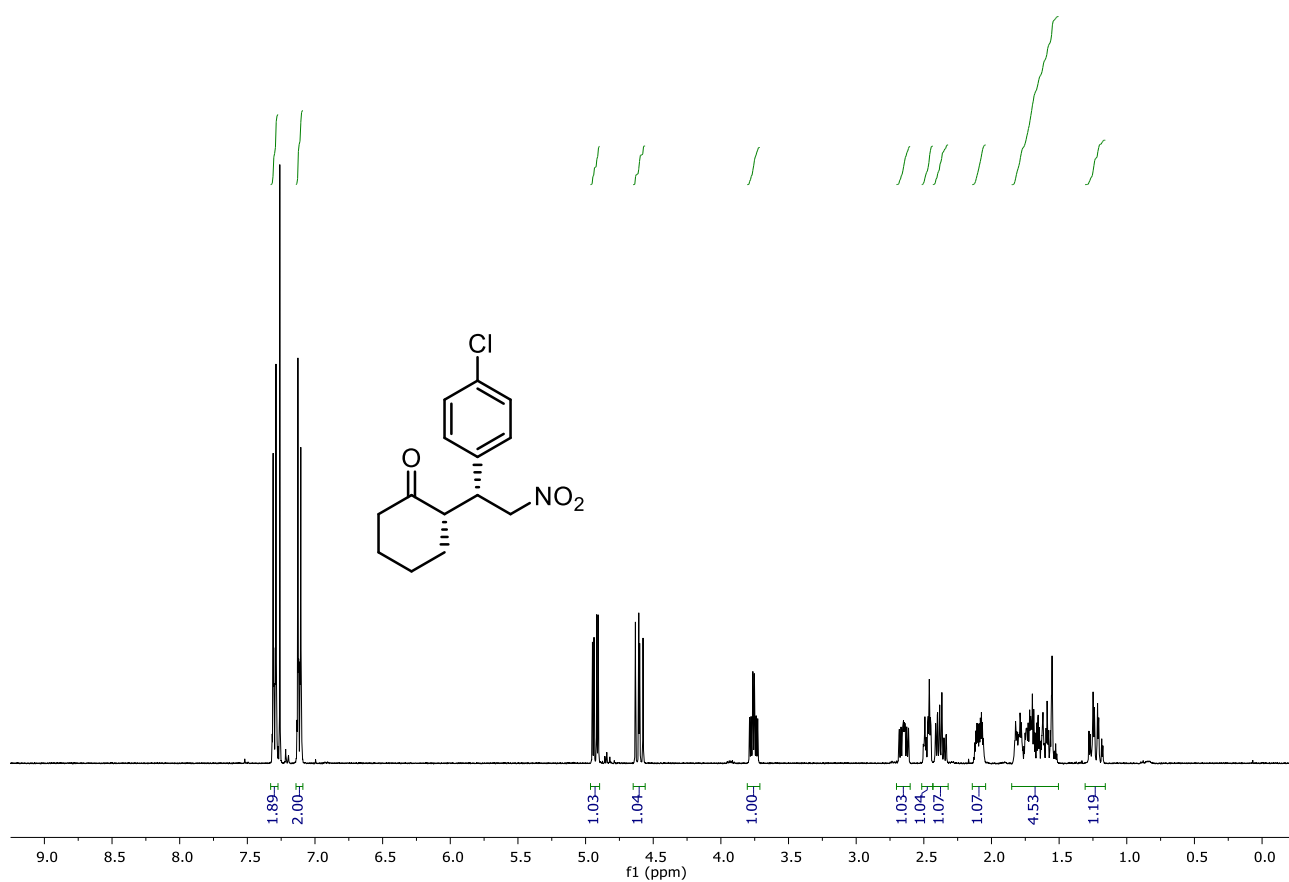
(S)-2-((R)-1-(4-methoxyphenyl)-2-nitroethyl)cyclohexan-1-one, 5b



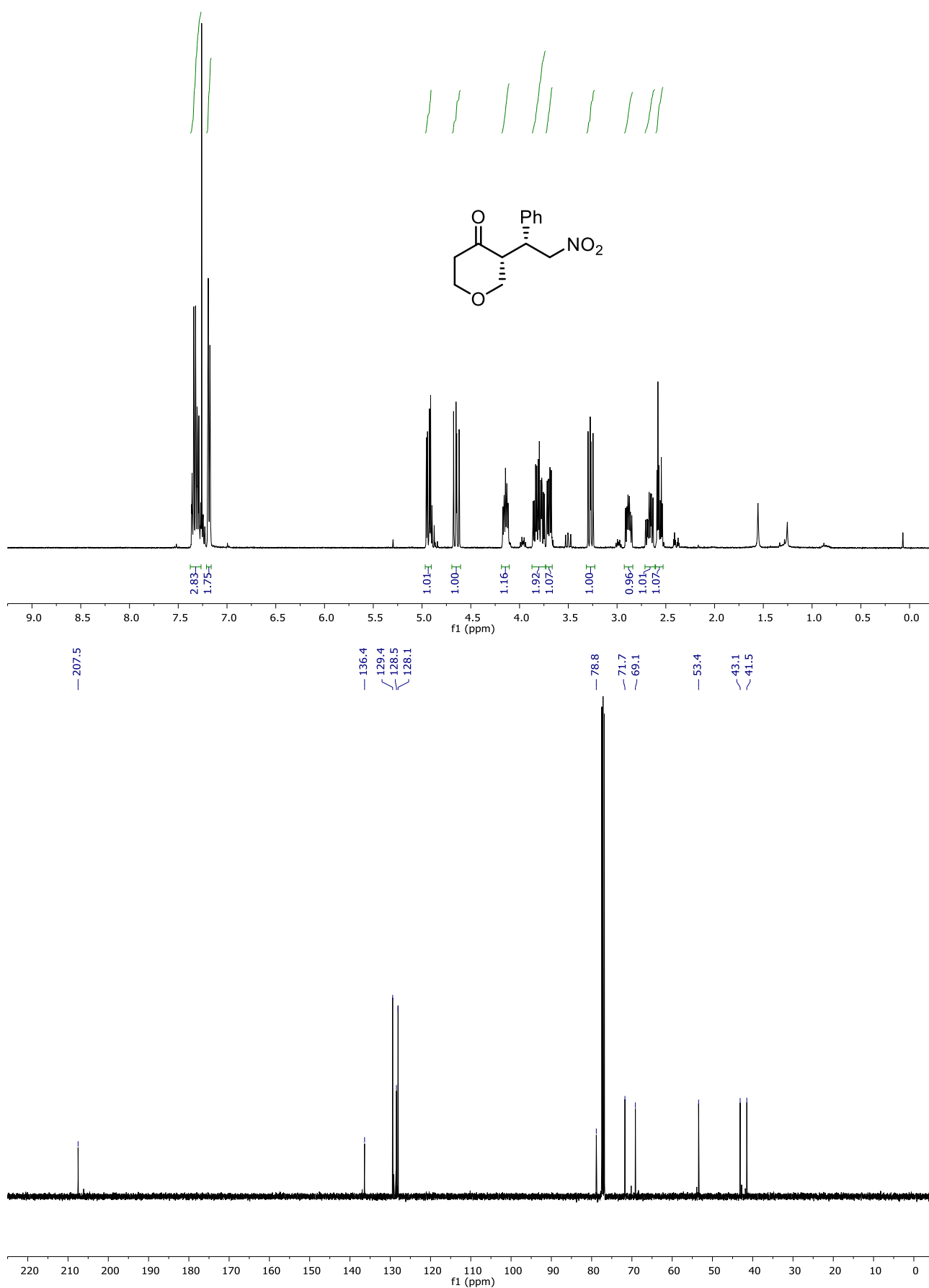
(S)-2-((R)-2-nitro-1-(p-tolyl)ethyl)cyclohexan-1-one, 5c



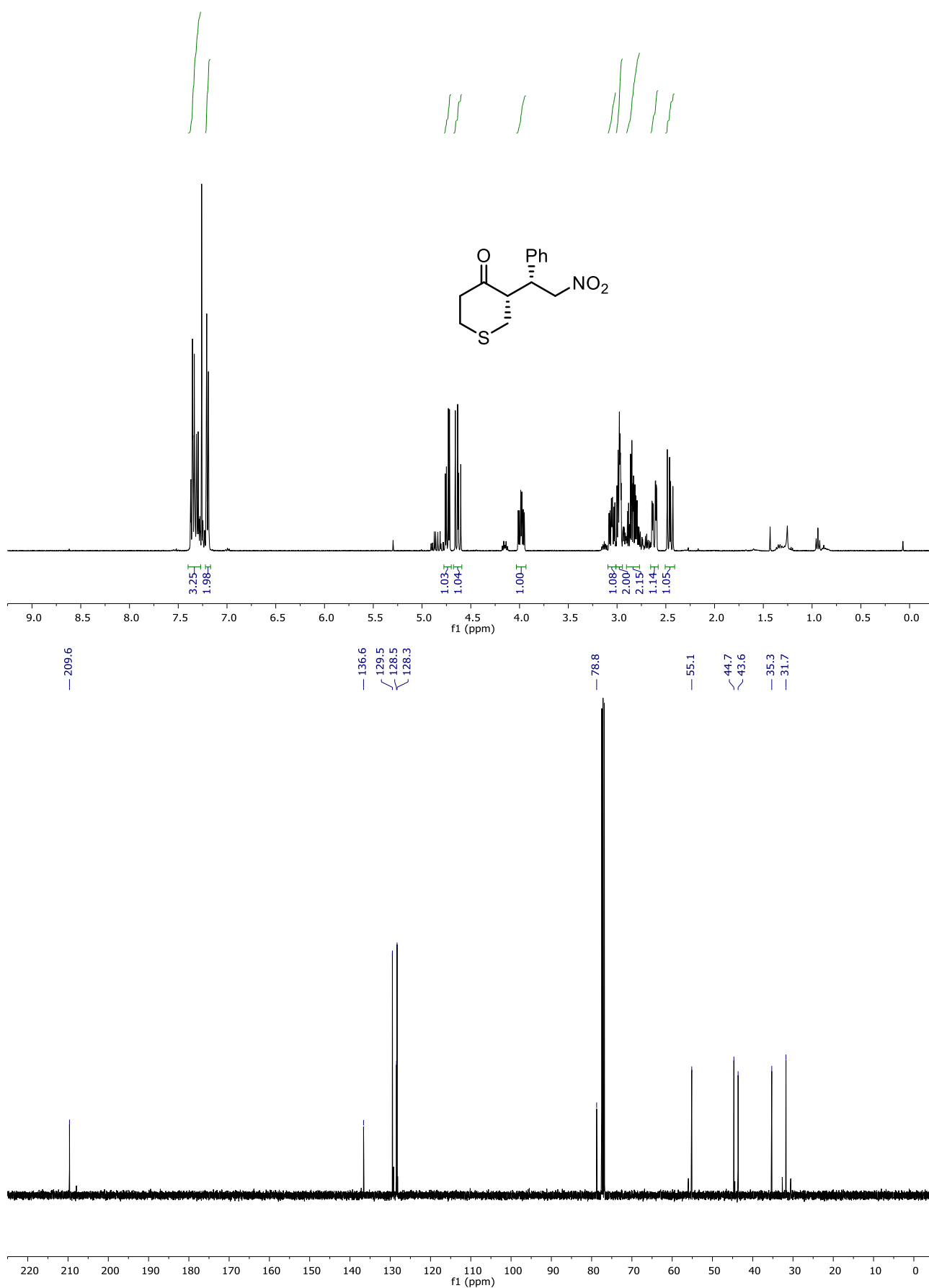
(S)-2-((R)-1-(4-chlorophenyl)-2-nitroethyl)cyclohexan-1-one, 5d



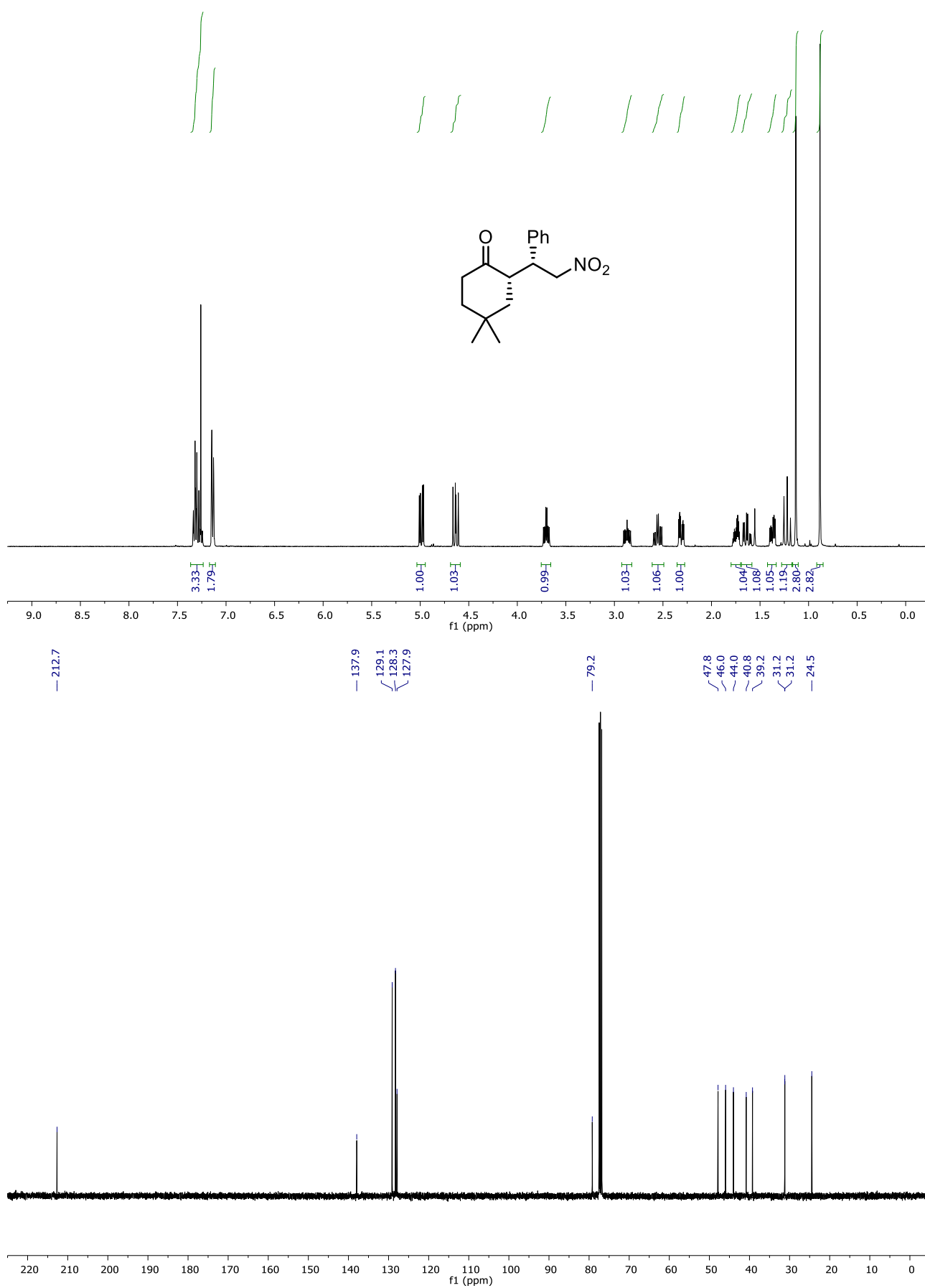
(R)-3-((R)-2-nitro-1-phenylethyl)tetrahydro-4H-pyran-4-one, 5e



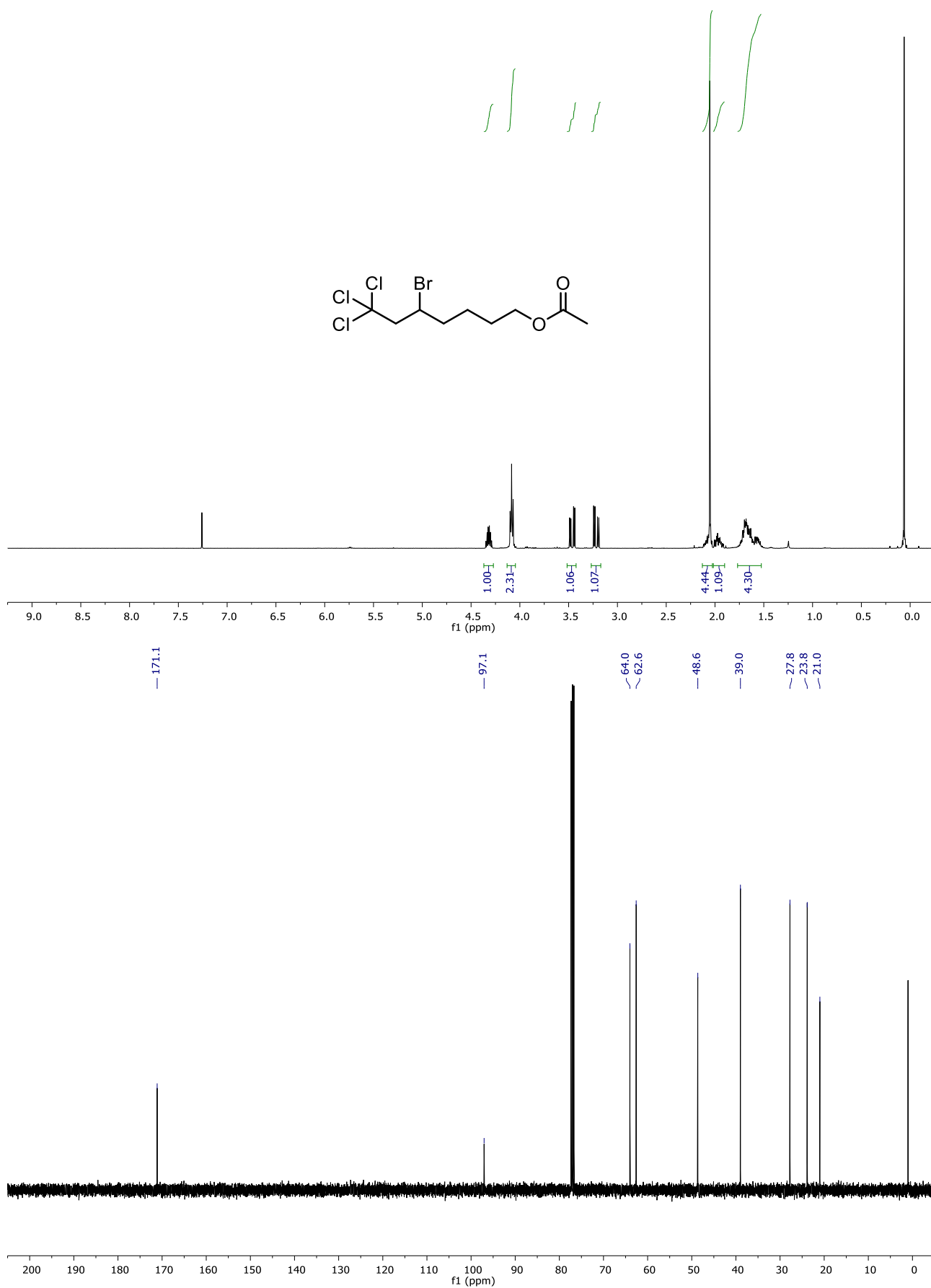
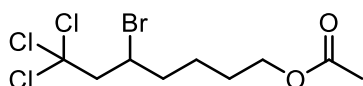
(R)-3-((R)-2-nitro-1-phenylethyl)tetrahydro-4H-pyran-4-one, 5f



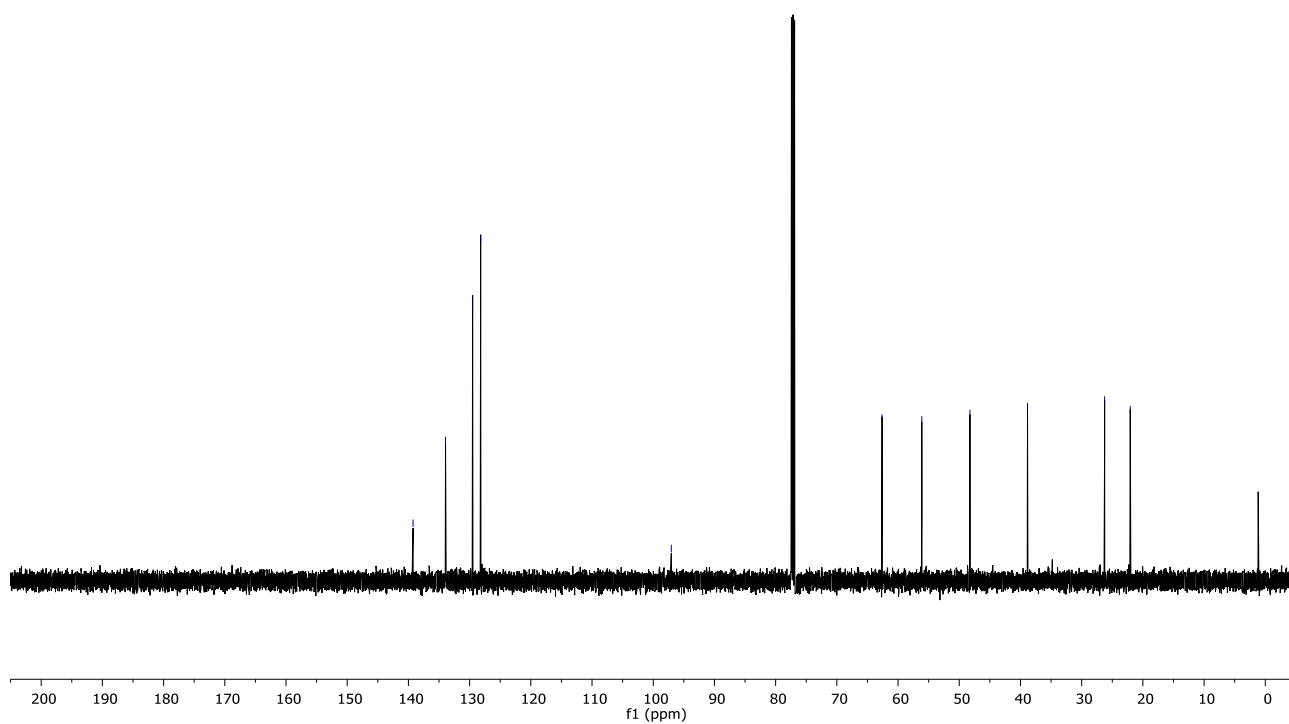
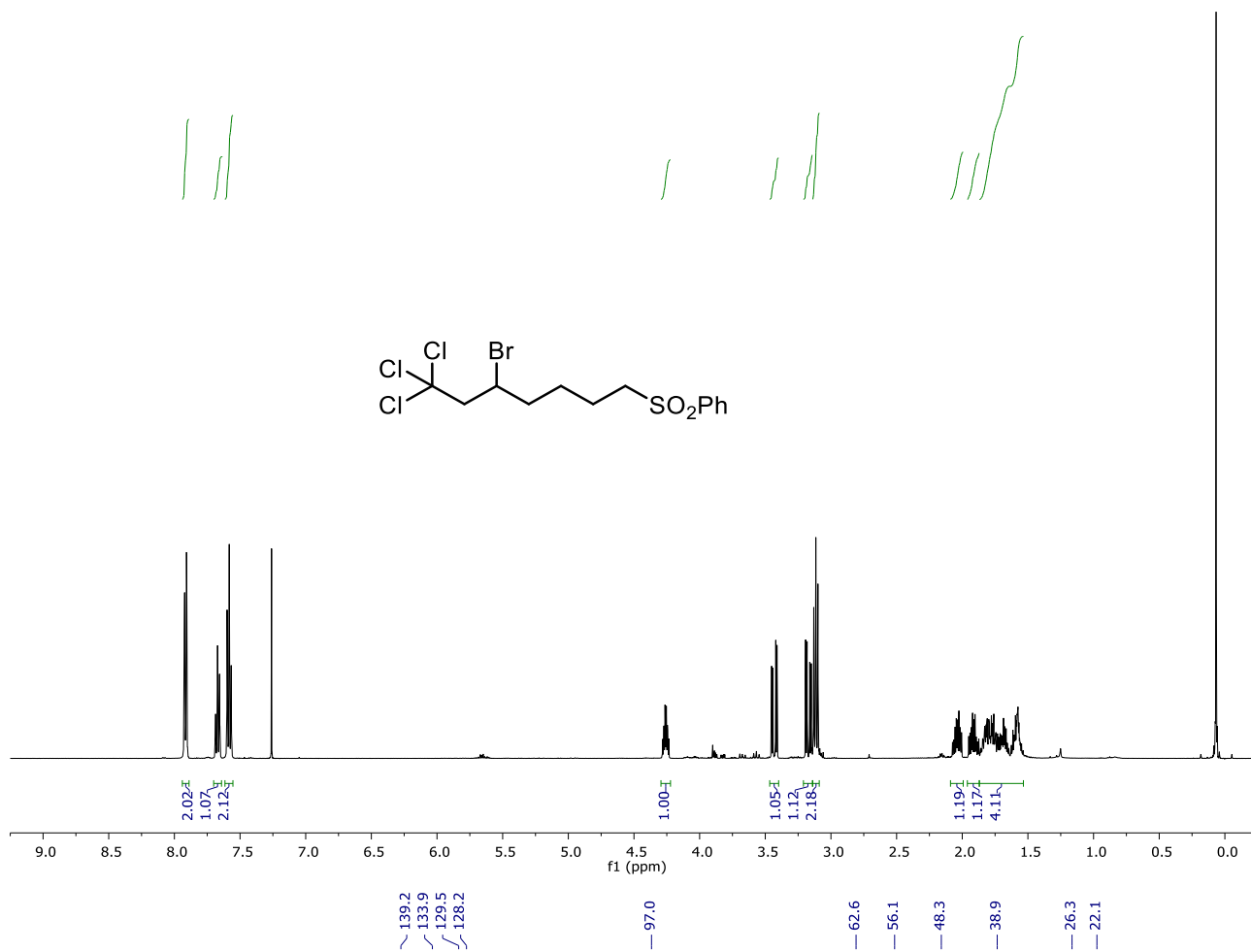
(S)-4,4-dimethyl-2-((R)-2-nitro-1-phenylethyl)cyclohexan-1-one, 5g



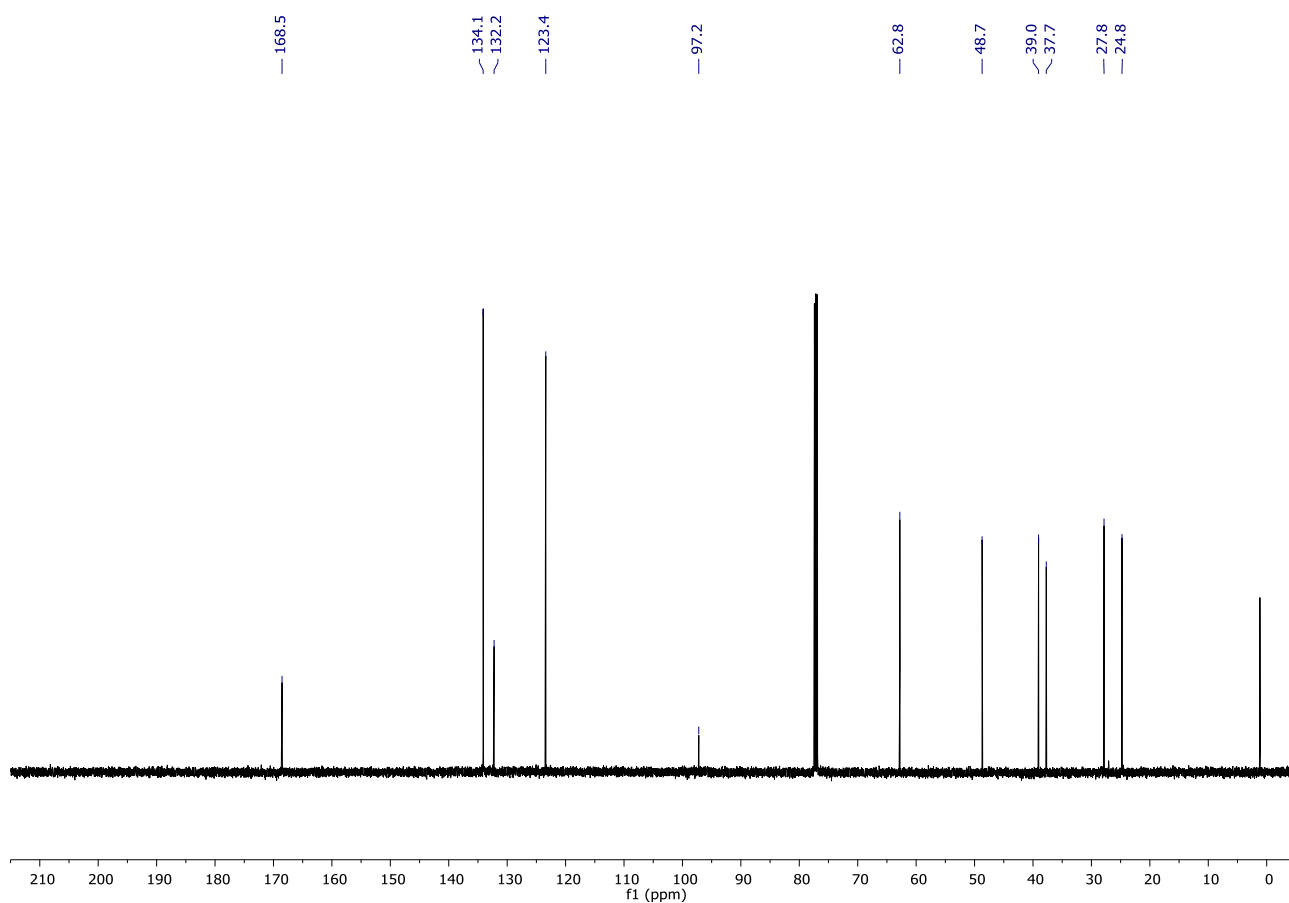
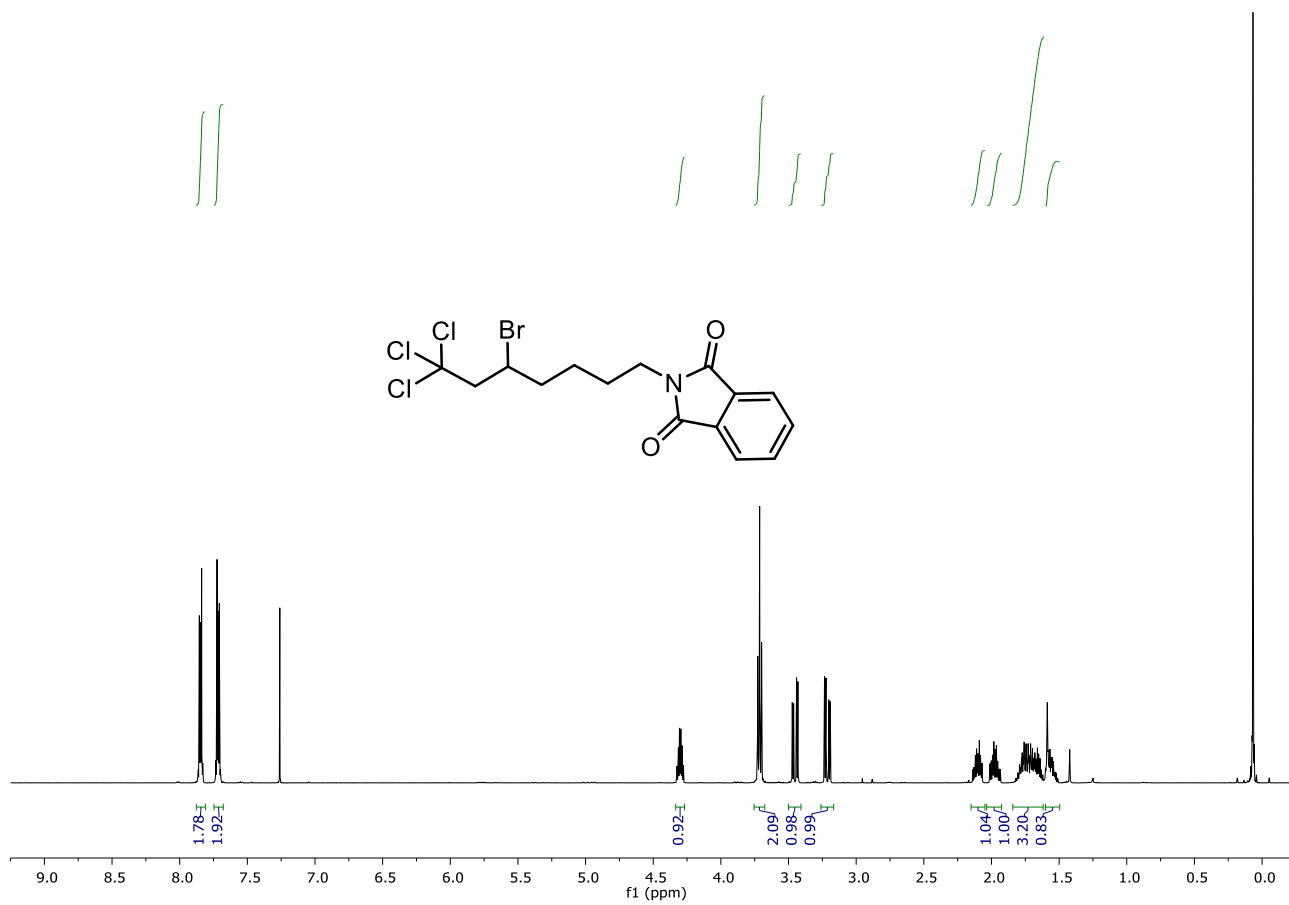
5-Bromo-7,7,7-trichloroheptyl acetate, 8a



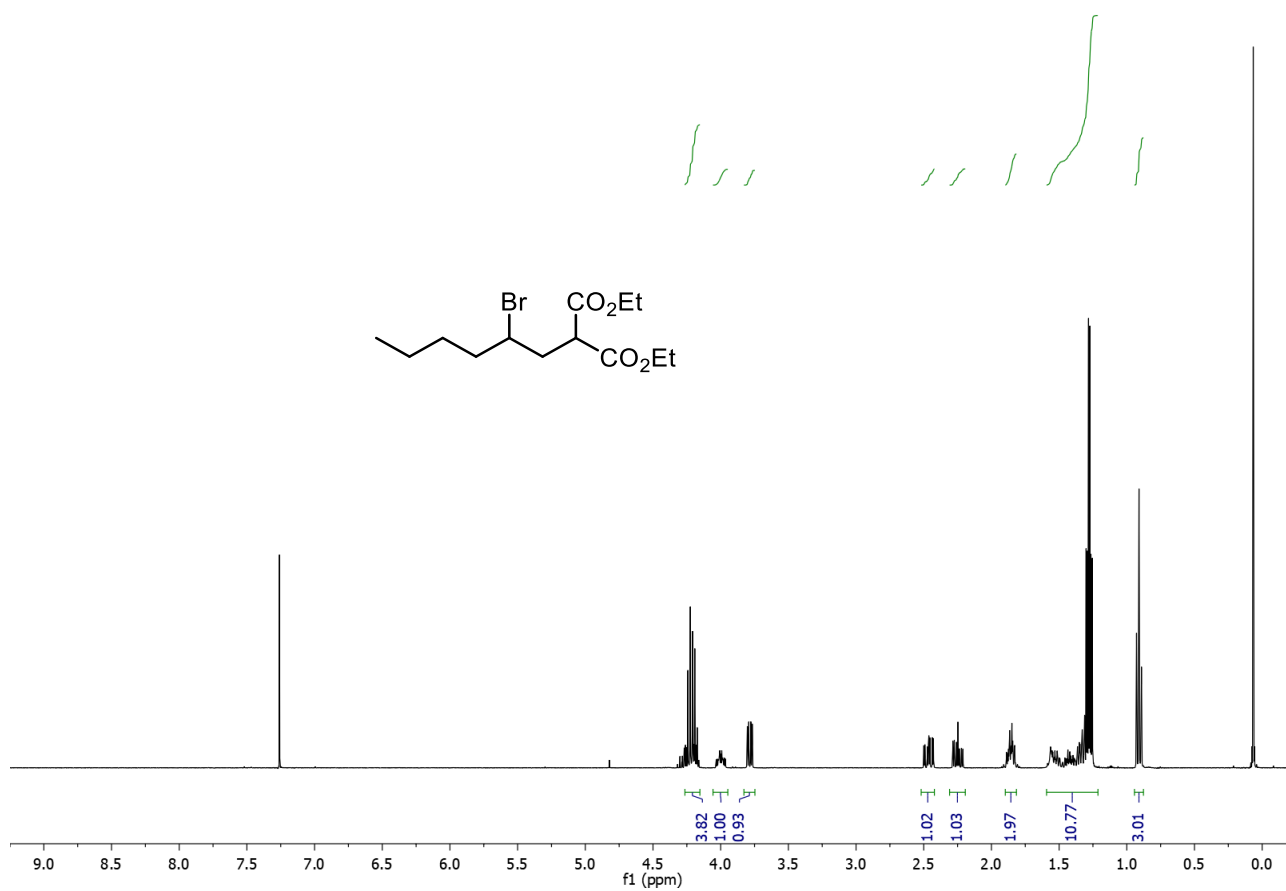
((5-Bromo-7,7,7-trichloroheptyl)sulfonyl)benzene, 8b



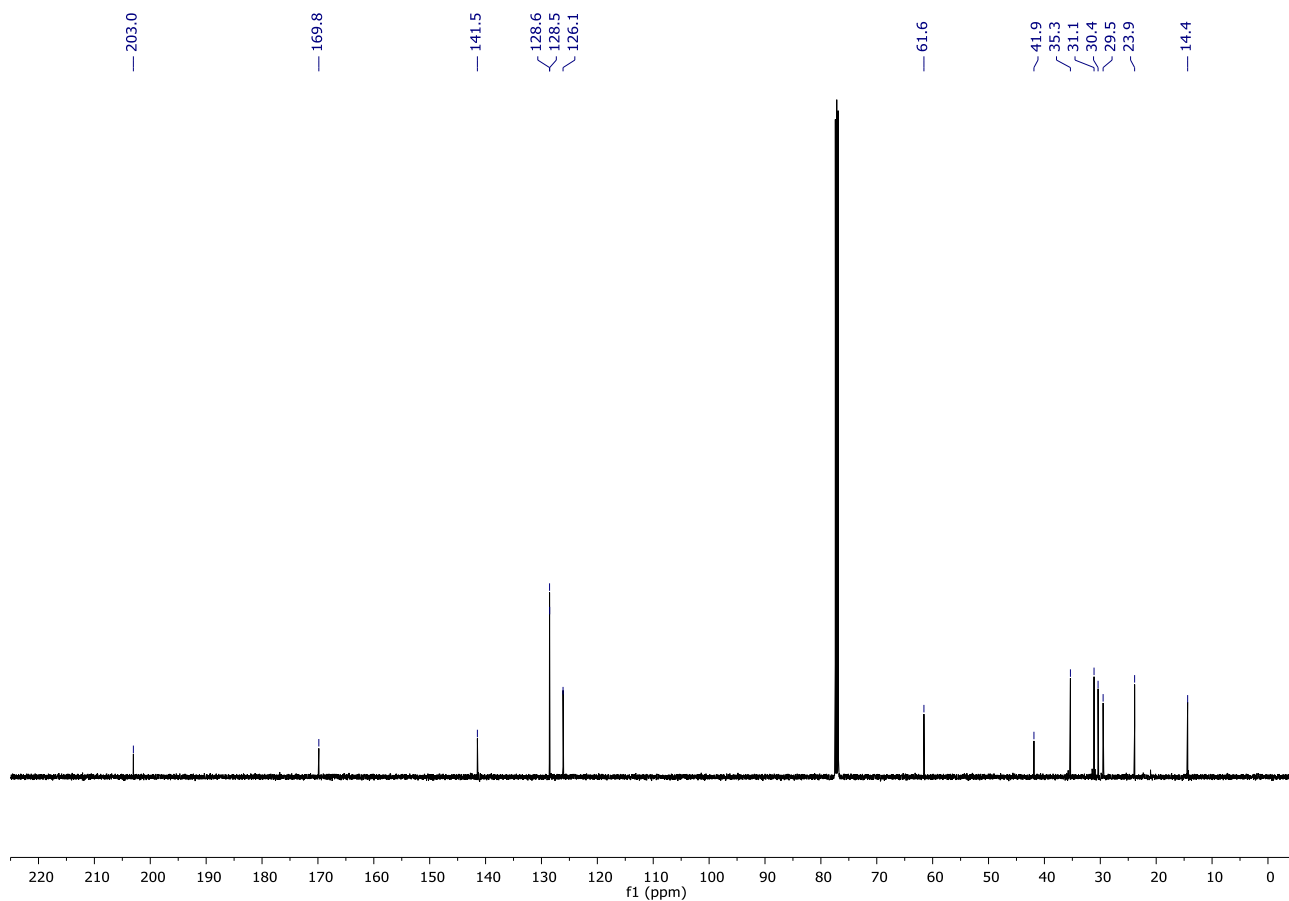
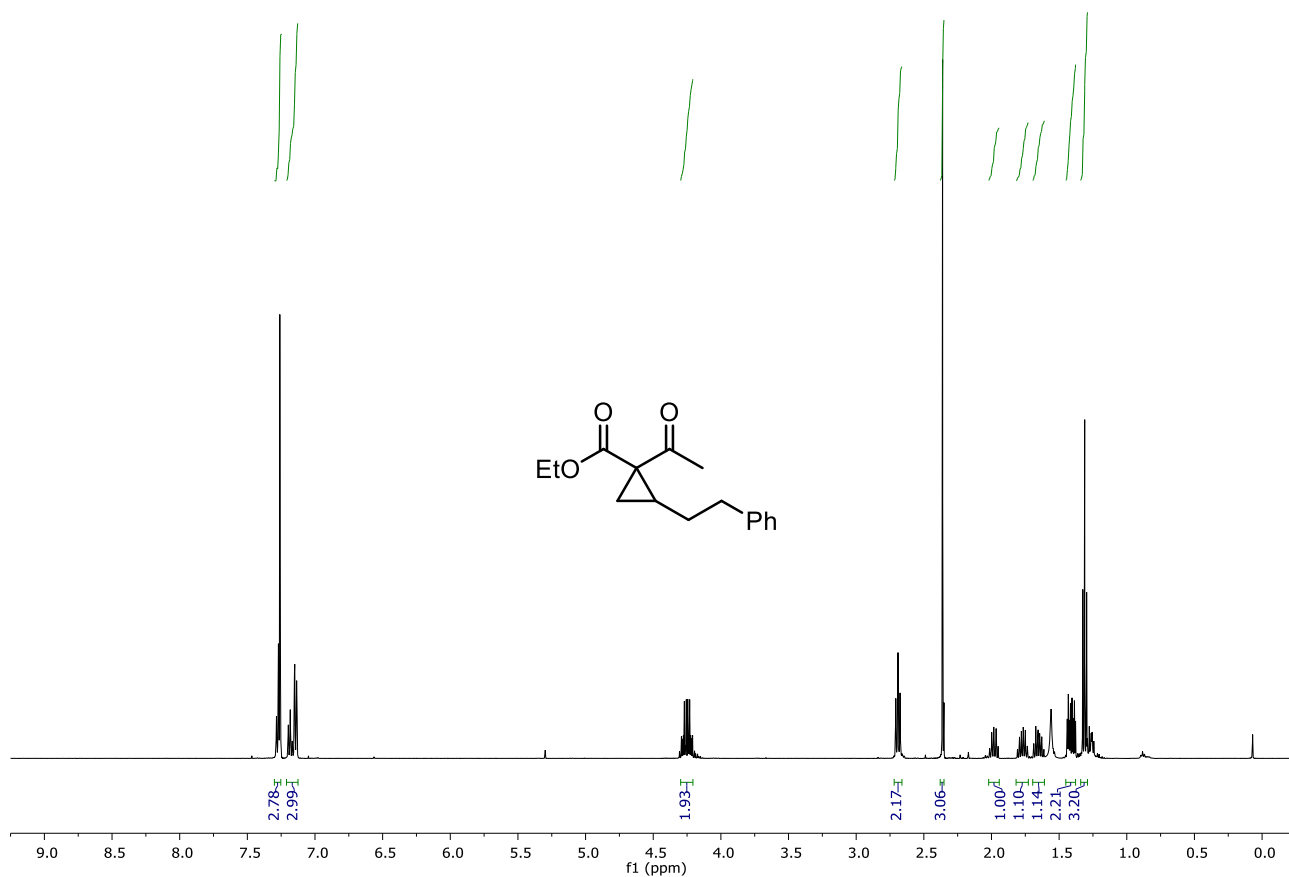
2-(5-Bromo-7,7,7-trichloroheptyl)isoindoline-1,3-dione, 8c



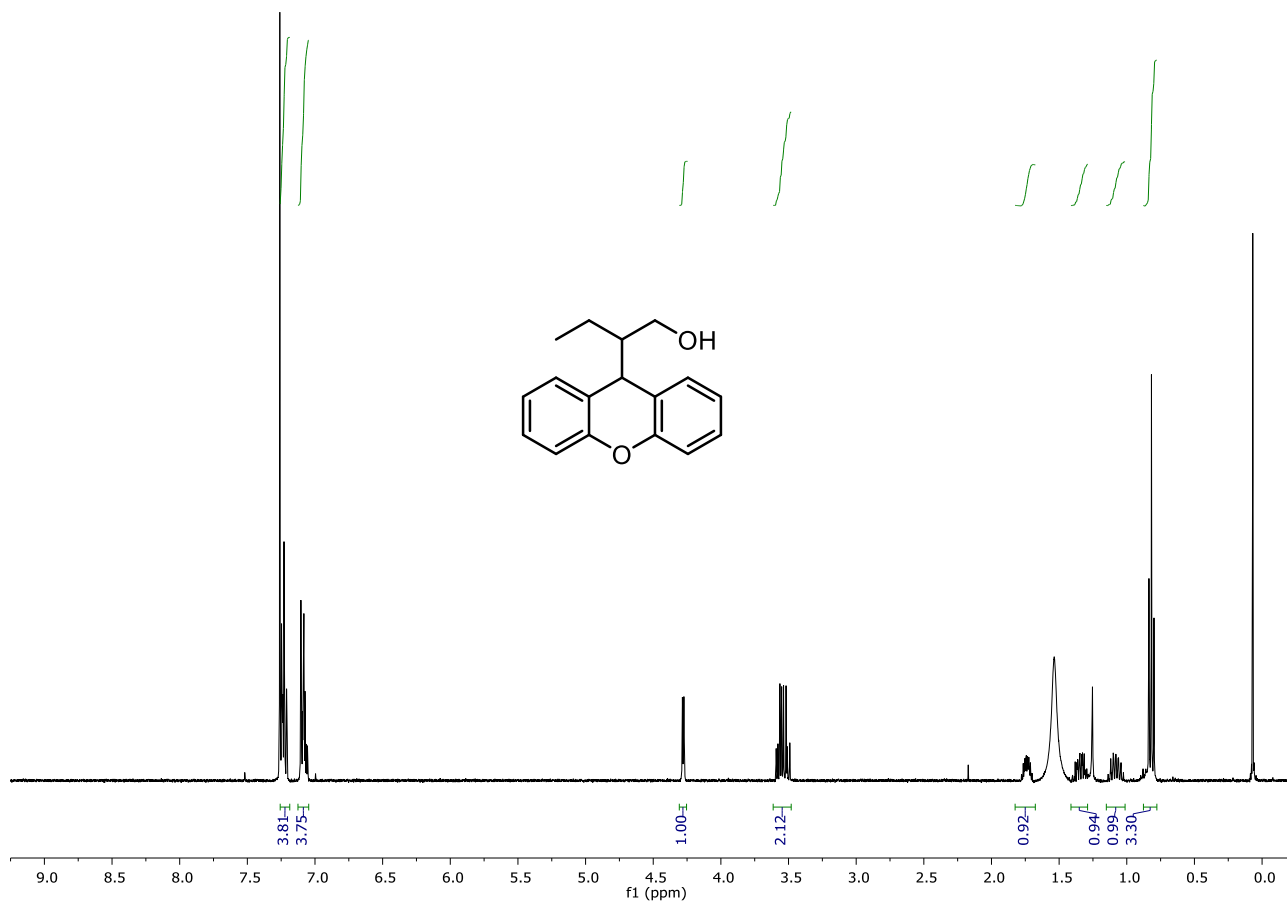
Diethyl 2-(2-bromohexyl)malonate, 8d



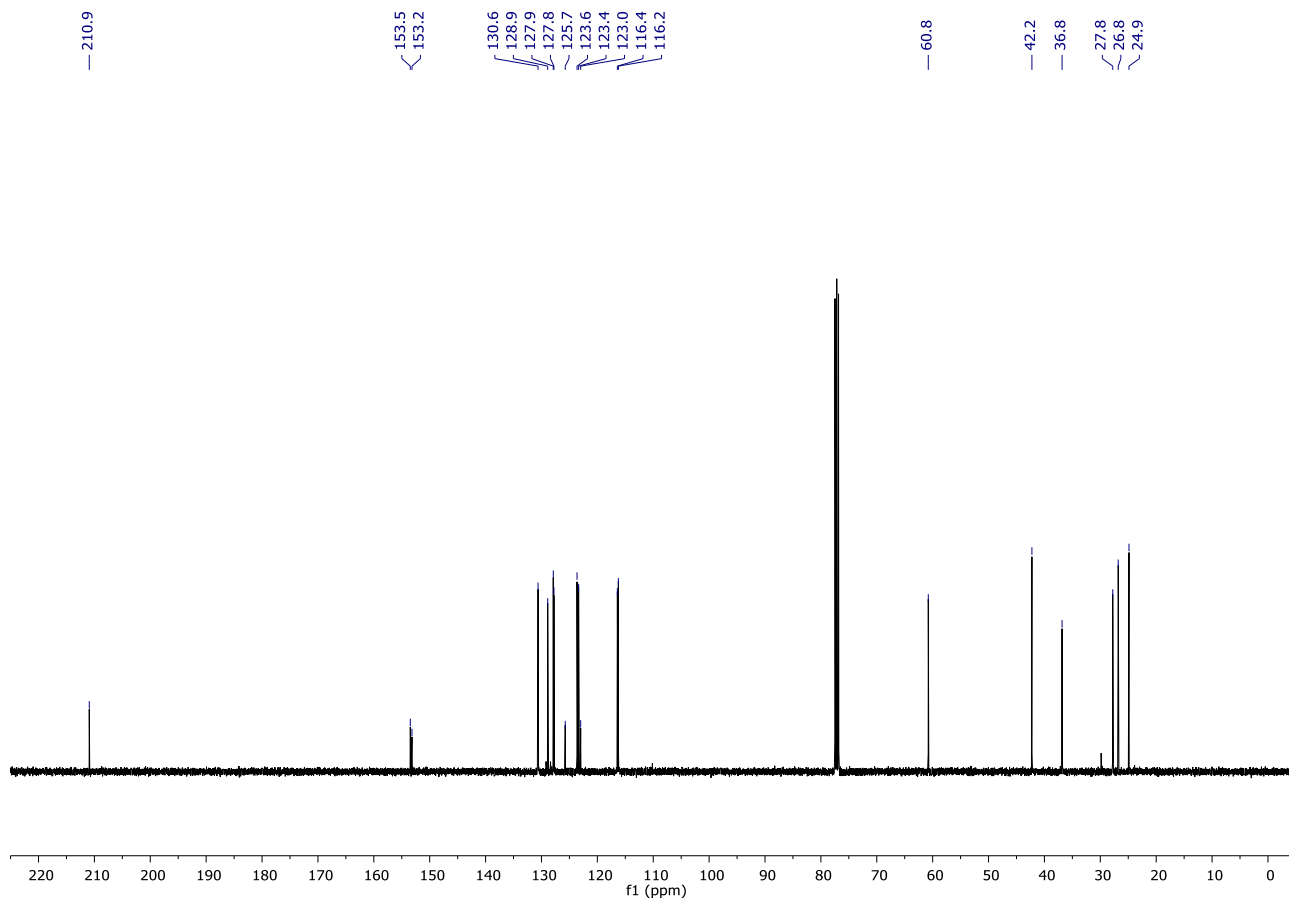
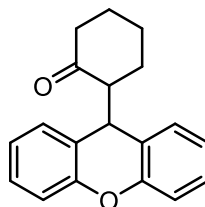
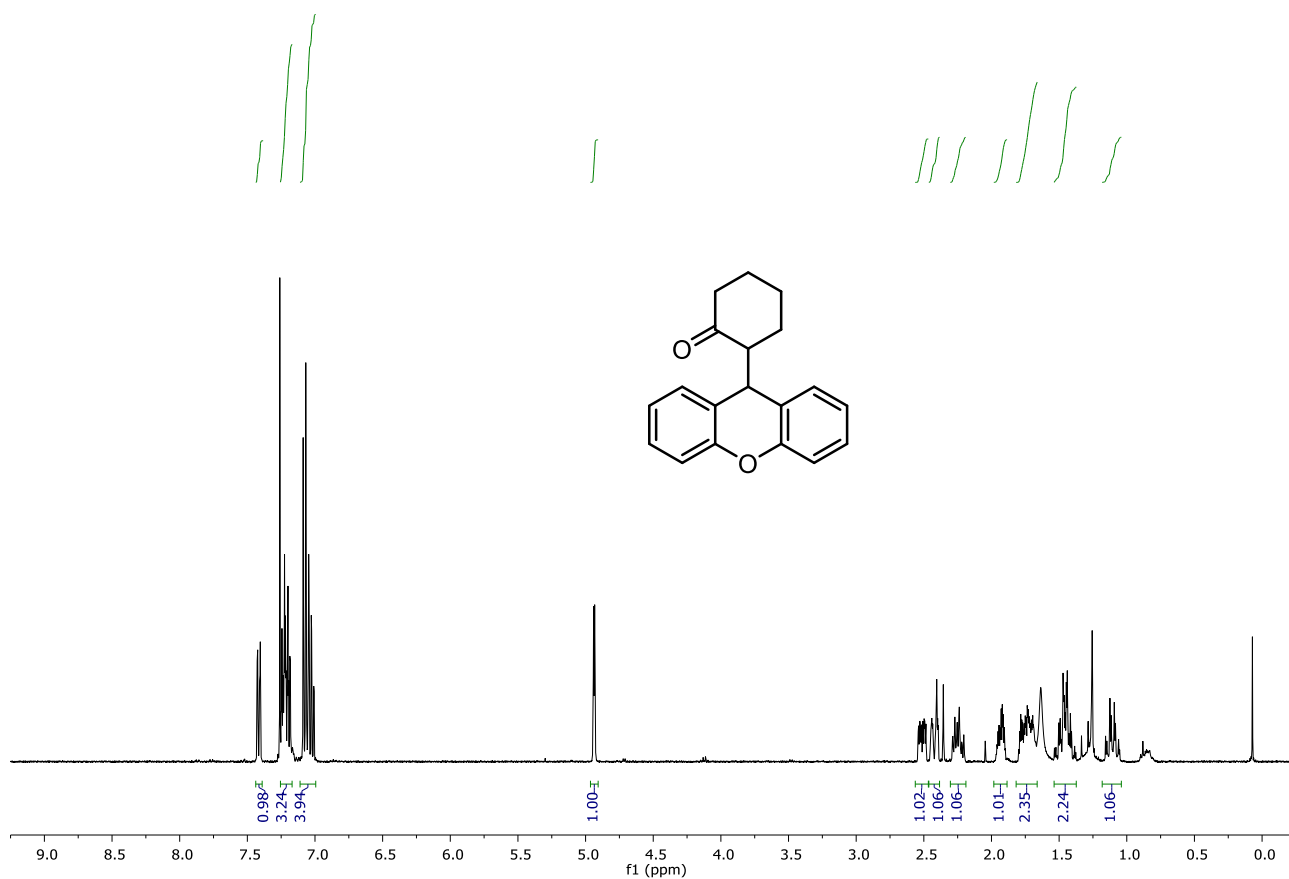
Ethyl 1-acetyl-2-phenethylcyclopropane-1-carboxylate, 11



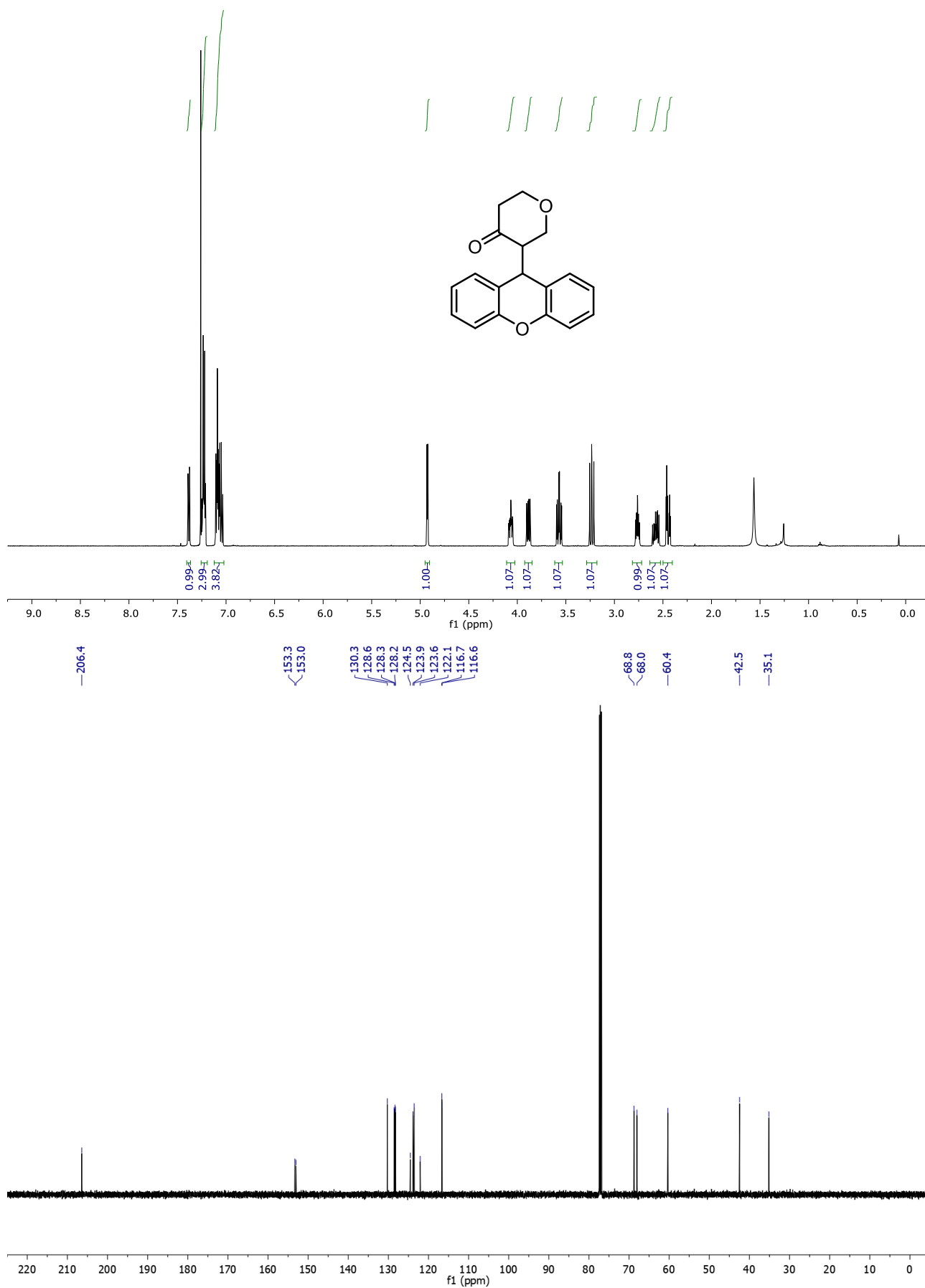
2-(9H-Xanthen-9-yl)butan-1-ol, 14a



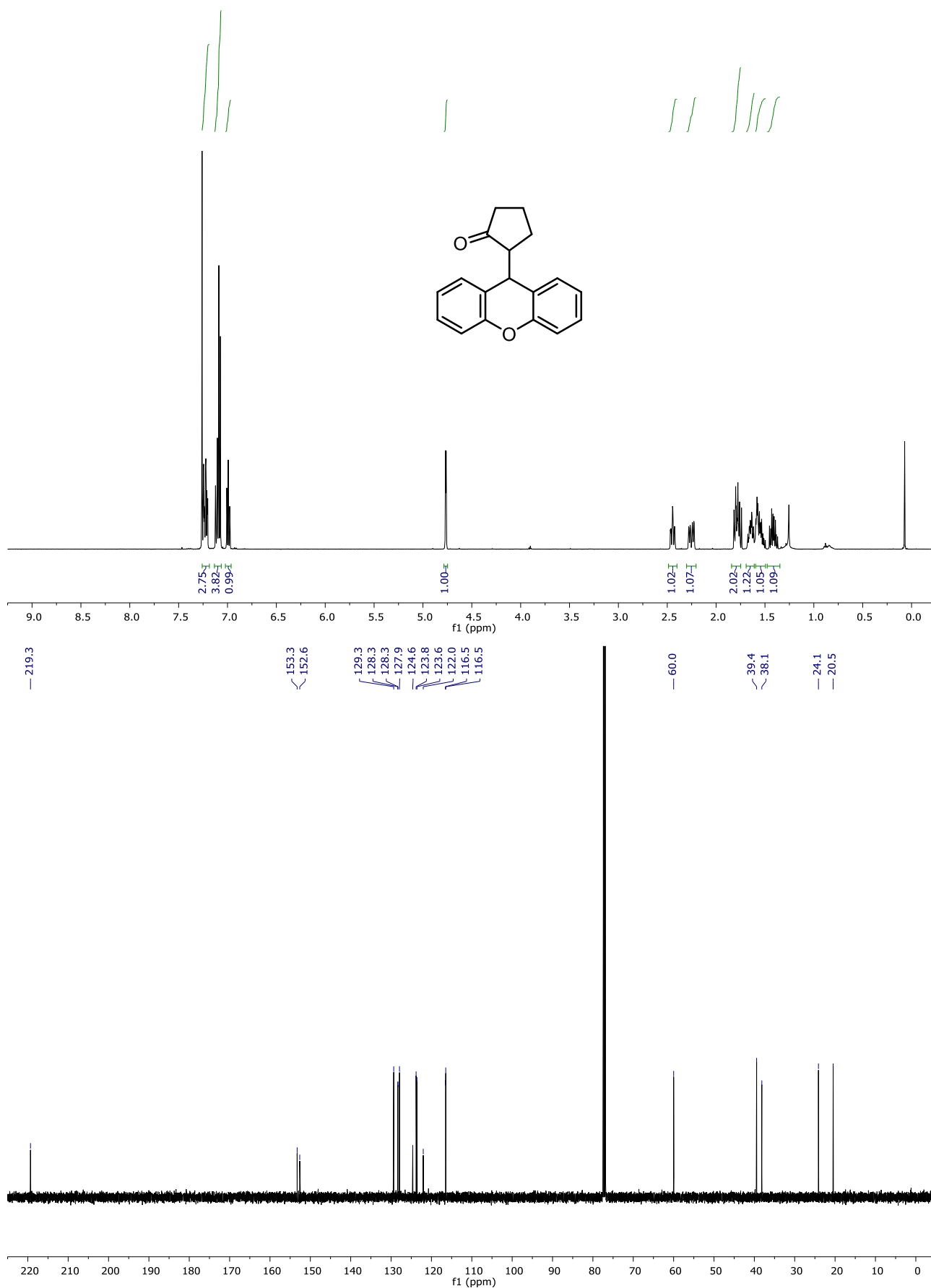
2-(9H-Xanthen-9-yl)cyclohexan-1-one, 14b



3-(9H-Xanthen-9-yl)tetrahydro-4H-pyran-4-one, 14c

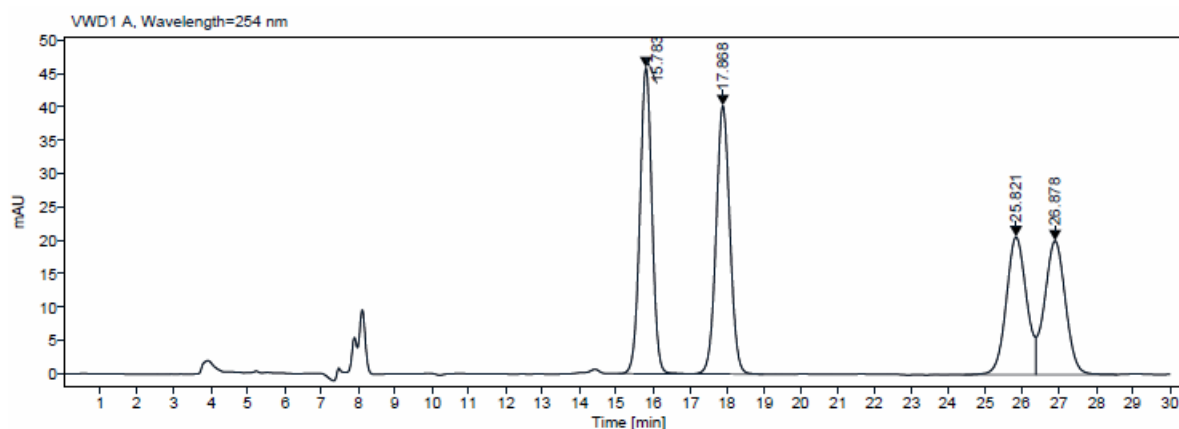


2-(9H-Xanthen-9-yl)cyclopentan-1-one, 14d



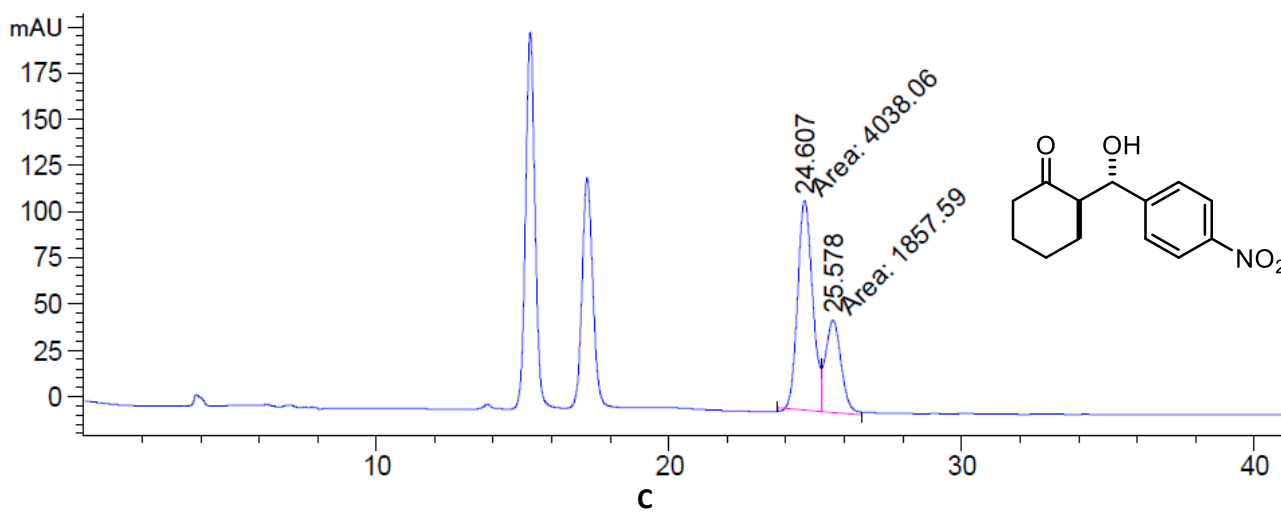
7. HPLC chromatograms

Anti-2-(hydroxy(4-nitrophenyl)methyl)cyclohexan-1-one, *anti*-3



Signal: VWD1 A, Wavelength=254 nm

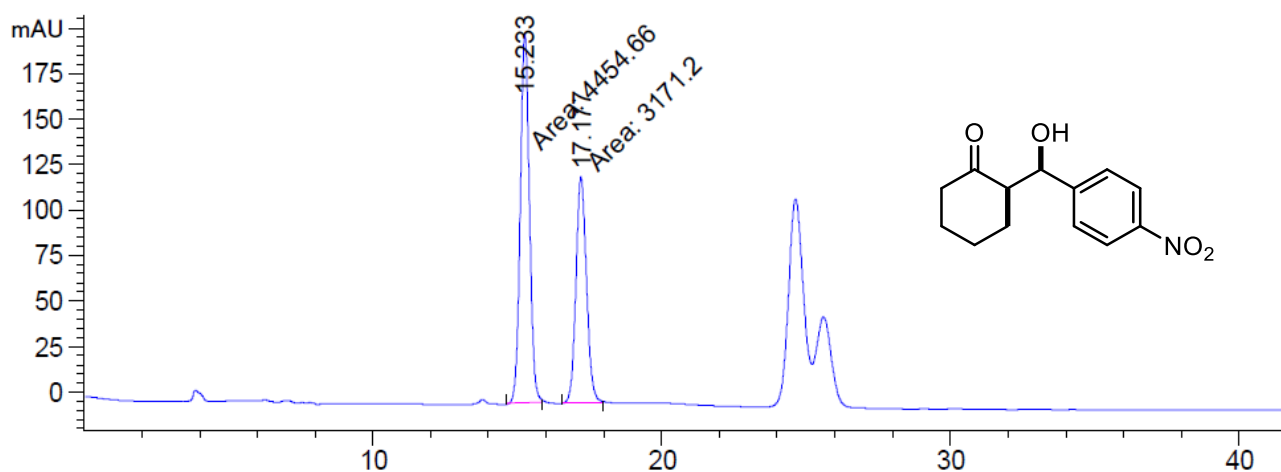
RT [min]	Type	Width [min]	Area	Height	Area%
15.783	BB	0.3509	1044.0654	45.9867	28.4197
17.868	BB	0.4012	1047.5201	40.3084	28.5137
25.821	BV	0.5872	789.3483	20.6840	21.4862
26.878	VB	0.6046	792.8077	20.0793	21.5804
Sum			3673.7416		



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	24.607	MF	0.5936	4038.06226	113.38090	68.4923
2	25.578	FM	0.6208	1857.58582	49.87144	31.5077

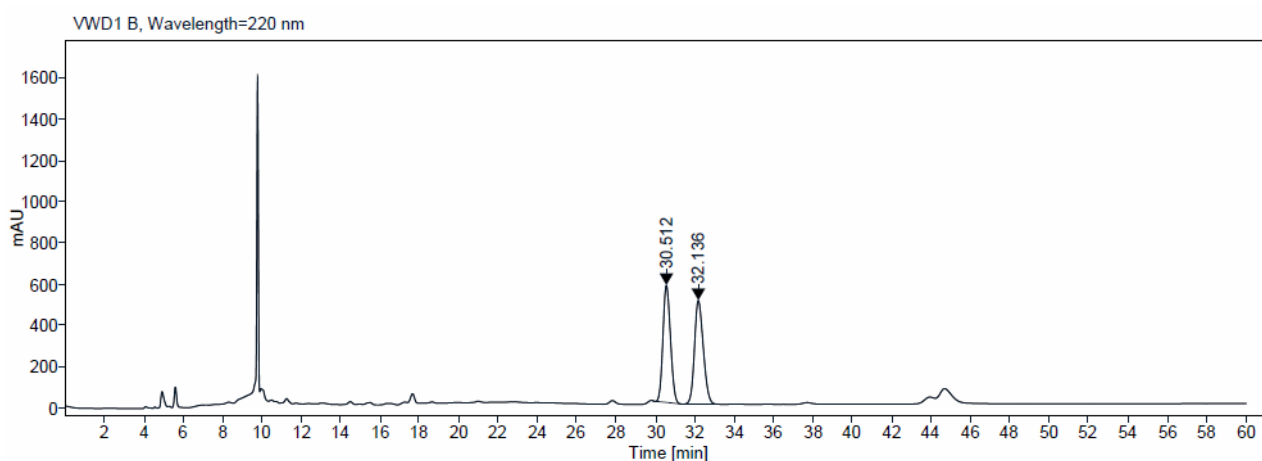
Totals : 5895.64807 163.25233

Syn-2-(hydroxy(4-nitrophenyl)methyl)cyclohexan-1-one, syn-3



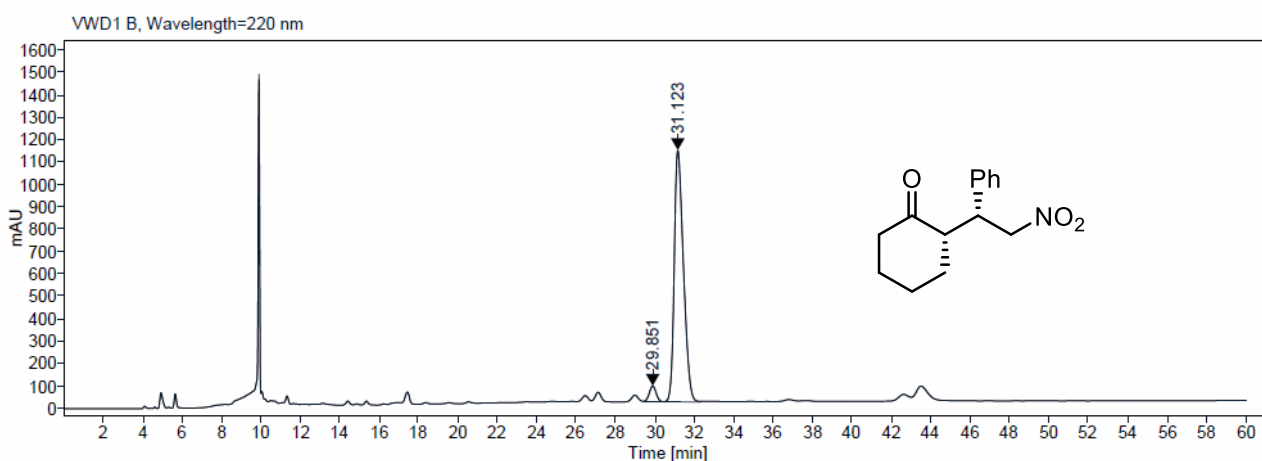
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.233	MM	0.3666	4454.65869	202.53972	58.4152
2	17.177	MM	0.4239	3171.19604	124.69632	41.5848
Totals :				7625.85474	327.23604	

(S)-2-((R)-2-Nitro-1-phenylethyl)cyclohexan-1-one, 5a



Signal: VWD1 B, Wavelength=220 nm

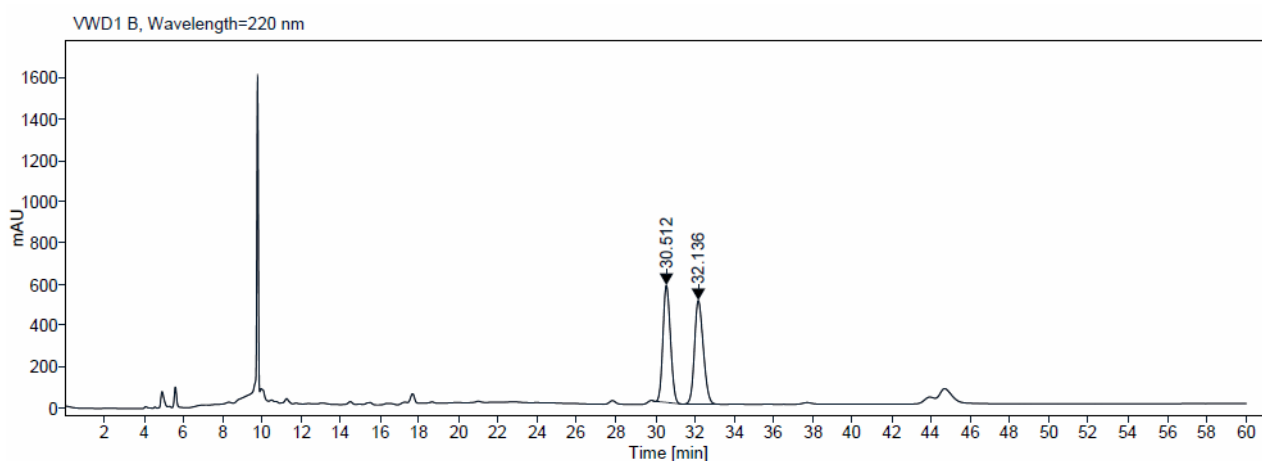
RT [min]	Type	Width [min]	Area	Height	Area%
30.512	MM	0.4431	15093.8877	567.7345	49.1861
32.136	MM	0.5175	15593.4014	502.2413	50.8139
Sum			30687.2891		



Signal: VWD1 B, Wavelength=220 nm

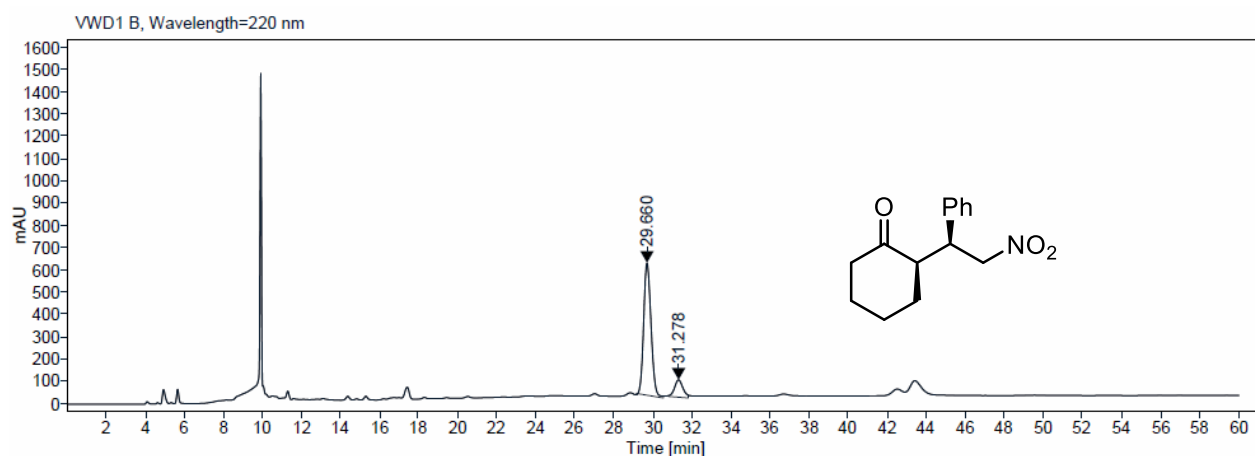
RT [min]	Type	Width [min]	Area	Height	Area%
29.851	MM	0.3911	1622.5236	69.1412	4.2780
31.123	MM	0.5384	36304.8086	1123.8943	95.7220
Sum			37927.3322		

(R)-2-((S)-2-nitro-1-phenylethyl)cyclohexan-1-one, ent-5a



Signal: VWD1 B, Wavelength=220 nm

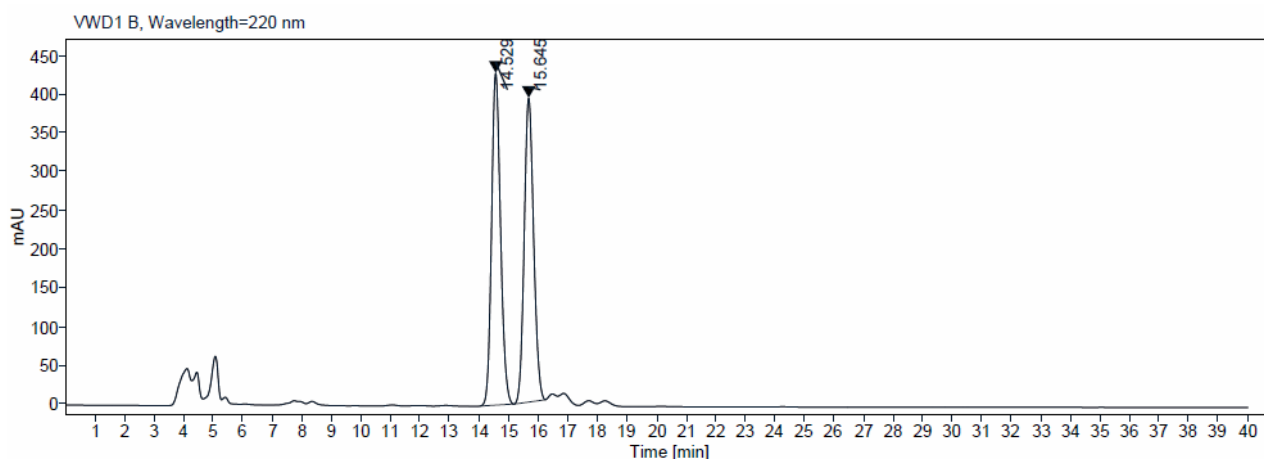
RT [min]	Type	Width [min]	Area	Height	Area%
30.512	MM	0.4431	15093.8877	567.7345	49.1861
32.136	MM	0.5175	15593.4014	502.2413	50.8139
Sum			30687.2891		



Signal: VWD1 B, Wavelength=220 nm

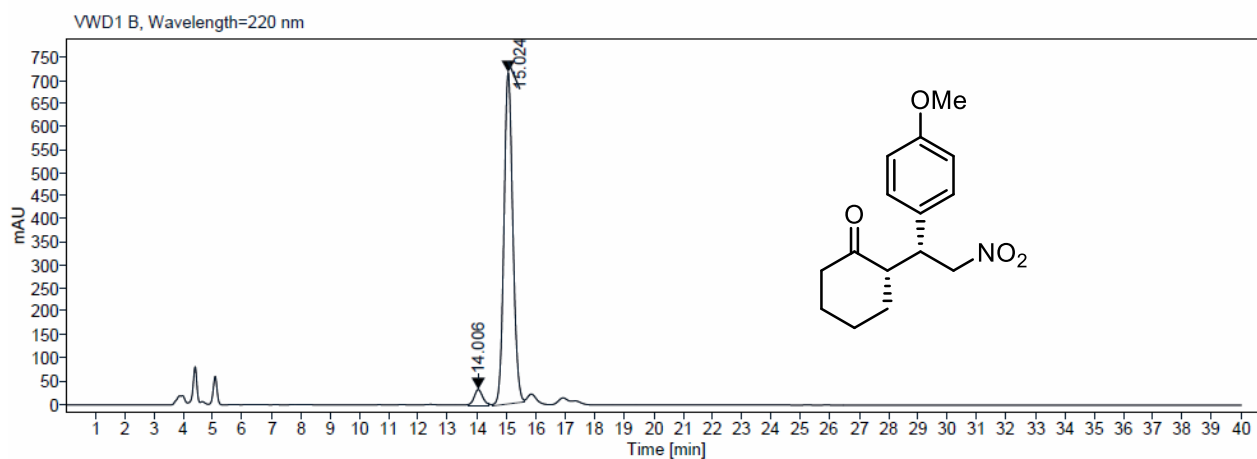
RT [min]	Type	Width [min]	Area	Height	Area%
29.660	MM	0.4347	15475.6846	593.3307	86.8540
31.278	MM	0.5014	2342.3672	77.8567	13.1460
Sum			17818.0518		

(S)-2-((R)-1-(4-methoxyphenyl)-2-nitroethyl)cyclohexan-1-one, 5b



Signal: VWD1 B, Wavelength=220 nm

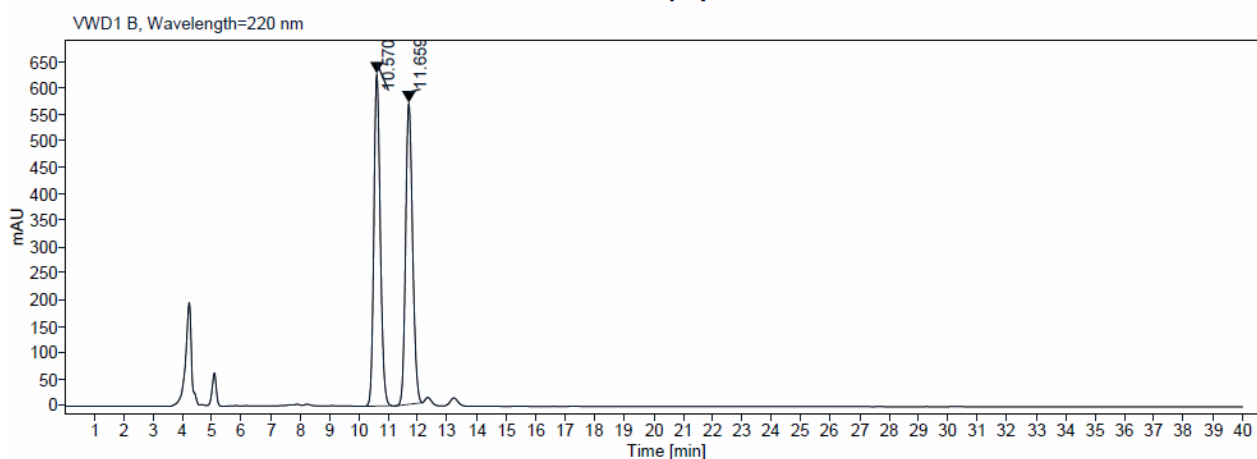
RT [min]	Type	Width [min]	Area	Height	Area%
14.529	MM	0.3505	9019.9004	428.9290	50.9661
15.645	MM	0.3684	8677.9453	392.5935	49.0339
Sum			17697.8457		



Signal: VWD1 B, Wavelength=220 nm

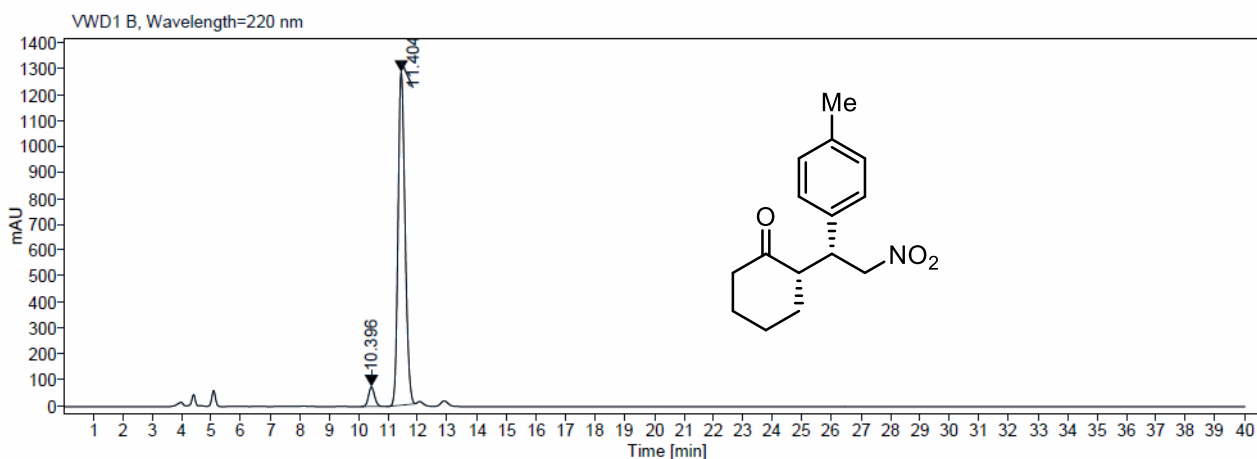
RT [min]	Type	Width [min]	Area	Height	Area%
14.006	MM	0.3439	728.5383	35.3064	4.6179
15.024	MM	0.3500	15047.8027	716.5395	95.3821
Sum			15776.3411		

(S)-2-((R)-2-nitro-1-(p-tolyl)ethyl)cyclohexan-1-one, 5c



Signal: VWD1 B, Wavelength=220 nm

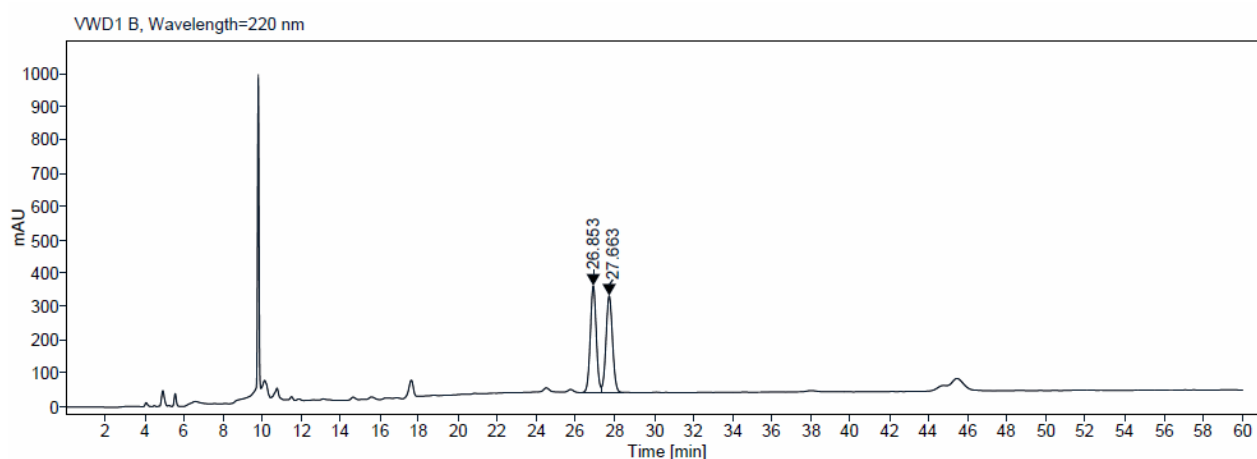
RT [min]	Type	Width [min]	Area	Height	Area%
10.570	MM	0.2523	9511.1963	628.2054	50.3396
11.659	MM	0.2746	9382.8770	569.4012	49.6604
Sum			18894.0732		



Signal: VWD1 B, Wavelength=220 nm

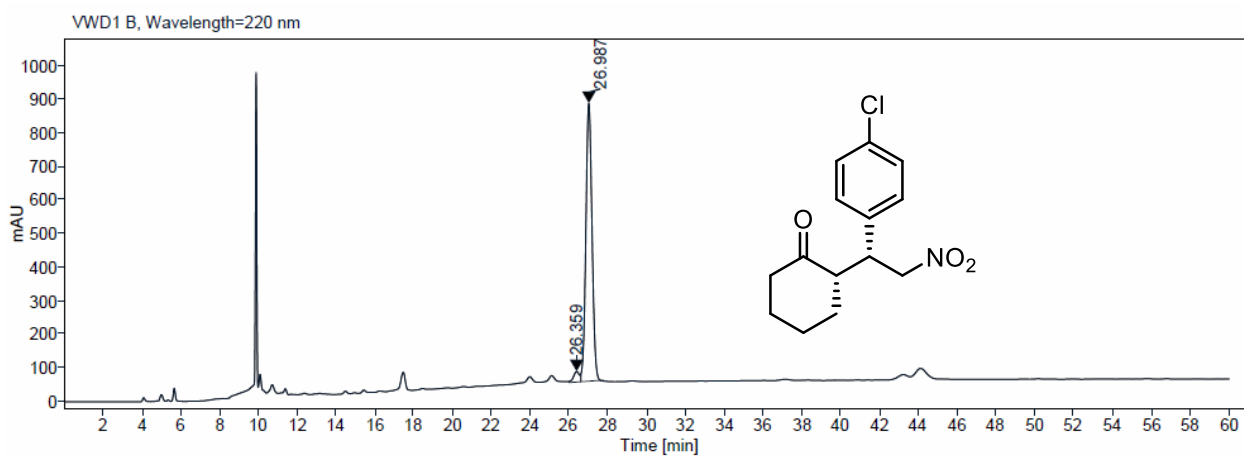
RT [min]	Type	Width [min]	Area	Height	Area%
10.396	MM	0.2380	1075.7338	75.3338	4.8314
11.404	MM	0.2750	21189.6816	1284.1577	95.1686
Sum			22265.4154		

(S)-2-((R)-1-(4-chlorophenyl)-2-nitroethyl)cyclohexan-1-one, 5d



Signal: VWD1 B, Wavelength=220 nm

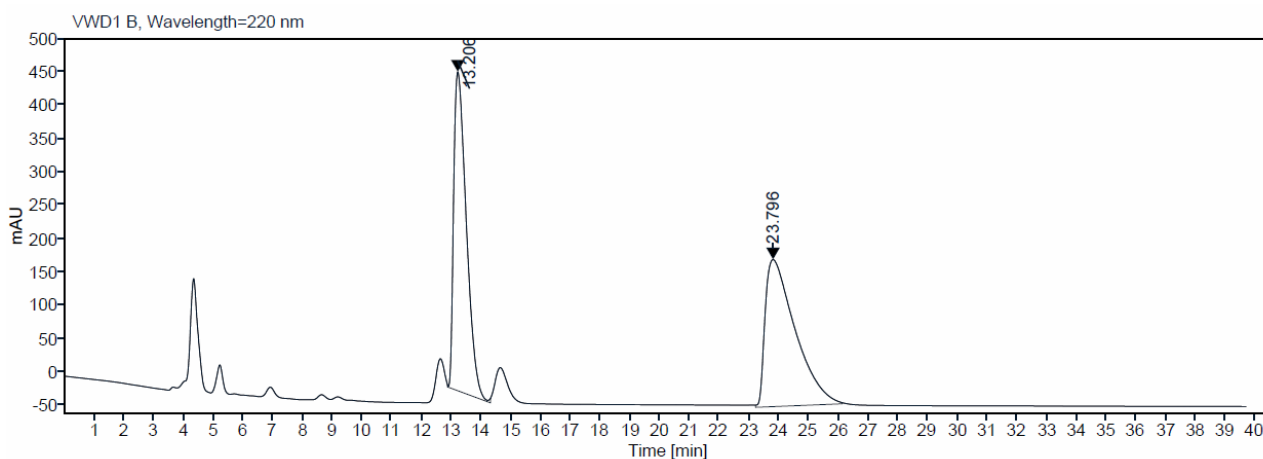
RT [min]	Type	Width [min]	Area	Height	Area%
26.853	MF	0.3549	6845.1523	321.4754	50.2783
27.663	FM	0.3870	6769.3784	291.5379	49.7217
Sum			13614.5308		



Signal: VWD1 B, Wavelength=220 nm

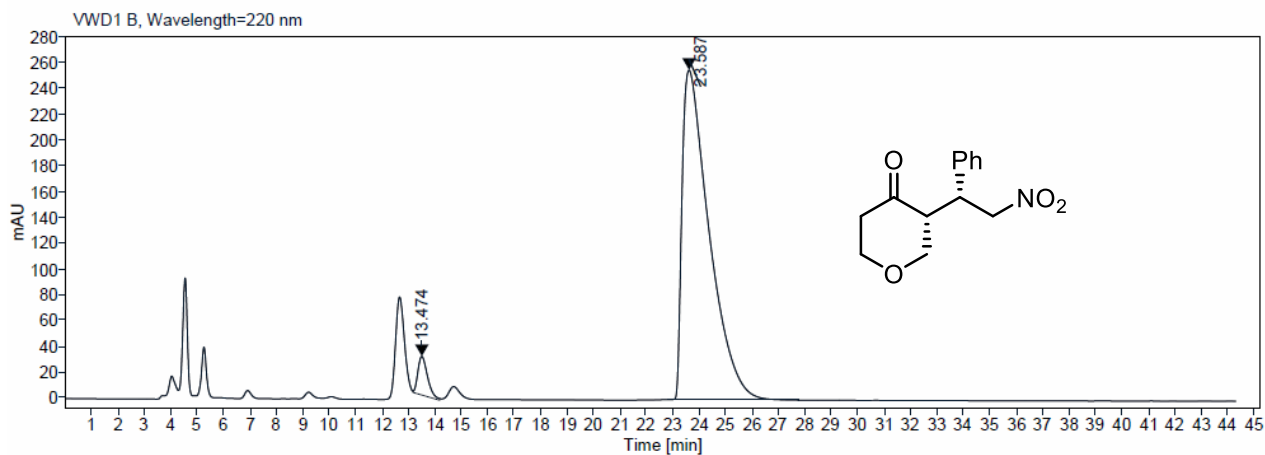
RT [min]	Type	Width [min]	Area	Height	Area%
26.359	MF	0.3536	665.5950	31.3745	3.5314
26.987	FM	0.3658	18182.1797	828.3491	96.4686
Sum			18847.7747		

(R)-3-((R)-2-nitro-1-phenylethyl)tetrahydro-4H-pyran-4-one, 5e



Signal: VWD1 B, Wavelength=220 nm

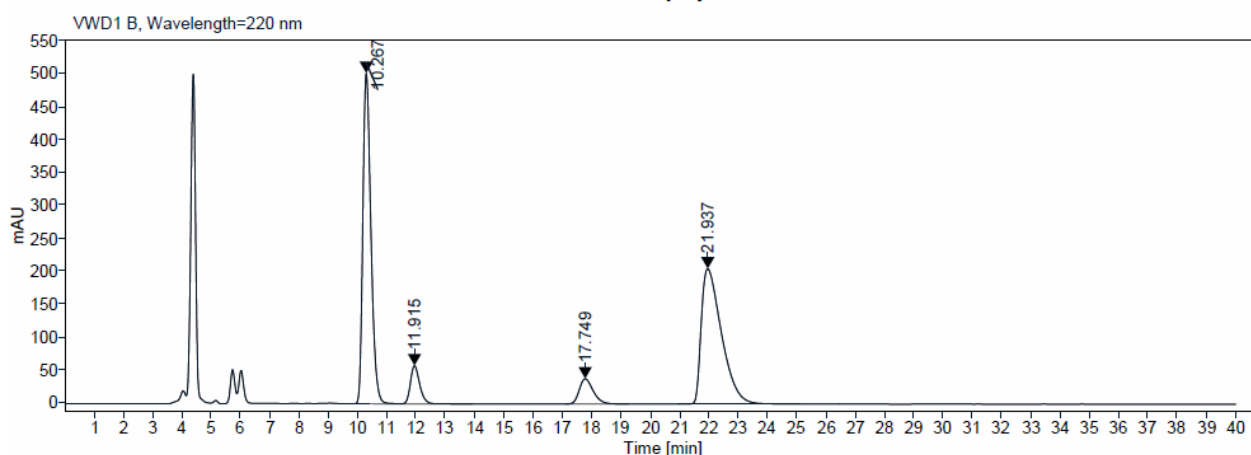
RT [min]	Type	Width [min]	Area	Height	Area%
13.206	MM	0.4908	14062.0928	477.5199	47.7273
23.796	MM	1.1659	15401.3145	220.1715	52.2727
Sum			29463.4072		



Signal: VWD1 B, Wavelength=220 nm

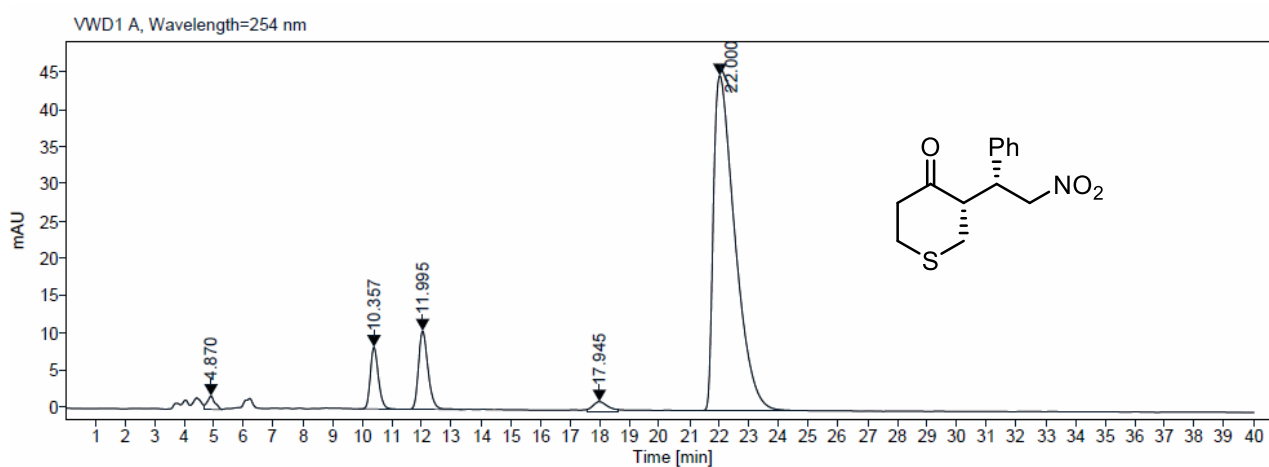
RT [min]	Type	Width [min]	Area	Height	Area%
13.474	MM	0.4225	758.9697	29.9411	4.0433
23.587	MM	1.1774	18012.0938	254.9667	95.9567
Sum			18771.0635		

(R)-3-((R)-2-nitro-1-phenylethyl)tetrahydro-4H-pyran-4-one, 5f



Signal: VWD1 B, Wavelength=220 nm

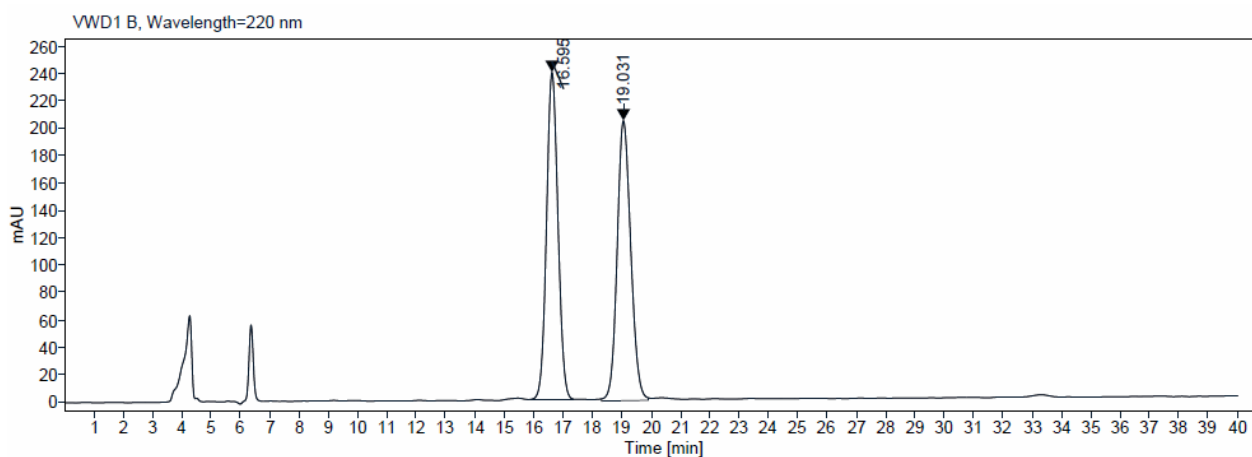
RT [min]	Type	Width [min]	Area	Height	Area%
10.267	BV	0.2949	9578.6436	501.2777	43.6045
11.915	VB	0.3409	1284.4694	57.8756	5.8472
17.749	BB	0.5100	1261.5707	38.1317	5.7430
21.937	BB	0.7337	9842.3906	205.1463	44.8052



Signal: VWD1 A, Wavelength=254 nm

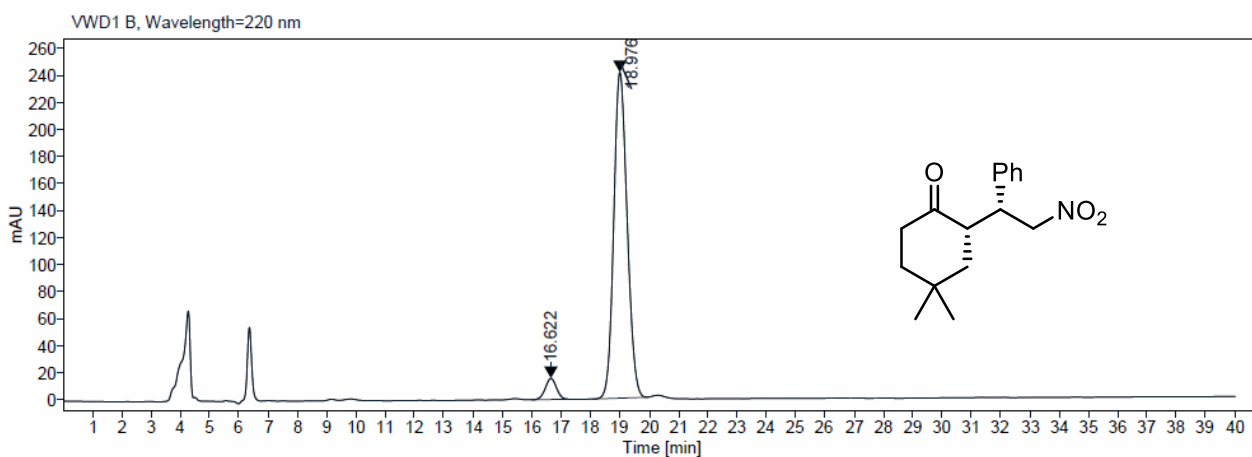
RT [min]	Type	Width [min]	Area	Height	Area%
4.870	VB	0.2527	32.0224	1.7734	1.1743
10.357	BB	0.2877	155.9744	8.2812	5.7199
11.995	BB	0.3415	233.6670	10.5046	8.5691
17.945	MM	0.6234	53.2246	1.4229	1.9519
22.000	BB	0.7611	2251.9768	44.9044	82.5848
Sum			2726.8652		

(S)-4,4-dimethyl-2-((R)-2-nitro-1-phenylethyl)cyclohexan-1-one, 5g



Signal: VWD1 B, Wavelength=220 nm

RT [min]	Type	Width [min]	Area	Height	Area%
16.595	MM	0.4508	6449.9932	238.4903	49.4823
19.031	MM	0.5378	6584.9624	204.0844	50.5177
Sum			13034.9556		



Signal: VWD1 B, Wavelength=220 nm

RT [min]	Type	Width [min]	Area	Height	Area%
16.622	MM	0.4408	412.0926	15.5829	5.1111
18.976	MM	0.5294	7650.6714	240.8593	94.8889
Sum			8062.7640		