

Supporting Information

Asymmetric Ring-opening Reactions of Donor–Acceptor Cyclopropanes with 1,3-Cyclodiones

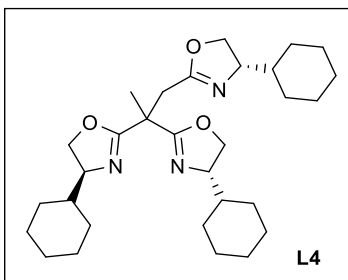
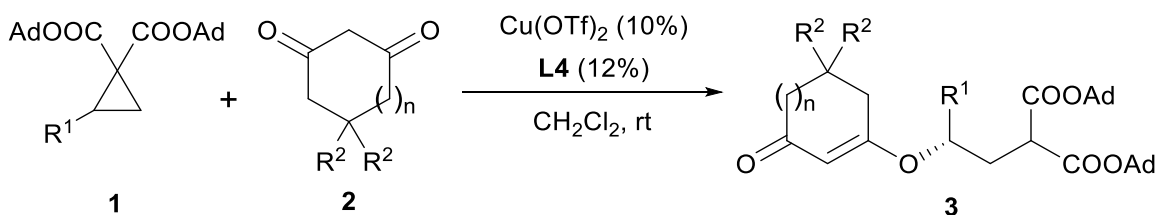
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1. General

^1H NMR and ^{13}C NMR were recorded on a Bruker-400 MHz spectrometer. Proton chemical shifts are reported in ppm downfield from tetramethylsilane or from the residual solvent as internal standard in CDCl_3 (δ 7.26 ppm) and in $(\text{CD}_3)_2\text{SO}$ (2.50 ppm). Carbon chemical shifts were internally referenced to the deuterated solvent signals in CDCl_3 (δ 77.0 ppm) and in $(\text{CD}_3)_2\text{SO}$ (39.5 ppm). High-resolution mass spectra were recorded on a Thermo Scientific LTQ Orbitrap ESI ion trap mass spectrometer. Enantiomeric excesses were determined by chiral-phase HPLC using a Shimadzu LC-2030 plus instrument. Optical rotations were measured on an Autopol-VI polarimeter. Reagents obtained from commercial sources are used without further purification and all solvents were purified and dried according to standard methods prior to use, unless stated otherwise. **L4** Ligand was synthesized according to known procedures.¹

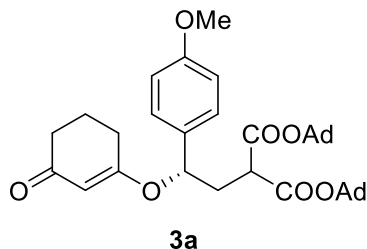
2. General procedures for asymmetric ring-opening reactions to obtain **3**.



A mixture of $\text{Cu}(\text{OTf})_2$ (0.02 mmol, 0.10 equiv) with **L4** (0.024 mmol, 0.12 equiv) in CH_2Cl_2 at room temperature (25 °C) for 1 h. Then, the 1,1-cyclopropane diester (**1**, 0.20 mmol, 1.0 equiv.) and the 1,3-cyclodione (**2**, 0.40 mmol, 2.0 equiv.) were added to the mixture of catalyst successively. The resulting suspension was allowed to stir at room temperature (25 °C) for 50 h. Then, the solvent was removed in vacuo and the residue was purified by silica gel flash chromatography (petroleum ether:ethyl acetate = 12:1 to 2:1) to provide product **3**.

1,1-cyclopropane diester **1** are known compounds and the characterization data all corresponded to the reported values.¹

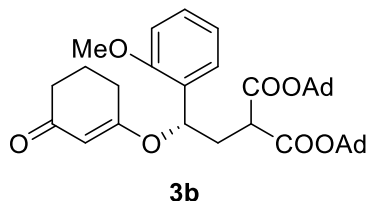
Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-(4-methoxyphenyl)-2-((3-oxocyclohex-1-en-1-yl)oxy)ethyl)malonate (3a)



Synthesized according to the general procedure; flash chromatography (petroleum ether: ethyl acetate = 8:1 to 4:1); 104.8 mg (85%).

Colorless foam. 99% *ee*. $[\alpha]_D^{26} = -7.9^\circ$ (c 1.10, CHCl₃). ¹H NMR (400 MHz, CDCl₃): $\delta = 7.12$ -7.16 (m, 4H), 5.17 (s, 1H), 5.04 (dd, *J* = 8.8 Hz, 4.8 Hz, 1H), 4.98 (d, *J* = 3.2 Hz, 1H), 3.55 (dd, *J* = 8.4 Hz, 6.4 Hz, 1H), 2.35-2.56 (m, 4H), 2.32 (s, 3H), 2.25 (d, *J* = 5.2 Hz, 1H), 2.23 (d, *J* = 5.6 Hz, 1H), 1.92-1.99 (m, 10H), 1.72-1.83 (m, 16H), 1.54 (t, *J* = 10.3 Hz, 4H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): $\delta = 199.6, 176.2, 168.2, 168.18, 138.2, 135.9, 129.6, 125.6, 105.1, 78.5, 78.2, 49.5, 37.2, 37.1, 36.9, 36.5, 36.2, 36.16, 31.8, 31.77, 31.7, 31.6, 28.9, 27.0, 26.8, 21.1, 21.0$ ppm. IR (KBr.cm⁻¹): 2909, 2855, 1725, 1650, 1605, 1514, 1449, 1386, 1248, 1172, 1099, 1044, 979, 896, 831; HRMS (ESI) *m/z*: [M + H]⁺ Calcd. For C₃₈H₄₉O₇ 617.3473; Found 617.3476. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 95:5, 0.8 mL/min, $\lambda = 254$ nm, 40 °C): *t*_S (major, (*S*)-**3a**) = 10.8 min, *t*_R (minor, (*R*)-**3a**) = 11.8 min.

Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-(2-methoxyphenyl)-2-((3-oxocyclohex-1-en-1-yl)oxy)ethyl)malonate (3b)

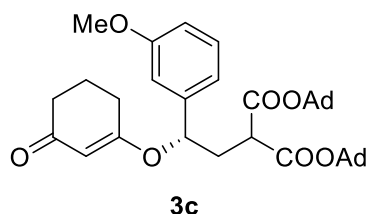


Synthesized according to the general procedure; flash chromatography (petroleum ether: ethyl acetate = 8:1 to 4:1); 87.6 mg (71%).

Colorless foam. 80% *ee*. $[\alpha]_D^{26} = -8.2^\circ$ (c 1.05, CHCl₃). ¹H NMR (400 MHz, CDCl₃): $\delta = 7.22$ -7.24 (m, 1H), 7.18 (dd, *J* = 7.6 Hz, 1.6 Hz, 1H), 6.92 (t, *J* = 7.6 Hz, 1H), 6.85 (d, *J* = 8.4 Hz, 1H), 5.54 (dd, *J* = 8.0 Hz, 4.8 Hz, 1H), 5.13 (s, 1H), 4.96 (d, *J* = 13.2 Hz, 2H), 3.82 (s, 3H), 3.58 (dd, *J* = 8.0 Hz, 6.8 Hz, 1H), 2.36-2.53 (m, 4H), 2.22-2.25 (m, 2H), 1.90-2.00 (m, 10H), 1.71-1.83 (m, 16H), 1.53 (d, *J* = 10.8 Hz, 4H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): $\delta = 199.7, 176.1, 168.3, 168.27, 155.6, 129.2, 127.0, 125.5, 120.9, 110.4, 104.7, 78.3, 78.2, 72.5, 55.3, 49.7, 37.2, 36.6, 36.2, 36.19, 36.16, 35.1, 31.8, 31.75, 31.7, 31.6, 29.6, 28.8, 27.1, 27.06, 26.8, 21.0$ ppm. HRMS (ESI) *m/z*: [M + H]⁺ Calcd. For C₃₈H₄₉O₇ 617.3473; Found 617.3470. HPLC

(Daicel Chiralpak IA, hexane/2-PrOH = 80:20, 1.0 mL/min, $\lambda = 254$ nm, 40 °C): t_S (major, (*S*)-**3b**) = 7.1 min, t_R (minor, (*R*)-**3b**) = 6.3 min.

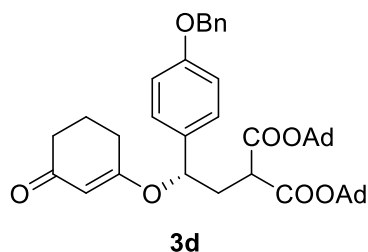
Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-(3-methoxyphenyl)-2-((3-oxocyclohex-1-en-1-yl)oxy)ethyl)malonate (3c**)**



Synthesized according to the general procedure; flash chromatography (petroleum ether: ethyl acetate = 8:1 to 4:1); 102.3 mg (83%).

Colorless foam. 90% *ee*. $[\alpha]_D^{26} = -8.0^\circ$ (c 1.05, CHCl₃). ¹H NMR (400 MHz, CDCl₃): $\delta = 7.26$ (t, $J = 8.0$ Hz, 1H), 6.8 (d, $J = 2.8$ Hz, 1H), 6.81 (d, $J = 2.4$ Hz, 1H), 6.77 (t, $J = 1.6$ Hz, 1H), 5.17 (s, 1H), 5.05 (dd, $J = 9.2$ Hz, 4.8 Hz, 1H), 4.98-5.00 (m, 2H), 3.80 (s, 3H), 3.57 (dd, $J = 8.4$ Hz, 8.6 Hz, 1H), 2.37-2.55 (m, 4H), 2.26 (t, $J = 6.8$ Hz, 2H), 1.93-2.00 (m, 10H), 1.72-1.88 (m, 16H), 1.52-1.55 (m, 4H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): $\delta = 199.5, 176.0, 168.2, 168.17, 160.0, 140.7, 130.1, 117.9, 113.5, 111.3, 105.2, 78.5, 78.2, 55.2, 49.5, 37.2, 37.16, 37.0, 36.6, 36.24, 36.2, 31.9, 31.8, 31.7, 31.66, 28.9, 27.1, 27.08, 26.8, 21.0$ ppm. HRMS (ESI) m/z : [M + H]⁺ Calcd. For C₃₈H₄₉O₇ 617.3473; Found 617.3470. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 98:2, 1.0 mL/min, $\lambda = 254$ nm, 40 °C): t_S (major, (*S*)-**3c**) = 30.9 min, t_R (minor, (*R*)-**3c**) = 34.5 min.

Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-(4-(benzyloxy)phenyl)-2-((3-oxocyclohex-1-en-1-yl)oxy)ethyl)malonate (3d**)**

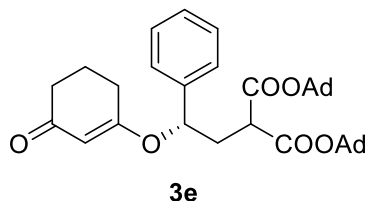


Synthesized according to the general procedure; flash chromatography (petroleum ether: ethyl acetate = 8:1 to 4:1); 120.6 mg (87%).

Colorless foam. 92% *ee*. $[\alpha]_D^{26} = -7.7^\circ$ (c 1.00, CHCl₃). ¹H NMR (400 MHz, CDCl₃): $\delta = 7.31$ -7.44 (m, 5H), 7.18 (d, $J = 8.8$ Hz, 2H), 6.94 (d, $J = 8.8$ Hz, 2H), 5.19 (s, 1H), 5.03-5.06 (m, 3H), 4.98 (s, 2H), 3.53 (dd, $J = 8.8$ Hz, 6.4 Hz, 1H), 2.34-2.57 (m, 4H), 2.25 (dd, $J = 8.0$ Hz, 6.0 Hz, 2H), 1.92-2.00 (m, 10H), 1.72-1.87 (m, 16H), 1.55 (t, $J = 9.2$ Hz, 4H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): $\delta = 199.5, 176.1, 168.23, 168.2, 158.8, 136.7, 131.2, 128.6, 128.0, 127.5,$

127.1, 115.2, 105.1, 78.5, 78.0, 70.1, 49.5, 37.2, 37.16, 36.9, 36.6, 36.23, 36.2, 31.84, 31.8, 31.7, 31.69, 31.6, 29.0, 27.1, 26.83, 26.8, 21.0 ppm. HRMS (ESI) m/z : $[M + H]^+$ Calcd. For $C_{44}H_{53}O_7$ 693.3786; Found 693.3791. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 95:5, 0.8 mL/min, λ = 254 nm, 40 °C): t_S (major, (S)-**3d**) = 21.2 min, t_R (minor, (R)-**3d**) = 23.5 min.

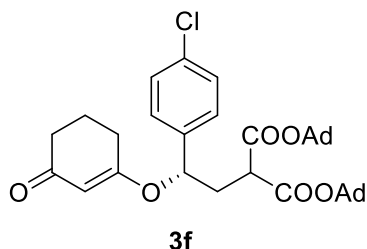
Di((3R,5R,7R)-adamantan-1-yl)2-((S)-2-((3-oxocyclohex-1-en-1-yl)oxy)-2-phenylethyl)malonate (3e)



Synthesized according to the general procedure (100 h); flash chromatography (petroleum ether : ethyl acetate = 8:1 to 4:1); 92.6 mg (79%).

Colorless foam. 90% *ee*. $[\alpha]_D^{26} = -6.6^\circ$ (c 1.05, $CHCl_3$). 1H NMR (400 MHz, $CDCl_3$): δ = 7.28-7.37 (m, 3H), 7.25 (d, J = 6.8 Hz, 2H), 5.17 (s, 1H), 5.08 (dd, J = 9.2 Hz, 4.4 Hz, 1H), 4.98-5.00 (m, 2H), 3.57 (dd, J = 8.4 Hz, 6.0 Hz, 1H), 2.39-2.57 (m, 4H), 2.26 (d, J = 6.0 Hz, 1H), 2.24 (d, J = 5.6 Hz, 1H), 1.92-2.00 (m, 10H), 1.72-1.88 (m, 16H), 1.52-1.57 (m, 4H) ppm; $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 199.5, 176.1, 168.2, 168.17, 139.0, 129.0, 128.4, 125.6, 105.2, 78.5, 78.3, 49.5, 37.20, 37.17, 37.0, 36.6, 36.24, 36.2, 31.9, 31.85, 31.8, 31.7, 31.6, 28.9, 27.1, 27.07, 26.84, 26.8, 21.0 ppm. HRMS (ESI) m/z : $[M + H]^+$ Calcd. For $C_{37}H_{47}O_6$ 587.3367; Found 587.3370. HPLC (Daicel Chiralpak IA, hexane/2-PrOH = 95:5, 1.0 mL/min, λ = 254 nm, 40 °C): t_S (major, (S)-**3e**) = 11.5 min, t_R (minor, (R)-**3e**) = 12.5 min.

Di((3R,5R,7R)-adamantan-1-yl)2-((S)-2-(4-chlorophenyl)-2-((3-oxocyclohex-1-en-1-yl)oxy)ethyl)malonate (3f)

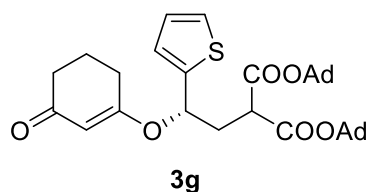


Synthesized according to the general procedure (100 h); flash chromatography (petroleum ether : ethyl acetate = 8:1 to 2:1); 87.0 mg (70%).

Colorless foam. 94% *ee*. $[\alpha]_D^{26} = -9.2^\circ$ (c 1.10, $CHCl_3$). 1H NMR (400 MHz, $CDCl_3$): δ = 7.31 (d, J = 8.4 Hz, 2H), 7.18 (d, J = 8.8 Hz, 2H), 5.10 (s, 1H), 5.06 (dd, J = 9.2 Hz, 4.8 Hz, 1H), 4.96-4.98 (m, 2H), 3.53 (dd, J = 8.4 Hz, 6.0 Hz, 1H), 2.35-2.52 (m, 4H), 2.22-2.26 (m, 2H), 1.90-1.98 (m, 10H), 1.71-1.86 (m, 16H), 1.51-1.56 (m, 4H) ppm; $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$): δ = 199.3, 175.8, 175.7, 168.0, 137.5, 134.2, 129.2, 127.0, 105.1, 78.6, 77.5, 49.3, 37.1,

37.08, 36.8, 36.5, 36.2, 36.1, 31.8, 31.78, 31.75, 31.6, 31.58, 28.8, 27.02, 27.0, 26.8, 26.75, 20.9 ppm. IR (KBr.cm⁻¹): 2915, 2850, 1738, 1720, 1650, 1608, 1490, 1237, 1217, 1183, 977, 828, 718, 666, 588; HRMS (ESI) m/z: [M + H]⁺ Calcd. For C₃₇H₄₆ClO₆ 621.2977; Found 621.2975. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 95:5, 0.8 mL/min, λ = 254 nm, 40 °C): t_S (major, (S)-**3f**) = 11.4 min, t_R (minor, (R)-**3f**) = 12.6 min.

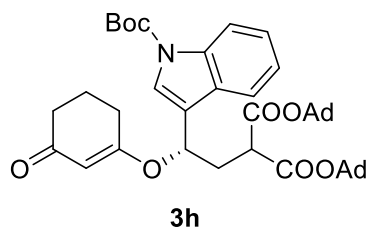
Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-((3-oxocyclohex-1-en-1-yl)oxy)-2-(thiophen-2-yl)ethyl)malonate (3g**)**



Synthesized according to the general procedure; flash chromatography (petroleum ether : ethyl acetate = 8:1 to 2:1); 104.3 mg (88%).

Colorless foam. 93% *ee*. [α]_D²⁶ = - 4.3° (c 1.10, CHCl₃). ¹H NMR (400 MHz, CDCl₃): δ = 7.26-7.27 (m, 1H), 6.99 (dd, *J* = 3.2 Hz, 0.4 Hz, 1H), 6.94 (dd, *J* = 4.8 Hz, 3.6 Hz, 1H), 5.39 (dd, *J* = 8.4 Hz, 5.2 Hz, 1H), 5.35 (s, 1H), 4.98 (d, *J* = 2.8 Hz, 2H), 3.52 (dd, *J* = 7.6 Hz, 6.8 Hz, 1H), 2.62-2.69 (m, 1H), 2.31-2.53 (m, 3H), 2.28-2.28 (m, 2H), 1.92-1.99 (m, 10H), 1.71-1.83 (m, 16H), 1.52-1.56 (m, 4H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): δ = 199.4, 175.8, 168.0, 167.9, 141.8, 125.8, 125.9, 125.7, 104.6, 78.6, 73.9, 49.3, 37.2, 37.1, 36.5, 36.2, 36.15, 31.8, 31.79, 31.7, 31.66, 31.6, 28.9, 27.0, 26.8, 26.77, 21.0 ppm. HRMS (ESI) m/z: [M + H]⁺ Calcd. For C₃₅H₄₅O₆S 593.2931; Found 593.2932. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 95:5, 0.8 mL/min, λ = 254 nm, 40 °C): t_S (major, (S)-**3g**) = 9.3 min, t_R (minor, (R)-**3g**) = 10.8 min.

Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-(1-(tert-butoxycarbonyl)-1*H*-indol-3-yl)-2-((3-oxocyclohex-1-en-1-yl)oxy)ethyl)malonate (3h**)**

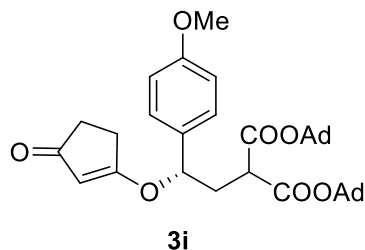


Synthesized according to the general procedure; flash chromatography (petroleum ether : ethyl acetate = 10:1 to 4:1); 120.5 mg (83%).

Colorless foam. 91% *ee*. [α]_D²⁶ = - 9.9° (c 0.95, CHCl₃). ¹H NMR (400 MHz, CDCl₃): δ = 8.13 (d, *J* = 6.0 Hz, 1H), 7.65 (d, *J* = 8.0 Hz, 1H), 7.50 (s, 1H), 7.33 (td, *J* = 7.2 Hz, 1.2 Hz, 1H), 7.23 (td, *J* = 8.0 Hz, 0.8 Hz, 1H), 5.40 (dd, *J* = 8.8 Hz, 4.8 Hz, 1H), 5.34 (m, 1H), 4.99 (d, *J* = 4.0 Hz, 2H), 3.61 (dd, *J* = 8.4 Hz, 6.4 Hz, 1H), 2.71-2.78 (m, 1H), 2.37-2.62 (m, 3H), 2.23-2.27 (m, 2H), 1.92-1.99 (m, 10H), 1.72-1.86 (m, 16H), 1.67 (s, 9H), 1.53-1.56 (m, 4H) ppm; ¹³C{¹H} NMR

(100 MHz, CDCl₃): δ = 199.7, 176.2, 168.2, 149.3, 127.4, 124.9, 123.5, 122.9, 119.6, 118.0, 115.5, 104.4, 84.2, 78.6, 78.56, 72.9, 49.4, 37.14, 37.1, 36.5, 36.2, 36.15, 35.2, 31.8, 31.78, 31.7, 31.65, 31.6, 28.9, 28.1, 27.04, 27.0, 26.8, 21.0 ppm. HRMS (ESI) m/z : [M + H]⁺ Calcd. For C₄₄H₅₆NO₈ 726.4000; Found 726.3996. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 98:2, 0.8 mL/min, λ = 254 nm, 40 °C): t_S (major, (*S*)-**3h**) = 12.6 min, t_R (minor, (*R*)-**3h**) = 14.8 min.

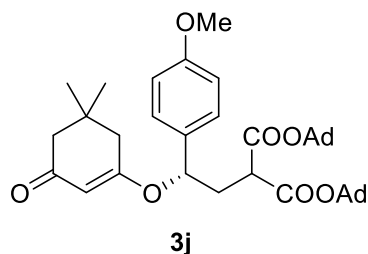
Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-(4-methoxyphenyl)-2-((3-oxocyclopent-1-en-1-yl)oxy)ethyl)malonate (3i**)**



Synthesized according to the general procedure (100 h); flash chromatography (petroleum ether : ethyl acetate = 8:1 to 4:1); 97.6 mg (81%).

Colorless foam. 95% *ee*. $[\alpha]_D^{26} = -7.3^\circ$ (c 1.10, CHCl₃). ¹H NMR (400 MHz, CDCl₃): δ = 8.13 (d, J = 6.0 Hz, 1H), 7.65 (d, J = 7.8 Hz, 1H), 7.50 (s, 1H), 7.31-7.35 (m, 1H), 7.21-7.25 (m, 1H), 6.39 (dd, J = 4.9 Hz, 9.0 Hz, 1H), 5.34 (s, 1H), 4.98 (d, J = 4.0 Hz, 1H), 3.61 (dd, J = 6.4 Hz, 8.4 Hz, 1H), 2.71-2.78 (m, 1H), 2.40-2.62 (m, 3H), 2.23-2.27 (m, 2H), 1.92-1.99 (m, 10H), 1.71-1.86 (m, 16H), 1.67 (s, 9H), 1.53-1.56 (m, 4H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): δ = 205.7, 188.4, 168.1, 168.08, 159.8, 130.3, 127.3, 114.4, 106.9, 81.7, 78.6, 55.3, 49.4, 37.15, 37.1, 36.5, 36.2, 33.7, 31.8, 31.76, 31.7, 31.68, 31.6, 31.58, 28.6, 27.0, 26.8, 26.78 ppm. HRMS (ESI) m/z : [M + H]⁺ Calcd. For C₃₇H₄₇O₇ 603.3316; Found 603.3315. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 98:2, 0.8 mL/min, λ = 254 nm, 40 °C): t_S (major, (*S*)-**3i**) = 18.5 min, t_R (minor, (*R*)-**3i**) = 20.6 min.

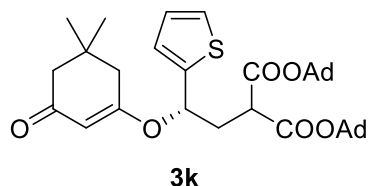
Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-((5,5-dimethyl-3-oxocyclohex-1-en-1-yl)oxy)-2-(4-methoxyphenyl)ethyl)malonate (3j**)**



Synthesized according to the general procedure; flash chromatography (petroleum ether : ethyl acetate = 12:1 to 6:1); 117.3 mg (91%).

Colorless solid, m.p. 135-137 °C. 95% *ee*. $[\alpha]_D^{26} = -8.9^\circ$ (c 1.10, CHCl₃). ¹H NMR (400 MHz, CDCl₃): $\delta = 7.14$ (d, *J* = 8.8 Hz, 2H), 6.83 (d, *J* = 8.8 Hz, 2H), 5.13 (s, 1H), 5.02 (dd, *J* = 8.4 Hz, 4.8 Hz, 1H), 4.95 (s, 2H), 3.75 (s, 3H), 3.49 (dd, *J* = 8.4 Hz, 6.4 Hz, 1H), 2.46-2.53 (m, 1H), 2.34-2.41 (m, 1H), 2.20-2.30 (m, 2H), 2.08 (d, *J* = 2.8 Hz, 2H), 1.89-1.97 (m, 8H), 1.69-1.84 (m, 16H), 1.51 (t, *J* = 10.0 Hz, 4H), 1.03 (s, 3H), 0.96 (s, 3H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): $\delta = 199.2, 174.4, 168.2, 168.1, 130.9, 126.9, 114.3, 103.9, 78.4, 78.0, 55.2, 50.5, 49.4, 42.9, 37.12, 37.1, 36.9, 36.2, 36.1, 32.3, 31.8, 31.7, 31.6, 31.58, 28.3, 27.9, 27.0, 26.8$ ppm. IR (KBr.cm⁻¹): 2928, 2852, 1723, 1650, 1600, 1519, 1449, 1373, 1248, 1214, 1177, 1034, 911, 825, 619, 578; HRMS (ESI) *m/z*: [M + H]⁺ Calcd. For C₄₀H₅₃O₇ 645.3786; Found 645.3788. HPLC (Daicel Chiralpak IA, hexane/2-PrOH = 80:20, 1.0 mL/min, $\lambda = 254$ nm, 40 °C): *t*_S (major, (*S*)-**3j**) = 8.8 min, *t*_R (minor, (*R*)-**3j**) = 9.4 min.

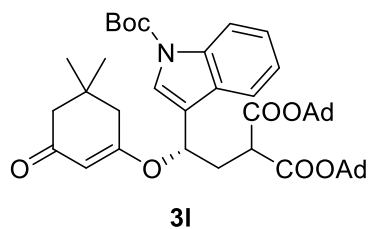
Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-((5,5-dimethyl-3-oxocyclohex-1-en-1-yl)oxy)-2-(thiophen-2-yl)ethyl)malonate (3k**)**



Synthesized according the general procedure; flash chromatography (petroleum ether : ethyl acetate = 8:1 to 2:1); 115.4 mg (93%).

Colorless foam. 79% *ee*. $[\alpha]_D^{26} = -6.4^\circ$ (c 1.00, CHCl₃). ¹H NMR (400 MHz, CDCl₃): $\delta = 7.26$ (dd, *J* = 4.8 Hz, 0.8 Hz, 1H), 6.98 (d, *J* = 2.8 Hz, 1H), 6.94 (dd, *J* = 4.8 Hz, 3.6 Hz, 1H), 5.42 (dd, *J* = 8.4 Hz, 5.2 Hz, 1H), 5.33 (s, 1H), 4.98 (d, *J* = 2.8 Hz, 2H), 3.52 (dd, *J* = 8.0 Hz, 7.2 Hz, 1H), 2.60-2.68 (m, 1H), 2.46-2.53 (m, 1H), 2.31-2.35 (m, 1H), 2.13-2.25 (m, 3H), 1.92-2.03 (m, 8H), 1.72-1.83 (m, 16H), 1.54 (t, *J* = 9.6 Hz, 4H), 1.54 (s, 3H), 0.99 (s, 3H) ppm; ¹³C{¹H} NMR (100 MHz, CDCl₃): $\delta = 199.3, 174.1, 168.0, 167.97, 141.9, 126.8, 125.8, 125.6, 103.6, 78.63, 78.6, 74.1, 50.6, 49.3, 42.8, 37.2, 37.18, 37.15, 36.2, 36.18, 32.4, 31.8, 31.78, 31.7, 31.6, 28.4, 27.9, 27.1, 26.83, 26.8$ ppm. HRMS (ESI) *m/z*: [M + H]⁺ Calcd. For C₃₇H₄₉O₆S 621.3244; Found 621.3246. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 95:5, 0.8 mL/min, $\lambda = 254$ nm, 40 °C): *t*_S (major, (*S*)-**3k**) = 12.1 min, *t*_R (minor, (*R*)-**3k**) = 14.0 min.

Di((3*R*,5*R*,7*R*)-adamantan-1-yl)2-((*S*)-2-(1-(tert-butoxycarbonyl)-1*H*-indol-3-yl)-2-((5,5-dimethyl-3-oxocyclohex-1-en-1-yl)oxy)ethyl)malonate (3l**)**



Synthesized according to the general procedure; flash chromatography (petroleum ether : ethyl acetate = 8:1 to 4:1); 131.1 mg (87%).

Colorless foam. 94% *ee*. $[\alpha]_{\text{D}}^{26} = -10.1^{\circ}$ (c 1.05, CHCl_3). ^1H NMR (400 MHz, CDCl_3): $\delta = 8.14$ (dd, $J = 8.0$ Hz, 1H), 7.63 (d, $J = 3.6$ Hz, 1H), 7.47 (m, 1H), 7.32 (td, $J = 7.2$ Hz, 1.2 Hz, 1H), 7.22 (td, $J = 8.0$ Hz, 0.8 Hz, 1H), 5.37 (dd, $J = 8.8$ Hz, 4.8 Hz, 1H), 5.31 (m, 1H), 4.99 (t, $J = 3.6$ Hz, 1H), 3.61 (dd, $J = 8.4$ Hz, 6.4 Hz, 1H), 2.68-2.75 (m, 1H), 2.57-2.64 (m, 1H), 2.25-2.40 (m, 2H), 2.11 (d, $J = 5.2$ Hz, 2H), 1.92-2.00 (m, 8H), 1.72-1.83 (m, 16H), 1.66 (m, 9H), 1.51-1.55 (m, 4H), 1.07 (m, 3H), 0.95 (m, 3H) ppm; $^{13}\text{C}\{^1\text{H}\}$ NMR (100 MHz, CDCl_3): $\delta = 199.5, 174.5, 168.2, 168.17, 149.3, 135.8, 127.3, 124.9, 123.3, 122.9, 119.5, 118.0, 115.5, 103.4, 84.1, 78.6, 78.58, 73.0, 50.5, 49.4, 42.8, 37.2, 37.1, 36.2, 36.19, 35.2, 32.4, 31.84, 31.8, 31.76, 31.7, 31.67, 31.6, 28.4, 28.1, 27.9, 27.1, 27.0, 26.8$ ppm. HRMS (ESI) m/z : $[\text{M} + \text{H}]^+$ Calcd. For $\text{C}_{46}\text{H}_{60}\text{NO}_8$ 754.4313; Found 754.4310. HPLC (Daicel Chiralpak IB, hexane/2-PrOH = 95:5, 0.8 mL/min, $\lambda = 254$ nm, 40 $^{\circ}\text{C}$): t_{S} (major, (*S*)-**3I**) = 10.8 min, t_{R} (minor, (*R*)-**3I**) = 12.3 min.

3. Procedure for gram-scale synthesis of **3a**.

A mixture of $\text{Cu}(\text{OTf})_2$ (107.4 mg, 0.297 mmol, 0.10 equiv.) with **L4** (177.4 mg, 0.356 mmol, 0.12 equiv.) in CH_2Cl_2 at room temperature (25 $^{\circ}\text{C}$) for 2 h. Then, the 1,1-cyclopropane diester (**1**, 1.50 g, 2.97 mmol, 1.0 equiv.) and the 1,3-cyclodione (**2**, 666.0 mg, 5.94 mmol, 2.0 equiv.) were added to the mixture of catalyst successively. The resulting solution was allowed to stir at room temperature (25 $^{\circ}\text{C}$) for 100 h. Then, the mixture was diluted with CH_2Cl_2 (25.0 mL) and washed with saturated NaHCO_3 . The aqueous phase was extracted with CH_2Cl_2 (25 mL \times 3). The organic layers were combined, washed with brine, dried over Na_2SO_4 , and concentrated. The residue was purified by silica gel flash chromatography (petroleum ether:ethyl acetate = 12:1 to 2:1) to provide product **3a** (1.50 g, 82% yield, 99% *ee*).

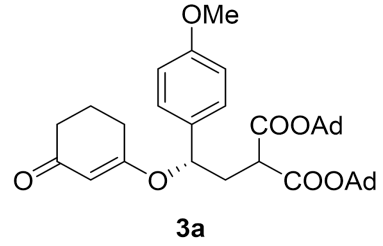
4. Reference

1. Q.-K. Kang, L.-J. Wang, Q.-Z. Liu, Z.-F. Li and Y. Tang, *J. Am. Chem. Soc.*, 2015, 137, 14594-14597.

7.260
7.161
7.138
7.116
5.167
5.057
5.045
5.035
5.023
4.982
4.974
3.565
3.549
3.544
3.528
2.525
2.510
2.503
2.487
2.469
2.452
2.438
2.427
2.417
2.411
2.406
2.395
2.381
2.369
2.323
2.259
2.246
2.241
2.227
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1.966
1.945
1.920
1.833
1.770
1.718
1.564
1.539
1.512

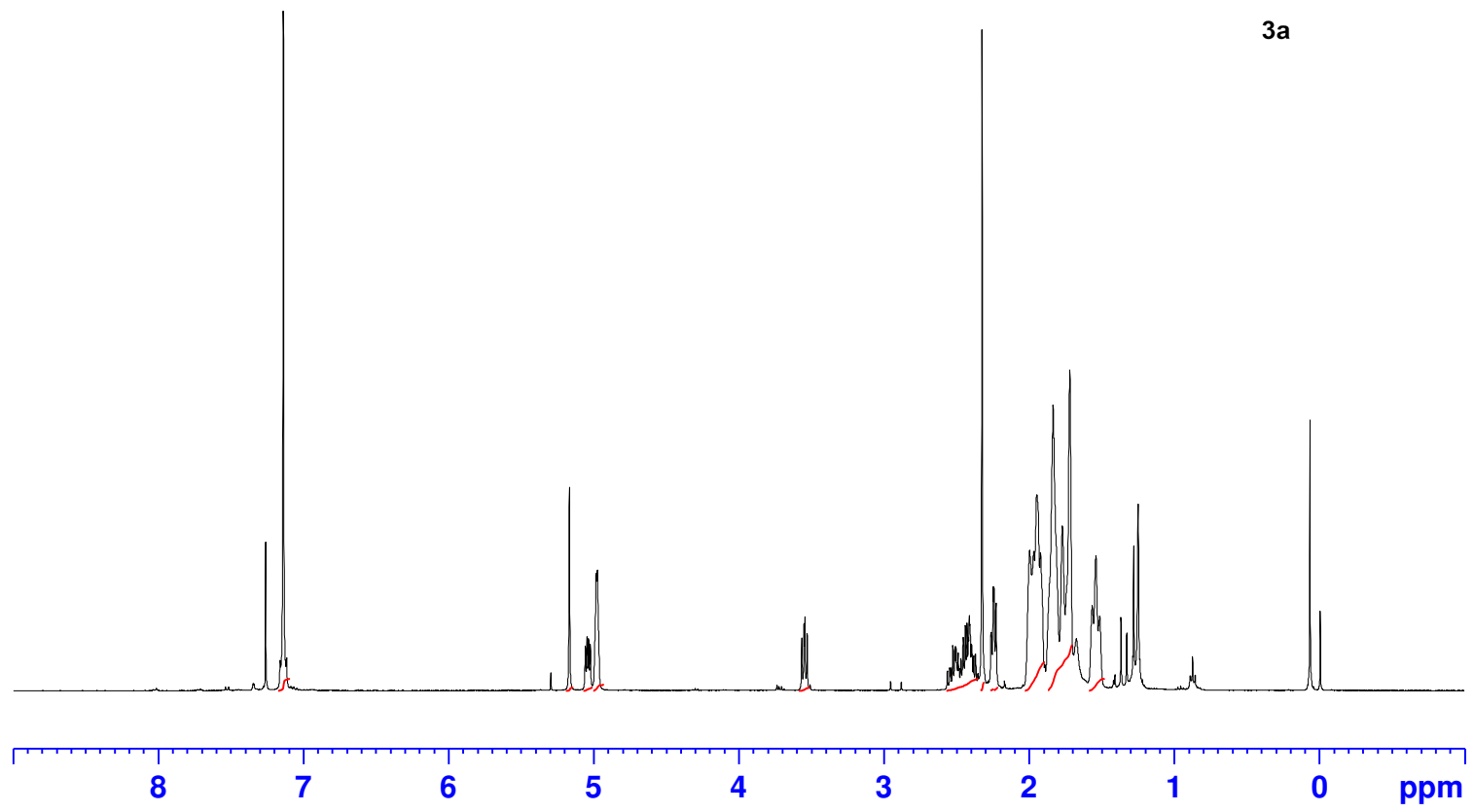
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 PROCNO 1

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 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 8223.685 Hz
 FIDRES 0.125483 Hz
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 RG 114
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 TE 291.8 K
 D1 1.00000000 sec
 TD0 1

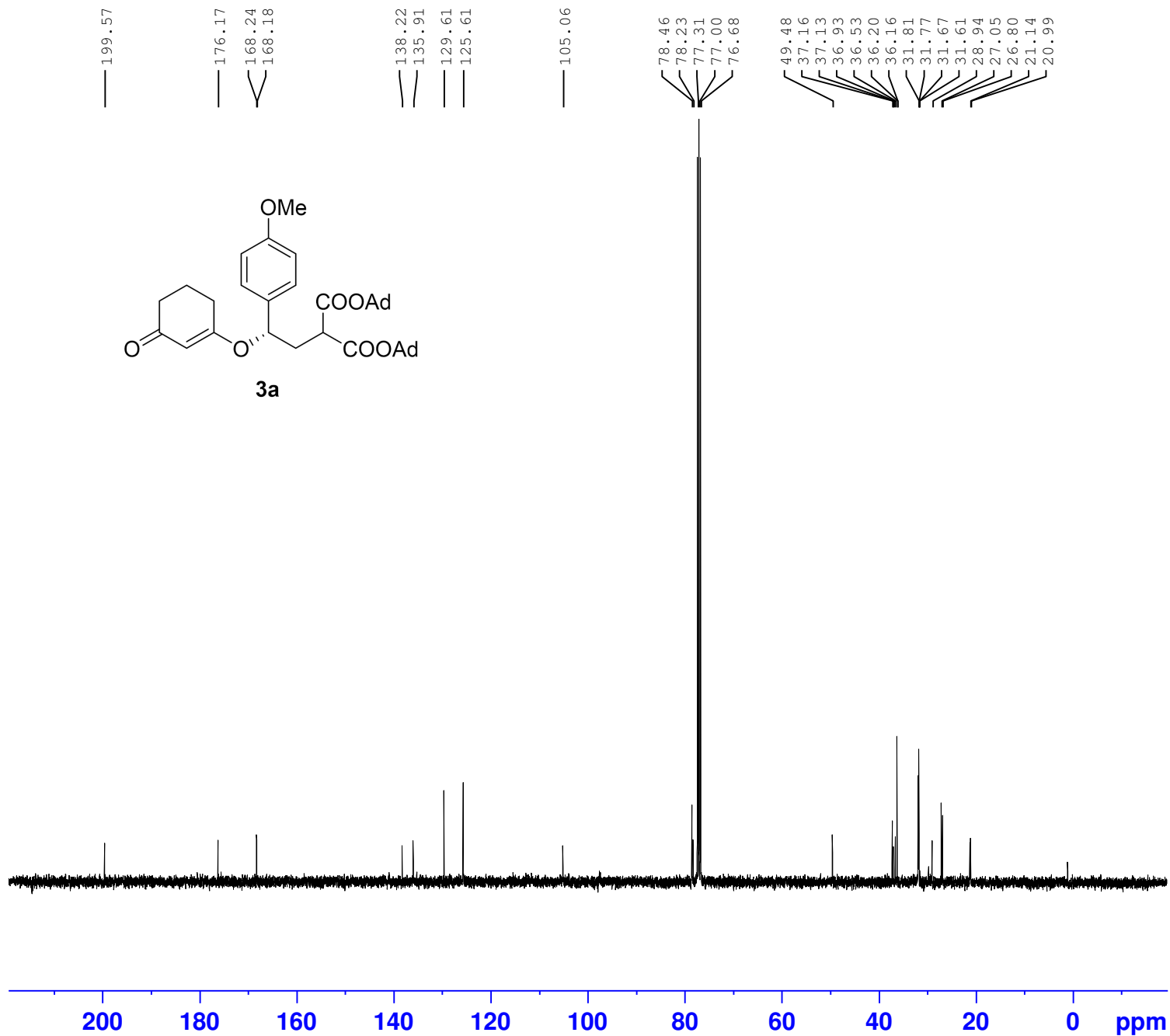


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 PL1W 10.90985775 W
 SFO1 400.1724712 MHz

F2 - Processing parameters
 SI 32768
 SF 400.1700160 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



4.06
1.00
1.01
2.04
1.00
4.09
2.93
0.90
1.01
10.10
16.11
4.22



Current Data Parameters
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 EXPNO 2019122402
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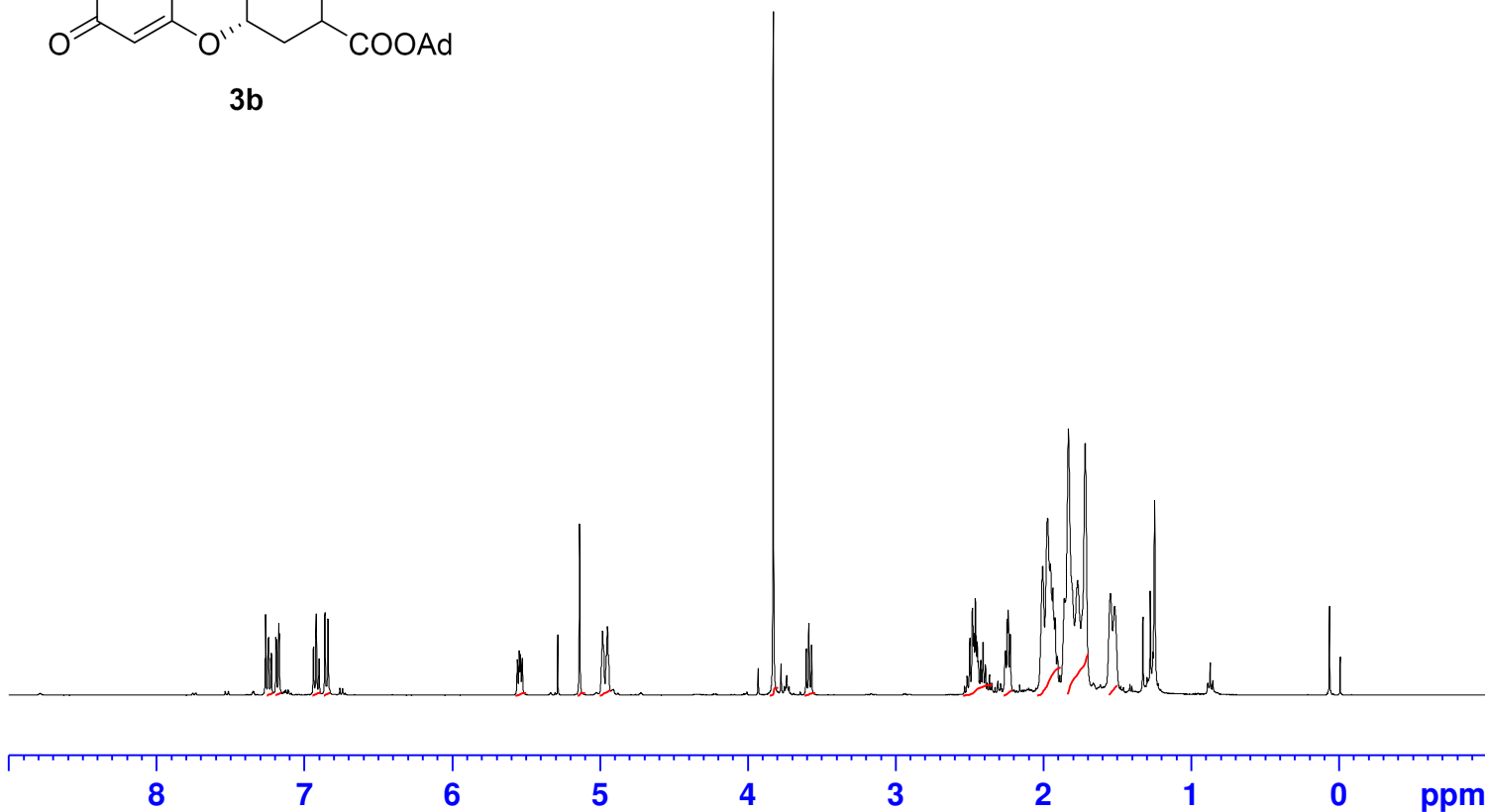
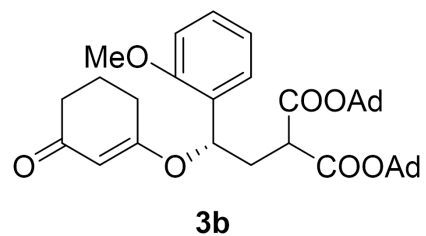
F2 - Acquisition Parameters
 Date_ 20191224
 Time 19.14
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 199
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 291.9 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

==== CHANNEL f1 =====
 NUC1 13C
 P1 9.90 usec
 PL1 -1.10 dB
 PL1W 40.29647064 W
 SFO1 100.6328888 MHz

==== CHANNEL f2 =====
 CPDPRG[2] waltz16
 NUC2 1H
 PCPD2 90.00 usec
 PL2 -1.00 dB
 PL12 14.68 dB
 PL13 17.68 dB
 PL2W 10.90985775 W
 PL12W 0.29499799 W
 PL13W 0.14784923 W
 SFO2 400.1716007 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6228344 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

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7.240
7.224
7.220
7.190
7.186
7.171
7.167
6.935
6.916
6.858
6.837
5.543
5.535
5.135
4.979
4.946
3.824
3.601
3.584
3.581
3.564
2.493
2.476
2.463
2.455
2.443
2.403
2.255
2.250
2.240
2.233
2.220
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1.513

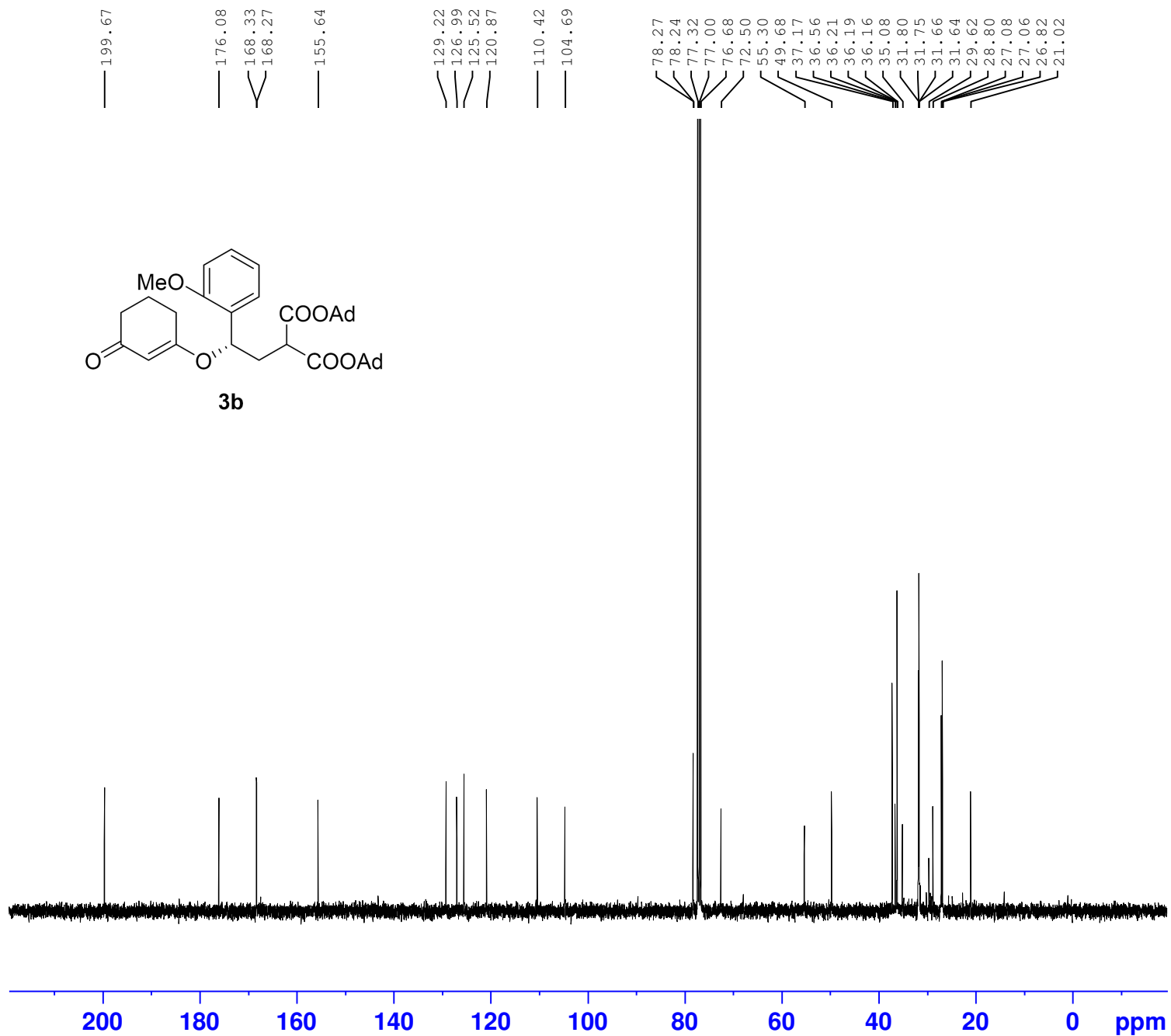


Current Data Parameters
NAME zjc-130
EXPNO 2019111101
PROCNO 1

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INSTRUM spect
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PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 64
DW 60.800 usec
DE 6.50 usec
TE 296.6 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700155 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



Current Data Parameters
 NAME zjc-130
 EXPNO 2019111102
 PROCNO 1

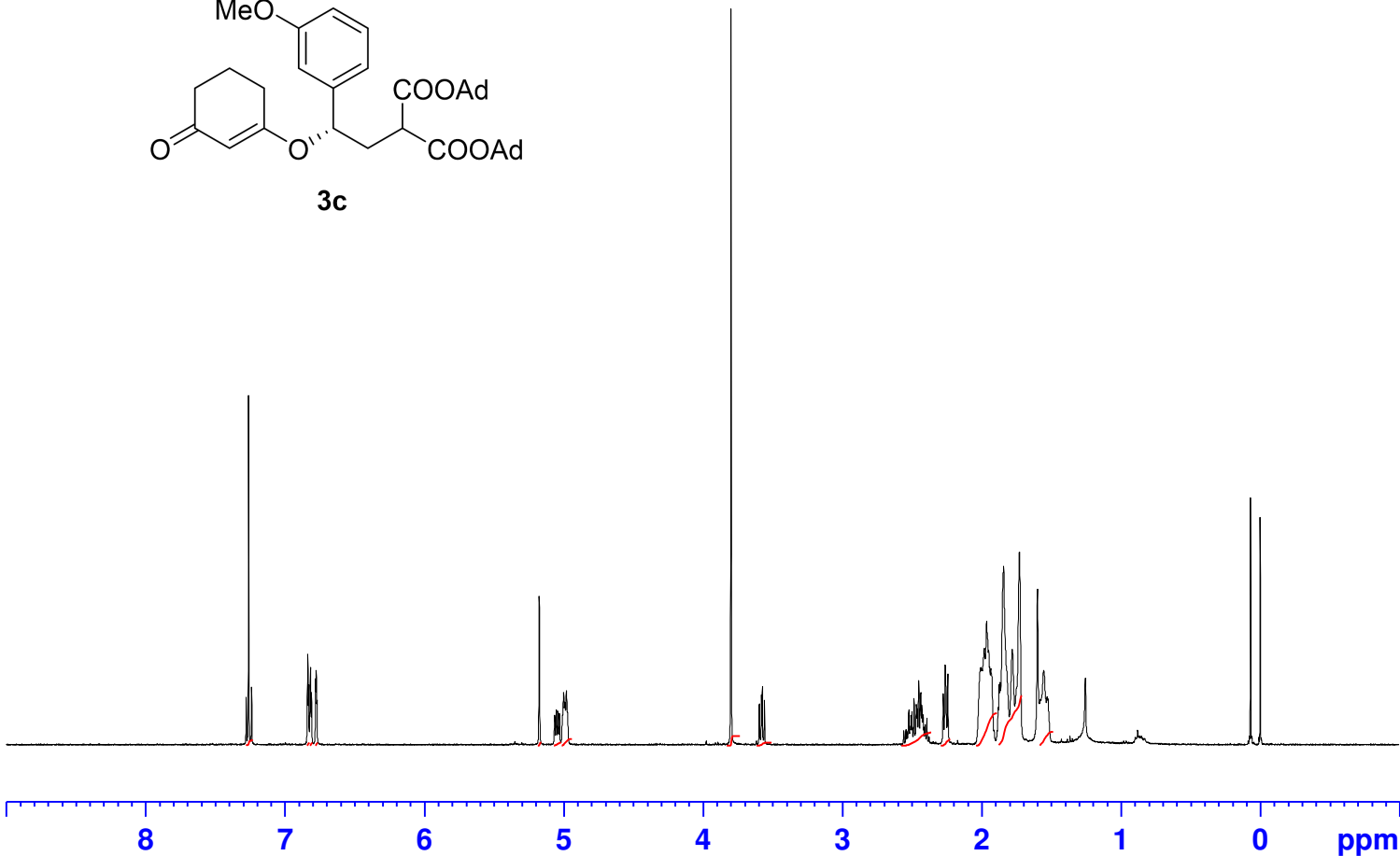
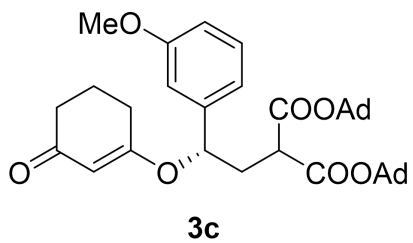
F2 - Acquisition Parameters
 Date_ 20191112
 Time 5.34
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 155
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 297.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

==== CHANNEL f1 =====
 NUC1 13C
 P1 9.90 usec
 PL1 -1.10 dB
 PL1W 40.29647064 W
 SFO1 100.6328888 MHz

==== CHANNEL f2 =====
 CPDPRG[2] waltz16
 NUC2 1H
 PCPD2 90.00 usec
 PL2 -1.00 dB
 PL12 14.68 dB
 PL13 17.68 dB
 PL2W 10.90985775 W
 PL12W 0.29499799 W
 PL13W 0.14784923 W
 SFO2 400.1716007 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6228352 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

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7.237
6.835
6.828
6.814
6.808
6.778
6.774
6.768
5.172
4.997
4.989
4.977
3.796
3.592
3.577
3.571
3.555
2.481
2.465
2.448
2.436
2.433
2.426
2.272
2.257
2.239
2.003
1.995
1.977
1.960
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1.526
1.521

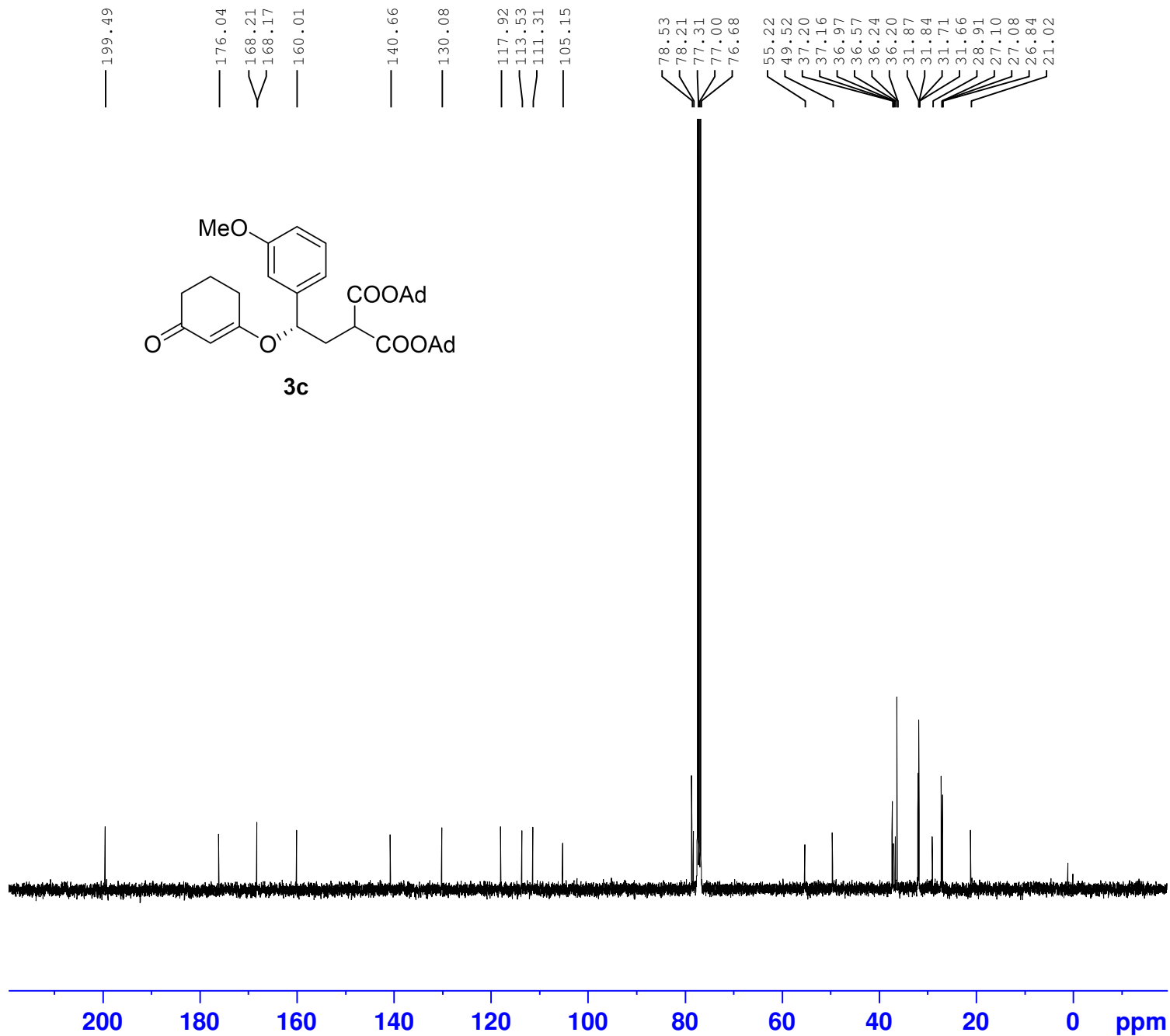


Current Data Parameters
NAME zjc-114-re
EXPNO 2019110701
PROCNO 1

F2 - Acquisition Parameters
Date_ 20191107
Time 16.45
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 228
DW 60.800 usec
DE 6.50 usec
TE 296.8 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700160 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



Current Data Parameters
 NAME zjc-114-re
 EXPNO 2019110702
 PROCNO 1

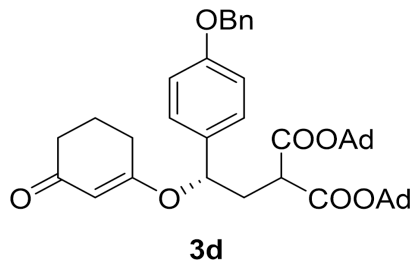
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 Date_ 20191107
 Time 17.34
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 1146
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 297.1 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

==== CHANNEL f1 =====
 NUC1 13C
 P1 9.90 usec
 PL1 -1.10 dB
 PL1W 40.29647064 W
 SFO1 100.6328888 MHz

==== CHANNEL f2 =====
 CPDPRG[2] waltz16
 NUC2 1H
 PCPD2 90.00 usec
 PL2 -1.00 dB
 PL12 14.68 dB
 PL13 17.68 dB
 PL2W 10.90985775 W
 PL12W 0.29499799 W
 PL13W 0.14784923 W
 SFO2 400.1716007 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6228315 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.432
7.416
7.412
7.407
7.405
7.388
7.383
7.368
7.345
7.328
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3.533
3.528
3.512
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2.399
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2.250
2.236
2.001
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1.953
1.940
1.933
1.924
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1.834
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1.819
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1.568
1.545
1.520

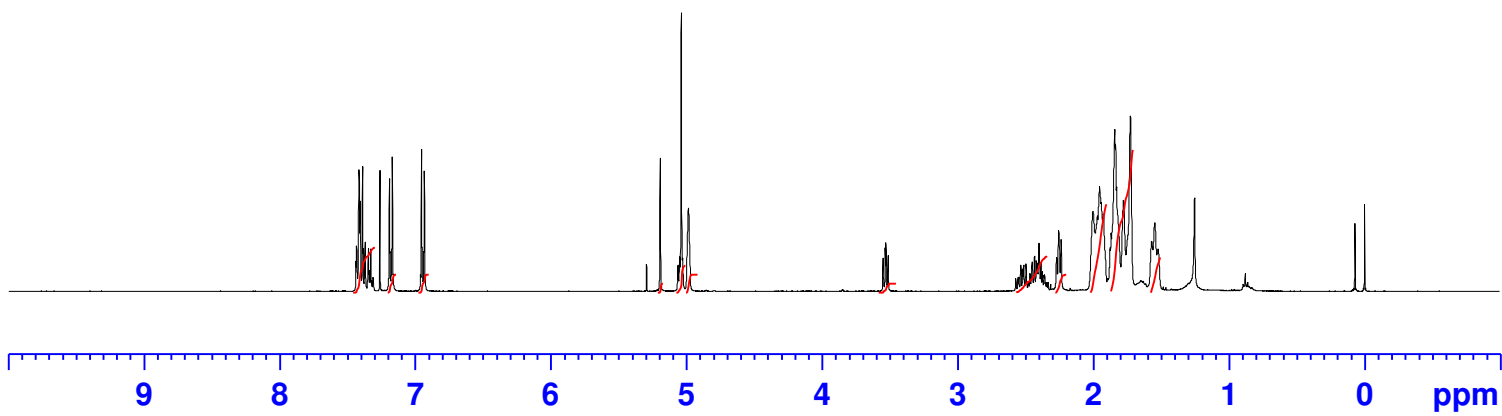


Current Data Parameters
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EXPNO 2019103101
PROCNO 1

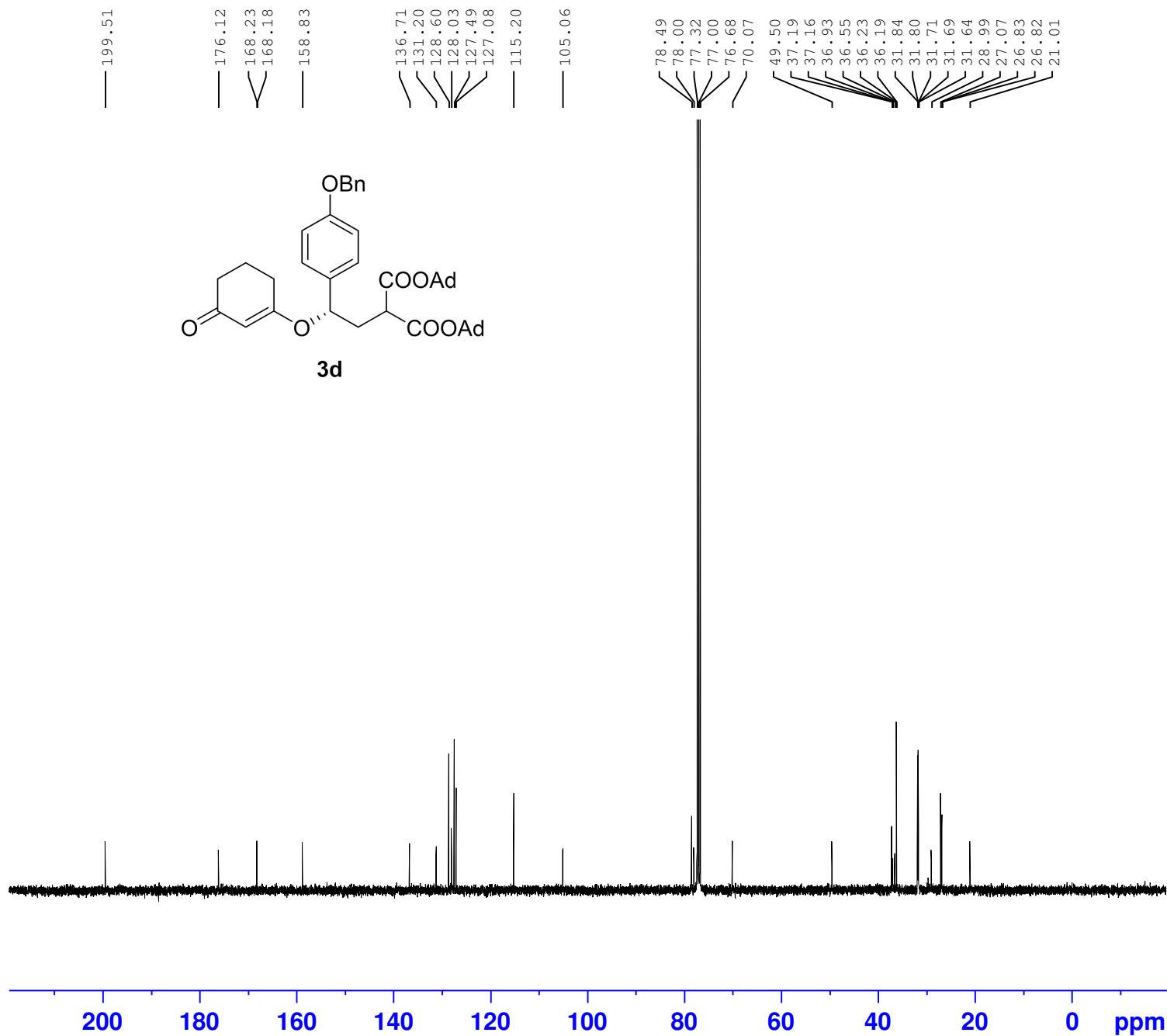
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PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 144
DW 60.800 usec
DE 6.50 usec
TE 296.2 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700160 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



5.06
2.04
2.03
1.00
3.02
2.06
1.02
4.12
2.02
10.01
16.06
4.01



Current Data Parameters
 NAME yl-121 re
 EXPNO 2019103102
 PROCNO 1

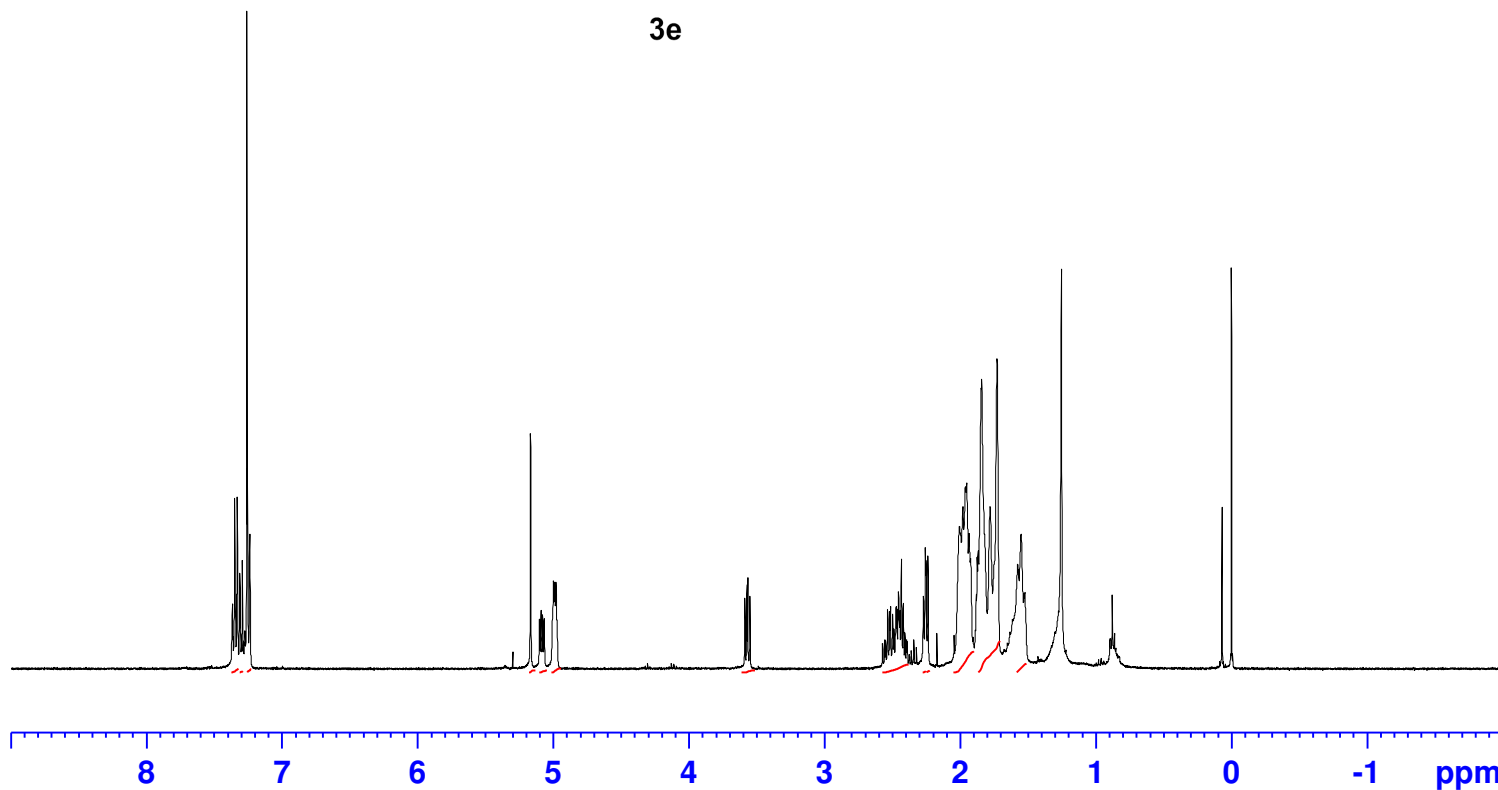
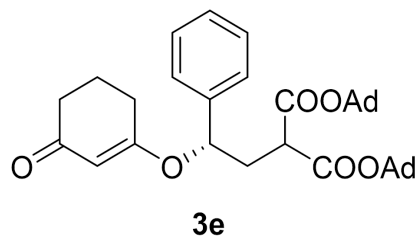
F2 - Acquisition Parameters
 Date_ 20191031
 Time 16.50
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 312
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 296.4 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

==== CHANNEL f1 =====
 NUC1 13C
 P1 9.90 usec
 PL1 -1.10 dB
 PL1W 40.29647064 W
 SFO1 100.6328888 MHz

==== CHANNEL f2 =====
 CPDPRG[2] waltz16
 NUC2 1H
 PCPD2 90.00 usec
 PL2 -1.00 dB
 PL12 14.68 dB
 PL13 17.68 dB
 PL2W 10.90985775 W
 PL12W 0.29499799 W
 PL13W 0.14784923 W
 SFO2 400.1716007 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6228330 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.366
7.349
7.345
7.330
7.310
7.307
7.293
7.260
7.255
7.238
5.167
4.997
4.989
4.979
3.586
3.570
3.565
3.549
2.512
2.470
2.452
2.431
2.416
2.269
2.255
2.250
2.236
2.003
1.977
1.961
1.950
1.933
1.921
1.879
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1.865
1.840
1.777
1.726
1.574
1.568
1.550
1.528
1.521



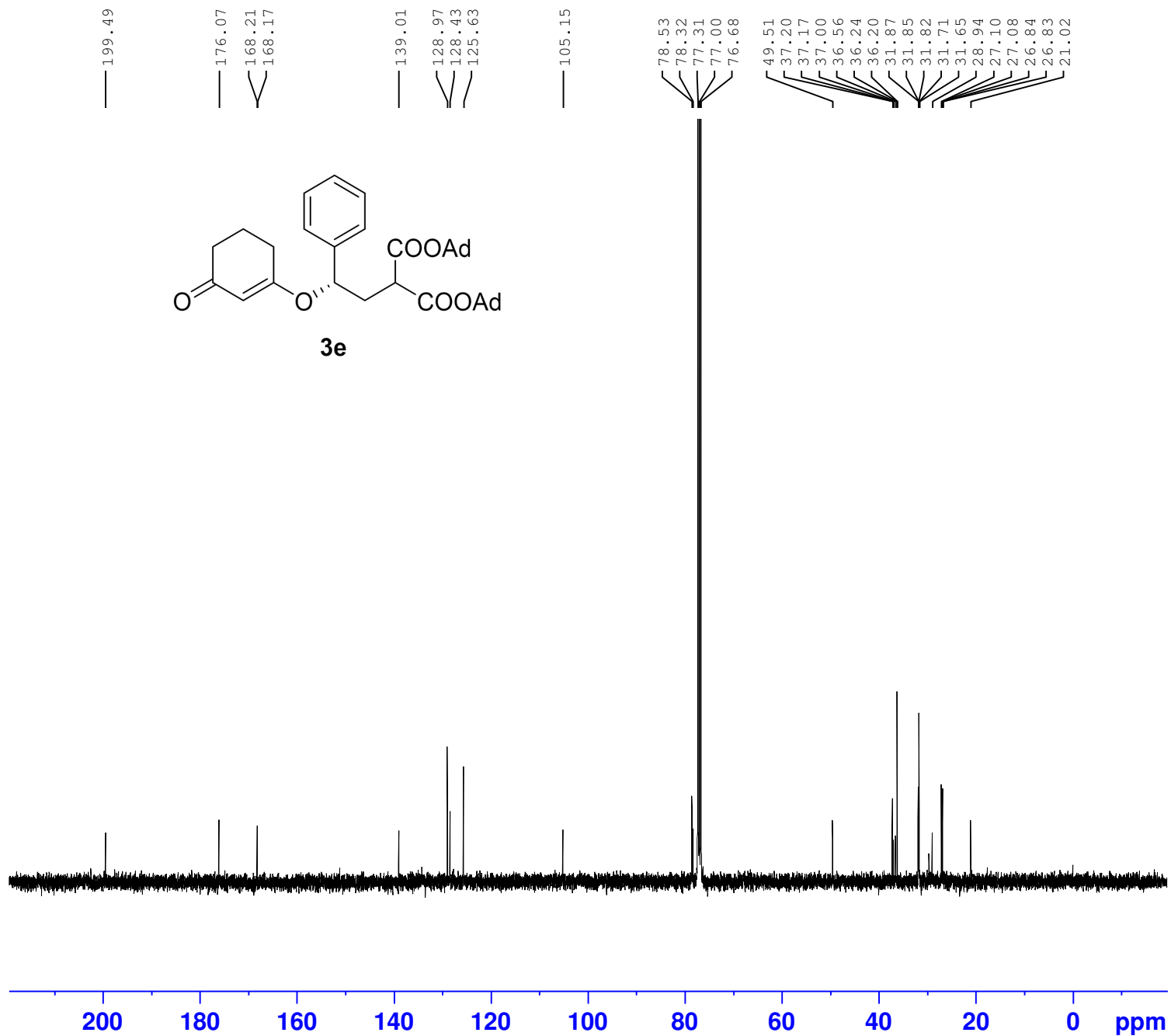
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0.99
10.85
16.17
4.79

Current Data Parameters
NAME yl-120 re
EXPNO 2019103101
PROCNO 1

F2 - Acquisition Parameters
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Time 16.00
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PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 228
DW 60.800 usec
DE 6.50 usec
TE 296.2 K
D1 1.00000000 sec
TD0 1

===== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700158 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



Current Data Parameters
 NAME yl-120 re
 EXPNO 2019103102
 PROCNO 1

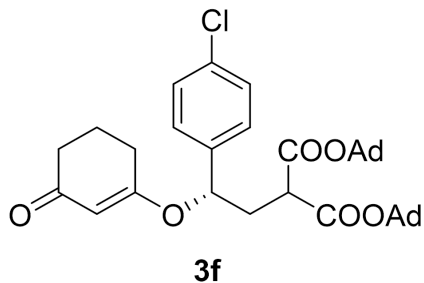
F2 - Acquisition Parameters
 Date_ 20191031
 Time 17.24
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 794
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 296.9 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

==== CHANNEL f1 =====
 NUC1 13C
 P1 9.90 usec
 PL1 -1.10 dB
 PL1W 40.29647064 W
 SFO1 100.6328888 MHz

==== CHANNEL f2 =====
 CPDPRG[2] waltz16
 NUC2 1H
 PCPD2 90.00 usec
 PL2 -1.00 dB
 PL12 14.68 dB
 PL13 17.68 dB
 PL2W 10.90985775 W
 PL12W 0.29499799 W
 PL13W 0.14784923 W
 SFO2 400.1716007 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6228315 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.322
7.301
7.192
7.170
5.105
5.060
5.049
5.038
4.975
4.967
4.958
3.550
3.535
3.528
3.513
2.485
2.470
2.464
2.448
2.420
2.407
2.398
2.387
2.259
2.244
2.241
2.226
1.983
1.963
1.949
1.941
1.934
1.927
1.919
1.903
1.856
1.850
1.824
1.758
1.709
1.556
1.532
1.513
1.507

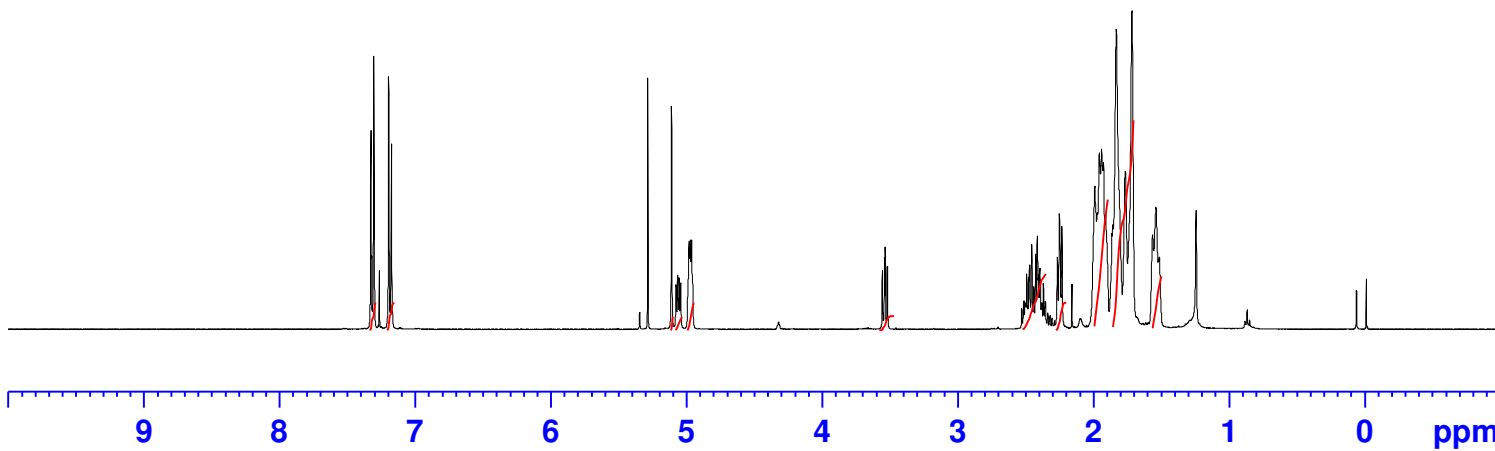


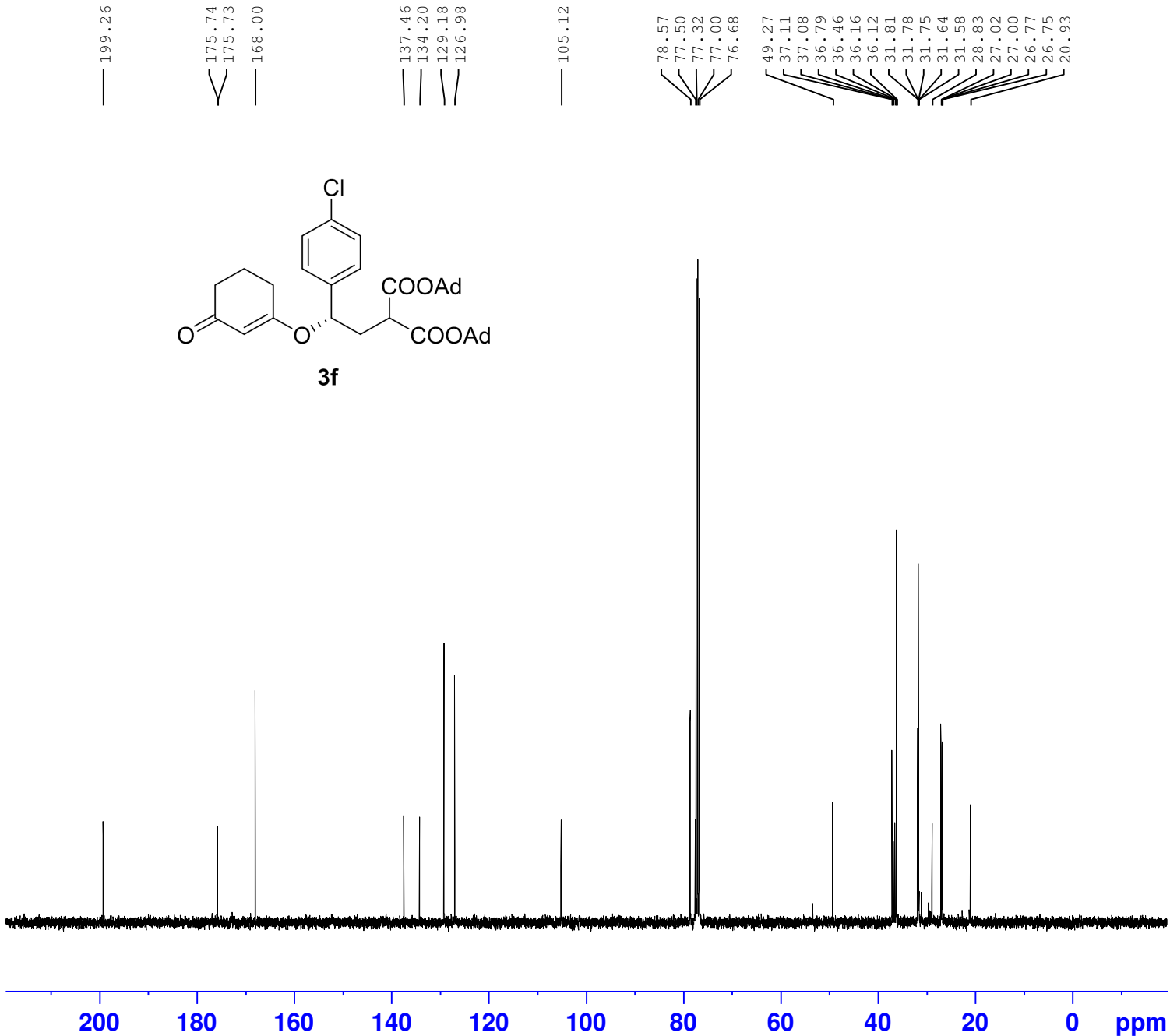
Current Data Parameters
NAME zjc-115 re
EXPNO 2019103101
PROCNO 1

F2 - Acquisition Parameters
Date_ 20191031
Time 15.52
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 40.3
DW 60.800 usec
DE 6.50 usec
TE 296.1 K
D1 1.0000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700158 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00





Current Data Parameters
 NAME zjc-115 re
 EXPNO 2019103102
 PROCNO 1

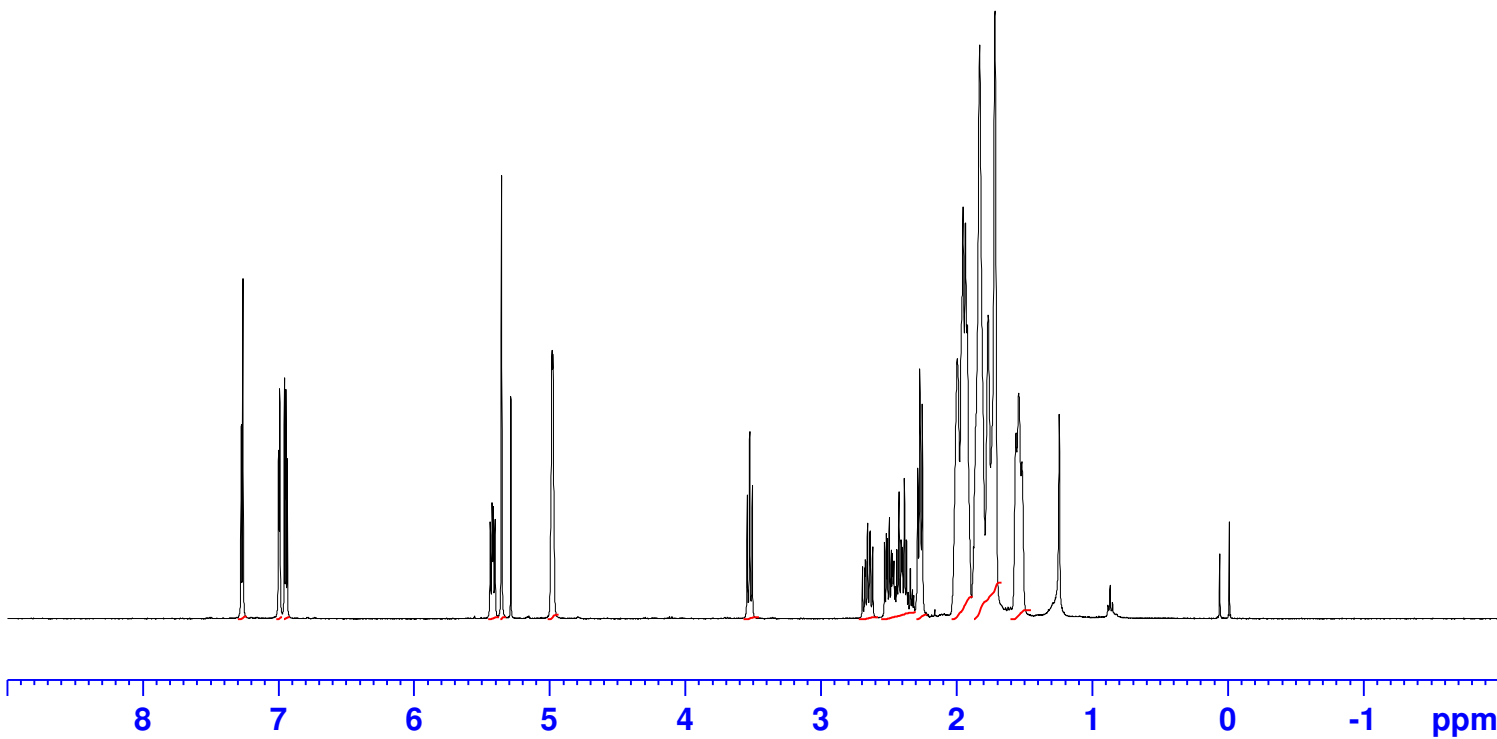
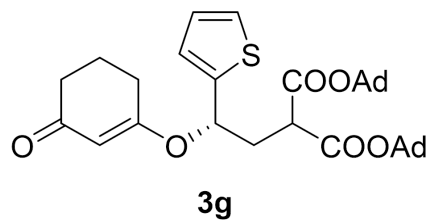
F2 - Acquisition Parameters
 Date_ 20191031
 Time 16.29
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 166
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 296.4 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

===== CHANNEL f1 =====
 NUC1 13C
 P1 9.90 usec
 PL1 -1.10 dB
 PL1W 40.29647064 W
 SFO1 100.6328888 MHz

===== CHANNEL f2 =====
 CPDPRG[2] waltz16
 NUC2 1H
 PCPD2 90.00 usec
 PL2 -1.00 dB
 PL12 14.68 dB
 PL13 17.68 dB
 PL2W 10.90985775 W
 PL12W 0.29499799 W
 PL13W 0.14784923 W
 SFO2 400.1716007 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6228366 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.275
7.272
7.260
6.998
6.997
6.990
6.988
6.955
6.946
6.943
6.934
5.436
5.423
5.415
5.402
5.353
4.982
4.975
3.541
3.524
3.521
3.504
2.654
2.638
2.633
2.514
2.508
2.494
2.421
2.382
2.283
2.269
2.265
2.250
1.993
1.949
1.933
1.919
1.826
1.764
1.714
1.558
1.539
1.516

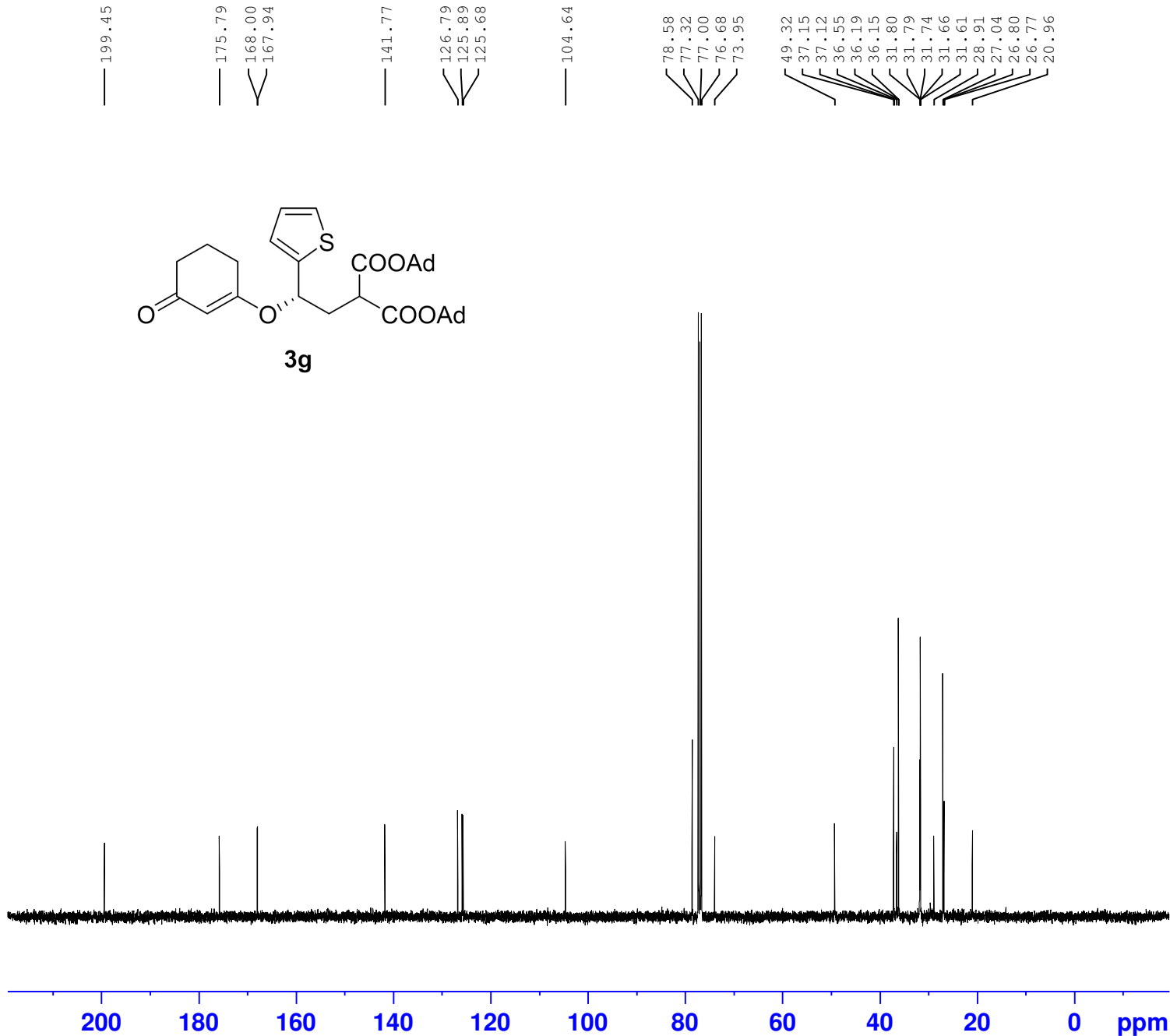


Current Data Parameters
NAME yl-119 re
EXPNO 2019103101
PROCNO 1

F2 - Acquisition Parameters
Date_ 20191031
Time 15.56
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 71.8
DW 60.800 usec
DE 6.50 usec
TE 296.1 K
D1 1.00000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700158 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



Current Data Parameters
 NAME yl-119 re
 EXPNO 2019103102
 PROCNO 1

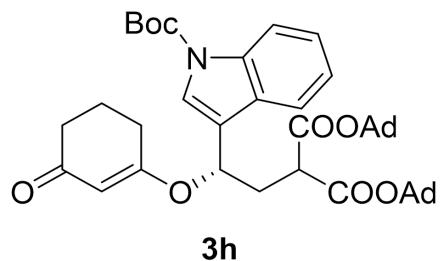
F2 - Acquisition Parameters
 Date_ 20191031
 Time 16.42
 INSTRUM spect
 PROBHD 5 mm PABBO BB-
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 132
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.366798 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 296.5 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1

==== CHANNEL f1 =====
 NUC1 13C
 P1 9.90 usec
 PL1 -1.10 dB
 PL1W 40.29647064 W
 SFO1 100.6328888 MHz

==== CHANNEL f2 =====
 CPDPRG[2] waltz16
 NUC2 1H
 PCPD2 90.00 usec
 PL2 -1.00 dB
 PL12 14.68 dB
 PL13 17.68 dB
 PL2W 10.90985775 W
 PL12W 0.29499799 W
 PL13W 0.14784923 W
 SFO2 400.1716007 MHz

F2 - Processing parameters
 SI 32768
 SF 100.6228352 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.655
7.636
7.499
7.330
7.327
7.309
7.306
7.260
7.250
7.247
7.230
7.228
5.403
5.393
5.338
4.992
4.982
3.633
3.617
3.612
3.596
2.429
2.257
2.249
2.244
2.238
2.229
1.990
1.968
1.951
1.937
1.916
1.865
1.858
1.832
1.811
1.771
1.738
1.716
1.671
1.558
1.555
1.543
1.527

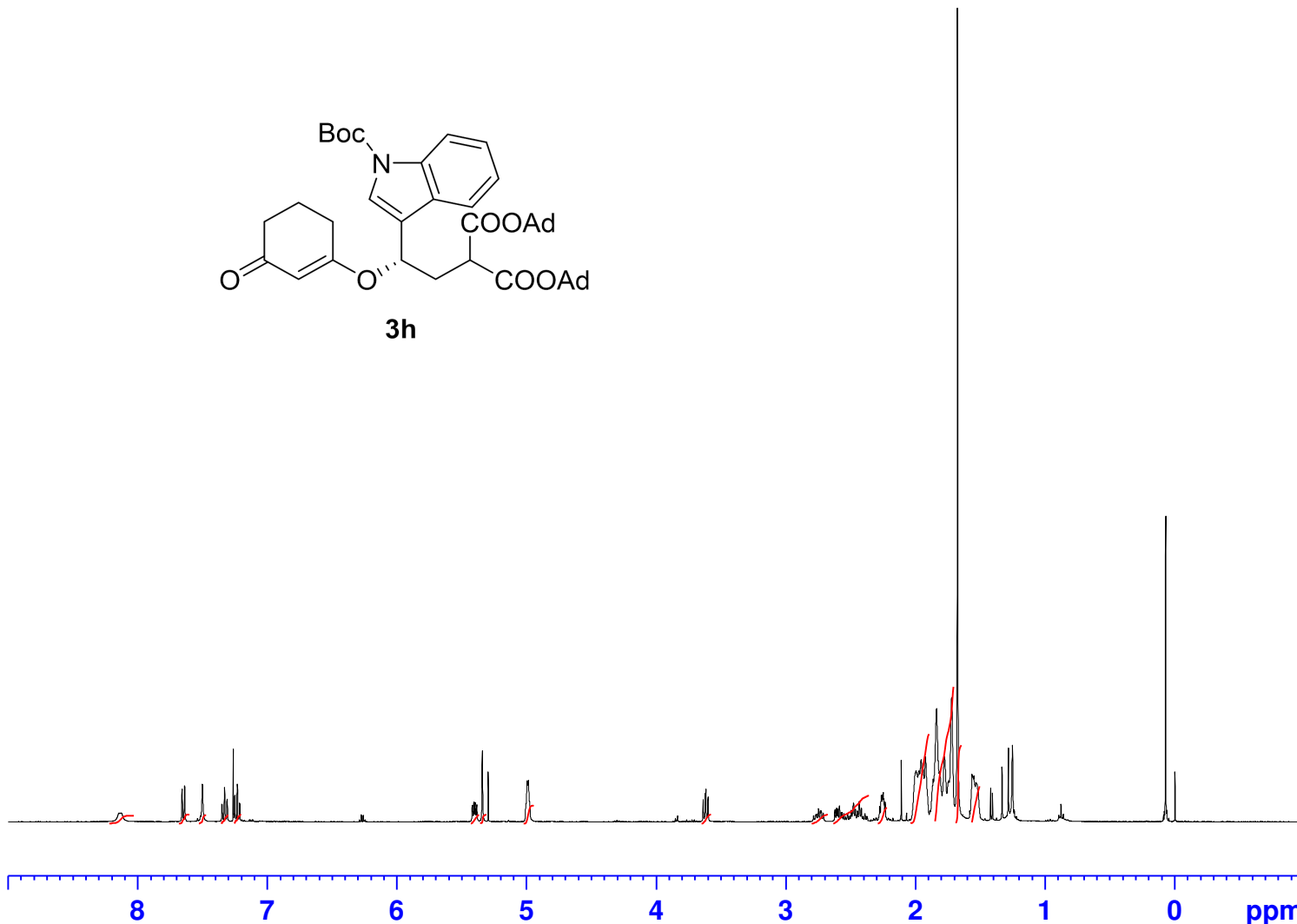


Current Data Parameters
NAME yl-143 rep2
EXPNO 2019121901
PROCNO 1

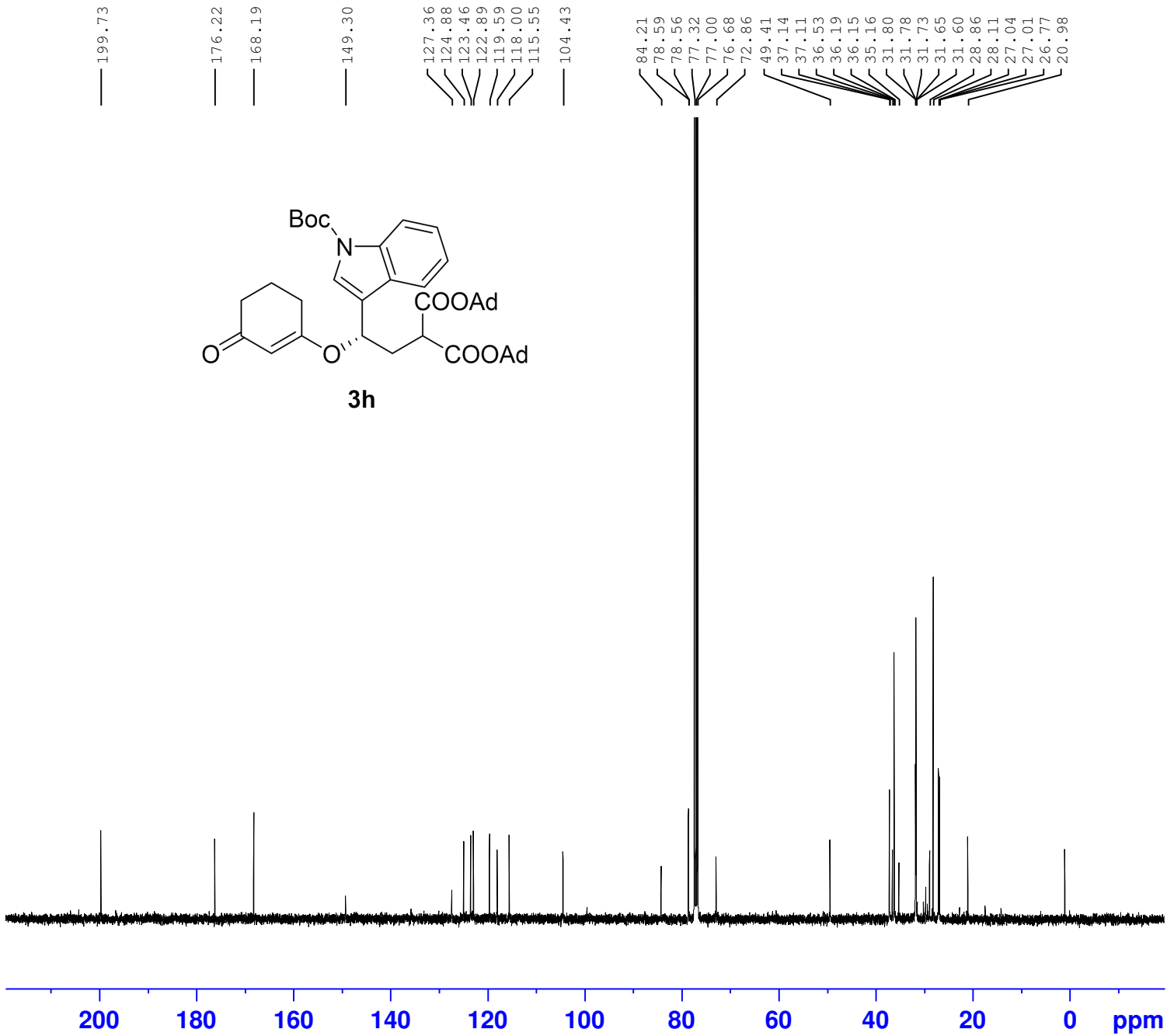
F2 - Acquisition Parameters
Date_ 20191219
Time 17.40
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 101
DW 60.800 usec
DE 6.50 usec
TE 291.7 K
D1 1.00000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700155 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



0.91
1.00
0.94
1.02
1.02
0.97
0.99
2.07
1.00
0.99
3.21
1.86
10.38
15.99
9.05
4.27



```

Current Data Parameters
NAME      yl-143 rep2
EXPNO     2019121902
PROCNO    1

F2 - Acquisition Parameters
Date_     20191219
Time      18.51
INSTRUM   spect
PROBHD    5 mm PABBO BB-
PULPROG   zgpg30
TD         65536
SOLVENT   CDC13
NS         705
DS         4
SWH        24038.461 Hz
FIDRES     0.366798 Hz
AQ         1.3631488 sec
RG         2050
DW         20.800 usec
DE         6.50 usec
TE         291.8 K
D1         2.00000000 sec
D11        0.03000000 sec
TD0        1

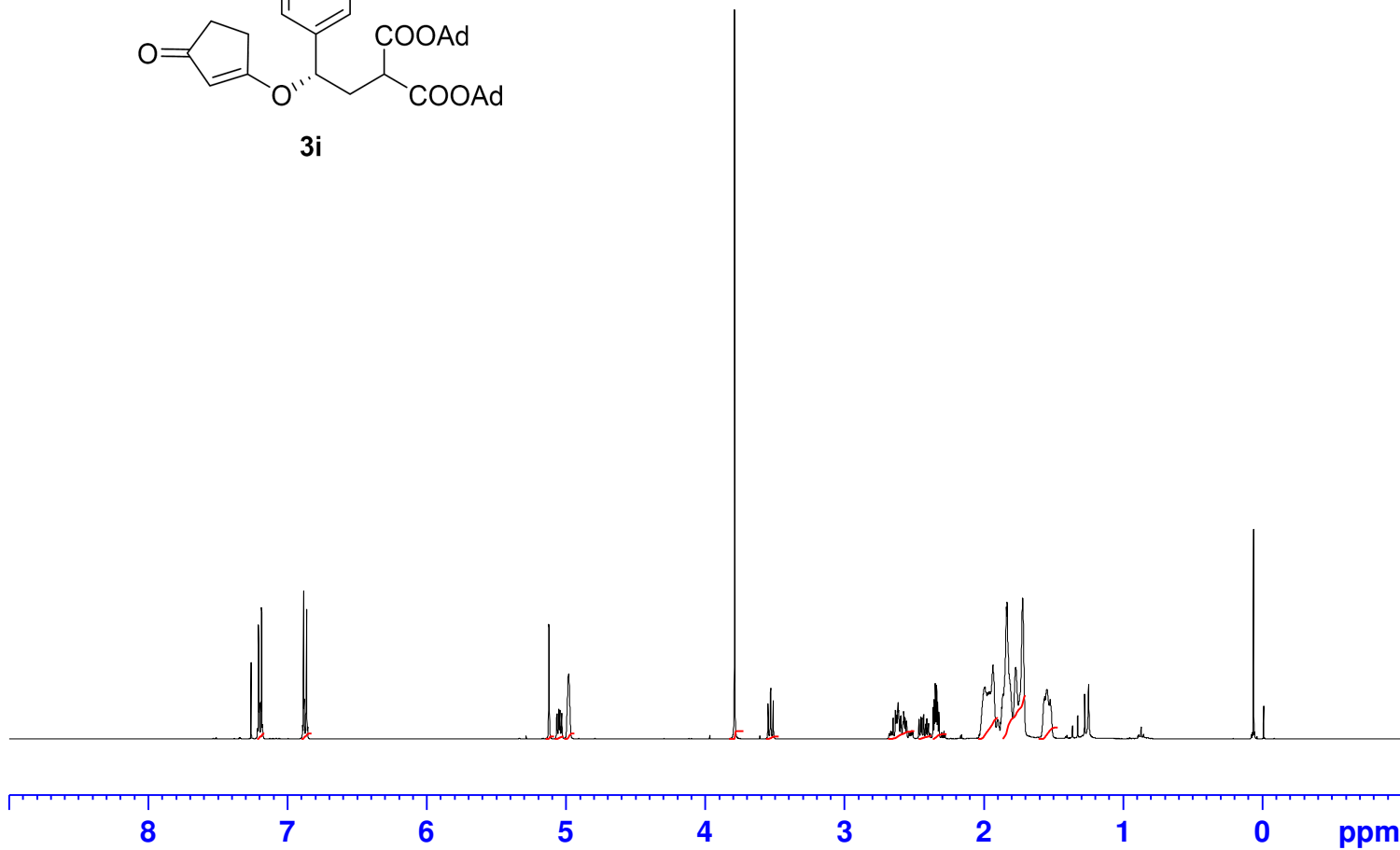
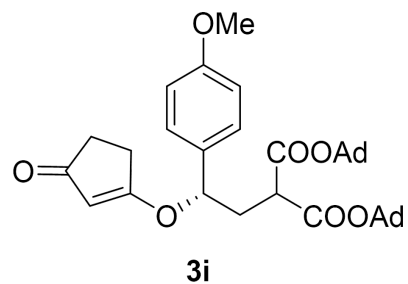
===== CHANNEL f1 =====
NUC1       13C
P1         9.90 usec
PL1        -1.10 dB
PL1W       40.29647064 W
SFO1       100.6328888 MHz

===== CHANNEL f2 =====
CPDPRG[2]  waltz16
NUC2       1H
PCPD2      90.00 usec
PL2        -1.00 dB
PL12       14.68 dB
PL13       17.68 dB
PL2W       10.90985775 W
PL12W      0.29499799 W
PL13W      0.14784923 W
SFO2       400.1716007 MHz

F2 - Processing parameters
SI         32768
SF         100.6228352 MHz
WDW        EM
SSB        0
LB         1.00 Hz
GB         0
PC         1.40

```

7.260
7.207
7.185
6.883
6.861
5.120
5.051
5.041
4.981
4.978
3.787
3.546
3.530
3.526
3.509
2.631
2.612
2.609
2.573
2.361
2.352
2.345
2.335
2.328
1.994
1.987
1.979
1.969
1.961
1.953
1.930
1.861
1.855
1.834
1.828
1.822
1.814
1.767
1.717
1.564
1.558
1.543
1.527
1.519

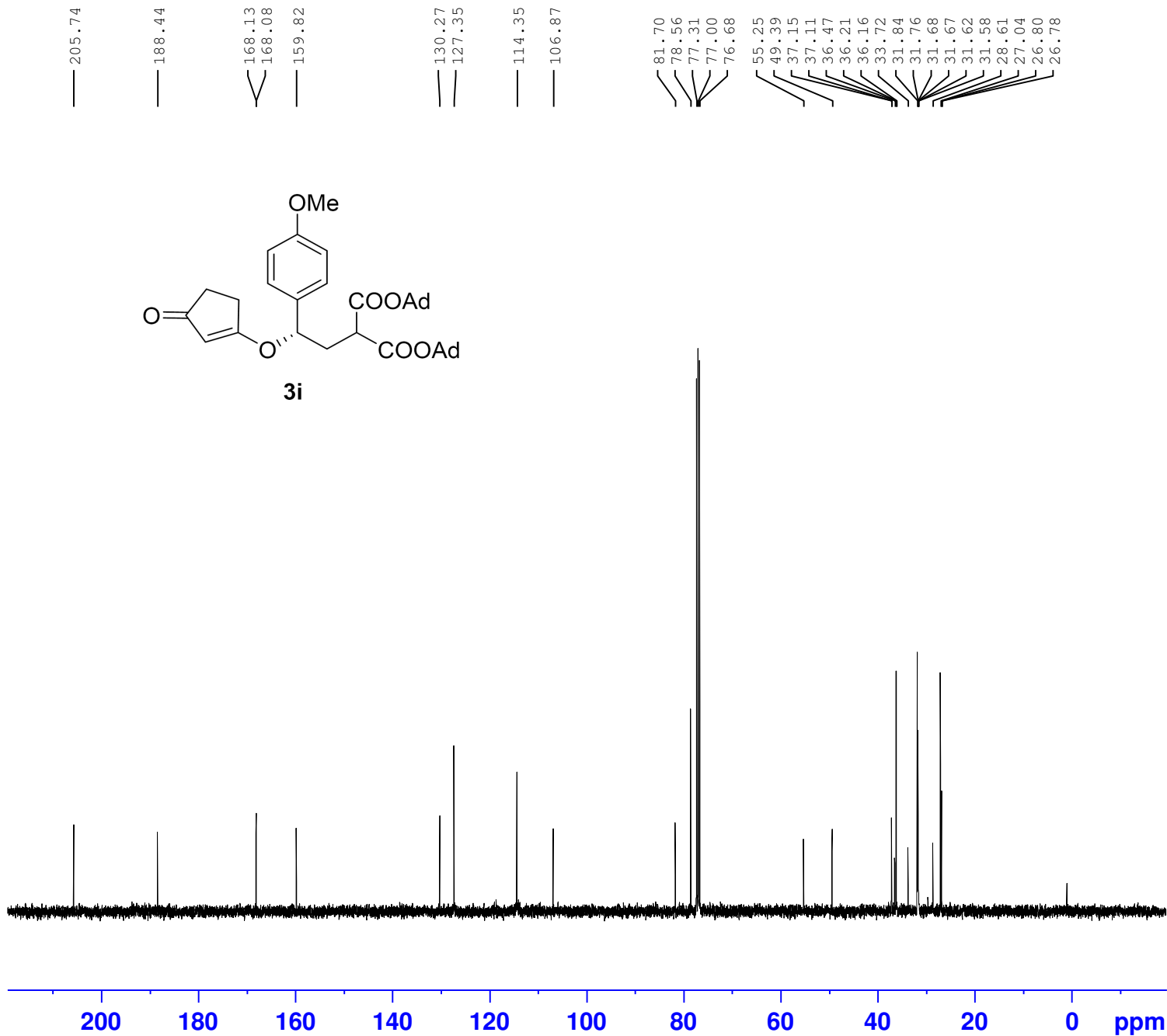


1.99
2.00
1.01
1.00
2.01
3.03
1.00
3.03
1.16
1.89
7.87
16.16
4.20

Current Data Parameters
NAME yl-164
EXPNO 2020052701
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200528
Time 8.45 h
INSTRUM spect
PROBHD Z108618_0256 (
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.250967 Hz
AQ 3.9845889 sec
RG 101
DW 60.800 usec
DE 6.50 usec
TE 298.5 K
D1 1.00000000 sec
TD0 1
SFO1 400.1724712 MHz
NUC1 1H
P0 3.33 usec
P1 10.00 usec
PLW1 15.00000000 W

F2 - Processing parameters
SI 32768
SF 400.1700092 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



Current Data Parameters
 NAME yl-164
 EXPNO 2020052702
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200528
 Time 12.28 h
 INSTRUM spect
 PROBHD Z108618_0256 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 101
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 298.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 100.6328888 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 50.00000000 W
 SFO2 400.1716007 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 90.00 usec
 PLW2 15.00000000 W
 PLW12 0.18519001 W
 PLW13 0.09314700 W

F2 - Processing parameters
 SI 32768
 SF 100.6228330 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

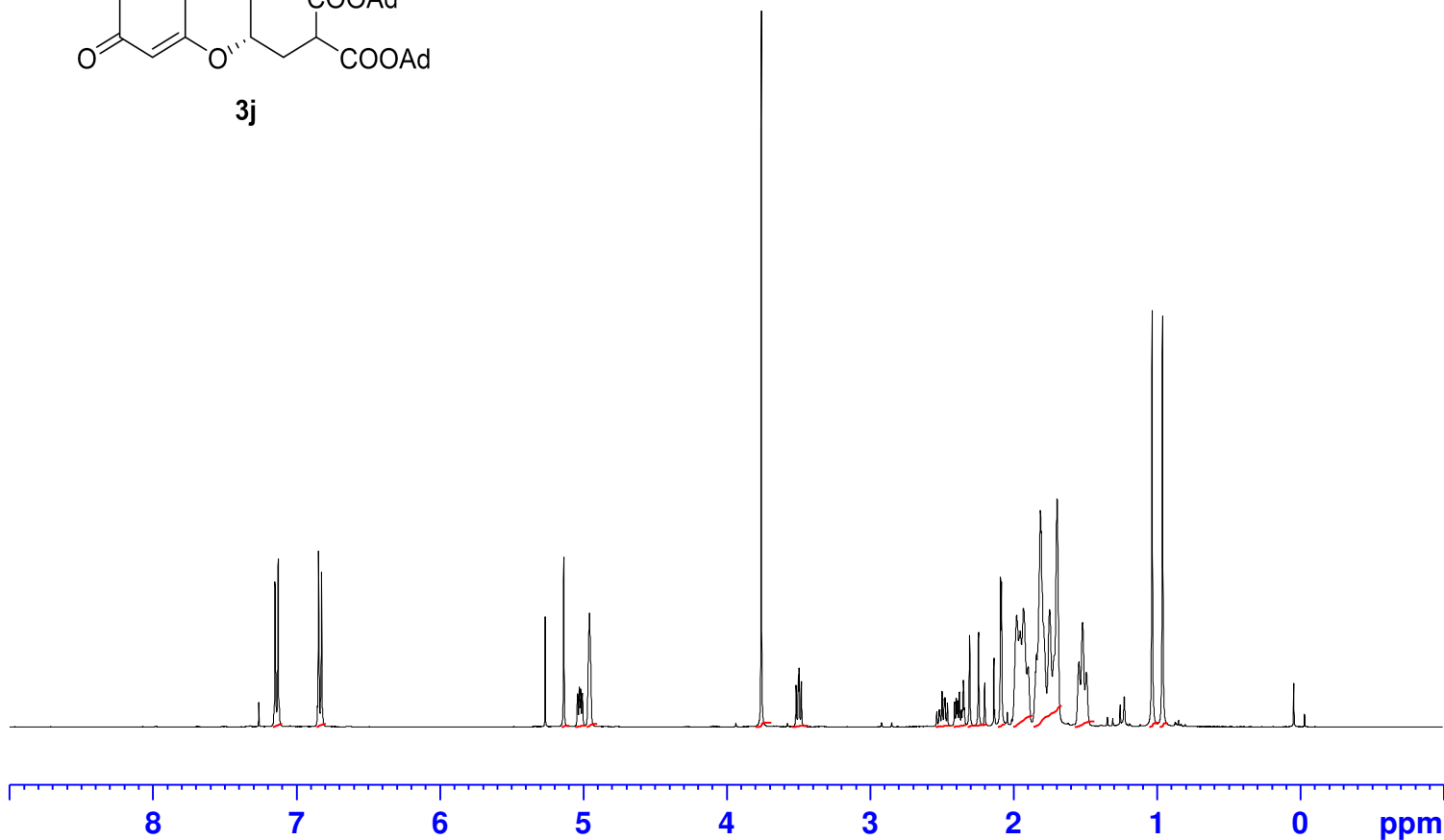
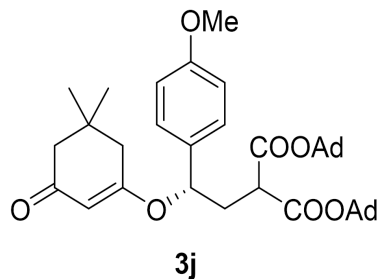
7.146
7.124
6.843
6.821
5.133
5.036
5.024
5.015
5.002
4.953
3.755
3.512
3.496
3.491
3.475
2.494
2.478
2.473
2.395
2.386
2.373
2.345
2.302
2.240
2.197
2.086
2.079
1.973
1.950
1.926
1.895
1.842
1.835
1.808
1.802
1.795
1.744
1.710
1.691
1.539
1.514
1.488
1.029
0.956

Current Data Parameters
NAME yl-163
EXPNO 2020010301
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200103
Time 17.42
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 28.5
DW 60.800 usec
DE 6.50 usec
TE 300.0 K
D1 1.00000000 sec
TD0 1

==== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

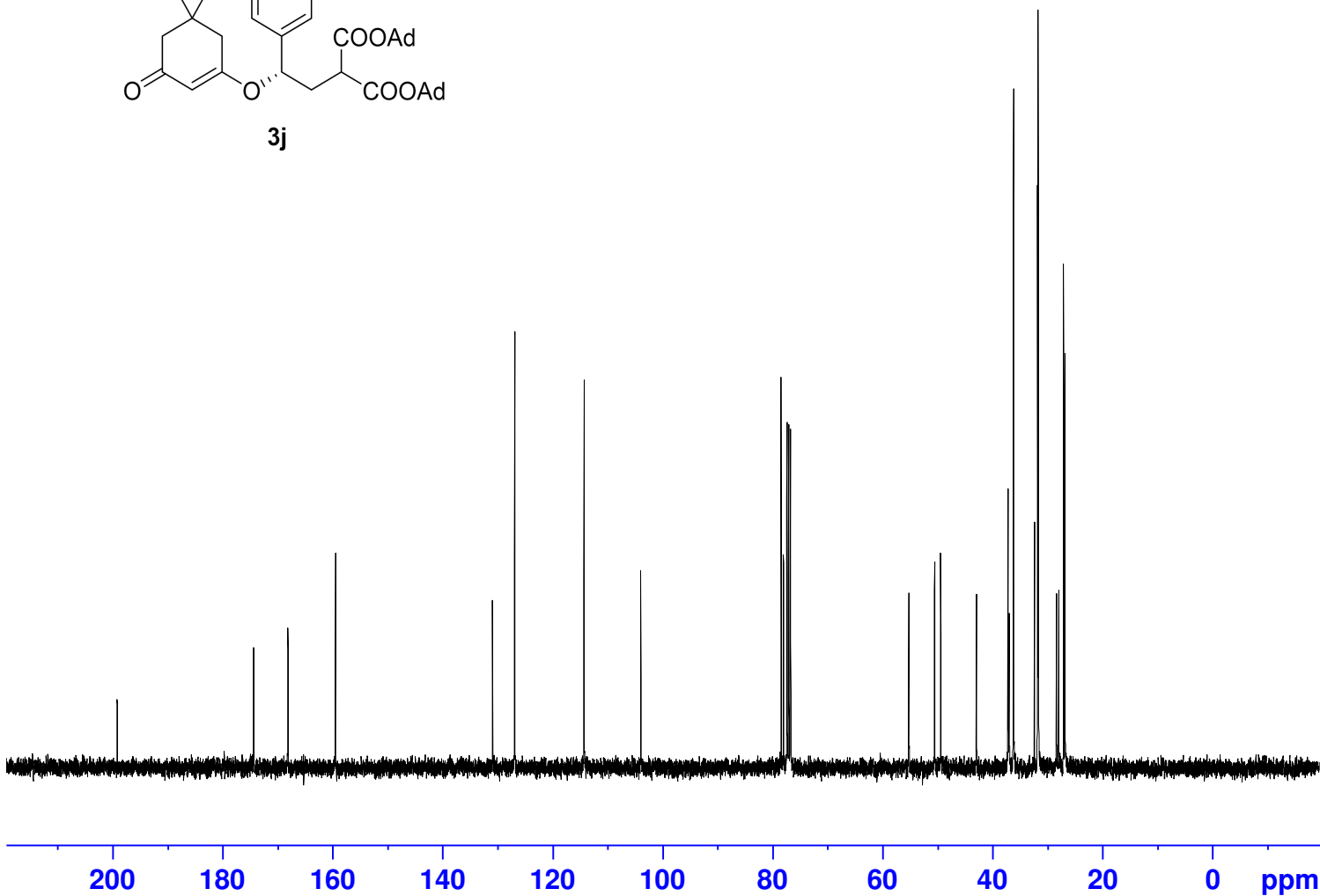
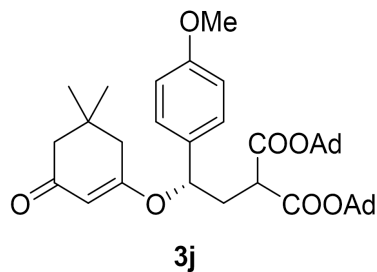
F2 - Processing parameters
SI 32768
SF 400.1700152 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



2.00
2.00
1.01
1.01
2.01
3.03
1.00
1.01
1.32
1.77
1.88
8.44
16.11
4.08
3.00
2.97

199.17
 174.35
 168.15
 168.11
 159.47
 130.90
 126.87
 114.26
 103.92

78.41
 77.97
 77.32
 77.00
 76.68
 55.18
 50.49
 49.38
 42.86
 37.13
 37.10
 36.92
 36.17
 36.13
 32.32
 31.79
 31.73
 31.65
 31.59
 28.31
 27.90
 27.02
 26.77

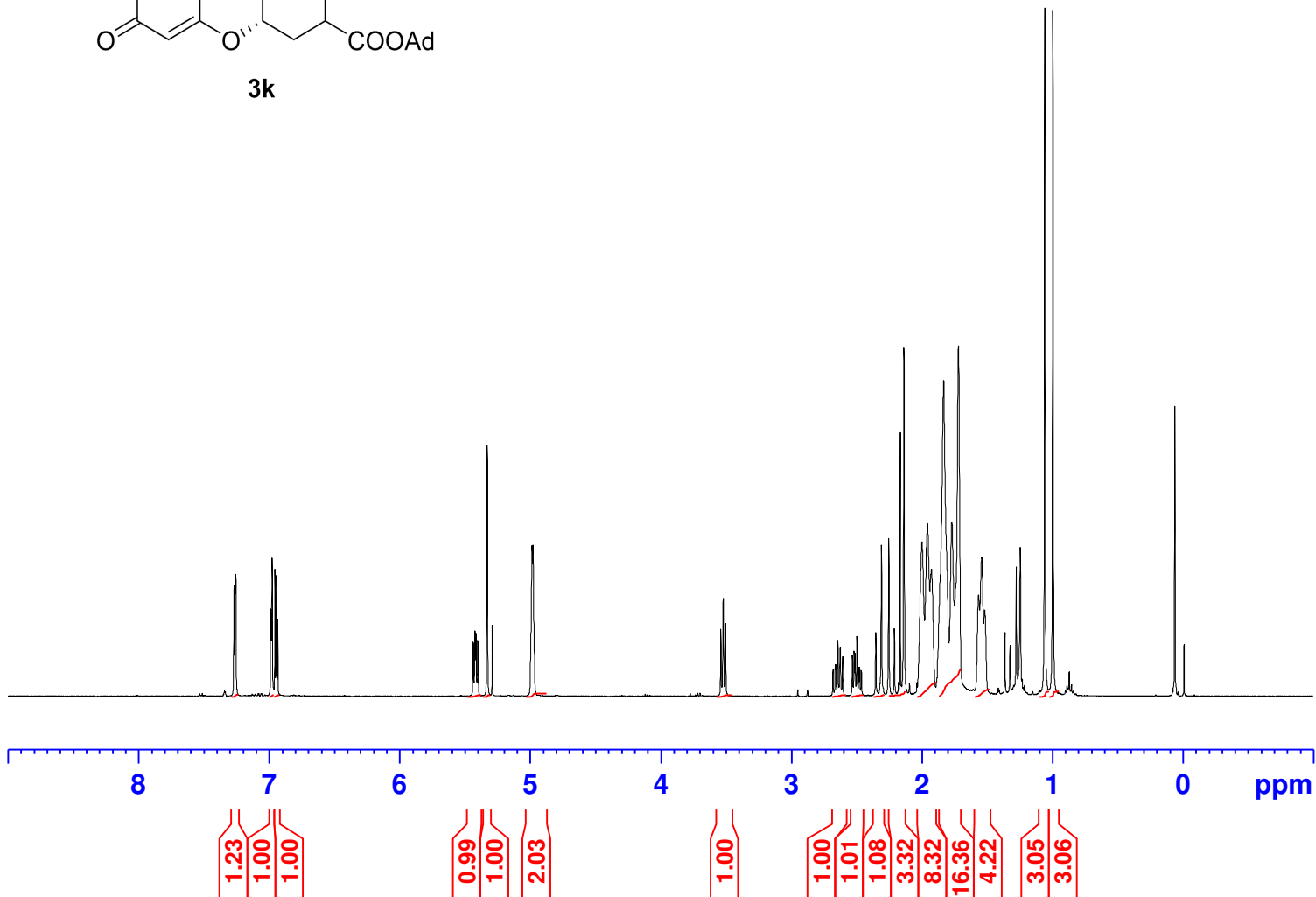
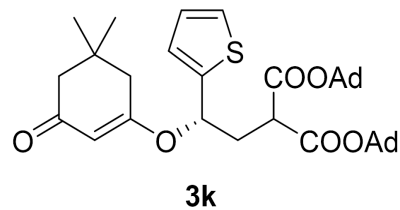


Current Data Parameters
 NAME yl-163
 EXPNO 20200527
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200528
 Time 6.14 h
 INSTRUM spect
 PROBHD z108618_0256 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 150
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 298.9 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 100.6328888 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 50.00000000 W
 SFO2 400.1716007 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 90.00 usec
 PLW2 15.00000000 W
 PLW12 0.18519001 W
 PLW13 0.09314700 W

F2 - Processing parameters
 SI 32768
 SF 100.6228351 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.268
7.266
7.260
7.256
7.254
6.984
6.977
6.954
6.945
6.942
6.933
5.434
5.421
5.413
5.400
5.327
4.984
4.977
3.538
3.520
3.518
3.500
2.641
2.624
2.621
2.516
2.495
2.349
2.306
2.250
2.207
2.161
2.134
1.995
1.954
1.923
1.828
1.765
1.715
1.562
1.539
1.514
1.054
0.992

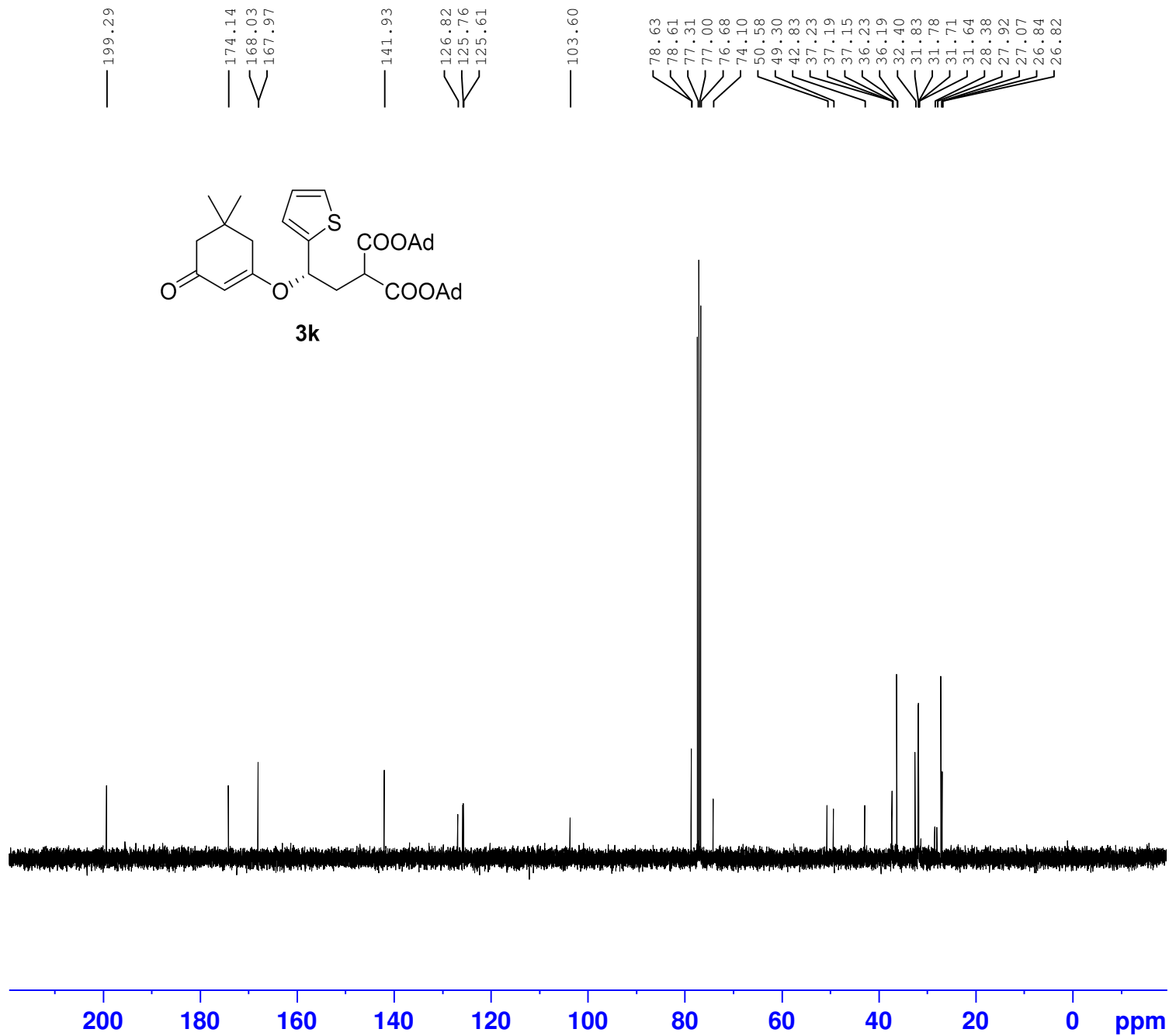


Current Data Parameters
NAME yl-166
EXPNO 2020010301
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200103
Time 17.47
INSTRUM spect
PROBHD 5 mm PABBO BB-
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.125483 Hz
AQ 3.9845889 sec
RG 80.6
DW 60.800 usec
DE 6.50 usec
TE 300.0 K
D1 1.00000000 sec
TDO 1

===== CHANNEL f1 =====
NUC1 1H
P1 14.80 usec
PL1 -1.00 dB
PL1W 10.90985775 W
SFO1 400.1724712 MHz

F2 - Processing parameters
SI 32768
SF 400.1700155 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00

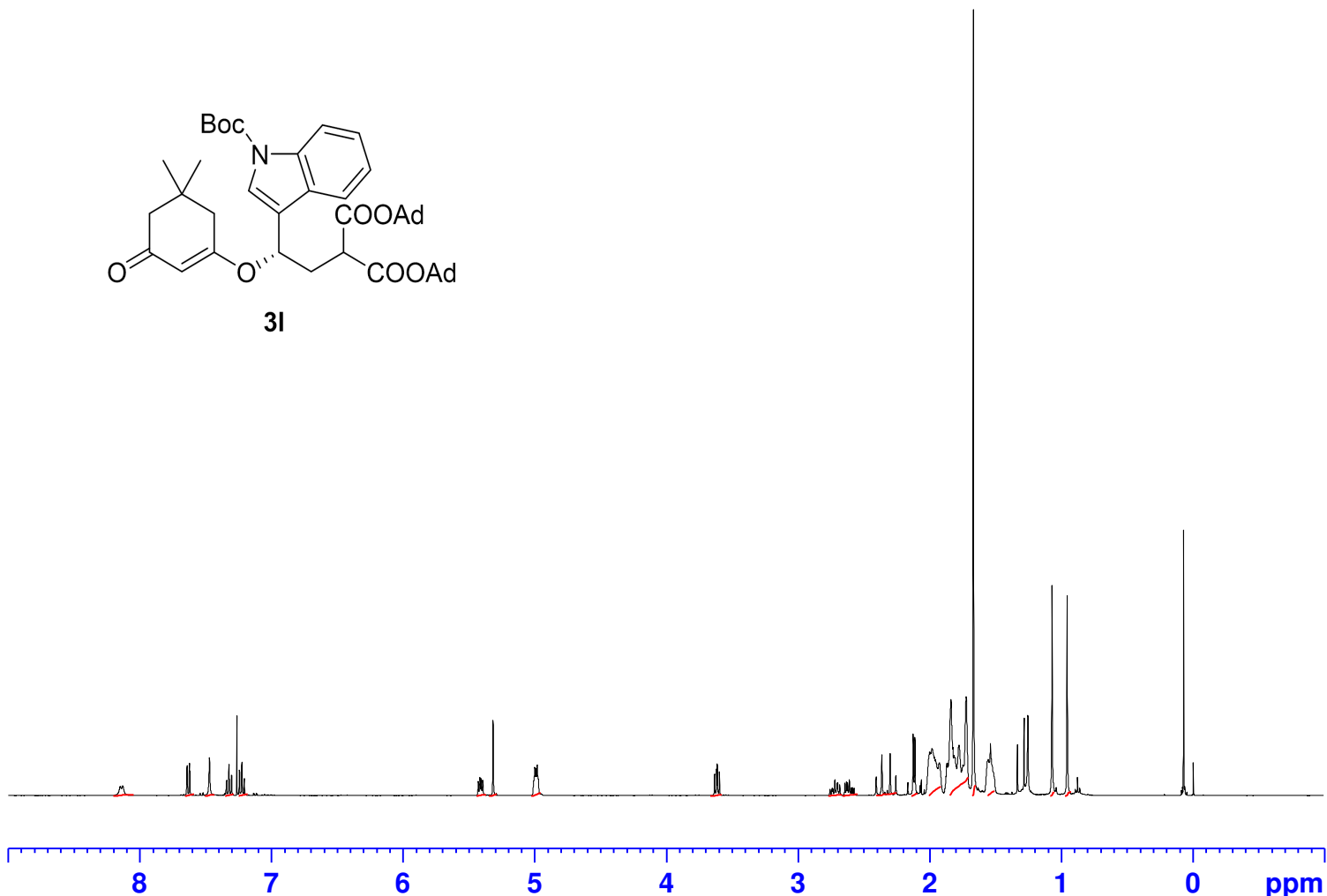
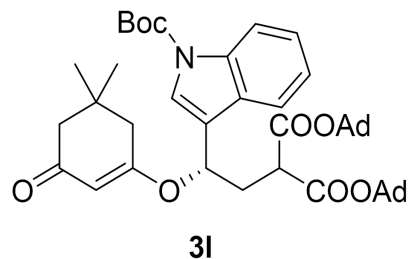


Current Data Parameters
 NAME yl-166
 EXPNO 20200527
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200528
 Time 6.27 h
 INSTRUM spect
 PROBHD Z108618_0256 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 150
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 299.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 100.6328888 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 50.00000000 W
 SFO2 400.1716007 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 90.00 usec
 PLW2 15.00000000 W
 PLW12 0.18519001 W
 PLW13 0.09314700 W

F2 - Processing parameters
 SI 32768
 SF 100.6228308 MHz
 WDW no
 SSB 0
 LB 0 Hz
 GB 0
 PC 1.40

7.639
7.620
7.469
7.323
7.321
7.260
7.243
7.241
7.223
7.221
5.314
4.997
4.988
4.978
3.631
3.615
3.609
3.594
2.359
2.296
2.121
2.108
1.997
1.989
1.980
1.959
1.951
1.944
1.935
1.920
1.834
1.819
1.811
1.804
1.773
1.744
1.737
1.719
1.664
1.550
1.534
1.511
1.066
0.951

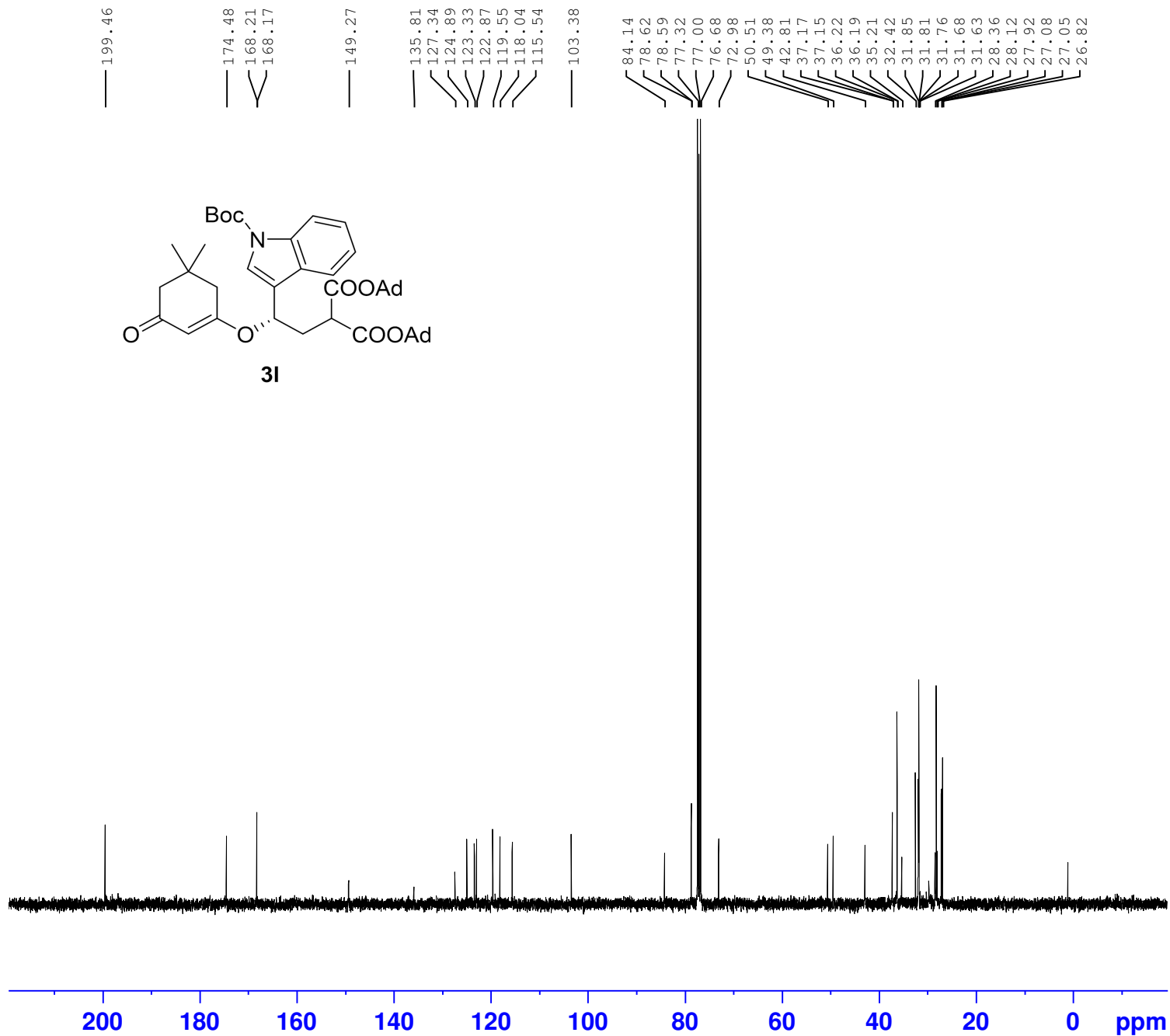


1.00
1.08
1.04
1.12
1.13
1.06
1.08
2.22
1.07
1.08
1.12
2.37
1.95
8.37
16.68
9.29
4.30
3.19
3.20

Current Data Parameters
NAME yl-169
EXPNO 2020052701
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200528
Time 8.50 h
INSTRUM spect
PROBHD Z108618_0256 (
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 8223.685 Hz
FIDRES 0.250967 Hz
AQ 3.9845889 sec
RG 101
DW 60.800 usec
DE 6.50 usec
TE 298.4 K
D1 1.00000000 sec
TD0 1
SFO1 400.1724712 MHz
NUC1 1H
P0 3.33 usec
P1 10.00 usec
PLW1 15.00000000 W

F2 - Processing parameters
SI 32768
SF 400.1700092 MHz
WDW no
SSB 0
LB 0 Hz
GB 0
PC 1.00



Current Data Parameters
 NAME yl-169
 EXPNO 2020052702
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200528
 Time 12.42 h
 INSTRUM spect
 PROBHD z108618_0256 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 200
 DS 4
 SWH 24038.461 Hz
 FIDRES 0.733596 Hz
 AQ 1.3631488 sec
 RG 2050
 DW 20.800 usec
 DE 6.50 usec
 TE 298.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 100.6328888 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 50.00000000 W
 SFO2 400.1716007 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 90.00 usec
 PLW2 15.00000000 W
 PLW12 0.18519001 W
 PLW13 0.09314700 W

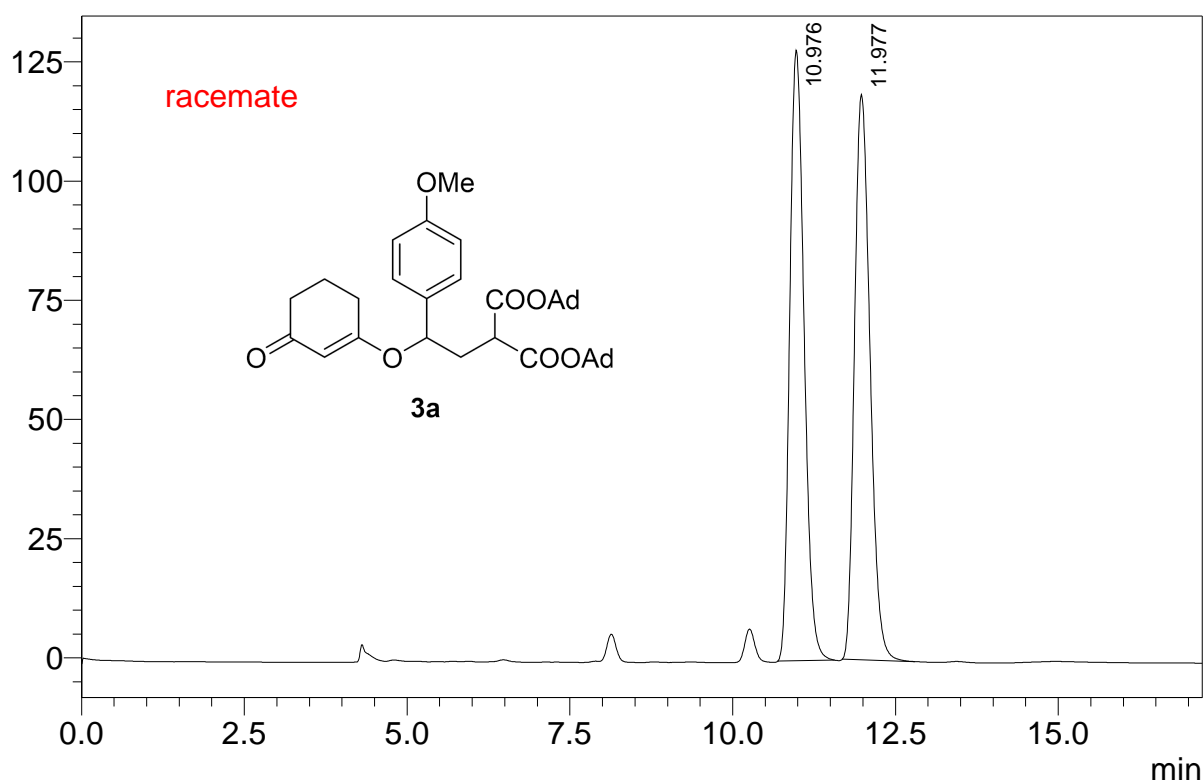
F2 - Processing parameters
 SI 32768
 SF 100.6228315 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

==== Analysis Report ====

Sample Name : yl-133rac
Sample ID :
Data Filename : yl-133rac001.lcd
Method Filename : ipa_hex5_95_254_30min.lcm
Batch Filename :
Vial # : 2-36
Injection Volume : 10 uL
Date Acquired : 2019/12/19 20:06:25
Date Processed : 2019/12/19 20:24:54
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

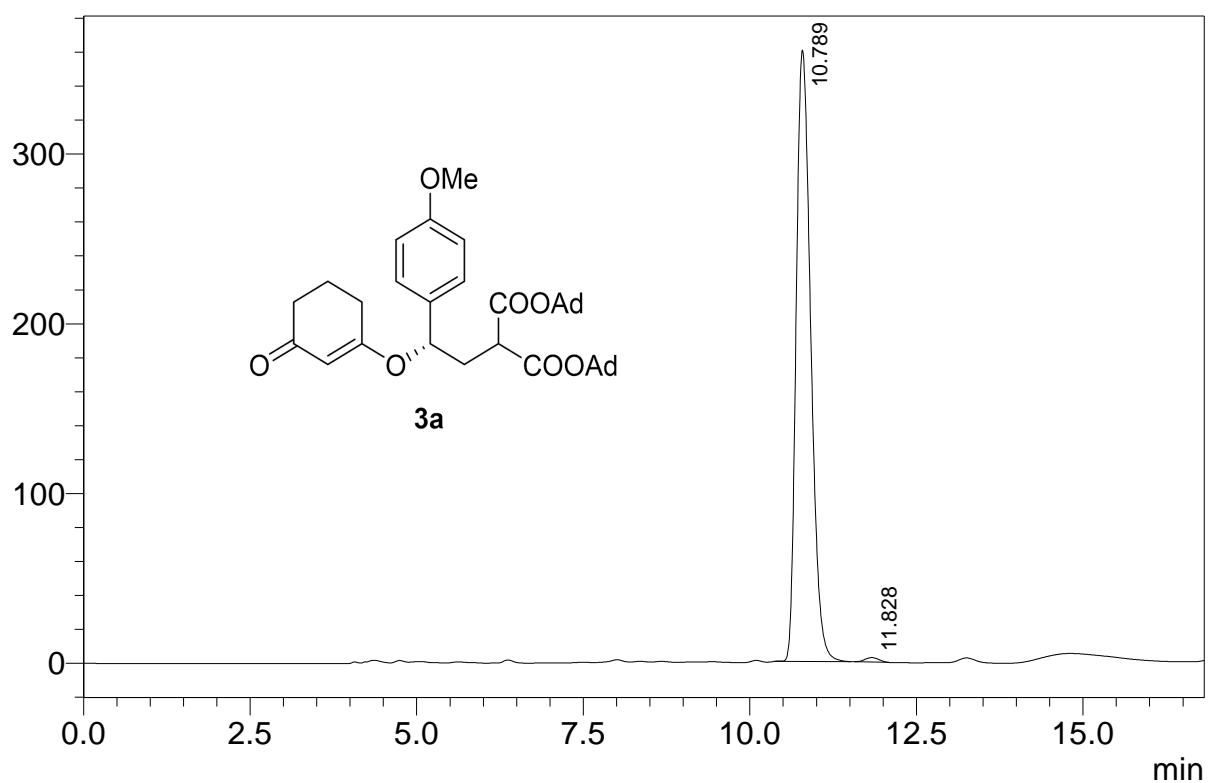
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 10.976 | 1966056 | 128008 | 50.022 |
| 2 | 11.977 | 1964307 | 118541 | 49.978 |
| 总计 | | 3930363 | 246549 | 100.000 |

==== Analysis Report ====

Sample Name : yl-133chr
 Sample ID :
 Data Filename : yl-133chr002.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 2-35
 Injection Volume : 10 uL
 Date Acquired : 2019/12/19 20:24:23
 Date Processed : 2019/12/19 20:42:43
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

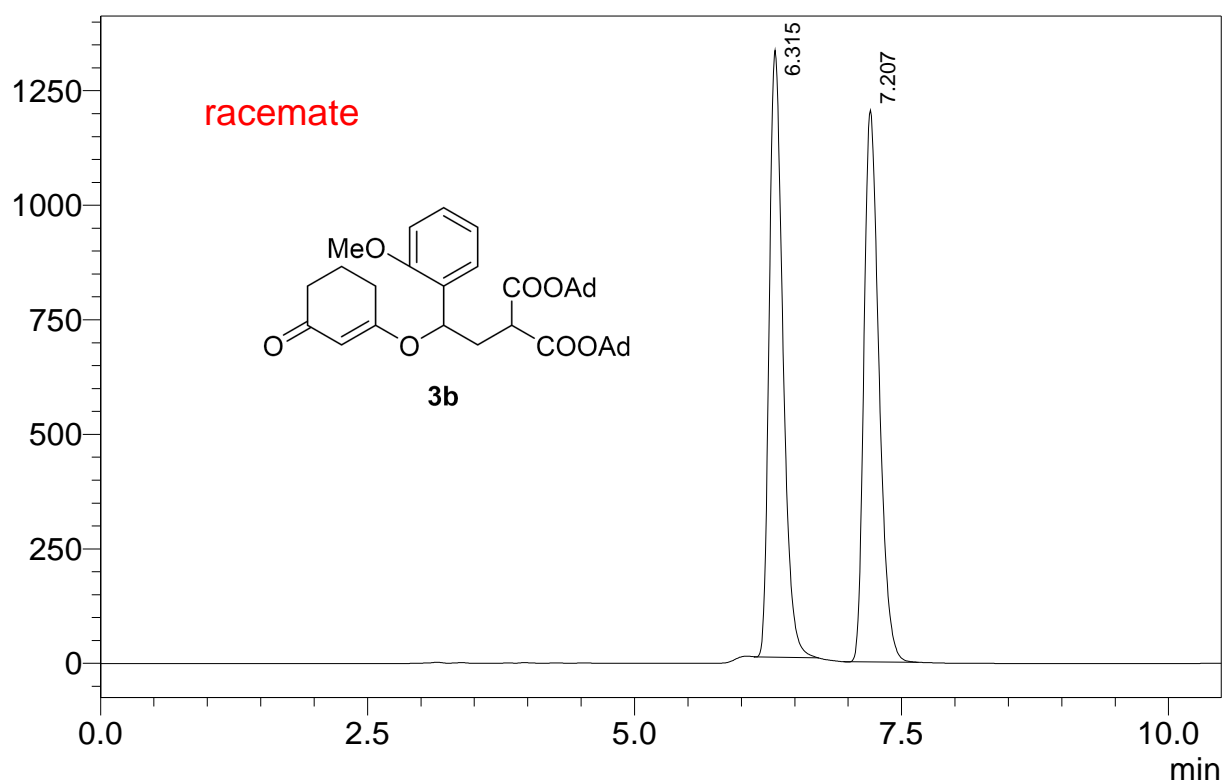
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 10.789 | 5479098 | 360139 | 99.315 |
| 2 | 11.828 | 37817 | 2630 | 0.685 |
| 总计 | | 5516915 | 362769 | 100.000 |

==== Analysis Report ====

Sample Name : zjc-130 rac
Sample ID :
Data Filename : zjc-130 rac001.lcd
Method Filename : ipa_hex20_80_254_25min.lcm
Batch Filename :
Vial # : 2-1
Injection Volume : 10 uL
Date Acquired : 2019/11/27 20:28:31
Date Processed : 2019/11/27 20:41:07
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

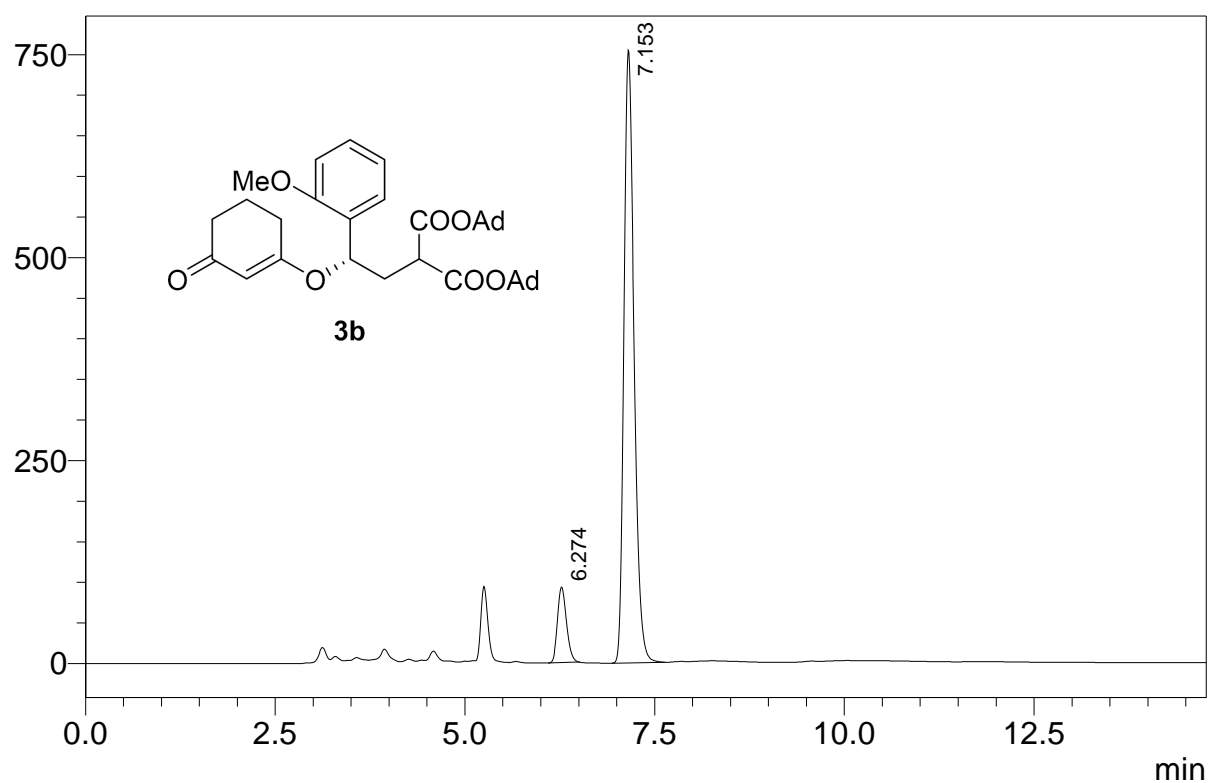
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|----------|---------|---------|
| 1 | 6.315 | 11880669 | 1324628 | 50.068 |
| 2 | 7.207 | 11848397 | 1204164 | 49.932 |
| 总计 | | 23729066 | 2528792 | 100.000 |

==== Analysis Report ====

Sample Name : zjc-130 chro rep
 Sample ID :
 Data Filename : zjc-130 chro rep001.lcd
 Method Filename : ipa_hex20_80_254_25min.lcm
 Batch Filename :
 Vial # : 2-9
 Injection Volume : 10 uL
 Date Acquired : 2019/12/11 20:04:39
 Date Processed : 2020/6/30 14:46:13
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

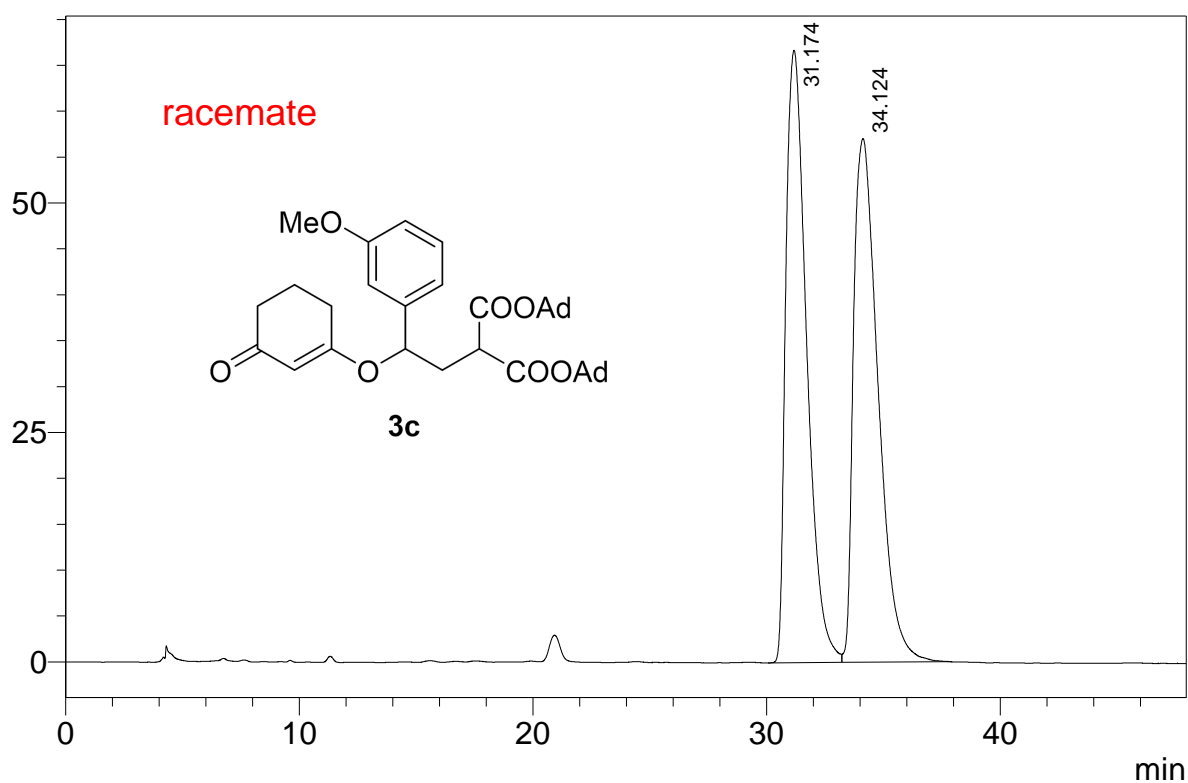
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 6.274 | 764698 | 93111 | 9.826 |
| 2 | 7.153 | 7018078 | 754487 | 90.174 |
| 总计 | | 7782776 | 847598 | 100.000 |

==== Analysis Report ====

Sample Name : zjc-114 rac
Sample ID :
Data Filename : zjc-114 rac004.lcd
Method Filename : ipa_hex_2_98_254.lcm
Batch Filename :
Vial # : 2-10
Injection Volume : 10 uL
Date Acquired : 2019/12/17 10:48:56
Date Processed : 2020/6/30 14:51:31
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

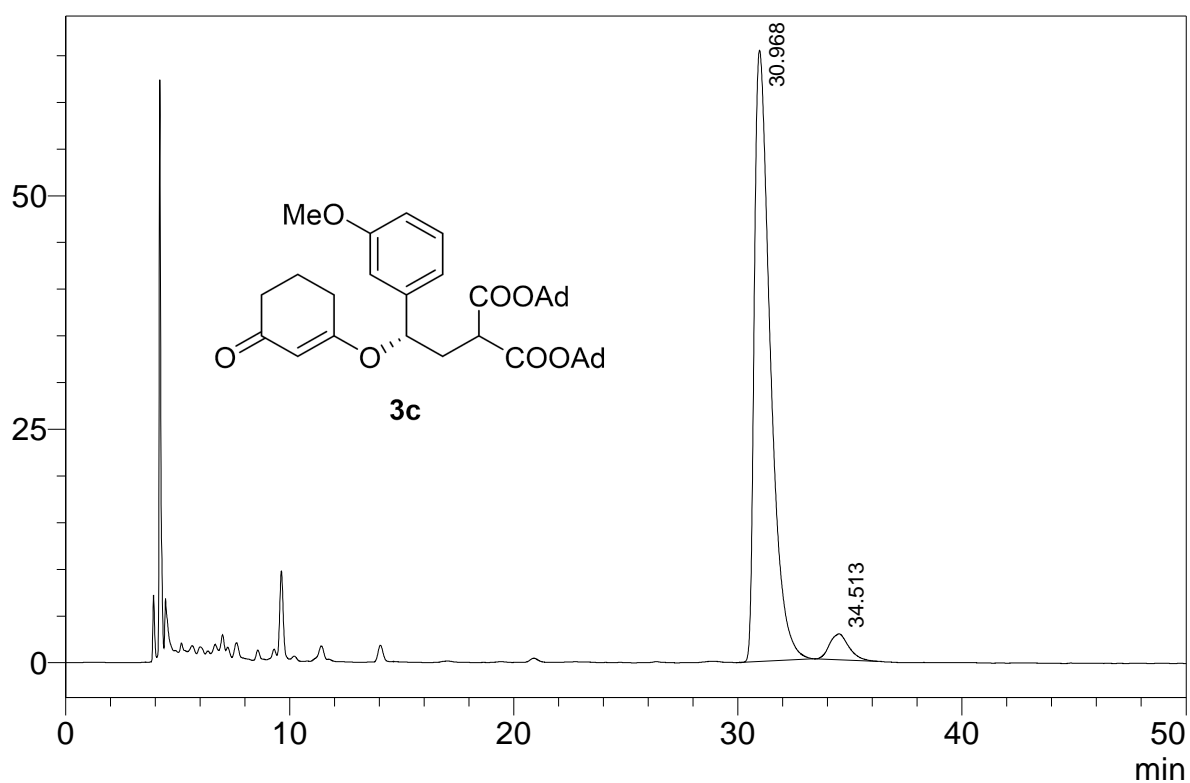
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 31.174 | 4137996 | 66732 | 49.749 |
| 2 | 34.124 | 4179829 | 57064 | 50.251 |
| 总计 | | 8317825 | 123796 | 100.000 |

==== Analysis Report ====

Sample Name : zjc-114 chro
 Sample ID :
 Data Filename : zjc-114 chro002.lcd
 Method Filename : ipa_hex_2_98_254.lcm
 Batch Filename :
 Vial # : 2-11
 Injection Volume : 10 uL
 Date Acquired : 2019/12/17 11:38:13
 Date Processed : 2019/12/17 14:22:43
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

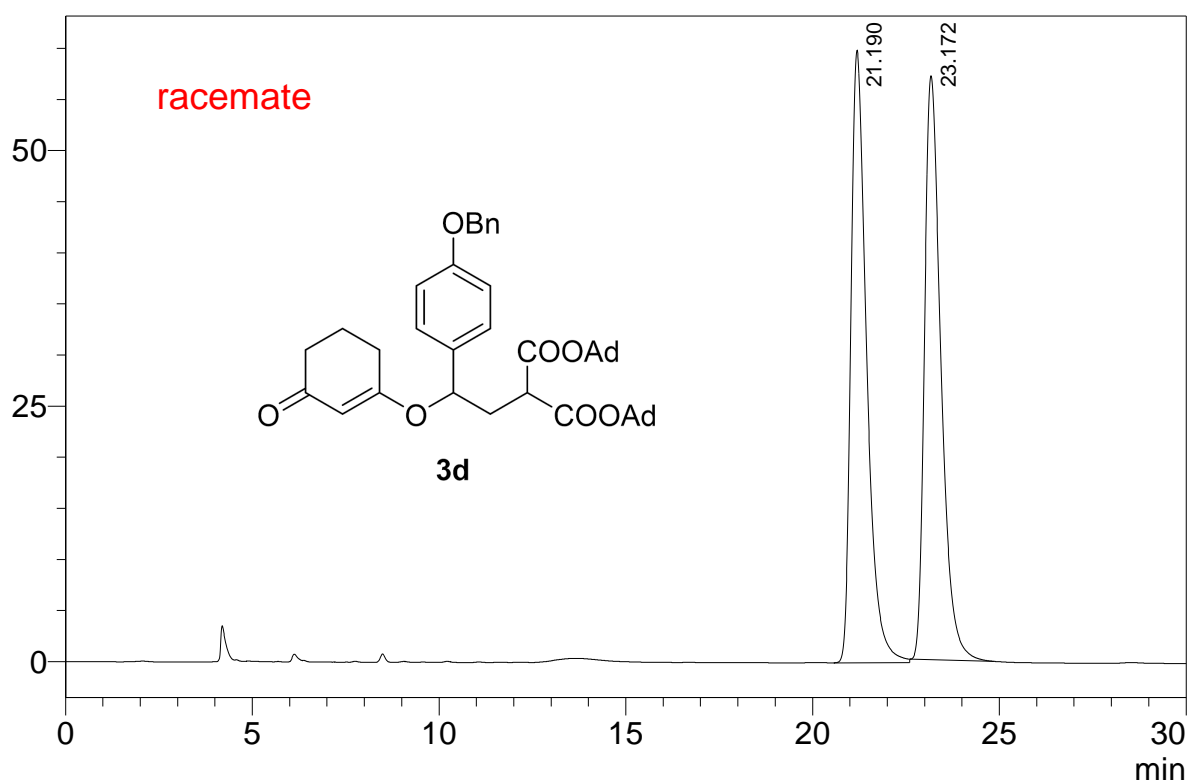
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 30.968 | 3251159 | 65434 | 95.126 |
| 2 | 34.513 | 166581 | 2786 | 4.874 |
| 总计 | | 3417741 | 68220 | 100.000 |

==== Analysis Report ====

Sample Name : yl-121-rac
Sample ID :
Data Filename : yl-121-rac-001.lcd
Method Filename : ipa_hex5_95_254_30min.lcm
Batch Filename :
Vial # : 1-41
Injection Volume : 10 uL
Date Acquired : 2019/11/1 21:24:16
Date Processed : 2019/11/1 22:13:15
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

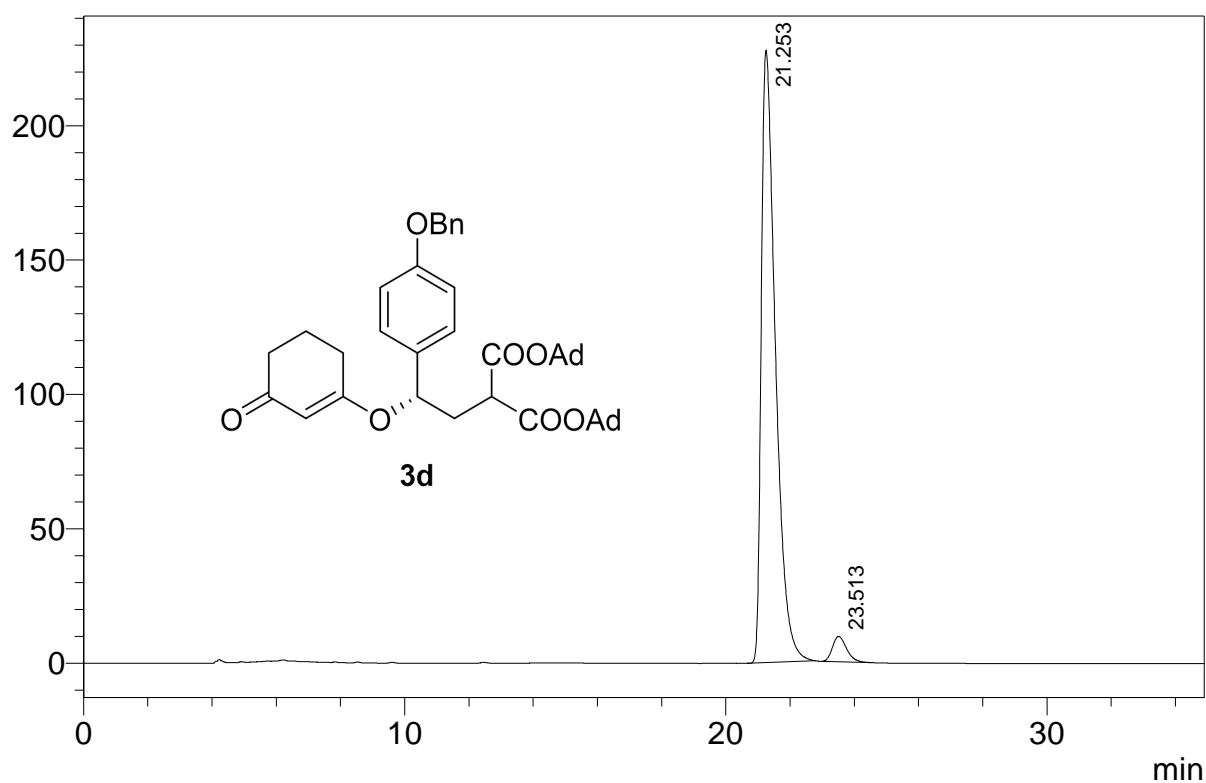
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 21.190 | 1762128 | 59929 | 50.195 |
| 2 | 23.172 | 1748410 | 57135 | 49.805 |
| 总计 | | 3510538 | 117064 | 100.000 |

==== Analysis Report ====

Sample Name : yl-121chrrep
 Sample ID :
 Data Filename : yl-121chrrep-001.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 2-21
 Injection Volume : 10 uL
 Date Acquired : 2019/12/6 11:05:38
 Date Processed : 2019/12/6 11:41:17
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

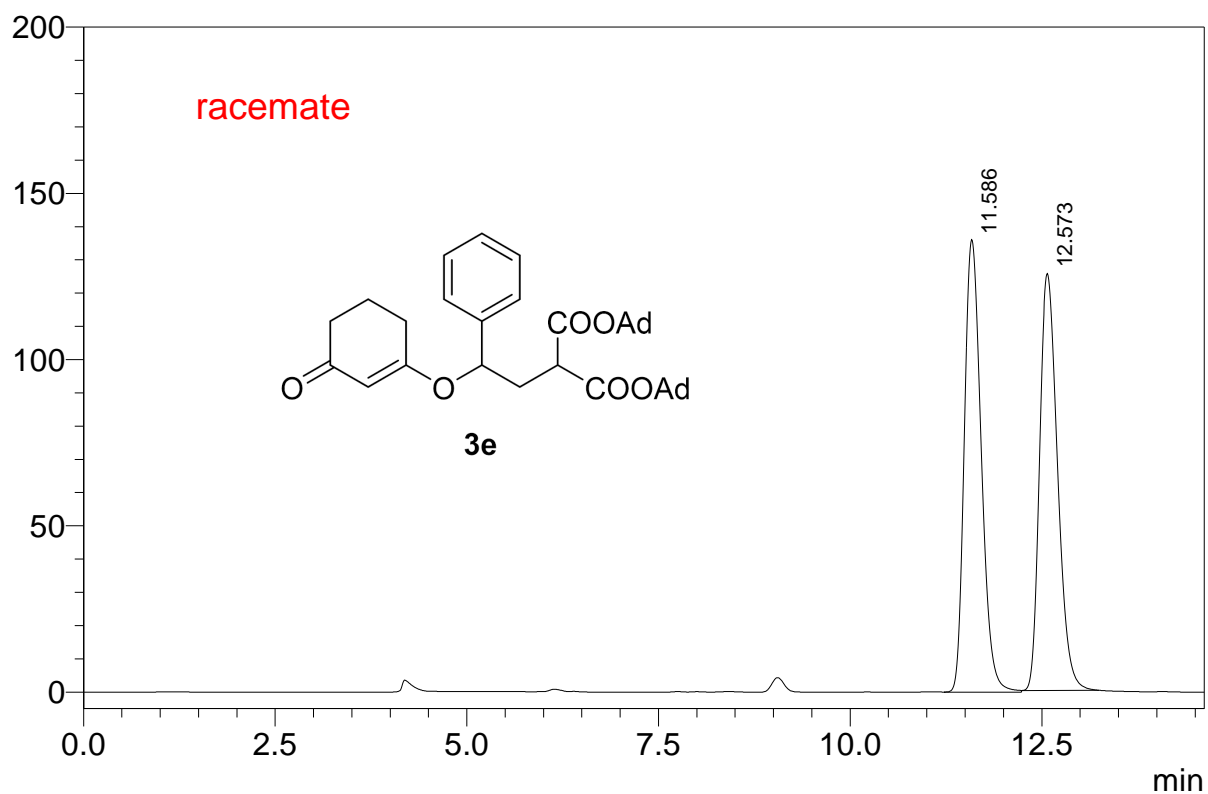
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 21.253 | 6979721 | 227904 | 96.026 |
| 2 | 23.513 | 288853 | 9437 | 3.974 |
| 总计 | | 7268574 | 237341 | 100.000 |

==== Analysis Report ====

Sample Name : yl-120-rac
 Sample ID :
 Data Filename : yl-120-rac-001.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 1-40
 Injection Volume : 10 uL
 Date Acquired : 2019/11/1 21:08:46
 Date Processed : 2019/11/1 21:24:47
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

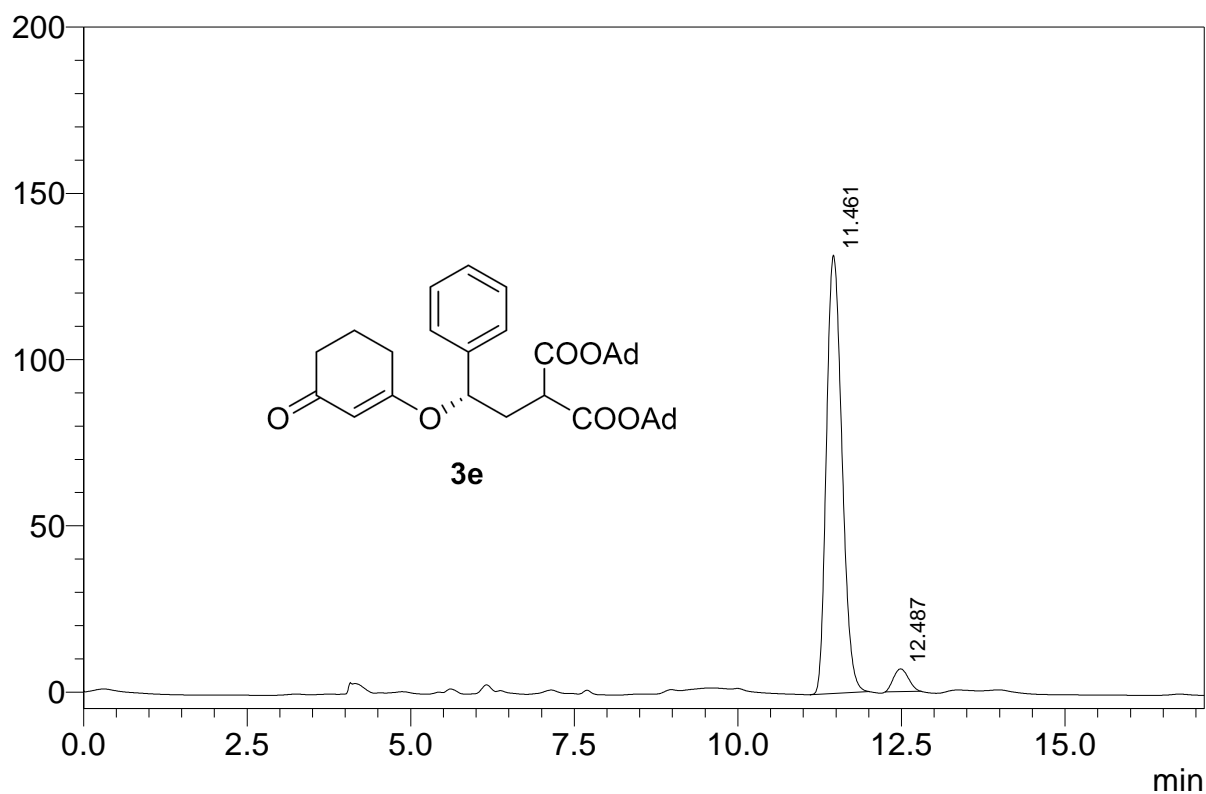
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 11.586 | 2086705 | 136150 | 50.304 |
| 2 | 12.573 | 2061444 | 125382 | 49.696 |
| 总计 | | 4148149 | 261532 | 100.000 |

==== Analysis Report ====

Sample Name : yl-120
Sample ID :
Data Filename : yl-120chr -005.lcd
Method Filename : ipa_hex5_95_254_30min.lcm
Batch Filename :
Vial # : 2-3
Injection Volume : 10 uL
Date Acquired : 2019/11/15 15:59:12
Date Processed : 2019/12/5 22:16:49
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

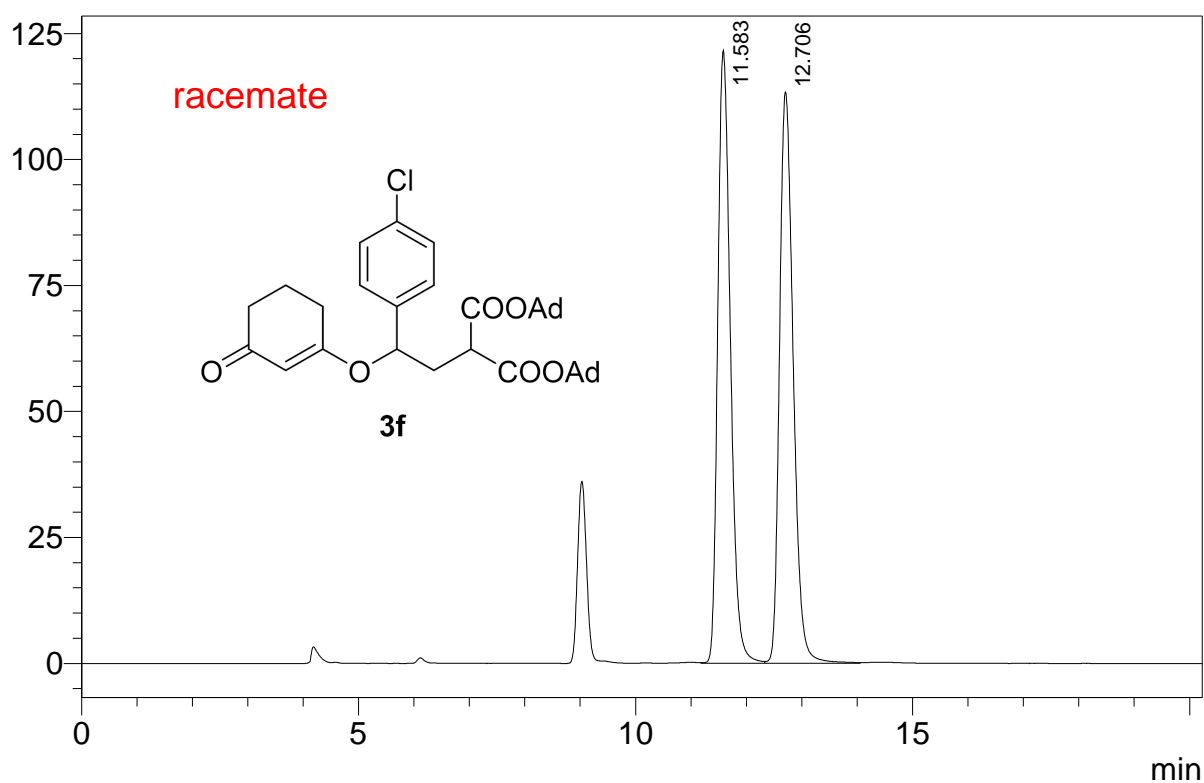
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 11.461 | 2174611 | 131769 | 95.203 |
| 2 | 12.487 | 109571 | 6840 | 4.797 |
| 总计 | | 2284181 | 138609 | 100.000 |

==== Analysis Report ====

Sample Name : zjc-115rac
 Sample ID :
 Data Filename : zjc-115rac-001.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 1-43
 Injection Volume : 10 uL
 Date Acquired : 2019/11/2 10:35:59
 Date Processed : 2019/11/2 11:29:02
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

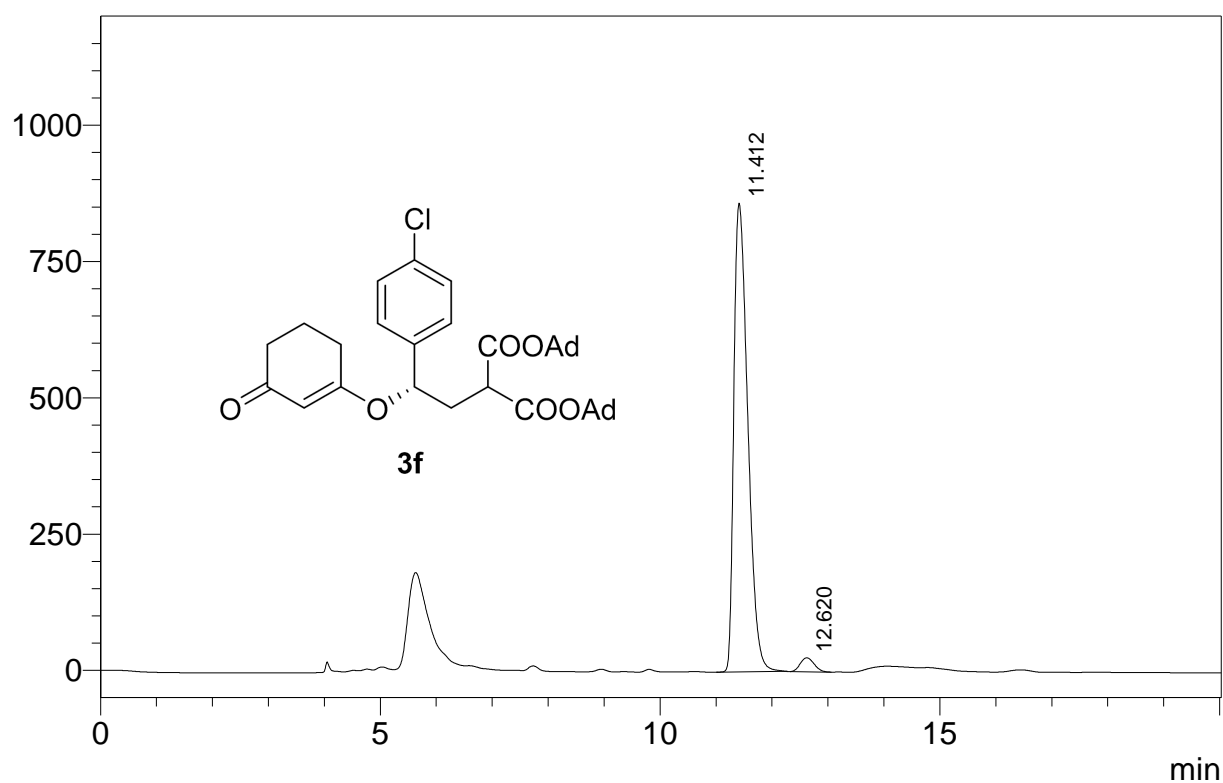
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 11.583 | 1932319 | 121644 | 49.766 |
| 2 | 12.706 | 1950471 | 113405 | 50.234 |
| 总计 | | 3882791 | 235049 | 100.000 |

==== Analysis Report ====

Sample Name : zjc-115 chro
 Sample ID :
 Data Filename : zjc-115 chro001.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 2-10
 Injection Volume : 10 uL
 Date Acquired : 2019/12/13 20:55:48
 Date Processed : 2019/12/13 21:18:30
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

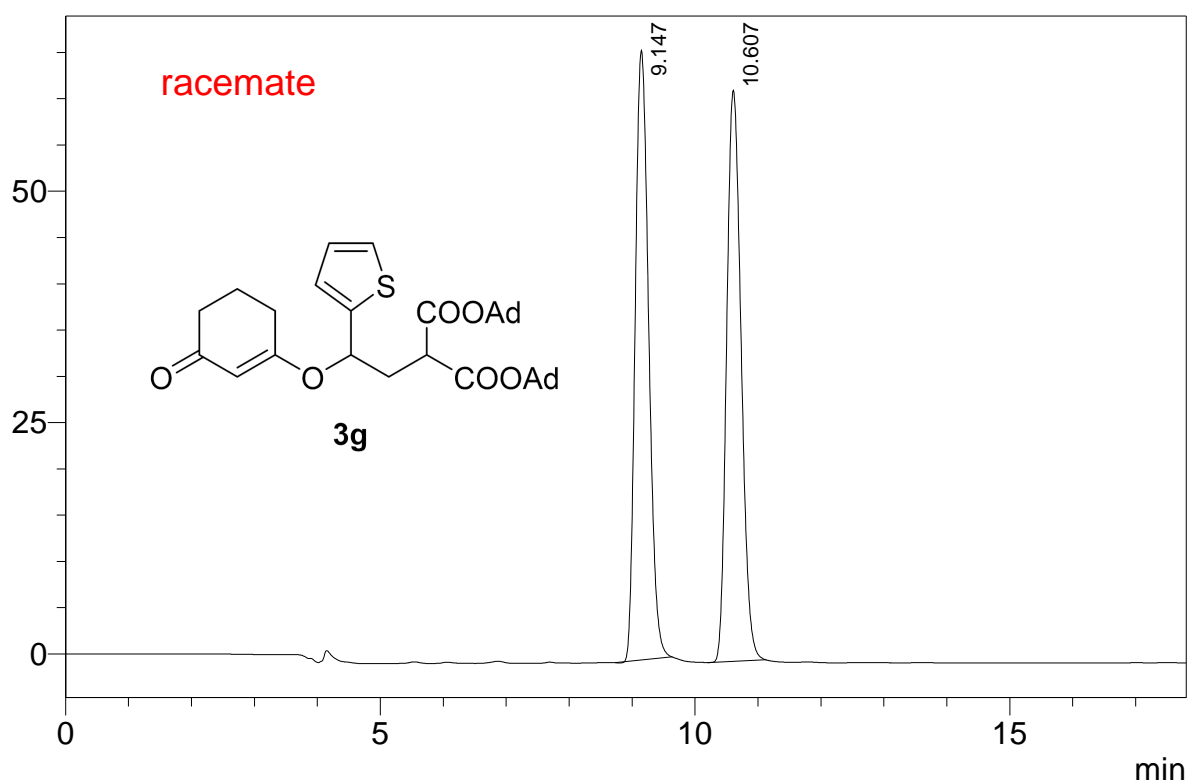
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|----------|--------|---------|
| 1 | 11.412 | 14856327 | 859897 | 97.118 |
| 2 | 12.620 | 440873 | 25520 | 2.882 |
| 总计 | | 15297200 | 885417 | 100.000 |

==== Analysis Report ====

Sample Name : yl-166rac
 Sample ID :
 Data Filename : yl-166rac001.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 2-47
 Injection Volume : 10 uL
 Date Acquired : 2019/12/31 20:03:11
 Date Processed : 2019/12/31 20:22:31
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

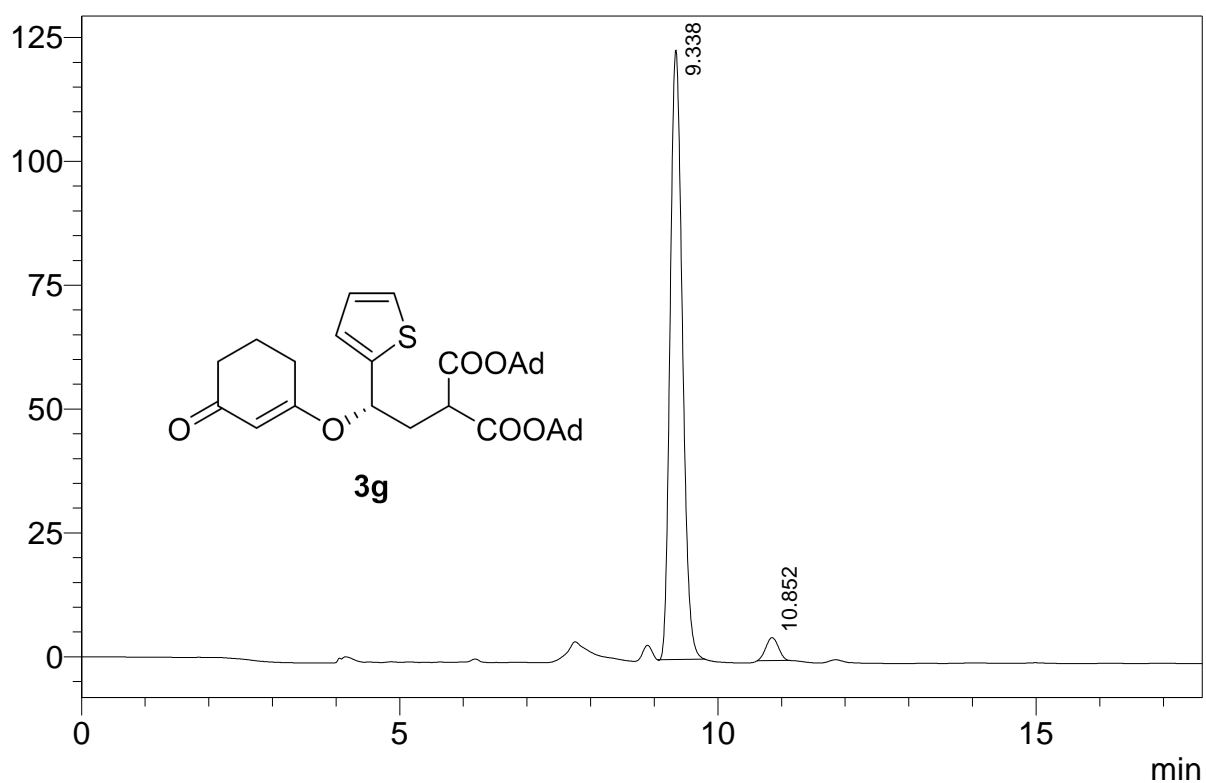
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 9.147 | 980348 | 65889 | 49.892 |
| 2 | 10.607 | 984610 | 61715 | 50.108 |
| 总计 | | 1964958 | 127604 | 100.000 |

==== Analysis Report ====

Sample Name : yl-166chr
 Sample ID :
 Data Filename : yl-166chr001.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 2-46
 Injection Volume : 10 uL
 Date Acquired : 2019/12/31 19:32:29
 Date Processed : 2019/12/31 19:52:55
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

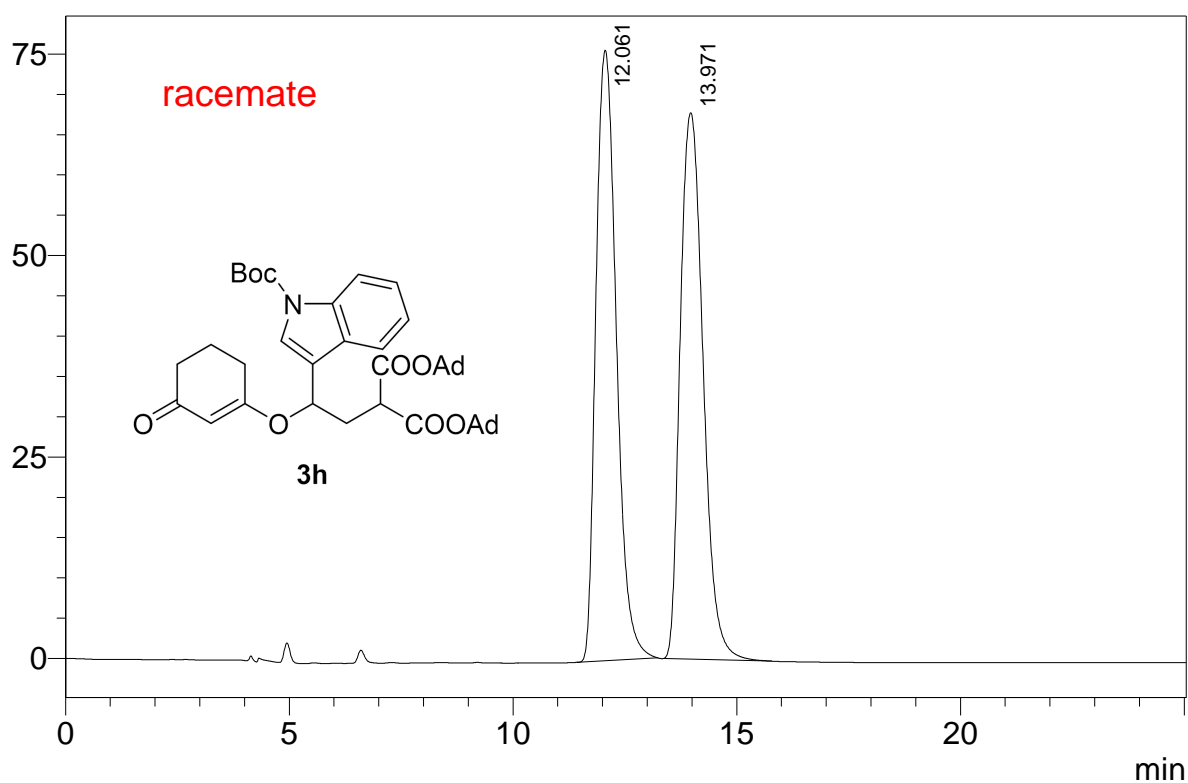
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 9.338 | 1647512 | 122994 | 96.276 |
| 2 | 10.852 | 63730 | 4617 | 3.724 |
| 总计 | | 1711242 | 127612 | 100.000 |

==== Analysis Report ====

Sample Name : yl-169rac
Sample ID :
Data Filename : yl-169rac002.lcd
Method Filename : ipa_hex_2_98_254.lcm
Batch Filename :
Vial # : 2-49
Injection Volume : 10 uL
Date Acquired : 2020/1/3 21:43:45
Date Processed : 2020/1/3 22:09:32
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

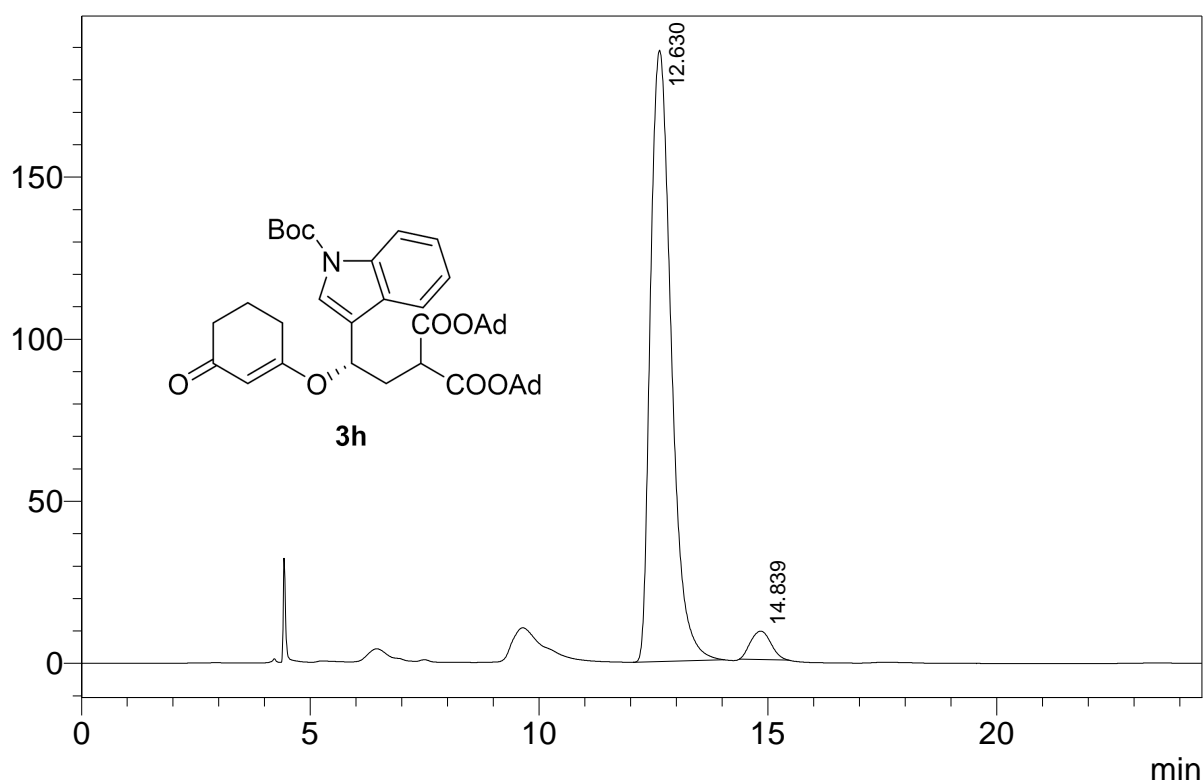
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 12.061 | 2409414 | 75752 | 49.976 |
| 2 | 13.971 | 2411764 | 67805 | 50.024 |
| 总计 | | 4821177 | 143556 | 100.000 |

==== Analysis Report ====

Sample Name : yl-169chr
 Sample ID :
 Data Filename : yl-169chr002.lcd
 Method Filename : ipa_hex_2_98_254.lcm
 Batch Filename :
 Vial # : 2-50
 Injection Volume : 10 uL
 Date Acquired : 2020/1/6 19:48:14
 Date Processed : 2020/1/6 20:13:27
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

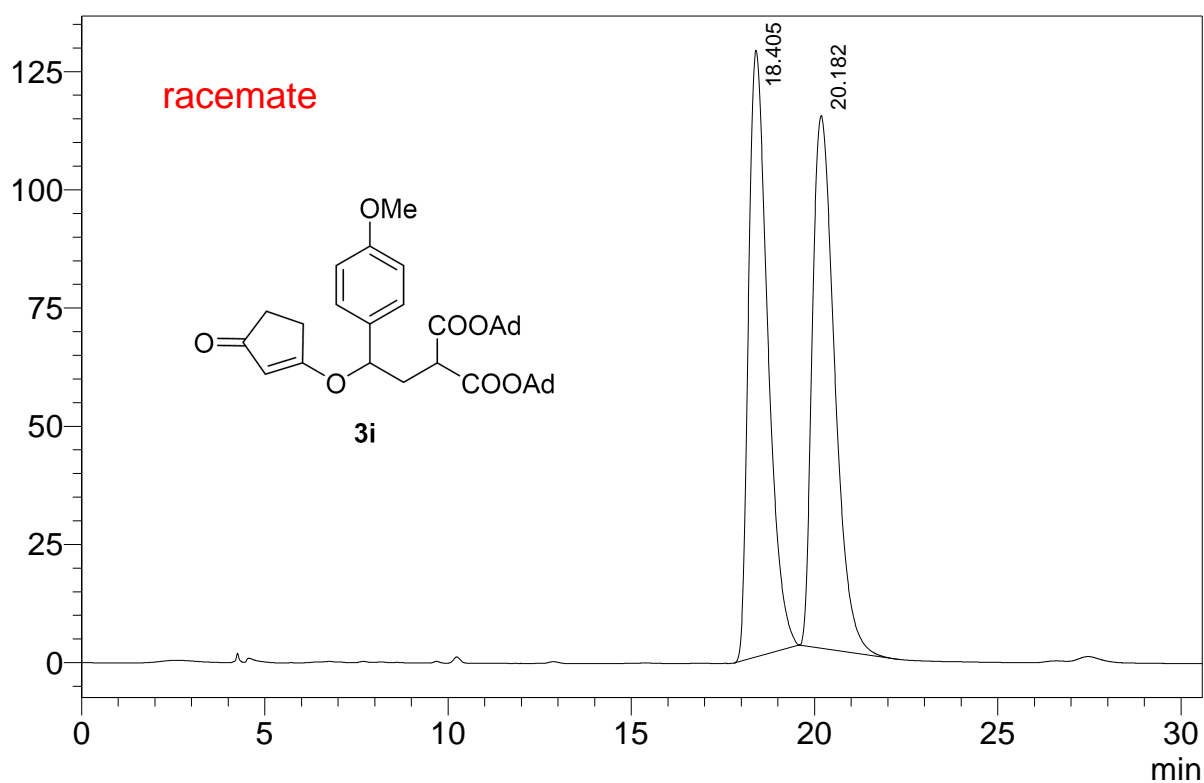
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 12.630 | 5959028 | 188581 | 95.619 |
| 2 | 14.839 | 273000 | 8774 | 4.381 |
| 总计 | | 6232029 | 197355 | 100.000 |

==== Analysis Report ====

Sample Name : yl-143rac
Sample ID :
Data Filename : yl-143rac003.lcd
Method Filename : ipa_hex_2_98_254.lcm
Batch Filename :
Vial # : 2-38
Injection Volume : 10 uL
Date Acquired : 2019/12/20 21:08:56
Date Processed : 2019/12/20 21:40:02
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

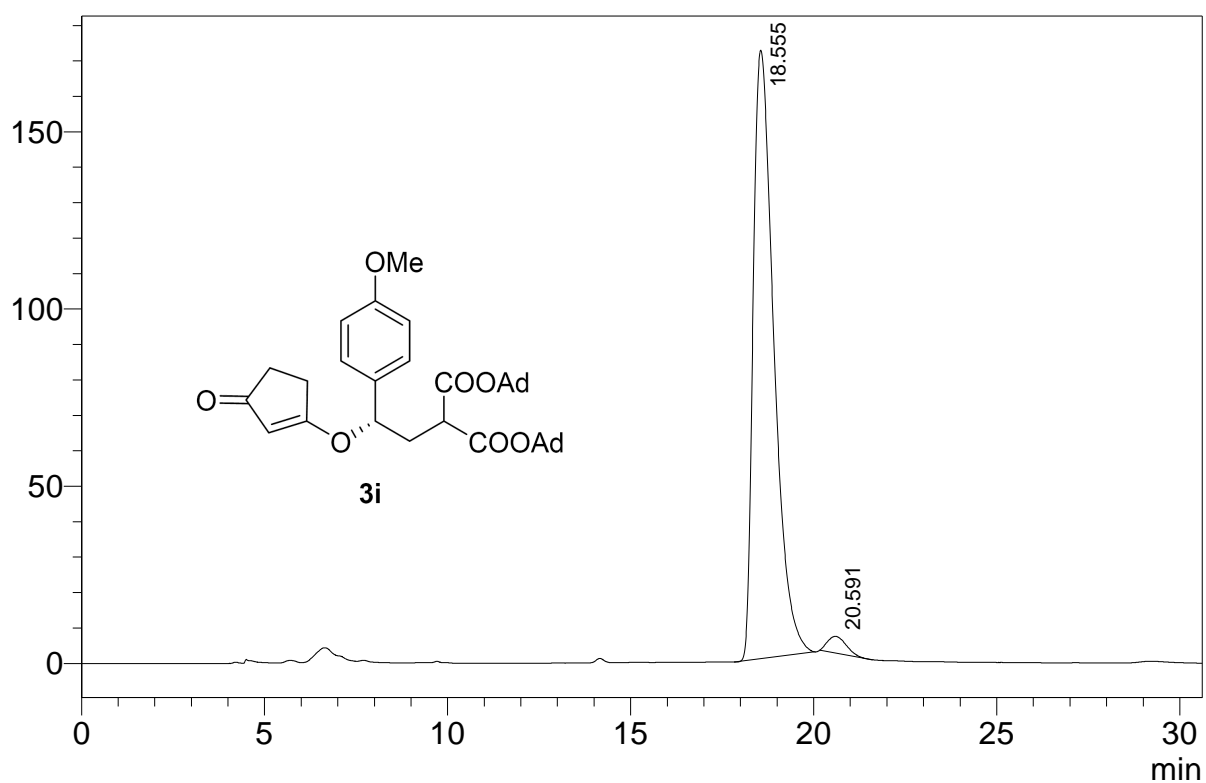
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 18.405 | 4722076 | 128303 | 49.665 |
| 2 | 20.182 | 4785861 | 112643 | 50.335 |
| 总计 | | 9507937 | 240945 | 100.000 |

==== Analysis Report ====

Sample Name : yl-143chr
 Sample ID :
 Data Filename : yl-143chr002.lcd
 Method Filename : ipa_hex_2_98_254.lcm
 Batch Filename :
 Vial # : 2-37
 Injection Volume : 10 uL
 Date Acquired : 2019/12/20 20:37:24
 Date Processed : 2019/12/20 21:10:23
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

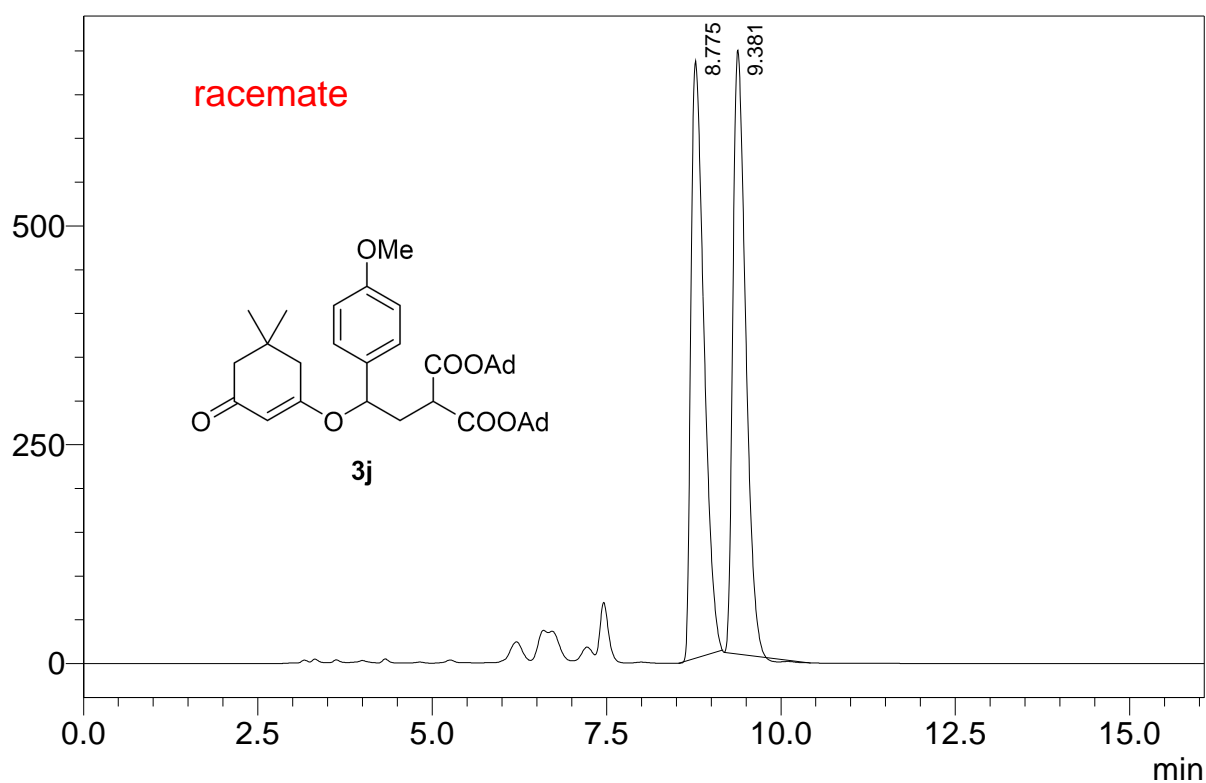
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 18.555 | 6724876 | 171663 | 97.575 |
| 2 | 20.591 | 167140 | 4694 | 2.425 |
| 总计 | | 6892016 | 176357 | 100.000 |

==== Analysis Report ====

Sample Name : yl-164rac
 Sample ID :
 Data Filename : yl-164rac001.lcd
 Method Filename : ipa_hex20_80_254_25min.lcm
 Batch Filename :
 Vial # : 1-30
 Injection Volume : 10 uL
 Date Acquired : 2020/1/13 16:22:13
 Date Processed : 2020/1/13 16:39:59
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

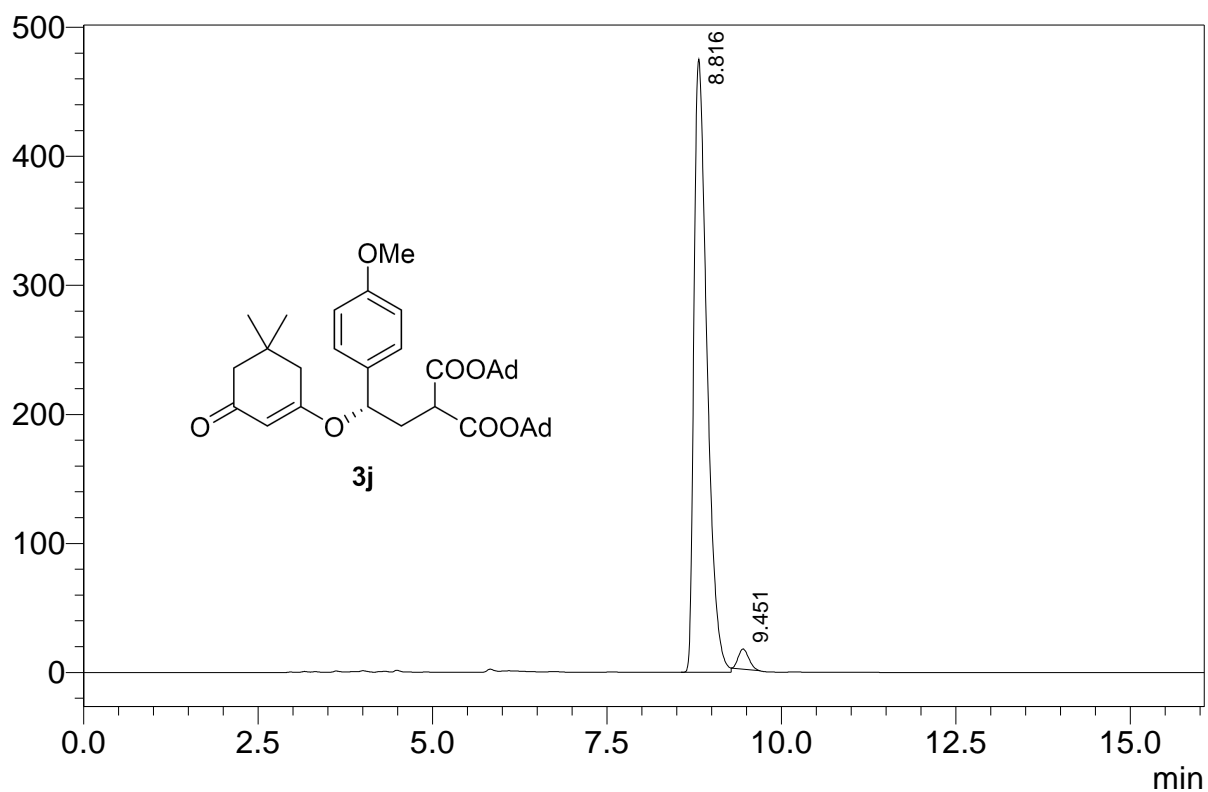
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|----------|---------|---------|
| 1 | 8.775 | 8907799 | 682442 | 50.273 |
| 2 | 9.381 | 8811219 | 690041 | 49.727 |
| 总计 | | 17719018 | 1372483 | 100.000 |

==== Analysis Report ====

Sample Name : yl-164chr
 Sample ID :
 Data Filename : yl-164chr001.lcd
 Method Filename : ipa_hex20_80_254_25min.lcm
 Batch Filename :
 Vial # : 1-31
 Injection Volume : 10 uL
 Date Acquired : 2020/1/13 16:39:15
 Date Processed : 2020/1/13 16:57:40
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

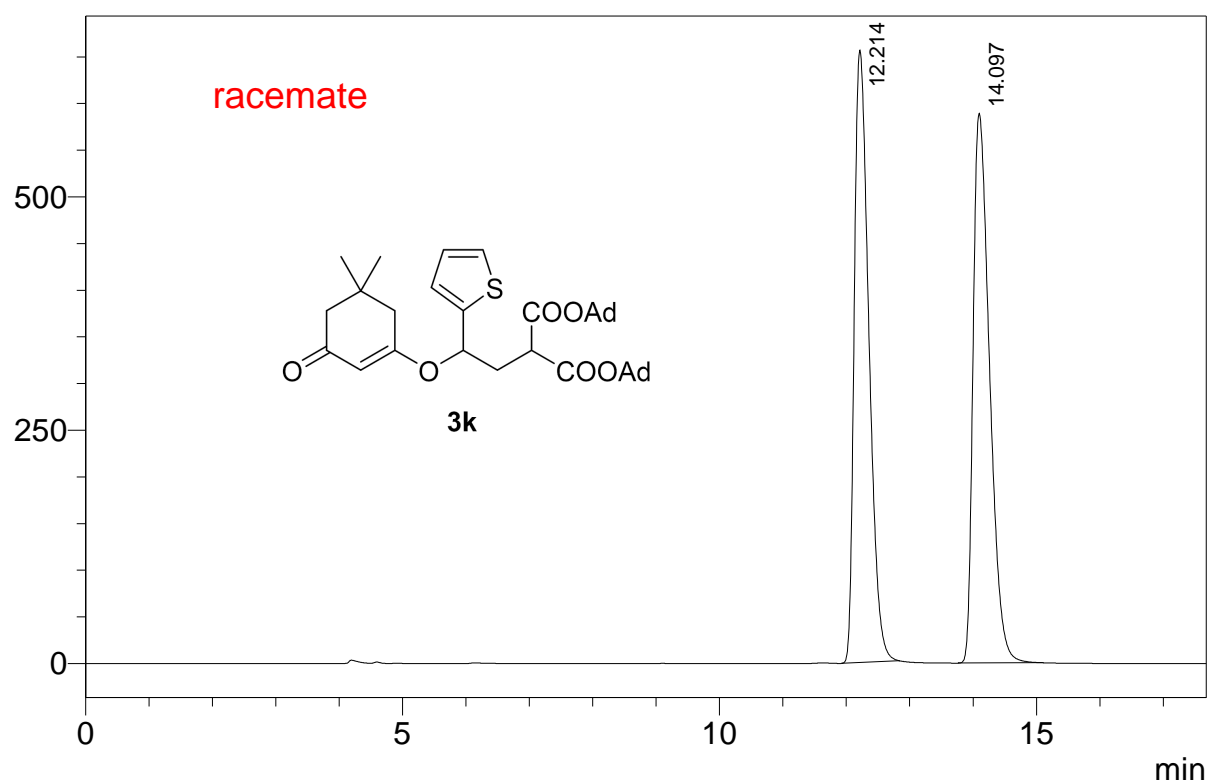
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 8.816 | 6189399 | 475119 | 97.432 |
| 2 | 9.451 | 163128 | 15611 | 2.568 |
| 总计 | | 6352528 | 490730 | 100.000 |

==== Analysis Report ====

Sample Name : yl-119-rac
Sample ID :
Data Filename : yl-119-rac-001.lcd
Method Filename : ipa_hex5_95_254_30min.lcm
Batch Filename :
Vial # : 1-38
Injection Volume : 10 uL
Date Acquired : 2019/11/1 20:32:18
Date Processed : 2020/6/30 13:58:56
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

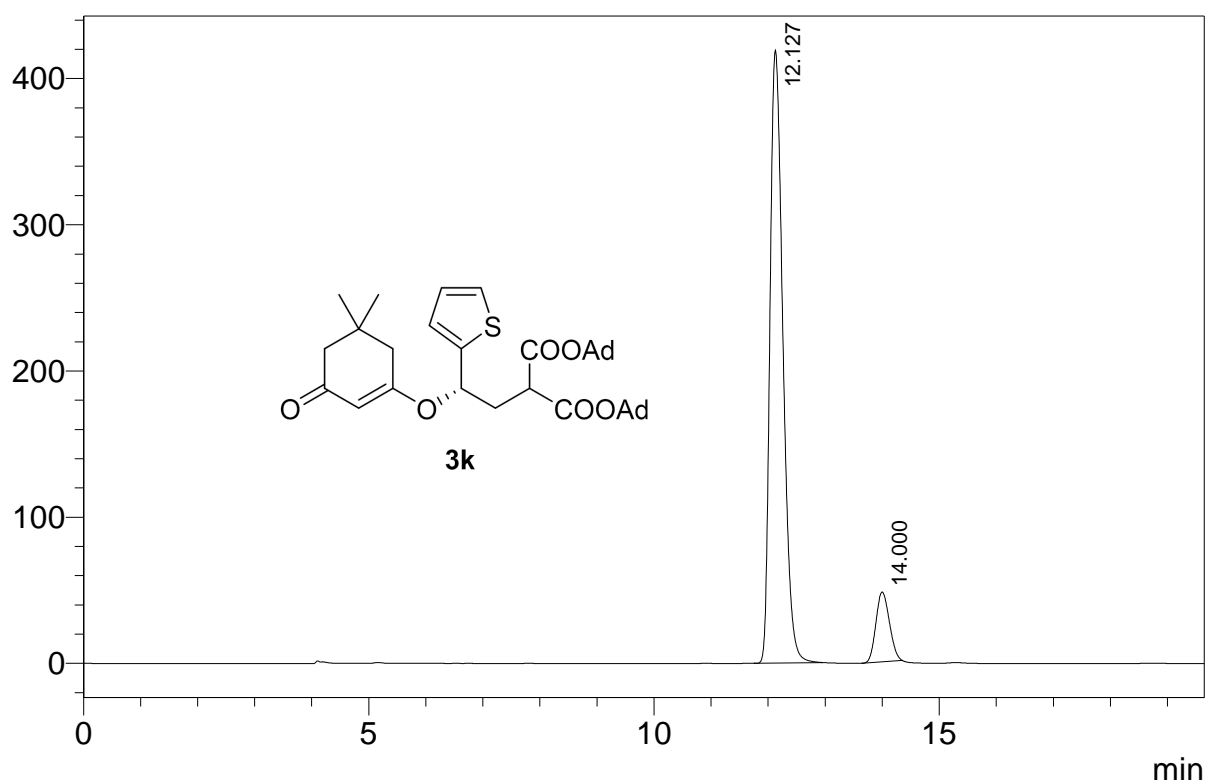
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|----------|---------|---------|
| 1 | 12.214 | 10530435 | 656027 | 49.720 |
| 2 | 14.097 | 10648908 | 588907 | 50.280 |
| 总计 | | 21179343 | 1244934 | 100.000 |

==== Analysis Report ====

Sample Name : yl-119chrrep
Sample ID :
Data Filename : yl-119chrrep-001.lcd
Method Filename : ipa_hex5_95_254_30min.lcm
Batch Filename :
Vial # : 2-20
Injection Volume : 10 uL
Date Acquired : 2019/12/6 10:45:01
Date Processed : 2020/6/30 14:01:45
Acquired by : System Administrator
Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

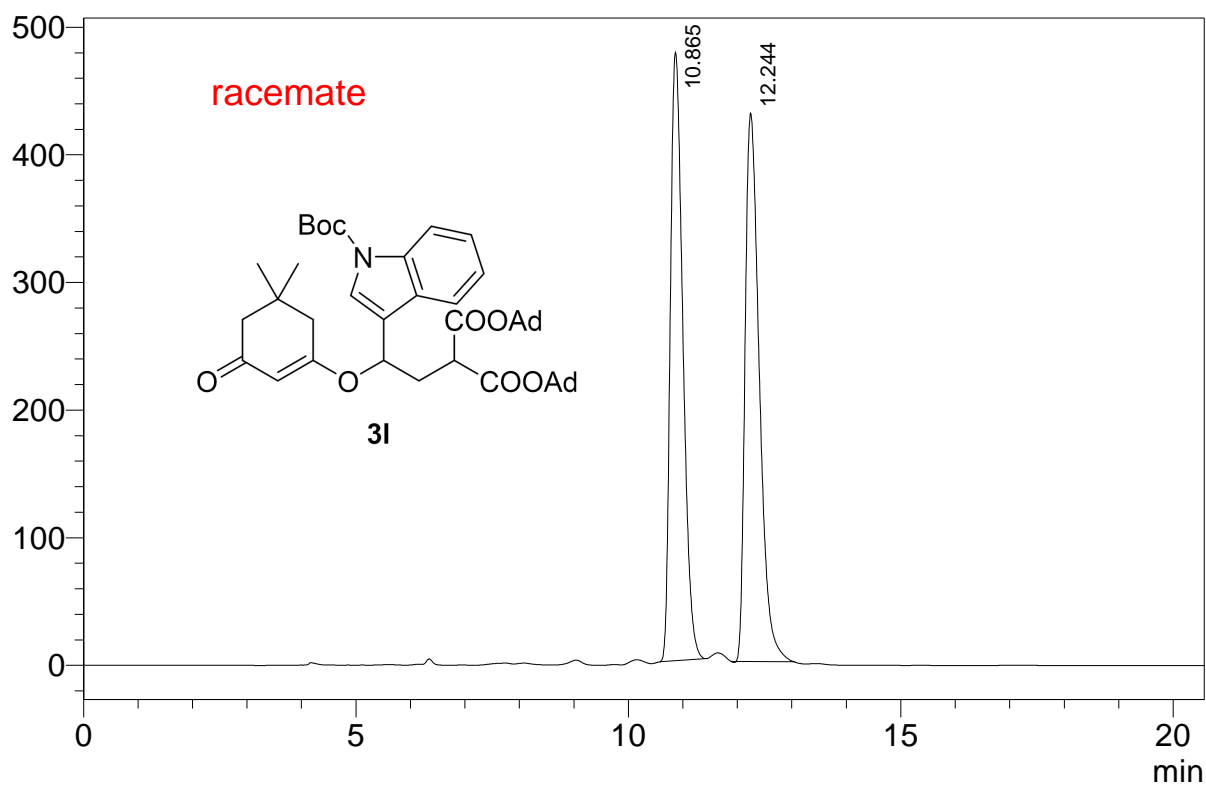
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 12.127 | 6589294 | 419161 | 89.339 |
| 2 | 14.000 | 786331 | 47812 | 10.661 |
| 总计 | | 7375625 | 466972 | 100.000 |

==== Analysis Report ====

Sample Name : yl-163rac
 Sample ID :
 Data Filename : yl-163rac002.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 2-39
 Injection Volume : 10 uL
 Date Acquired : 2019/12/27 11:10:17
 Date Processed : 2019/12/27 11:31:32
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

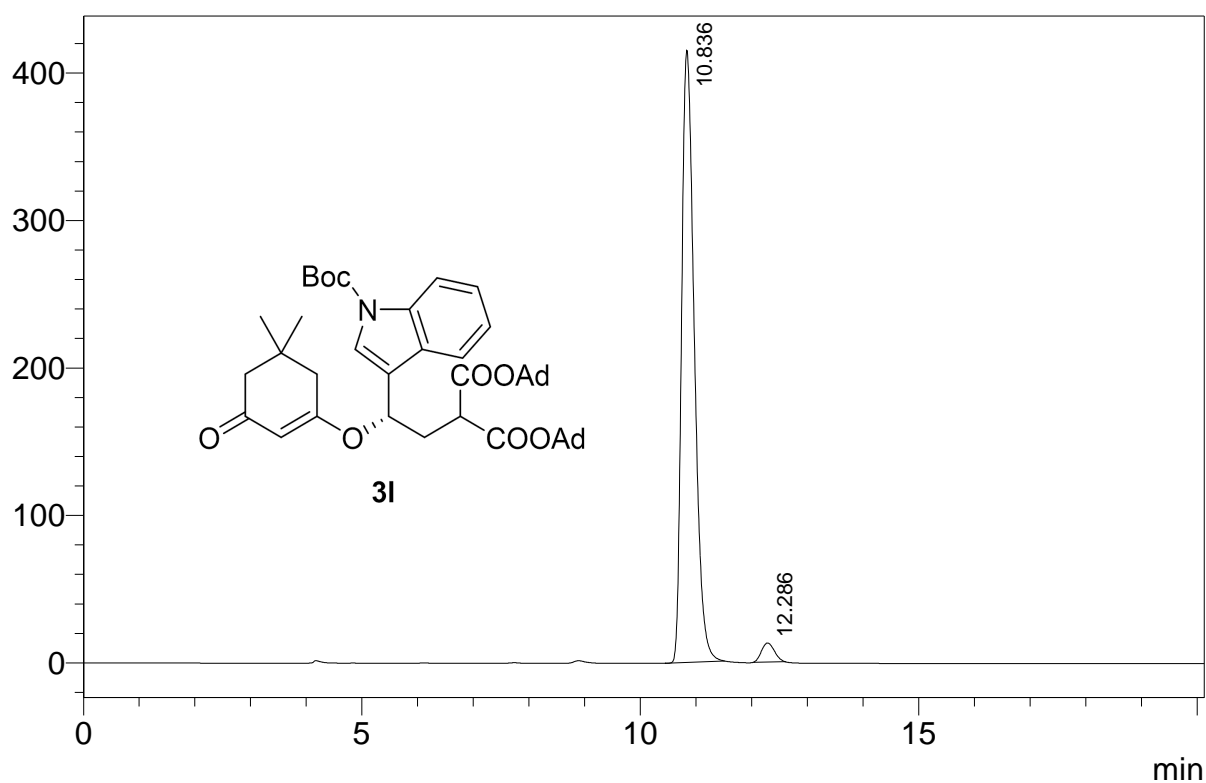
| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|----------|--------|---------|
| 1 | 10.865 | 7641712 | 476783 | 49.434 |
| 2 | 12.244 | 7816599 | 429673 | 50.566 |
| 总计 | | 15458311 | 906455 | 100.000 |

==== Analysis Report ====

Sample Name : yl-163chr
 Sample ID :
 Data Filename : yl-163chr002.lcd
 Method Filename : ipa_hex5_95_254_30min.lcm
 Batch Filename :
 Vial # : 2-40
 Injection Volume : 10 uL
 Date Acquired : 2019/12/27 10:49:19
 Date Processed : 2019/12/27 11:10:45
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>

mV



<Peak Table>

检测器A 254nm

| Peak# | Ret. Time | Area | Height | Aera % |
|-------|-----------|---------|--------|---------|
| 1 | 10.836 | 6563146 | 415117 | 96.946 |
| 2 | 12.286 | 206745 | 12897 | 3.054 |
| 总计 | | 6769891 | 428015 | 100.000 |