

Supporting Information

Catalytic Enantioselective Oxa-Hetero-Diels-Alder Reactions of Enones with Aryl Trifluoromethyl Ketones: Synthesis of Tetrahydropyranones

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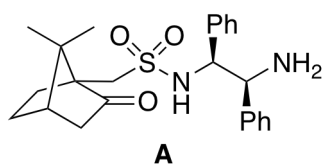
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General

For thin layer chromatography (TLC), Merck silica gel 60 F254 aluminum sheets were used and the compounds were visualized by irradiation with UV light. Flash column chromatography was performed using Merck silica gel 60 (230-400 mesh) or Yamazen flash column (60 Å, 40 µm). ¹H NMR and ¹³C NMR spectra were recorded on a Bruker Avance 400 or a Bruker Avance 500. Proton chemical shifts are reported in ppm downfield from tetramethylsilane (δ 0.00 ppm) or relative to the residual proton signal of the deuterated solvent in CDCl₃ (δ 7.26 ppm). Carbon chemical shifts were internally referenced to the deuterated solvent signals in CDCl₃ (δ 77.0 ppm). High-resolution mass spectra were recorded on a Thermo Scientific LTQ Orbitrap ESI ion trap mass spectrometer. Optical rotations were measured on a Jasco P2200 polarimeter.

1. Synthesis of Amine Derivative A

Amine derivative **A** was synthesized by the reported procedure.¹

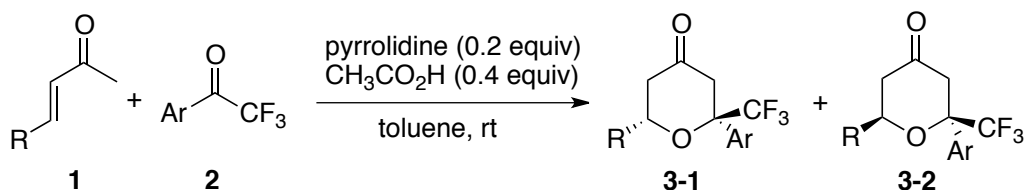


To a solution of (1*S*,2*S*)-(-)-1,2-diphenylethylenediamine (1.27 g, 6.0 mmol) and triethylamine (1.00 mL, 7.2 mmol) in dehydrated CH₂Cl₂ (15 mL), (-)-10-camphorsulfonyl chloride (1.50 g, 6.0 mmol) was added at 0 °C, and the mixture was stirred at same temperature for 2 h. To the mixture, saturated aqueous NH₄Cl

solution was added, and the mixture was extracted with CH₂Cl₂. Organic layers were combined, washed with brine, dried over Na₂SO₄, filtered, concentrated, and purified by flash column chromatography (CHCl₃/MeOH = 98:2) to give **A** (2.40 g, 88%) as a colorless solid. ¹H and ¹³C NMR data of the obtained **A** were consistent with those previously reported.¹

2. Oxa-Hetero-Diels-Alder Reactions (Table 2)

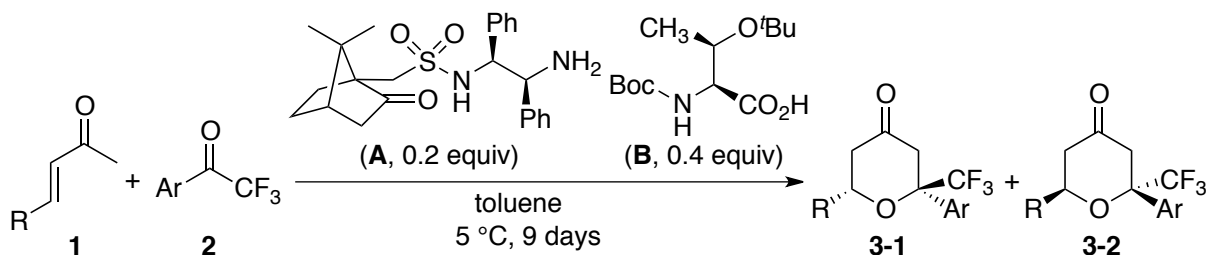
General procedure for the synthesis of racemic standards of **3**



Racemic standards of compounds **3** were synthesized by the reported procedure² but with modified conditions.

To a solution of enone **1** (1.0 mmol) and aryl trifluoromethyl ketone **2** (3.0 mmol) in toluene (dehydrated, 2.0 mL), pyrrolidine (16.5 μL, 0.20 mmol) and acetic acid (22.8 μL, 0.40 mmol) were added at room temperature (25 °C), and the mixture was stirred at the same temperature until **1** was consumed (monitored by ¹H NMR analyses). For monitoring the reaction progress by ¹H NMR analyses, a portion (50 μL) of the reaction mixture was taken out and diluted with CDCl₃, which was directly used for the NMR analyses. The mixture (remaining portion) was purified by flash column chromatography (hexane/EtOAc = 98:2) to give racemic product **3**. For each of all cases of **3** synthesized by this method, compound **3-1** (R and CF₃, *trans*)¹ was the major diastereomer and compound **3-2** (R and CF₃, *cis*)¹ was the minor diastereomer.

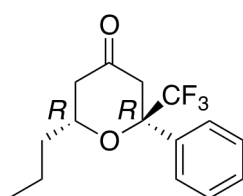
General procedure for the catalytic enantioselective oxa-hetero-Diels-Alder reactions



To a solution of amine derivative **A** (85.6 mg, 0.2 mmol) and *N*-Boc-*O*-*t*Bu-*L*-threonine (**B**) (110 mg, 0.40 mmol) in toluene (dehydrated, 2.0 mL), enone **1** (1.0 mmol) and aryl trifluoromethyl

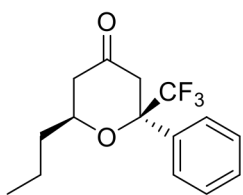
ketone **2** (3.0 mmol) were added at 5 °C, and the mixture was stirred at the same temperature for 9 days until **1** was completely or almost consumed (monitored by TLC and/or ¹H NMR analyses). Before purification, the diastereomer ratio (dr) was determined by ¹H NMR analysis. The mixture was purified by flash column chromatography (hexane/EtOAc = 98:2, this solvent system was used for the purification of each of all **3**) to give **3-1** (R and CF₃, *trans*)¹ and **3-2** (R and CF₃, *cis*)¹ separately. For each of all the cases of **3** synthesized by this method, compound **3-1** (R and CF₃, *trans*)¹ was the major diastereomer and compound **3-2** (R and CF₃, *cis*)¹ was the minor diastereomer. Formation of the aldol product was <5% relative to the oxa-hetero-Diels-Alder products (i.e., **3**) for all reactions performed by this method. The enantiomer ratio (er) of **3-1** was determined by chiral-phase HPLC analysis after purification. The absolute configuration of **3a-1** obtained by this procedure was determined to be (*R,R*); see Section 3 (page S8).

Compound **3a-1** (minor diastereomer)



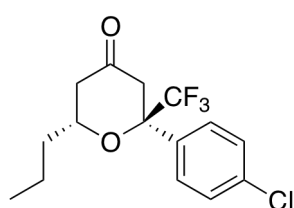
General procedure, dr **3a-1/3a-2** = 8:1 (before purification), **3a-1** 201 mg (70%, er 91:9), R_f 0.39 (hexane/EtOAc = 95:5), colorless oil. [α]²⁴_D -40.7 (c 1.00, CH₂Cl₂, er 91:9). ¹H NMR (500 MHz, CDCl₃): δ 7.55 (d, *J* = 6.7 Hz, 2H), 7.42-7.34 (m, 3H), 4.45-4.37 (m, 1H), 3.31 (d, *J* = 15.6 Hz, 1H), 2.90 (d, *J* = 15.6 Hz, 1H), 2.47 (d, *J* = 16.5 Hz, 1H), 2.22 (dd, *J* = 16.5 Hz, 11.8 Hz, 1H), 1.85-1.76 (m, 1H), 1.76-1.51 (m, 3H), 1.01 (t, *J* = 7.0 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃): δ 203.4, 137.7, 129.0, 128.3, 126.2, 125.1 (q, *J*_{C,F} = 288 Hz), 78.7 (q, *J*_{C,F} = 28 Hz), 73.0, 45.7, 43.9, 38.4, 18.4, 13.7. ESI-HRMS: *m/z* calcd for C₁₅H₁₈O₂F₃ ([M+H]⁺) 287.1253, found 287.1249. HPLC (Daicel Chiralpak AS-3, hexane/*i*-PrOH = 98:2, 0.5 mL/min, λ = 220 nm): *t*_R (major diastereomer, major enantiomer) = 24.5 min, *t*_R (major diastereomer, minor enantiomer) = 22.7 min.

Compound **3a-2** (minor diastereomer)



R_f 0.27 (hexane/EtOAc = 95:5), colorless oil. ¹H NMR (500 MHz, CDCl₃): δ 7.49 (d, *J* = 6.7 Hz, 2H), 7.44-7.37 (m, 3H), 3.75-3.67 (m, 1H), 3.26 (d, *J* = 14.8 Hz, 1H), 3.01 (d, *J* = 14.8 Hz, 1H), 2.37 (dd, *J* = 14.8 Hz, 11.5 Hz, 1H), 2.25 (d, *J* = 14.8 Hz, 1H), 1.85-1.74 (m, 1H), 1.69-1.38 (m, 3H), 0.94 (t, *J* = 7.2 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃): δ 203.6, 133.3, 129.5, 128.7, 128.3, 123.8 (q, *J*_{C,F} = 282 Hz), 80.7 (q, *J*_{C,F} = 29 Hz), 71.8, 46.8, 42.8, 38.1, 18.4, 13.9. ESI-HRMS: *m/z* calcd for C₁₅H₁₈O₂F₃ ([M+H]⁺) 287.1253, found 287.1248.

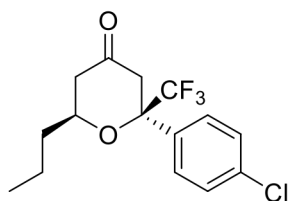
Compound **3b-1** (major diastereomer)



General procedure, dr **3b-1/3b-2** = 7:1 (before purification), **3b-1** 220 mg (69%, er 95:5), R_f 0.23 (hexane/EtOAc = 95:5), colorless oil. [α]²⁴_D -31.9 (c 1.00, CH₂Cl₂, er 95:5). ¹H NMR (500 MHz, CDCl₃): δ 7.48 (d, *J* = 8.6 Hz, 2H), 7.36 (d, *J* = 8.6 Hz, 2H), 4.44-4.38 (m, 1H), 3.28 (d, *J* = 15.5 Hz, 1H), 2.84 (d, *J* = 15.5 Hz, 1H), 2.48 (dd, *J* = 16.6 Hz, 2.5 Hz, 1H), 2.21 (dd, *J* = 16.6 Hz, 11.7 Hz, 1H), 1.81-1.73 (m, 1H), 1.69-1.49 (m, 3H), 1.0 (t, *J* = 7.1 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃): δ 202.9,

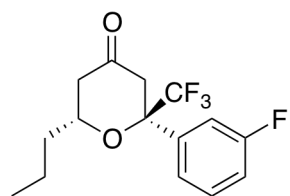
136.1, 135.2, 128.5, 127.7, 124.9 (q, $J_{C,F} = 288$ Hz), 78.4 (q, $J_{C,F} = 29$ Hz), 73.2, 45.7, 43.8, 38.3, 18.4, 13.7. ESI-HRMS: m/z calcd for $C_{15}H_{17}O_2ClF_3$ ($[M+H]^+$) 321.0864, found 321.0858. HPLC (Daicel Chiralpak AS-3, hexane/*i*-PrOH = 98:2, 0.5 mL/min, $\lambda = 220$ nm): t_R (major diastereomer, major enantiomer) = 23.5 min, t_R (major diastereomer, minor enantiomer) = 27.0 min.

Compound 3b-2 (minor diastereomer)



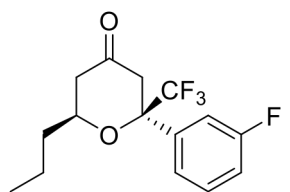
R_f 0.20 (hexane/EtOAc = 95:5), colorless oil. 1H NMR (500 MHz, $CDCl_3$): δ 7.44-7.38 (m, 4H), 3.70-3.65 (m, 1H), 3.19 (d, $J = 14.6$ Hz, 1H), 3.01 (d, $J = 14.6$ Hz, 1H), 2.38 (dd, $J = 14.8$ Hz, 11.6 Hz, 1H), 2.26 (ddd, $J = 14.8$ Hz, 2.6 Hz, 1.6 Hz, 1H), 1.80-1.73 (m, 1H), 1.64-1.47 (m, 2H), 1.45-1.33 (m, 1H), 0.94 (t, $J = 7.3$ Hz, 3H). ^{13}C NMR (125 MHz, $CDCl_3$): δ 203.1, 135.9, 131.9, 129.7, 129.1, 123.6 (q, $J_{C,F} = 282$ Hz), 80.5 (q, $J_{C,F} = 30$ Hz), 72.1, 46.7, 42.7, 38.1, 18.4, 13.9. ESI-HRMS: m/z calcd for $C_{15}H_{17}O_2ClF_3$ ($[M+H]^+$) 321.0864, found 321.0857.

Compound 3c-1 (major diastereomer)

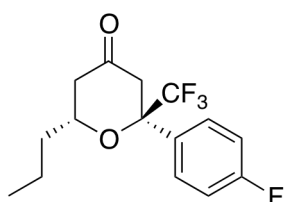


General procedure, dr **3c-1**/**3c-2** = 5:1 (before purification), **3c-1** 182 mg (60%, er 93:7), R_f 0.34 (hexane/EtOAc = 95:5), colorless oil. $[\alpha]_D^{24}$ -34.3 (c 1.00, CH_2Cl_2 , er 93:7). 1H NMR (500 MHz, $CDCl_3$): δ 7.37-7.23 (m, 3H), 7.05 (td, $J = 7.9$ Hz, 1.9 Hz, 1H), 4.43-4.37 (m, 1H), 3.26 (d, $J = 15.6$ Hz, 1H), 2.84 (d, $J = 15.6$ Hz, 1H), 2.47 (dd, $J = 16.6$ Hz, 2.2 Hz, 1H), 2.20 (dd, $J = 16.6$ Hz, 11.7 Hz, 1H), 1.81-1.71 (m, 1H), 1.67-1.44 (m, 3H), 0.99 (t, $J = 7.0$ Hz, 3H). ^{13}C NMR (125 MHz, $CDCl_3$): δ 202.9, 162.6 (d, $J_{C,F} = 245$ Hz), 140.2 (d, $J_{C,F} = 8$ Hz), 129.9 (d, $J_{C,F} = 9$ Hz), 124.9 (q, $J_{C,F} = 288$ Hz), 121.8, 116.0 (d, $J_{C,F} = 20$ Hz), 114.0 (d, $J_{C,F} = 24$ Hz), 78.3 (qd, $J_{C,F} = 29$ Hz, 2 Hz), 73.2, 45.7, 43.9, 38.3, 18.4, 13.7. ESI-HRMS: m/z calcd for $C_{15}H_{17}O_2F_4$ ($[M+H]^+$) 305.1159, found 305.1157. HPLC (Daicel Chiralpak AS-3, hexane/*i*-PrOH = 98:2, 0.5 mL/min, $\lambda = 220$ nm): t_R (major diastereomer, major enantiomer) = 18.9 min, t_R (major diastereomer, minor enantiomer) = 23.2 min.

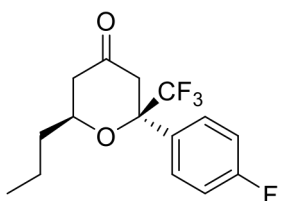
Compound 3c-2 (minor diastereomer)



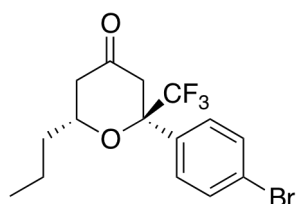
R_f 0.31 (hexane/EtOAc = 95:5), colorless oil. 1H NMR (500 MHz, $CDCl_3$): δ 7.39 (dt, $J = 8.0$ Hz, 6.0 Hz, 1H), 7.27-7.21 (m, 2H), 7.13-7.08 (m, 1H), 3.75-3.69 (m, 1H), 3.18 (d, $J = 14.7$ Hz, 1H), 3.02 (d, $J = 14.7$ Hz, 1H), 2.39 (dd, $J = 14.9$ Hz, 11.6 Hz, 1H), 2.27 (ddd, $J = 14.9$ Hz, 2.7 Hz, 1.5 Hz, 1H), 1.84-1.74 (m, 1H), 1.67-1.48 (m, 2H), 1.48-1.38 (m, 1H) 0.94 (t, $J = 7.2$ Hz, 3H). ^{13}C NMR (125 MHz, $CDCl_3$): δ 203.0, 162.9 (d, $J_{C,F} = 246$ Hz), 136.1 (d, $J_{C,F} = 6$ Hz), 130.4 (d, $J_{C,F} = 9$ Hz), 124.0, 123.6 (q, $J_{C,F} = 285$ Hz), 116.7 (d, $J_{C,F} = 21$ Hz), 115.5 (d, $J_{C,F} = 22$ Hz), 80.4 (q, $J_{C,F} = 30$ Hz), 72.1, 46.6, 43.9, 38.1, 18.3, 13.8. ESI-HRMS: m/z calcd for $C_{15}H_{17}O_2F_4$ ($[M+H]^+$) 305.1159, found 305.1154.

Compound 3d-1 (major diastereomer)

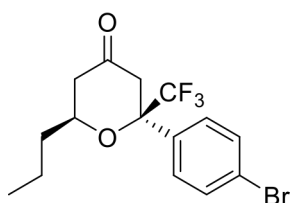
General procedure, dr **3d-1/3d-2** = 8:1 (before purification), **3d-1** 194.2 mg (64%, er 94:6), R_f 0.33 (hexane/EtOAc = 95:5), colorless oil. $[\alpha]_D^{24}$ -41.2 (c 1.00, CH₂Cl₂, er 94:6). ¹H NMR (500 MHz, CDCl₃): δ 7.52 (dd, J = 8.7 Hz, 5.3 Hz, 2H), 7.09-7.05 (m, 2H), 4.44-4.37 (m, 1H), 3.29 (d, J = 15.5 Hz, 1H), 2.86 (d, J = 15.5 Hz, 1H), 2.48 (dd, J = 16.6 Hz, 2.6 Hz, 1H), 2.21 (dd, J = 16.6 Hz, 11.7 Hz, 1H), 1.81-1.74 (m, 1H), 1.67-1.48 (m, 3H), 1.01 (t, J = 7.1 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃): δ 203.1, 163.0 (d, $J_{C,F}$ = 248 Hz), 133.5 (d, $J_{C,F}$ = 2 Hz), 128.3 (d, $J_{C,F}$ = 8 Hz), 125.0 (q, $J_{C,F}$ = 287 Hz), 115.3 (d, $J_{C,F}$ = 21 Hz), 78.4 (q, $J_{C,F}$ = 28 Hz), 73.2, 45.7, 43.9, 38.4, 18.4, 13.7. ESI-HRMS: m/z calcd for C₁₅H₁₇O₂F₄ ([M+H]⁺) 305.1159, found 305.1153. HPLC (Daicel Chiralpak AS-3, hexane/*i*-PrOH = 98:2, 0.5 mL/min, λ = 220 nm): t_R (major diastereomer, major enantiomer) = 26.0 min, t_R (major diastereomer, minor enantiomer) = 30.9 min.

Compound 3d-2 (minor diastereomer)

R_f 0.31 (hexane/EtOAc = 95:5), colorless oil. ¹H NMR (500 MHz, CDCl₃): δ 7.47 (dd, J = 8.6 Hz, 5.2 Hz, 2H), 7.13-7.08 (m, 2H), 3.71-3.65 (m, 1H), 3.20 (d, J = 15.0 Hz, 1H), 3.01 (dd, J = 15.0 Hz, 0.5 Hz, 1H), 2.38 (dd, J = 14.8 Hz, 11.7 Hz, 1H), 2.26 (ddd, J = 14.8 Hz, 2.7 Hz, 1.7 Hz, 1H), 1.83-1.73 (m, 1H), 1.65-1.46 (m, 2H), 1.46-1.35 (m, 1H), 0.93 (t, J = 7.3 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃): δ 203.3, 163.3 (d, $J_{C,F}$ = 248 Hz), 130.4 (d, $J_{C,F}$ = 9 Hz), 129.1 (d, $J_{C,F}$ = 4 Hz), 123.7 (q, $J_{C,F}$ = 282 Hz), 115.9 (d, $J_{C,F}$ = 21 Hz), 80.4 (q, $J_{C,F}$ = 30 Hz), 72.0, 46.8, 42.8, 38.1, 18.4, 13.8. ESI-HRMS: m/z calcd for C₁₅H₁₇O₂F₄ ([M+H]⁺) 305.1159, found 305.1155.

Compound 3e-1 (major diastereomer)

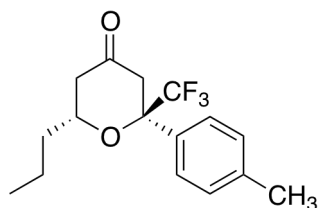
General procedure, dr **3e-1/3e-2** = 7:1 (before purification), **3e-1** 158 mg (72%, er 96:4), R_f 0.36 (hexane/EtOAc = 95:5), colorless oil. $[\alpha]_D^{24}$ -20.2 (c 0.50, CH₂Cl₂, er 96:4). ¹H NMR (500 MHz, CDCl₃): δ 7.52 (d, J = 8.3 Hz, 2H), 7.41 (d, J = 8.3 Hz, 2H), 4.44-4.38 (m, 1H), 3.28 (d, J = 15.5 Hz, 1H), 2.84 (d, J = 15.5 Hz, 1H), 2.48 (d, J = 16.5 Hz, 1H), 2.20 (dd, J = 16.5 Hz, 11.8 Hz, 1H), 1.81-1.73 (m, 1H), 1.60-1.47 (m, 3H), 1.00 (t, J = 7.0 Hz, 3H). ¹³C NMR (125 MHz, CDCl₃): δ 202.8, 136.7, 131.5, 128.0, 124.8 (q, $J_{C,F}$ = 287 Hz), 123.5, 78.5 (q, $J_{C,F}$ = 29 Hz), 73.2, 45.7, 43.7, 38.3, 18.4, 13.7. ESI-HRMS: m/z calcd for C₁₅H₁₇O₂BrF₃ ([M+H]⁺) 365.0359, found 365.0349. HPLC (Daicel Chiralpak AS-3, hexane/*i*-PrOH = 98:2, 0.5 mL/min, λ = 220 nm): t_R (major diastereomer, major enantiomer) = 24.5 min, t_R (major diastereomer, minor enantiomer) = 30.5 min.

Compound 3e-2 (minor diastereomer)

R_f 0.34 (hexane/EtOAc = 95:5), colorless oil. ¹H NMR (500 MHz, CDCl₃): δ 7.55 (d, J = 8.3 Hz, 2H), 7.35 (d, J = 8.3 Hz, 2H), 3.71-3.64 (m, 1H), 3.18 (d, J = 14.6 Hz, 1H), 3.00 (d, J = 14.6 Hz, 1H), 2.38 (dd, J = 14.8 Hz, 11.6 Hz, 1H), 2.26 (d, J = 14.8 Hz, 1H), 1.80-

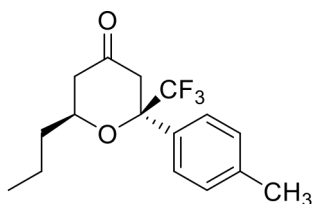
1.70 (m, 1H), 1.60-1.46 (m, 2H), 1.46-1.33 (m, 1H), 0.93 (t, $J = 7.2$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 203.1, 132.4, 132.0, 130.0, 124.2, 123.5 (q, $J_{\text{C,F}} = 282$ Hz), 80.5 (q, $J_{\text{C,F}} = 30$ Hz), 72.1, 46.7, 42.6, 38.1, 18.4, 13.9. ESI-HRMS: m/z calcd for $\text{C}_{15}\text{H}_{17}\text{O}_2\text{BrF}_3$ ($[\text{M}+\text{H}]^+$) 365.0359, found 365.0348.

Compound 3f-1 (major diastereomer)



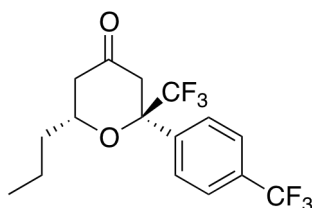
General procedure, dr **3f-1/3f-2** = 4:1 (before purification), **3f-1** 157.8 mg (53%, er 90:10), R_f 0.37 (hexane/EtOAc = 95:5), colorless oil. $[\alpha]_D^{24}$ -11.7 (c 0.20, CH_2Cl_2 , er 90:10). ^1H NMR (500 MHz, CDCl_3): δ 7.43 (d, $J = 7.8$ Hz, 2H), 7.20 (d, $J = 7.8$ Hz, 2H), 4.43-4.37 (m, 1H), 3.28 (d, $J = 15.6$ Hz, 1H), 2.89 (d, $J = 15.6$ Hz, 1H), 2.46 (d, $J = 16.4$ Hz, 1H), 2.35 (s, 3H), 2.21 (dd, $J = 16.4$ Hz, 11.8 Hz, 1H), 1.83-1.75 (m, 1H), 1.70-1.50 (m, 3H), 1.01 (t, $J = 7.0$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 203.6, 138.9, 134.8, 129.0, 126.3, 126.1, 125.1 (q, $J_{\text{C,F}} = 287$ Hz), 124.0, 78.6 (q, $J_{\text{C,F}} = 33.7$ Hz), 73.0, 45.7, 43.9, 38.4, 21.0, 18.4, 13.8. ESI-HRMS: m/z calcd for $\text{C}_{16}\text{H}_{20}\text{O}_2\text{F}_3$ ($[\text{M}+\text{H}]^+$) 301.1410, found 301.1408. HPLC (Daicel Chiralpak IB, hexane/*i*-PrOH = 98:2, 0.5 mL/min, $\lambda = 220$ nm): t_R (major diastereomer, major enantiomer) = 11.6 min, t_R (major diastereomer, minor enantiomer) = 13.3 min.

Compound 3f-2 (minor diastereomer)

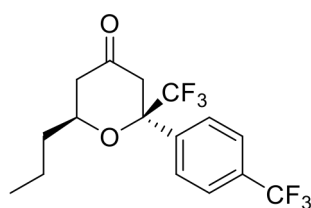


R_f 0.35 (hexane/EtOAc = 95:5), colorless oil. ^1H NMR (500 MHz, CDCl_3): δ 7.36 (d, $J = 7.8$ Hz, 2H), 7.22 (d, $J = 7.8$ Hz, 2H), 3.73-3.67 (m, 1H), 3.24 (d, $J = 14.6$ Hz, 1H), 2.97 (d, $J = 14.6$ Hz, 1H), 2.39-2.32 (m, 4H), 2.23 (d, $J = 14.6$ Hz, 1H), 1.81-1.72 (m, 1H), 1.65-1.55 (m, 1H), 1.53-1.35 (m, 2H), 0.93 (t, $J = 7.2$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 203.7, 139.6, 130.2, 129.5, 128.3, 123.9 (q, $J_{\text{C,F}} = 282$ Hz), 80.7 (q, $J_{\text{C,F}} = 29$ Hz), 71.7, 46.9, 42.8, 38.2, 21.0, 18.4, 13.9. ESI-HRMS: m/z calcd for $\text{C}_{16}\text{H}_{20}\text{O}_2\text{F}_3$ ($[\text{M}+\text{H}]^+$) 301.1410, found 301.1406.

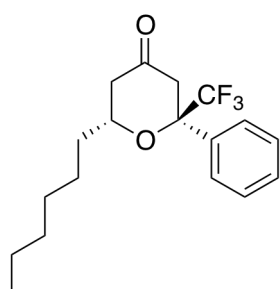
Compound 3g-1 (major diastereomer)



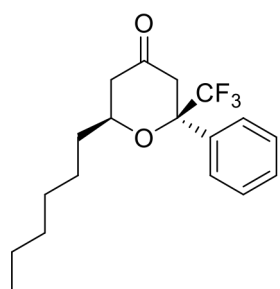
General procedure, dr **3g-1/3g-2** = 6:1 (before purification), **3g-1** 196 mg (56%, er 95:5), R_f 0.35 (hexane/EtOAc = 95:5), colorless oil. $[\alpha]_D^{24}$ -36.3 (c 1.00, CH_2Cl_2 , er 95:5). ^1H NMR (500 MHz, CDCl_3): δ 7.69 (d, $J = 9.0$ Hz, 2H), 7.66 (d, $J = 9.0$ Hz, 2H), 4.48-4.40 (m, 1H), 3.33 (d, $J = 15.5$ Hz, 1H), 2.87 (d, $J = 15.5$ Hz, 1H), 2.51 (dd, $J = 16.6$ Hz, 2.5 Hz, 1H), 2.22 (dd, $J = 16.6$ Hz, 11.7 Hz, 1H), 1.84-1.76 (m, 1H), 1.68-1.47 (m, 3H), 1.02 (t, $J = 7.1$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 202.6, 141.5, 131.3 (q, $J_{\text{C,F}} = 32$ Hz), 126.9, 125.3 (q, $J_{\text{C,F}} = 4$ Hz), 124.8 (q, $J_{\text{C,F}} = 287$ Hz), 123.8 (q, $J_{\text{C,F}} = 271$ Hz), 78.6 (q, $J_{\text{C,F}} = 29$ Hz), 73.4, 45.7, 43.8, 38.4, 18.4, 13.7. ESI-HRMS: m/z calcd for $\text{C}_{16}\text{H}_{17}\text{O}_2\text{F}_6$ ($[\text{M}+\text{H}]^+$) 355.1127, found 355.1119. HPLC (Daicel Chiralpak IB, hexane/*i*-PrOH = 98:2, 0.5 mL/min, $\lambda = 220$ nm): t_R (major diastereomer, major enantiomer) = 14.5 min, t_R (major diastereomer, minor enantiomer) = 18.9 min.

Compound 3g-2 (minor diastereomer)

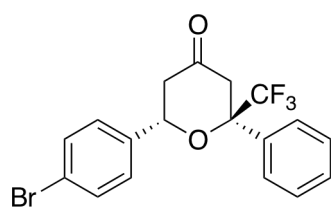
R_f 0.31 (hexane/EtOAc = 95:5), colorless oil. ^1H NMR (500 MHz, CDCl_3): δ 7.69 (d, $J = 8.4$ Hz, 2H), 7.63 (d, $J = 8.4$ Hz, 2H), 3.71-3.65 (m, 1H), 3.23 (d, $J = 14.7$ Hz, 1H), 3.07 (d, $J = 14.7$ Hz, 1H), 2.42 (dd, $J = 14.9$ Hz, 11.6 Hz, 1H), 2.28 (ddd, $J = 14.9$ Hz, 2.6 Hz, 1.5 Hz, 1H), 1.84-1.75 (m, 1H), 1.66-1.49 (m, 2H), 1.49-1.36 (m, 1H), 0.95 (t, $J = 7.2$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 202.8, 137.6, 131.8 (q, $J_{\text{C,F}} = 32$ Hz), 128.8, 125.8 (q, $J_{\text{C,F}} = 4$ Hz), 123.6 (q, $J_{\text{C,F}} = 270$ Hz), 123.5 (q, $J_{\text{C,F}} = 281$ Hz) 80.6 (q, $J_{\text{C,F}} = 30$ Hz), 72.4, 46.7, 42.7, 38.1, 18.4, 13.9. ESI-HRMS: m/z calcd for $\text{C}_{16}\text{H}_{17}\text{O}_2\text{F}_6$ ($[\text{M}+\text{H}]^+$) 355.1127, found 355.1118.

Compound 3h-1 (major diastereomer)

General procedure, dr **3h-1/3h-2** = 5:1 (before purification), **3h-1** 206.9 mg (63%, er 89:11), R_f 0.34 (hexane/EtOAc = 95:5), colorless oil. $[\alpha]_D^{24}$ -10.6 (c 0.40, CH_2Cl_2 , er 89:11). ^1H NMR (500 MHz, CDCl_3): δ 7.54 (d, $J = 6.4$ Hz, 2H), 7.42-7.36 (m, 3H), 4.43-4.36 (m, 1H), 3.30 (d, $J = 15.6$ Hz, 1H), 2.90 (d, $J = 15.6$ Hz, 1H), 2.48 (d, $J = 15.0$ Hz, 1H), 2.21 (dd, $J = 15.0$ Hz, 11.8 Hz, 1H), 1.85-1.75 (m, 1H), 1.70-1.20 (m, 9H), 0.91 (t, $J = 6.4$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 203.5, 137.7, 129.0, 128.3, 126.3, 125.1 (q, $J_{\text{C,F}} = 286$ Hz), 78.7 (q, $J_{\text{C,F}} = 29$ Hz), 73.4, 45.8, 44.0, 36.4, 31.7, 29.0, 25.1, 22.5, 14.0. ESI-HRMS: m/z calcd for $\text{C}_{18}\text{H}_{24}\text{O}_2\text{F}_3$ ($[\text{M}+\text{H}]^+$) 329.1723, found 329.1720. HPLC (Daicel Chiralpak IB, hexane/*i*-PrOH = 98:2, 0.5 mL/min, $\lambda = 220$ nm): t_R (major diastereomer, major enantiomer) = 12.2 min, t_R (major diastereomer, minor enantiomer) = 14.1 min.

Compound 3h-2 (minor diastereomer)

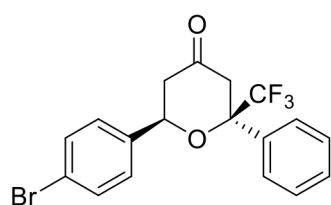
R_f 0.31 (hexane/EtOAc = 95:5), colorless oil. ^1H NMR (500 MHz, CDCl_3): δ 7.49 (d, $J = 6.4$ Hz, 2H), 7.45-7.37 (m, 3H), 3.74-3.67 (m, 1H), 3.25 (d, $J = 14.6$ Hz, 1H), 3.01 (d, $J = 14.6$ Hz, 1H), 2.37 (dd, $J = 14.6$ Hz, 11.3 Hz, 1H), 2.25 (d, $J = 14.6$ Hz, 1H), 1.82-1.74 (m, 1H), 1.63-1.49 (m, 2H), 1.35-1.25 (m, 7H), 0.90 (t, $J = 6.3$ Hz, 3H). ^{13}C NMR (125 MHz, CDCl_3): δ 203.6, 133.3, 129.5, 128.7, 128.3, 123.8 (q, $J_{\text{C,F}} = 282$ Hz), 80.7 (q, $J_{\text{C,F}} = 29$ Hz) 72.0, 46.8, 42.8, 36.0, 31.6, 29.1, 25.0, 22.6, 14.0. ESI-HRMS: m/z calcd for $\text{C}_{18}\text{H}_{24}\text{O}_2\text{F}_3$ ($[\text{M}+\text{H}]^+$) 329.1723, found 329.1717.

Compound 3i-1 (major diastereomer)

General procedure, dr **3i-1/3i-2** = 3:1 (before purification), **3i-1** 220 mg (56%, er 80:20), R_f 0.36 (hexane/EtOAc = 95:5), colorless oil. $[\alpha]_D^{24}$ -12.8 (c 0.50, CH_2Cl_2 , er 80:20). ^1H NMR (500 MHz, CDCl_3): δ 7.61-7.55 (m, 4H), 7.45-7.40 (m, 3H), 7.34 (d, $J = 8.2$ Hz, 2H), 5.42 (d, $J = 11.9$ Hz, 1H), 3.44 (d, $J = 15.7$ Hz, 1H), 3.05 (d, $J = 15.8$ Hz, 1H), 2.72 (d, $J = 15.8$ Hz, 1H), 2.52 (dd, $J = 15.8$

Hz, 11.9 Hz, 1H). ^{13}C NMR (125 MHz, CDCl_3): δ 201.9, 138.7, 137.1, 132.0, 129.3, 128.5, 127.6, 126.3, 125.0 (q, $J_{\text{C,F}} = 286$ Hz) 122.5, 74.7, 47.2, 43.8. ESI-HRMS: m/z calcd for $\text{C}_{18}\text{H}_{15}\text{O}_2\text{BrF}_3$ ($[\text{M}+\text{H}]^+$) 399.0202, found 399.0197. HPLC (Daicel Chiralpak IB, hexane/*i*-PrOH = 98:2, 0.5 mL/min, $\lambda = 220$ nm): t_{R} (major diastereomer, major enantiomer) = 30.5 min, t_{R} (major diastereomer, minor enantiomer) = 43.5 min.

Compound 3i-2 (minor diastereomer)

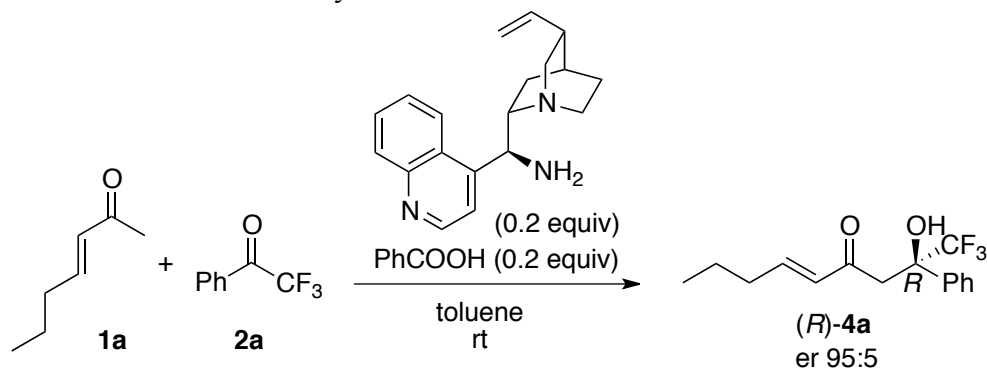


R_f 0.33 (hexane/EtOAc = 95:5), colorless oil. ^1H NMR (500 MHz, CDCl_3): δ 7.54-7.48 (m, 4H), 7.44-7.40 (m, 3H), 7.25 (d, $J = 8.3$ Hz, 2H), 4.70 (d, $J = 11.8$ Hz, 1H), 3.36 (d, $J = 14.8$ Hz, 1H), 3.13 (d, $J = 14.8$ Hz, 1H), 2.62 (dd, $J = 14.8$ Hz, 11.8 Hz, 1H), 2.50 (d, $J = 14.8$ Hz, 1H). ^{13}C NMR (125 MHz, CDCl_3): δ 202.1, 138.4, 132.6, 131.9, 129.8, 129.0, 128.2, 127.3, 123.7 (q, $J_{\text{C,F}} = 282$ Hz), 122.3, 81.2 (q, $J_{\text{C,F}} = 30$ Hz), 73.0, 48.3, 42.7. ESI-HRMS: m/z calcd for $\text{C}_{18}\text{H}_{15}\text{O}_2\text{BrF}_3$ ($[\text{M}+\text{H}]^+$) 399.0202, found 399.0194.

3. Determination of the Absolute Configuration of 3a-1 (Scheme 2)

Synthesis of (*R*)-4a³

Aldol (*R*)-4a³ was synthesized by the previously reported procedure using cinchonidine-derived amine with benzoic acid as the catalyst.³



Aldol (*R*)-4a³

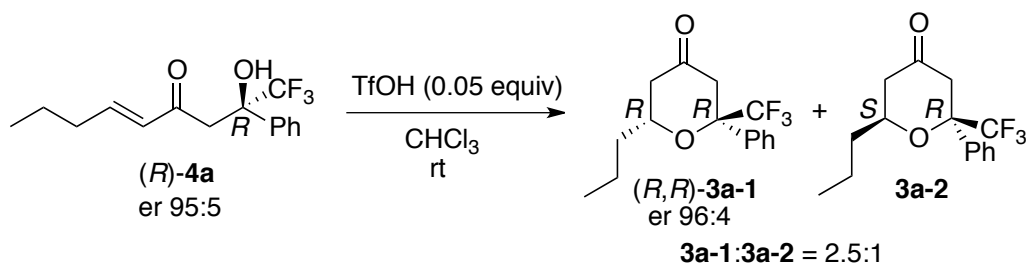
$[\alpha]_{\text{D}}^{24}$ -114 (c 1.0, CH_2Cl_2 , er 95:5 determined by HPLC analysis). Lit. $[\alpha]_{\text{D}}^{24}$ -71.8 (c 0.28, CH_2Cl_2 , 93% ee) for (*R*)-4a.³ HPLC (Daicel Chiralpak AS-3, hexane/*i*-PrOH = 99:1, 0.5 mL/min, $\lambda = 220$ nm): t_{R} (major enantiomer) = 27 min, t_{R} (minor enantiomer) = 32 min.

Synthesis of (\pm)-4a

Racemic standard of aldol (\pm)-4a was synthesized by the procedure that was used for the synthesis of (*R*)-4a but using ethylenediamine (0.1 equiv) with benzoic acid (0.1 equiv) as the catalyst instead of the cinchonidine-derived amine with benzoic acid.

Transformation of (*R*)-4a to 3a: Intramolecular oxa-Michael reaction of (*R*)-4

Aldol (*R*)-4a³ (er 95:5) was transformed to 3a in the presence of TfOH.⁴

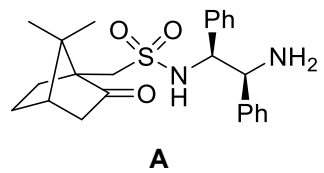
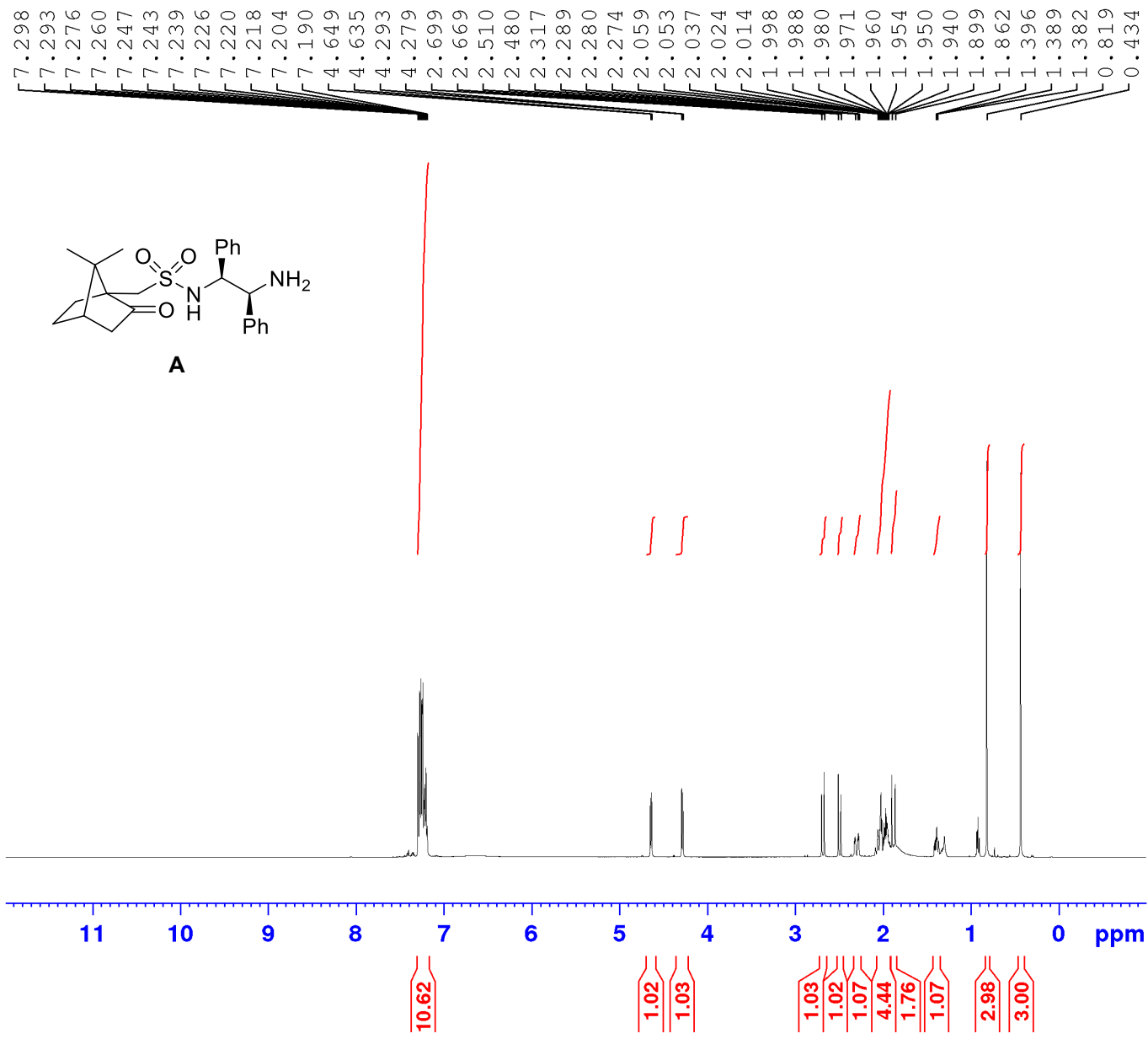


To a solution of $(R)\text{-4a}$ (er 95:5, 180 mg, 0.62 mmol) in CHCl_3 (5.0 mL), TfOH (2.7 μL , 0.031 mmol) was added at room temperature (25 $^\circ\text{C}$), and the mixture was stirred at the same temperature for 3 days. A portion of the mixture was diluted with CDCl_3 and analyzed by ^1H NMR to observe the product formation and the dr; the ratios were $3\text{a}/4\text{a} = 7:3$ and $3\text{a-1}/3\text{a-2} = 2.5:1$. The mixture (remaining portion) was purified by flash column chromatography (hexane/EtOAc = 98:2) to give $(R,R)\text{-3a-1}$ (er 96:4).

Based on the comparison of HPLC retention times of 3a-1 obtained in the presence of amine **A** and acid **B** (page S2-S3) and of $(R,R)\text{-3a-1}$ obtained from $(R)\text{-4a}$, the absolute configuration of 3a-1 obtained in the presence of **A** and **B** (page S2-S3) was determined to be (R,R) .

4. References

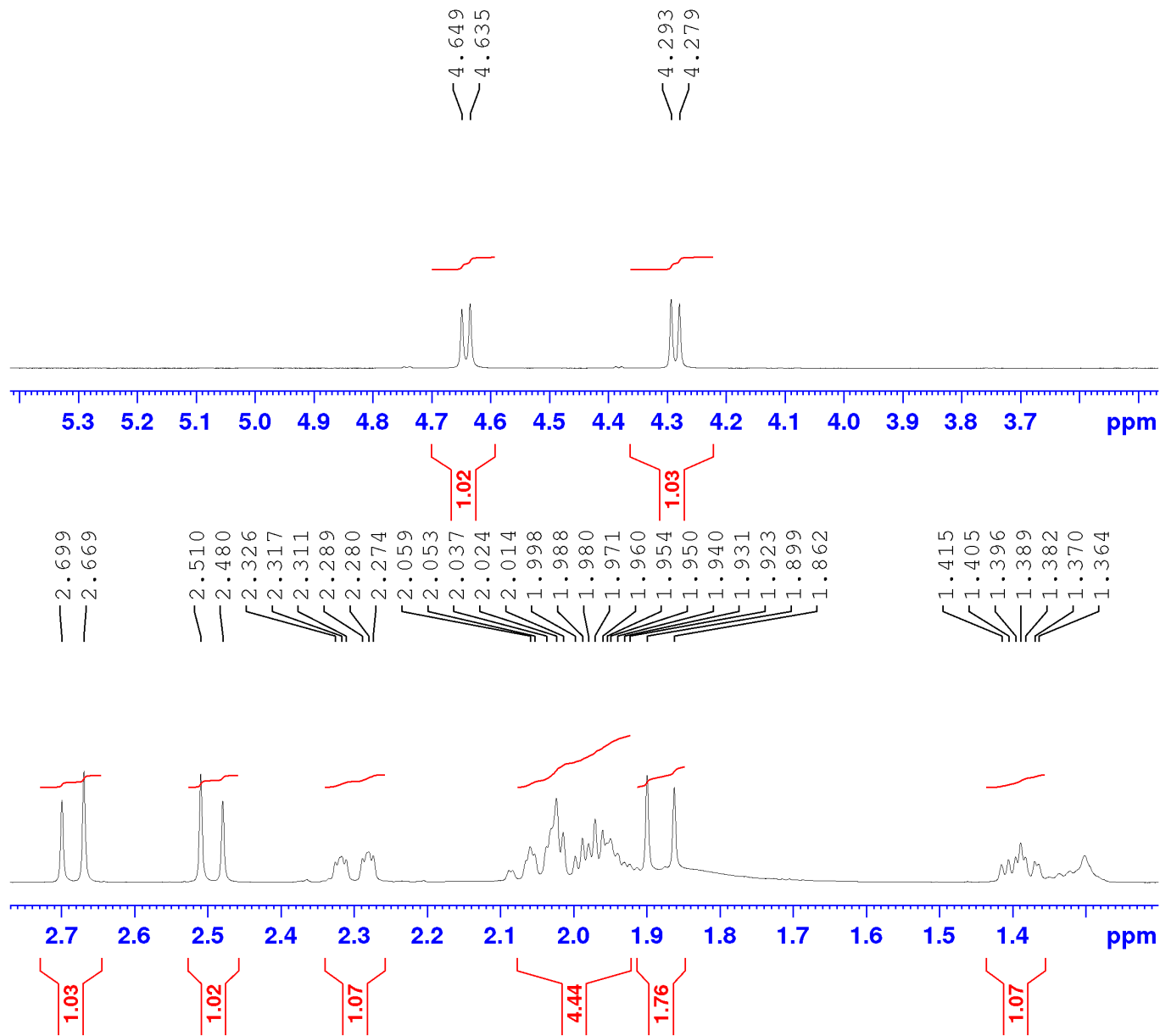
1. C. Lu, Z. Luo, L. Huang, and X. Li, *Tetrahedron Asymmetry* 2011, **22**, 722.
2. D. Zhang and F. Tanaka, *RSC Advances* 2016, **6**, 61454.
3. J. Lin, T. Kang, Q. Liu, and L. He, *Tetrahedron:Asymmetry* 2014, **25**, 949.
4. M. Pasha, M. Sohail, and F. Tanaka, *Heterocycles*, 2020, **101**, 339.



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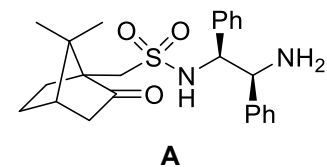
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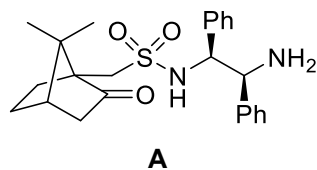
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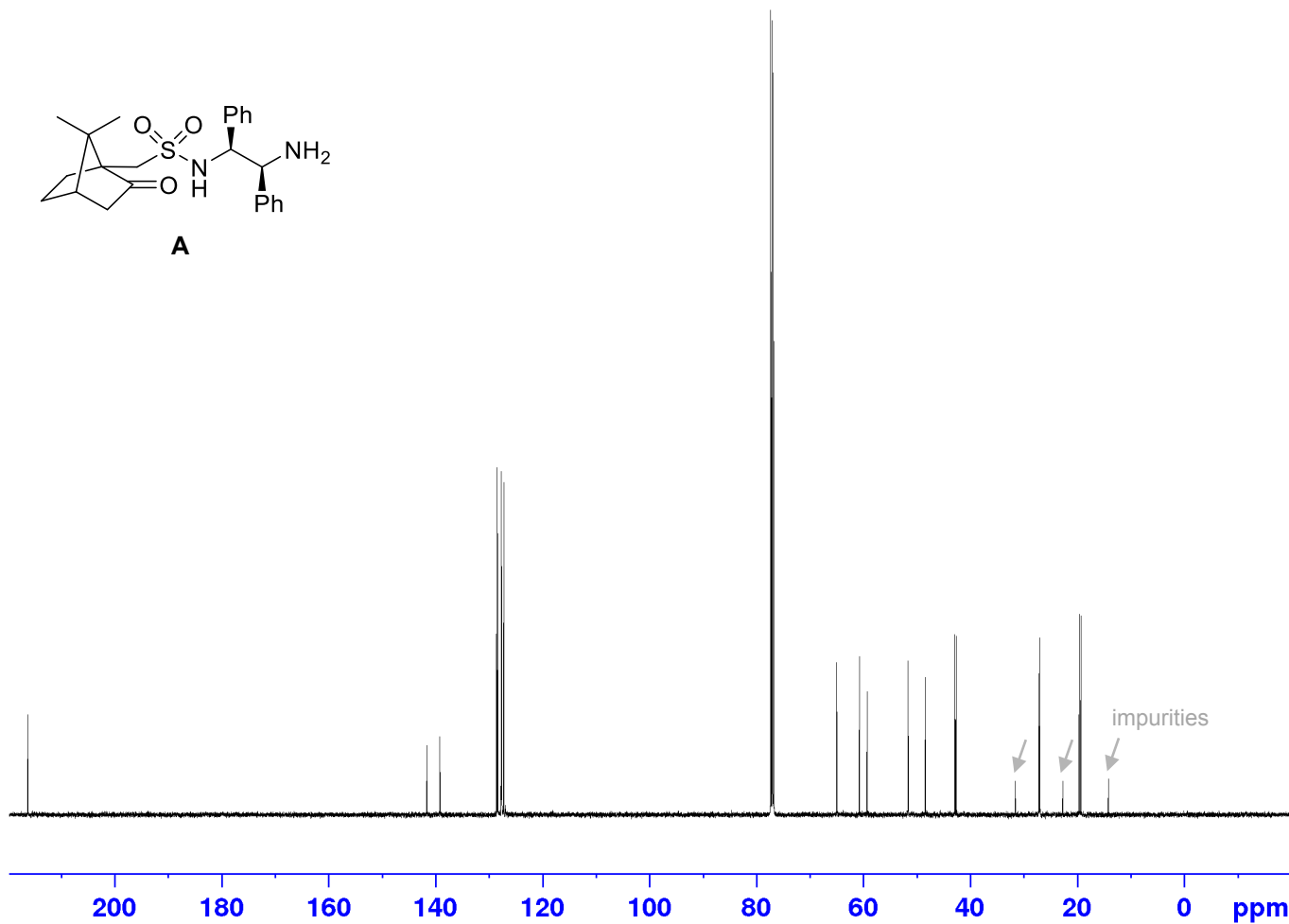


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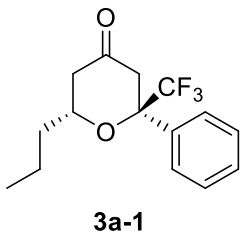
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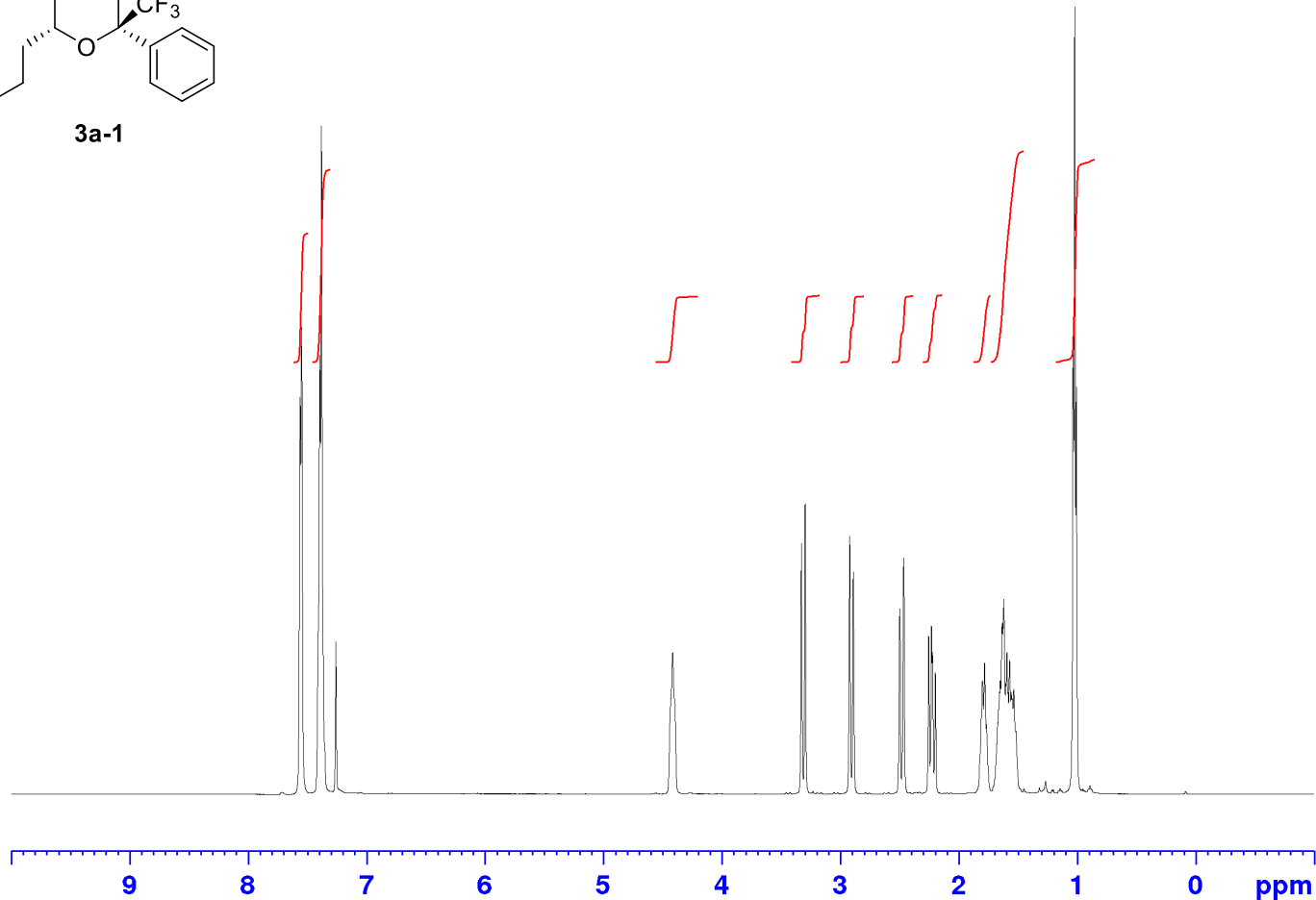
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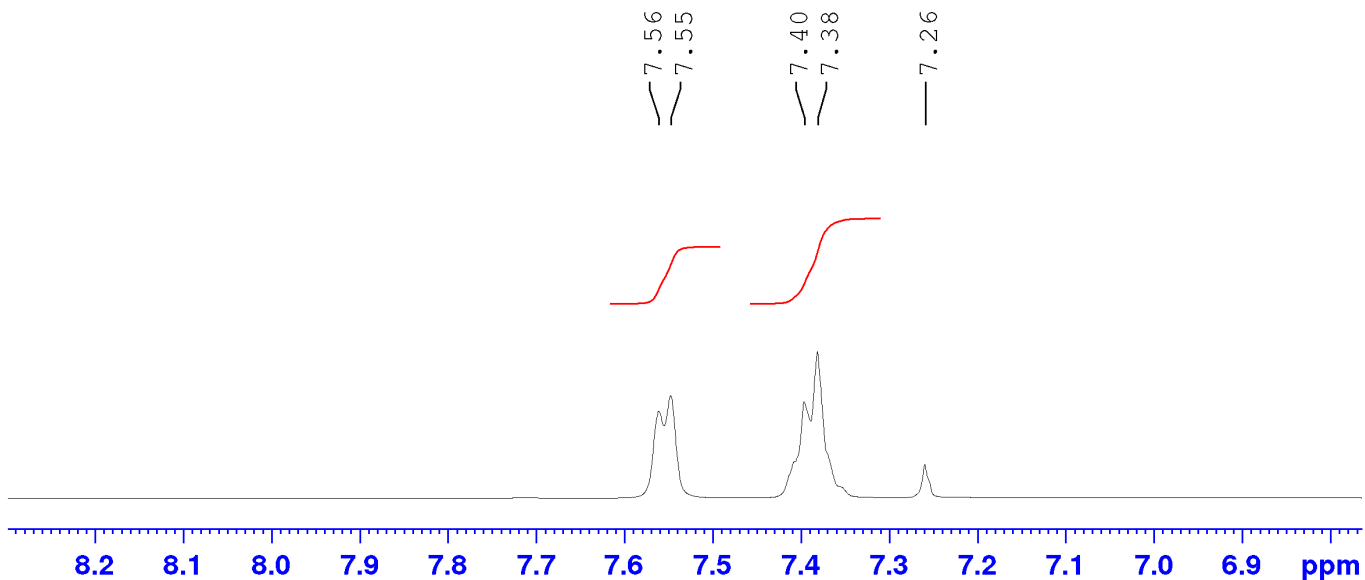
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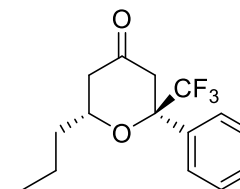
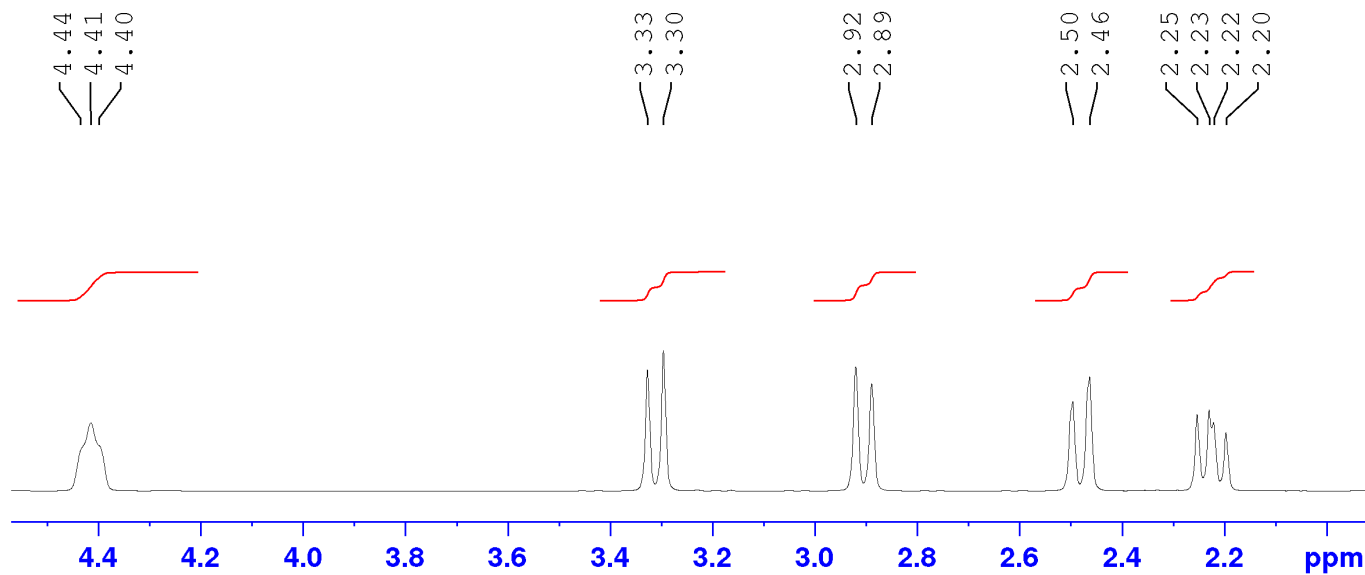
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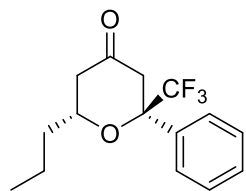
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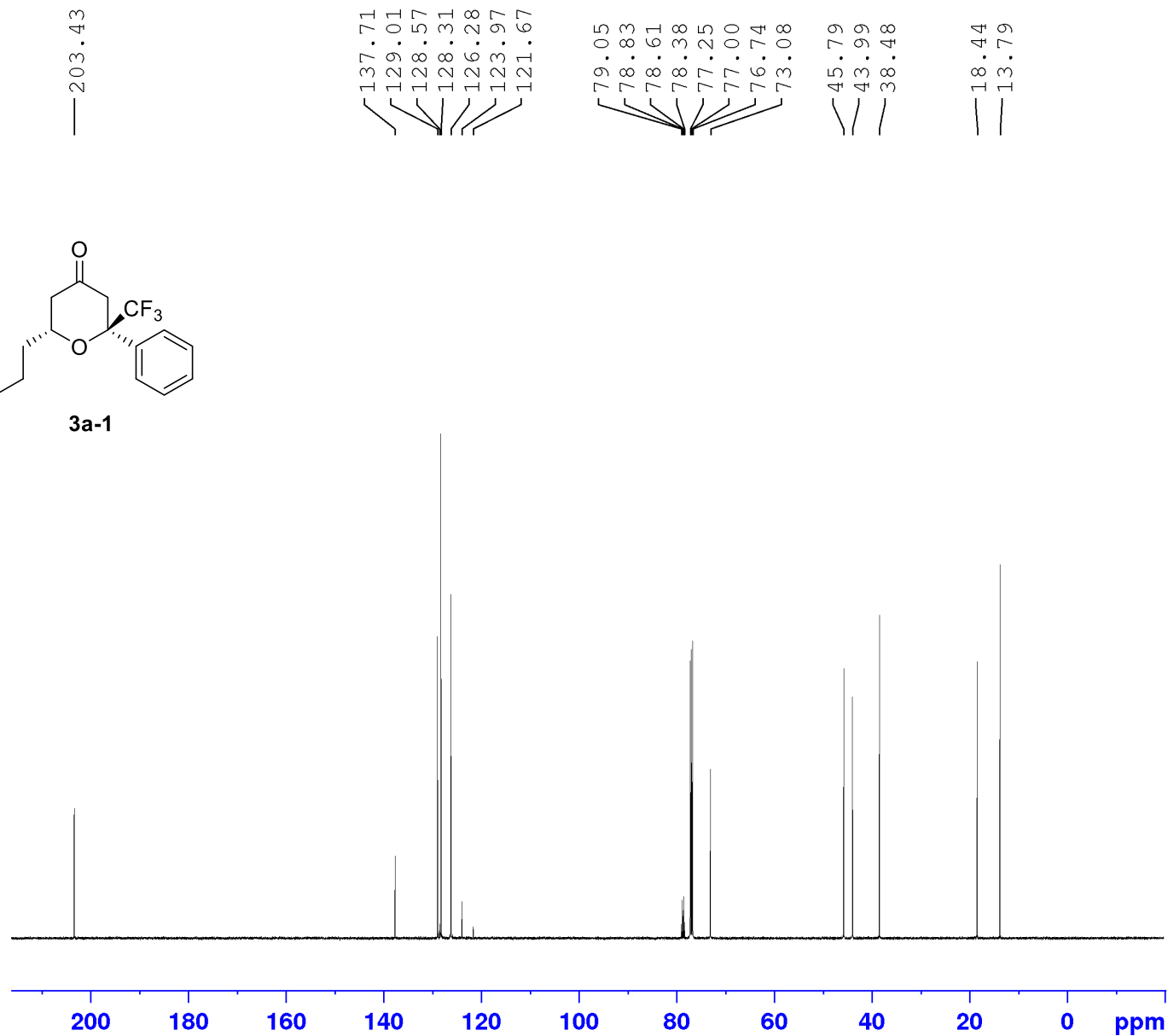
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3a-1



3a-1



Current Data Parameters
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 EXPNO 11
 PROCNO 1

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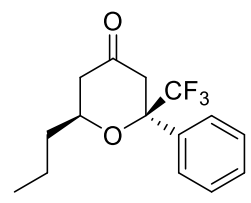
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0.928

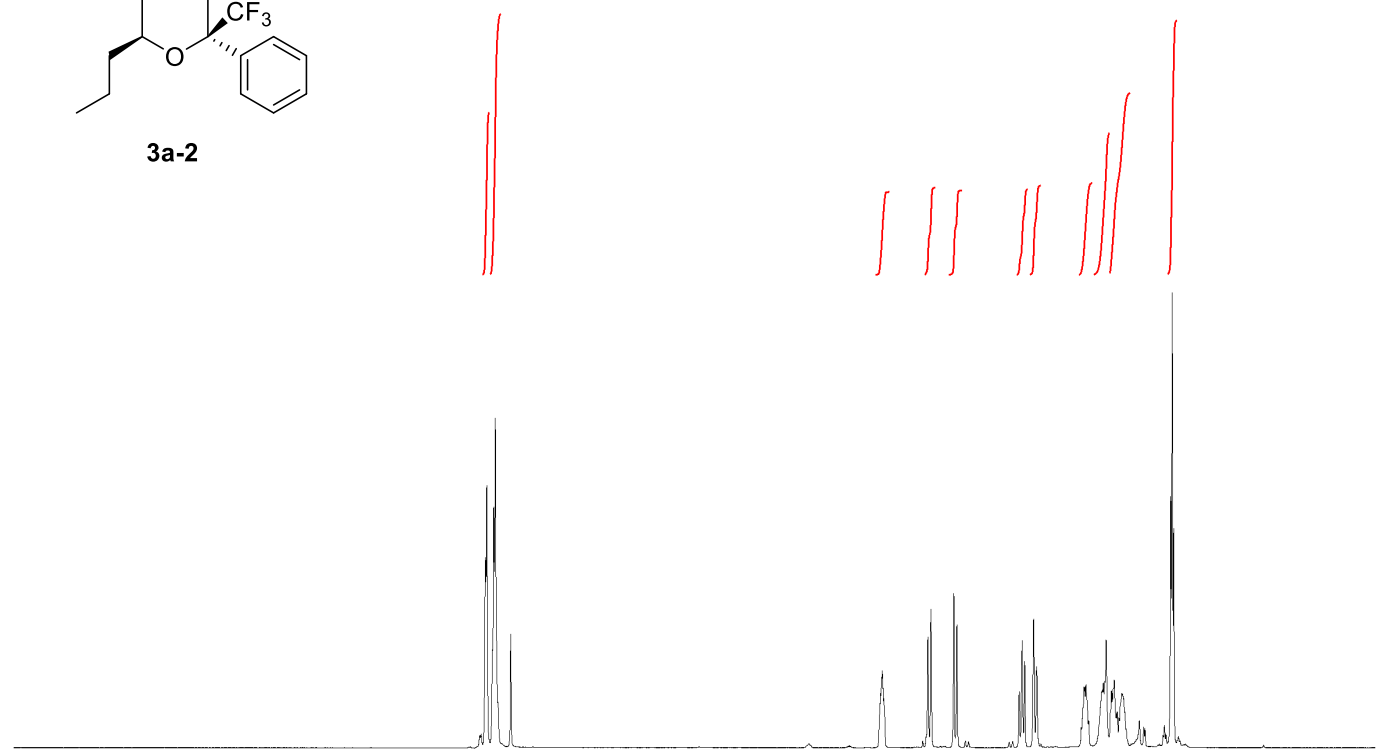
Current Data Parameters
NAME MH-307-MINOR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200212
Time 16.14 h
INSTRUM Avance
PROBHD Z151574_0027 (
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 101
DW 50.000 usec
DE 11.14 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
SF01 500.1330883 MHz
NUC1 1H
P0 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

F2 - Processing parameters
SI 65536
SF 500.1300131 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

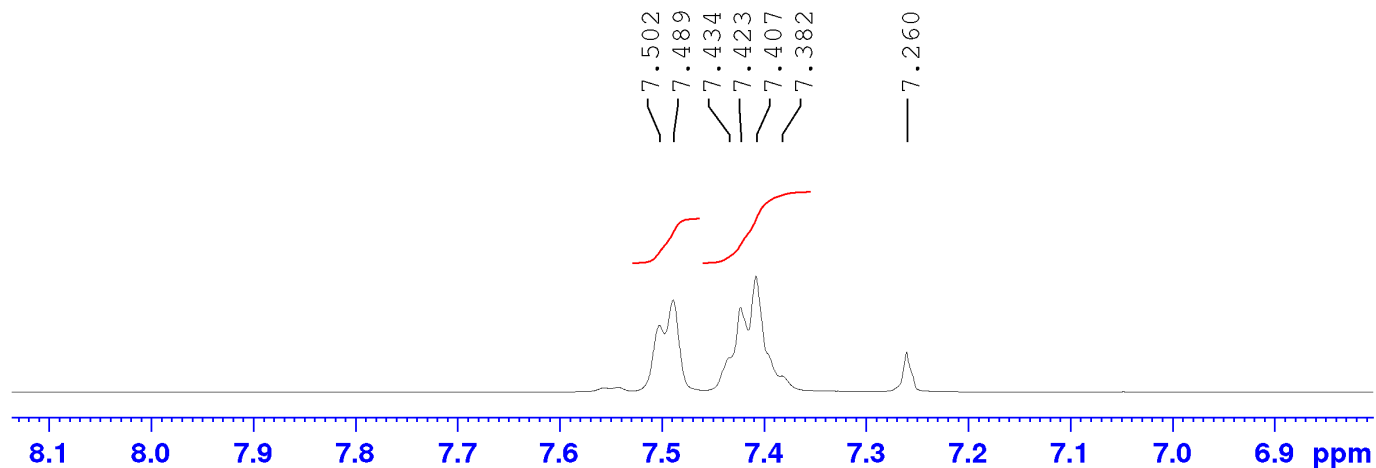


3a-2



11 10 9 8 7 6 5 4 3 2 1 0 ppm

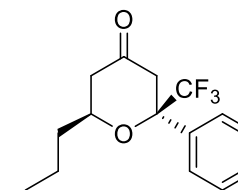
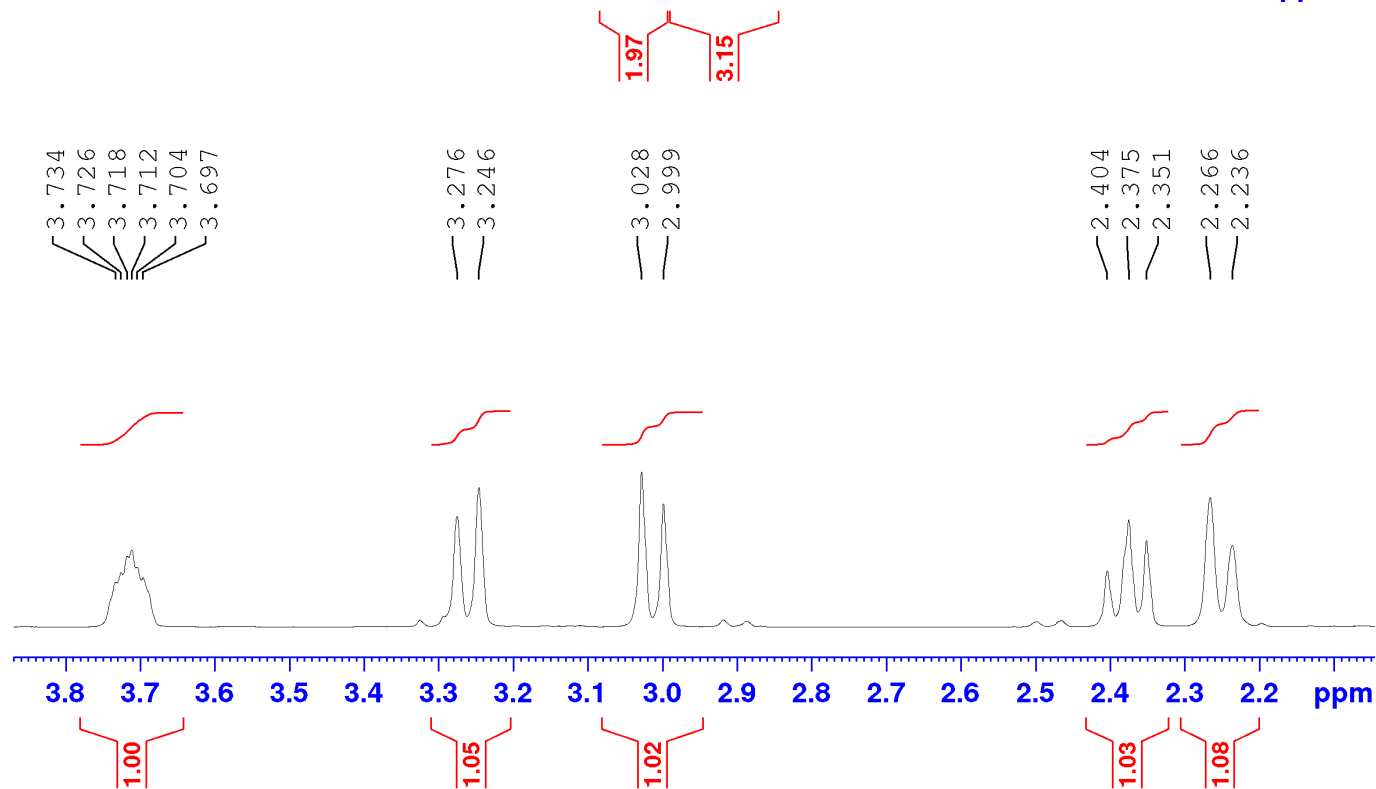
1.97 3.15 1.00 1.05 1.02 1.03 1.08 1.11 1.71 2.19 3.07



Current Data Parameters
 NAME MH-307-MINOR
 EXPNO 10
 PROCNO 1

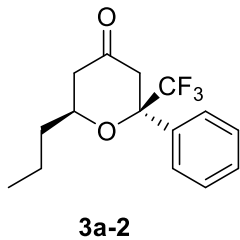
F2 - Acquisition Parameters
 Date_ 20200212
 Time 16.14 h
 INSTRUM Avance
 PROBHD Z151574_0027 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 101
 DW 50.000 usec
 DE 11.14 usec
 TE 298.0 K
 D1 1.00000000 sec
 TD0 1
 SF01 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300131 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

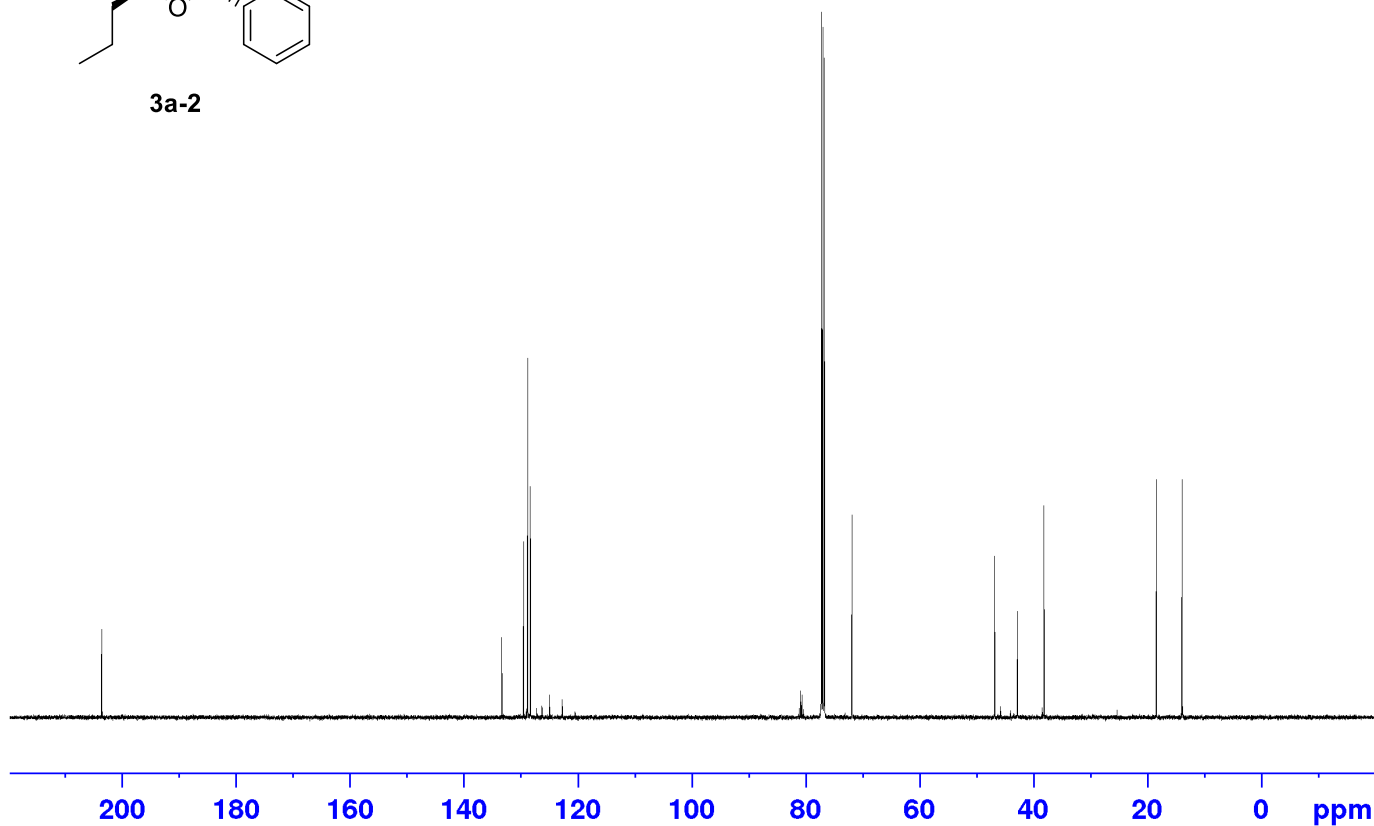


3a-2

— 203.61



133.34
129.53
129.04
128.79
128.34
127.25
126.30
124.99
122.74
120.48
81.14
80.91
80.67
80.43
77.25
77.00
76.74
71.87
46.85
42.82
38.19
18.43
13.93

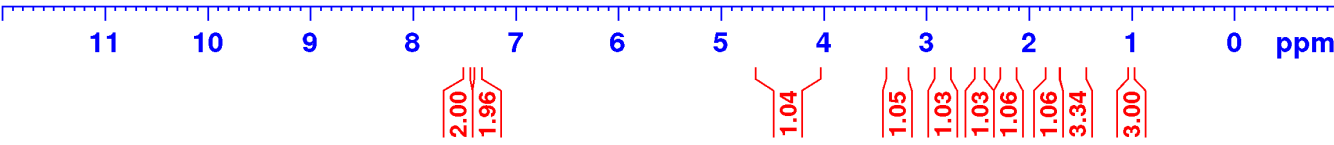
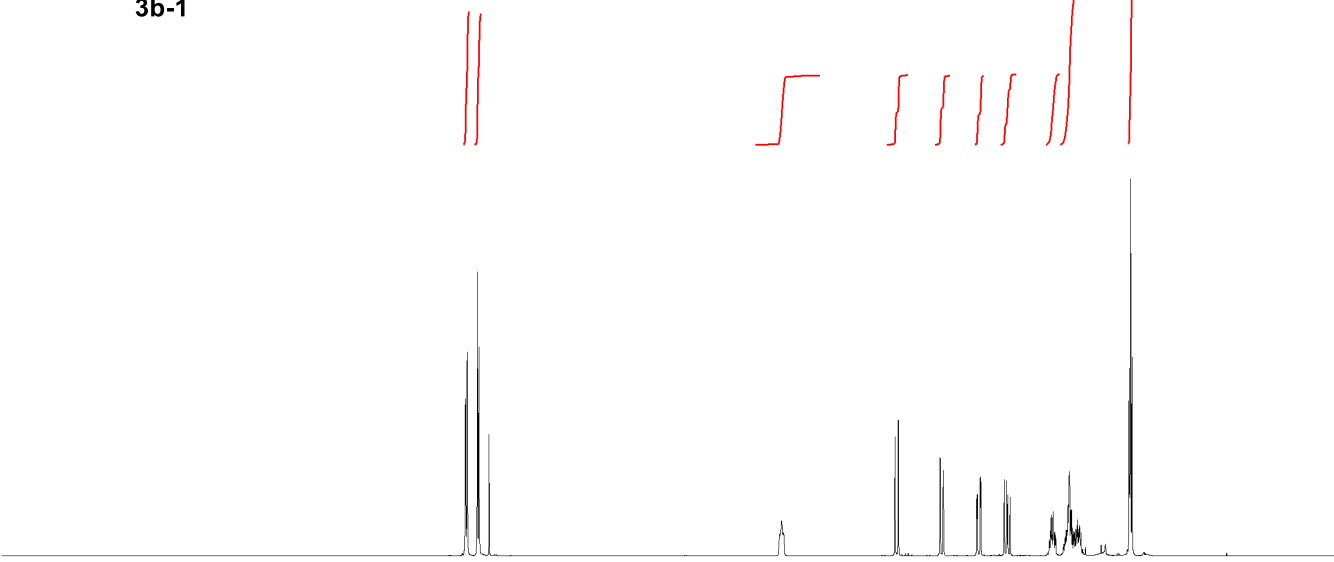
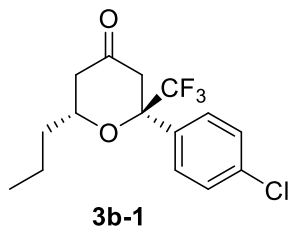


Current Data Parameters
NAME MH-307-MINOR
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200212
Time 17.08 h
INSTRUM Avance
PROBHD Z151574_0027 (
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 30120.482 Hz
FIDRES 0.919204 Hz
AQ 1.0878977 sec
RG 101
DW 16.600 usec
DE 6.50 usec
TE 298.0 K
D1 2.0000000 sec
D11 0.03000000 sec
TD0 1
SFO1 125.7703643 MHz
NUC1 13C
P0 3.33 usec
P1 10.00 usec
PLW1 88.26000214 W
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2] waltz65
PCPD2 80.00 usec
PLW2 23.68499947 W
PLW12 0.23684999 W
PLW13 0.11913000 W

F2 - Processing parameters
SI 32768
SF 125.7577920 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

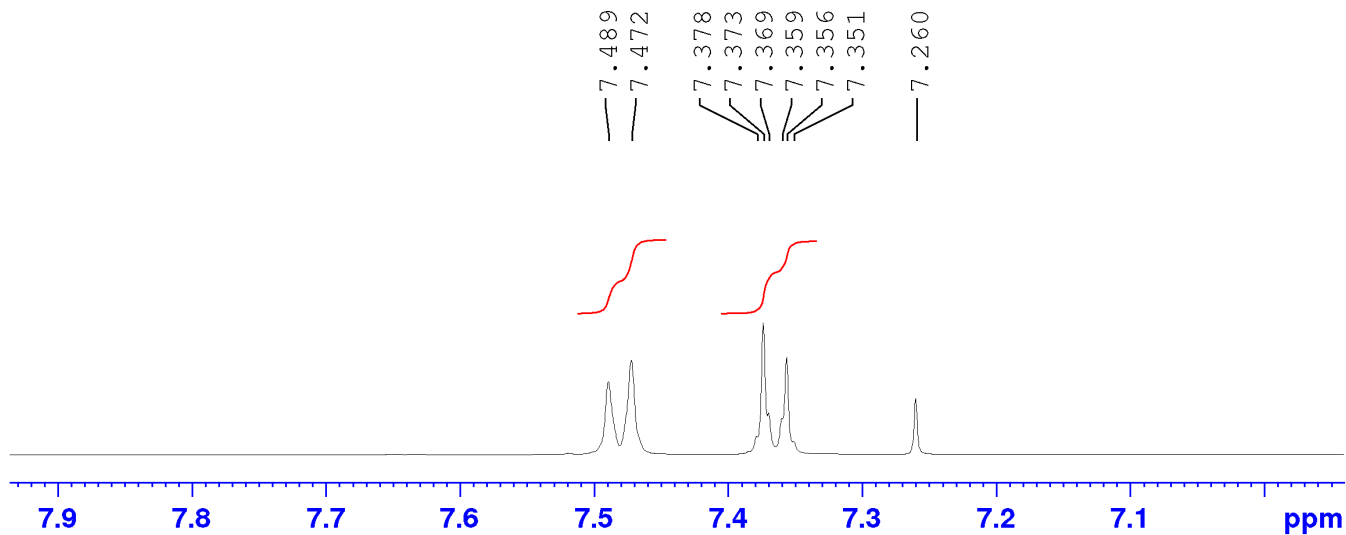
7.489
7.472
7.378
7.373
7.369
7.359
7.356
7.351
7.260
4.410
4.408
3.303
3.272
2.865
2.834
2.507
2.502
2.474
2.468
2.239
2.216
2.206
2.183
1.788
1.782
1.763
1.636
1.621
1.615
1.609
1.606
1.603
1.594
1.584
1.575
1.550
1.535
1.526
1.512
1.507
1.023
1.009
0.995



Current Data Parameters
 NAME mh-310-major
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200130
 Time 18.12 h
 INSTRUM Avance
 PROBHD z167889_0002 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 12.8984
 DW 50.000 usec
 DE 10.45 usec
 TE 298.2 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 4.00 usec
 P1 12.00 usec
 PLW1 6.80000019 W

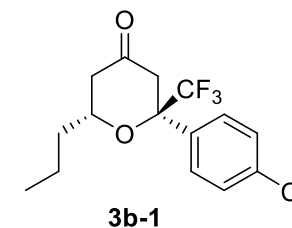
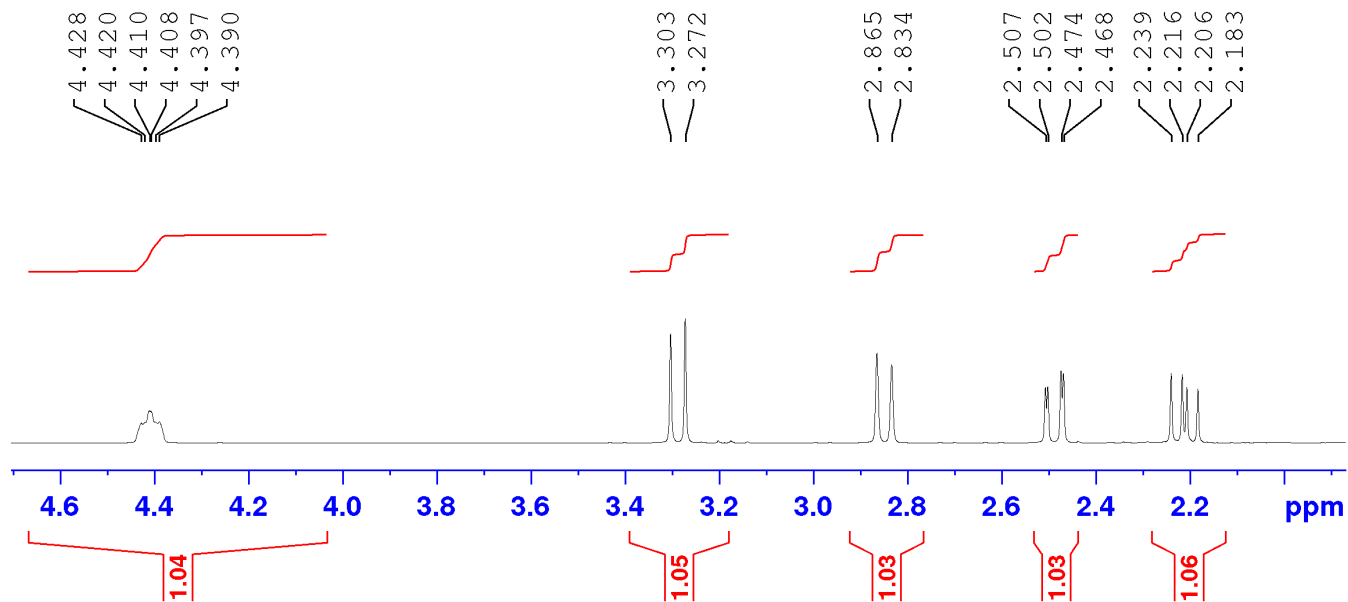
F2 - Processing parameters
 SI 65536
 SF 500.1300128 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



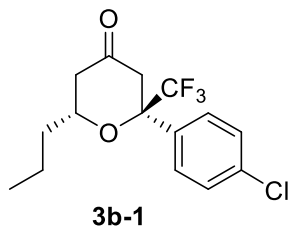
Current Data Parameters
 NAME mh-310-major
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200130
 Time 18.12 h
 INSTRUM Avance
 PROBHD z167889_0002 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 12.8984
 DW 50.000 usec
 DE 10.45 usec
 TE 298.2 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 4.00 usec
 P1 12.00 usec
 PLW1 6.80000019 W

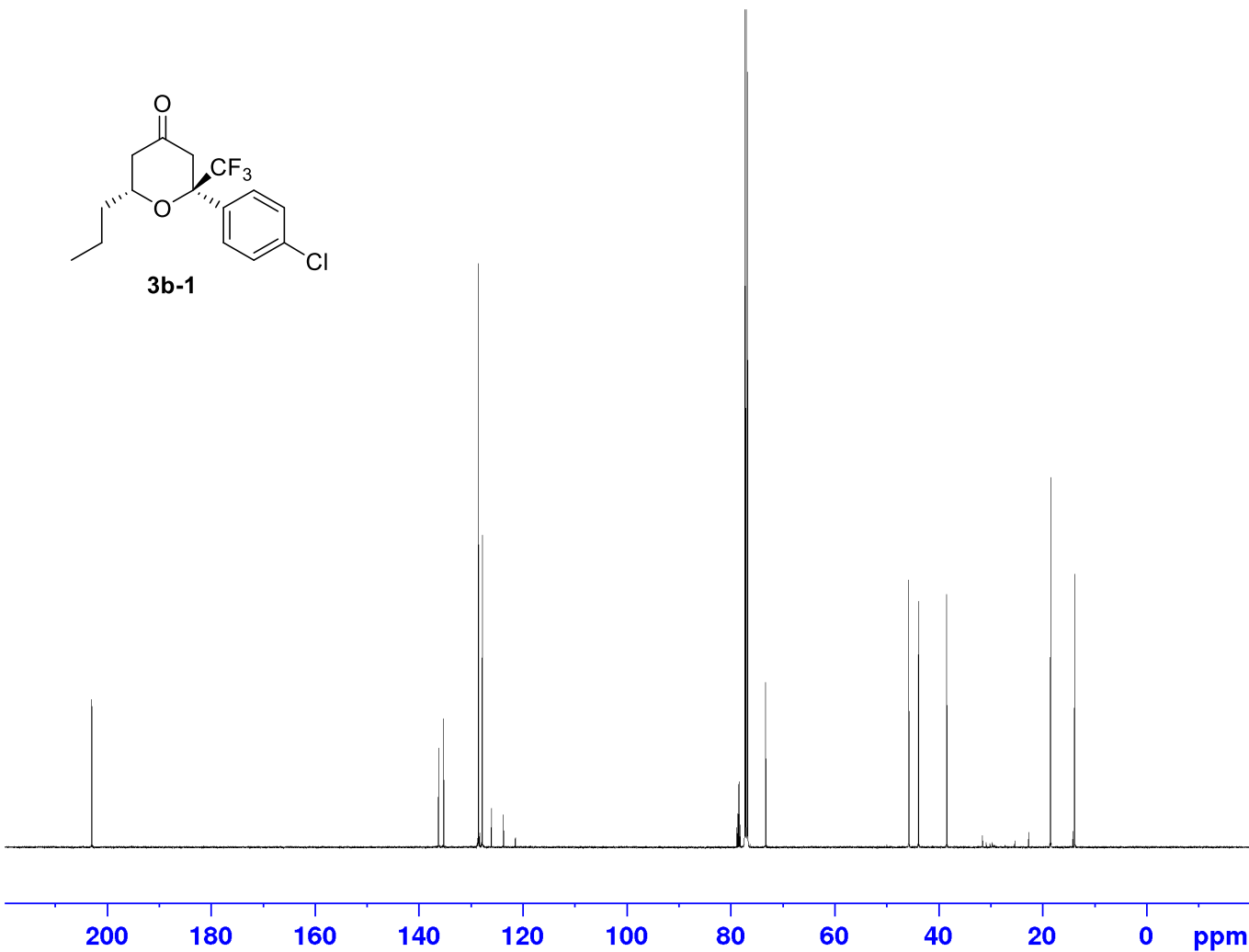
F2 - Processing parameters
 SI 65536
 SF 500.1300128 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



— 202.96



136.19
135.24
128.56
128.33
127.80
126.03
123.74
121.44
78.79
78.56
78.33
78.11
77.25
77.00
76.74
73.26
45.72
43.83
38.40
31.56
30.81
30.07
29.67
25.32
22.62
18.42
14.09
13.78

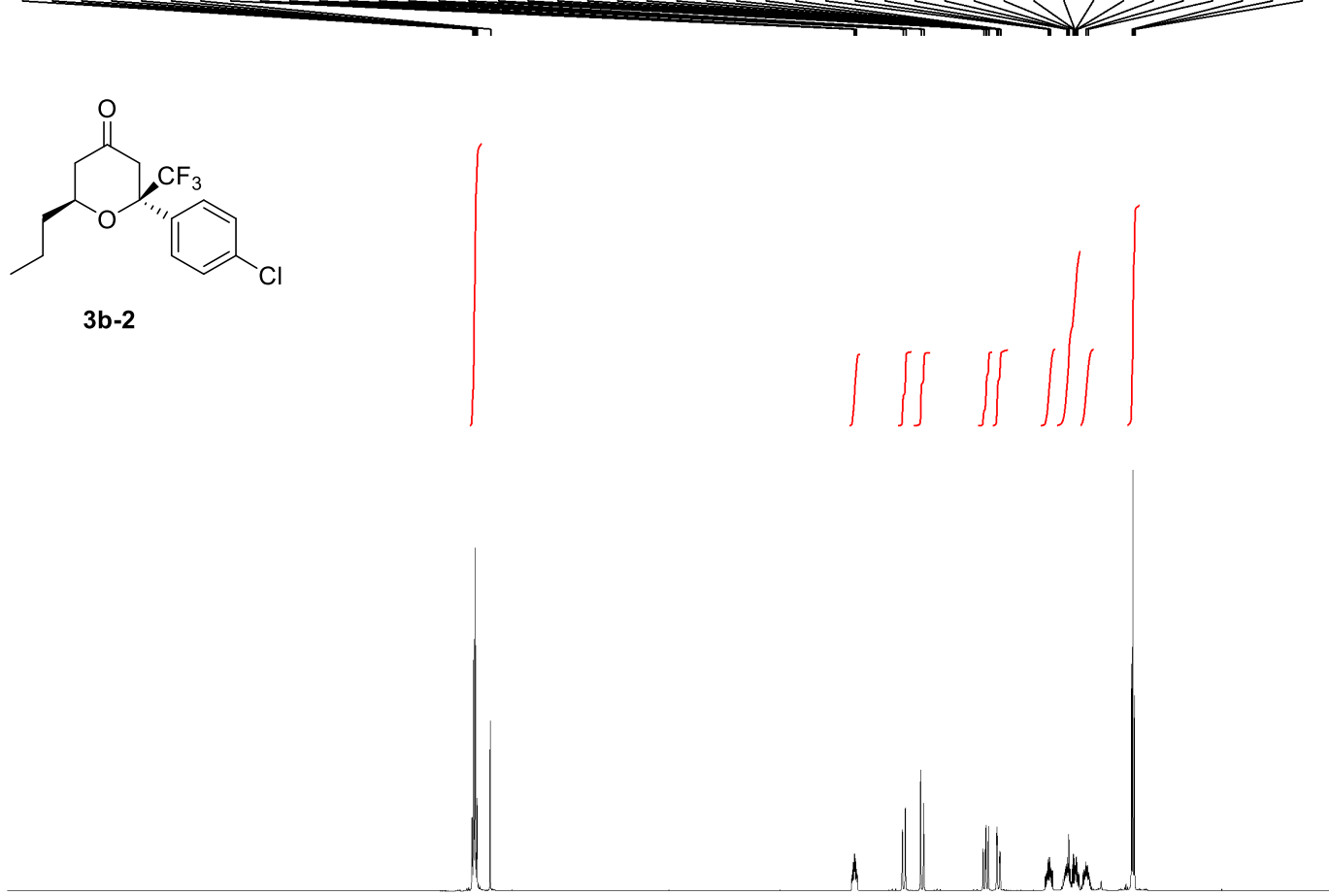
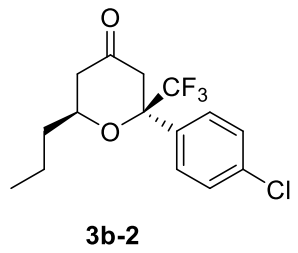


Current Data Parameters
NAME MH-310-MAJOR-C13
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200201
Time 6.58 h
INSTRUM Avance
PROBHD Z167889_0002 (
PULPROG zgpg30
TD 65536
SOLVENT CDC13
NS 1024
DS 4
SWH 30120.482 Hz
FIDRES 0.919204 Hz
AQ 1.0878977 sec
RG 101
DW 16.600 usec
DE 30.00 usec
TE 298.1 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 125.7703643 MHz
NUC1 13C
P0 3.33 usec
P1 10.00 usec
PLW1 27.79999924 W
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2] waltz65
PCPD2 80.00 usec
PLW2 6.80000019 W
PLW12 0.15300000 W
PLW13 0.07683500 W

F2 - Processing parameters
SI 32768
SF 125.7577938 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

7.438
7.420
7.406
7.402
7.393
7.389
7.260
3.689
3.681
3.674
3.666
3.208
3.178
3.028
2.999
2.415
2.392
2.385
2.362
2.283
2.280
2.277
2.274
2.253
2.250
2.248
2.244
1.778
1.769
1.758
1.595
1.584
1.573
1.536
1.527
1.517
1.506
1.498
1.490
1.407
1.387
0.956
0.942
0.927



11 10 9 8 7 6 5 4 3 2 1 0 ppm

3.96
1.00
1.04
1.03
1.04
1.07
1.08
2.45
1.08
3.10

Current Data Parameters
NAME Mh-310-minor
EXPNO 10
PROCNO 1

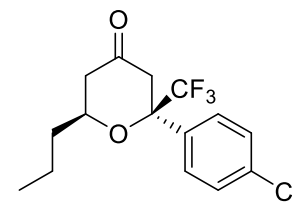
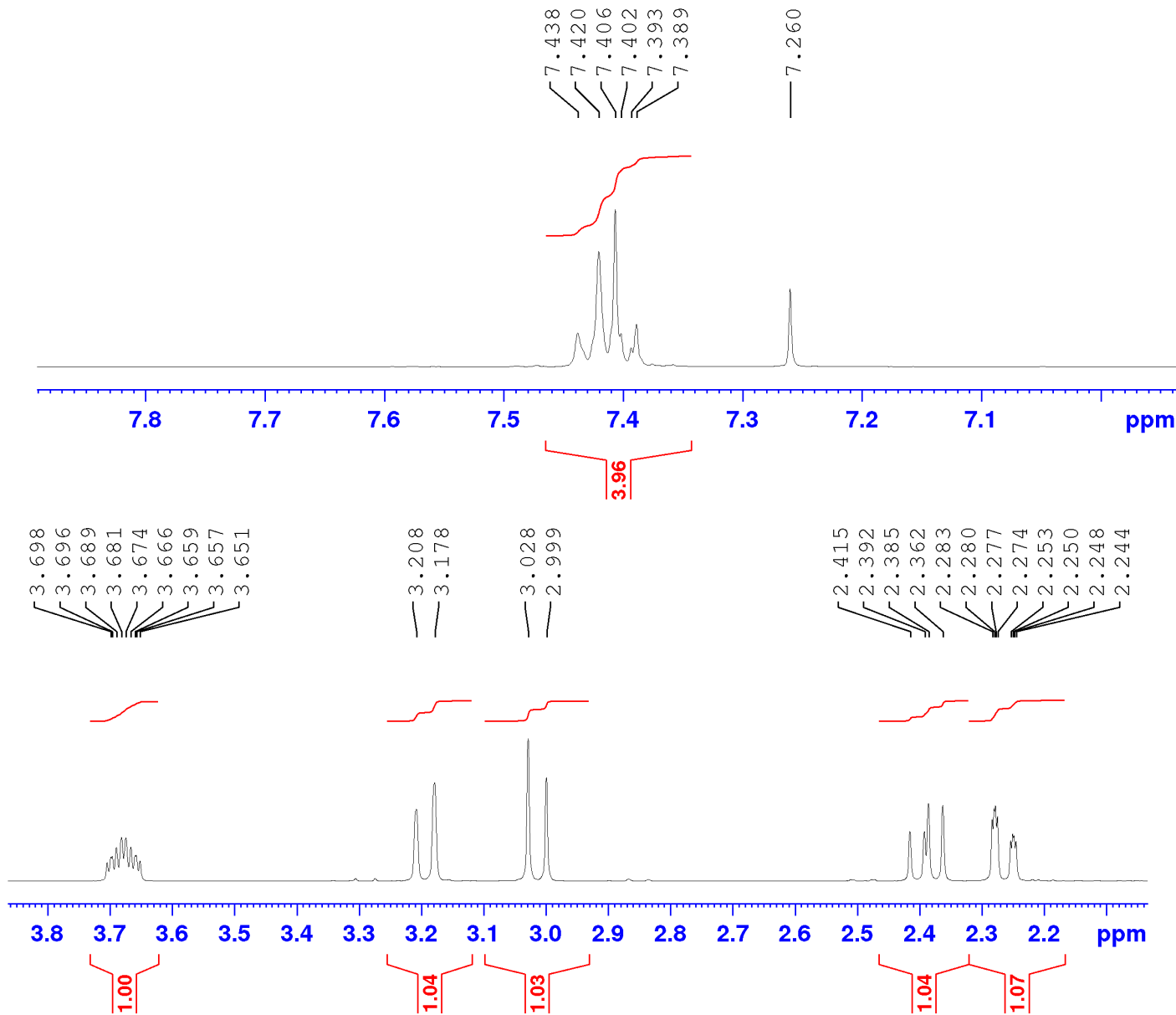
F2 - Acquisition Parameters
Date_ 20200130
Time 18.18 h
INSTRUM Avance
PROBHD Z167889_0002 (
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 12.4562
DW 50.000 usec
DE 10.45 usec
TE 298.1 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
PO 4.00 usec
P1 12.00 usec
PLW1 6.80000019 W

F2 - Processing parameters
SI 65536
SF 500.1300124 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

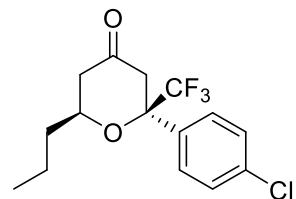
Current Data Parameters
 NAME Mh-310-minor
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200130
 Time 18.18 h
 INSTRUM Avance
 PROBHD Z167889_0002 (
 PULPROG zg30
 ID 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 12.4562
 DW 50.000 usec
 DE 10.45 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 4.00 usec
 P1 12.00 usec
 PLW1 6.80000019 W

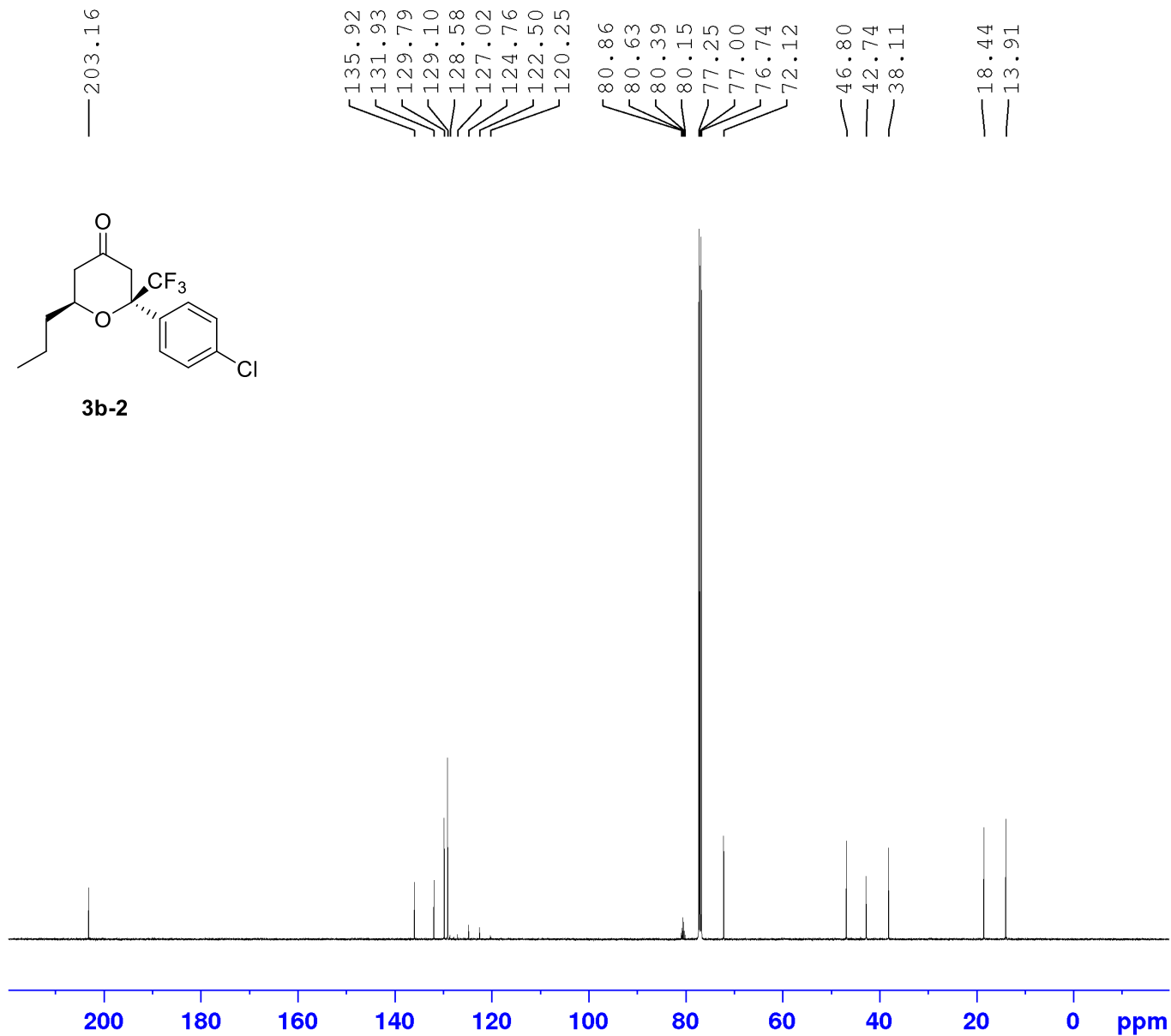
F2 - Processing parameters
 SI 65536
 SF 500.1300124 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



3b-2



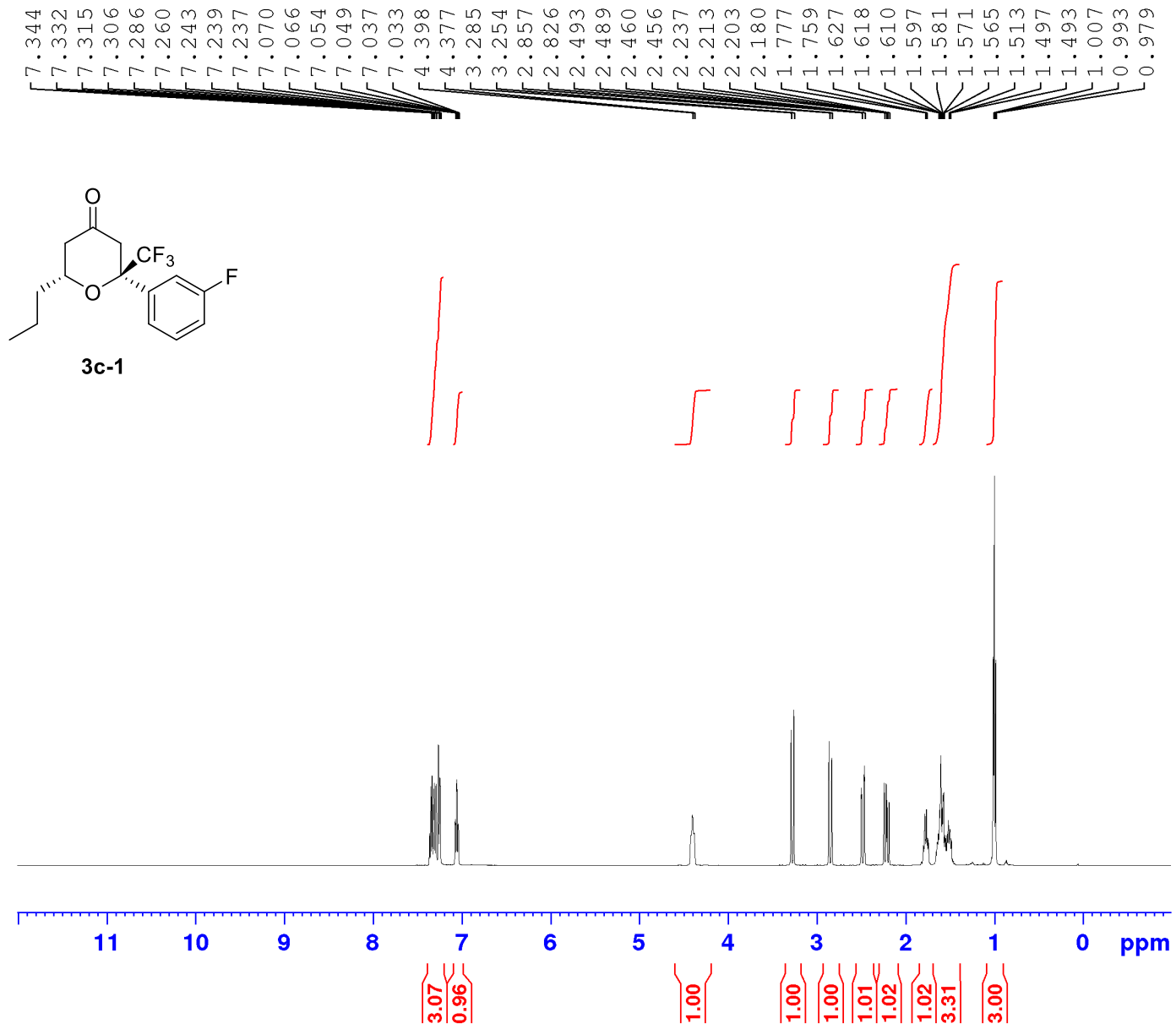
3b-2



Current Data Parameters
 NAME MH-310-MINOR-C13
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200131
 Time 15.44 h
 INSTRUM Avance
 PROBHD Z167889_0002 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 566
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 30.00 usec
 TE 298.1 K
 D1 2.0000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 27.79999924 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 6.80000019 W
 PLW12 0.15300000 W
 PLW13 0.07683500 W

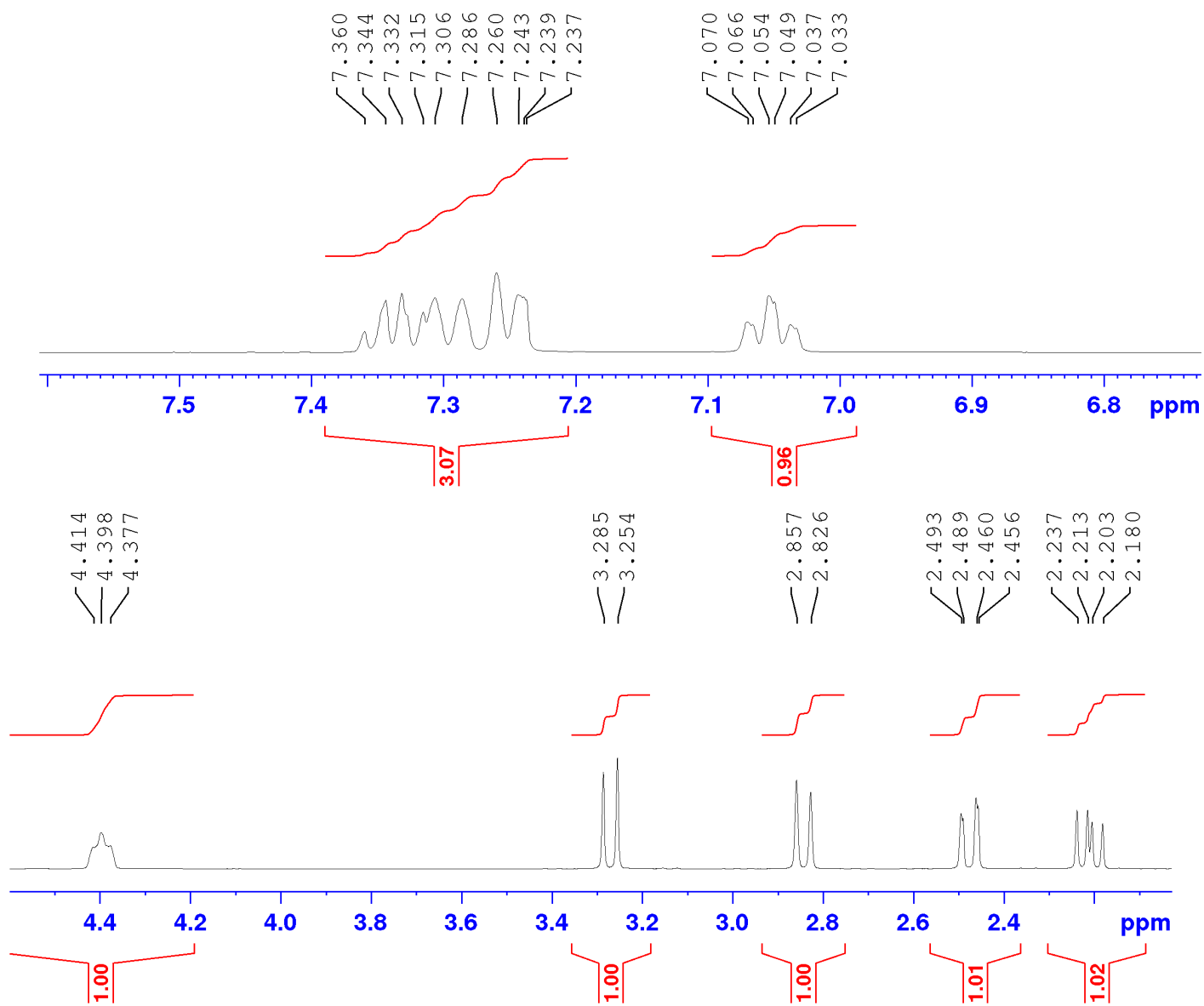
F2 - Processing parameters
 SI 32768
 SF 125.7577923 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40



Current Data Parameters
 NAME MH-311-MAJOR
 EXPNO 30
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200201
 Time 11.57 h
 INSTRUM Avance
 PROBHD z167889_0002 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 9.3756
 DW 50.000 usec
 DE 10.45 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 4.00 usec
 P1 12.00 usec
 PLW1 6.80000019 W

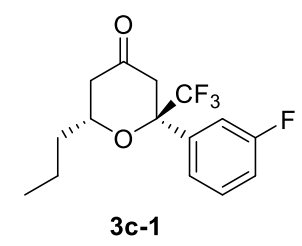
F2 - Processing parameters
 SI 65536
 SF 500.1300231 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

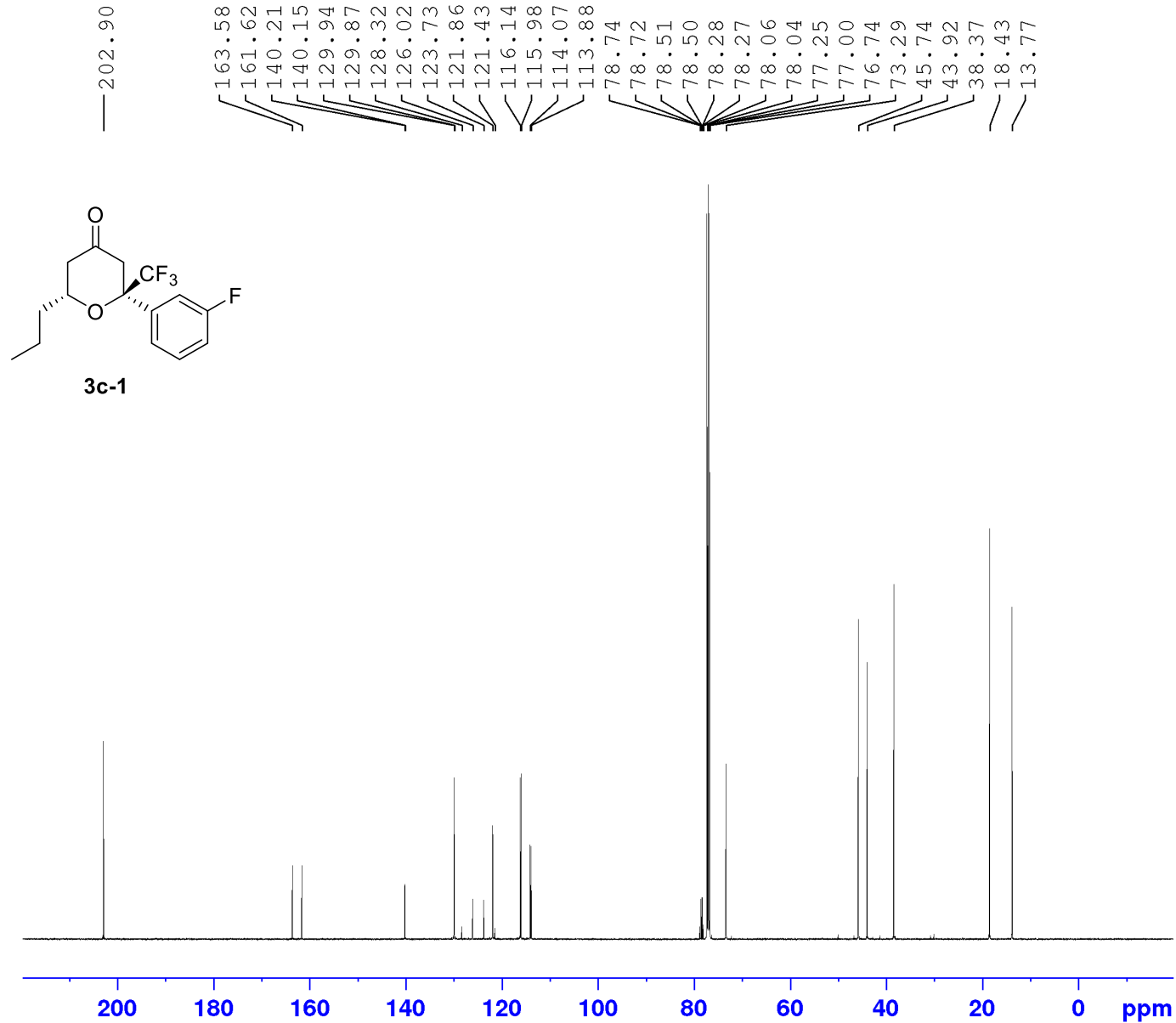


Current Data Parameters
 NAME MH-311-MAJOR
 EXPNO 30
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200201
 Time 11.57 h
 INSTRUM Avance
 PROBHD z167889_0002 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 9.3756
 DW 50.000 usec
 DE 10.45 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 4.00 usec
 P1 12.00 usec
 PLW1 6.80000019 W

F2 - Processing parameters
 SI 65536
 SF 500.1300231 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



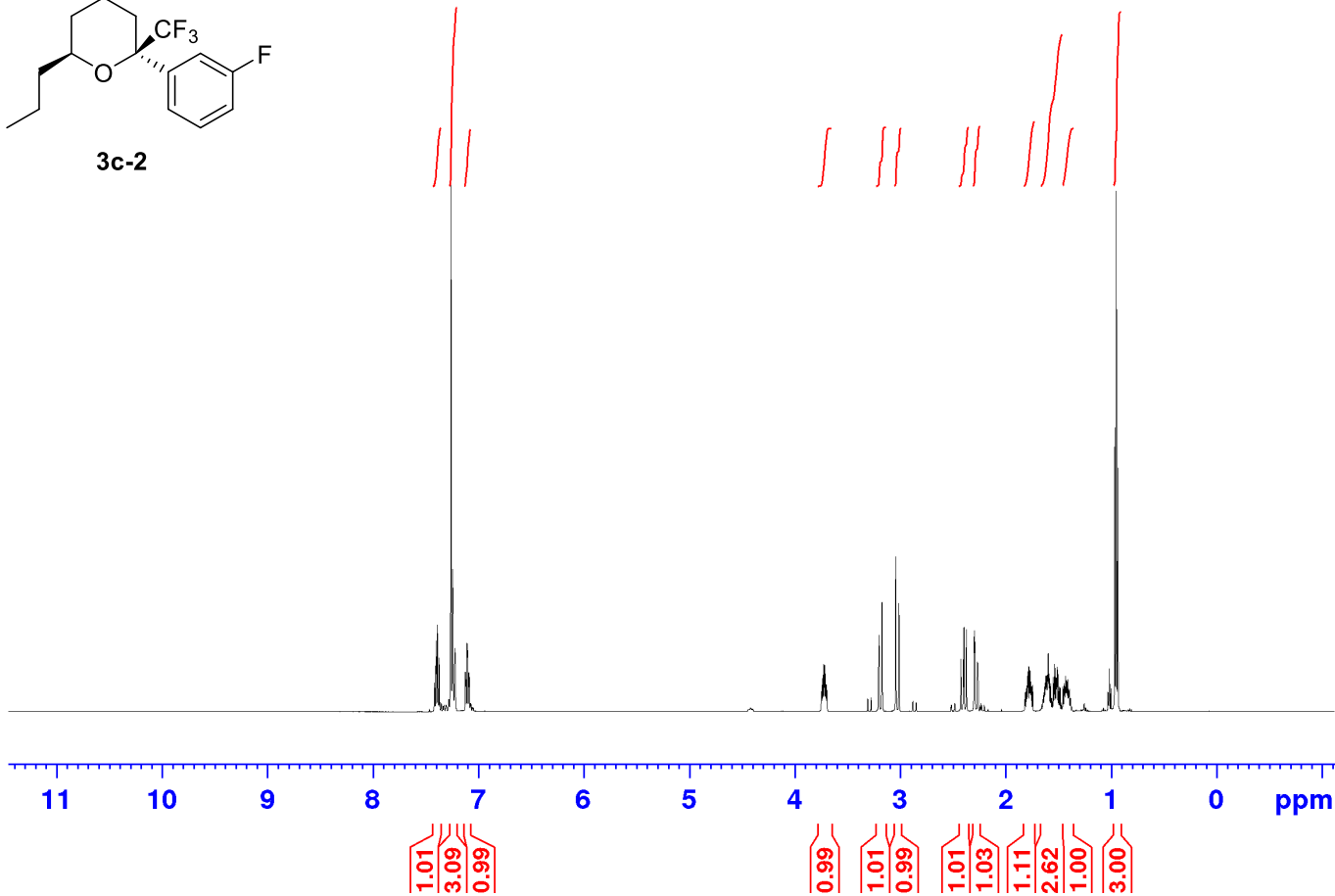
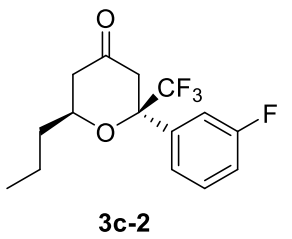


Current Data Parameters
 NAME MH-311-MAJOR
 EXPNO 21
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200131
 Time 14.42 h
 INSTRUM Avance
 PROBHD Z167889_0002 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 30.00 usec
 TE 298.1 K
 D1 2.0000000 sec
 D11 0.03000000 sec
 ID0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 27.79999924 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 6.80000019 W
 PLW12 0.15300000 W
 PLW13 0.07683500 W

F2 - Processing parameters
 SI 32768
 SF 125.7577937 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

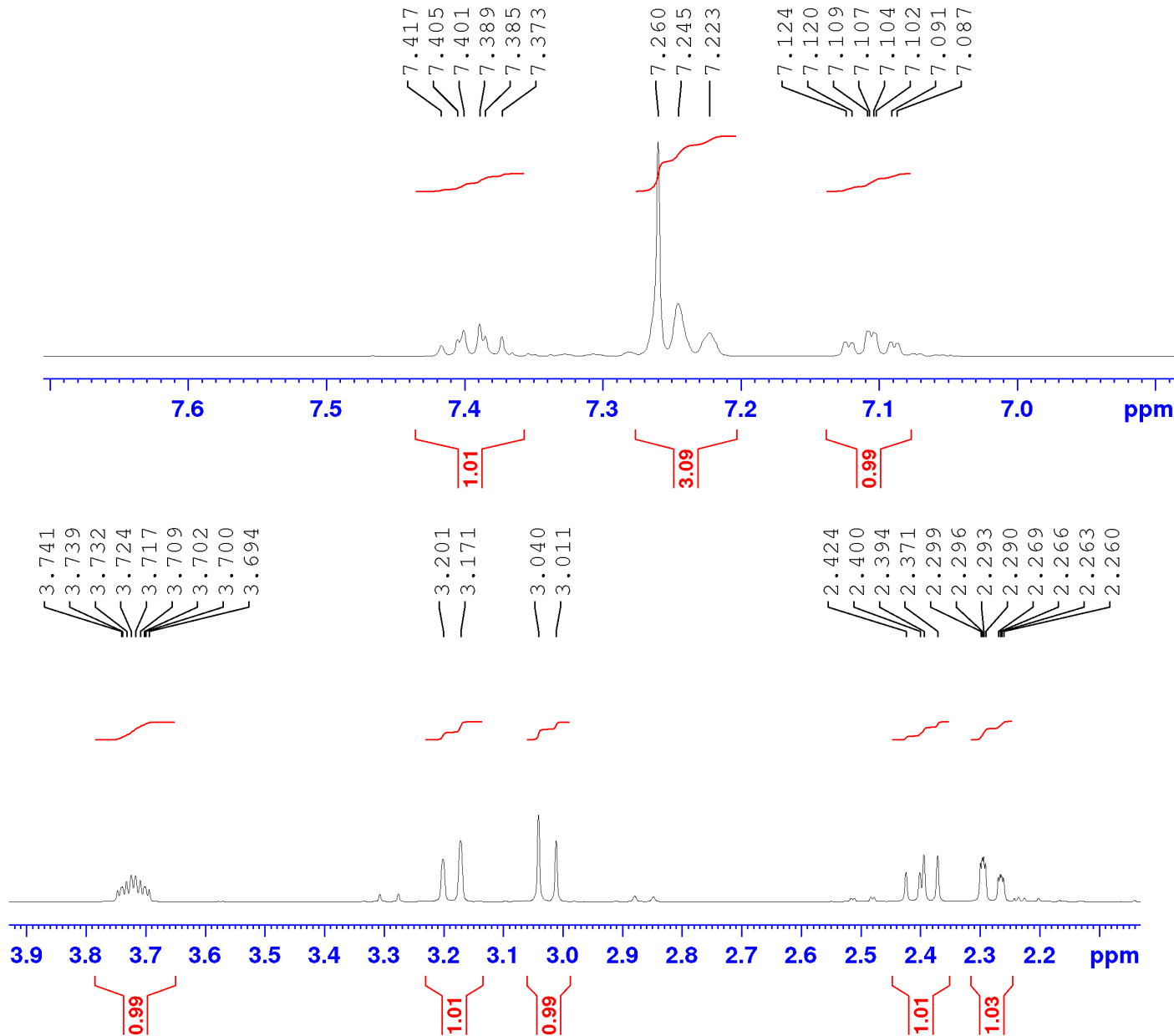
7.405
7.401
7.389
7.385
7.373
7.260
7.245
7.223
7.124
7.109
7.107
7.104
7.102
7.091
3.724
3.717
3.201
3.171
3.040
3.011
2.424
2.400
2.394
2.371
2.299
2.296
2.293
2.290
2.269
2.266
2.263
2.260
1.788
1.779
1.768
1.597
1.593
1.587
1.538
1.528
1.510
0.963
0.948
0.934



Current Data Parameters
NAME MH-311-MIN
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200131
Time 10.41 h
INSTRUM Avance
PROBHD Z167889_0002 (
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 6
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 12.6367
DW 50.000 usec
DE 10.45 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
PO 4.00 usec
P1 12.00 usec
PLW1 6.80000019 W

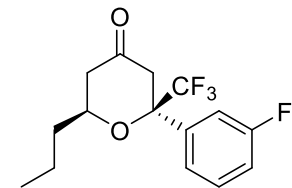
F2 - Processing parameters
SI 65536
SF 500.1300121 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



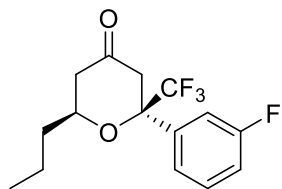
Current Data Parameters
 NAME MH-311-MIN
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200131
 Time 10.41 h
 INSTRUM Avance
 PROBHD z167889_0002 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 6
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 12.6367
 DW 50.000 usec
 DE 10.45 usec
 TE 298.2 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 4.00 usec
 P1 12.00 usec
 PLW1 6.80000019 W

F2 - Processing parameters
 SI 65536
 SF 500.1300121 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

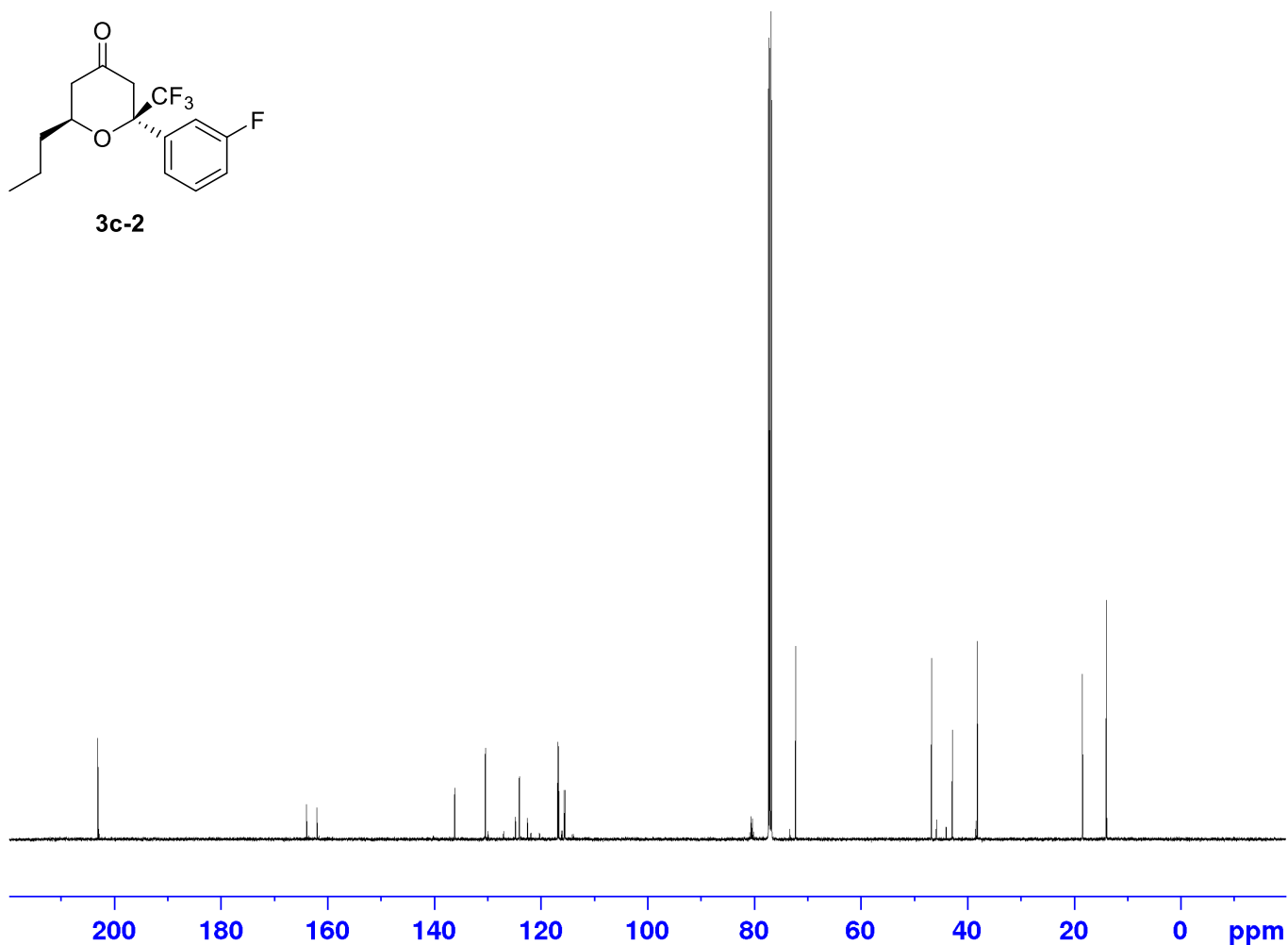


3c-2



3c-2

203.08
 163.94
 161.97
 136.17
 136.12
 130.45
 130.38
 129.95
 129.88
 127.00
 124.74
 124.00
 122.48
 121.86
 120.23
 116.81
 116.64
 116.16
 115.99
 115.63
 115.45
 80.78
 80.56
 80.54
 80.31
 80.07
 77.25
 76.99
 76.74
 73.30
 72.17
 46.69
 45.76
 43.94
 38.38
 38.10
 18.38
 13.87

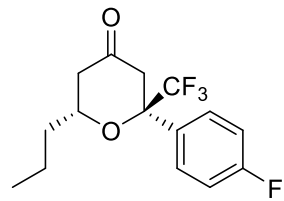


Current Data Parameters
 NAME MH-311-MIN
 EXPNO 11
 PROCNO 1

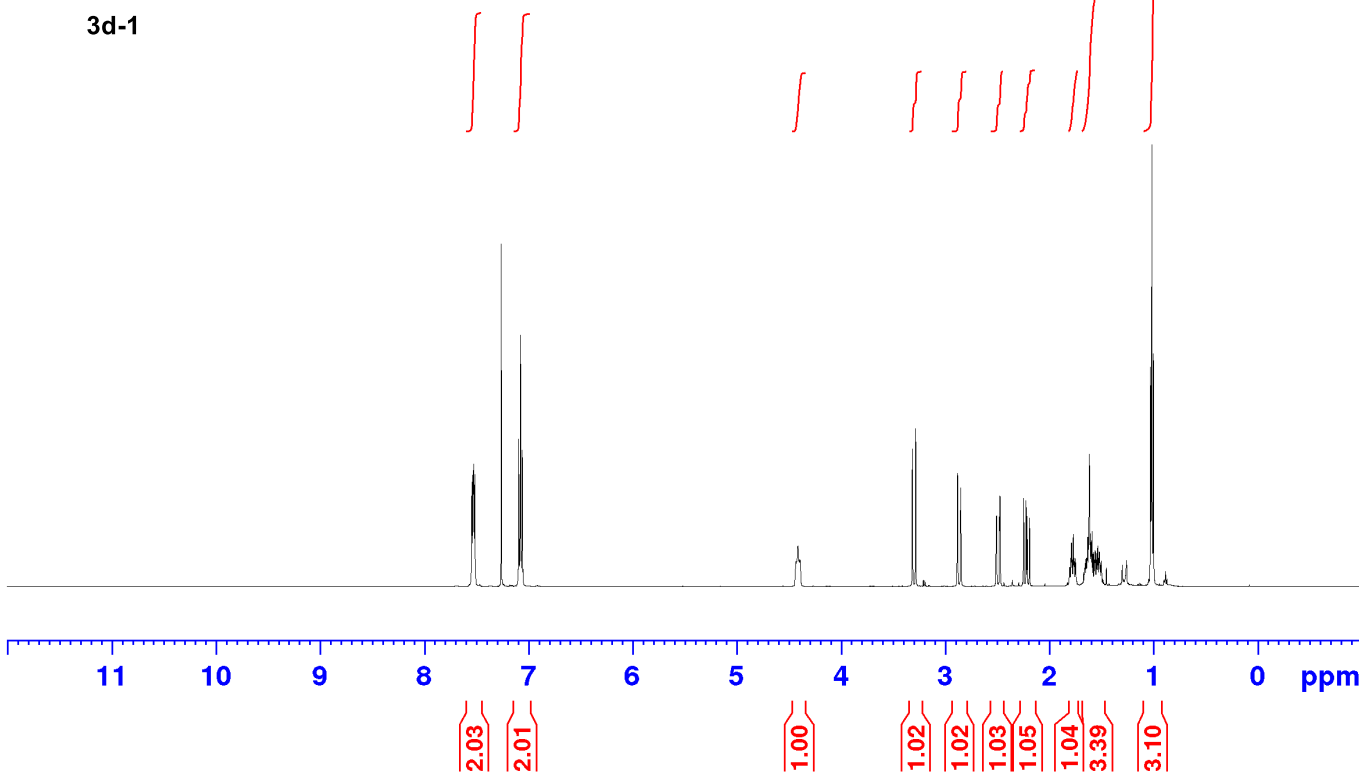
F2 - Acquisition Parameters
 Date_ 20200131
 Time 15.00 h
 INSTRUM Avance
 PROBHD Z167889_0002 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 267
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 30.00 usec
 TE 298.2 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 27.79999924 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 6.80000019 W
 PLW12 0.15300000 W
 PLW13 0.07683500 W

F2 - Processing parameters
 SI 32768
 SF 125.7577927 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.541
7.530
7.524
7.513
7.260
7.092
7.088
7.075
7.061
7.057
4.411
4.408
3.311
3.280
2.877
2.846
2.506
2.501
2.473
2.468
2.243
2.219
2.209
2.186
1.790
1.783
1.765
1.627
1.620
1.611
1.603
1.596
1.585
1.576
1.567
1.559
1.554
1.540
1.531
1.516
1.511
1.025
1.010
0.996



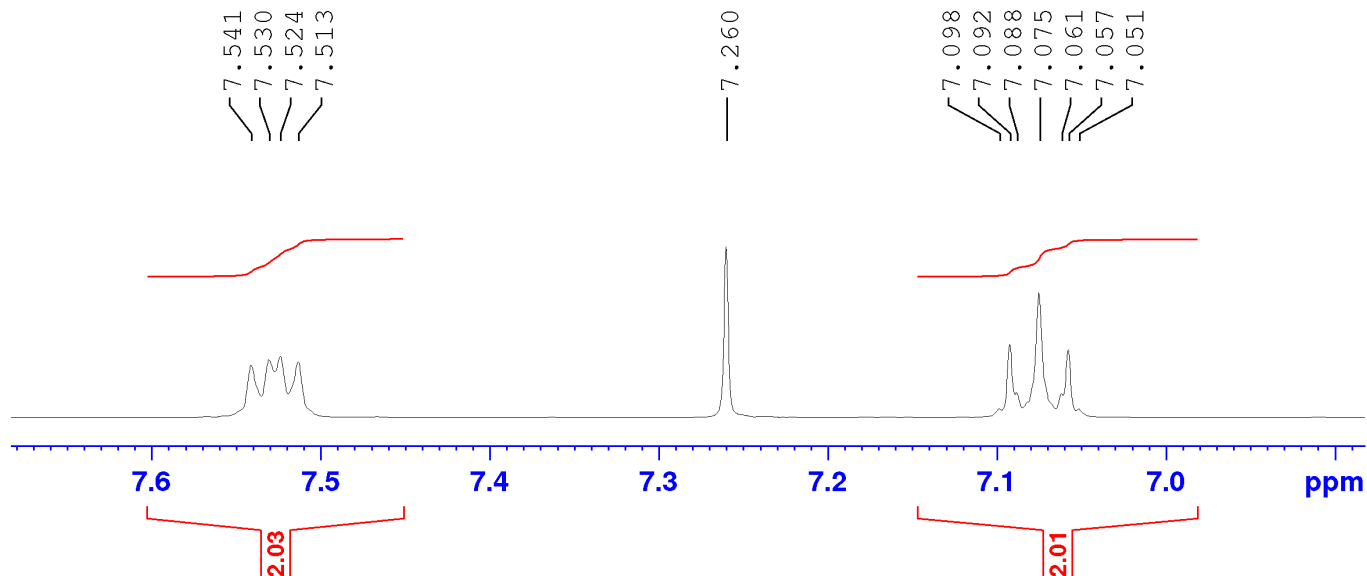
3d-1



Current Data Parameters
NAME MH-314-MAJOR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200208
Time 15.02 h
INSTRUM Avance
PROBHD z151574_0027 (zg30)
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 51.2821
DW 50.000 usec
DE 11.14 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
P0 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

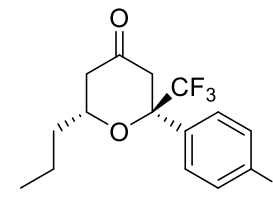
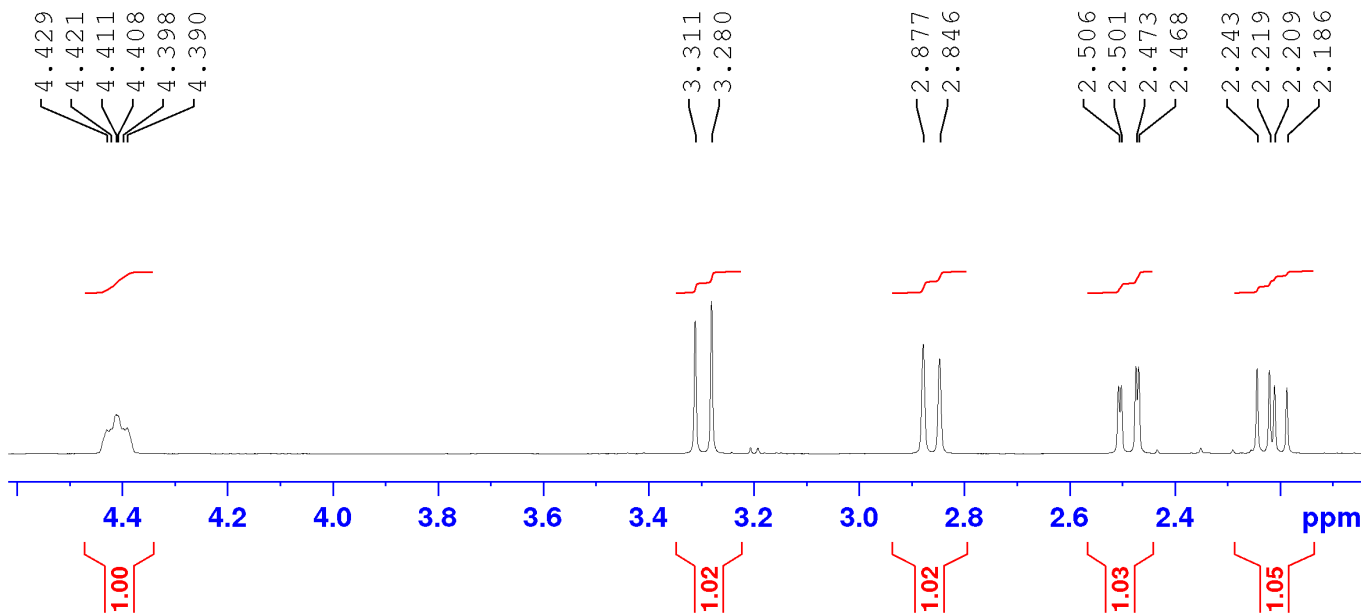
F2 - Processing parameters
SI 65536
SF 500.1300115 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



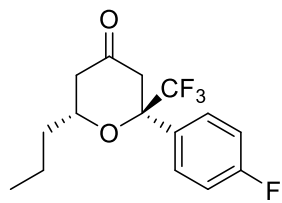
Current Data Parameters
 NAME MH-314-MAJOR
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200208
 Time 15.02 h
 INSTRUM Avance
 PROBHD z151574_0027 (zg30)
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 51.2821
 DW 50.000 usec
 DE 11.14 usec
 TE 298.0 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300115 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



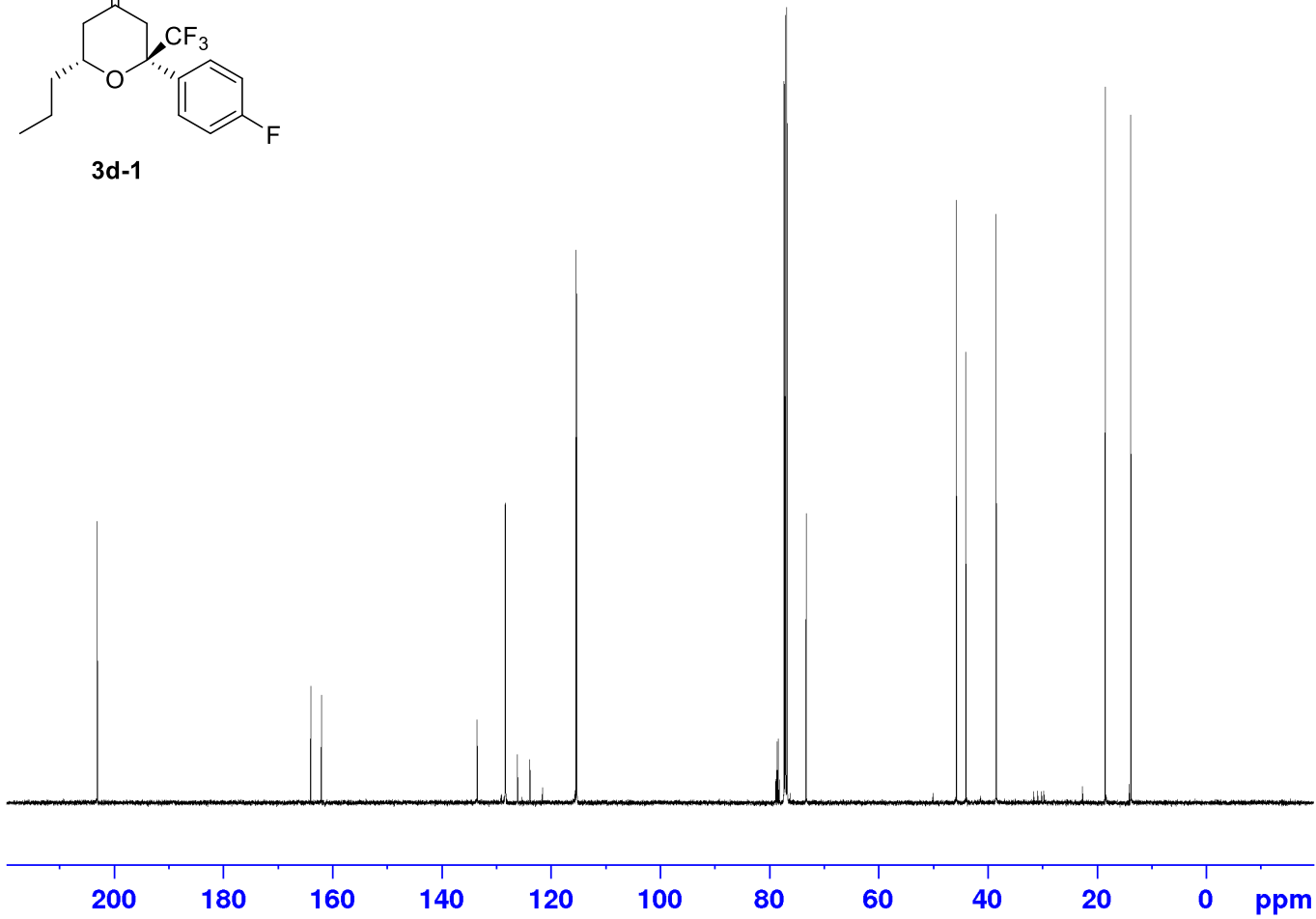
3d-1



3d-1

— 203.11

- 164.00
- 162.02
- 133.51
- 133.49
- 129.08
- 129.01
- 128.34
- 128.28
- 126.12
- 123.82
- 121.53
- 115.39
- 115.22
- 78.79
- 78.56
- 78.34
- 78.11
- 77.25
- 77.00
- 76.74
- 73.22
- 49.99
- 45.73
- 43.97
- 41.31
- 38.44
- 31.56
- 30.84
- 30.09
- 29.67
- 22.62
- 18.43
- 14.08
- 13.78

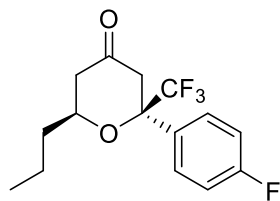


Current Data Parameters
 NAME MH-314-MAJOR
 EXPNO 11
 PROCNO 1

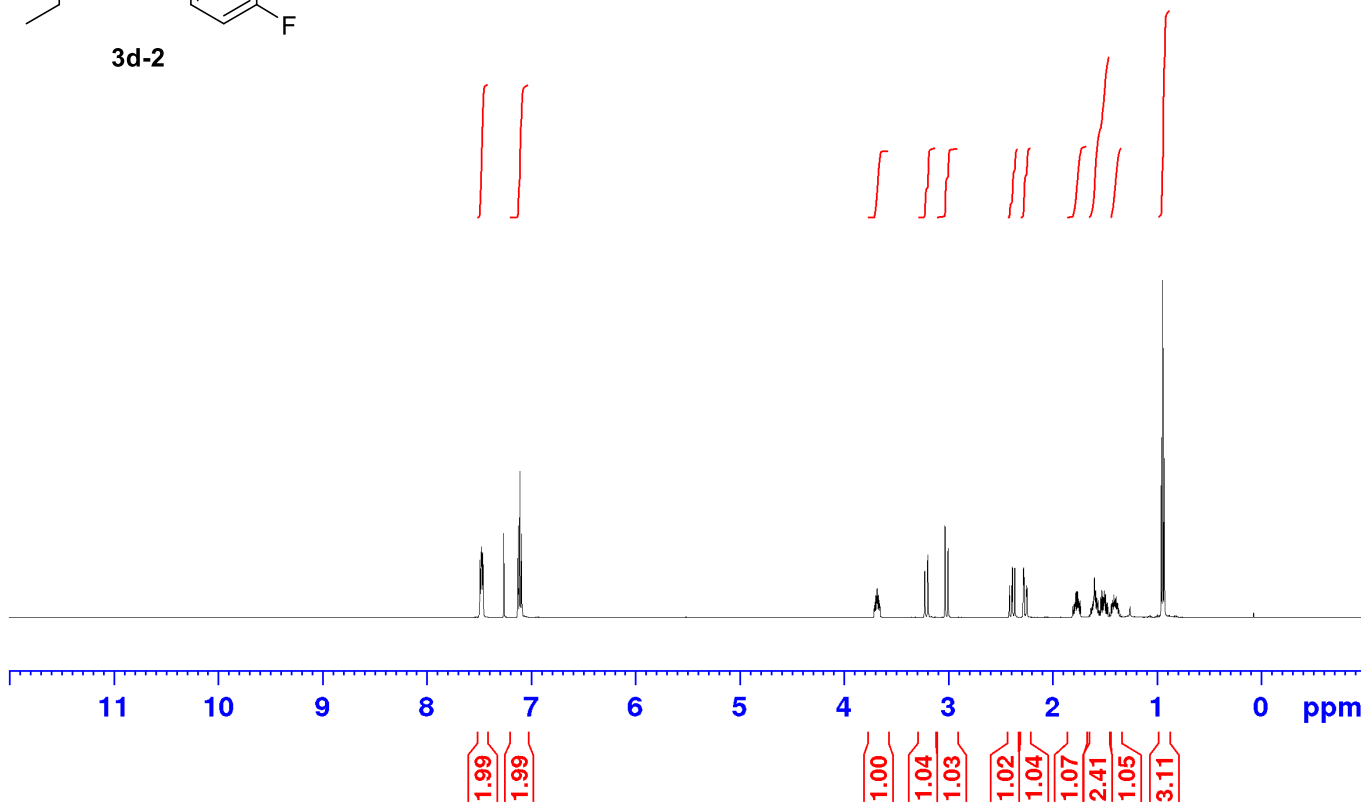
F2 - Acquisition Parameters
 Date_ 20200208
 Time 16.04 h
 INSTRUM Avance
 PROBHD Z151574_0027 ()
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23014790 W
 PLW13 0.11535020 W

F2 - Processing parameters
 SI 32768
 SF 125.7577928 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

7.489
7.479
7.472
7.461
7.260
7.123
7.119
7.106
7.093
7.089
3.684
3.676
3.223
3.192
3.029
3.028
3.000
2.999
2.412
2.388
2.382
2.359
2.279
2.276
2.274
2.270
2.250
2.246
2.244
2.241
1.778
1.768
1.758
1.599
1.595
1.585
1.526
1.516
1.497
1.489
1.408
0.953
0.939
0.924



3d-2



Current Data Parameters
NAME MH-314-MINOR
EXPNO 20
PROCNO 1

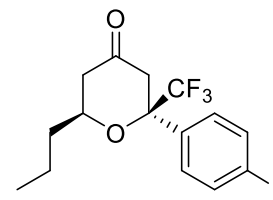
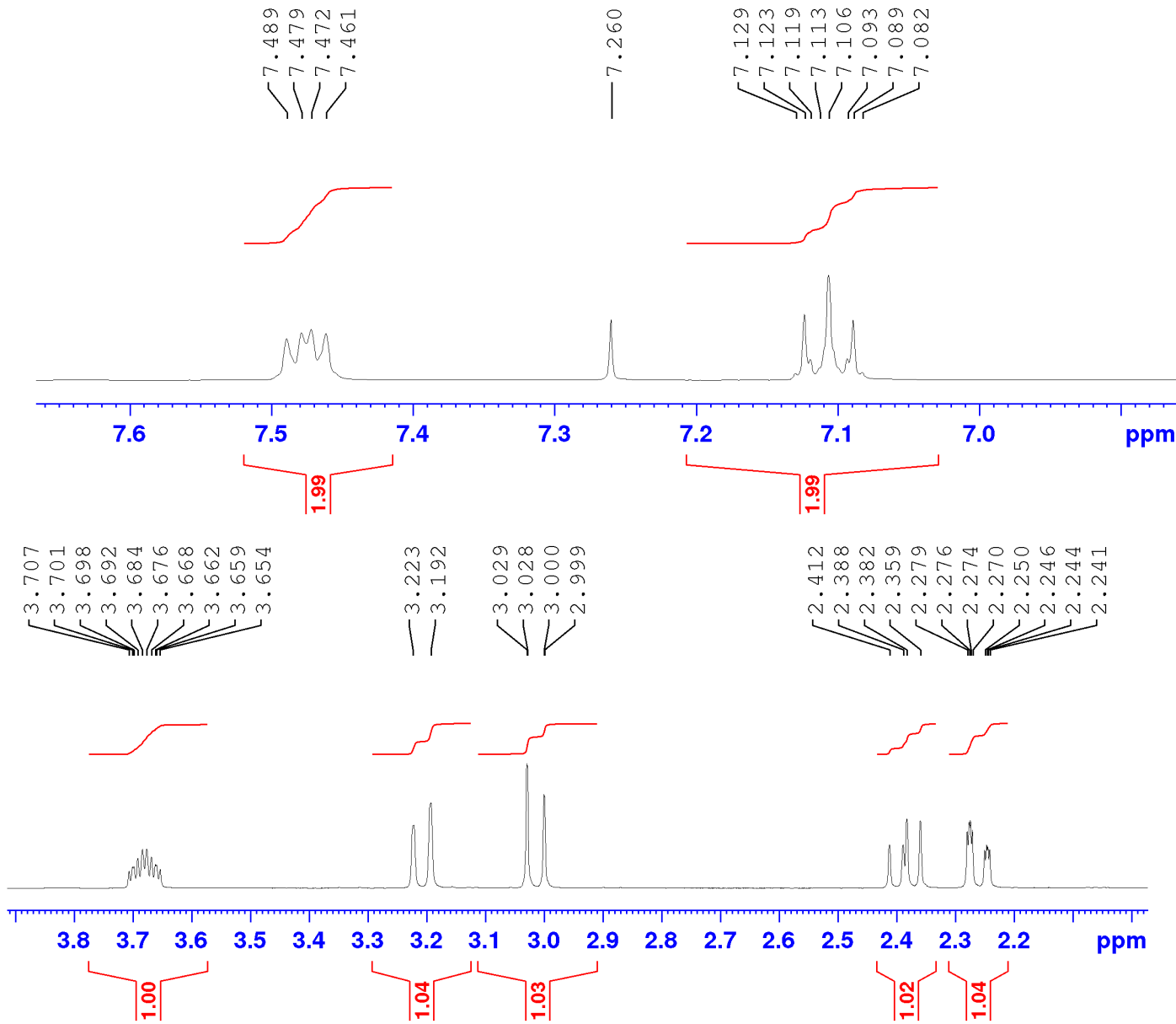
F2 - Acquisition Parameters
Date_ 20200208
Time 16.09 h
INSTRUM Avance
PROBHD Z151574_0027 (
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 66.6667
DW 50.000 usec
DE 11.14 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
P0 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

F2 - Processing parameters
SI 65536
SF 500.1300115 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

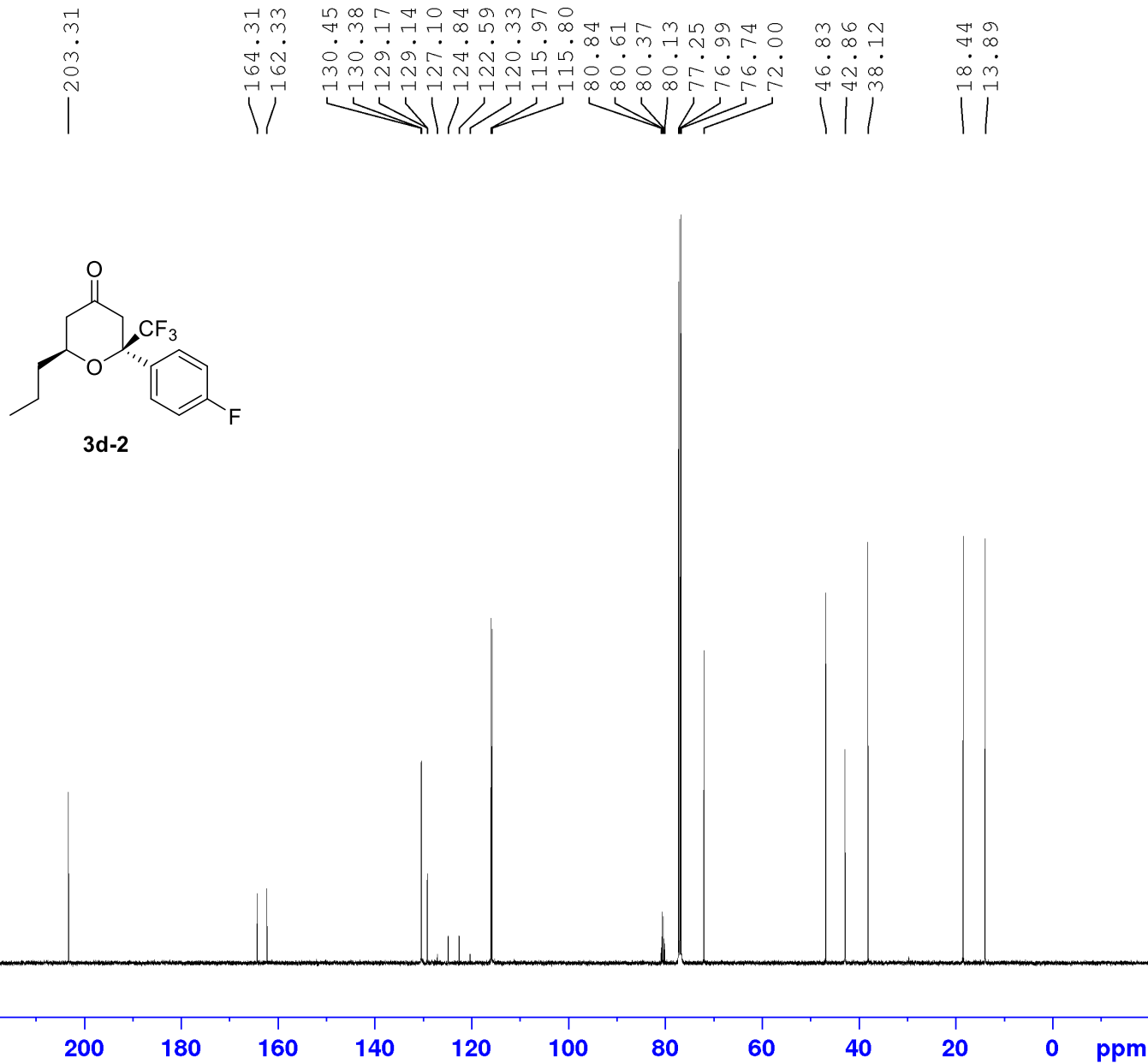
Current Data Parameters
 NAME MH-314-MINOR
 EXPNO 20
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200208
 Time 16.09 h
 INSTRUM Avance
 PROBHD z151574_0027 (zg30)
 PULPROG ID 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 66.6667
 DW 50.000 usec
 DE 11.14 usec
 TE 298.0 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300115 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



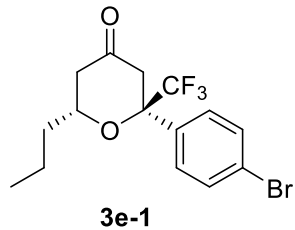
3d-2



Current Data Parameters
 NAME MH-314-MINOR
 EXPNO 21
 PROCNO 1

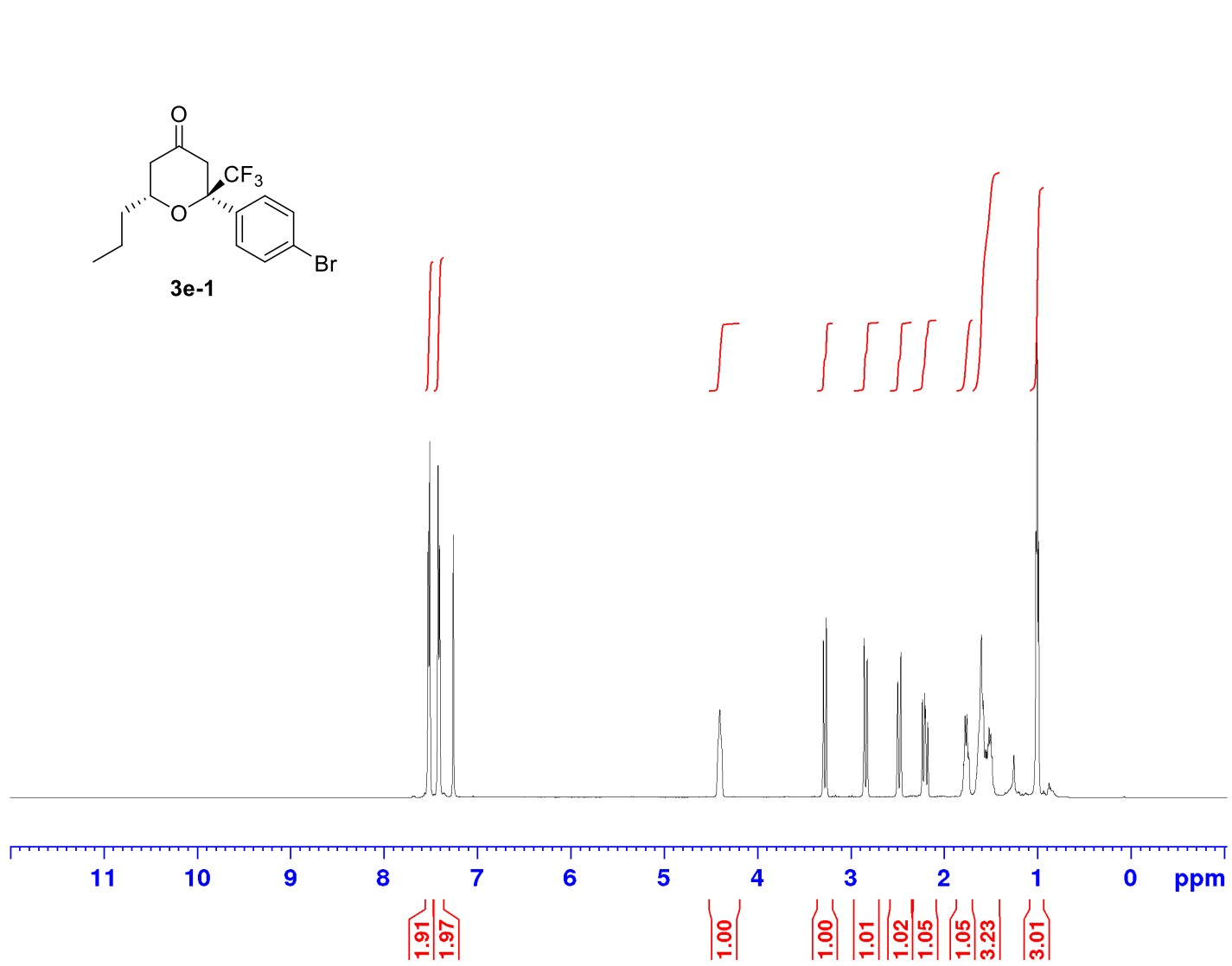
F2 - Acquisition Parameters
 Date_ 20200208
 Time 17.03 h
 INSTRUM Avance
 PROBHD Z151574_0027 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.0 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23014790 W
 PLW13 0.11535020 W

F2 - Processing parameters
 SI 32768
 SF 125.7577920 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40



7.529
7.512
7.422
7.406
7.259

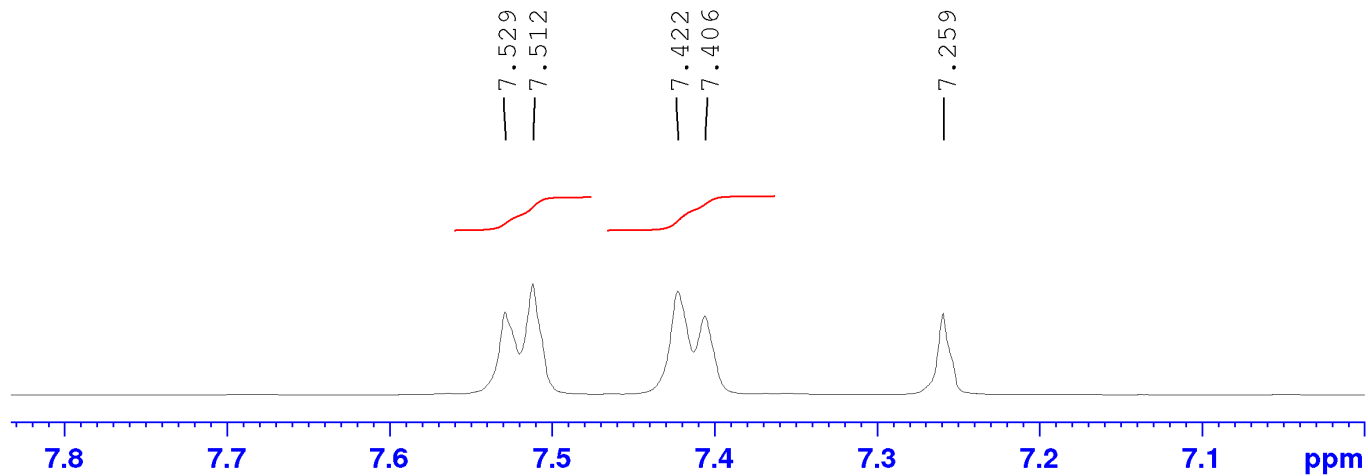
4.429
4.405
4.389
3.296
3.265
2.858
2.827
2.498
2.465
2.235
2.211
2.202
2.178
1.815
1.794
1.778
1.759
1.743
1.736
1.602
1.591
1.582
1.562
1.556
1.546
1.531
1.522
1.503
1.489
1.474
1.019
1.006
0.991



Current Data Parameters
NAME MH-315-MAJOR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200210
Time 15.10 h
INSTRUM Avance
PROBHD z151574_0027 ()
PULPROG zg30
TD 65536
SOLVENT CDC13
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 42.5532
DW 50.000 usec
DE 11.14 usec
TE 298.0 K
D1 1.00000000 sec
TDO 1
SFO1 500.1330883 MHz
NUC1 1H
P0 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

F2 - Processing parameters
SI 65536
SF 500.1300134 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



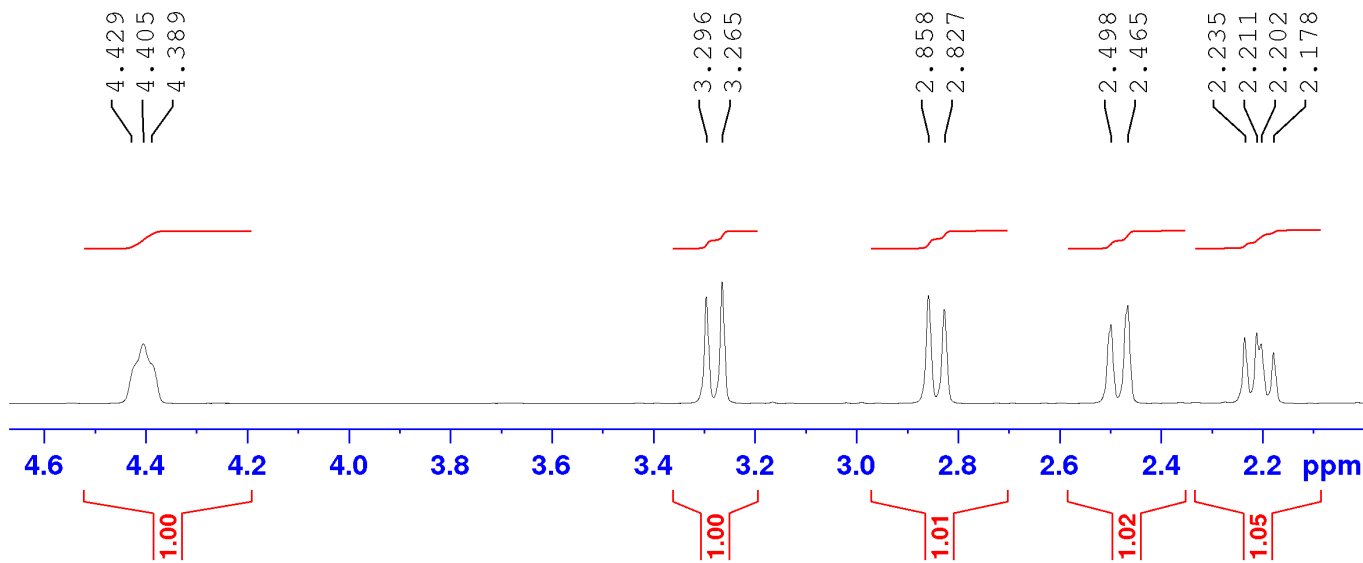
7.529
7.512
7.422
7.406
7.259

1.91
1.97

Current Data Parameters
 NAME MH-315-MAJOR
 EXPNO 10
 PROCNO 1

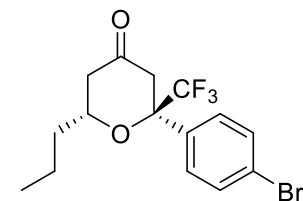
F2 - Acquisition Parameters
 Date_ 20200210
 Time 15.10 h
 INSTRUM Avance
 PROBHD z151574_0027 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 42.5532
 DW 50.000 usec
 DE 11.14 usec
 TE 298.0 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300134 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

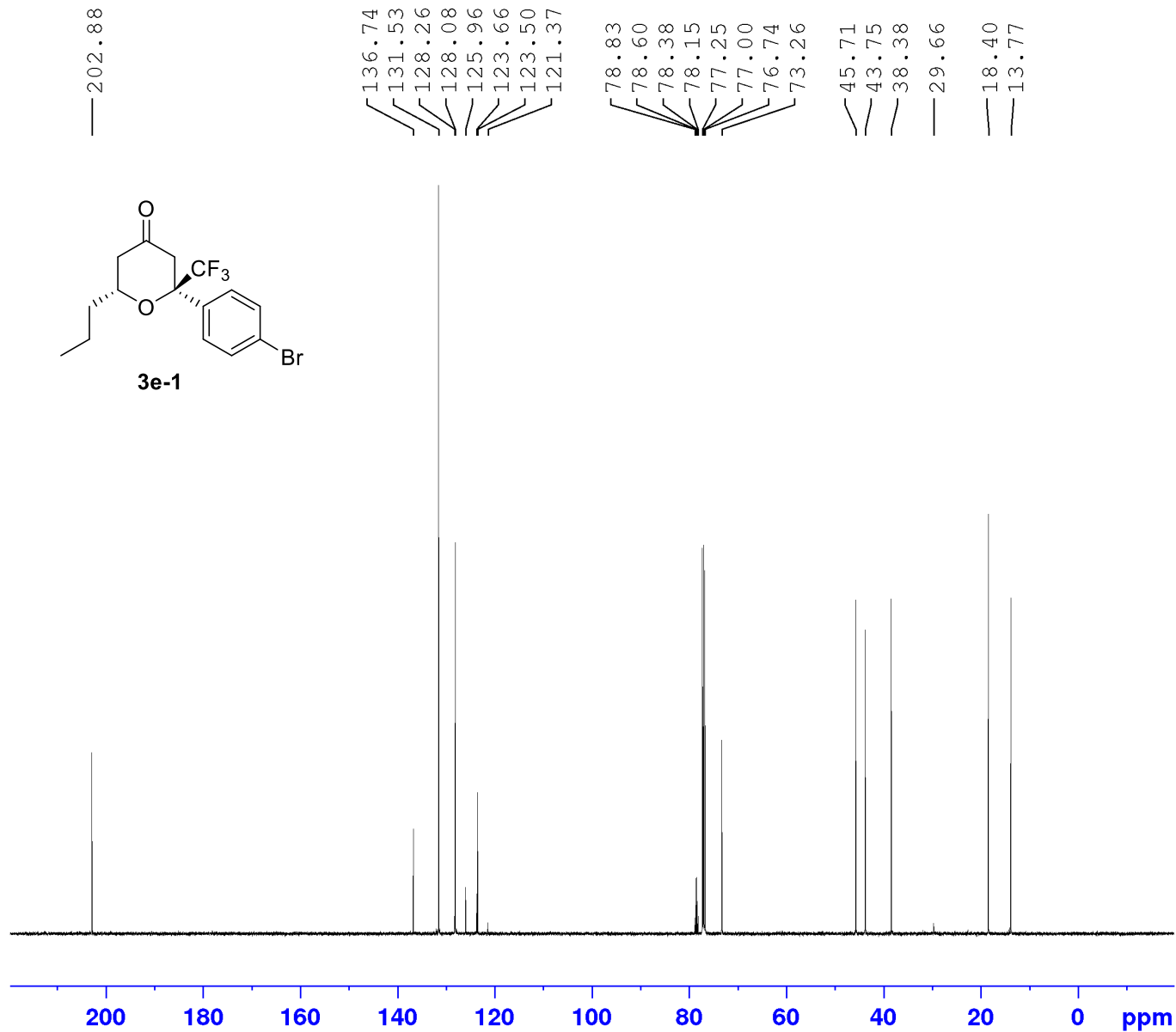
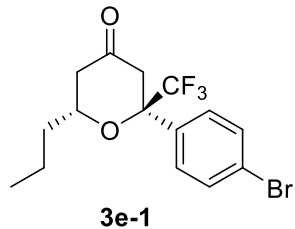


4.429
4.405
4.389
3.296
3.265
2.858
2.827
2.498
2.465
2.235
2.211
2.202
2.178

1.00
1.00
1.01
1.02
1.05



3e-1



Current Data Parameters
NAME MH-315-MAJOR
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200210
Time 15.46 h
INSTRUM Avance
PROBHD Z151574_0027 ()
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 478
DS 4
SWH 30120.482 Hz
FIDRES 0.919204 Hz
AQ 1.0878977 sec
RG 101
DW 16.600 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 125.7703643 MHz
NUC1 13C
P0 3.33 usec
P1 10.00 usec
PLW1 88.26000214 W
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2] waltz65
PCPD2 80.00 usec
PLW2 23.68499947 W
PLW12 0.23684999 W
PLW13 0.11913000 W

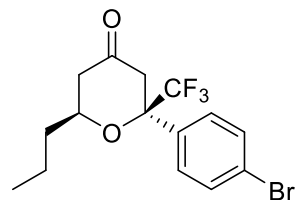
F2 - Processing parameters
SI 32768
SF 125.7577948 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

7.565
7.548
7.368
7.352
7.260
3.697
3.691
3.682
3.676
3.669
3.661
3.197
3.168
3.022
2.993
2.412
2.389
2.383
2.360
2.276
2.246
1.774
1.765
1.754
1.604
1.591
1.585
1.581
1.570
1.566
1.534
1.525
1.515
1.503
1.497
1.489
1.415
1.404
1.399
1.394
1.385
0.953
0.939
0.924

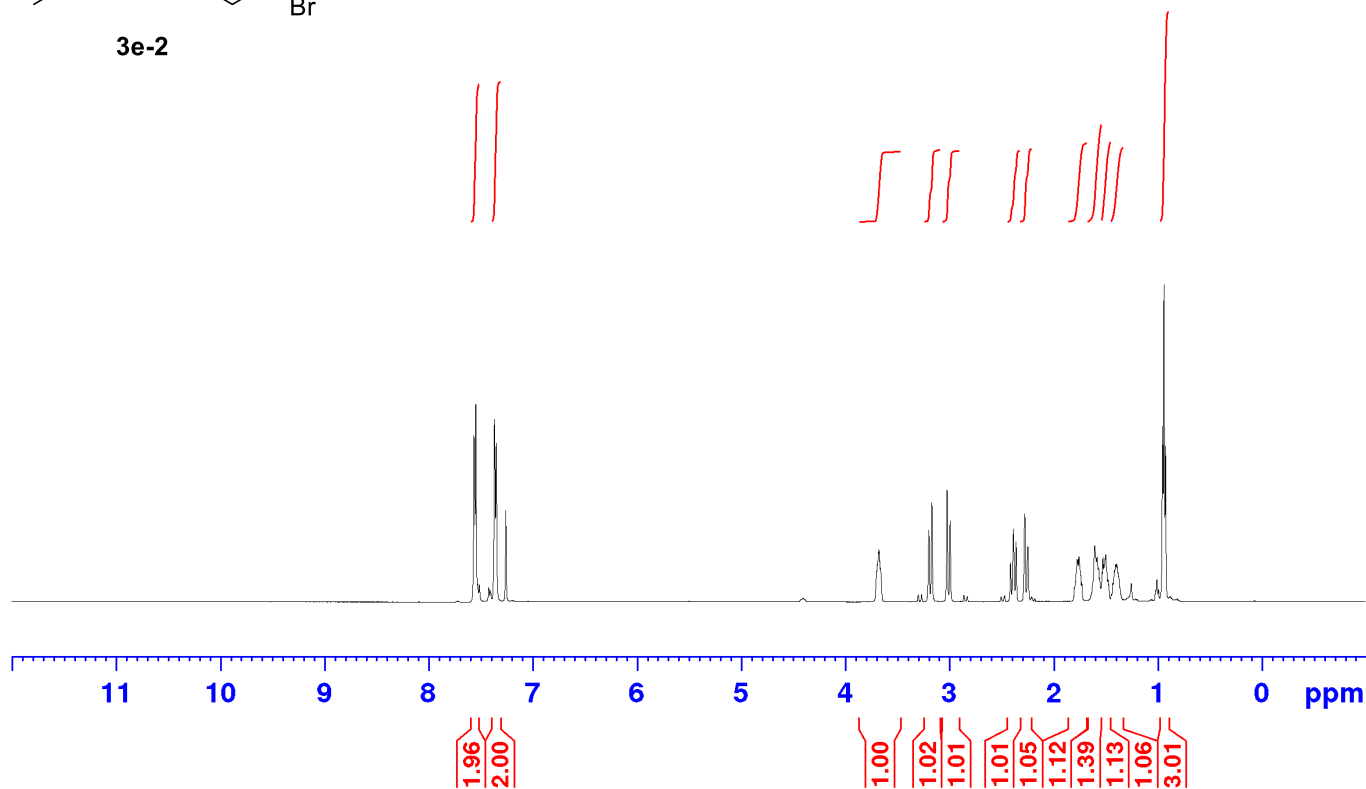
Current Data Parameters
NAME MH-315-MINOR
EXPNO 20
PROCNO 1

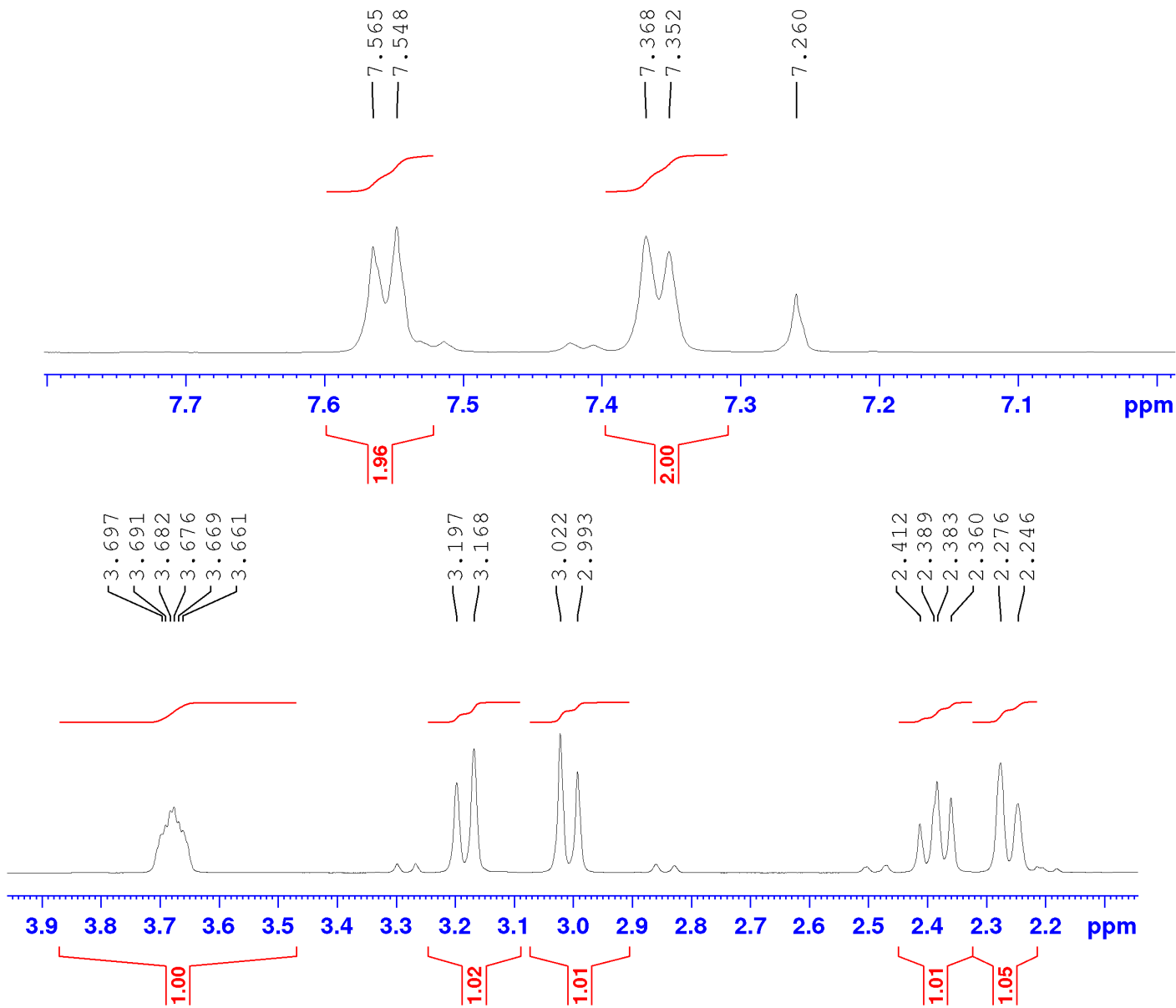
F2 - Acquisition Parameters
Date_ 20200210
Time 16.03 h
INSTRUM Avance
PROBHD Z151574_0027 (
PULPROG zg30
ID 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 77.6398
DW 50.000 usec
DE 11.14 usec
TE 298.0 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
PO 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

F2 - Processing parameters
SI 65536
SF 500.1300130 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



3e-2

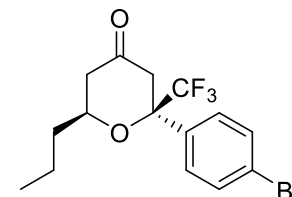




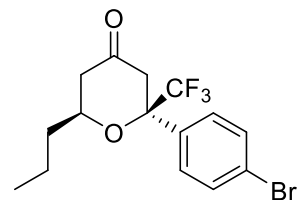
Current Data Parameters
 NAME MH-315-MINOR
 EXPNO 20
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200210
 Time 16.03 h
 INSTRUM Avance
 PROBHD Z151574_0027 (
 PULPROG zg30
 ID 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 77.6398
 DW 50.000 usec
 DE 11.14 usec
 TE 298.0 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300130 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



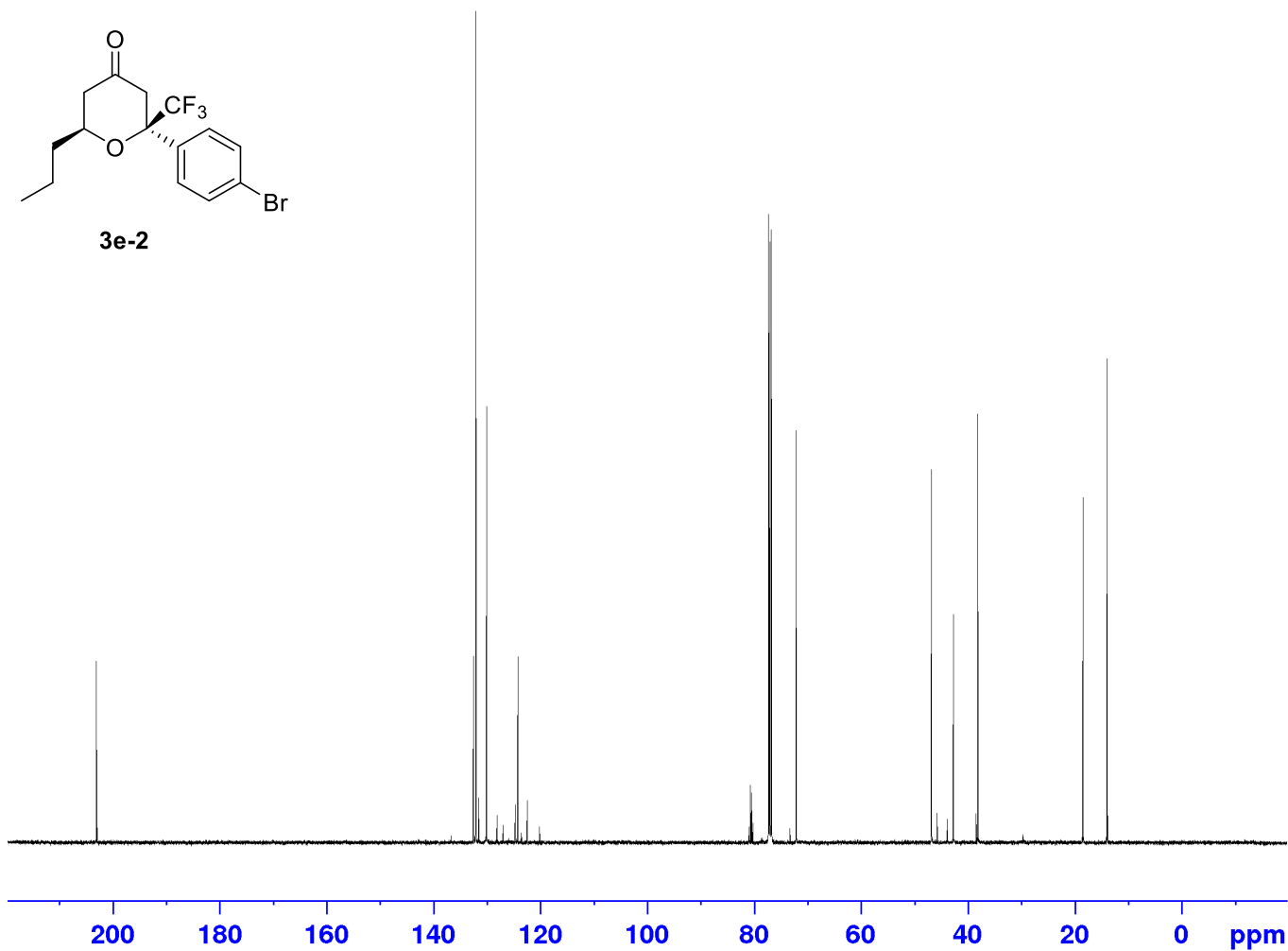
3e-2



3e-2

— 203.10

132.49
132.07
131.55
130.05
128.09
126.94
124.68
124.22
123.52
122.43
120.17
80.91
80.68
80.44
80.20
77.25
77.00
76.74
73.27
72.13
46.77
45.72
43.77
42.67
38.40
38.10
29.67
18.43
13.90
13.79



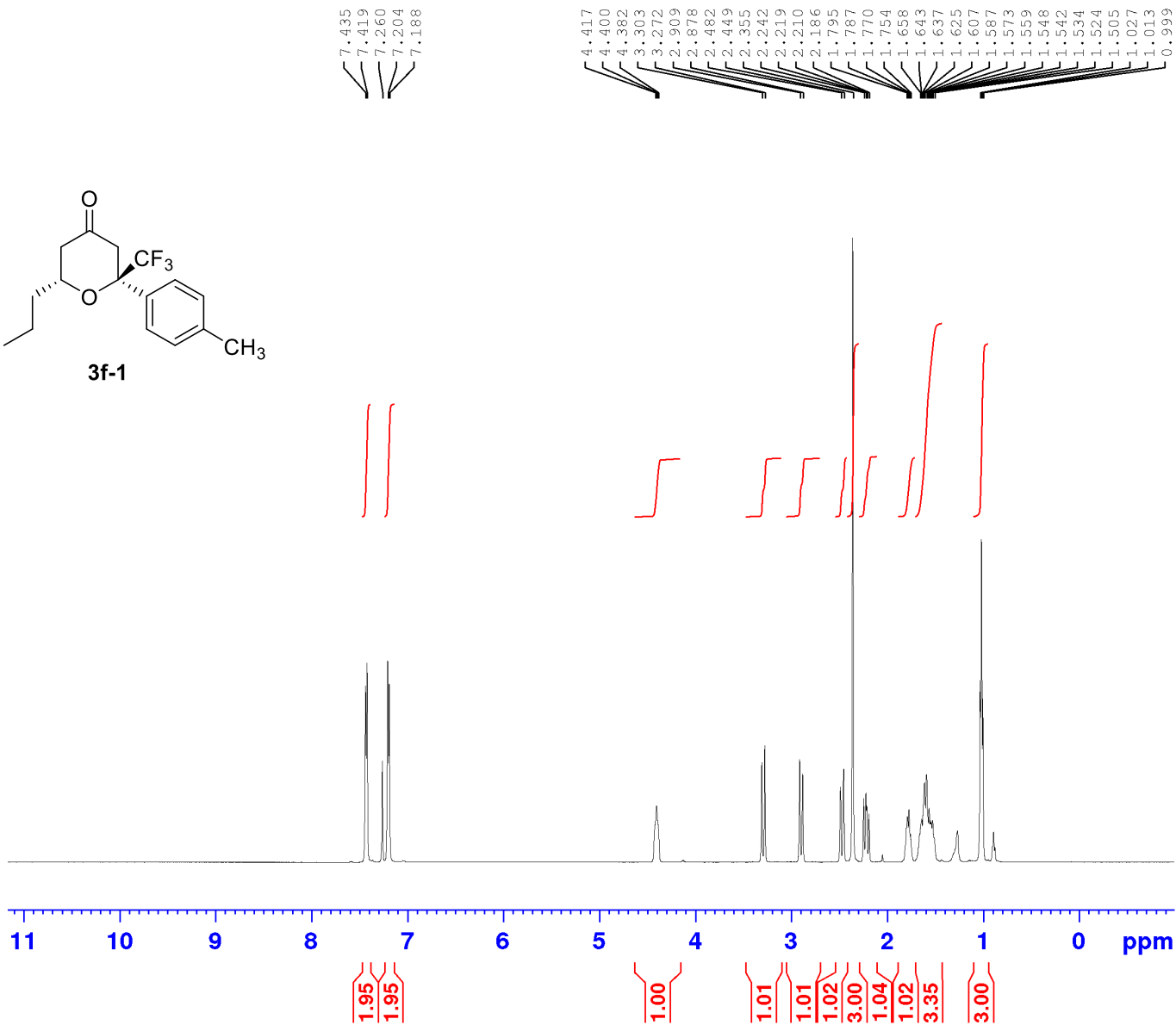
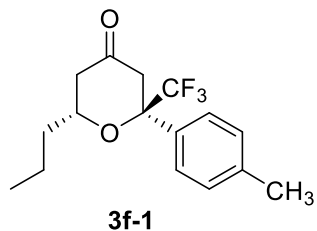
```

Current Data Parameters
NAME          MH-315-MINOR
EXPNO         21
PROCNO        1

F2 - Acquisition Parameters
Date_         20200210
Time          16.57 h
INSTRUM       Avance
PROBHD        Z151574_0027 (
PULPROG       zgpg30
TD            65536
SOLVENT       CDCl3
NS            1024
DS            4
SWH           30120.482 Hz
FIDRES        0.919204 Hz
AQ            1.0878977 sec
RG            101
DW            16.600 usec
DE            6.50 usec
TE            298.0 K
D1            2.00000000 sec
D11           0.03000000 sec
TD0           1
SFO1          125.7703643 MHz
NUC1          13C
P0            3.33 usec
P1            10.00 usec
PLW1          88.26000214 W
SFO2          500.1320005 MHz
NUC2          1H
CPDPRG[2]    waltz65
PCPD2         80.00 usec
PLW2          23.68499947 W
PLW12         0.23684999 W
PLW13         0.11913000 W

F2 - Processing parameters
SI            32768
SF            125.7577931 MHz
WDW           EM
SSB           0
LB            1.00 Hz
GB            0
PC            1.40

```



Current Data Parameters
 NAME MH-320-MAJOR-CS
 EXPNO 10
 PROCNO 1

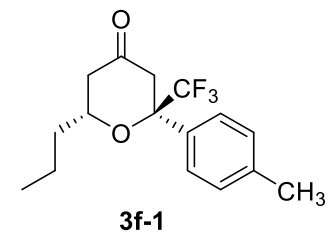
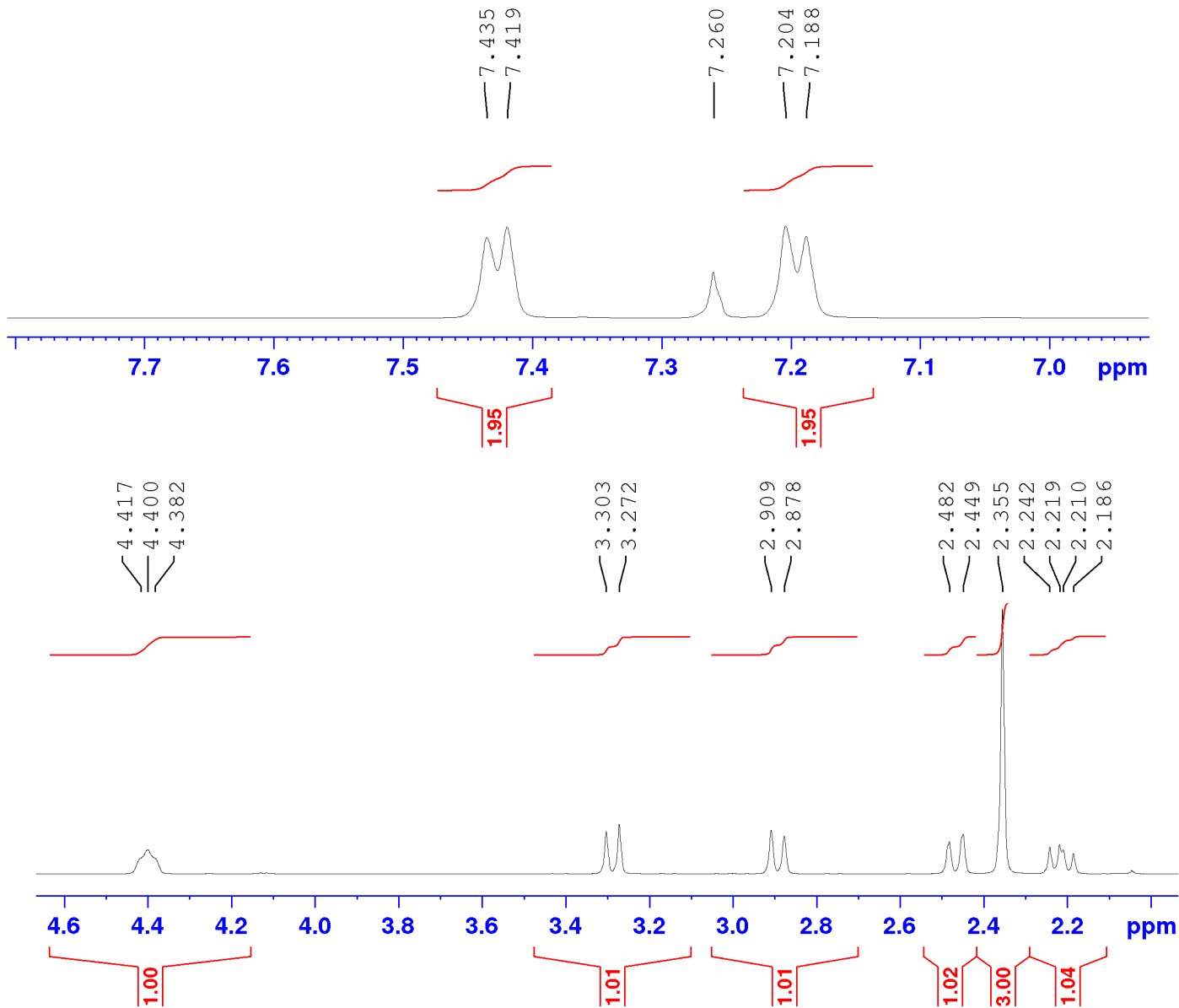
F2 - Acquisition Parameters
 Date_ 20200304
 Time 20.13 h
 INSTRUM Avance
 PROBHD Z151574_0027 ()
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 60.6061
 DW 50.000 usec
 DE 11.14 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

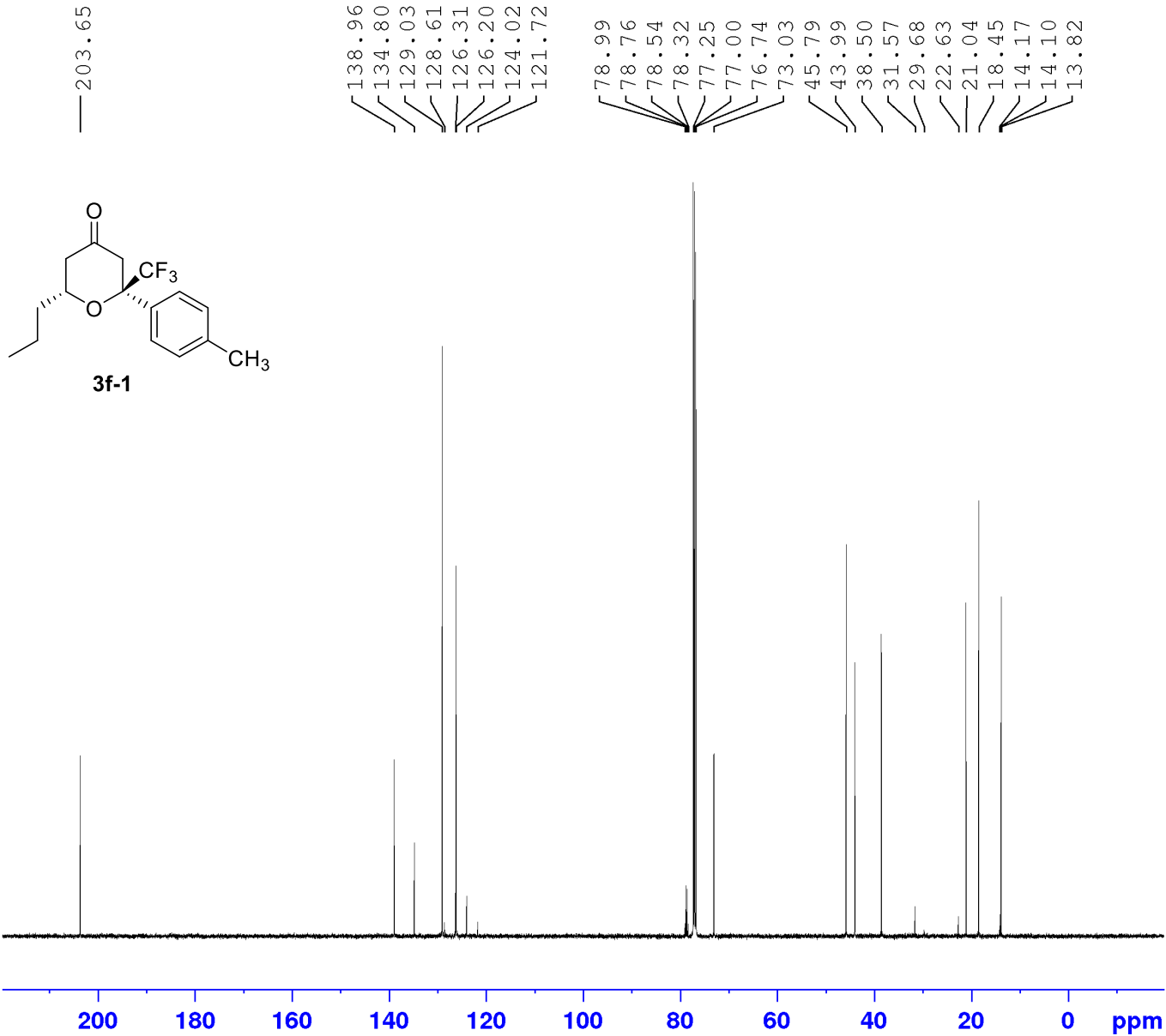
F2 - Processing parameters
 SI 65536
 SF 500.1300131 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

Current Data Parameters
 NAME MH-320-MAJOR-CS
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200304
 Time 20.13 h
 INSTRUM Avance
 PROBHD z151574_0027 (
 PULPROG zg30
 ID 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 60.6061
 DW 50.000 usec
 DE 11.14 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300131 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



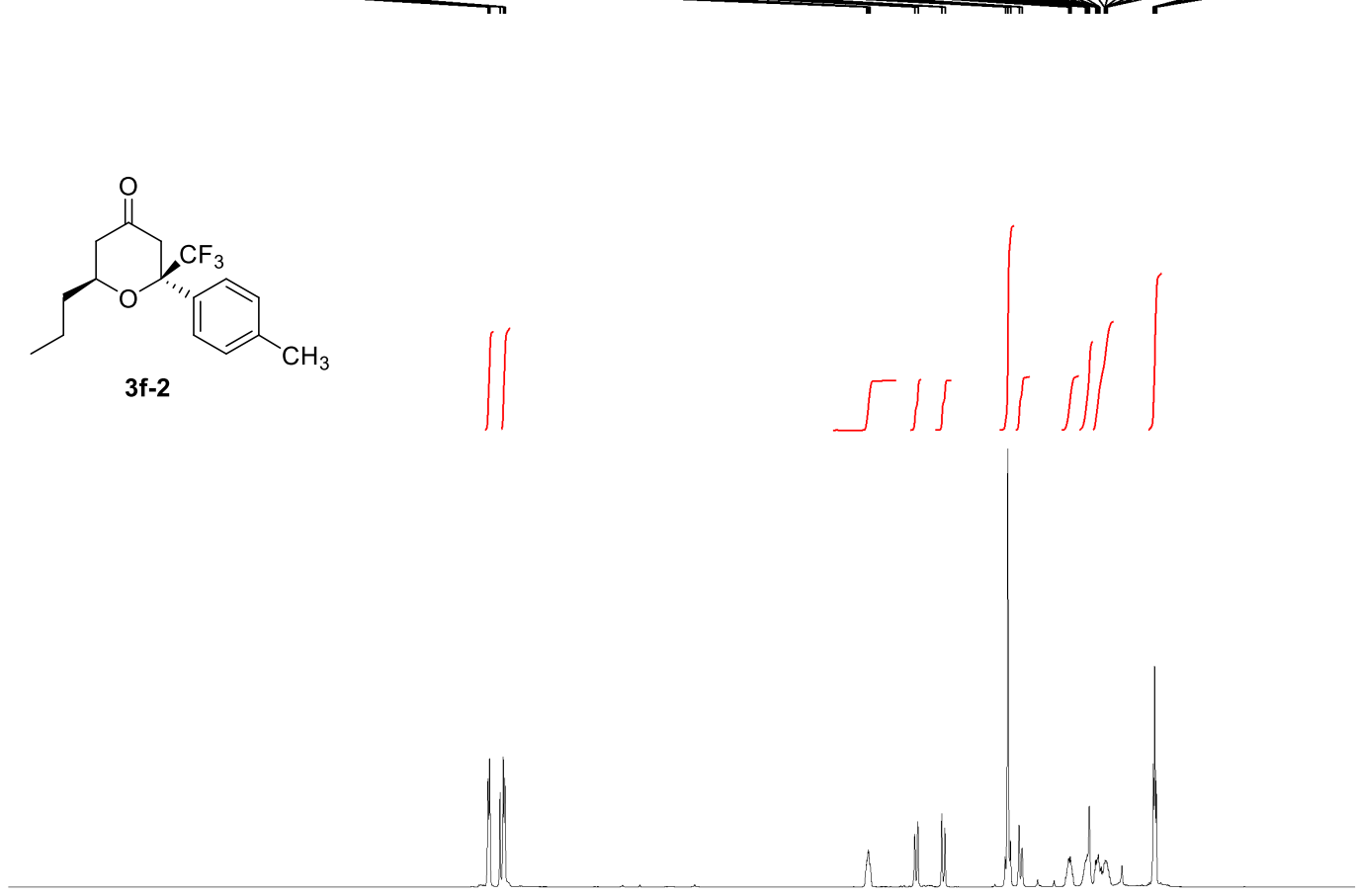
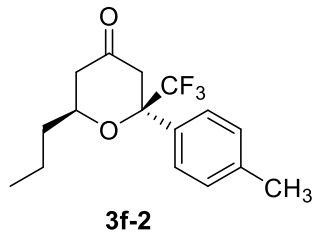


Current Data Parameters
 NAME MH-320-MAJOR-CS
 EXPNO 11
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200304
 Time 22.11 h
 INSTRUM Avance
 PROBHD Z151574_0027 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDC13
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.2 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23684999 W
 PLW13 0.11913000 W

F2 - Processing parameters
 SI 32768
 SF 125.7577928 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

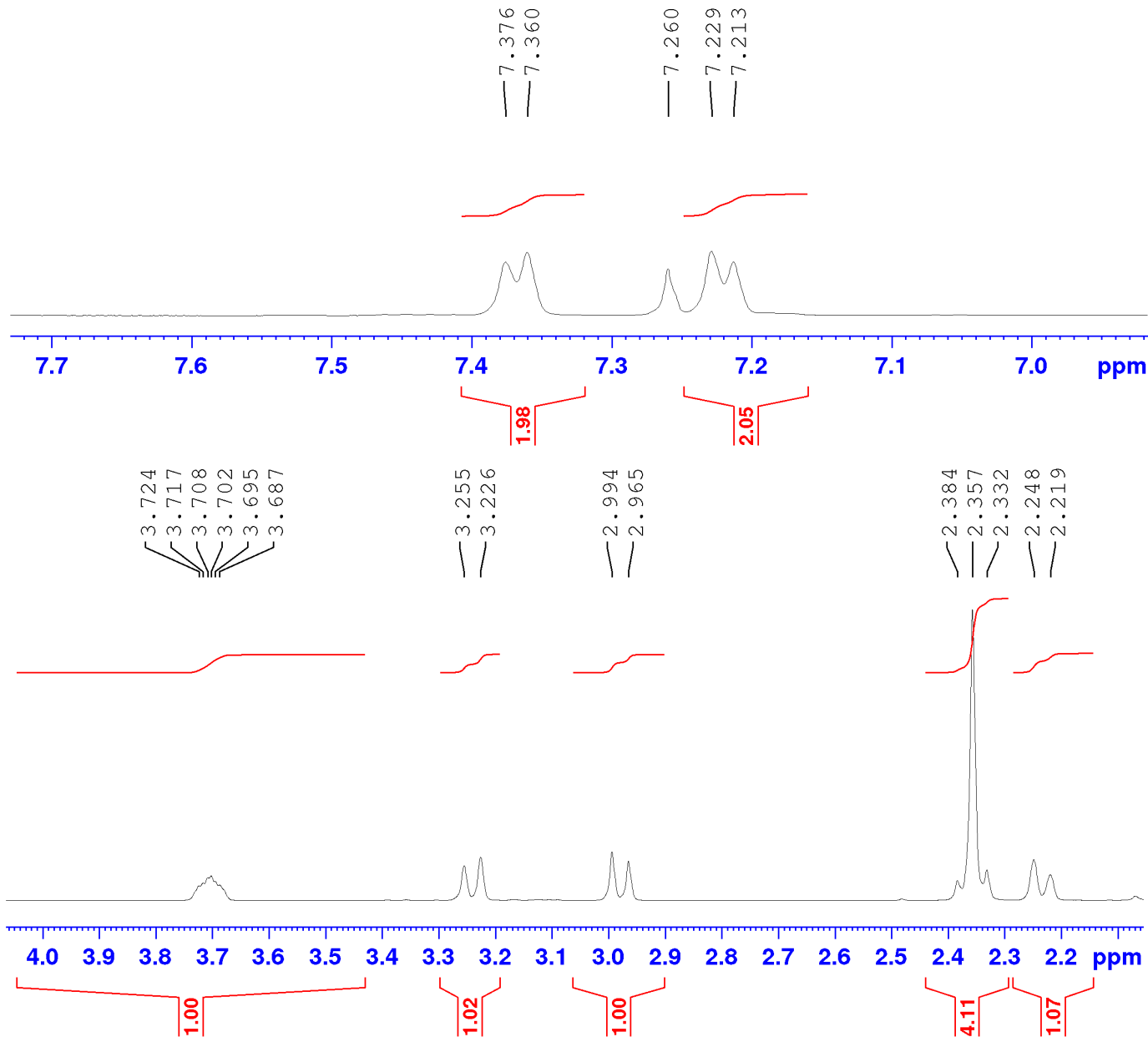
7.376
7.360
7.260
7.229
7.213
3.724
3.717
3.708
3.702
3.695
3.687
3.255
3.226
2.994
2.965
2.384
2.357
2.332
2.248
2.219
1.773
1.765
1.754
1.748
1.609
1.605
1.600
1.590
1.570
1.509
1.500
1.492
1.488
1.481
1.474
1.428
1.423
1.417
1.412
1.408
1.398
0.953
0.939
0.924



Current Data Parameters
NAME MH-320-MINOR-CS
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200304
Time 20.19 h
INSTRUM Avance
PROBHD Z151574_0027 (
PULPROG zg30
ID 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 101
DW 50.000 usec
DE 11.14 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
PO 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

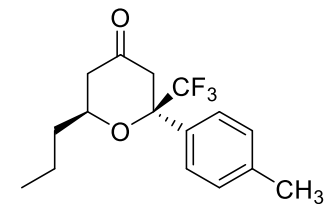
F2 - Processing parameters
SI 65536
SF 500.1300132 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



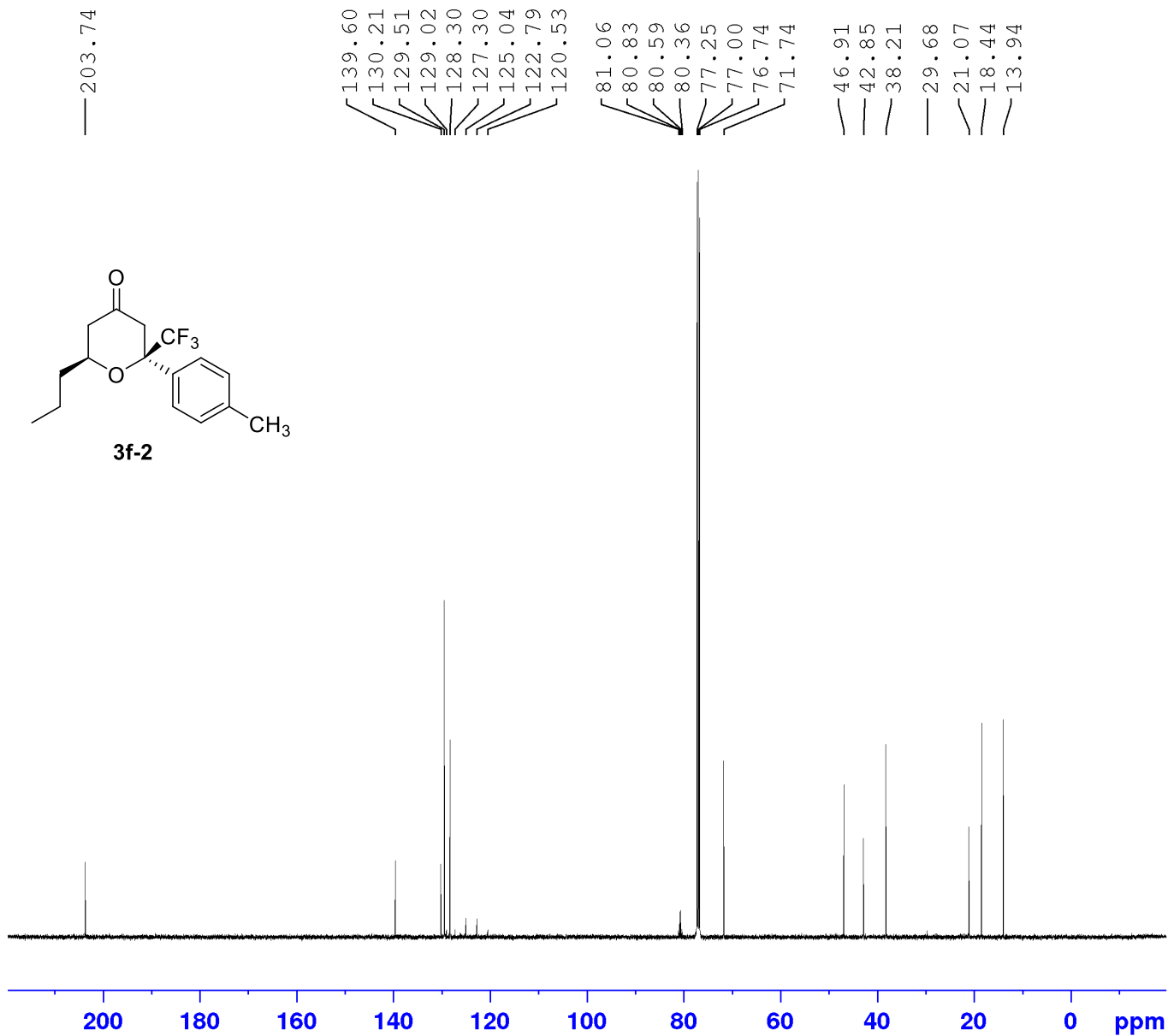
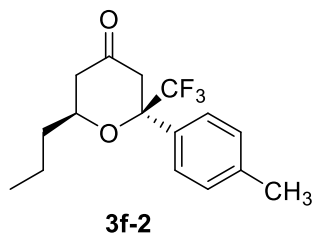
Current Data Parameters
 NAME MH-320-MINOR-CS
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200304
 Time_ 20.19 h
 INSTRUM Avance
 PROBHD Z151574_0027 (
 PULPROG zg30
 ID 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 101
 DW 50.000 usec
 DE 11.14 usec
 TE 298.2 K
 D1 1.00000000 sec
 TDO 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300132 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



3f-2



Current Data Parameters
 NAME MH-320-MINOR-CS
 EXPNO 11
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200304
 Time 21.13 h
 INSTRUM Avance
 PROBHD Z151574_0027 ()
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.2 K
 D1 2.0000000 sec
 D11 0.0300000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23684999 W
 PLW13 0.11913000 W

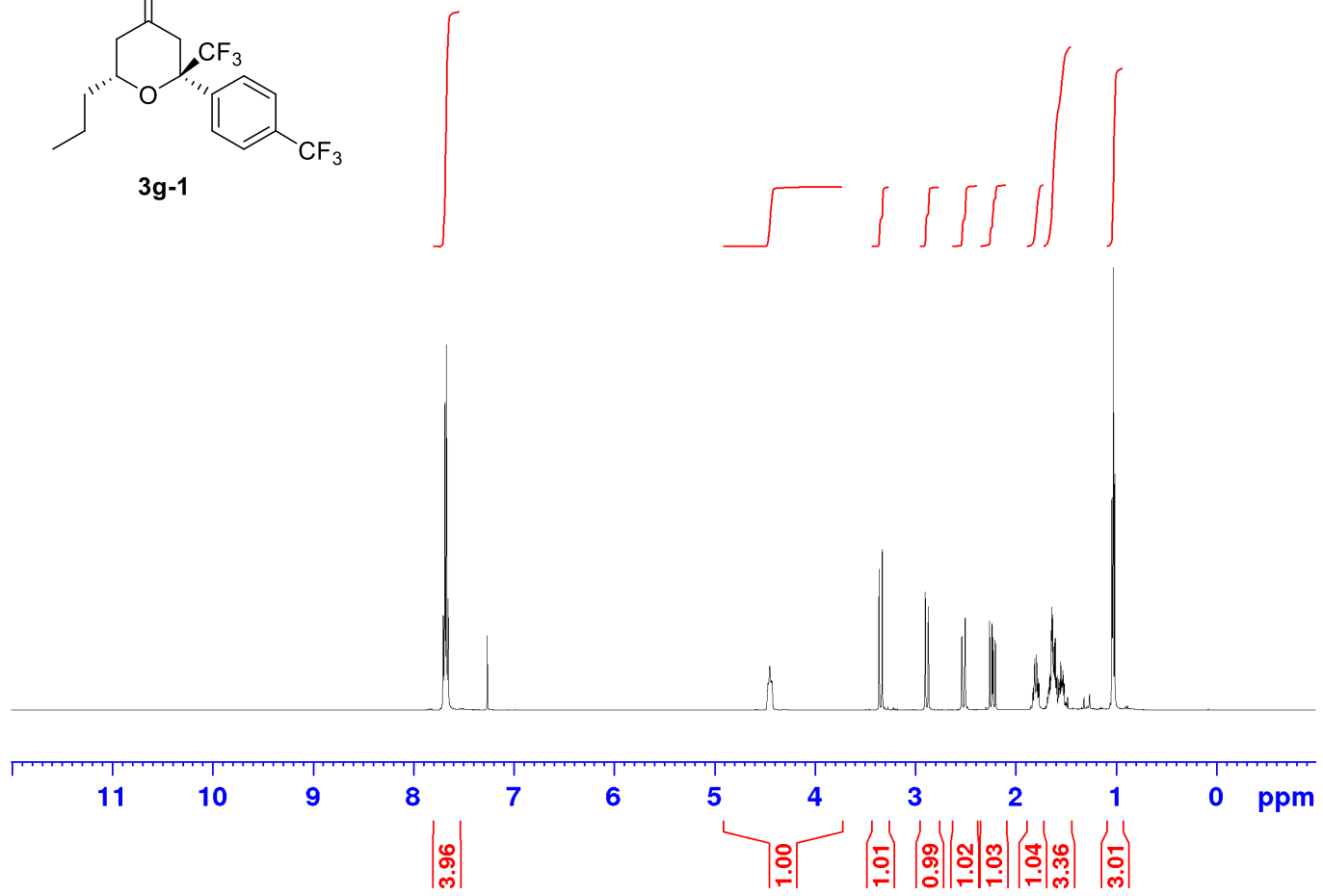
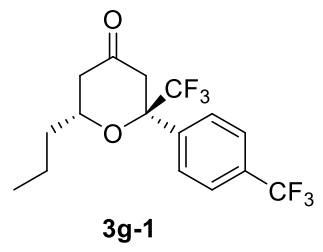
F2 - Processing parameters
 SI 32768
 SF 125.7577919 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

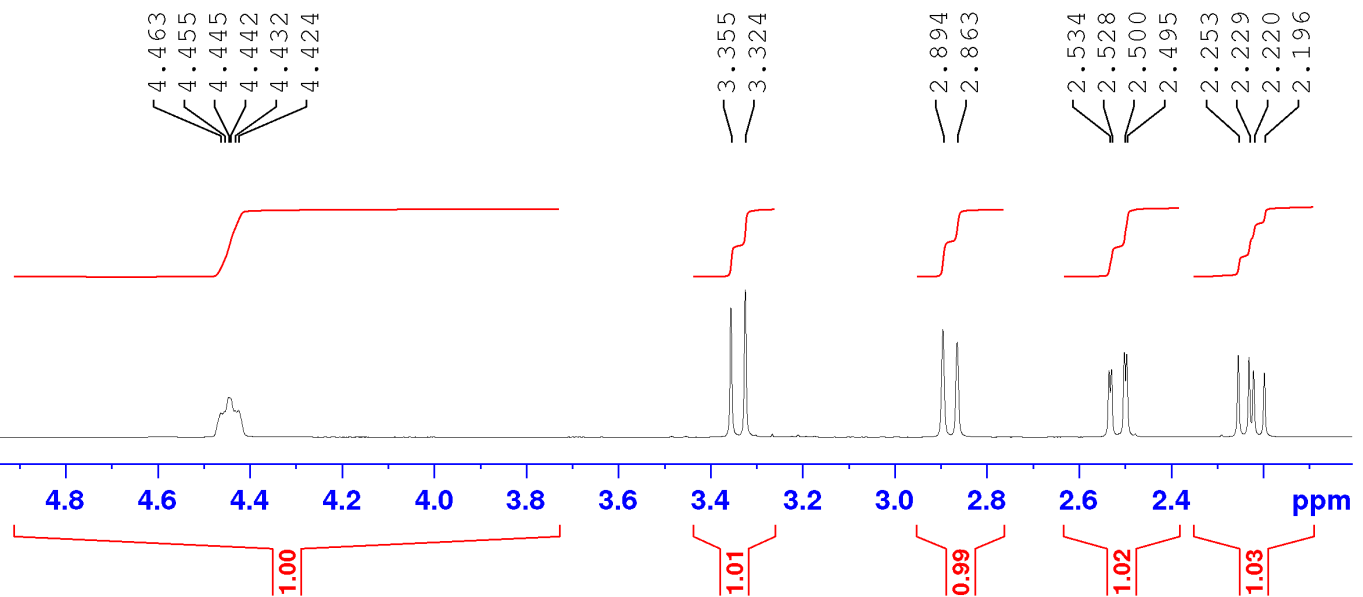
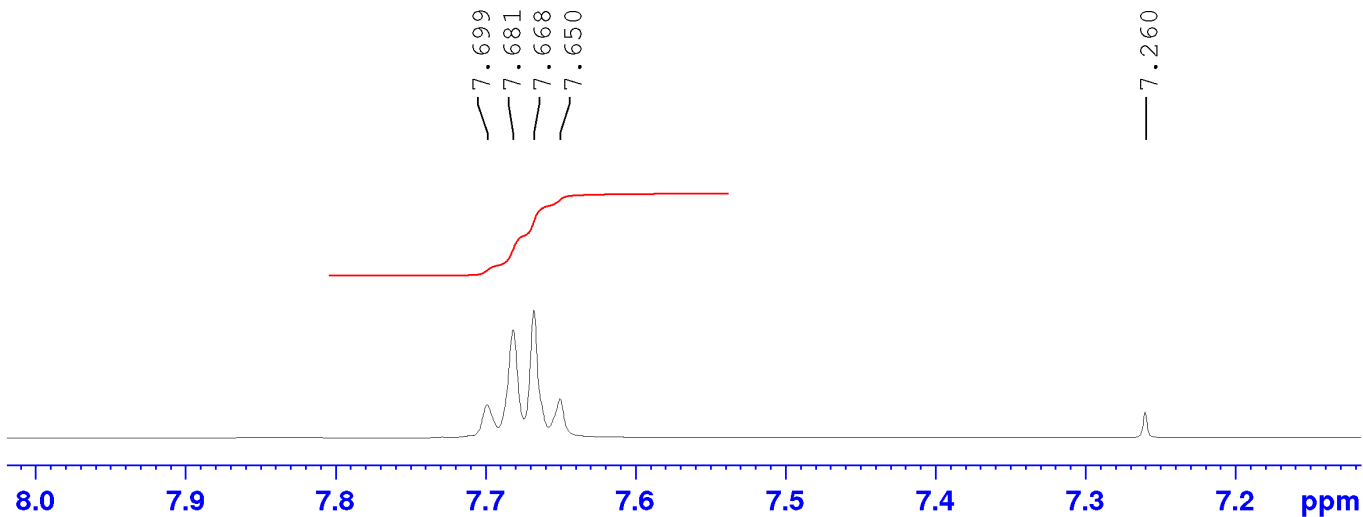
7.699
7.681
7.668
7.650
7.260
4.445
4.442
4.424
3.355
3.324
2.894
2.863
2.534
2.528
2.500
2.495
2.253
2.229
2.220
2.196
1.803
1.785
1.768
1.653
1.646
1.638
1.634
1.624
1.617
1.613
1.608
1.598
1.589
1.581
1.568
1.553
1.544
1.539
1.529
1.524
1.520
1.035
1.021
1.006

Current Data Parameters
NAME MH-324-MAJOR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200320
Time 13.47 h
INSTRUM Avance
PROBHD z151574_0027 (zg30)
PULPROG zg30
TD 65536
SOLVENT CDCl3
Ns 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 70.8617
DW 50.000 usec
DE 11.14 usec
TE 298.1 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
PO 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

F2 - Processing parameters
SI 65536
SF 500.1300115 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00

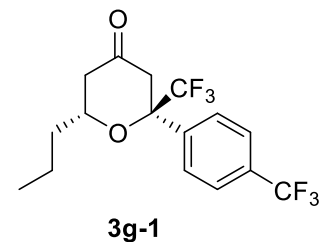


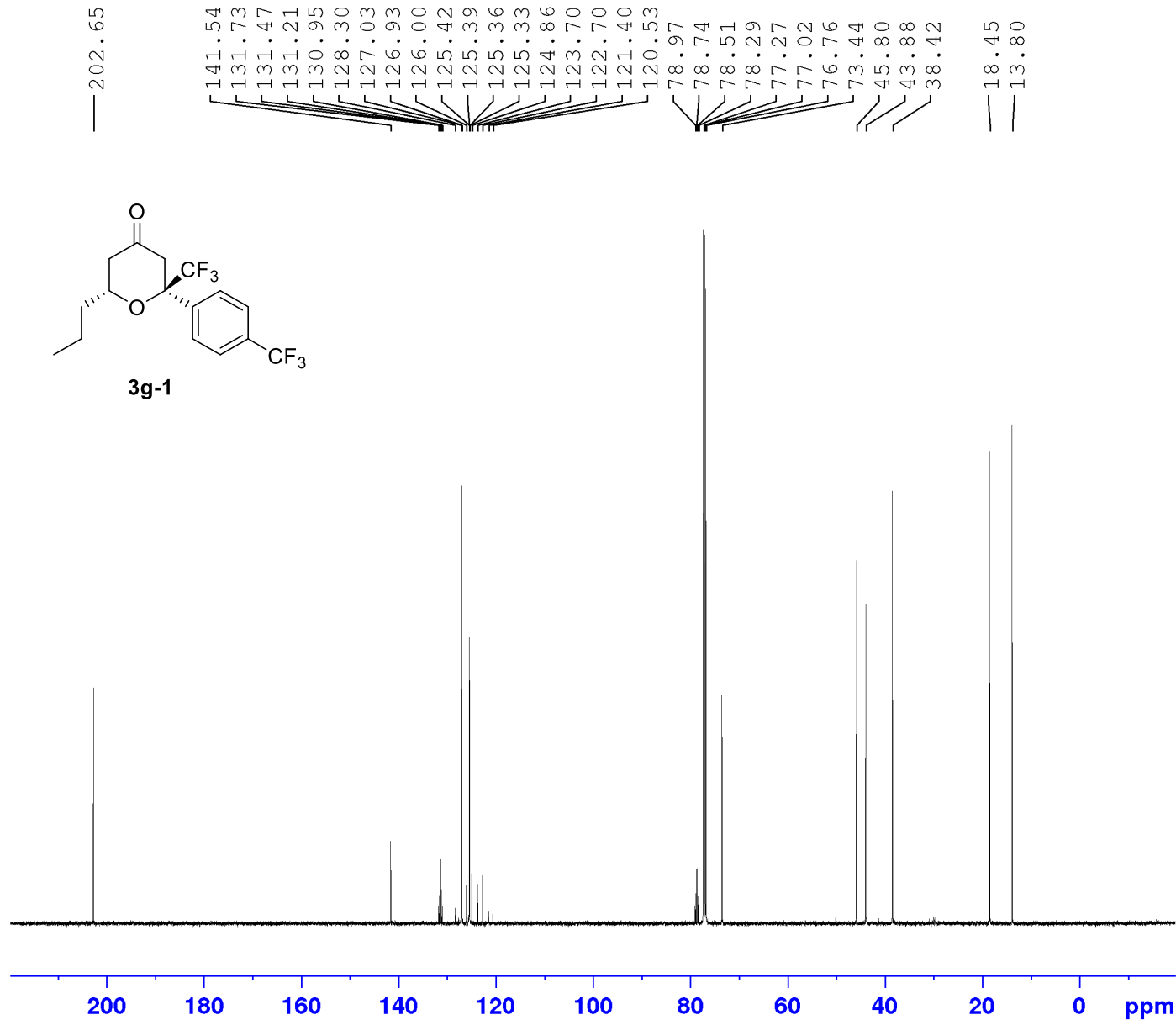
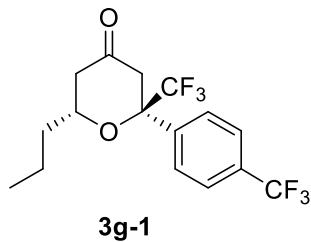


Current Data Parameters
 NAME MH-324-MAJOR
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200320
 Time 13.47 h
 INSTRUM Avance
 PROBHD z151574_0027 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 70.8617
 DW 50.000 usec
 DE 11.14 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 PO 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300115 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



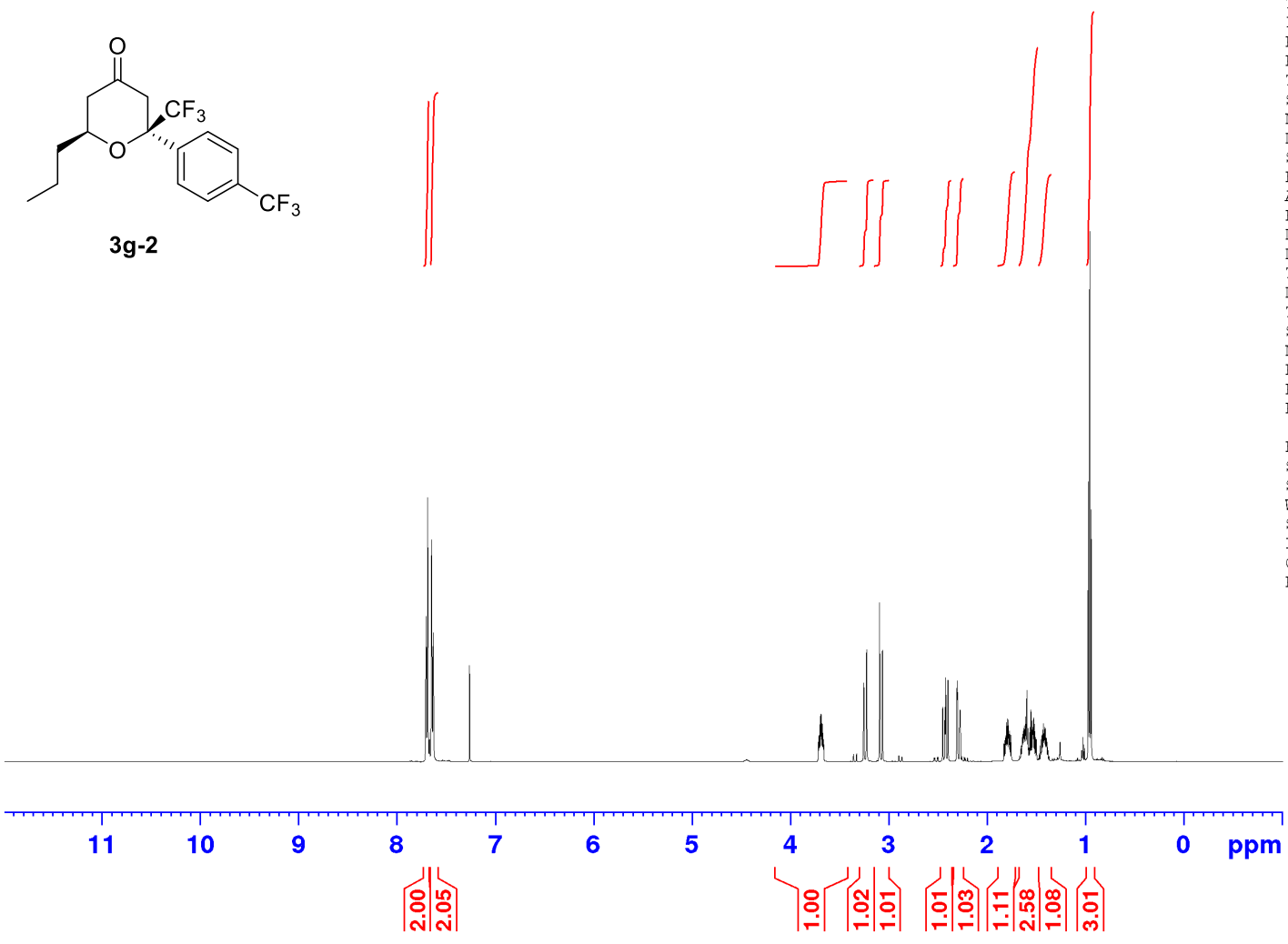
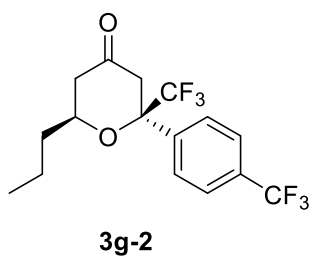


Current Data Parameters
 NAME MH-324-MAJOR
 EXPNO 11
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200320
 Time 14.49 h
 INSTRUM Avance
 PROBHD Z151574_0027 (
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.2 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23014790 W
 PLW13 0.11535020 W

F2 - Processing parameters
 SI 32768
 SF 125.7577885 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

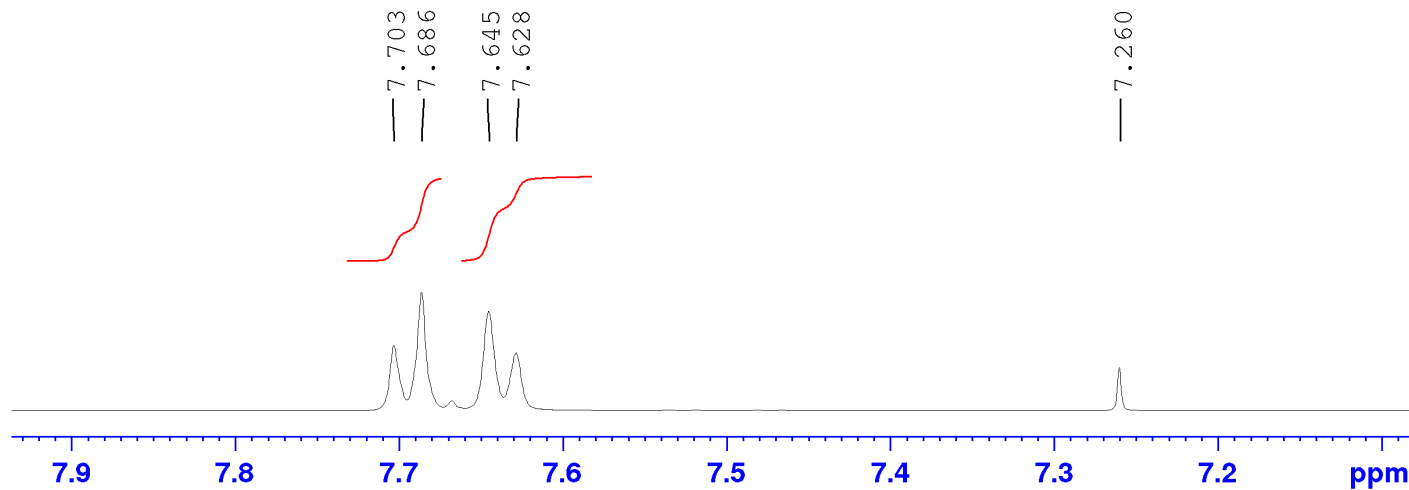
7.703
7.686
7.645
7.628
7.260
3.697
3.689
3.682
3.674
3.251
3.221
3.090
3.061
2.448
2.424
2.418
2.395
2.305
2.302
2.300
2.297
2.275
2.272
2.270
2.267
1.799
1.790
1.779
1.616
1.606
1.596
1.591
1.582
1.560
1.551
1.541
1.530
1.523
1.514
1.425
1.415
1.405
0.968
0.953
0.939



Current Data Parameters
NAME MH-324-MINOR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200320
Time 13.52 h
INSTRUM Avance
PROBHD Z151574_0027 ()
PULPROG zg30
ID 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 71.4286
DW 50.000 usec
DE 11.14 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
PO 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

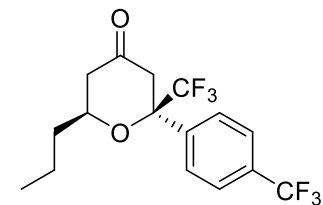
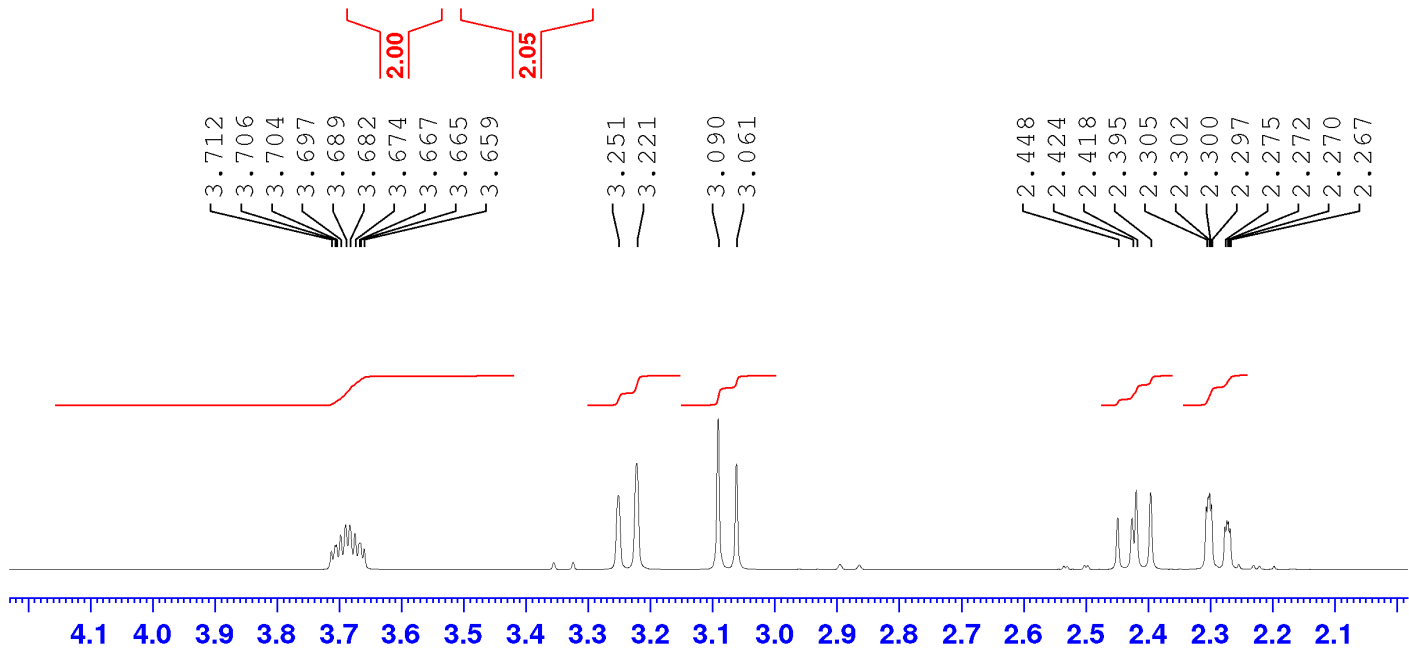
F2 - Processing parameters
SI 65536
SF 500.1300116 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



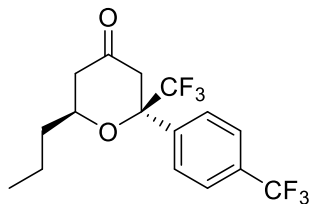
Current Data Parameters
 NAME MH-324-MINOR
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200320
 Time 13.52 h
 INSTRUM Avance
 PROBHD z151574_0027 (zg30)
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 71.4286
 DW 50.000 usec
 DE 11.14 usec
 TE 298.2 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

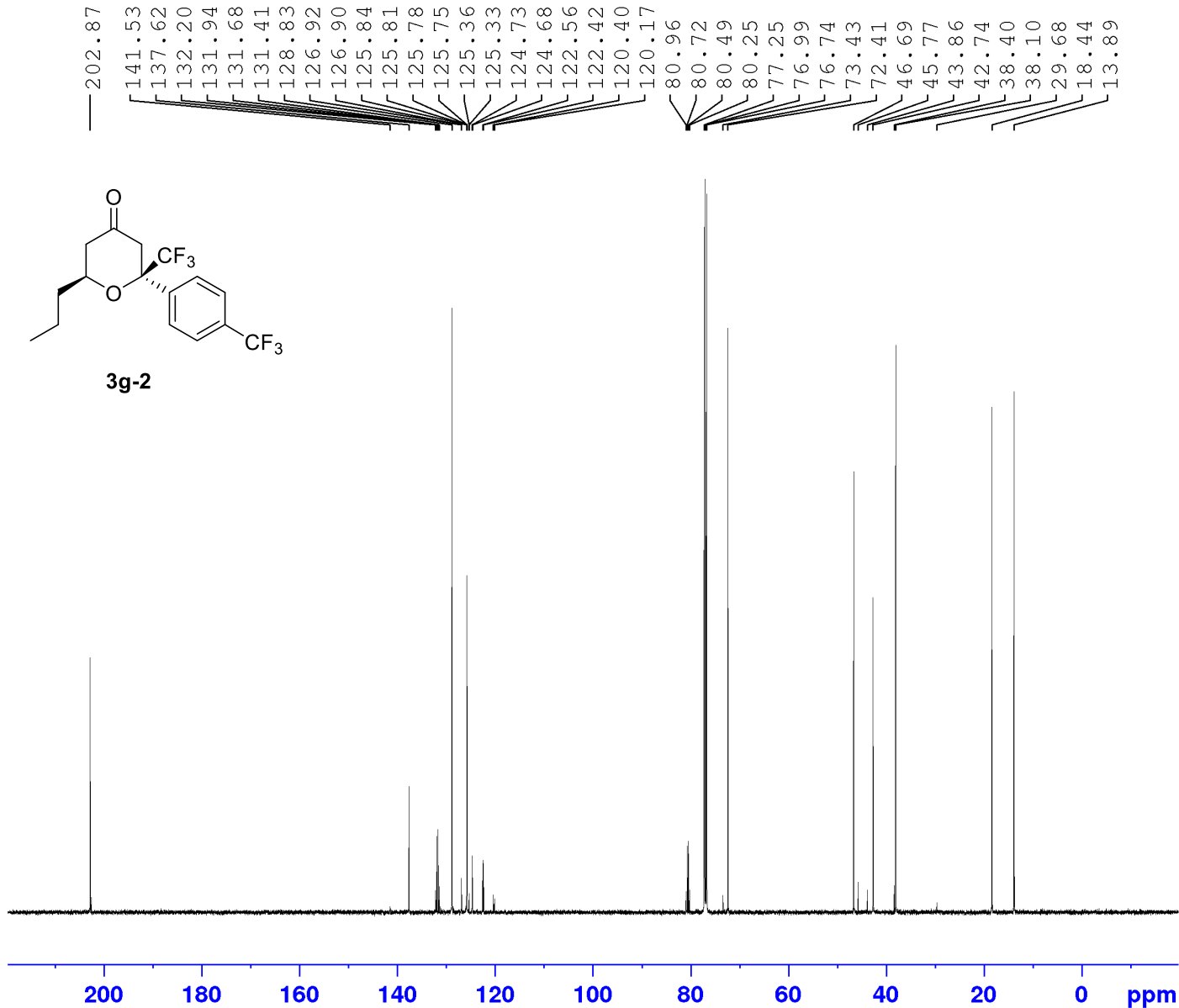
F2 - Processing parameters
 SI 65536
 SF 500.1300116 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



3g-2



3g-2



Current Data Parameters
 INSTRUM MH-324-MIN-AGAIN-C13
 EXPNO 12
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200414
 Time 18.10 h
 INSTRUM Avance
 PROBHD Z151574_0027 ()
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.2 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23014790 W
 PLW13 0.11535020 W

F2 - Processing parameters
 SI 32768
 SF 125.7577911 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40

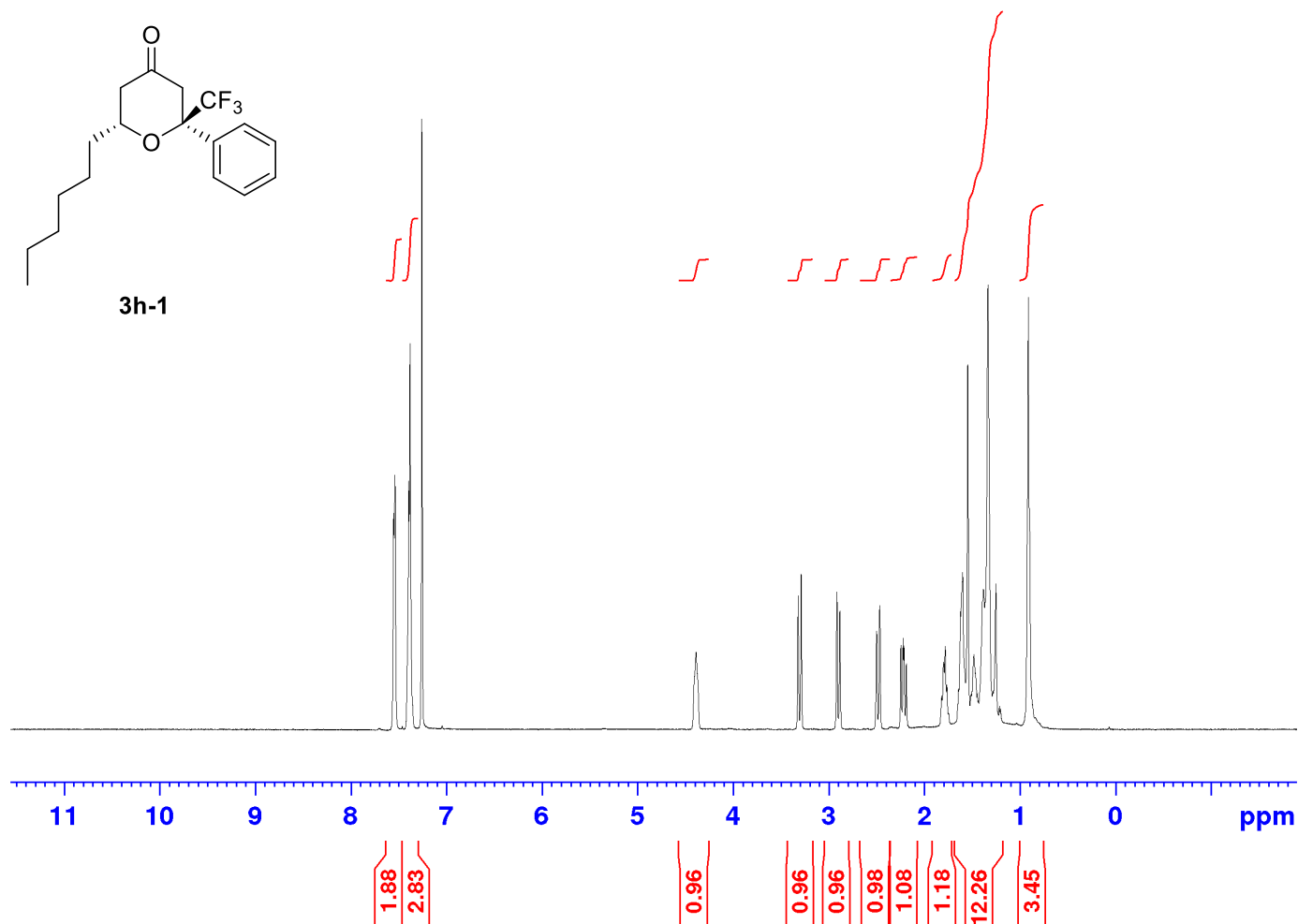
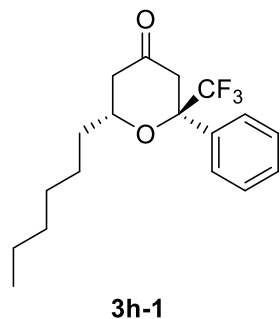
Current Data Parameters
 NAME MH-322-MAJOR-CLEAN
 EXPNO 10
 PROCNO 1

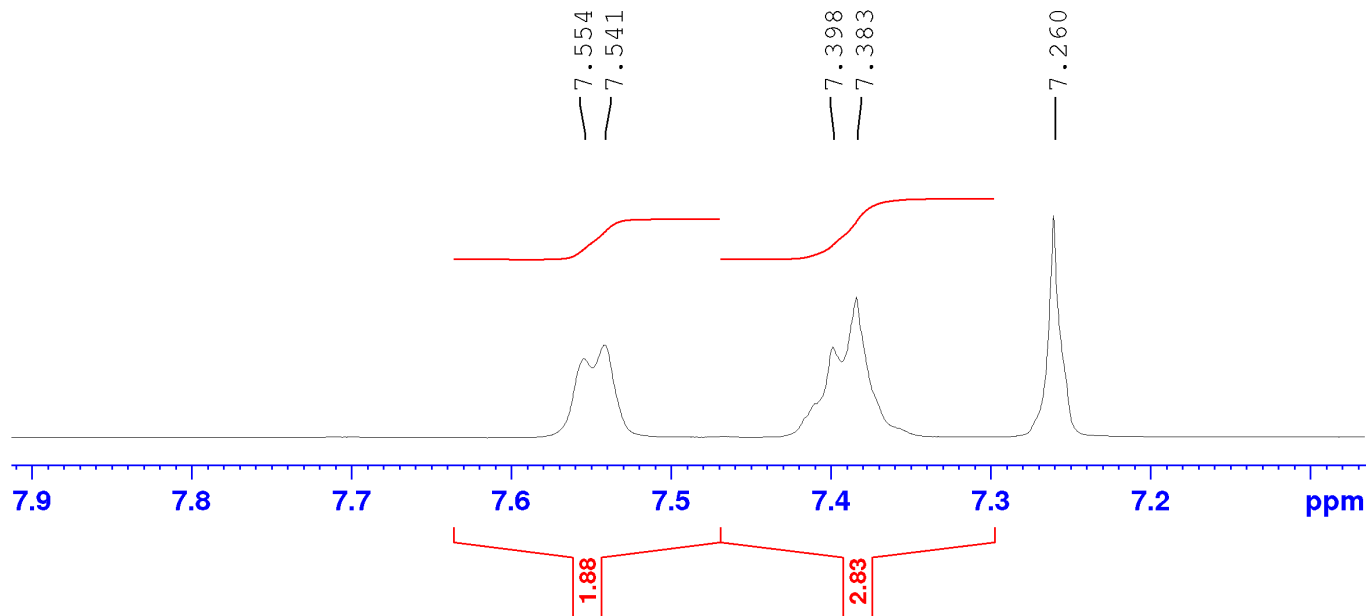
F2 - Acquisition Parameters
 Date_ 20200310
 Time 16.11 h
 INSTRUM Avance
 PROBHD Z151574_0027 (
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 101
 DW 50.000 usec
 DE 11.14 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300131 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

7.554
 7.541
 7.398
 7.383
 7.260

4.420
 4.391
 4.369
 3.323
 3.292
 2.918
 2.886
 2.501
 2.471
 2.248
 2.225
 2.216
 2.192
 1.821
 1.803
 1.785
 1.768
 1.750
 1.644
 1.625
 1.602
 1.549
 1.513
 1.483
 1.449
 1.439
 1.393
 1.385
 1.337
 1.284
 1.255
 1.217
 1.205
 0.927
 0.914
 0.901

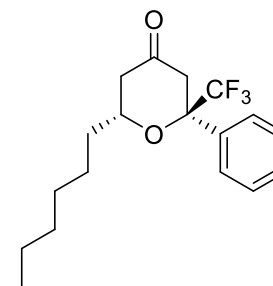
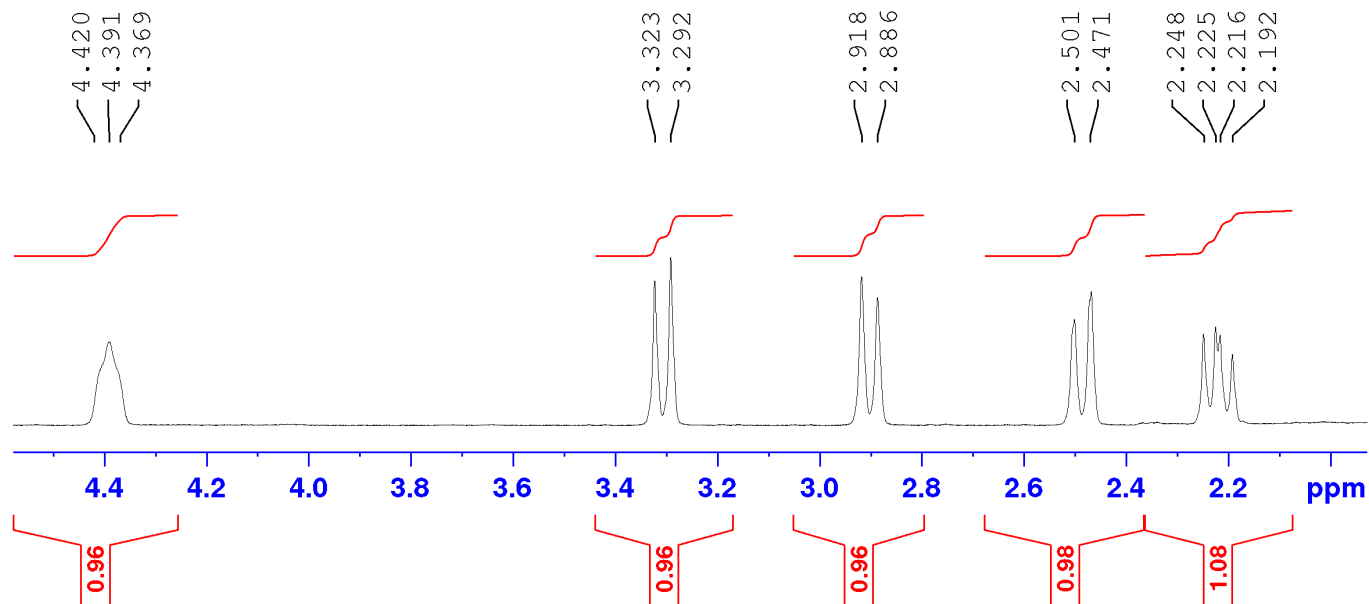




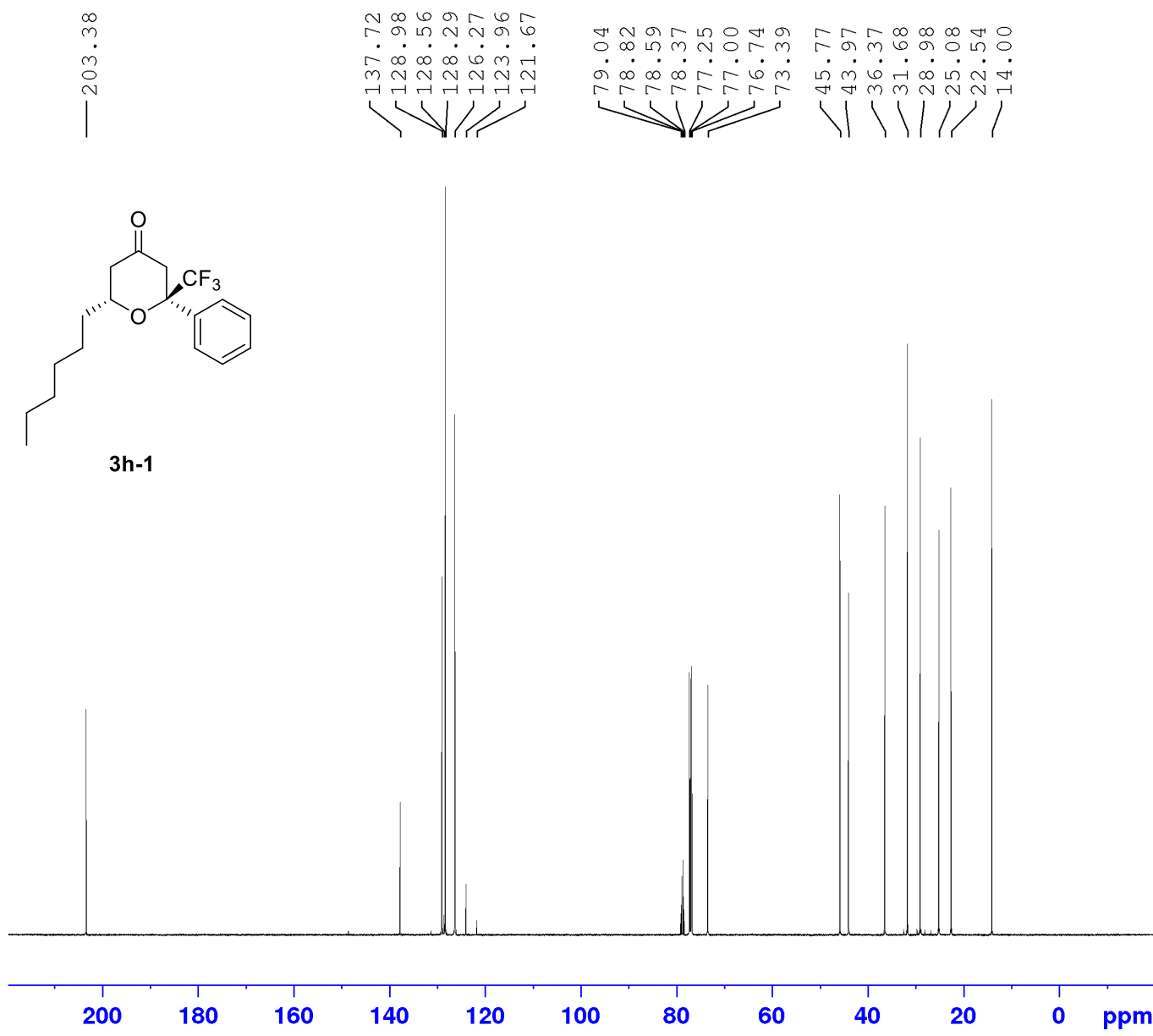
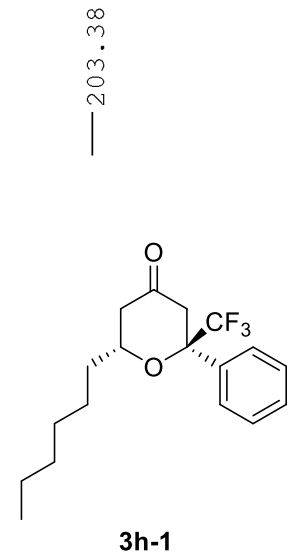
Current Data Parameters
 NAME MH-322-MAJOR-CLEAN
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200310
 Time 16.11 h
 INSTRUM Avance
 PROBHD z151574_0027 (zg30)
 PULPROG zg30
 TD 65536
 SOLVENT CDC13
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 101
 DW 50.000 usec
 DE 11.14 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300131 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



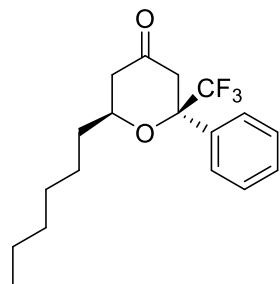
3h-1



Current Data Parameters
 NAME MH-322-MAJORAGAN
 EXPNO 11
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200529
 Time 18.19 h
 INSTRUM Avance
 PROBHD Z151574_0027 ()
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.1 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23014790 W
 PLW13 0.11535020 W

F2 - Processing parameters
 SI 32768
 SF 125.7577969 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40



3h-2

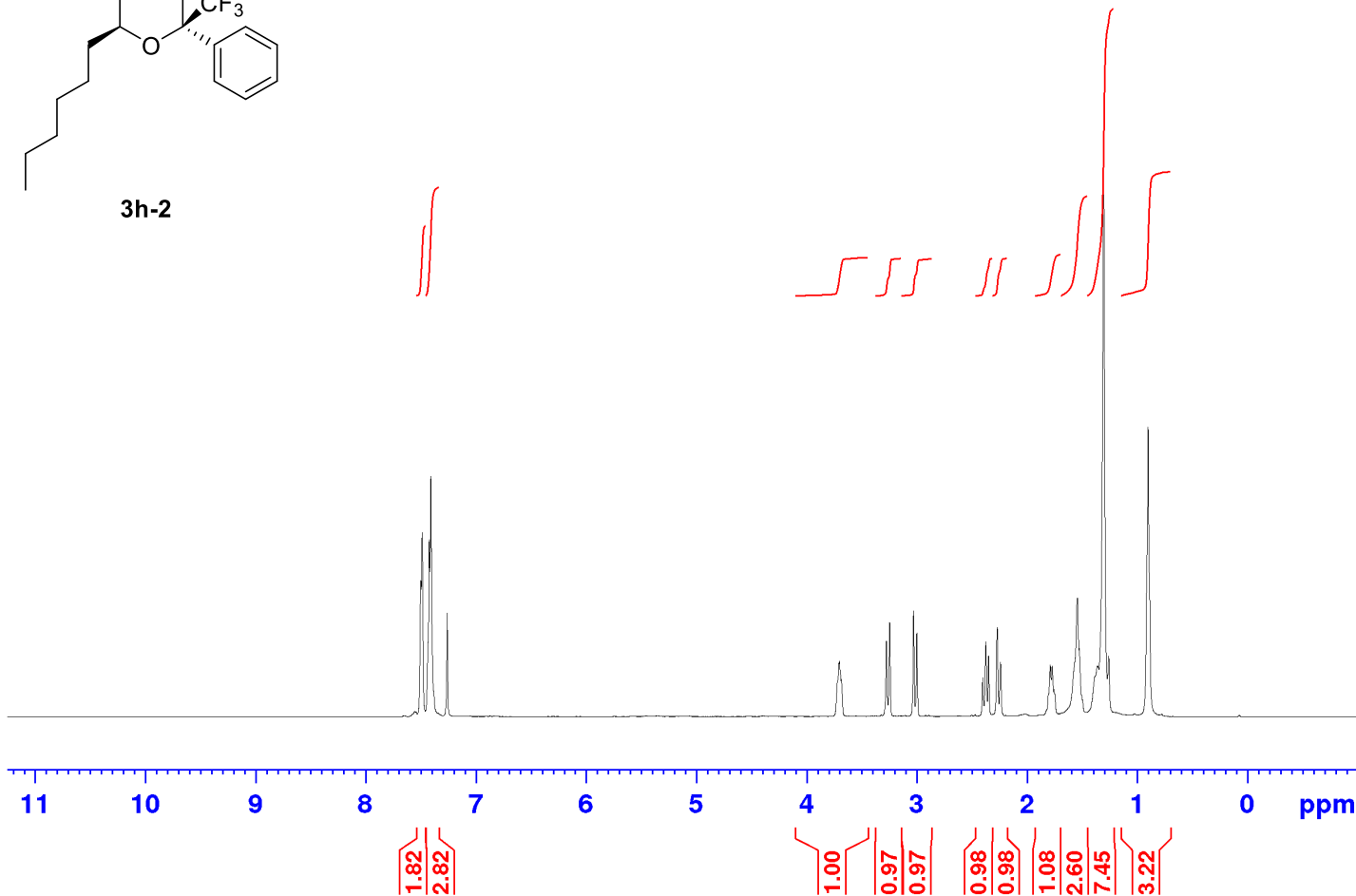
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7.422
7.407
7.259

3.718
3.711
3.704
3.698
3.690
3.682
3.273
3.244
3.027
2.997
2.399
2.377
2.370
2.347
2.267
2.239
1.824
1.804
1.787
1.769
1.752
1.745
1.539
1.522
1.501
1.493
1.359
1.353
1.302
1.256
0.911
0.899
0.886

Current Data Parameters
NAME MH-322-MINOR-C
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200310
Time 17.14 h
INSTRUM Avance
PROBHD Z151574_0027 (zg30)
PULPROG zg30
TD 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 101
DW 50.000 usec
DE 11.14 usec
TE 298.1 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
P0 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

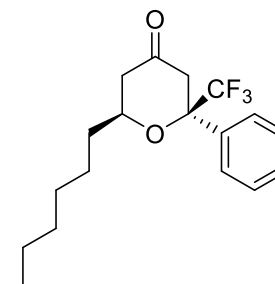
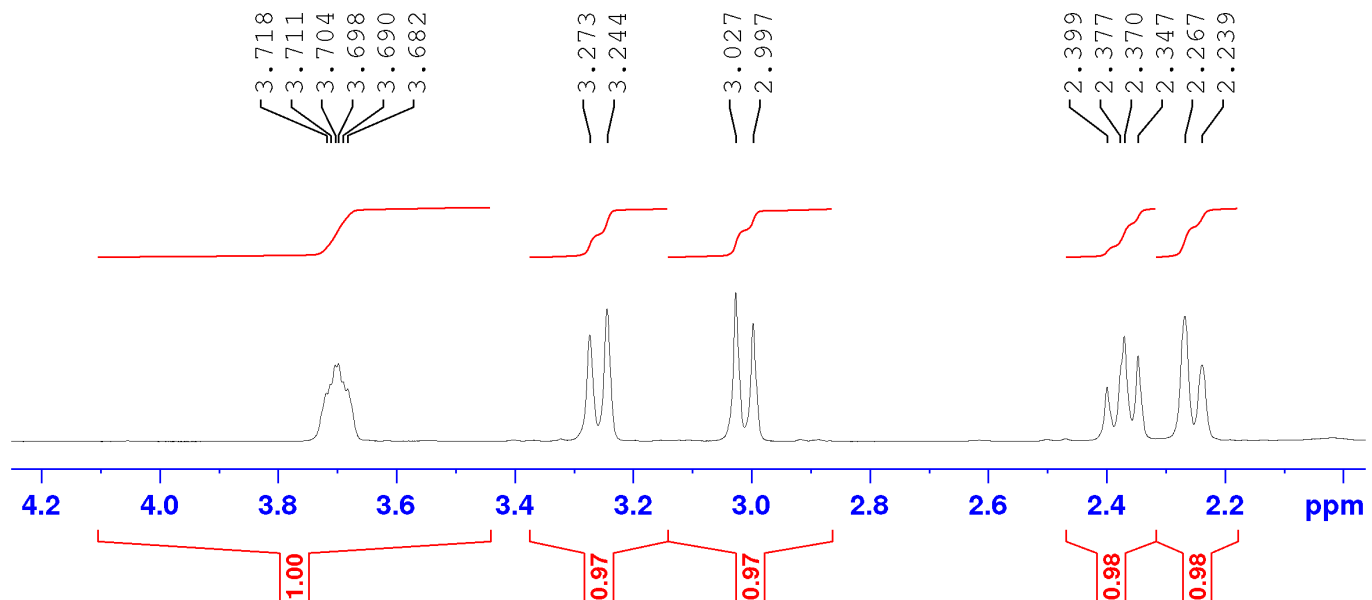
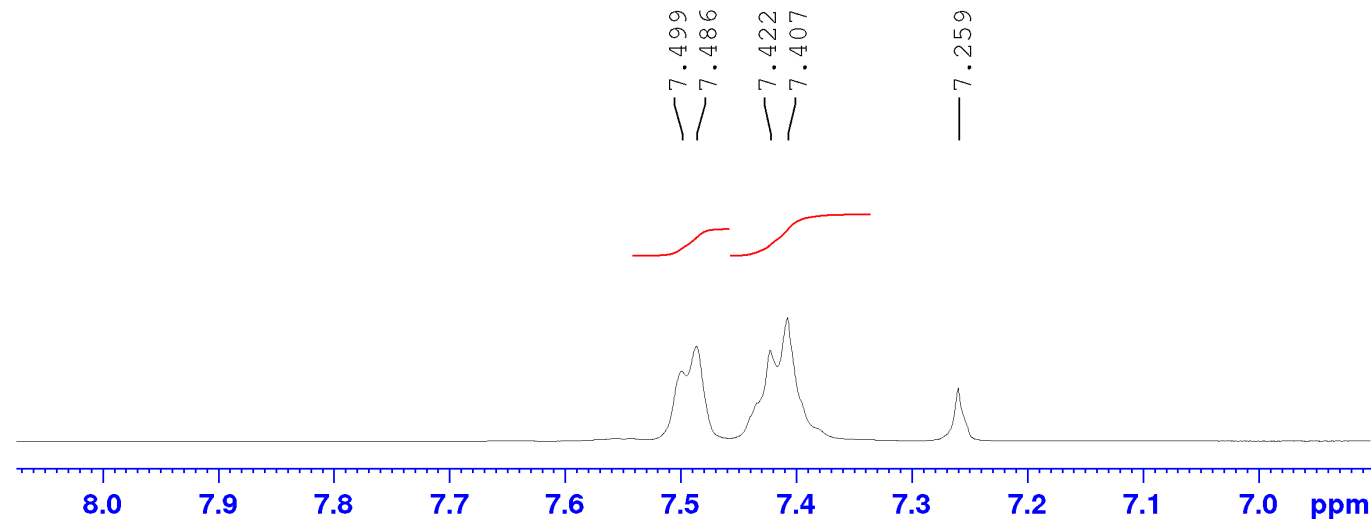
F2 - Processing parameters
SI 65536
SF 500.1300134 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00



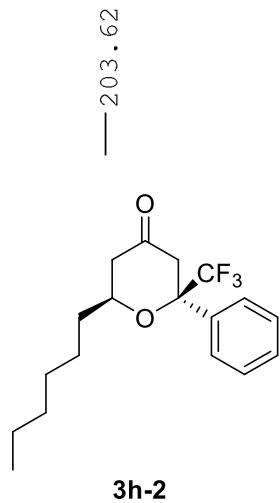
Current Data Parameters
 NAME MH-322-MINOR-C
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200310
 Time 17.14 h
 INSTRUM Avance
 PROBHD z151574_0027 (zg30)
 PULPROG zg30
 TD 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 101
 DW 50.000 usec
 DE 11.14 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SFO1 500.1330883 MHz
 NUC1 1H
 P0 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300134 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00



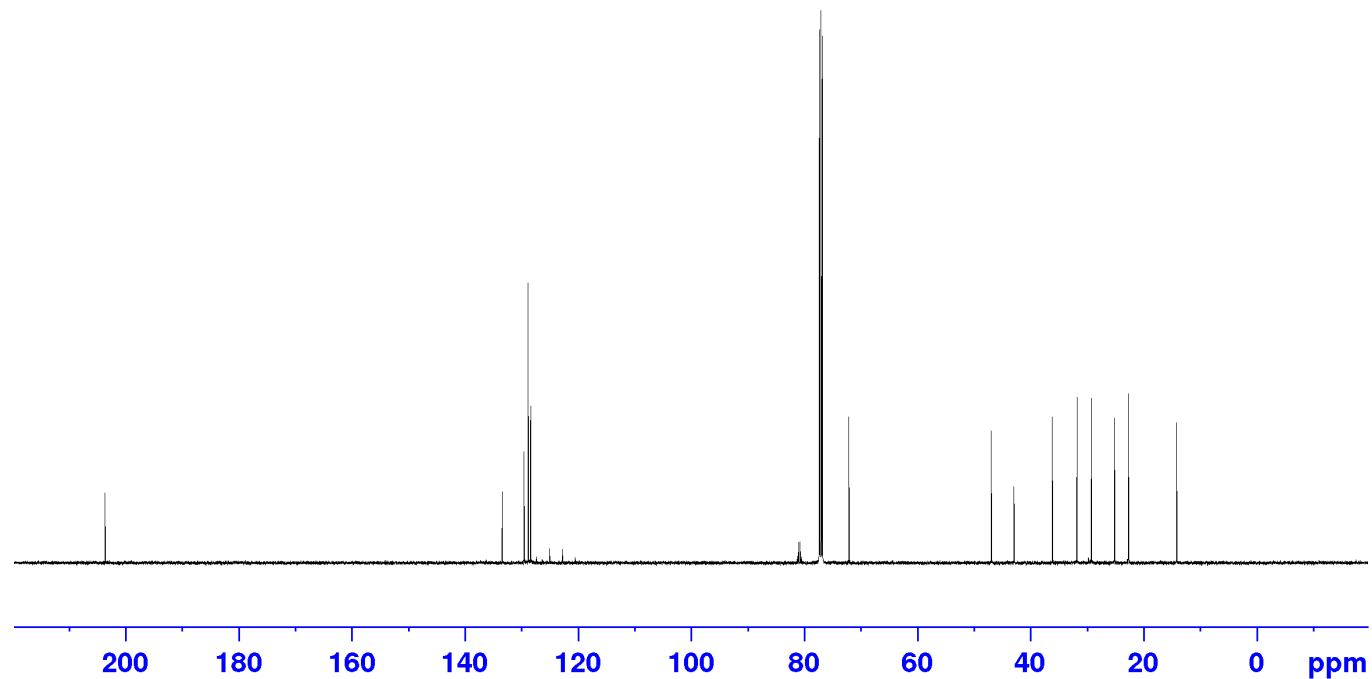
3h-2



133.36
129.52
128.78
128.34
127.25
124.99
122.74
120.48

81.14
80.91
80.67
80.44
77.25
77.00
76.74
72.05

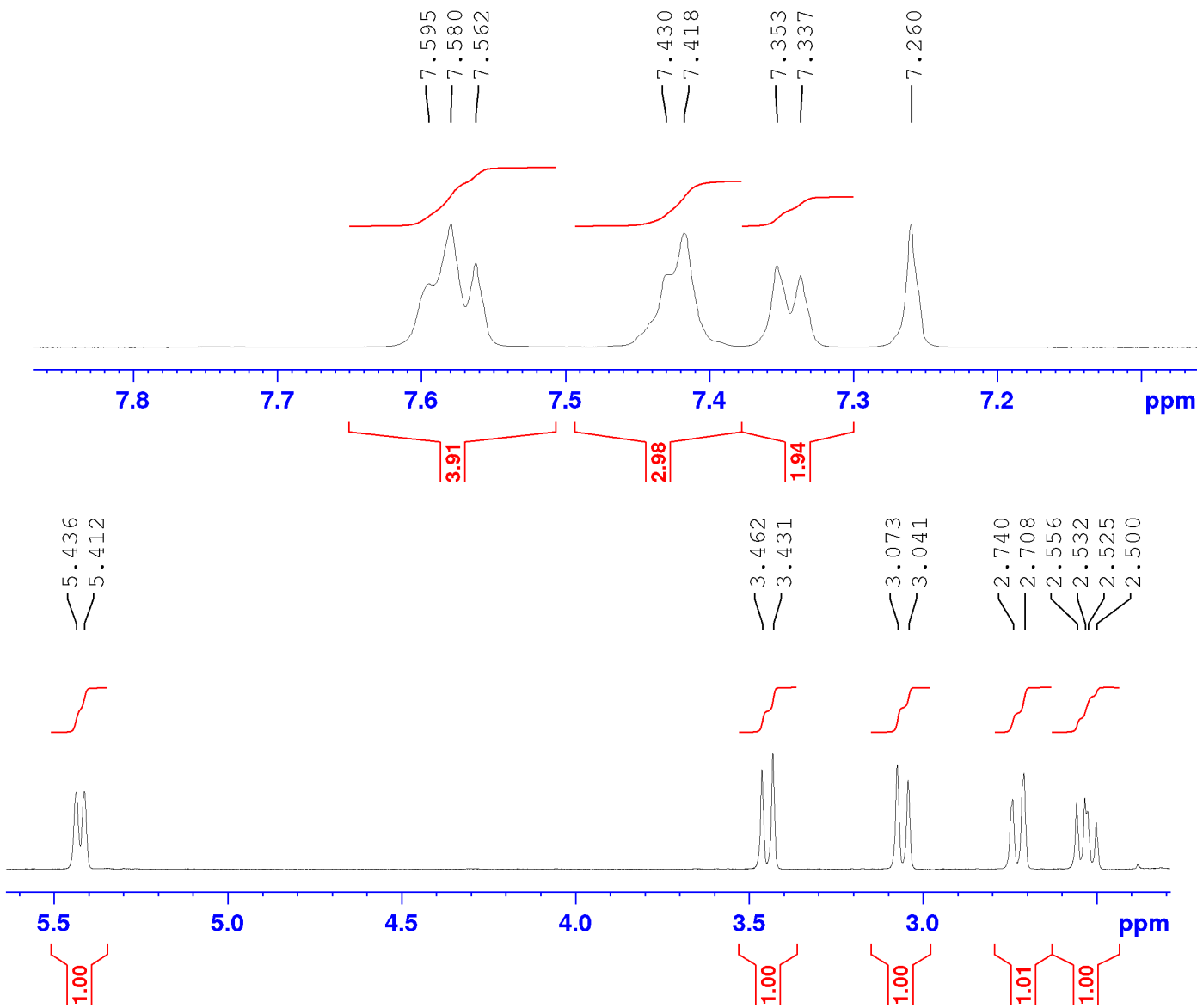
46.85
42.83
36.04
31.69
29.11
25.04
22.60
14.06



Current Data Parameters
NAME MH-322-MINOR-C
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200310
Time 18.08 h
INSTRUM Avance
PROBHD z151574_0027 (
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 30120.482 Hz
FIDRES 0.919204 Hz
AQ 1.0878977 sec
RG 101
DW 16.600 usec
DE 6.50 usec
TE 298.2 K
D1 2.00000000 sec
D11 0.03000000 sec
TD0 1
SFO1 125.7703643 MHz
NUC1 13C
P0 3.33 usec
P1 10.00 usec
PLW1 88.26000214 W
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2] waltz65
PCPD2 80.00 usec
PLW2 23.68499947 W
PLW12 0.23684999 W
PLW13 0.11913000 W

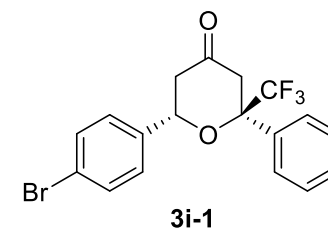
F2 - Processing parameters
SI 32768
SF 125.7577919 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

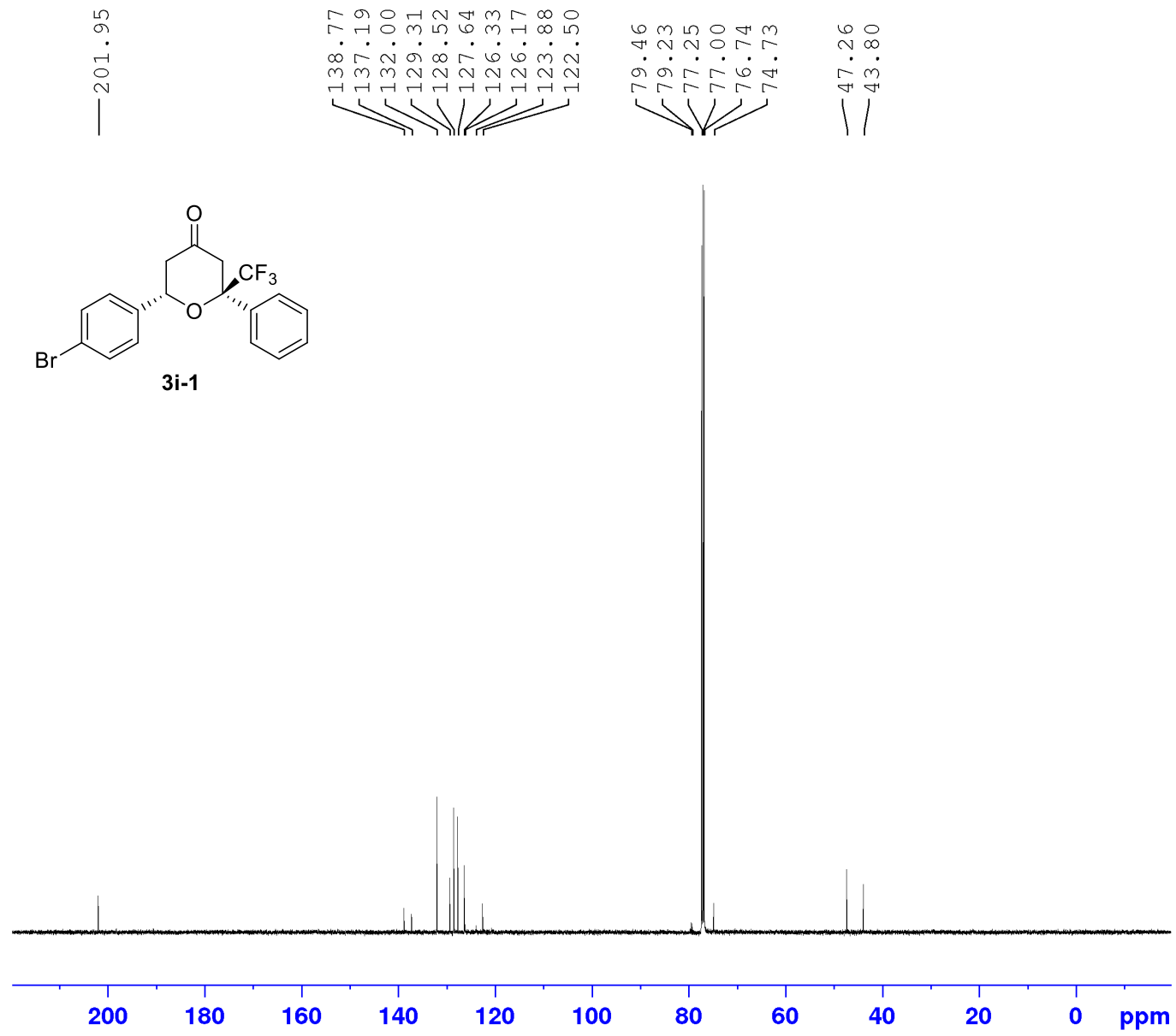
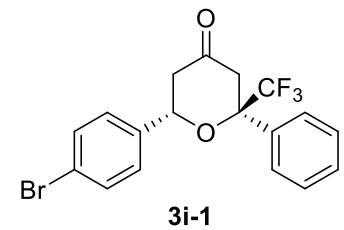


Current Data Parameters
 NAME MH-318-MAJOR
 EXPNO 10
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200229
 Time 15.47 h
 INSTRUM Avance
 PROBHD z151574_0027 (
 PULPROG zg30
 ID 65536
 SOLVENT CDCl3
 NS 16
 DS 2
 SWH 10000.000 Hz
 FIDRES 0.305176 Hz
 AQ 3.2767999 sec
 RG 101
 DW 50.000 usec
 DE 11.14 usec
 TE 298.1 K
 D1 1.00000000 sec
 TD0 1
 SF01 500.1330883 MHz
 NUC1 1H
 PO 2.67 usec
 P1 8.00 usec
 PLW1 23.68499947 W

F2 - Processing parameters
 SI 65536
 SF 500.1300131 MHz
 WDW EM
 SSB 0
 LB 0.30 Hz
 GB 0
 PC 1.00

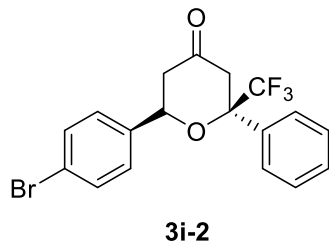




Current Data Parameters
 NAME MH-318-MAJOR
 EXPNO 11
 PROCNO 1

F2 - Acquisition Parameters
 Date_ 20200229
 Time 16.43 h
 INSTRUM Avance
 PROBHD Z151574_0027 ()
 PULPROG zgpg30
 TD 65536
 SOLVENT CDCl3
 NS 1024
 DS 4
 SWH 30120.482 Hz
 FIDRES 0.919204 Hz
 AQ 1.0878977 sec
 RG 101
 DW 16.600 usec
 DE 6.50 usec
 TE 298.1 K
 D1 2.00000000 sec
 D11 0.03000000 sec
 TD0 1
 SFO1 125.7703643 MHz
 NUC1 13C
 P0 3.33 usec
 P1 10.00 usec
 PLW1 88.26000214 W
 SFO2 500.1320005 MHz
 NUC2 1H
 CPDPRG[2] waltz65
 PCPD2 80.00 usec
 PLW2 23.68499947 W
 PLW12 0.23684999 W
 PLW13 0.11913000 W

F2 - Processing parameters
 SI 32768
 SF 125.7577919 MHz
 WDW EM
 SSB 0
 LB 1.00 Hz
 GB 0
 PC 1.40



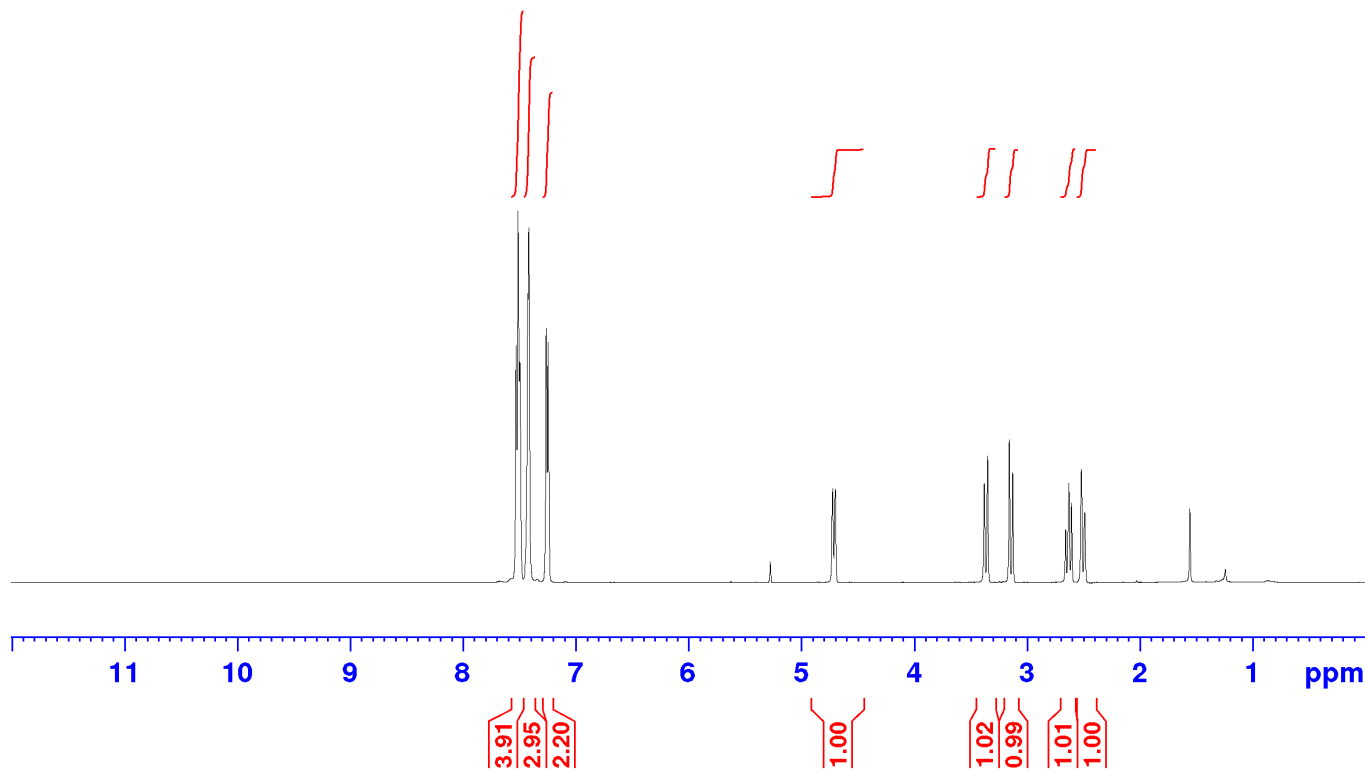
7.527
7.510
7.493
7.421
7.415
7.260
7.243

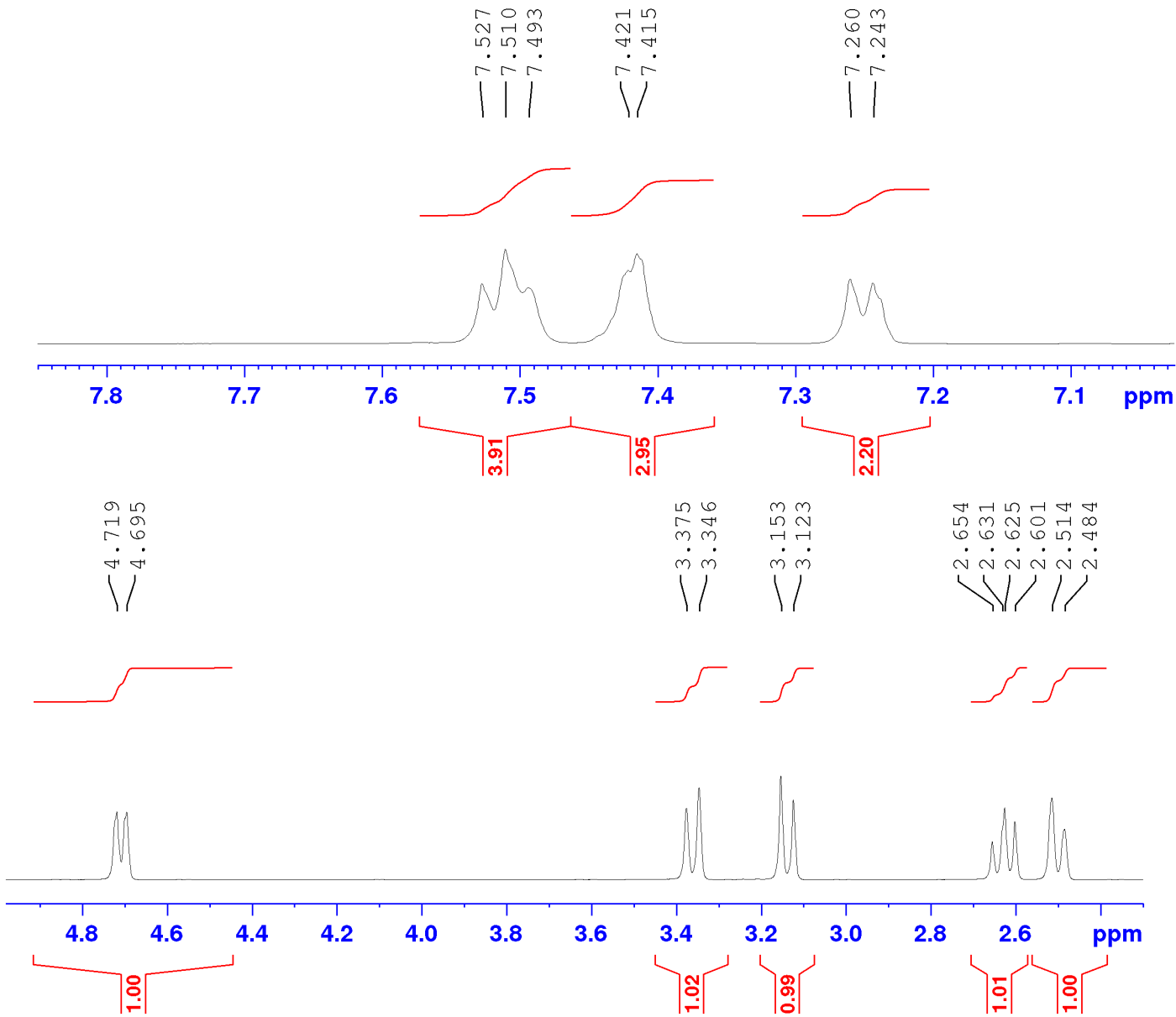
4.719
4.695
3.375
3.346
3.153
3.123
2.654
2.631
2.625
2.601
2.514
2.484

Current Data Parameters
NAME MH-318-MINOR
EXPNO 10
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200229
Time 16.48 h
INSTRUM Avance
PROBHD z151574_0027 (
PULPROG zg30
ID 65536
SOLVENT CDCl3
NS 16
DS 2
SWH 10000.000 Hz
FIDRES 0.305176 Hz
AQ 3.2767999 sec
RG 101
DW 50.000 usec
DE 11.14 usec
TE 298.2 K
D1 1.00000000 sec
TD0 1
SFO1 500.1330883 MHz
NUC1 1H
PO 2.67 usec
P1 8.00 usec
PLW1 23.68499947 W

F2 - Processing parameters
SI 65536
SF 500.1300246 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00





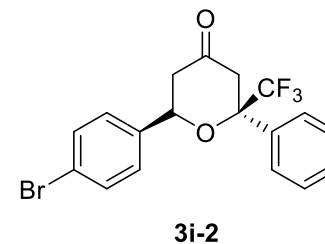
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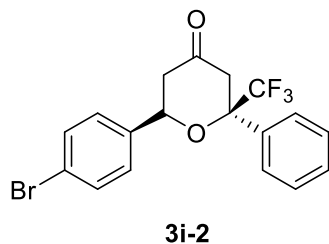
Current Data Parameters
NAME      MH-318-MINOR
EXPNO     10
PROCNO    1

F2 - Acquisition Parameters
Date_     20200229
Time      16.48 h
INSTRUM   Avance
PROBHD    Z151574_0027 (
PULPROG   zg30
ID        65536
SOLVENT   CDCl3
NS        16
DS        2
SWH       10000.000 Hz
FIDRES    0.305176 Hz
AQ        3.2767999 sec
RG        101
DW        50.000 usec
DE        11.14 usec
TE        298.2 K
D1        1.00000000 sec
TD0       1
SFO1      500.1330883 MHz
NUC1      1H
PO        2.67 usec
P1        8.00 usec
PLW1      23.68499947 W

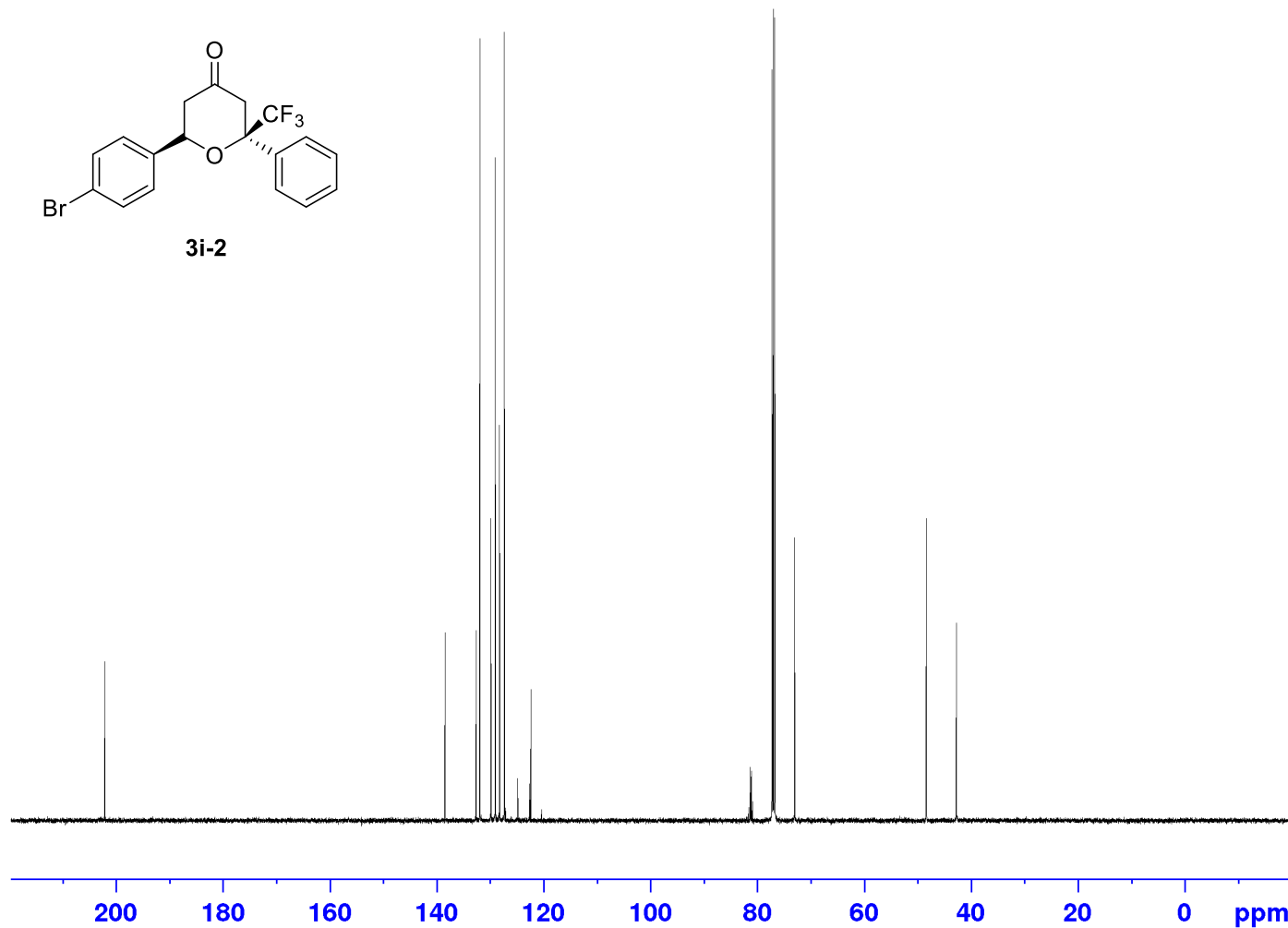
F2 - Processing parameters
SI        65536
SF        500.1300246 MHz
WDW       EM
SSB       0
LB        0.30 Hz
GB        0
PC        1.00

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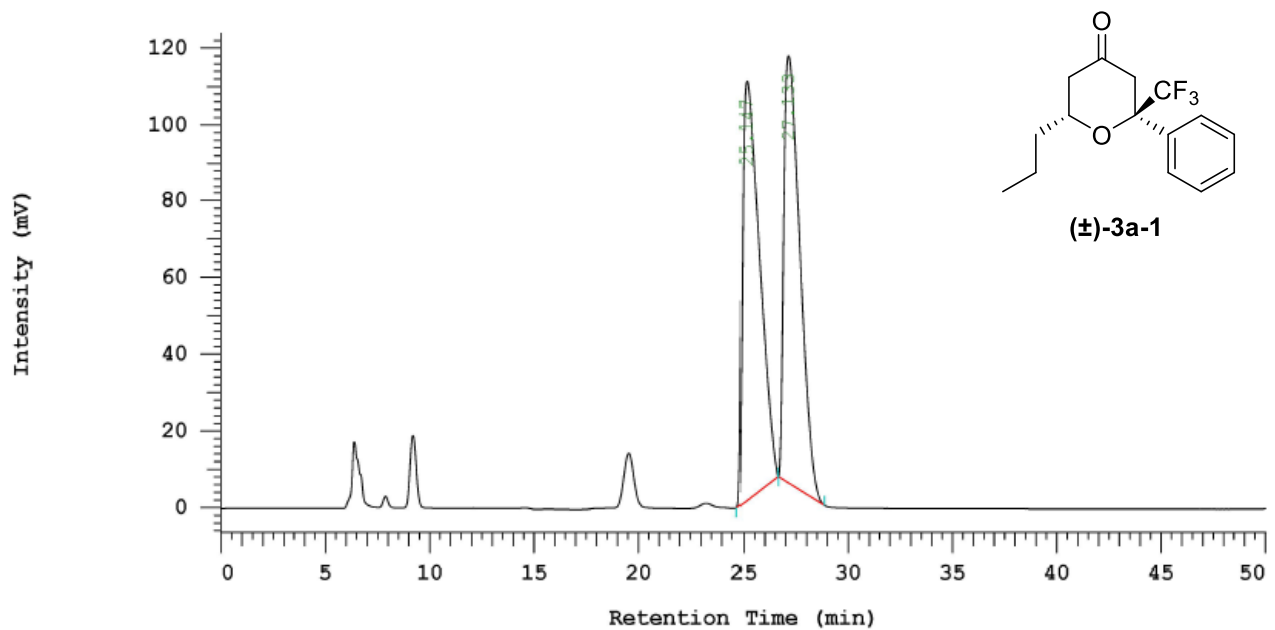
138.42
132.61
131.93
129.86
129.07
128.24
127.34
127.13
124.87
122.62
122.39
120.36
81.61
81.37
81.13
80.89
77.25
77.00
76.74
73.02
48.35
42.73



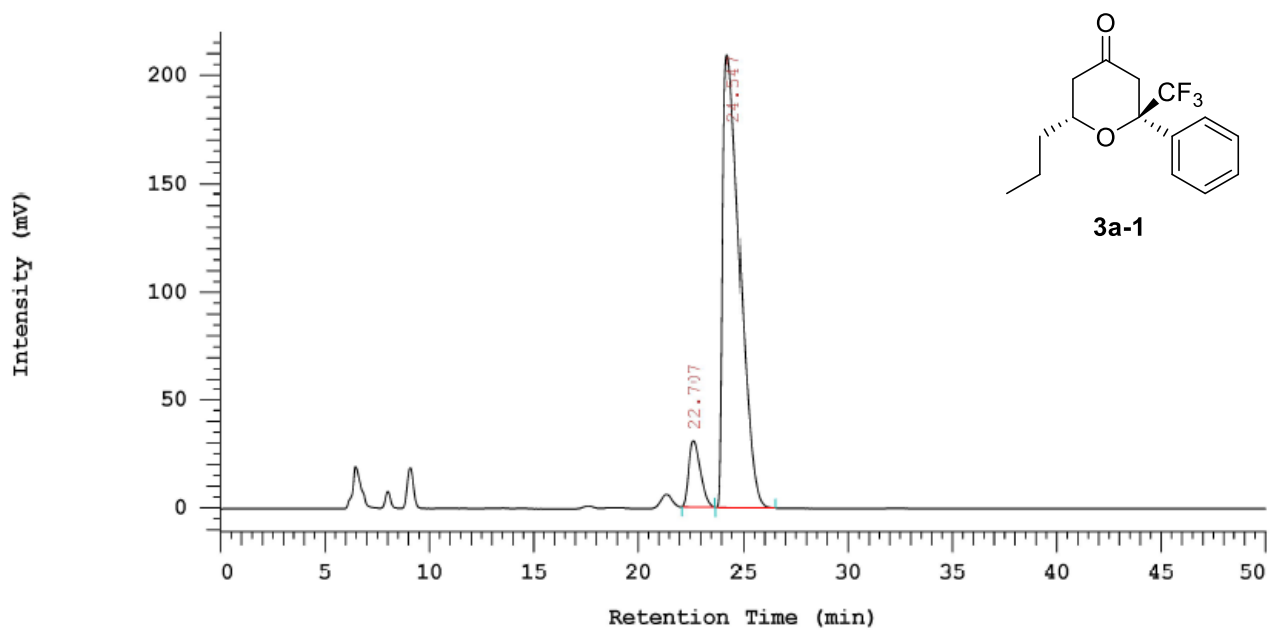
Current Data Parameters
NAME MH-318-MINOR
EXPNO 11
PROCNO 1

F2 - Acquisition Parameters
Date_ 20200229
Time 17.43 h
INSTRUM Avance
PROBHD Z151574_0027 (
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 1024
DS 4
SWH 30120.482 Hz
FIDRES 0.919204 Hz
AQ 1.0878977 sec
RG 101
DW 16.600 usec
DE 6.50 usec
TE 298.2 K
D1 2.0000000 sec
D11 0.03000000 sec
TD0 1
SFO1 125.7703643 MHz
NUC1 13C
P0 3.33 usec
P1 10.00 usec
PLW1 88.26000214 W
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2] waltz65
PCPD2 80.00 usec
PLW2 23.68499947 W
PLW12 0.23684999 W
PLW13 0.11913000 W

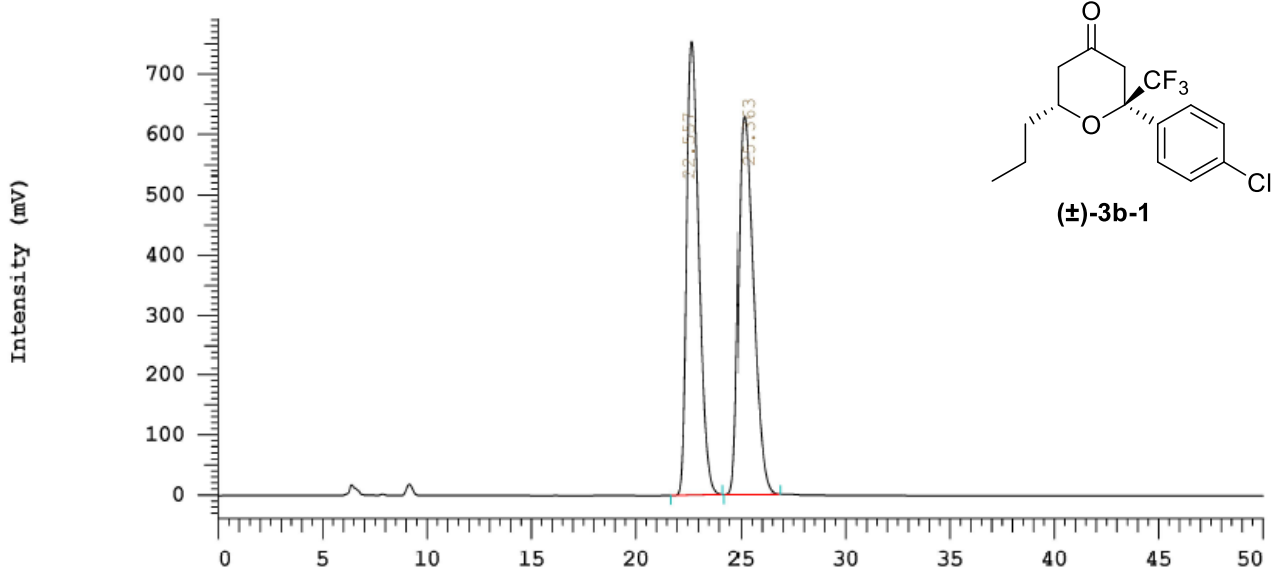
F2 - Processing parameters
SI 32768
SF 125.7577937 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



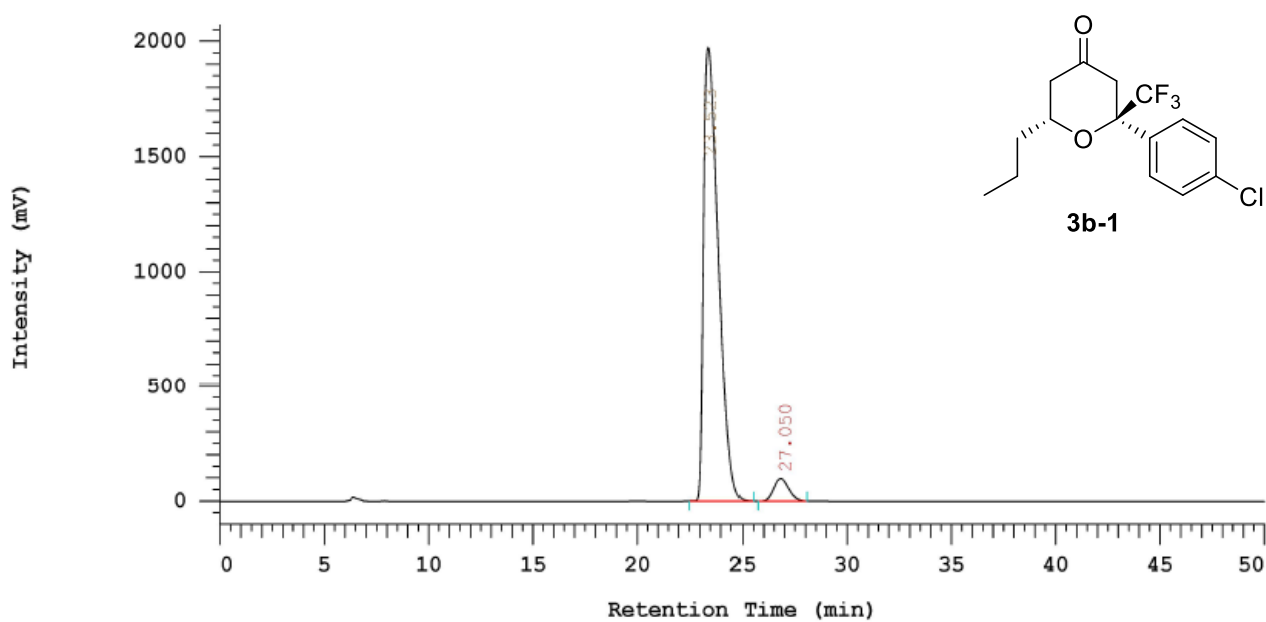
No.	RT	Area	Area %	BC
1	25.147	5910259	49.990	BB
2	27.133	5912606	50.010	BB
			11822865	100.000



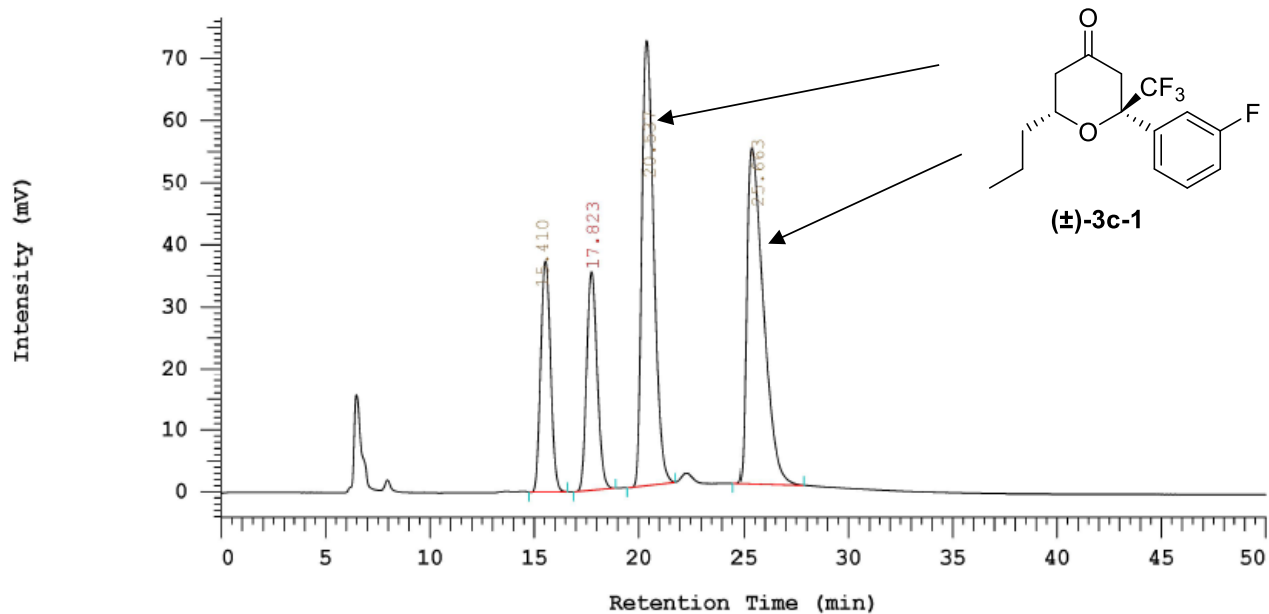
No.	RT	Area	Area %	BC
1	22.707	1163983	9.358	MC
2	24.547	11274919	90.642	MC
			12438902	100.000



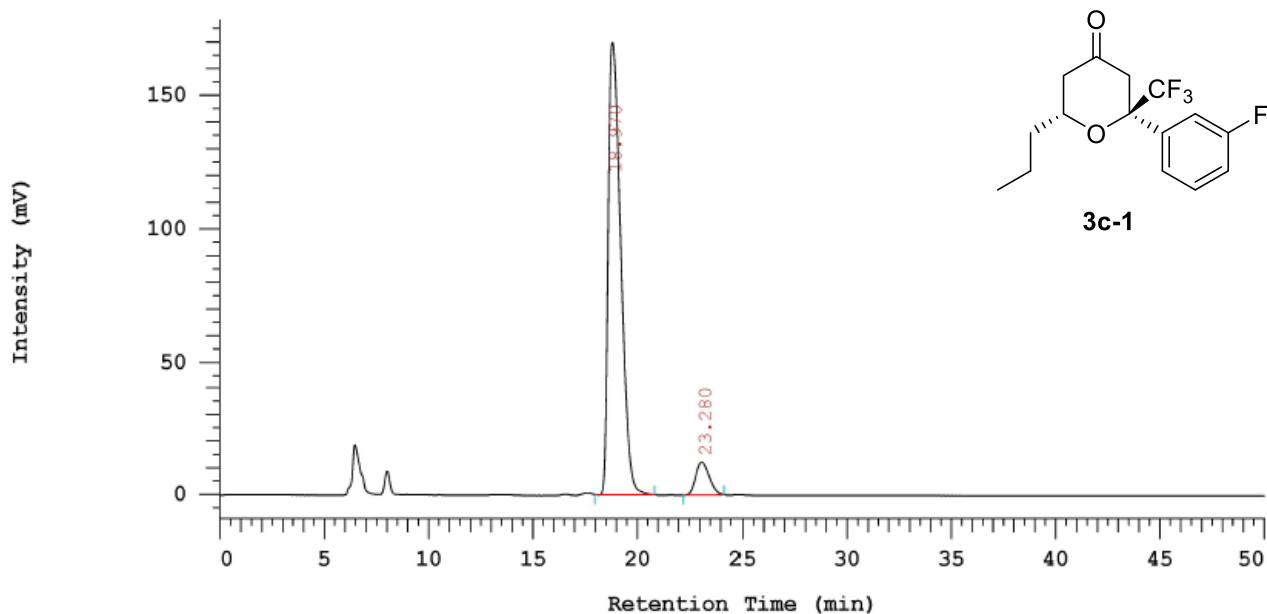
No.	RT	Area	Area %	BC
1	22.557	30426974	50.258	MC
2	25.363	30114621	49.742	MC
			60541595	100.000



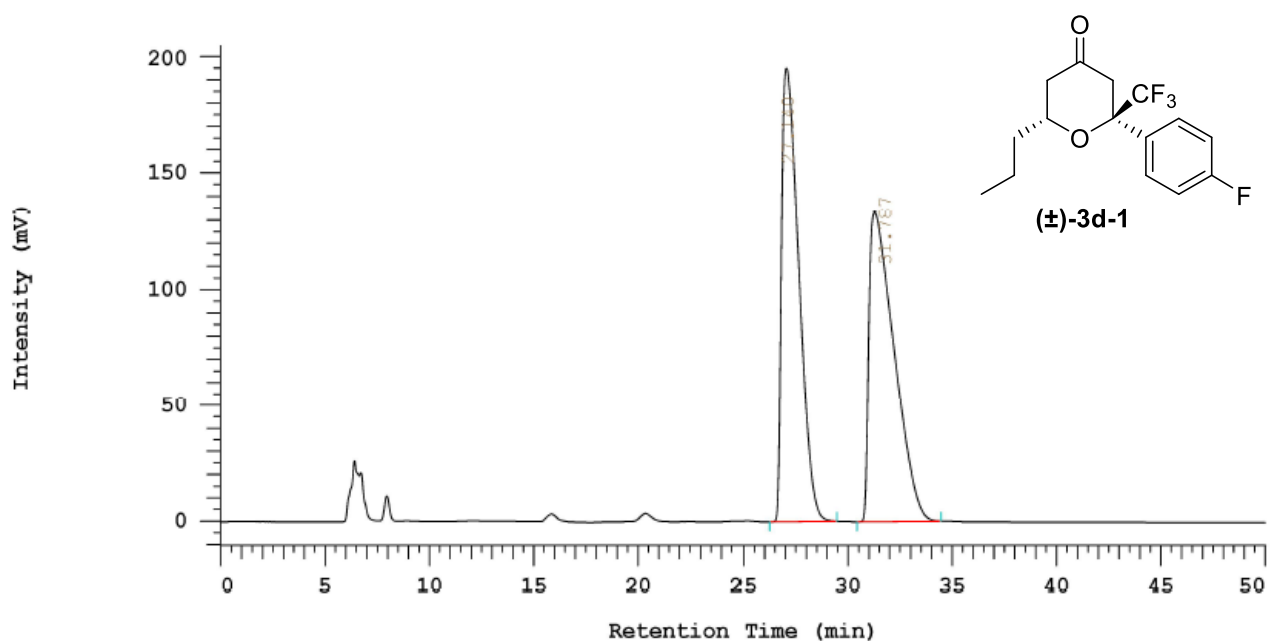
No.	RT	Area	Area %	BC
1	23.523	95405742	95.224	MC
2	27.050	4785074	4.776	MC
			1.001E+08	100.000



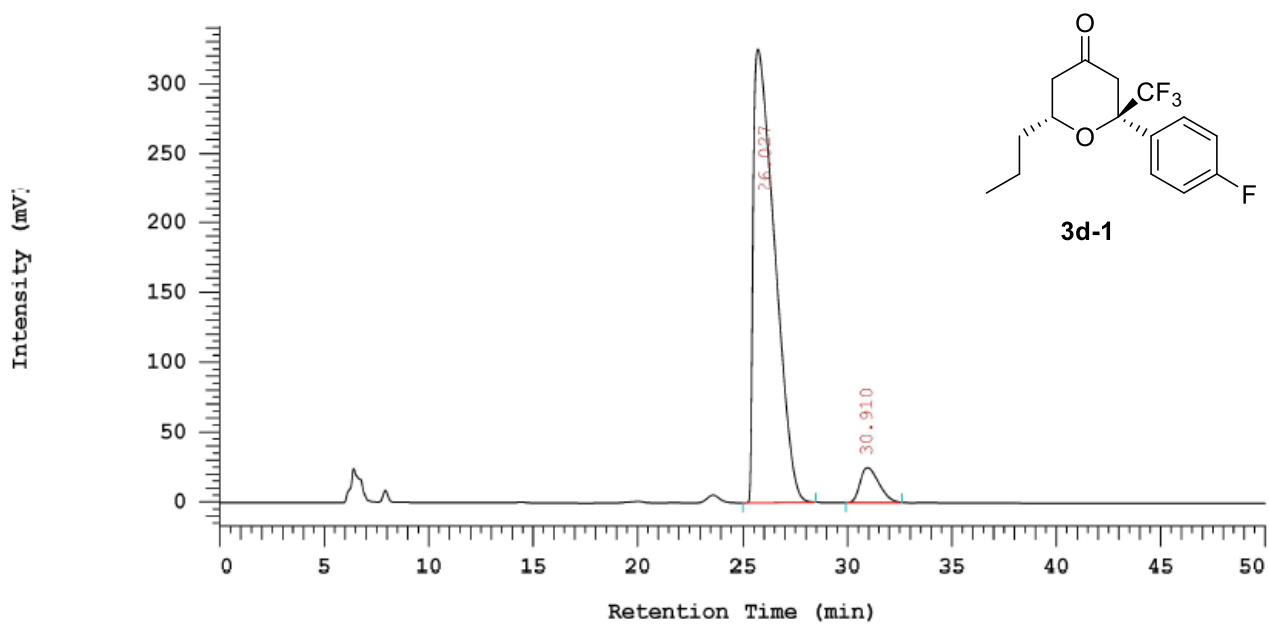
No.	RT	Area	Area %	BC
1	15.410	1202606	14.733	MC
2	17.823	1217127	14.910	MC
3	20.537	2820174	34.549	MC
4	25.663	2922999	35.808	MC
		8162906	100.000	



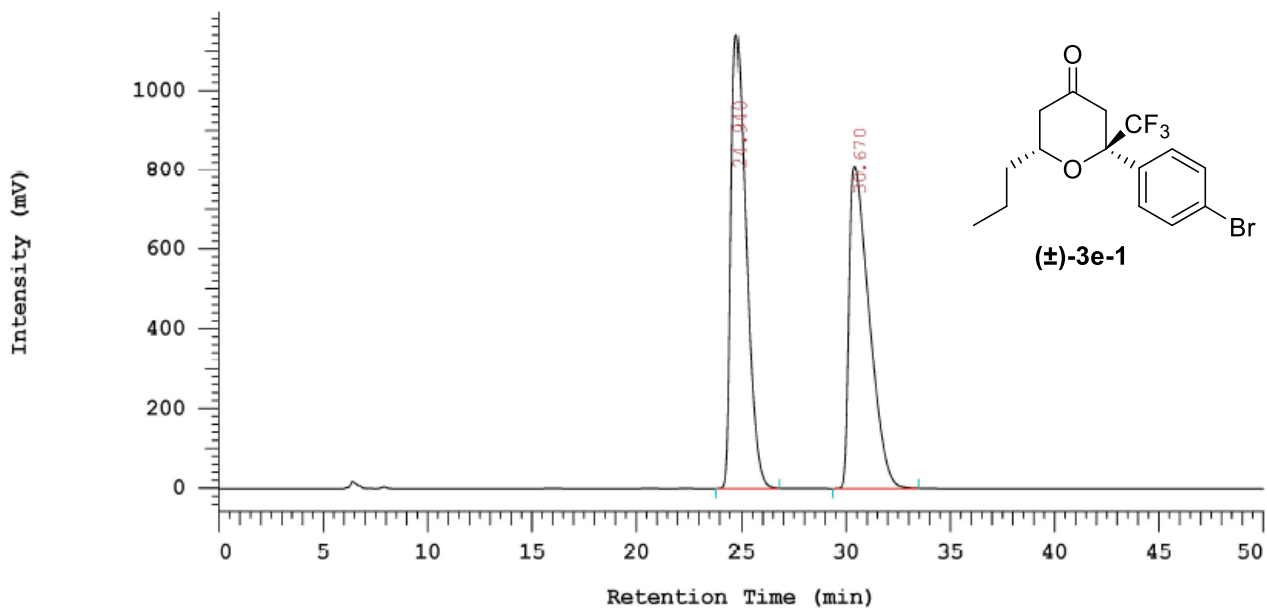
No.	RT	Area	Area %	BC
1	18.970	6988923	92.783	MC
2	23.280	543607	7.217	MC
		7532530	100.000	



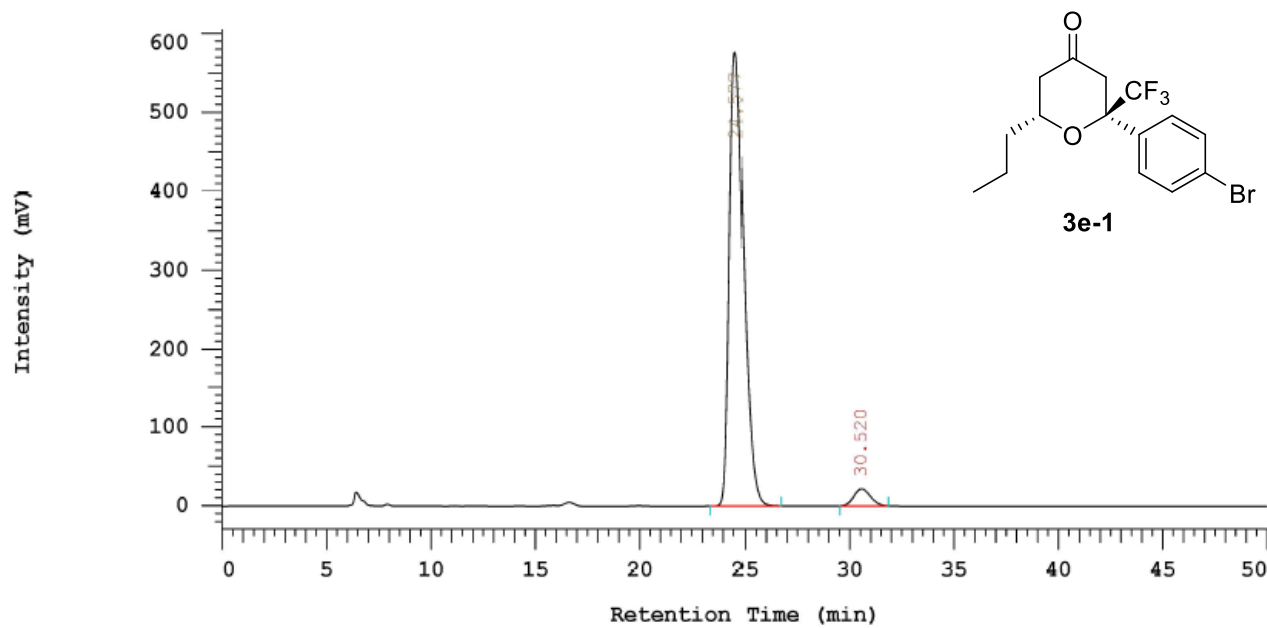
No.	RT	Area	Area %	BC
1	27.140	11102158	49.996	MC
2	31.787	11104156	50.004	MC
			22206314	100.000



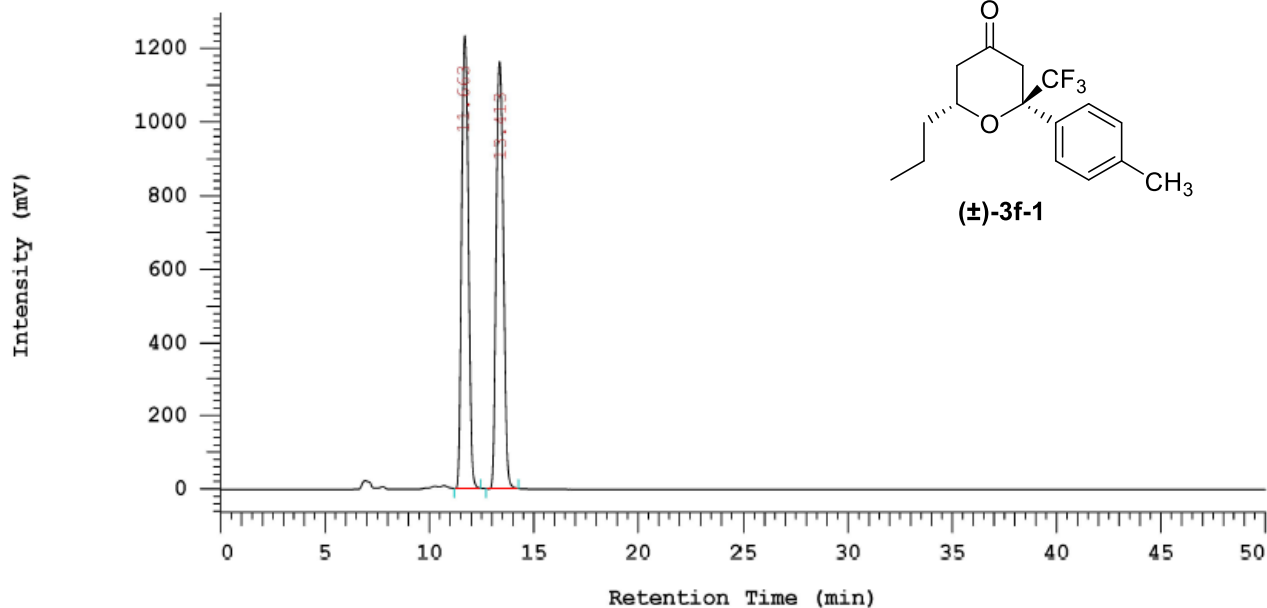
No.	RT	Area	Area %	BC
1	26.027	22810647	93.653	MC
2	30.910	1546000	6.347	MC
			24356647	100.000



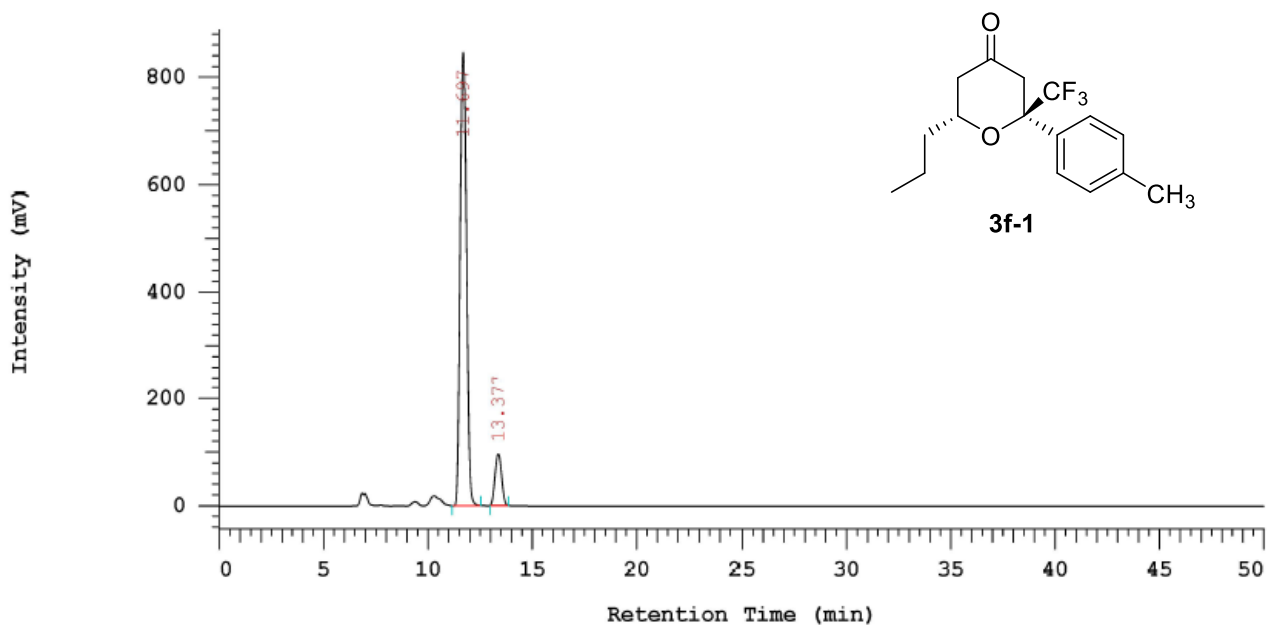
No.	RT	Area	Area %	BC
1	24.940	53695595	50.066	MC
2	30.670	53553623	49.934	MC
			1.072E+08	100.000



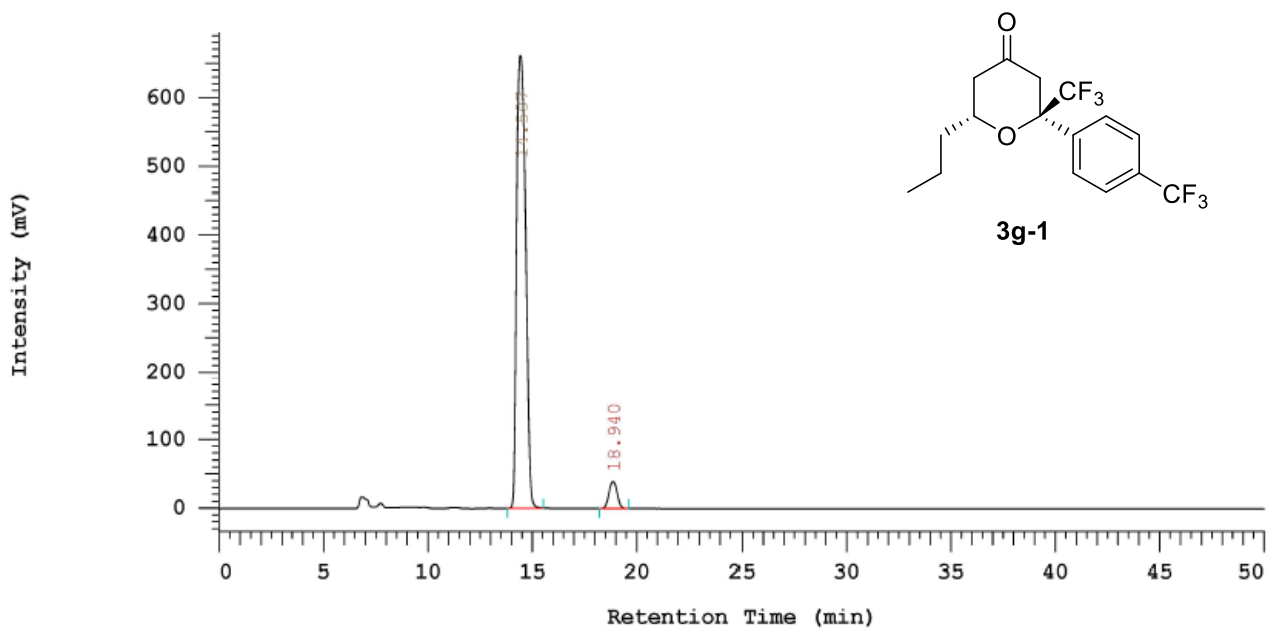
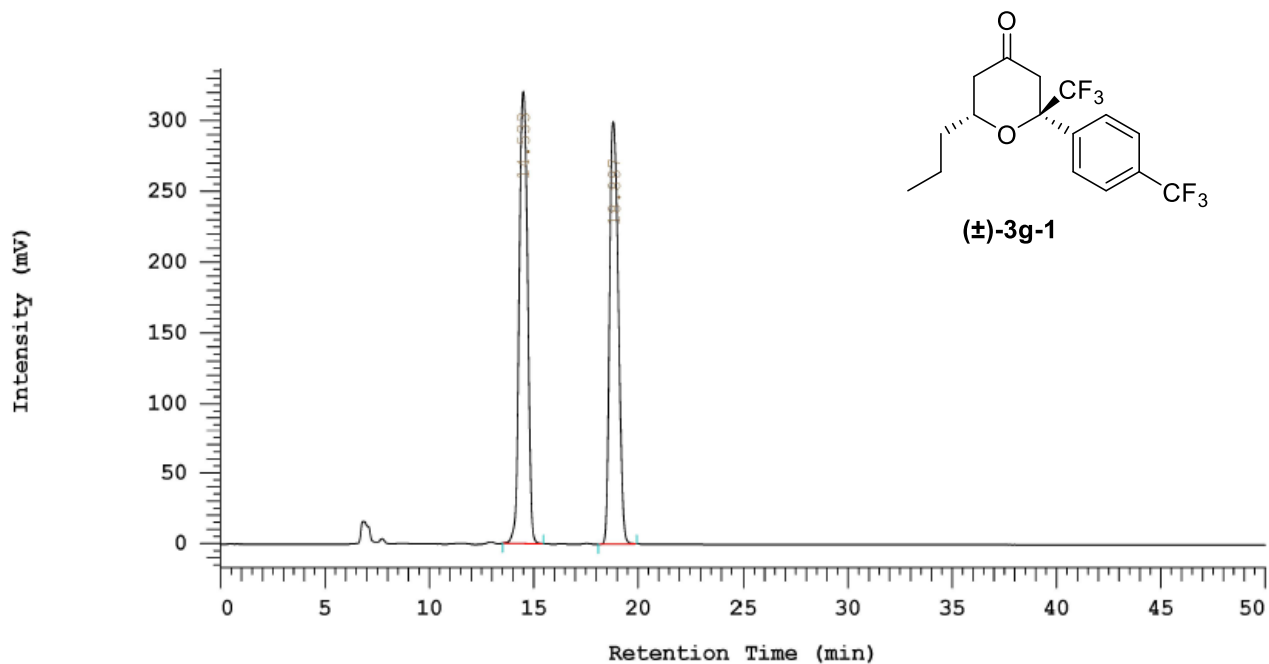
No.	RT	Area	Area %	BC
1	24.577	25800875	95.652	MC
2	30.520	1172833	4.348	MC
			26973708	100.000

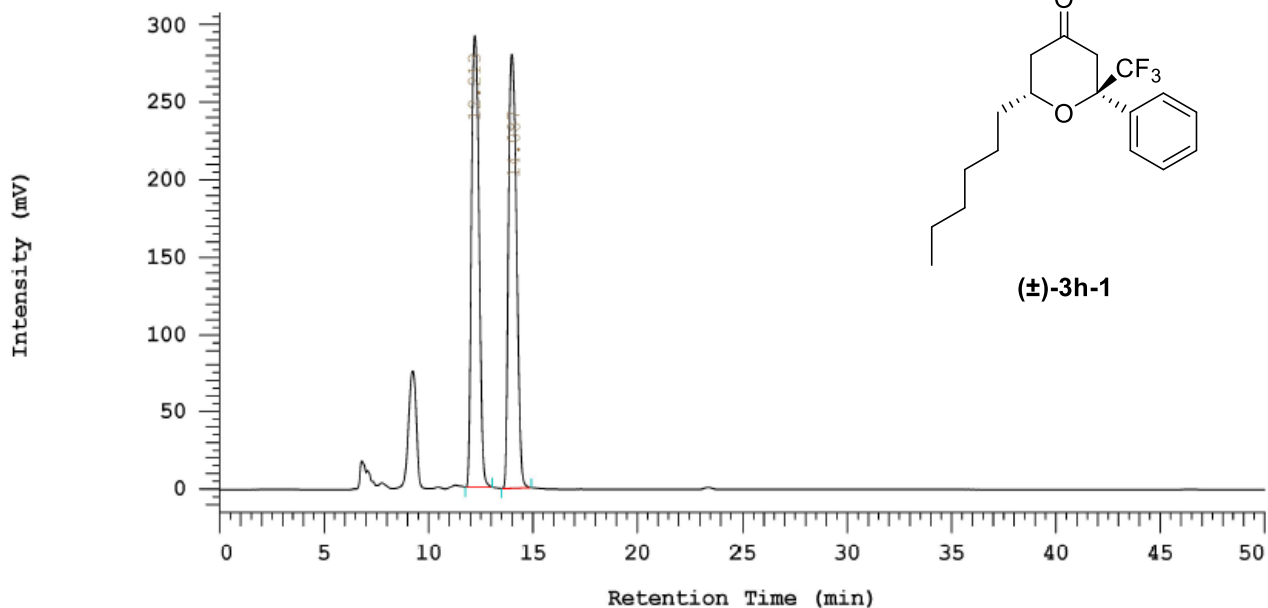


No.	RT	Area	Area %	BC
1	11.663	27110169	49.842	MC
2	13.413	27282472	50.158	MC
			100.000	

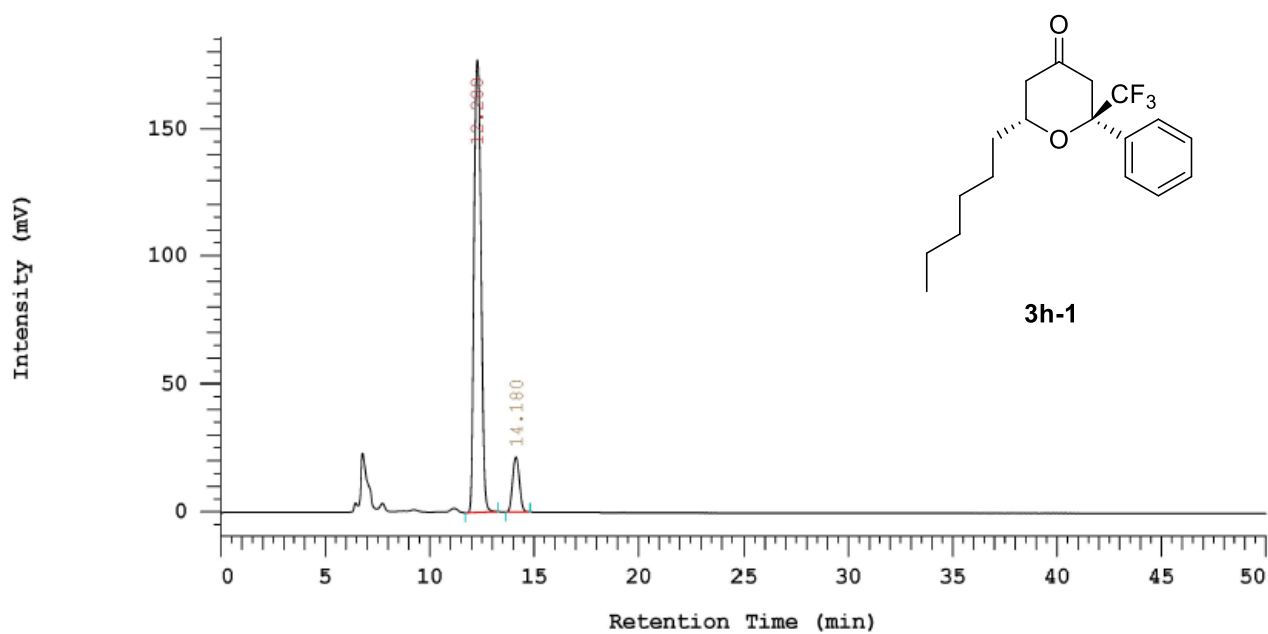


No.	RT	Area	Area %	BC
1	11.697	17530685	89.570	MC
2	13.377	2041395	10.430	MC
			100.000	

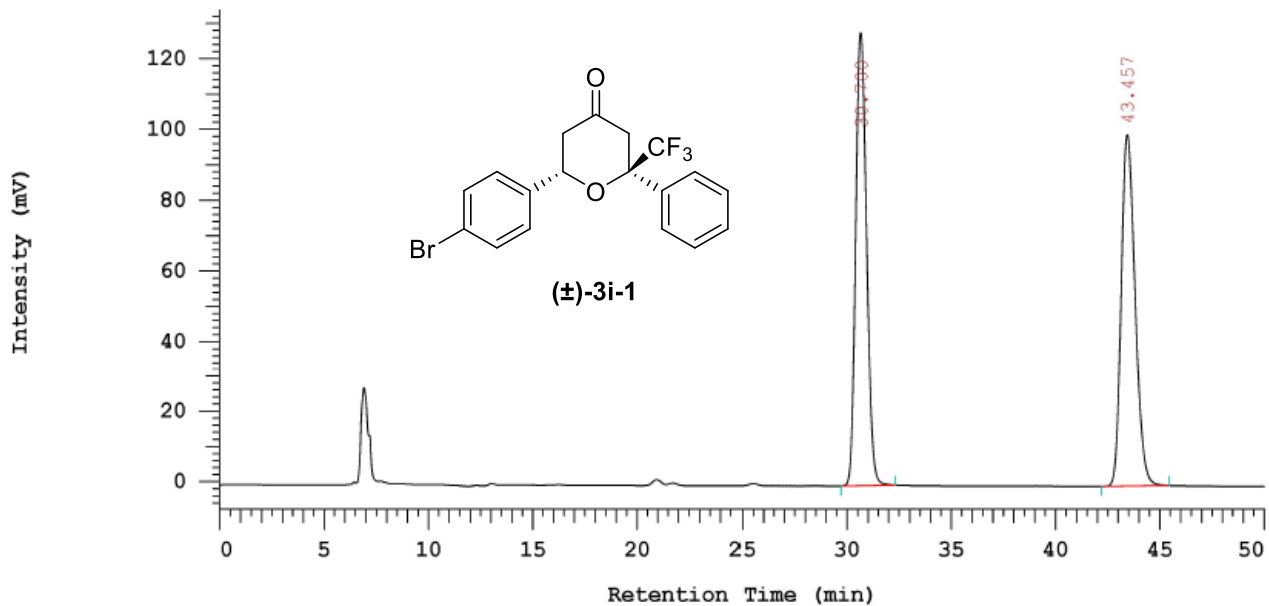




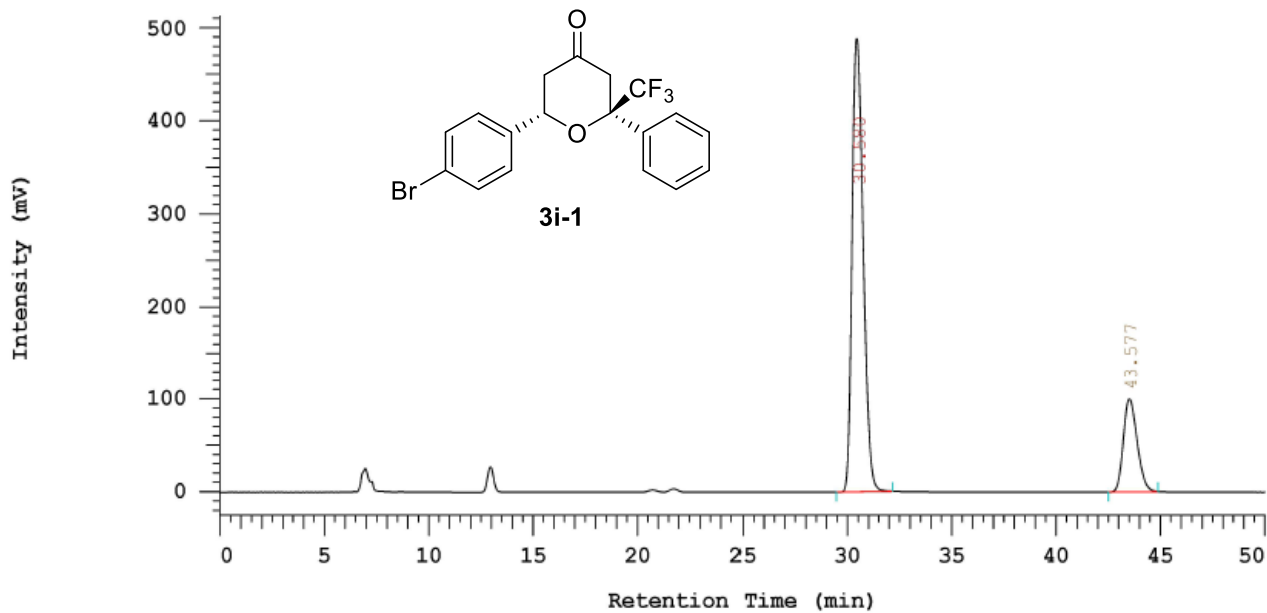
No.	RT	Area	Area %	BC
1	12.213	7178251	49.637	MC
2	14.087	7283346	50.363	MC
			14461597	100.000



No.	RT	Area	Area %	BC
1	12.280	3967642	89.323	MC
2	14.180	474237	10.677	MC
			4441879	100.000



No.	RT	Area	Area %	BC
1	30.700	4527337	50.011	MC
2	43.457	4525296	49.989	MC
		9052633	100.000	



No.	RT	Area	Area %	BC
1	30.580	17679033	79.620	MC
2	43.577	4525214	20.380	MC
		22204247	100.000	