Supporting Information

Metal Free C-H Functionalization of Pyrrolidine to Pyrrolinium-based Room Temperature Ionic Liquid Crystals

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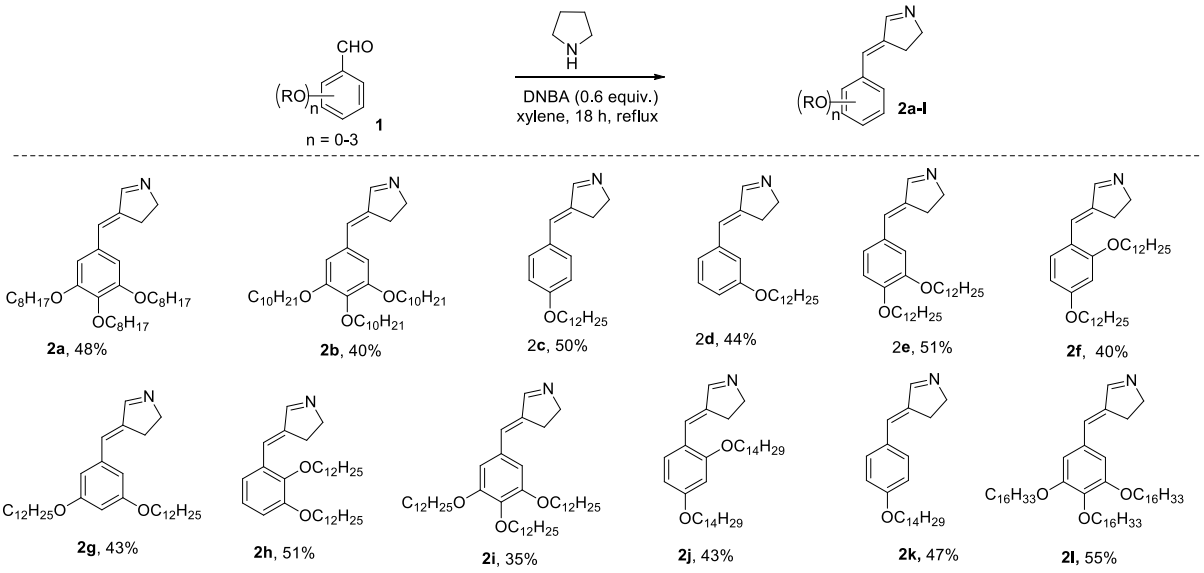
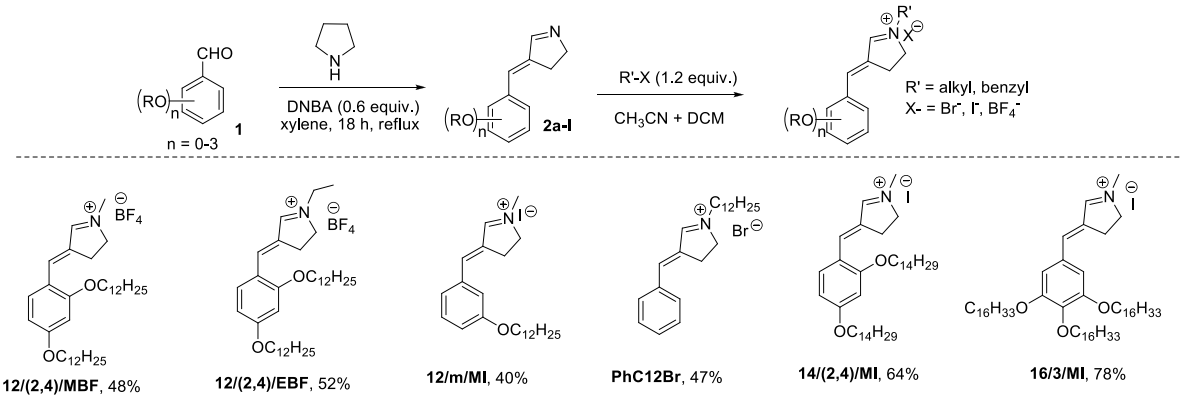


Scheme s1: Metal free direct C-H functionalization of pyrrolidine to pyrroline derivatives.



Scheme s2: Structures of additional pyrrolinium ions.

1. Mesomorphic behavior

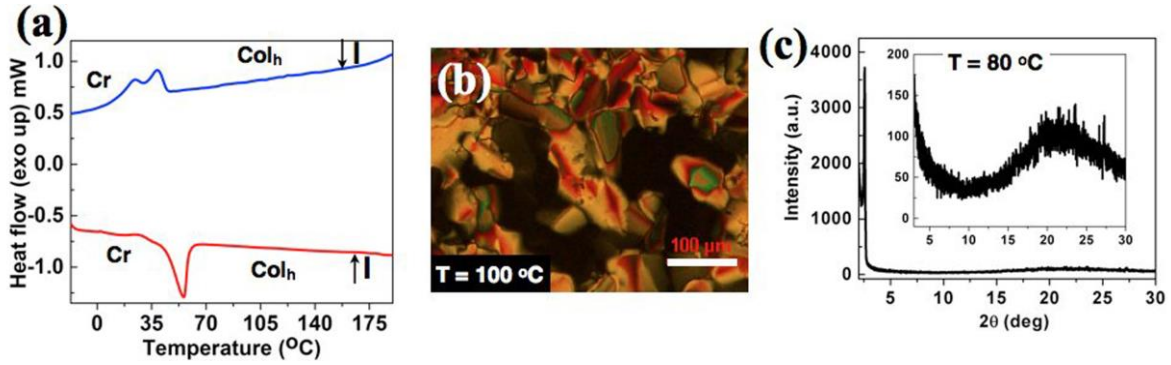


Figure S1. DSC scans of compound **10/3/MI** in the first cooling and second heating scans (a); POM image obtained for compound **10/3/MI** at 100 ^{o}C in Col$_h$ phase (b); XRD profile of compound **10/3/MI** depicting the intensity *vs* 2θ obtained in Col$_h$ phase at 80 ^{o}C (c). Scale bar corresponds to 100 µm.

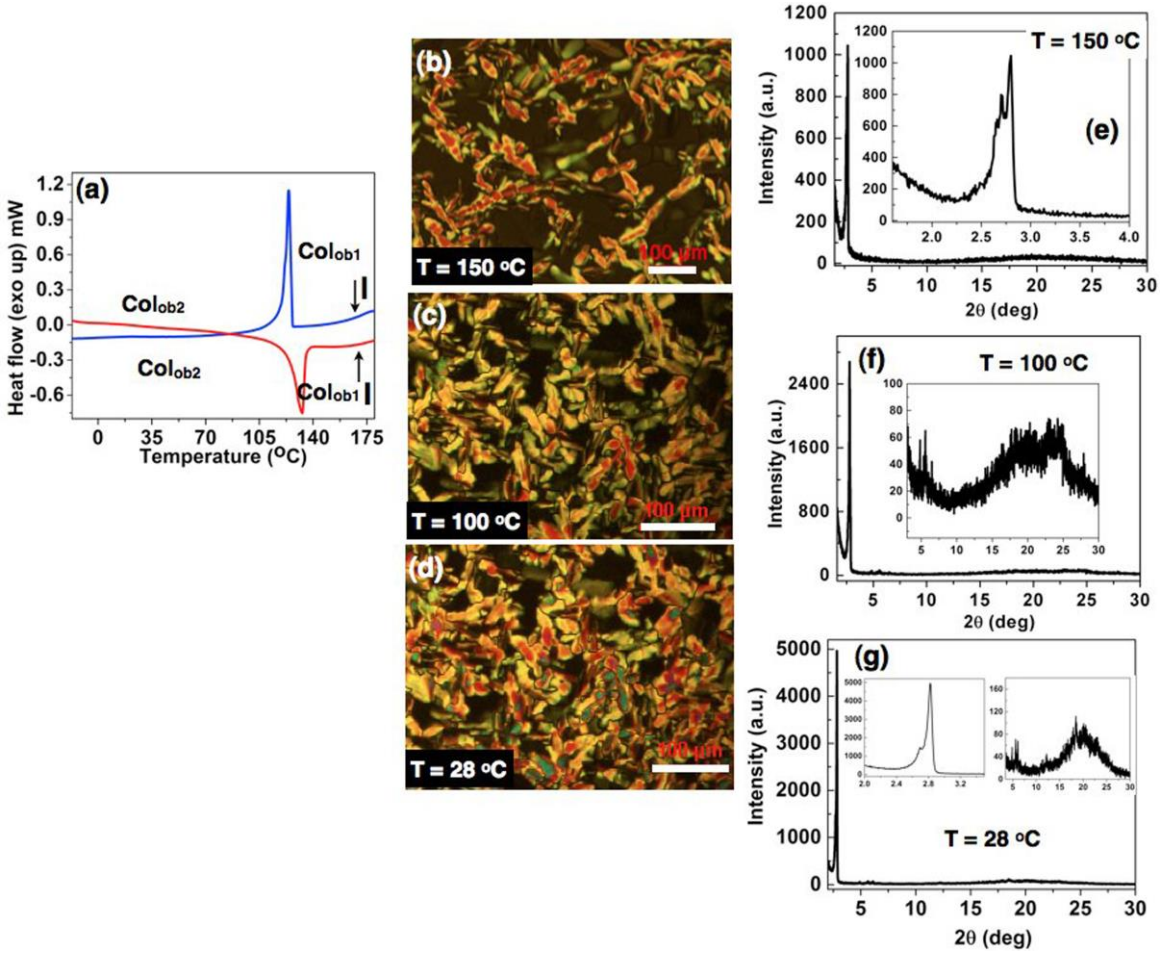


Figure S2. DSC scans of compound **8/3/MI** in the first cooling and second heating scans (a); POM image obtained for compound **8/3/MI** at 150 ^{o}C in Col$_{ob1}$ phase (b); at 100 ^{o}C in Col$_{ob2}$ phase (c); at 28 ^{o}C in Col$_{ob2}$ phase (d); XRD profile of compound **8/3/MI** depicting the intensity *vs* 2θ obtained in Col$_{ob1}$ phase at 150 ^{o}C (e); Col$_{ob2}$ phase at 100 ^{o}C (f) and Col$_{ob2}$ phase at 28 ^{o}C (g). Scale bar corresponds to 100 µm.

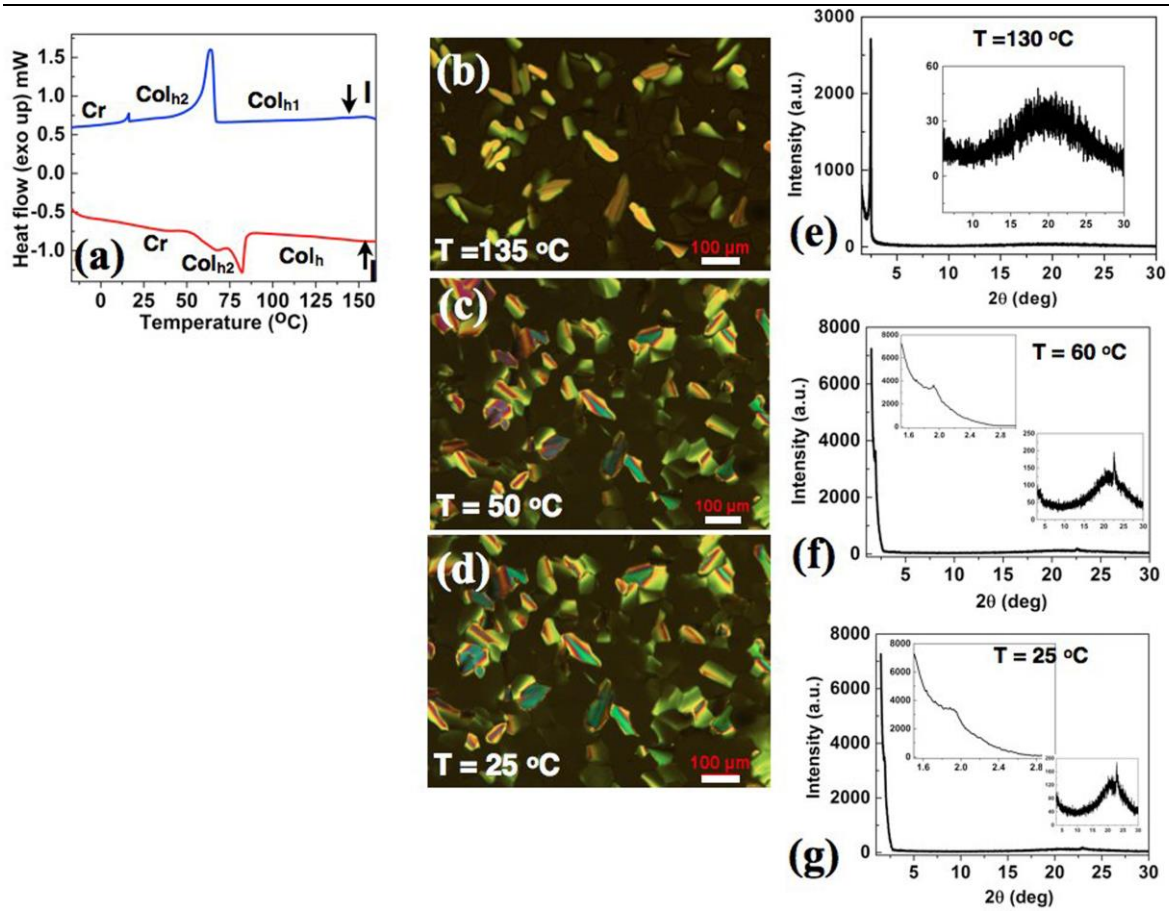


Figure S3. DSC scans of compound **12/3/EI** in the first cooling and second heating scans (a); POM images obtained for compound **12/3/EI** at 135 °C in Col_{h1} phase (b); at 50 °C in Col_{h2} phase (c); at 25 °C in Col_{h2} phase (d); XRD profiles of compound **12/3/EI** depicting the intensity *vs* 2θ obtained for Col_{h1} phase (e); for the Col_{h2} phase at 60 °C (e) and for the Col_{h2} phase at 25 °C (f). Scale bar corresponds to 100 µm.

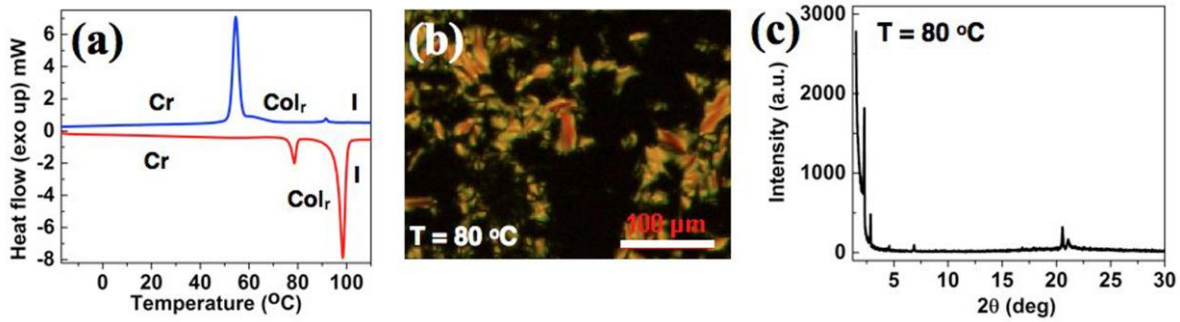


Figure S4. DSC scans of compound **12/3/C12I** in the first cooling and second heating scans (a); POM image obtained for compound **12/3/C12I** at 80 °C in Col_r phase (b); XRD profiles of compound **12/3/C12I** depicting the intensity *vs* 2θ obtained for Col_r phase at 80 °C (c). Scale bar corresponds to 100 µm.

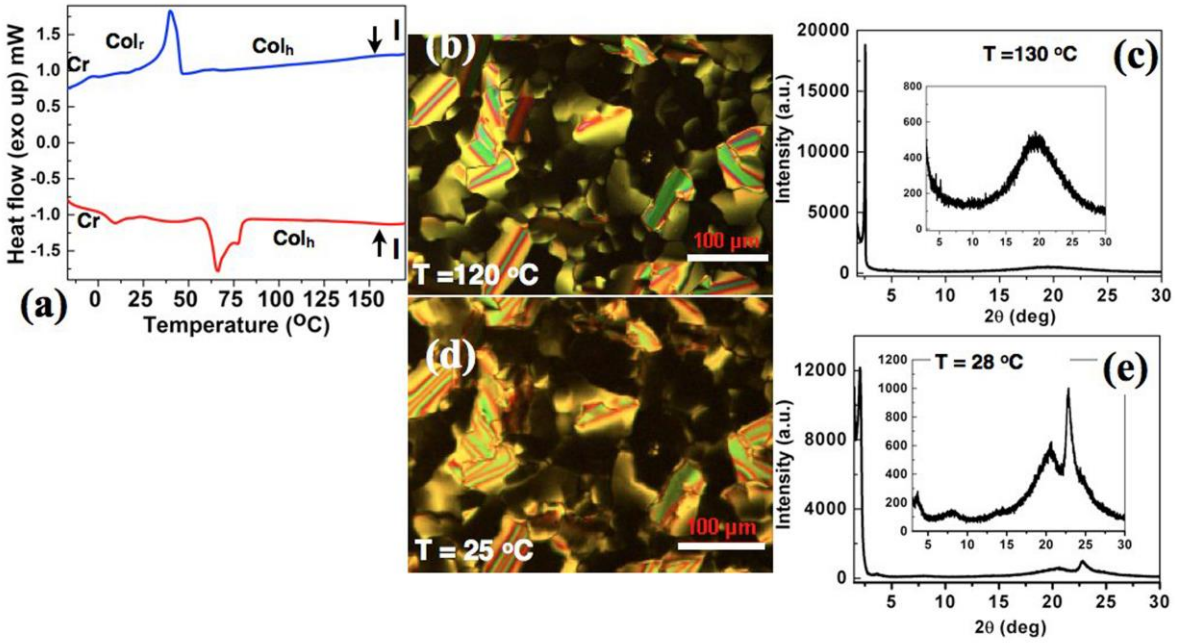


Figure S5. DSC scans of compound **12/3/MBF** in the first cooling and second heating scans (a); POM images obtained for compound **12/3/MBF** at 120 °C in Col_h phase (b); and at 20 °C in Col_r phase (c); XRD profiles of compound **12/3/MBF** depicting the intensity *vs* 2θ obtained for Col_h phase (d) and for the Col_r phase (e). Scale bar corresponds to 100 µm.

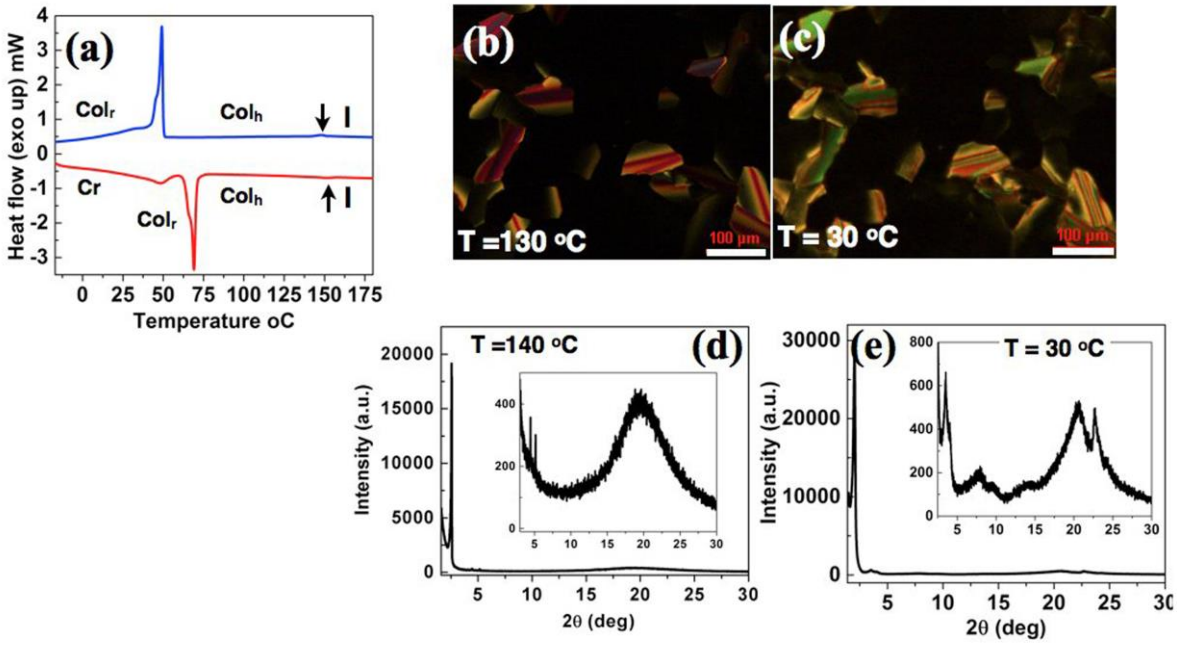


Figure S6. DSC scans of compound **12/3/EBF** in the first cooling and second heating scans (a); POM images obtained for compound **12/3/EBF** at 130 °C in Col_h phase (b); and at 30 °C in Col_r phase (c); XRD profiles of compound **12/3/EBF** depicting the intensity *vs* 2θ obtained for Col_h phase (d) and for the Col_r phase (e). Scale bar corresponds to 100 µm.

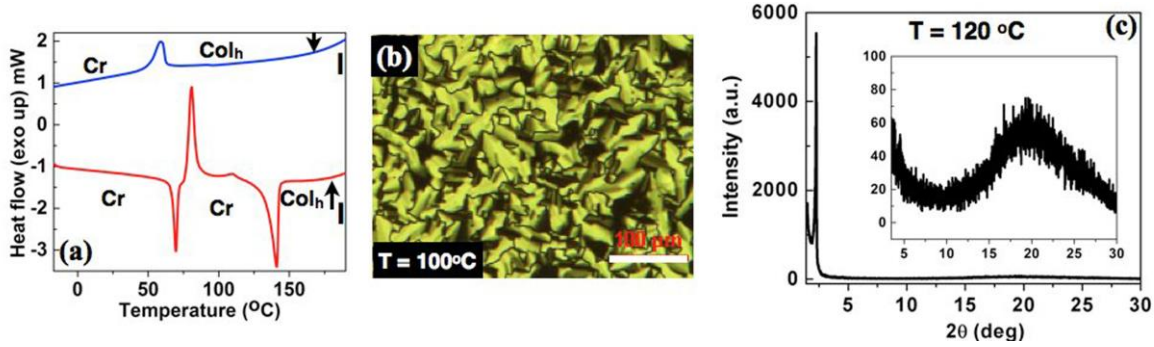


Figure S7. DSC scans of compound **12(3,4)/MI** in the first cooling and second heating scans (a); POM image obtained for the Sm phase of compound **12(3,4)/MI** (b); the XRD profiles of compound **12(3,4)/MI** depicting the intensity *vs* 2θ obtained for Col_h phase (c). Scale bar corresponds to 100 μm.

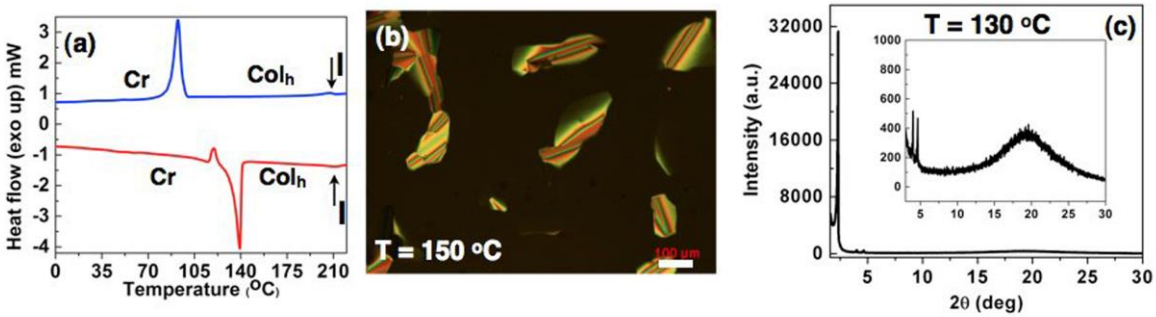


Figure S8. DSC scans of compound **12(3,4)/MBF** in the first cooling and second heating scans (a); POM image obtained for the Col_h phase of compound **12(3,4)/MBF** at 150 °C (b); the XRD profiles of compound **12(3,4)/MBF** depicting the intensity *vs* 2θ obtained for Col_h phase (c). Scale bar corresponds to 100 μm.

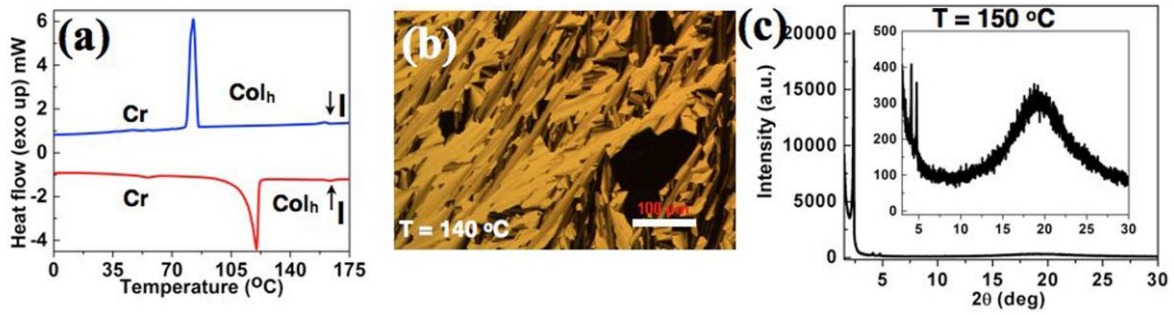


Figure S9. DSC scans of compound **12(3,4)/EBF** in the first cooling and second heating scans (a); POM image obtained for compound **12(3,4)/EBF** at 140 °C in Col_h phase (b); XRD profile of compound **12(3,4)/EBF** depicting the intensity *vs* 2θ obtained for Col_h phase at 150 °C (c). Scale bar corresponds to 100 μm.

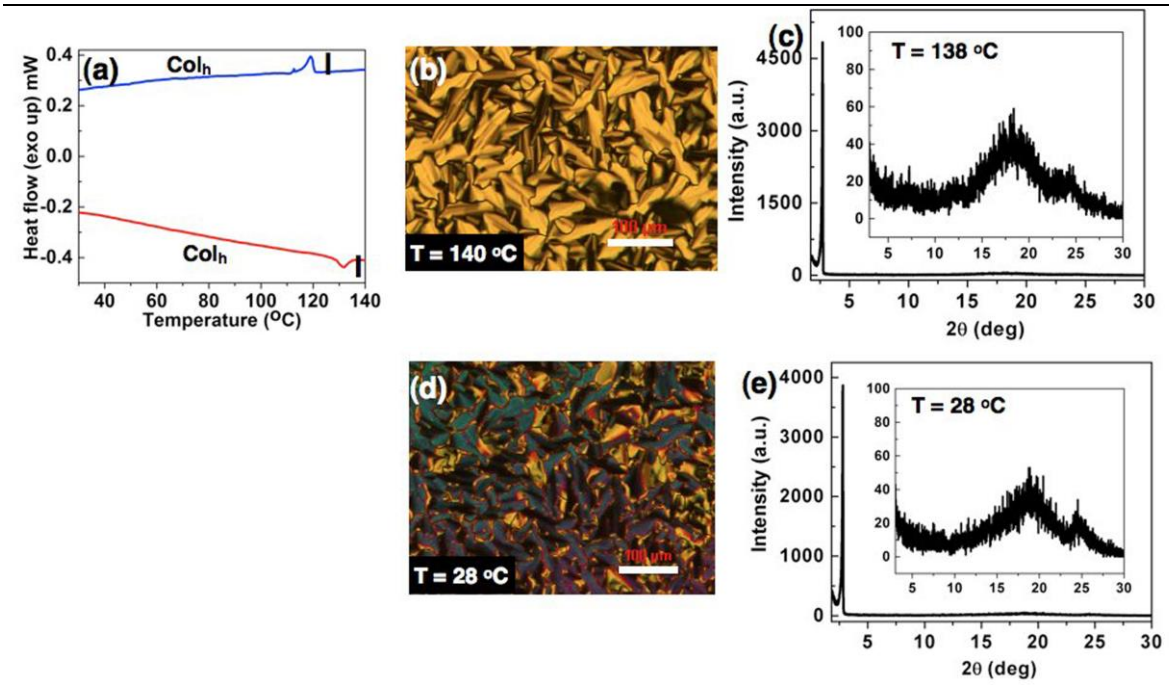


Figure S10. DSC scans of compound **12(3,5)/MI** in the first cooling and second heating scans (a); POM image obtained for compound **12(3,5)/MI** at 140 ^{o}C (b); at 28 ^{o}C in Col$_h$ phase (c); XRD profile of compound **12(3,5)/MI** depicting the intensity *vs* 2θ obtained for Col$_h$ phase at 138 ^{o}C (d) and at 28 ^{o}C (e). Scale bar corresponds to 100 μm.

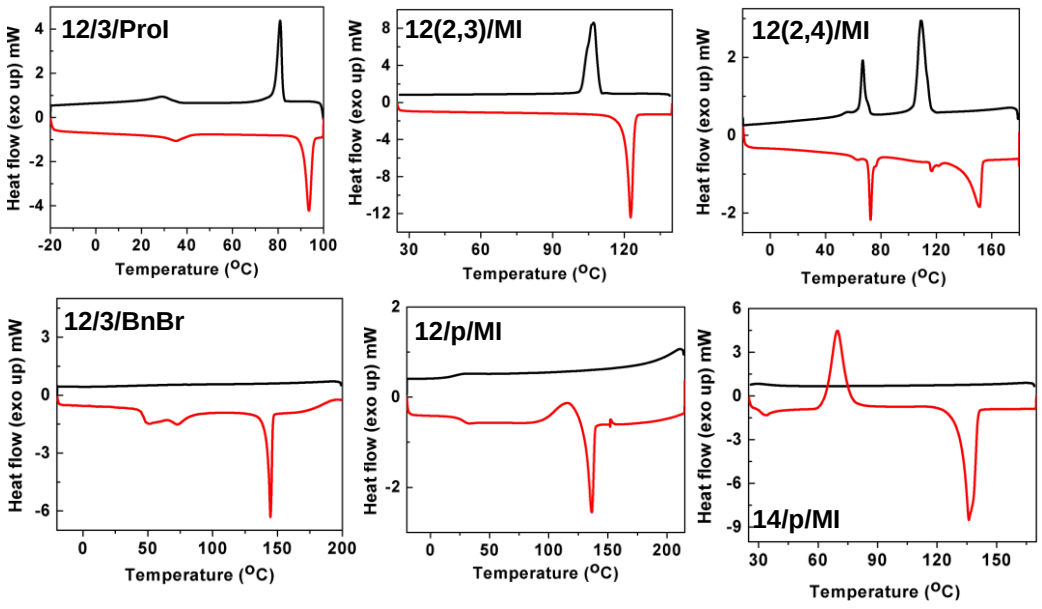


Figure S11. DSC scans of obtained for the crystalline compounds **12/3/ProI**, **12/3/BnBr**, **12(2,3)/MI, 12/p/MI, 12(2,4)/MI** and **14/p/MI** in the first cooling (black trace) and second heating (red trace) scans.

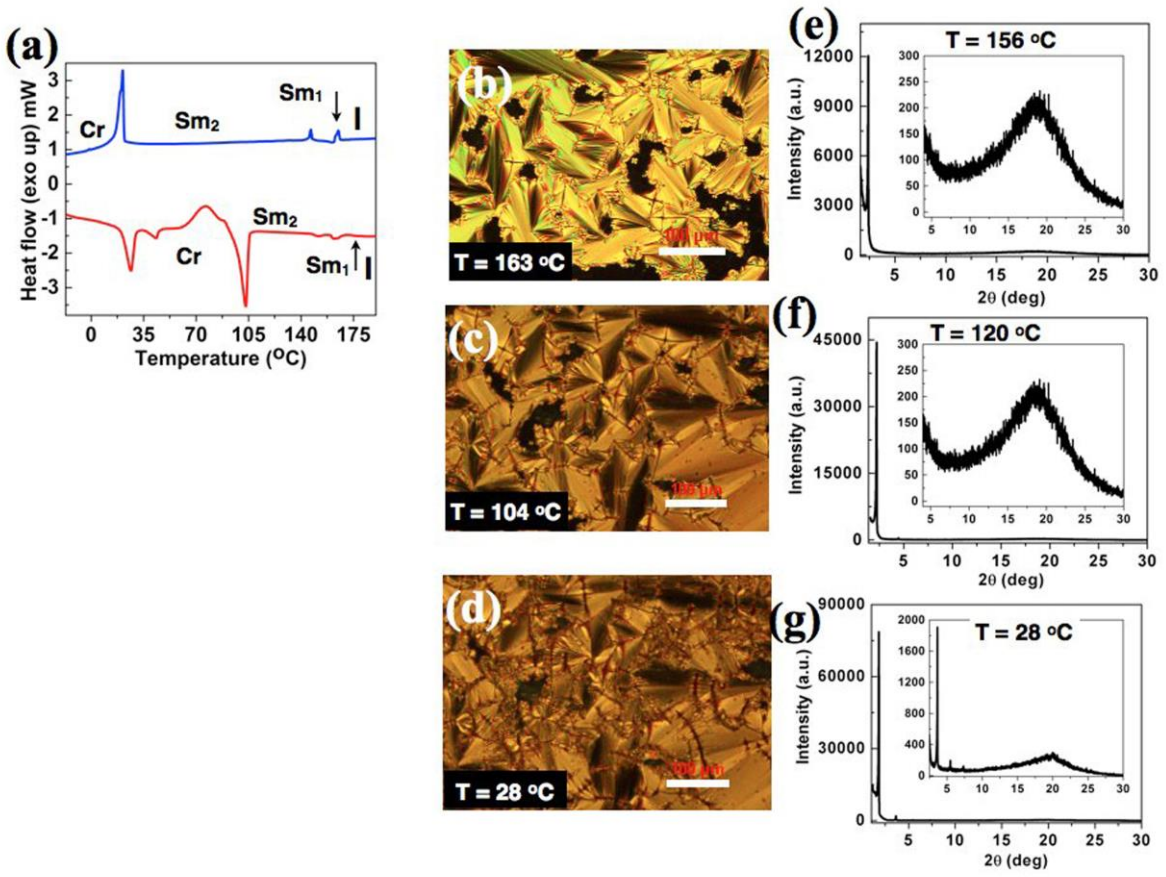


Figure S12. DSC scans of compound **12/p/EBF** in the first cooling and second heating scans (a); POM image obtained for compound **12/p/EBF** at 156 °C in Sm_1 phase (b); at 120 °C (c); at 28 °C in Sm_2 phase (d); XRD profile of compound **12/p/EBF** depicting the intensity *vs* 2θ obtained in Sm_1 phase at 156 °C (e); in Sm_1 phase at 120 °C (f) and in Sm_2 phase at 28 °C (g). Scale bar corresponds to 100 μm.

Table S1. Results of (*hkl*) indexation of the XRD profiles of ionic LCs at a given temperature (T) of the mesophases[a]

Entry/ Molecular length (Å)	Phase (T/°C)	d_{obs} (Å)	d_{cal} (Å)	Miller indices (*hk*)	Lattice parameters (Å)
12/3/MI 24.99	130 Col_h	35.08 4.37 (h_a)	35.08	10	a = 40.50; c = 4.37; S =1230.5; V = 5376.6; Z = 3.8.[b]
	28 Col_r	40.98 20.37 4.44 3.73	40.98 20.37	01 10	a = 40.98; b = 20.37; S = 834.8; c = 3.73; V = 3117.6; Z = 2.2
10/3/MI 22.6	80 Col_h	34.54 4.07 3.78 (h_a) 3.27 (h_c)	34.54	10	a = 39.88; S = 1193.1; c = 3.27; V = 3905.8; Z = 3.1.
8/3/MI 20	150 Col_{ob1}	33.35 31.82 18.38	33.35 31.82 18.39	01 10 11	a = 38.68; b = 40.55; γ = 55.3°

		15.87 4.17 (h_a)	15.91	20	S = 1290.3, V = 5383.8, Z = 4.7[b]
	100 Col_{ob2}	31.86 30.92 18.35 15.85 4.72 (h_a) 3.71 (h_c)	31.86 30.92 18.35 15.93	10 01 11 20	a = 35.94, b = 34.88, γ = 62.4° S = 1111.2, V = 5242.5, Z = 4.6
	28 Col_{ob2}	31.31 18.08 15.70 14.49 7.25 4.81 4.47	31.31 18.08 15.65 14.49 7.25	11 01 22 10 20	a = 31.91, b = 39.81, γ = 27° S = 576.92, V = 4185.5, Z = 3.7
12/3/EI 26.2	130 Col_{h1}	35.48 4.43 (h_a)	35.48	10	a = 40.97; S = 1259; c = 4.43; V = 5575.9; Z =3.9. [b]
	60 Col_{h2}	45.60 4.14 (h_a) 3.94 (h_c)	45.60	10	a = 52.7, S = 2401, c = 3.94; V = 9460, Z = 6.6
	25 Col_{h2}	46.02 4.10 (h_a) 3.87 (h_c)	46.02	10	a = 53.1; S = 2117.4; c = 3.87; V = 8192.4; Z = 5.7
12/3/C12I 38.4	80 Col_r	38.82 30.90 19.34 12.88 9.94 5.26 4.32 4.21 (h_a) 4.15 (h_c)	38.82 30.90 19.41 12.94 9.92 5.22 4.30 4.18	01 10 02 03 23 27 72 73	a = 30.9; b = 38.82; S = 1199.5; c = 4.32; V = 4977.8; Z = 3.0
12/3/MBF 25.1	130 Col_{h1}	34.38 19.78 17.10 4.51 (h_a)	34.38 19.85 17.19	10 11 20	a = 39.70; S = 1182.2; c = 4.51; V = 5327.3; Z = 4.0. [b]
	28 Col_r	43.0 23.99 11.06 4.32 3.89	43.01 23.99 11.55 3.64	01 10 21	a = 23.99; b = 43.01 c = 3.89; S = 1031.8; V = 4017.2; Z = 3.0
12/3/EBF 25.1	140 Col_h	34.52 19.86 17.17 4.51 (h_a)	34.52 19.93 17.26	10 11 20	a = 39.86; S = 1191.8; c = 4.51; V = 5375.7; Z = 3.9. [b]
	30 Col_r	43.46 25.03 11.28	43.46 25.03 10.87	01 11 04	a = 30.62; b = 43.46; S = 1330.7;

		9.34 4.3 (h_a) 3.91 (h_c)	9.24	32	c = 3.91; V = 5203.2; Z = 3.79.

[a]The length (L) of the molecule (estimated from the Chem 3D 17 molecular model software from Cambridge Soft). d_{obs}: spacing observed; d_{cal}: spacing calculated (deduced from the lattice parameters; a for Col_h phase, a and b for Col_r phase). The spacings marked h_a and h_c correspond to the diffused reflections in the wide-angle region arising from correlations between the alkyl chains and core regions, respectively. Z indicates the number of molecules per columnar slice of thickness h_c, estimated from the lattice area S and the volume V. [b]In the absence of the core–core peak, the spacing of the alkyl chain stacking (h_a) is used in these calculations.

Table S2. Results of (*hkl*) indexation of the XRD profiles of ionic LCs at a given temperature (T) of the mesophases[a]

Entry/ Molecular length (Å)	Phase (T/°C)	d_{obs} (Å)	d_{cal} (Å)	Miller indices (*hk*)	Lattice parameters (Å)
12(3,4)/MI 25.9	120 Col_h	39.13 19.46 4.41 (h_a)	39.13 19.57	10 20	a = 45.19, c = 4.41, S = 1531.4, V = 6749.4, Z = 7.5
12(3,4)/MBF 25.7	130 Col_h	38.30 22.03 19.06 4.56 (h_a)	38.30 22.11 19.15	10 11 20	a = 44.22; S = 1466.7; c = 4.56 V = 6689.3; Z = 6.4
12(3,4)/EBF 25.8	150 Col_h	37.42 21.54 18.63 4.59	37.43 21.61 18.71	10 11 20	a = 43.21; S = 1400.6; c = 4.59 V = 6437.1; Z = 6
12(3,5)/MI 24.7	138 Col_h	32.50 4.88 (h_a) 3.66 (h_c)	32.50	10	a = 37.57; S = 1056; c = 3.66 V = 3868.2; Z = 3.5
	28 Col_h	31.64 4.74 (h_a) 3.58 (h_c)	31.64	10	a = 36.58; S = 1001.1; c = 3.58 V = 3584.2; Z = 3.2
12/p/EBF 27	156 Sm_1	37.18 4.72 (h_a)			d/L = 1.4
	120 Sm_2 Ratio: 1:0.5	39.62 19.71 4.70 (h_a)			d/L = 1.5
	28 Sm_2	48.83 24.23 16.12			d/L = 1.8

	Ratio: 1:0.5: 0.33:0.25	12.07 4.64 (h_a) 4.44 (h_c)			
[a]The length (L) of the molecule (estimated from the Chem 3D 17 molecular model software from Cambridge Soft). d_{obs}: spacing observed; d_{cal}: spacing calculated (deduced from the lattice parameters; *a* for Col_h phase, *a* and *b* for Col_r phase). The spacings marked h_a and h_c correspond to the diffused reflections in the wide-angle region arising from correlations between the alkyl chains and core regions, respectively. *Z* indicates the number of molecules per columnar slice of thickness h_c, estimated from the lattice area *S* and the volume *V*. [b]In the absence of the core–core peak, the spacing of the alkyl chain stacking (h_a) is used in these calculations.					

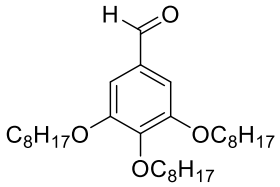
Experimental Section:

General: All reactions involving air- or moisture-sensitive reagents or intermediates were carried out in oven-dried glassware under an argon atmosphere. Dichloromethane (CH_2Cl_2) was freshly distilled from phosphorus (V) oxide (P_2O_5). Secondary amines were distilled from KOH and stored under argon. Commercial grade xylene, DMF, THF were distilled before use. All other solvents and reagents were purified according to standard procedures or were used as received from Aldrich, Acros, Merck and Spectrochem. ^{1}H, ^{13}CNMR spectroscopy: *Varian Mercury plus 400 MHz, Bruker 600 MHz* (at 298 K). Chemical shifts, δ (in ppm), are reported relative to TMS δ (1H) 0.0 ppm, δ (13C) 0.0 ppm which was used as the inner reference. Otherwise the solvents residual proton resonance and carbon resonance ($CHCl_3$, δ (1H) 7.26 ppm, δ (13C) 77.2 ppm; CD_3OD, (1H) 3.31 ppm, δ (13C) 49.0 ppm) were used for calibration. Column chromatography: Merck, Spectrochem or FischerScientific silica gel 60-120 and neutral Al_2O_3 under gravity. IR spectra were recorded on Perkin Elmer Instrument at normal temperature making KBr pellet grinding the sample with KBr (IR Grade). MS (ESI-HRMS): Mass spectra were recorded on an Agilent Accurate-MassQ-TOF LC/MS 6520 and peaks are given in *m/z* (% of basis peak). The mesogenic compounds were investigated for their liquid crystalline behavior (birefringence and fluidity) by employing a polarizing optical microscope (Nikon Eclipse LV100POL) equipped with a programmable hot stage (Mettler Toledo FP90). Clean glass slides and coverslips were employed for the polarizing optical microscopic observations. The transition temperatures and associated enthalpy changes were determined by differential scanning calorimeter (Mettler Toledo DSC1) under nitrogen atmosphere. Peak temperatures obtained in DSC corresponding to transitions were in agreement with the polarizing optical microscopic observations. The transition temperatures obtained from calorimetric measurements of the first heating and cooling cycles at a rate of 5 °C/min are tabulated. In the cases where the DSC signatures are not observed for the phase transitions, the transition temperatures have been taken from microscopic observations. Temperature dependent X-ray diffraction studies were carried on unaligned powder samples in

Lindemanncapillaries (1mm diameter) held in programmable hot stage and irradiated with CuKα radiation (λ = 1.5418 Å). The samples were filled in the capillary tube in their isotropic state and their both ends were flame sealed. The apparatus essentially consisted of a high resolution powder X-ray diffractometer (Xenocs) equipped with a focusing elliptical mirror and a high resolution fast detector. UV-Vis spectra were obtained by using Perkin-Elmer Lambda 750, UV/VIS/NIR spectrometer. Fluorescence emission spectra in solution state were recorded with Horiba Fluoromax-4 fluorescence spectrophotometer or *Perkin Elmer* LS 50B spectrometer.

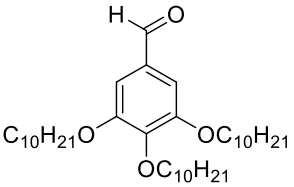
Experimental procedure:

3,4,5-Tris(octyloxy)benzaldehyde (1a):[1]



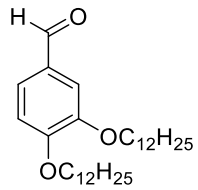
The compound was synthesized through a reported procedure. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.82 (s, 1H), 7.08 (s, 2H), 4.06 – 4.02 (m, 6H), 1.85 – 1.80 (m, 4H), 1.77 – 1.72 (m, 2H), 1.63 – 1.62 (m, 2H), 1.50 – 1.45 (m, 6H), 1.38 – 1.25 (m, 22H), 0.89 – 0.87 (m, 9H) ppm.

3,4,5-Tris(decyloxy)benzaldehyde (1b):[1]



The compound was synthesized in a known procedure used for **1a** preparation. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.83 (s, 1H), 7.08 (s, 2H), 4.07 – 4.02 (m, 6H), 1.85 – 1.81 (m, 4H), 1.78 – 1.73 (m, 2H), 1.51 – 1.46 (m, 6H), 1.37 – 1.27 (m, 36H), 0.89 – 0.87 (m, 9H) ppm.

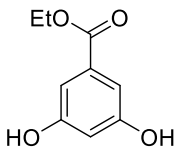
3,4-Bis(dodecyloxy)benzaldehyde (1e):[2]



The compound was synthesized in a known procedure used for **1a** preparation. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.82 (s, 1H), 7.41 – 7.39 (m, 2H), 6.94 (d, *J* = 7.8 Hz, 1H), 4.08 – 4.03 (m, 4H), 1.88 – 1.83 (m, 4H), 1.49 – 1.45 (m, 4H), 1.38 – 1.26 (m, 32H), 0.88 (t, *J* = 7.2 Hz, 6H) ppm.

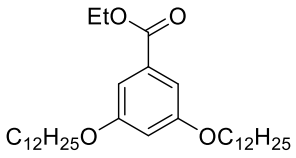
Ethyl 3,5-dihydroxybenzoate:[3]

Conc. H_2SO_4 was added drop wise to a solution of 3,5-dihydroxybenzoic acid (10.0 g, 64.93 mmol) soluble in EtOH (50 mL) and was refluxed for 24 hours. After completion of reaction (checked by TLC), the reaction was stopped, EtOH was evaporated under reduced pressure, the reaction mixture was quenched with saturated $NaHCO_3$ solution, diluted with ethyl acetate, washed with brine, dried over anhydrous Na_2SO_4, and concentrated in *vaccuo* to get crude product which was recrystallized from EtOH to give desired product (1.06 g, 90%). ^{1}H NMR (600 MHz, MeOD) δ = 6.934 (s, 1H), 6.930 (s, 1H), 6.48 – 6.47 (m, 1H), 4.29 (q, *J* = 7.2 Hz, 2H), 1.34 (t, *J* = 7.2 Hz, 3H) ppm. ^{13}C NMR (151 MHz, MeOD) δ = 168.2, 159.6, 133.3, 108.7, 108.1, 62.0, 14.5 ppm.



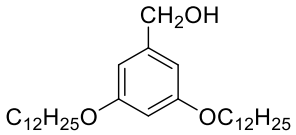
Ethyl 3,5-bis(dodecyloxy)benzoate:[4]

A mixture of ethyl 3,5-dihydroxybenzoate (6.50 g, 12.50 mmol), anhydrous K_2CO_3 (7.59 g, 55.01 mmol), *n*-bromododecane (6.60 mL, 27.61 mmol) and KI (41 mg, 0.25 mmol) were taken in dry DMF (10 mL) and heated at 80 °C for 24 hours under nitrogen atmosphere. Then the reaction mixture was poured into ice-water and extracted with CH_2Cl_2. The combined extract was washed with water and brine, dried over anhydrous Na_2SO_4 and concentrated. The crude product was purified by column chromatography on neutral alumina. Elution with hexanes followed by (ethyl acetate:hexane, 1:15) yielded the desired product (5.50 g, 85%). ^{1}H NMR (600 MHz, $CDCl_3$) δ = 7.164 (s, 1H), 7.160 (s, 1H), 6.63 – 6.62 (m, 1H), 4.35 (q, *J* = 7.2 Hz, 2H), 3.97 – 3.95 (m, 4H), 1.79 – 1.75 (m, 4H), 1.47 – 1.42 (m, 4H), 1.39 – 1.26 (m, 35H), 0.89 – 0.87 (m, 6H) ppm.



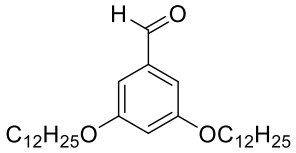
3,5-Bis(dodecyloxy)phenyl)methanol:[5]

To a stirred suspension of lithium aluminium hydride (LAH) (0.38 g, 9.97 mmol) in dry THF (15 mL) under nitrogen atmosphere, ethyl 3,5-bis(dodecyloxy)benzoate (3.44 g, 6.65 mmol) soluble in THF (5 mL) was added drop wise at 0 °C. Then the reaction mixture was allowed to reach room temperature and stirred for 2 hours. Excess LAH present was quenched by the addition of moist sodium sulphate. Reaction mixture was extracted with EtOAc (5 X 50 mL). The combined extracts were washed with water, dried over anhydrous Na_2SO_4 and concentrated in *vaccuo*. Purification was done by column chromatography over silica gel (60-120) with (ethyl acetate:hexane, 1:10) as eluent to give the desired product (2.50 g, 79%). ^{1}H NMR (600 MHz, $CDCl_3$) δ = 6.471 (s, 1H), 6.468 (s, 1H), 6.36 – 6.35 (m, 1H), 4.56 (s, 2H), 3.91 (t, *J* = 6.6 Hz, 4H), 2.15 (br. s, 1H), 1.77 – 1.72 (m, 4H), 1.45 – 1.40 (m, 4H), 1.33 – 1.26 (m, 32H), 0.89 – 0.87 (m, 6H) ppm.

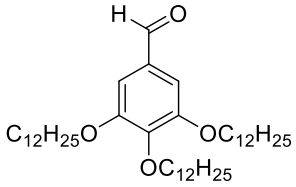


3,5-Bis(dodecyloxy)benzaldehyde (1g):[6]

An appropriate (3,5-bis(dodecyloxy)phenyl)methanol (2.17 g, 4.56 mmol) was taken in DCM (15 mL). To this pyridiniumchlorochromate (1.08 g, 5.02 mmol) adsorbed over equal amount of silica gel is added and stirred at room temperature for 1 hour. The reaction mixture was filtered over celite bed and concentrated to get the crude product, which was further purified by column chromatography on silica gel (60-120) with (ethyl acetate:hexane, 1:10) as eluent to give **1g** (1.72 g, 80%). ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.87 (s, 1H), 6.974 – 6.971 (m, 2H), 6.69 (s, 1H), 3.97 (t, *J* = 6.6 Hz, 4H), 1.80 – 1.76 (m, 4H), 1.47 – 1.42 (m, 4H), 1.35 – 1.27 (m, 32H), 0.89 – 0.87 (m, 6H) ppm.

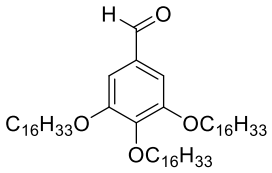


3,4,5-Tris(dodecyloxy)benzaldehyde (1i):[1]



The compound was synthesized in same procedure used for **1a** preparation. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.82 (s, 1H), 7.08 (s, 2H), 4.06 – 4.02 (m, 6H), 1.85 – 1.80 (m, 4H), 1.77 – 1.72 (m, 2H), 1.50 – 1.45 (m, 6H), 1.35 – 1.26 (m, 48H), 0.89 – 0.86 (m, 9H) ppm.

3,4,5-Tris(hexadecyloxy)benzaldehyde (1l):[7]

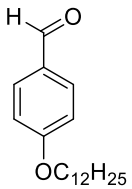


The compound was synthesized in a known procedure used for **1a** preparation. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.83 (s, 1H), 7.08 (s, 2H), 4.06 – 4.02 (m, 6H), 1.85 – 1.80 (m, 4H), 1.76 – 1.72 (m, 2H), 1.50 – 1.45 (m, 6H), 1.35 – 1.26 (m, 72H), 0.89 – 0.87 (m, 9H).

General procedure for the alkylation of aldehydes (GP I**):**

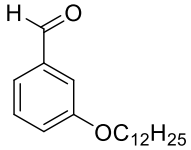
In a clean round bottom flask, a mixture of hydroxy benzaldehyde (3.38 – 10.86 mmol, 1.0 equiv.), anhydrous K_2CO_3 (7.22 – 47.83 mmol, 2.2 equiv.), alkyl bromide (3.94 – 26.06 mmol, 1.2 equiv.) and KI (0.07 – 0.22 mmol, 0.02 equiv.) was taken in dry DMF (4 – 10 mL) and heated at 85-90 °C for 24 hours under nitrogen atmosphere. Then the reaction mixture was poured into ice water and extracted with ethyl acetate (3 X 30 mL). The organic layer was washed with brine (40 mL), dried over anhydrous Na_2SO_4 and concentrated in *vacuo*. The crude product was purified by column chromatography on silica.

4-(Dodecyloxy)benzaldehyde (1c):[8]



According to GP I, 4-hydroxybenzaldehyde (1.0 g, 8.20 mmol), anhydrous K_2CO_3 (2.49 g, 18.04 mmol), *n*-bromododecane (2.30 mL, 9.60 mmol) and KI (27 mg, 0.16 mmol) were taken in 10 mL dry DMF and heated at 80 °C for 24 hours under nitrogen atmosphere and then SiO_2-column chromatography (ethyl acetate:hexane, 1:30) gave product **1c** as white solid (2.2 g, 93%). ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.86 (s, 1H), 7.81 (d, *J* = 8.4 Hz, 2H), 6.98 (d, *J* = 8.4 Hz, 2H), 4.02 (t, *J* = 6.6 Hz, 2H), 1.83 – 1.78 (m, 2H), 1.48 – 1.26 (m, 18H), 0.89 – 0.87 (m, 3H) ppm.

3-(Dodecyloxy)benzaldehyde (1d):



According to GP I, 3-hydroxybenzaldehyde (1.0 g, 8.20 mmol), anhydrous K_2CO_3 (2.49 g, 18.04 mmol), *n*-bromododecane (2.30 mL, 9.61 mmol) and KI (27 mg, 0.16 mmol) was taken in 10 mL dry DMF and heated at 80 °C for 24 hours under nitrogen atmosphere and then SiO_2-column chromatography (ethyl acetate:hexane, 1:30) gave product **1d** as colourless liquid (2.19 g, 92%). FTIR (KBr): ῡ = 3383, 2925, 2854, 2723, 1702, 1599, 1585, 1486, 1467, 1454, 1386, 1321, 1287, 1263, 1168, 1148, 1078, 1033, 869, 787, 757, 683, 648, 605, 442 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.96 (s, 1H), 7.43 – 7.40 (m,

2H), 7.38 – 7.37 (m, 1H), 7.17 – 7.15 (m, 1H), 4.00 (t, *J* = 6.6 Hz, 2H), 1.82 – 1.77 (m, 2H), 1.48 – 1.43 (m, 2H), 1.37 – 1.26 (m, 16H), 0.88 (t, *J* = 7.2 Hz, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ = 192.3, 159.9, 137.9, 130.1, 123.4, 122.1, 112.9, 68.4, 32.1, 29.84, 29.81, 29.77, 29.7, 29.54, 29.53, 29.3, 26.2, 22.9, 14.3 ppm. HRMS (ESI): Exact mass calculated for $C_{19}H_{31}O_2^+$ ([M+H]+): 291.2319; Found: 291.2312.

2,4-Bis(dodecyloxy)benzaldehyde (1f):

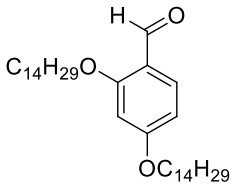
According to GP I, 2,4-dihydroxybenzaldehyde (1.5 g, 10.86 mmol), anhydrous K_2CO_3 (6.6 g, 47.83 mmol), *n*-bromododecane (6.2 mL, 26.06 mmol) and KI (36 mg, 0.22 mmol) was taken in 10 mL dry DMF and heated at 80 °C for 24 hours under nitrogen atmosphere and then SiO_2-column chromatography (ethyl acetate:hexane, 1:30) gave product **1f** as white solid (4.0 g, 77%). Mp 40–45 °C. FTIR (KBr): ῡ = 3434, 2957, 2919, 2850, 1693, 1584, 1483, 1464, 1397, 1383, 131305, 1269, 1251, 1208, 1171, 1079, 1059, 1046, 1024, 994, 893, 791, 729, 719, 674, 546 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 10.45 (s, 1H), 7.39 (d, *J* = 7.8 Hz, 1H), 7.12 – 7.06 (m, 2H), 4.13 (t, *J* = 6.6 Hz, 2H), 4.00 (t, *J* = 6.0 Hz, 2H), 1.86 – 1.83 (m, 2H), 1.81 – 1.77 (m, 2H), 1.52 – 1.44 (m, 4H), 1.37 – 1.27 (m, 32H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 190.6, 152.8, 152.5, 130.3, 123.9, 119.3, 119.1, 75.2, 69.3, 32.1, 30.3, 29.9, 29.85, 29.82, 29.7, 29.6, 29.5, 26.4, 26.2, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{31}H_{55}O_3^+$ ([M+H]+): 475.4146; Found: 475.4167.

2,3-Bis(dodecyloxy)benzaldehyde (1h):

According to GP I, 2,3-dihydroxybenzaldehyde (1.0 g, 7.25 mmol), anhydrous K_2CO_3 (4.4 g, 31.88 mmol), *n*-bromododecane (4.1 mL, 17.40 mmol) and (24 mg, 0.14 mmol) was taken in 7 mL dry DMF and heated at 80 °C for 24 hours under nitrogen atmosphere and then SiO_2-column chromatography (ethyl acetate:hexane, 1:30) gave product **1h** as white solid (2.5 g, 72%). Mp 40–45 °C. FTIR (KBr): ῡ = 3434, 2954, 2917, 2851, 1668, 1644, 1601, 1503, 1466, 1435, 1330, 1261, 1190, 1100, 1066, 1017, 997, 958, 835, 823, 806, 719, 676, 601, 552, 500, 461 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 10.32 (s, 1H), 7.79 (d, *J* = 9.0 Hz, 1H), 6.50 (d, *J* = 8.4 Hz, 1H), 6.42 – 6.41 (m, 1H), 4.03 – 3.99 (m, 4H), 1.85 – 1.82 (m, 2H), 1.80 – 1.76 (m, 2H), 1.50 – 1.43 (m, 4H), 1.35 – 1.26 (m, 32H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 188.4, 165.9, 163.5, 130.3, 119.1, 106.4, 99.1, 68.6, 32.1, 29.84, 29.82, 29.77, 29.7, 29.5, 29.3, 29.2, 26.24, 26.16, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{31}H_{55}O_3^+$ ([M+H]+): 475.4146; Found: 475.4145.

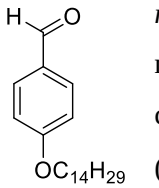
2,4-Bis(tetradecyloxy)benzaldehyde (1j):

According to GP I, 2,4-dihydroxybenzaldehyde (0.5 g, 3.62 mmol), anhydrous K_2CO_3 (2.2 g, 15.90 mmol), *n*-bromotetradecane (2.36 mL, 7.96 mmol) and KI (12 mg, 0.07 mmol) was taken in 5 mL dry DMF and heated at 80 °C for 24 hours under nitrogen atmosphere and then SiO_2-column chromatography (ethyl acetate:hexane, 1:30) gave product **1j** as white solid (1.35 g, 70%). Mp 38–43 °C. FTIR (KBr): ῡ = 3430, 2953, 2918, 2849, 1678, 1607, 1572, 1494, 1467, 1439, 1402, 1386, 1311, 1297, 1265, 1192, 1114, 1021, 861, 822, 792, 718, 644, 609, 575, 464 cm^{-1}. ^1H NMR (400 MHz, $CDCl_3$) δ = 10.33 (s, 1H), 7.79 (d, *J* = 8.8 Hz, 1H), 6.52 – 6.50 (m, 1H), 6.42 (d, *J* = 2.0 Hz, 1H), 4.04 – 3.99 (m, 4H), 1.87 – 1.75 (m, 4H), 1.51 – 1.43 (m, 4H), 1.36 – 1.26 (m, 40H), 0.90 – 0.86 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 188.6, 166.0, 163.5, 130.3, 119.1, 106.4, 99.1, 68.7, 68.6, 32.1, 29.90, 29.88, 29.86, 29.80, 29.76 (2C), 29.6, 29.55, 29.54, 29.3, 29.2, 26.25, 26.17, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{35}H_{63}O_3^+$ ([M+H]+): 531.4772; Found: 531.4757.



4-(Tetradecyloxy)benzaldehyde (1k):

According to GP I, 4-hydroxybenzaldehyde (0.4 g, 3.28 mmol), anhydrous K_2CO_3 (1.0 g, 7.22 mmol), *n*-bromotetradecane (1.18 mL, 3.94 mmol) and KI (11 mg, 0.66 mmol) was taken in 4 mL dry DMF and heated at 80 °C for 24 hours under nitrogen atmosphere and then SiO_2-column chromatography (ethyl acetate:hexane, 1:30) gave product **1k** as white solid (1.03 gm, 90%). Mp 45–50 °C. FTIR (KBr): ῡ = 3366, 2918, 2849, 2733, 1693, 1603, 1578, 1509, 1469, 1428, 1396, 1386, 1311, 1255, 1216, 1161, 1109, 1039, 1024, 1013, 858, 832, 720, 651, 640, 616, 514 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 9.88 (s, 1H), 7.83 (d, J = 8.4 Hz, 2H), 6.99 (d, J = 8.4 Hz, 2H), 4.04 (t, J = 6.6 Hz, 2H), 3.75 – 3.70 (m, 2H), 1.85 – 1.78 (m, 2H), 1.49 – 1.44 (m, 2H), 1.37 – 1.23 (m, 18H), 0.90 – 0.86 (m, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 191.0, 164.4, 132.1, 129.9, 114.9, 68.6, 32.1, 29.88, 29.86, 29.84, 29.77, 29.7, 29.55, 29.53, 29.2, 26.1, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{21}H_{35}O_2^+$ ([M+H]+): 319.2632; Found: 319.2645.



General procedure for the synthesis of *β*-substituted secondary cyclic imines (GP II):

3,5-Dinitrobenzoic acid (0.28 – 4.37 mmol, 0.6 equiv.) was added to a solution of aldehydes (0.44 – 6.72 mmol, 1 equiv.) and pyrrolidine (1.74 – 28.89 mmol, 4 equiv.) in *m*-xylene (5 – 10 mL) and the mixture was refluxed for 18 hours. After disappearance of starting materials (indicated by TLC), the reaction was quenched by addition of saturated sodium bicarbonate solution (50 mL). The mixture was extracted with dichloromethane (3 X 40 mL). The combined organic layers were washed (brine), dried (Na_2SO_4) and concentrated under reduced pressure. The crude product was subjected to column chromatography (neutral alumina) to afford the analytically pure product.

(*E*)-4-(3,4,5-Tris(octyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2a):

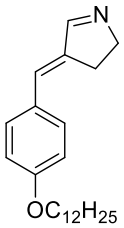
According to GP II, a mixture of 3,4,5-tris(octyloxy)benzaldehyde (0.4 g, 0.82 mmol), pyrrolidine (0.27 mL, 3.26 mmol), 3,5-dinitrobenzoic acid (0.11 g, 0.53 mmol) was refluxed for 18 hours in 5 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2a** as brownish gum (0.42 g, 48%). FTIR (KBr): ŭ = 3433, 2954, 2925, 2855, 1685, 1638, 1577, 1504, 1467, 1432, 1334, 1236, 1161, 1115, 1037, 976, 925, 873, 817, 723, 633, 516, 425, 411 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 7.84 (s, 1H), 6.73 (s, 1H), 6.67 (s, 2H), 4.22 – 4.18 (m, 2H), 3.98 (t, *J* = 6.6 Hz, 6H), 2.83 – 2.81 (m, 2H), 1.84 – 1.79 (m, 4H), 1.77 – 1.72 (m, 2H), 1.49 – 1.45 (m, 6H), 1.37 – 1.28 (m, 24H), 0.89 (t, *J* = 6.6 Hz, 9H) ppm. ^{13}C NMR (101 MHz, $CDCl_3$) δ = 168.6, 153.4, 142.6, 139.0, 132.1, 127.6, 108.2, 73.8, 69.6, 62.4, 32.1, 32.0, 30.6, 29.74, 29.67, 29.58, 29.56, 29.5, 28.4, 26.3, 22.89, 22.86, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): HRMS (ESI): Exact mass calculated for $C_{35}H_{60}NO_3^+$ ([M+H]+): 542.4568; Found: 542.4568.

(*E*)-4-(3,4,5-Tris(decyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2b):

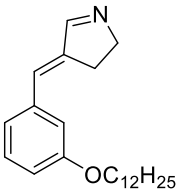
According to GP II, a mixture of 3,4,5-tris(decyloxy)benzaldehyde (0.46 g, 0.81 mmol), pyrrolidine (0.27 mL, 3.24 mmol), 3,5-dinitrobenzoic acid (0.11 g, 0.53 mmol) was refluxed for 18 hours in 5 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2b** as brownish gum (0.20 g, 40%). FTIR (KBr): ŭ = 3416, 2955, 2925, 2854, 1637, 1577, 1504, 1466, 1434, 1378, 1335, 1238, 1116, 803, 721, 518, 470, 444, 413, 403 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 7.83 (s, 1H), 6.72 (s, 1H), 6.67 (s, 2H), 4.21 – 4.18 (m, 2H), 4.00 – 3.97 (m, 6H), 2.82 – 2.80 (m, 2H), 1.83 – 1.79 (m, 4H), 1.77 – 1.72 (m, 2H), 1.50 – 1.45 (m, 6H), 1.35 – 1.27 (m, 36H), 0.89 – 0.87 (m, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 168.6, 153.3, 142.6, 138.8, 132.1, 127.6, 108.0, 73.7, 69.4, 62.4, 32.14, 32.12, 30.5, 29.94, 29.87, 29.85, 29.79, 29.6, 29.5, 28.4, 26.3, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{41}H_{72}NO_3^+$ ([M+H]+): 626.5507; Found: 626.5535.

(*E*)-4-(4-(Dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2c):

According to GP II, a mixture of 4-(dodecyloxy)benzaldehyde (1.95 g, 6.72 mmol), pyrrolidine (2.21 mL, 28.89 mmol), 3,5-dinitrobenzoic acid (0.93 g, 4.37 mmol) was refluxed for 18 hours in 10 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2c** as brownish gum (1.13 g, 50%). FTIR (KBr): ŭ = 3428, 2917, 2850, 1605, 1578, 1511, 1473, 1423, 1395, 1385, 1314, 1289, 1254, 1240, 1181, 1166, 1118, 1033, 1023, 1002, 969, 924, 885, 851, 829, 810, 775, 719, 597, 538, 516, 413 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 7.81 (s, 1H), 7.37 (d, *J* = 8.4 Hz, 2H), 6.90 (d, *J* = 7.8 Hz, 2H), 6.74 (s, 1H), 4.18 – 4.15 (m, 2H), 3.96 (t, *J* = 6.0 Hz, 2H), 2.78 – 2.75 (m, 2H), 1.79 – 1.76 (m, 2H), 1.45 – 1.44 (m, 2H), 1.34 – 1.26 (m, 16H), 0.89 – 0.87 (m, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 168.6, 159.1, 141.4, 130.3, 129.4, 126.7, 114.8, 68.2, 62.3, 32.0, 29.79, 29.77, 29.73, 29.71, 29.52, 29.48, 29.3, 28.2, 26.1, 22.8, 14.2 ppm. HRMS (ESI): Exact mass calculated for $C_{23}H_{36}NO^+$ ([M+H]+): 342.2791; Found: 342.2796.

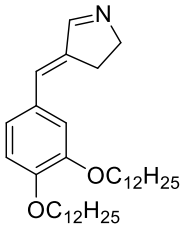


(*E*)-4-(3-(Dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2d):



According to GP II, a mixture of 3-(dodecyloxy)benzaldehyde (0.40 g, 1.38 mmol), pyrrolidine (0.45 mL, 5.52 mmol), 3,5-dinitrobenzoic acid (0.19 g, 0.90 mmol) was refluxed for 18 hours in 7 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2d** as brownish gum (0.21 g, 44%). FTIR (KBr): ŭ = 3435, 2954, 2918, 2852, 1640, 1593, 1582, 1488, 1474, 1384, 1318, 1299, 1268, 1239, 1175, 1165, 1035, 973, 954, 925, 898, 868, 838, 805, 778, 719, 684, 596, 521, 454 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 7.87 (s, 1H), 7.31 – 7.28 (m, 1H), 7.04 (d, *J* = 7.8 Hz, 1H), 6.99 (s, 1H), 6.85 – 6.84 (m, 1H), 6.79 (s, 1H), 4.21 – 4.19 (m, 2H), 3.97 (t, *J* = 6.6 Hz, 2H), 2.85 – 2.82 (m, 2H), 1.81 – 1.77 (m, 2H), 1.67 – 1.65 (m, 2H), 1.48 – 1.43 (m, 2H), 1.37 – 1.26 (m, 14H), 0.89 – 0.87 (m, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 168.6, 159.5, 143.9, 138.2, 129.7, 127.3, 121.4, 115.1, 114.3, 68.2, 62.4, 32.1, 29.9, 29.84, 29.81, 29.78, 29.6, 29.55, 29.48, 28.5, 26.3, 22.9, 14.3 ppm. HRMS (ESI): Exact mass calculated for $C_{23}H_{36}NO^+$ ([M+H]+): 342.2791; Found: 342.2804.

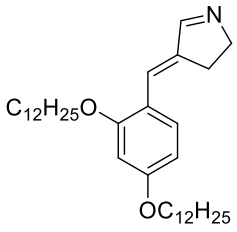
(*E*)-4-(3,4-Bis(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2e):



According to GP II, a mixture of 3,4-bis(dodecyloxy)benzaldehyde (0.4 g, 0.84 mmol), pyrrolidine (1.6 mL, 3.37 mmol), 3,5-dinitrobenzoic acid (0.12 g, 0.55 mmol) was refluxed for 18 hours in 5 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2e** as brownish gum (0.23 g, 51%). FTIR (KBr): ŭ = 3430, 2955, 2921, 2851, 1632, 1599, 1572, 1518, 1470, 1380, 1328, 1263, 1239, 1179, 1156, 1136, 1064, 1025, 917, 882, 796, 719, 625, 605, 519, 468 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 7.83 (s, 1H), 7.02 – 7.00 (m, 2H), 6.89 (d, *J* = 7.8 Hz, 1H), 6.74 (s, 1H), 4.21 – 4.18 (m, 2H), 4.02 (t, *J* = 6.0 Hz, 4H), 2.85 – 2.75 (m, 2H), 1.84 – 1.81 (m, 4H), 1.50 – 1.44 (m, 4H), 1.38–

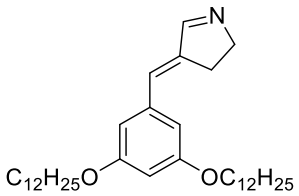
1.26 (m, 32H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 168.7, 149.5, 149.1, 141.7, 130.0, 127.2, 122.5, 114.6, 113.6, 69.6, 69.3, 62.4, 32.1, 29.91, 29.87, 29.8, 29.65, 29.62, 29.58, 29.5, 29.4, 28.3, 26.3, 26.2, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{35}H_{60}NO_2^+$ ([M+H]+): 526.4619; Found: 526.4637.

(*E*)-4-(2,4-Bis(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2f):



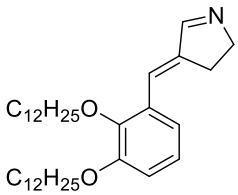
According to GP II, a mixture of 2,4-bis(dodecyloxy)benzaldehyde (2.23 g, 4.71 mmol), pyrrolidine (1.6 mL, 18.8 mmol), 3,5-dinitrobenzoic acid (0.65 g, 3.06 mmol) was refluxed for 18 hours in 7 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2f** as brownish gum (1.0 g, 40%). FTIR (KBr): ῡ = 3421, 2954, 2921, 2852, 1604, 1575, 1502, 1469, 1428, 1385, 1312, 1288, 1273, 1226, 1184, 1159, 1106, 1069, 1032, 925, 972, 926, 882, 871, 820, 798, 786, 719, 632, 610, 598, 515, 487, 472, 441, 422 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 7.86 (s, 1H), 7.43 (d, *J* = 8.4 Hz, 1H), 7.17 – 7.16 (m, 1H), 6.50 – 6.48 (m, 1H), 6.46 – 6.45 (m, 1H), 4.16 – 4.13 (m, 2H), 3.98 – 3.95 (m, 4H), 2.77 – 2.74 (m, 2H), 1.85 – 1.81 (m, 2H), 1.80 – 1.75 (m, 2H), 1.50 – 1.43 (m, 4H), 1.39 – 1.26 (m, 32H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 169.2, 160.5, 158.5, 141.0, 128.8, 120.9, 118.8, 105.2, 99.9, 68.7, 68.3, 62.1, 32.1, 29.9, 29.83, 29.80, 29.77, 29.6, 29.5, 29.4, 29.3, 28.4, 26.3, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{35}H_{60}NO_2^+$ ([M+H]+): 526.4619; Found: 526.4634.

(*E*)-4-(3,5-Bis(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2g):



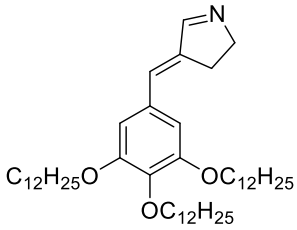
According to GP II, a mixture of 3,5-bis(dodecyloxy)benzaldehyde (0.42 g, 0.89 mmol), pyrrolidine (0.29 mL, 3.56 mmol), 3,5-dinitrobenzoic acid (0.12 g, 0.38 mmol) was refluxed for 18 hours in 5 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2g** as brownish gum (0.38 g, 43%). FTIR (KBr): ῡ = 3430, 3065, 3003, 2956, 2924, 2851, 1639, 1590, 1466, 1392, 1373, 1352, 1293, 1178, 1152, 1129, 1070, 1050, 971, 945, 928, 919, 871, 833, 813, 767, 734, 724, 685, 593, 514 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 7.83 (s, 1H), 6.71 (s, 1H), 6.571 – 6.569 (m, 2H), 6.41 (s, 1H), 4.18 – 4.16 (m, 2H), 3.93 (t, *J* = 6.6 Hz, 4H), 2.81 – 2.80 (m, 2H), 1.79 – 1.74 (m, 4H), 1.46 – 1.42 (m, 4H), 1.34 – 1.26 (m, 32H), 0.88 (t, *J* = 7.2 Hz, 6H) ppm. ^{13}C NMR (101 MHz, $CDCl_3$) δ = 168.5, 160.5, 143.9, 138.5, 127.4, 107.5, 101.3, 68.2, 62.4, 32.1, 29.83, 29.80, 29.77, 29.7, 29.6, 29.5, 29.4, 28.5, 26.2, 22.8, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{35}H_{60}NO_2^+$ ([M+H]+): 526.4619; Found: 526.4621.

(*E*)-4-(2,3-Bis(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2h):



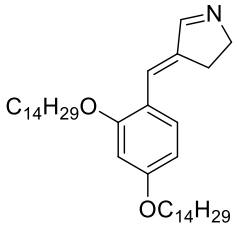
According to GP II, a mixture of 2,3-bis(dodecyloxy)benzaldehyde (1.82 g, 3.85 mmol), pyrrolidine (1.3 mL, 15.4 mmol), 3,5-dinitrobenzoic acid (0.53 g, 2.50 mmol) was refluxed for 18 hours in 7 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2h** as brownish gum (1.03 g, 51%). FTIR (KBr): ŭ = 3431, 2956, 2924, 2854, 1639, 1595, 1577, 1466, 1383, 1273, 1259, 1214, 1154, 1075, 1031, 924, 749, 721, 515 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 7.89 (s, 1H), 7.22 – 7.21 (m, 1H), 7.12 (d, *J* = 7.8 Hz, 1H), 7.05 – 7.02 (m, 1H), 6.88 – 6.85 (m, 1H), 4.19 – 4.16 (m, 2H), 3.99 – 3.93 (m, 4H), 2.80 – 2.77 (m, 2H), 1.85 – 1.76 (m, 6H), 1.51 – 1.46 (m, 4H), 1.38 – 1.26 (m, 30H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 169.1, 152.7, 147.4, 144.1, 131.3, 123.7, 121.6, 119.8, 113.4, 74.1, 68.9, 62.3, 56.0, 32.1, 30.5, 29.92, 29.88, 29.86, 29.8, 29.63, 29.59, 28.3, 26.4, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{35}H_{60}NO_2^+$ ([M+H]+): 526.4619; Found: 526.4629.

(*E*)-4-(3,4,5-Tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2i):



According to GP II, a mixture of 3,4,5-tris(dodecyloxy)benzaldehyde (0.29 g, 0.44 mmol), pyrrolidine (0.14 mL, 1.74 mmol), 3,5-dinitrobenzoic acid (0.06 g, 0.28 mmol) was refluxed for 18 hours in 5 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2i** as brownish gum (0.11 g, 35%). FTIR (KBr): ŭ = 3443, 2921, 2851, 1630, 1575, 1507, 1468, 1432, 1384, 1337, 1293, 1244, 1232, 1160, 1123, 970, 921, 874, 814, 721, 636, 513 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 7.84 (s, 1H), 6.72 (s, 1H), 6.67 (s, 2H), 4.22 – 4.18 (m, 2H), 4.00 – 3.97 (m, 6H), 2.83 – 2.79 (m, 2H), 1.83 – 1.79 (m, 4H), 1.76 – 1.72 (m, 4H), 1.48 – 1.45 (m, 8H), 1.37 – 1.26 (m, 44H), 0.89 – 0.87 (m, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 168.7, 153.3, 142.6, 138.7, 132.1, 127.6, 107.9, 73.8, 69.4, 62.4, 32.15, 32.14, 30.5, 30.0, 29.95, 29.92, 29.87, 29.86, 29.8, 29.63, 29.61, 29.58, 28.4, 26.3, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{47}H_{84}NO_3^+$ ([M+H]+): 710.6446; Found: 710.6452.

(*E*)-4-(2,4-Bis(tetradecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2j):

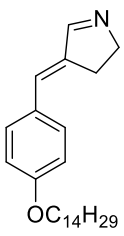


According to GP II, a mixture of 2,4-bis(tetradecyloxy)benzaldehyde (0.57 g, 1.07 mmol), pyrrolidine (0.35 mL, 4.28 mmol), 3,5-dinitrobenzoic acid (0.15 g, 0.69 mmol) was refluxed for 18 hours in 6 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2j** as brownish gum (0.27 g, 43%). FTIR (KBr): ŭ = 3426, 2954, 2918, 2852, 1604, 1574, 1502,

1472, 1438, 1386, 1313, 1288, 1276, 1201, 1184, 1159, 1073, 1040, 1030, 1050, 1018, 1007, 926, 882, 871, 814, 799, 717, 631, 640, 598, 535, 515, 487, 426 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.89 – 7.84 (m, 1H), 7.47 – 7.42 (m, 1H), 7.20 – 7.17 (m, 1H), 6.53 – 6.46 (m, 2H), 4.21 – 4.11 (m, 2H), 4.00 – 3.95 (m, 4H), 2.80 – 2.73 (m, 2H), 1.87 – 1.75 (m, 4H), 1.52 – 1.26 (m, 44H), 0.91 – 0.86 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 169.3, 160.5, 158.5, 141.1, 128.8, 120.9, 118.9, 105.3, 99.9, 68.7, 68.3, 62.1, 32.1, 29.90, 29.89, 29.87, 29.82, 29.81, 29.78, 29.60, 29.57, 29.5, 29.4, 28.4, 26.3, 26.2, 22.9, 14.3 ppm. HRMS (ESI): Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. Exact mass calculated for $C_{39}H_{68}NO_2^+$ ([M+H]+): 582.5245; Found: 582.5263.

(*E*)-4-(4-(Tetradecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2k):

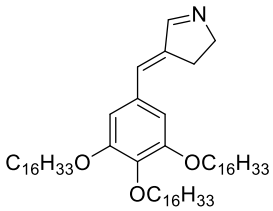
According to GP II, a mixture of 4-(tetradecyloxy)benzaldehyde (0.87 g, 2.86 mmol), pyrrolidine



(0.94 mL, 11.43 mmol), 3,5-dinitrobenzoic acid (0.4 g, 1.89 mmol) was refluxed for 18 hours in 16 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2k** as brownish gum (0.50 g, 47%). FTIR (KBr): ῡ = 3433, 2939, 2917, 2850, 1605, 1578, 1510, 1474, 1395, 1385, 1307, 1290, 1254, 1240, 1181, 1166, 1118, 1040, 1021, 969, 957, 924, 885, 851, 829, 799, 775, 751, 718, 667, 597, 538, 517 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$) δ = 7.83 (s, 1H), 7.38 (d, *J* = 8.4 Hz, 2H), 6.91 (d, *J* = 8.4 Hz, 2H), 6.76 (s, 1H), 4.24 – 4.15 (m, 2H), 3.99 – 3.96 (m, 2H), 2.82 – 2.76 (m, 2H), 1.80 – 1.77 (m, 2H), 1.45 – 1.26 (m, 22H), 0.89 – 0.86 (m, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 168.7, 159.1, 141.5, 130.3, 129.4, 126.8, 114.8, 68.2, 62.4, 32.1, 29.9, 29.84, 29.78, 29.76, 29.6, 29.5, 29.4, 28.3, 26.2, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{25}H_{40}NO^+$ ([M+H]+): 370.3104; Found: 370.3119.

(E)-4-(3,4,5-Tris(hexadecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrole (2l):

According to GP II, a mixture of 3,4,5-tris(hexadecyloxy)benzaldehyde (1.04 g, 1.26 mmol),



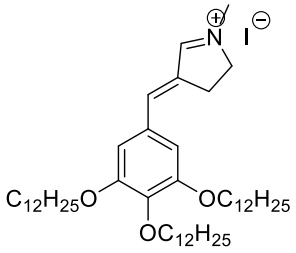
pyrrolidine (0.41 mL, 5.03 mmol), 3,5-dinitrobenzoic acid (0.17 g, 0.82 mmol) was refluxed for 18 hours in 10 mL *m*-xylene and column chromatography (neutral-Al_2O_3; ethyl acetate:hexane, 1:5) gave **2l** as brownish gum (0.61 g, 55%). FTIR (KBr): ῡ = 3431, 2955, 2918, 2849, 1630, 1572, 1508, 1469, 1432, 1384, 1371, 1337, 1293, 1251, 1232, 1160, 1023, 986, 969, 934, 921, 875, 814, 790, 635, 586 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 7.84 (s, 1H), 6.73 (s, 1H), 6.66 (s, 2H), 4.21 – 4.19 (m, 2H), 4.00 – 3.97 (m, 6H), 2.83 – 2.80 (m, 2H), 1.83 – 1.72 (m, 8H), 1.50 – 1.45 (m, 6H), 1.37 – 1.34 (m, 6H), 1.31 – 1.26 (m, 64H), 0.89 – 0.87 (m, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 168.6, 153.3, 142.5, 138.7, 132.0, 127.7, 107.8, 73.7, 69.4, 62.3, 32.1, 30.5, 29.95, 29.93, 29.88, 29.86, 29.8, 29.63, 29.59, 28.3, 26.3, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected

due to the merging of signals in the aromatic region. HRMS (ESI): Exact mass calculated for $C_{59}H_{108}NO_3^+$ ([M+H]+): 878.8324; Found: 878.8342.

General procedure for the synthesis of α,β-unsaturated secondary cyclic iminium ions (GP III): Alkylating reagent (MeI, $Me_3O^+BF4^-$, $Et_3O^+BF4^-$) (0.14 – 1.59 mmol, 1.5 equiv.) was added to solution of *β*-unsaturated cyclic imines (0.09 – 0.72 mmol, 1.0 equiv.) in mixture of DCM and CH_3CN (1:3, 1 – 4 mL) solvents and the mixture was stirred at room temperature for next 24-72 hours under inert atmosphere. After completion of reaction (checked by TLC), the reaction mixture was concentrated *in vacuo*, the solid was filtered through a filter paper, washed with ETOAc (4 X 20 mL) and dried to give the iminium ions.

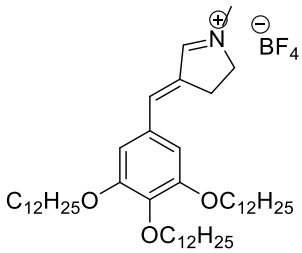
(*E*)-1-methyl-4-(3,4,5-tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (12/3/MI):

According to GP III, methyl iodide (32 µL, 0.50 mmol) was reacted with **2i** (0.18 g, 0.25 mmol) in 4 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/3/MI** as yellow solid (0.17 g, 79%). FTIR (KBr): ῡ = 3427, 2953, 2918, 2849, 1609, 1578, 1568, 1506, 1464, 1443, 1378, 1340, 1316, 1253, 1177, 1154, 1123, 1092, 1029, 989, 969, 871, 803, 720, 627, 504 cm^{-1}.^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.80 (s, 1H), 7.74 (s, 1H), 6.72 (s, 2H), 4.42 – 4.39 (m, 2H), 4.05 – 4.03 (m, 2H), 3.97 – 3.95 (m, 4H), 3.85 (s, 3H), 3.37 – 3.35 (m, 2H), 1.82 – 1.79 (m, 4H), 1.76 –1.71 (m, 2H), 1.49 – 1.44 (m, 6H), 1.35 – 1.33 (m, 6H), 1.31 – 1.26 (m, 42H), 0.88 (t, *J* = 7.2 Hz, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.1, 153.5, 146.5, 142.3, 133.8, 129.0, 110.1, 73.9, 69.6, 60.3, 41.3, 32.1, 30.5, 29.92, 29.90, 29.87, 29.8, 29.7, 29.6, 29.5, 27.6, 26.2, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. Exact mass calculated for $C_{48}H_{86}NO_3^+$ ([M]$^+$): 724.6602; Found: 724.6613.



(*E*)-1-methyl-4-(3,4,5-tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium tetrafluoroborate (12/3/MBF):

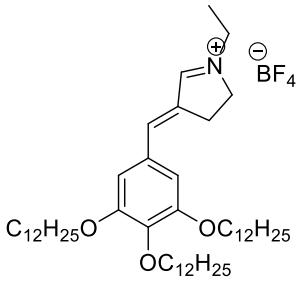
According to GP III, trimethyloxonium tetrafluoroborate (0.06 g, 0.42 mmol) was reacted with **2i** (0.15 g, 0.21 mmol) in 3 mL DCM:CH_3CN (1:1) for 24 hours. Filtration of the solid precipitate gave **12/3/MBF** as yellow solid (0.12 g, 70%). FTIR (KBr): ῡ = 3429, 2954, 2919, 2850, 1615, 1572, 1504, 1469, 1443, 1381, 1342, 1306, 1253, 1178, 1124, 1084, 1064, 1035, 919, 873, 808, 721, 522, 499 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 8.66 (s, 1H), 7.53 (s, 1H), 6.70 (s, 2H), 4.33 – 4.31 (m, 2H), 4.01 (t, *J* = 6.6 Hz, 2H), 3.94 – 3.92 (m, 4H), 3.68 (s, 3H), 3.32 – 3.30 (m, 2H), 1.81 – 1.77 (m, 4H), 1.76 – 1.70 (m, 2H), 1.48 – 1.43



(m, 6H), 1.34 – 1.26 (m, 48H), 0.89 – 0.87 (m, 9H). ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.5, 153.5, 146.1, 142.1, 134.3, 129.1, 110.0, 73.9, 69.5, 59.6, 40.2, 32.1, 30.6, 30.0, 29.95, 29.91, 29.89, 29.8, 29.7, 29.6, 27.4, 26.35, 26.27, 22.9, 14.3. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{48}H_{86}NO_3^+$ ($[M]^+$): 724.6602; Found: 724.6608.

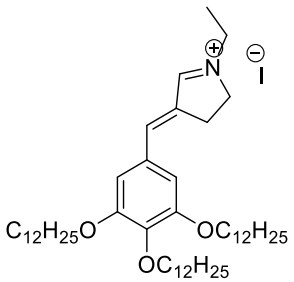
(*E*)-1-ethyl-4-(3,4,5-tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium tetrafluoroborate (12/3/EBF):

According to GP III, triethyloxonium tetrafluoroborate (0.06 g, 0.31 mmol) was reacted with **2i** (0.15 g, 0.21 mmol) in 3 mL DCM:CH_3CN (1:1) for 24 hours. Filtration of the solid precipitate gave **12/3/EBF** as yellow solid (0.13 g, 76%). FTIR (KBr): ῡ = 3401, 3058, 2954, 2918, 2849, 2872, 1608, 1577, 1507, 1446, 1388, 1316, 1471, 1342, 1252, 1180, 1151, 1132, 1062, 1124, 1038, 990, 970, 809, 720, 928, 899, 871, 841, 629, 694, 522 cm^{-1}. ^{1}H NMR (400 MHz, $CDCl_3$) δ = 8.74 (s, 1H), 7.64 (s, 1H), 6.76 (s, 2H), 4.40 – 4.37 (m, 2H), 4.03 (t, *J* = 6.4 Hz, 2H), 3.96 (t, *J* = 6.0 Hz, 4H), 3.26 – 3.21 (m, 2H), 1.83 – 1.78 (m, 4H), 1.76 – 1.70 (m, 2H), 1.50 – 1.43 (m, 6H), 1.36 – 1.26 (m, 53H), 0.90 – 0.86 (m, 9H) ppm. ^{13}C NMR (101 MHz, $CDCl_3$) δ = 174.1, 153.5, 147.7, 142.3, 134.3, 129.0, 110.1, 74.0, 69.5, 53.9, 32.2, 32.1, 30.6, 30.0, 29.95, 29.93, 29.90, 29.89, 29.8, 29.7, 29.62, 29.60, 29.5, 26.35, 26.26, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{49}H_{88}NO_3^+$ ($[M]^+$): 738.6759; Found: 738.6770.



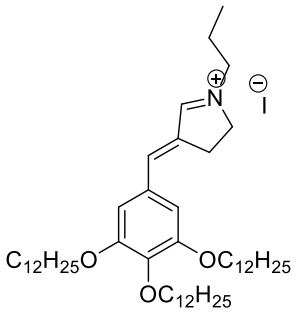
(*E*)-1-ethyl-4-(3,4,5-tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (12/3/EI):

According to GP III, ethyl iodide (28 µL, 0.35 mmol) was reacted with **2i** (0.12 g, 0.18 mmol) in 2 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/3/EI** as yellow solid (0.08 g, 50%). FTIR (KBr): ῡ = 3435, 2954, 2918, 2849, 1604, 1575, 1506, 1464, 1443, 1386, 1315, 1342, 1250, 1153, 1177, 1132, 1124, 990, 806, 720, 630, 511 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.80 (s, 1H), 7.83 (s, 1H), 6.74 (s, 2H), 4.37 – 4.35 (m, 2H), 4.16 – 4.03 (m, 2H), 4.06 – 4.04 (m, 2H), 3.98 – 3.96 (m, 4H), 3.38 – 3.35 (m, 2H), 1.83 – 1.79 (m, 4H), 1.76 – 1.72 (m, 2H), 1.57 (t, *J* = 7.2 Hz, 3H), 1.50 – 1.45 (m, 6H), 1.38 – 1.26 (m, 48H), 0.89 – 0.87 (m, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 171.5, 153.5, 146.7, 142.4, 133.9, 129.1, 110.2, 73.9, 69.6, 58.1, 49.1, 32.0, 30.5, 29.85, 29.78, 29.7, 29.6, 29.5, 27.3, 26.3, 26.2, 22.8, 14.2, 13.2 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{49}H_{88}NO_3^+$ ($[M]^+$): 738.6759; Found: 738.6769.



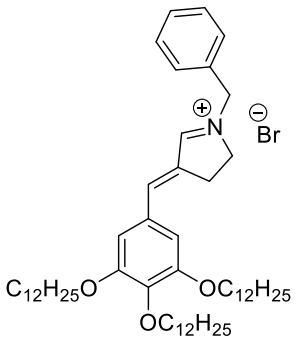
(*E*)-1-propyl-4-(3,4,5-tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (12/3/ProI):

According to GP III, propyl iodide (53 µL, 0.50 mmol) was reacted with **2i** (0.19 g, 0.27 mmol) in 4 mL DCM:CH_3CN (1:3) for 72 hours. Filtration of the solid precipitate gave **12/3/ProI** as yellow solid (0.11 g, 68%). FTIR (KBr): ŭ = 3456, 2955, 2850, 1919, 1612, 1574, 1504, 1467, 1439, 1383, 1340, 1249, 1192, 1174, 1123, 1028, 990, 921, 811, 721, 630, 497 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 9.84 (s, 1H), 7.84 (s, 1H), 6.74 (s, 2H), 4.39 – 4.37 (m, 2H), 4.08 – 4.03 (m, 4H), 3.97 – 3.95 (m, 4H), 3.38 – 3.36 (m, 2H), 1.96 – 1.90 (m, 2H), 1.83 – 1.78 (m, 4H), 1.76 – 1.71 (m, 2H), 1.49 – 1.45 (m, 6H), 1.38 – 1.26 (m, 48H), 1.04 – 1.01 (m, 3H), 0.88 (t, *J* = 7.2 Hz, 9H). ^{13}C NMR (151 MHz, $CDCl_3$) δ = 172.4, 153.5, 147.2, 142.4, 133.4, 129.0, 110.1, 74.0, 69.6, 57.8, 55.3, 32.14, 32.13, 30.6, 30.0, 29.95, 29.94, 29.92, 29.90, 29.87, 29.86, 29.8, 29.64, 29.60, 29.58, 29.5, 27.3, 26.3, 26.2, 22.9, 21.2, 14.3, 11.1 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{50}H_{90}NO_3^+$ ($[M]^+$): 752.6915; Found: 752.6932.



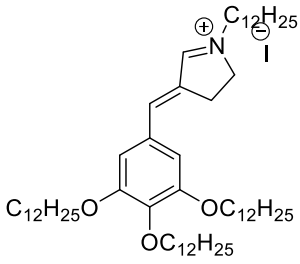
(*E*)-1-benzyl-4-(3,4,5-tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium bromide (12/3/BnBr):

According to GP III, benzyl bromide (46 µL, 0.39 mmol) was reacted with **2i** (0.14 g, 0.19 mmol) in 2 mL DCM:CH_3CN (1:3) for 72 hours. Filtration of the solid precipitate gave **12/3/BnBr** as yellow solid (0.04 g, 23%). FTIR (KBr): ŭ = 3435, 3043, 2953, 2919, 2849, 2870, 1622, 1574, 1504, 1444, 1393, 1264, 1210, 1173, 1155, 1028, 1465, 1339, 1324, 1251, 11888, 1119, 929, 856, 973, 964, 1044, 994, 807, 766, 722, 699, 640, 625, 498 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 10.32 (s, 1H), 7.77 (s, 1H), 7.55 – 7.54 (m, 2H), 7.40 – 7.38 (m, 3H), 6.67 (s, 2H), 5.49 (s, 2H), 4.34 – 4.32 (m, 2H), 4.02 (t, *J* = 6.6 Hz, 2H), 3.93 – 3.91 (m, 4H), 3.27 – 3.25 (m, 2H), 1.81 – 1.76 (m, 4H), 1.74 – 1.70 (m, 2H), 1.47 – 1.43 (m, 6H), 1.34 – 1.26 (m, 48H), 0.89 – 0.87 (m, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.0, 153.4, 147.5, 142.4, 133.7, 131.3, 129.9, 129.8, 129.6, 129.0, 110.1, 73.9, 69.5, 57.2, 56.9, 32.1, 30.5, 29.92, 29.90, 29.8, 29.7, 29.62, 29.58, 29.56, 29.5, 27.1, 26.3, 26.2, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{54}H_{90}NO_3^+$ ($[M]^+$): 800.6915; Found: 800.6937.



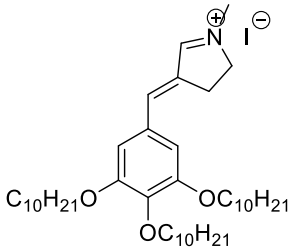
(*E*)-1-dodecyl-4-(3,4,5-tris(dodecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (12/3/C12I):

According to GP III, n-iodohexadecane (0.12 mL, 0.50 mmol) was reacted with **2i** (0.18 g, 0.25 mmol)



in 4 mL DCM:CH_3CN (1:3) for 72 hours. Filtration of the solid precipitate gave **12/3/C12I** as yellow solid (0.04 g, 16%). FTIR (KBr): ŭ = 3434, 2955, 2920, 2851, 1614, 1575, 1504, 1468, 1439, 1382, 1340, 1250, 1172, 1123, 1027, 990, 813, 721, 634, 493, 427 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 9.77 (s, 1H), 7.84 (s, 1H), 6.74 (s, 2H), 4.42 – 4.38 (m, 2H), 4.09 (t, *J* = 7.2 Hz, 2H), 4.03 (t, *J* = 6.6 Hz, 2H), 3.96 (t, *J* = 6.0 Hz, 4H), 3.37 – 3.34 (m, 2H), 1.85 – 1.71 (m, 12H), 1.49 – 1.24 (m, 71H), 0.88 (t, *J* = 6.6 Hz, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 172.1, 153.5, 146.9, 142.5, 133.6, 129.0, 110.3, 73.9, 69.7, 58.0, 54.0, 32.1, 30.6, 29.91, 29.89, 29.83, 29.78, 29.75, 29.69, 29.64, 29.56, 29.5, 29.3, 27.7, 27.4, 26.6, 26.3, 26.2, 22.8, 14.2 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{59}H_{108}NO_3^+$ ([M]$^+$): 878.8324; Found: 878.8335.

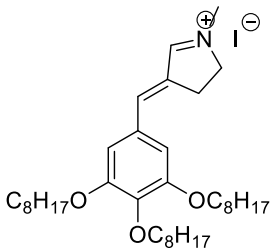
(*E*)-1-methyl-4-(3,4,5-tris(decyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (10/3/MI):



According to GP III, methyl iodide (21 µL, 0.34 mmol) was reacted with **2b** (0.11 g, 0.17 mmol) in 4 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **10/3/MI** as yellow solid (0.08 g, 75%). FTIR (KBr): ŭ = 3429, 2955, 2922, 2851, 1609, 1578, 1506, 1466, 1443, 1378, 1316, 1253, 1177, 1156, 1128, 1122, 1089, 972, 845, 804, 720, 626, 503 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 9.74 (s, 1H), 7.76 (s, 1H), 6.74 (s, 2H), 4.42 – 4.39 (m, 2H), 4.04 – 4.02 (m, 2H), 3.97 – 3.95 (m, 4H), 3.85 (s, 3H), 3.36 – 3.34 (m, 2H), 1.82 – 1.77 (m, 4H), 1.76 – 1.71 (m, 2H), 1.678 – 1.676 (m, 2H), 1.49 – 1.44 (m, 6H), 1.35 – 1.27 (m, 34H), 0.88 (t, *J* = 7.2 Hz, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.2, 153.5, 146.6, 142.4, 133.7, 129.0, 110.2, 74.0, 69.6, 60.3, 41.3, 32.1, 30.6, 29.93, 29.87, 29.85, 29.80, 29.76, 29.65, 29.59, 29.56, 27.6, 26.3, 26.2, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. Exact mass calculated for $C_{42}H_{74}NO_3^+$ ([M]$^+$): 640.5663; Found: 640.5681.

(*E*)-1-methyl-4-(3,4,5-tris(octyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (8/3/MI):

According to GP III, methyl iodide (35 µL, 0.34 mmol) was reacted with **2a** (0.15 g, 0.28 mmol) in 6

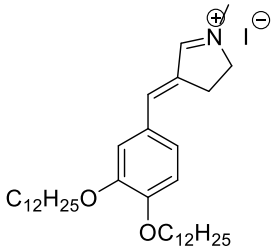


mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **8/3/MI** as yellow solid (0.12 g, 63%). FTIR (KBr): ŭ = 3426, 2955, 2921, 2851, 1609, 1577, 1504, 1468, 14443, 1378, 1339, 1315, 1253, 1208, 1176, 1154, 1131, 1121, 1091, 1031, 978, 925, 869, 845, 804, 722, 626, 503 cm^{-1}.^1H NMR (400 MHz, $CDCl_3$) δ = 9.73 (s, 1H), 7.73 (s, 1H), 6.73 (s, 2H), 4.48 – 4.43 (m, 2H), 4.05 – 3.94 (m, 6H), 3.86 (s, 3H), 3.38 – 3.33 (m, 2H), 1.87 – 1.70 (m, 6H), 1.50

– 1.29 (m, 30H), 0.91 – 0.87 (m, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.2, 153.5, 146.5, 142.4, 133.8, 128.9, 110.2, 74.0, 69.6, 60.3, 41.3, 32.1, 32.0, 30.5, 29.7, 29.6, 29.54, 29.52, 29.46, 27.6, 26.3, 26.2, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{36}H_{62}NO_3^+$ ($[M]^+$): 556.4724; Found: 556.4726.

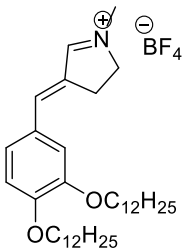
(*E*)-4-(3,4-bis(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium iodide (12/(3,4)/MI):

According to GP III, methyl iodide (13 µL, 0.20 mmol) was reacted with **2e** (0.05 g, 0.10 mmol) in 2 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/(3,4)/MI** as yellow solid (0.06 g, 88%). FTIR (KBr): ϑ = 3436, 2956, 2917, 2873, 2848, 1616, 1586, 1518, 1439, 1394, 1337, 1283, 1248, 1149, 1181, 1072, 1031, 994, 954, 915, 871, 805, 721, 614, 599, 494 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.65 (s, 1H), 7.77 (s, 1H), 7.14 (d, *J* = 8.4 Hz, 1H), 7.01 – 7.00 (m, 1H), 6.89 (d, *J* = 8.4 Hz, 1H), 4.42 – 4.40 (m, 2H), 4.05 – 4.03 (m, 2H), 4.00 – 3.97 (m, 2H), 3.83 (s, 3H), 3.35 – 3.33 (m, 2H), 1.86 – 1.79 (m, 4H), 1.49 – 1.45 (m, 4H), 1.36 – 1.26 (m, 32H), 0.89 – 0.87 (m, 6H). ^{13}C NMR (151 MHz, $CDCl_3$) δ = 172.6, 152.9, 149.2, 145.9, 132.6, 126.8, 126.3, 115.7, 112.9, 69.6, 69.2, 60.2, 41.1, 32.0, 29.80, 29.78, 29.74, 29.71, 29.6, 29.5, 29.4, 29.3, 29.1, 27.6, 26.1, 26.1, 22.8, 14.2 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{36}H_{62}NO_2^+$ ($[M]^+$): 540.4775; Found: 540.4776.



(*E*)-4-(3,4-bis(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium tetrafluoroborate (12/(3,4)/MBF):

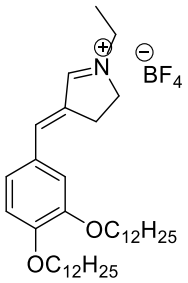
According to GP III, trimethyloxonium tetrafluoroborate (32 mg, 0.22 mmol) was reacted with **2e** (0.06 g, 0.11 mmol) in 2 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/(3,4)/MBF** as yellow solid (0.04 g, 59%). FTIR (KBr): ϑ = 3428, 2955, 2918, 2849, 1646, 1619, 1590, 1519, 1468, 1419, 1390, 1325, 1283, 1251, 1184, 1150, 1071, 1040, 995, 955, 915, 871, 832, 916, 721, 631, 616, 600, 521, 499 cm^{-1}.^{1}H NMR (600 MHz, $CDCl_3$) δ = ^{1}H NMR (600 MHz, $CDCl_3$) δ = 8.67 (s, 1H), 7.56 (s, 1H), 7.10 (d, *J* = 7.8 Hz, 1H), 6.98 (s, 1H), 6.87 (d, *J* = 8.4 Hz, 1H), 4.33 – 4.30 (m, 2H), 4.02 (t, *J* = 6.6 Hz, 2H), 3.96 (t, *J* = 6.6 Hz, 2H), 3.67 (s, 3H), 3.31 – 3.29 (m, 2H), 1.85 – 1.78 (m, 4H), 1.49 – 1.44 (m, 4H), 1.36 – 1.26 (m, 32H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.4, 153.1, 149.4, 146.1, 132.9, 127.0, 126.3, 115.9, 113.0, 69.7, 69.3, 59.5, 40.1, 32.1, 29.95, 29.93, 29.88, 29.8, 29.7, 29.63, 29.59, 29.5, 29.3, 27.5, 26.3, 26.2, 22.9, 14.3 ppm. Total



count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{36}H_{62}NO_2^+$ ($[M]^+$): 540.4775; Found: 540.4778.

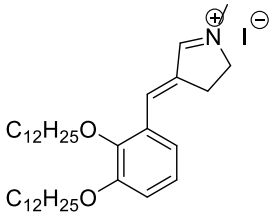
(*E*)-4-(3,4-bis(dodecyloxy)benzylidene)-1-ethyl-3,4-dihydro-2*H*-pyrrolium tetrafluoroborate (12/(3,4)/EBF):

According to GP III, triethyloxonium tetrafluoroborate (27 mg, 0.14 mmol) was reacted with **2e** (49 mg, 0.09 mmol) in 1 mL DCM:CH_3CN (1:1) for 24 hours. Filtration of the solid precipitate gave **12/(3,4)/EBF** as yellow solid (41 mg, 68%). FTIR (KBr): ŭ = 3266, 2955, 2918, 2849, 1618, 1587, 1517, 1467, 1440, 1396, 1282, 1249, 1183, 1149, 1073, 957, 914, 874, 835, 798, 721, 600, 522, 500 cm^{-1}.^1H NMR (400 MHz, $CDCl_3$) δ = 8.65 (s, 1H), 7.58 (s, 1H), 7.09 (d, *J* = 8.4 Hz, 1H), 6.97 (s, 1H), 6.85 (d, *J* = 8.4 Hz, 1H), 4.33 – 4.29 (m, 2H), 4.02 – 3.98 (m, 2H), 3.95 – 3.90 (m, 4H), 3.29 – 3.26 (m, 2H), 1.85 – 1.76 (m, 4H), 1.47 – 1.43 (m, 8H), 1.32 – 1.26 (m, 31H), 0.90 – 0.86 (m, 6H) ppm. ^{13}C NMR (101 MHz, $CDCl_3$) δ = 171.5, 152.9, 149.2 146.0, 133.0, 127.1, 126.3, 115.8, 112.9, 69.6, 69.2, 57.3, 48.4, 32.1, 29.93, 29.91, 29.87, 29.8, 29.7, 29.63, 29.58, 29.57, 29.4, 29.3, 27.0, 26.25, 26.18, 22.9, 14.3, 12.7 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{37}H_{64}NO_2^+$ ($[M]^+$): 554.4932; Found: 554.4922.



(*E*)-4-(2,3-bis(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium iodide (12/(2,3)MI):

According to GP III, methyl iodide (31 µL, 0.49 mmol) was reacted with **2h** (0.12 g, 0.24 mmol) in 4 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/(2,3)MI** as yellow solid (93 mg, 57%). FTIR (KBr): ŭ = 3435, 3041, 2953, 2920, 2849, 2870, 1613, 1642, 1589, 1573, 1479, 1467, 1455, 1425, 1379, 1304, 1278, 1263, 1219, 1159, 1193, 1088, 1057, 986, 964, 948, 908, 863, 832, 786, 764, 746, 721, 616, 497 cm^{-1}.^1H NMR (600 MHz, $CDCl_3$) δ = 9.36 (s, 1H), 8.06 (s, 1H), 7.08 – 7.06(m, 2H), 7.01 – 7.00 (m, 1H), 4.49 – 4.47 (m, 2H), 4.03 – 4.01 (m, 2H), 3.97 (t, *J* = 6.6 Hz, 2H), 3.91 (s, 3H), 3.35 – 3.34 (m, 2H), 1.85 – 1.77 (m, 6H), 1.50 – 1.45 (m, 2H), 1.44 – 1.41 (m, 2H), 1.36 – 1.26 (m, 30H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.2, 152.7, 149.4, 140.6, 135.8, 128.3, 124.2, 120.7, 117.0, 75.0, 69.0, 60.7, 41.8, 32.09, 32.08, 30.4, 29.91, 29.88, 29.86, 29.8, 29.7, 29.6, 29.55, 29.52, 29.48, 27.7, 26.4, 26.1, 22.8, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aromatic region. HRMS (ESI): Exact mass calculated for $C_{36}H_{62}NO_2^+$ ($[M]^+$): 540.4775; Found: 540.4771.



(*E*)-4-(2,4-bis(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium iodide (12/(2,4)/MI):

According to GP III, methyl iodide (40 µL, 0.63 mmol) was reacted with **2f** (0.15 g, 0.32 mmol) in 4 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/(2,4)/MI** as yellow solid (0.14 g, 66%). FTIR (KBr): ϋ = 3432, 2872, 2922, 2851, 1640, 1584, 1499, 1469, 1447, 1435, 1389, 1318, 1266, 1230, 1193, 1164, 1110, 1079, 1029, 1008, 989, 912, 826, 721, 616, 594, 535, 498, 490 cm^{-1}.^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.07 (s, 1H), 8.03 (s, 1H), 7.45 (d, *J* = 9.0 Hz, 1H), 6.55 – 6.53 (m, 1H), 6.41 (s, 1H), 4.46 – 4.44 (m, 2H), 4.02 – 3.97 (m, 4H), 3.86 (s, 3H), 3.34 – 3.22 (m, 2H), 1.87 – 1.84 (m, 2H), 1.81 – 1.78 (m, 2H), 1.48 – 1.41 (m, 4H), 1.36 – 1.26 (m, 31H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 172.5, 164.7, 161.1, 140.2, 131.6, 131.2, 116.4, 106.8, 99.6, 69.2, 68.7, 60.1, 41.3, 32.1, 29.84, 29.81, 29.77, 29.7, 29.54, 29.50, 29.2, 29.1, 28.0, 26.1, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aromatic region. HRMS (ESI): Exact mass calculated for $C_{36}H_{62}NO_2^+$ ($[M]^+$): 540.4775; Found: 540.4787.

(*E*)-4-(3,5-bis(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium iodide (12/(3,5)/MI):

According to GP III, methyl iodide (31 µL, 0.50 mmol) was reacted with **2g** (0.13 g, 0.25 mmol) in 4 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/(3,5)/MI** as yellow solid (59 mg, 35%). FTIR (KBr): ϋ = 3435, 2955, 2920, 2851, 1618, 1585, 1466, 1418, 1384, 1341, 1302, 1260, 1165, 1196, 1090, 1059, 890, 835, 721, 680, 494 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.77 (s, 1H), 7.75 (s, 1H), 6.59 (s, 2H), 6.51 (s, 1H), 4.46 – 4.43 (m, 2H), 3.91 – 3.89 (m, 6H), 3.37 – 3.34 (m, 2H), 1.92 – 1.89 (m, 2H), 1.78 – 1.73 (m, 4H), 1.45 – 1.41 (m, 4H), 1.35 – 1.27 (m, 31H), 0.89 – 0.87 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.4, 160.7, 146.1, 135.8, 135.4, 109.4, 105.1, 68.6, 60.6, 41.6, 32.1, 29.84, 29.80, 29.76, 29.6, 29.5, 29.3, 27.7, 26.2, 22.8, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{36}H_{62}NO_2^+$ ($[M]^+$): 540.4775; Found: 540.4769.

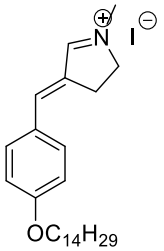
(*E*)-4-(4-(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium iodide (12/p/MI):

According to GP III, methyl iodide (15 µL, 0.25 mmol) was reacted with **2c** (42 mg, 0.12 mmol) in 2 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/p/MI** as yellow solid (49 mg, 83%). FTIR (KBr): ϋ = 3436, 2948, 2867, 2948, 2921, 1643, 1617, 1594, 1575, 1560, 1511, 1471, 1448, 1423, 1381, 1312, 1274, 1257, 1189, 1178, 1160, 1120, 1090, 1058, 1043, 913, 1003, 1025, 991, 896, 848, 811, 835,

788, 765, 720, 609, 587, 540, 494 cm^{-1}. ^1H NMR (400 MHz, $CDCl_3$) δ = 9.55 (s, 1H), 7.79 (s, 1H), 7.48 (d, *J* = 8.8 Hz, 2H), 6.92 (d, *J* = 8.4 Hz, 2H), 4.48 – 4.45 (m, 2H), 3.98 (t, *J* = 6.4 Hz, 2H), 3.83 (s, 3H), 3.33 – 3.30 (m, 2H), 1.82 – 1.75 (m, 2H), 1.45 – 1.41 (m, 2H), 1.32 – 1.27 (m, 16H), 0.90 – 0.86 (m, 3H). ^{13}C NMR (101 MHz, cdcl$_3$) δ = 172.6, 162.4, 145.6, 133.6, 132.5, 126.6, 115.4, 68.5, 60.3, 32.0, 29.74, 29.71, 29.68, 29.6, 29.5, 29.4, 29.1, 27.69, 27.68, 26.0, 22.8, 14.2 ppm. HRMS (ESI): Exact mass calculated for $C_{24}H_{38}NO^+$ ($[M]^+$): 356.2948; Found: 356.2955.

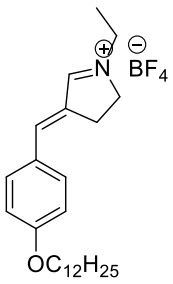
(*E*)-1-methyl-4-(4-(tetradecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (14/p/MI):

According to GP III, methyl iodide (31 µL, 0.49 mmol) was reacted with **2k** (0.09 g, 0.24 mmol) in 2 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **14/p/MI** as yellow solid (0.08 g, 67%). FTIR (KBr): ϑ = 3436, 2948, 2920, 2851, 1617, 1594, 1561, 1512, 1471, 1448, 1423, 1382, 1312, 1275, 1259, 1179, 1161, 1120, 1037, 1024, 1013, 976, 914, 896, 811, 719, 610, 588, 540, 494 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 9.62 (s, 1H), 7.81 (s, 1H), 7.49 (d, *J* = 9.0 Hz, 2H), 6.94 (d, *J* = 8.4 Hz, 2H), 4.41 – 4.38 (m, 2H), 4.01 – 3.99 (m, 2H), 3.83 (s, 3H), 3.35 – 3.33 (m, 2H), 1.82 – 1.78 (m, 2H), 1.67 – 1.64 (m, 4H), 1.48 – 1.43 (m, 2H), 1.36 – 1.26 (m, 16H), 0.88 (t, *J* = 7.2 Hz, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.0, 162.6, 146.1, 133.7, 132.4, 126.7, 115.6, 68.7, 60.2, 41.1, 32.1, 29.88, 29.86, 29.85, 29.84, 29.79, 29.7, 29.6, 29.5, 29.2, 27.7, 26.1, 22.9, 14.3 ppm. HRMS (ESI): Exact mass calculated for $C_{26}H_{42}NO^+$ ($[M]^+$): 384.3261; Found: 384.3256.



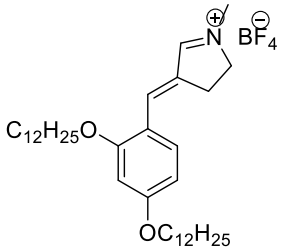
(*E*)-4-(4-(dodecyloxy)benzylidene)-1-ethyl-3,4-dihydro-2*H*-pyrrolium tetrafluoroborate (12/p/EBF):

According to GP III, triethyloxonium tetrafluoroborate (0.19 g, 1.0 mmol) was reacted with **2c** (0.17 g, 0.50 mmol) in 4 mL DCM:CH_3CN (1:1) for 24 hours. Filtration of the solid precipitate gave **12/p/EBF** as yellow solid (0.12 g, 53%). FTIR (KBr): ϑ = 3443, 3495, 3084, 3291, 2919, 2849, 1593, 1562, 1513, 1617, 1469, 1430, 1395, 1386, 1324, 1311, 1256, 1175, 1159, 1072, 1055, 1024, 904, 834, 813, 765, 722, 622, 589, 541, 521, 503 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 8.67 (s, 1H), 7.63 – 7.62 (m, 1H), 7.45 – 7.43 (m, 2H), 6.90 – 6.88 (m, 2H), 4.32 – 4.30 (m, 2H), 3.98 – 3.92 (m, 4H), 3.28 – 3.27 (m, 2H), 1.80 – 1.75 (m, 3H), 1.47 – 1.43 (m, 4H), 1.35 – 1.27 (m, 16H), 0.88 (t, *J* = 7.2 Hz, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 171.3, 162.1, 145.1, 133.4, 133.1, 126.9, 115.3, 68.5, 57.4, 48.3, 32.0, 29.8, 29.75, 29.70, 29.55, 29.46, 29.2, 26.9, 26.1, 22.8, 14.2, 12.5 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{25}H_{40}NO^+$ ($[M]^+$): 370.3104; Found: 370.3126.



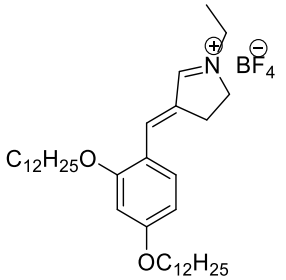
(*E*)-4-(2,4-bis(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium tetrafluoroborate (12/(2,4)/MBF):

According to GP III, trimethyloxonium tetrafluoroborate (0.1 g, 0.67 mmol) was reacted with **2f** (0.16 g, 0.33 mmol) in 4 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/(2,4)/MBF** as yellow solid (0.10 g, 48%). FTIR (KBr): ϑ = 3428, 3089, 2921, 2851, 1587, 1502, 1470, 1436, 1405, 1390, 1319, 1269, 1232, 1194, 1164, 1113, 1067, 1033, 913, 826, 721, 643, 614, 594, 535, 522, 497 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 8.47 (s, 1H), 7.95 (s, 1H), 7.42 (d, *J* = 9.0 Hz, 1H), 6.53 (d, *J* = 8.4 Hz, 1H), 6.40 (s, 1H), 4.32 (t, *J* = 6.6 Hz, 2H), 4.00 – 3.95 (m, 4H), 3.67 (s, 3H), 3.31 – 3.26 (m, 2H), 1.86 – 1.83 (m, 2H), 1.81 – 1.78 (m, 2H), 1.47 – 1.41 (m, 4H), 1.35 – 1.27 (m, 32H), 0.89 – 0.86 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 172.6, 164.4, 160.8, 139.3, 132.0, 131.4, 116.5, 106.6, 99.5, 69.1, 68.6, 59.3, 39.8, 32.0, 29.80, 29.77, 29.74, 29.71, 29.53, 29.48, 29.4, 29.2, 29.0, 27.7, 26.1, 26.0, 22.8, 14.2 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aromatic region. HRMS (ESI): Exact mass calculated for $C_{36}H_{62}NO_2^+$ ($[M]^+$): 540.4775; Found: 540.4750.



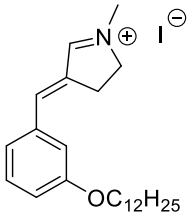
(*E*)-4-(2,4-bis(dodecyloxy)benzylidene)-1-ethyl-3,4-dihydro-2*H*-pyrrolium tetrafluoroborate (12/(2,4)/EBF):

According to GP III, triethyloxonium tetrafluoroborate (0.13 g, 0.70 mmol) was reacted with **2f** (0.16 g, 0.35 mmol) in 4 mL DCM:CH_3CN (1:1) for 24 hours. Filtration of the solid precipitate gave **12/(2,4)/EBF** as yellow solid (0.12 g, 52%). FTIR (KBr): ϑ = 3443, 2921, 2851, 1584, 1501, 1470, 1435, 1391, 1320, 1271, 1216, 1194, 1159, 1111, 1083, 1060, 1033, 908, 826, 721, 643, 613, 595, 521, 501 cm^{-1}.^1H NMR (600 MHz, $CDCl_3$) δ = 8.49 (s, 1H), 7.99 (s, 1H), 7.43 (d, *J* = 9.0 Hz, 1H), 6.53 (d, *J* = 9.0 Hz, 1H), 6.40 (d, *J* = 2.4 Hz, 1H), 4.33 – 4.31 (m, 2H), 4.01 – 3.96 (m, 6H), 3.31 – 3.28 (m, 2H), 1.87 – 1.82 (m, 2H), 1.81 – 1.76 (m, 2H), 1.49 – 1.41 (m, 8H), 1.38 – 1.27 (m, 31H), 0.89 – 0.86 (m, 6H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 171.1, 164.6, 161.1, 140.1, 131.61, 131.56, 116.6, 106.7, 99.6, 69.2, 68.7, 57.2, 48.3, 32.1, 29.9, 29.85, 29.80, 29.78, 29.6, 29.5, 29.3, 29.0, 27.4, 26.1, 22.9, 14.3, 12.9 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{37}H_{64}NO_2^+$ ($[M]^+$): 554.4932; Found: 554.4933.



(*E*)-4-(3-(dodecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium iodide (12/m/MI):

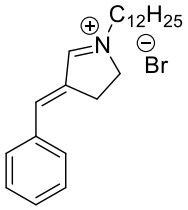
According to GP III, methyl iodide (13 µL, 0.21 mmol) was reacted with **2d** (36 mg, 0.11 mmol) in 1



mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **12/m/MI** as yellow solid (21 mg, 40%). FTIR (KBr): ῡ = 3489, 3422, 2954, 2922, 2851, 1616, 1594, 1576, 1494, 1457, 1385, 1331, 1309, 1264, 1206, 1181, 1158, 1093, 1030, 954, 909, 888, 787, 721, 684, 501, 463 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 9.78 (s, 1H), 7.81 (s, 1H), 7.34 – 7.32 (m, 1H), 7.09 (d, *J* = 7.8 Hz, 1H), 6.98 (s, 2H), 4.47 – 4.45 (m, 2H), 3.94 – 3.92 (m, 2H), 3.88 (s, 3H), 3.40 – 3.34 (m, 2H), 1.78 – 1.76 (m, 4H), 1.47 – 1.42 (m, 2H), 1.35 – 1.27 (m, 14H), 0.89 – 0.87 (m, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.4, 159.7, 146.0, 135.7, 135.1, 130.4, 123.5, 118.5, 116.7, 68.5, 60.7, 41.6, 32.1, 29.85, 29.81, 29.80, 29.8, 29.6, 29.5, 29.4, 27.7, 26.2, 22.9, 14.3 ppm. HRMS (ESI): Exact mass calculated for $C_{24}H_{38}NO^+$ ($[M]^+$): 356.2948; Found: 356.2968.

(*E*)-4-benzylidene-1-dodecyl-3,4-dihydro-2*H*-pyrrolium bromide (PhC12Br):

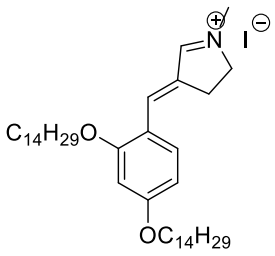
According to GP III, *n*-bromododecane (0.38 mL, 1.59 mmol) was reacted with previously



synthesized (*E*)-4-benzylidene-3,4-dihydro-2H-pyrrole[9] (0.11 g, 0.72 mmol) in 4 mL DCM:CH_3CN (1:3) in an inert atmosphere and allowed to heat at 60 °C for 72 hours. Filtration of the solid precipitate gave **PhC12Br** as brown soft solid (0.14 g, 47%). FTIR (KBr): ῡ = 3476, 2955, 2922, 2852, 1622, 1595, 1574, 1493, 1470, 1457, 1388, 1357, 1327, 1192, 1182, 1104, 1029, 1003, 935, 895, 801, 773, 723, 693, 504, 435 cm^{-1}. ^1H NMR (600 MHz, $CDCl_3$) δ = 10.00 (s, 1H), 7.96 (s, 1H), 7.53 – 7.52 (m, 2H), 7.46 – 7.41 (m, 3H), 4.50 – 4.48 (m, 2H), 4.18 – 4.16 (m, 2H), 3.39 – 3.38 (m, 2H), 1.88 – 1.83 (m, 2H), 1.35 – 1.23 (m, 18H), 0.89 – 0.86 (m, 3H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 172.8, 146.2, 135.5, 134.0, 131.9, 131.2, 129.4, 58.0, 53.9, 45.3, 32.0, 29.7, 29.6, 29.5, 29.4, 29.1, 27.5, 27.1, 26.5, 24.4, 22.8, 14.2 ppm. HRMS (ESI): Exact mass calculated for $C_{23}H_{36}N^+$ ($[M]^+$): 326.2842; Found: 326.2863.

(*E*)-4-(2,4-bis(tetradecyloxy)benzylidene)-1-methyl-3,4-dihydro-2*H*-pyrrolium iodide (14/(2,4)/MI):

According to GP III, methyl iodide (31 µL, 0.50 mmol) was reacted with **2j** (0.14 g, 0.25 mmol) in 2

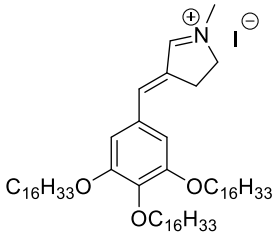


mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **14/(2,4)/MI** as yellow solid (0.11 g, 64%). FTIR (KBr): ῡ = 3436, 2947, 2920, 2850, 1617, 1594, 1560, 1511, 1471, 1423, 1382, 1312, 1275, 1259, 1178, 1161, 1120, 1036, 1024, 1013, 896, 835, 811, 797, 719, 610, 588, 540, 494 cm^{-1}. ^1H NMR (400 MHz, $CDCl_3$) δ = 9.07 (s, 1H), 8.03 (s, 1H), 7.45 (d, *J* = 8.8 Hz, 1H), 6.54 (dd, *J* = 8.8, 2.0 Hz, 1H), 6.41 (d, *J* = 2.0 Hz, 1H), 4.47 – 4.44 (m, 2H), 4.02 – 3.96 (m, 4H), 3.86 (s, 3H), 3.35 – 3.32 (m, 2H), 1.87 – 1.77 (m, 4H), 1.47

– 1.42 (m, 4H), 1.31 – 1.26 (m, 40H), 0.89 – 0.86 (m, 6H) ppm. ^{13}C NMR (101 MHz, $CDCl_3$) δ = 172.5, 164.6, 161.0, 140.0, 131.6, 131.2, 116.4, 106.7, 99.5, 69.1, 68.7, 60.1, 41.3, 32.1, 29.88, 29.86, 29.83, 29.77, 29.7, 29.54, 29.53, 29.49, 29.2, 29.0, 28.0, 26.1, 22.9, 14.3 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aromatic region. HRMS (ESI): Exact mass calculated for $C_{40}H_{70}NO_2^+$ ([M]$^+$): 596.5401; Found: 596.5372.

(*E*)-1-methyl-4-(3,4,5-tris(hexadecyloxy)benzylidene)-3,4-dihydro-2*H*-pyrrolium iodide (16/3/MI):

According to GP III, methyl iodide (28 µL, 0.45 mmol) was reacted with **2l** (0.20 g, 0.22 mmol) in 2 mL DCM:CH_3CN (1:3) for 24 hours. Filtration of the solid precipitate gave **16/3/MI** as yellow solid (0.88 g, 78%). FTIR (KBr): ϑ = 3400, 2955, 2917, 2849, 1612, 1571, 1502, 1467, 1437, 1379, 1339, 1252, 1176, 1124, 987, 920, 815, 720, 633, 498 cm^{-1}. ^{1}H NMR (600 MHz, $CDCl_3$) δ = 9.81 (s, 1H), 7.75 (s, 1H), 6.73 (s, 2H), 4.37 – 4.35 (m, 2H), 4.05 (t, *J* = 6.6 Hz, 2H), 3.96 (t, *J* = 6.6 Hz, 4H), 3.84 (s, 3H), 3.37 – 3.36 (m, 2H), 1.83 – 1.79 (m, 4H), 1.76 – 1.71 (m, 3H), 1.50 – 1.45 (m, 6H), 1.38 – 1.26 (m, 71H), 0.88 (t, *J* = 7.2 Hz, 9H) ppm. ^{13}C NMR (151 MHz, $CDCl_3$) δ = 173.5, 153.6, 147.2, 142.7, 133.2, 128.8, 110.3, 74.0, 69.7, 60.0, 41.1, 32.1, 30.6, 30.0, 29.90, 29.89, 29.8, 29.7, 29.6, 29.5 (2C), 26.3, 26.2, 22.9, 14.4 ppm. Total count of ^{13}C is less than expected due to the merging of signals in the aliphatic region. HRMS (ESI): Exact mass calculated for $C_{60}H_{110}NO_3^+$ ([M]$^+$): 892.8480; Found: 892.8478.



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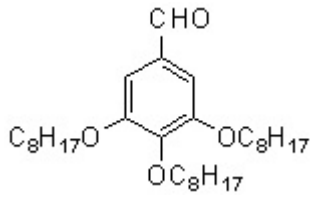
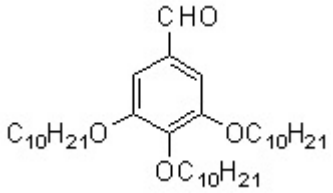

CHO
C8H17O
OC8H17
OC8H17

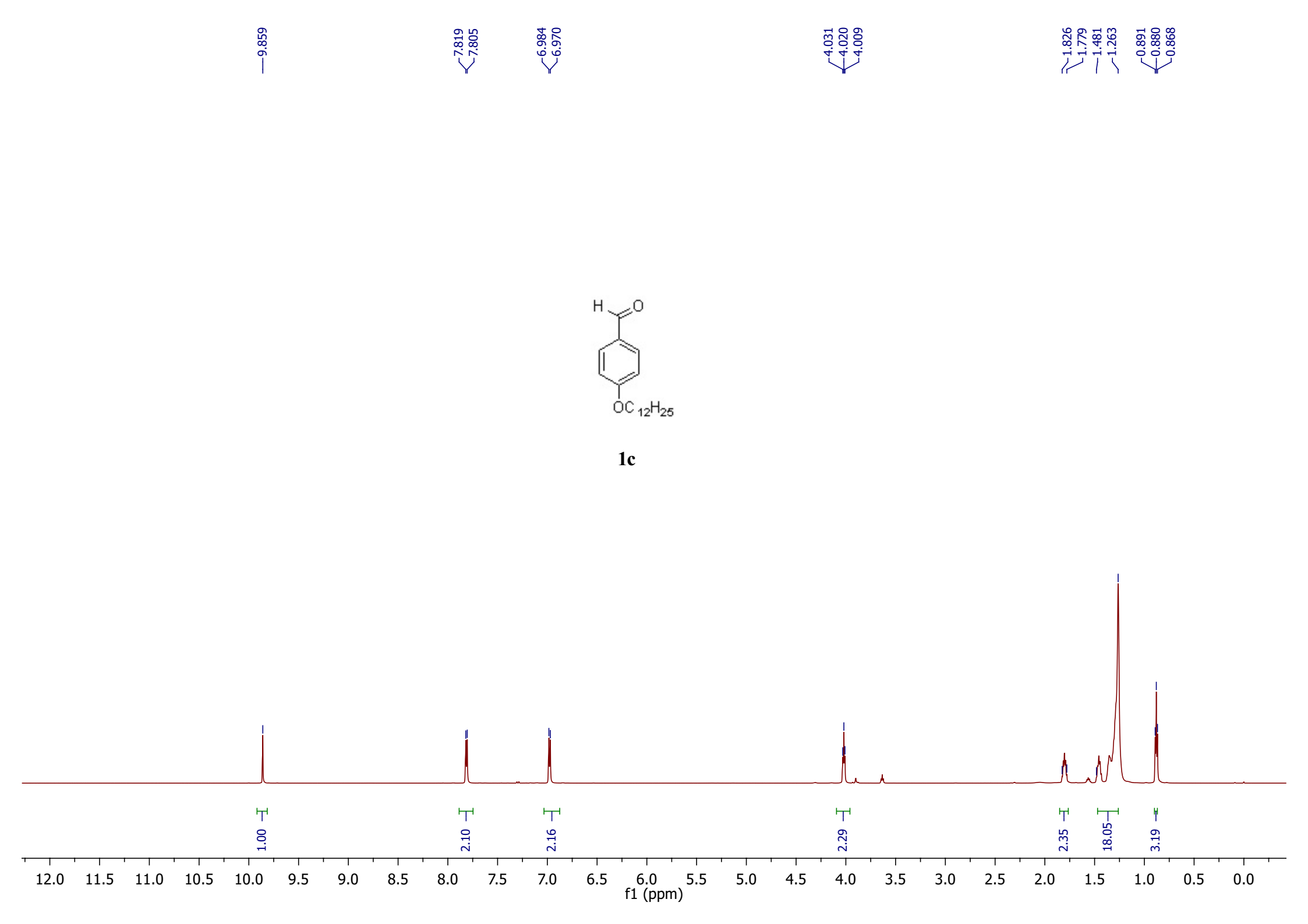
1a

9.823
7.260
7.077
4.064
4.053
4.018
1.847
1.799
1.770
1.723
1.635
1.616
1.498
1.448
1.376
1.250
0.894
0.882
0.867
0.97
2.16
6.23
4.43
2.24
1.87
6.01
22.33
9.32
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


CHO
C10H21O
OC10H21
OC10H21

1b

9.828
7.270
7.084
4.072
4.033
4.023
1.853
1.806
1.779
1.731
1.506
1.457
1.374
1.272
0.894
0.883
0.871
0.99
2.07
6.25
4.15
2.20
6.27
36.31
9.34
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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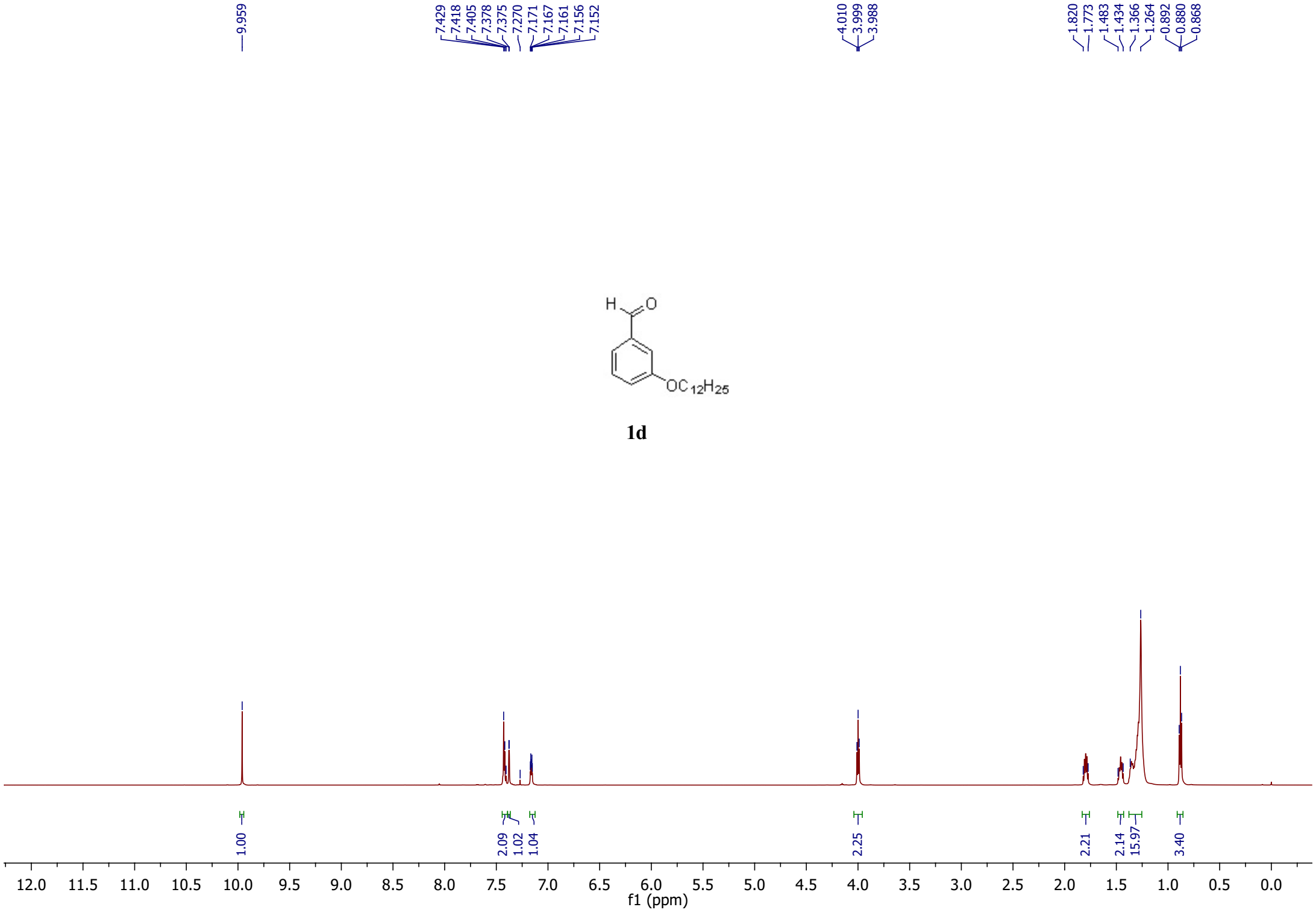
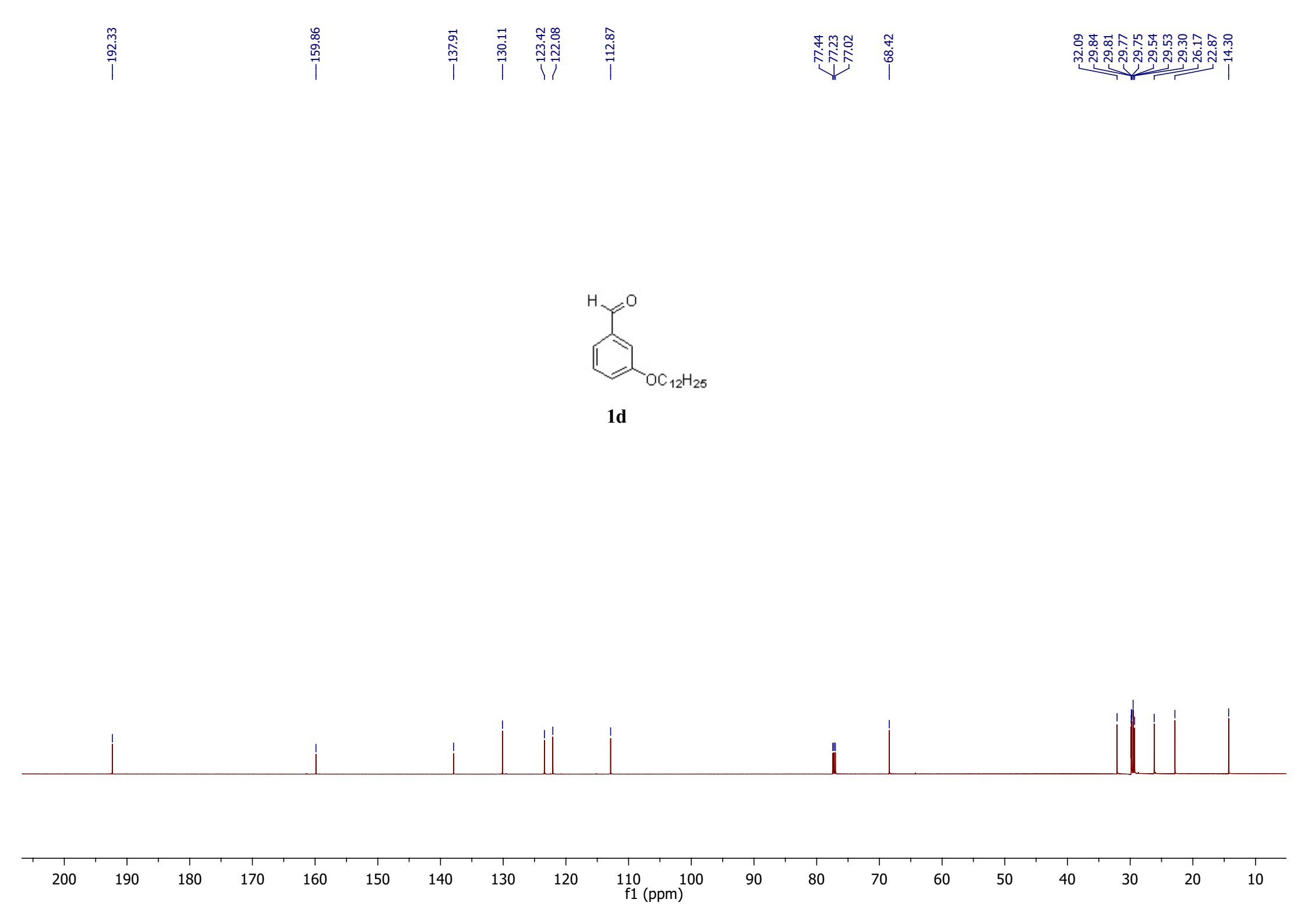
7.819
7.805
6.984
6.970
4.031
4.020
4.009
1.826
1.779
1.481
1.263
0.891
0.880
0.868
H
O
OC 12H25
1.00
2.10
2.16
2.29
2.35
18.05
3.19
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

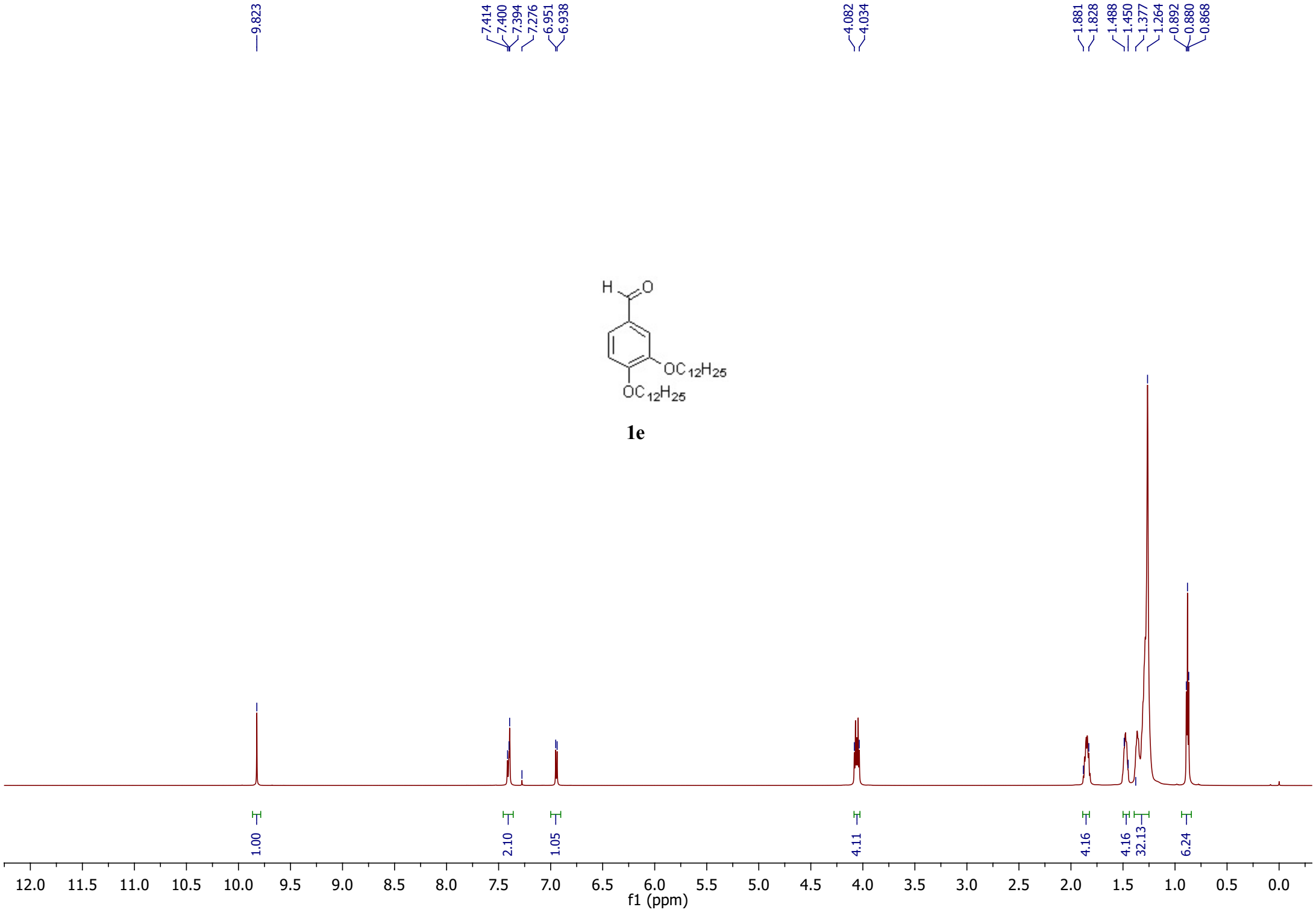
1c


9.959
7.429
7.418
7.405
7.378
7.375
7.270
7.171
7.167
7.161
7.156
7.152
4.010
3.999
3.988
1.820
1.773
1.483
1.434
1.366
1.264
0.892
0.880
0.868
H
O
OC12H25
1.00
2.09
1.02
1.04
2.25
2.21
2.14
15.97
3.40
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

1d


192.33
159.86
137.91
130.11
123.42
122.08
112.87
77.44
77.23
77.02
68.42
32.09
29.84
29.81
29.77
29.75
29.54
29.53
29.30
26.17
22.87
14.30
H
O
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

1d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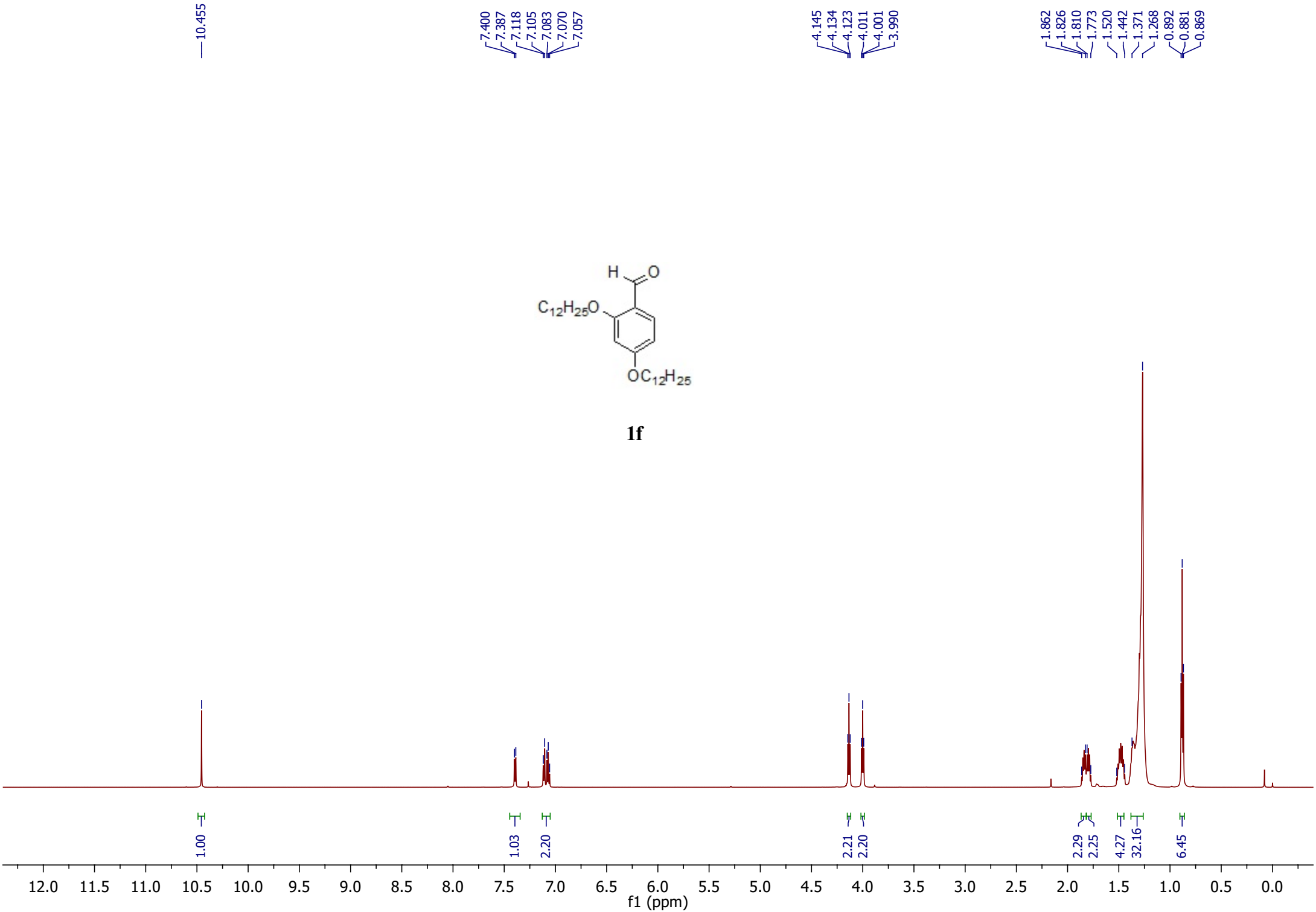
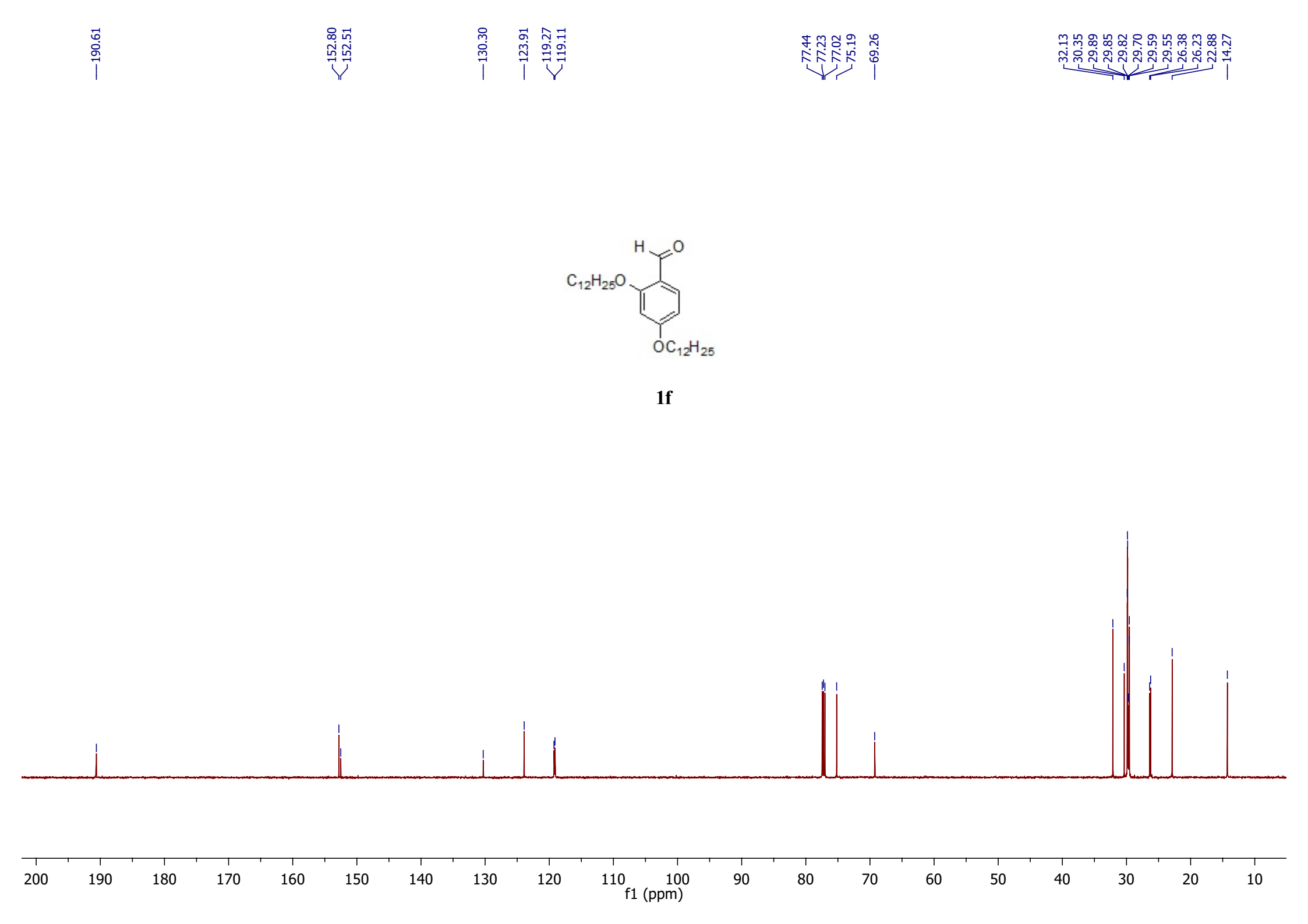
7.400
7.394
7.276
6.951
6.938
4.082
4.034
1.881
1.828
1.488
1.450
1.377
1.264
0.892
0.880
0.868
H
O
OC12H25
OC12H25
1.00
2.10
1.05
4.11
4.16
4.16
32.13
6.24
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

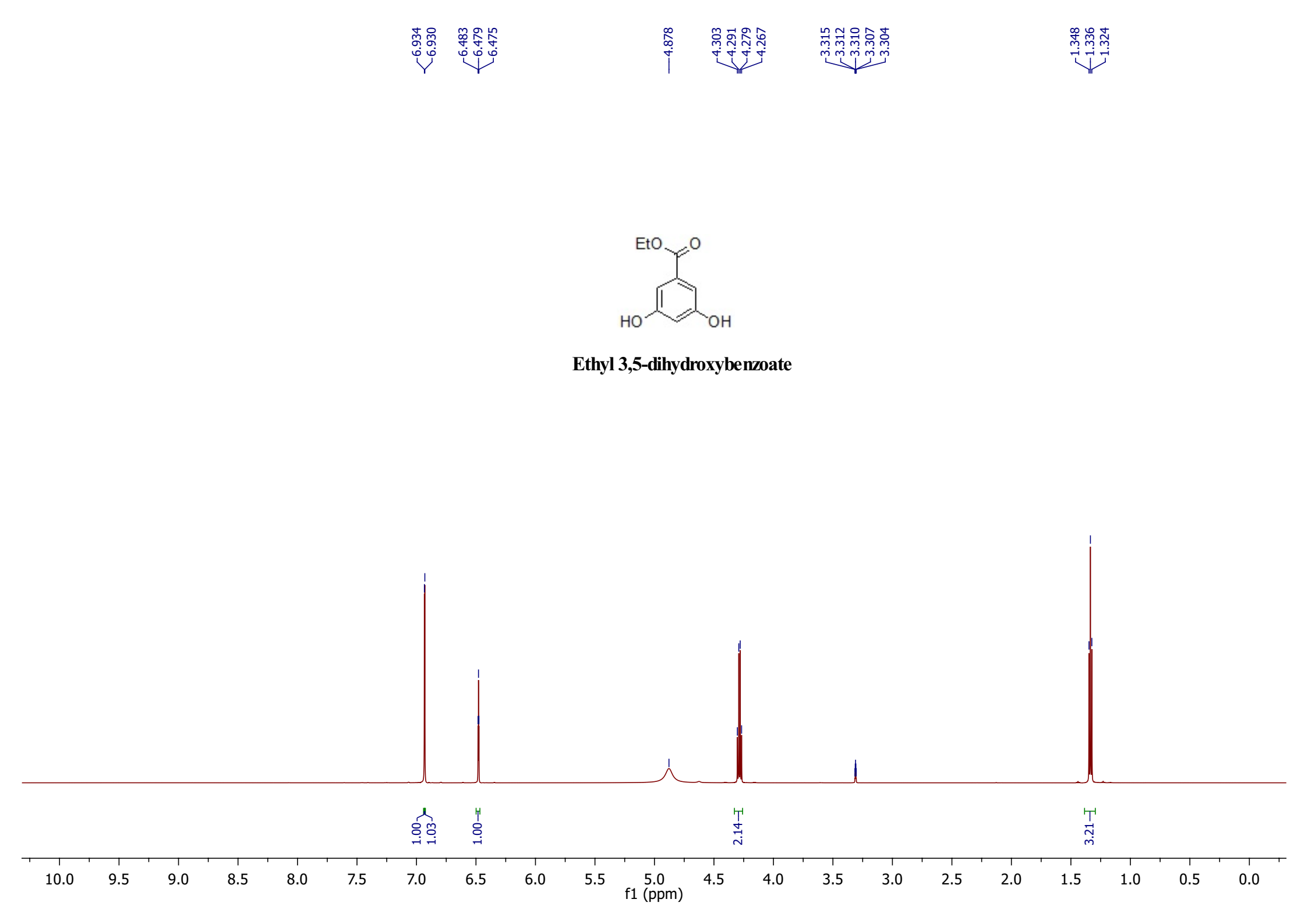
1e


10.455
7.400
7.387
7.118
7.105
7.083
7.070
7.057
4.145
4.134
4.123
4.011
4.001
3.990
1.862
1.826
1.810
1.773
1.520
1.442
1.371
1.268
0.892
0.881
0.869
H
O
C12H25O
OC12H25
1.00
1.03
2.20
2.21
2.20
2.29
2.25
4.27
32.16
6.45
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

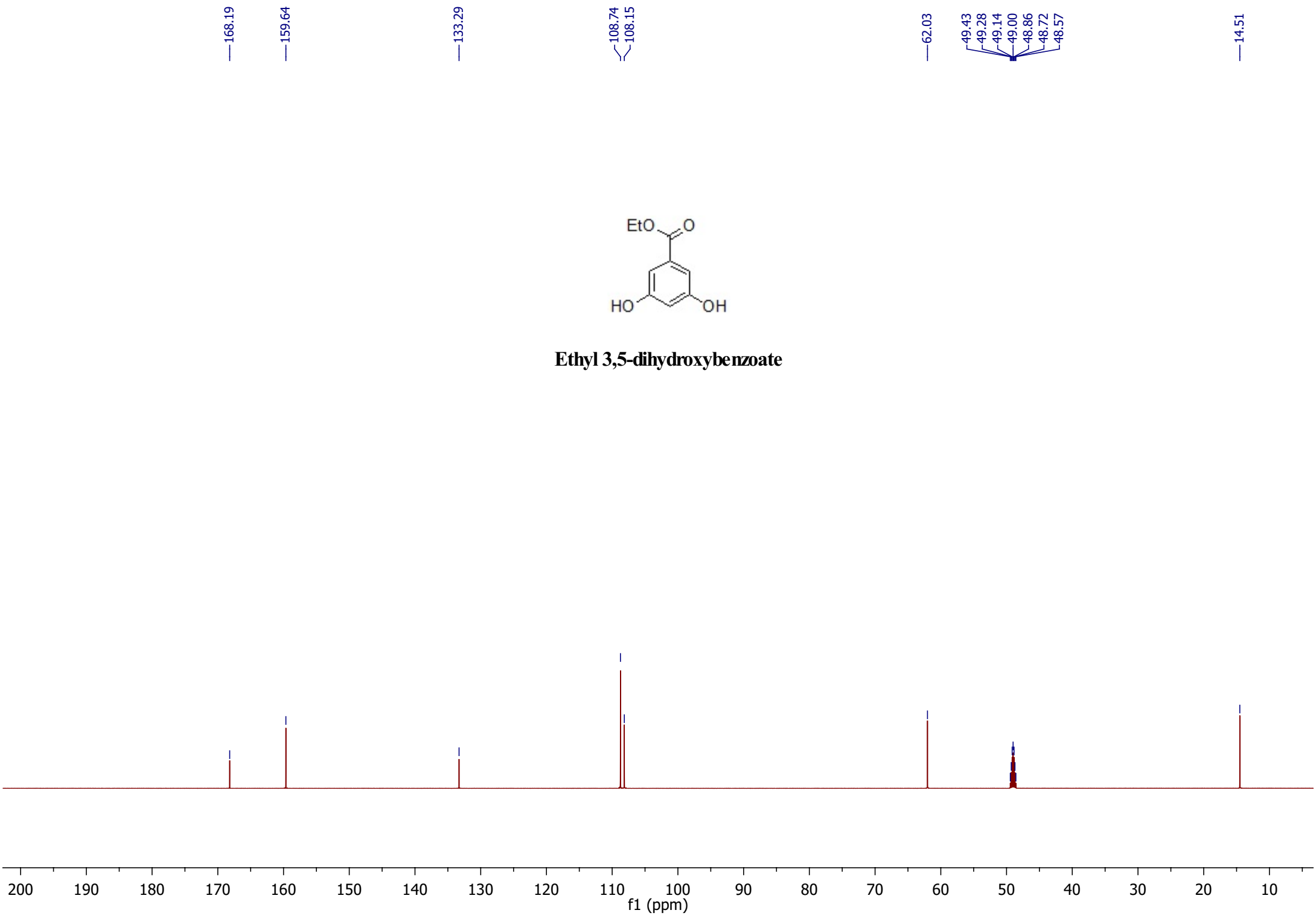
1f


190.61
152.80
152.51
130.30
123.91
119.27
119.11
77.44
77.23
77.02
75.19
69.26
32.13
30.35
29.89
29.85
29.82
29.70
29.59
29.55
26.38
26.23
22.88
14.27
H
O
C12H25O
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

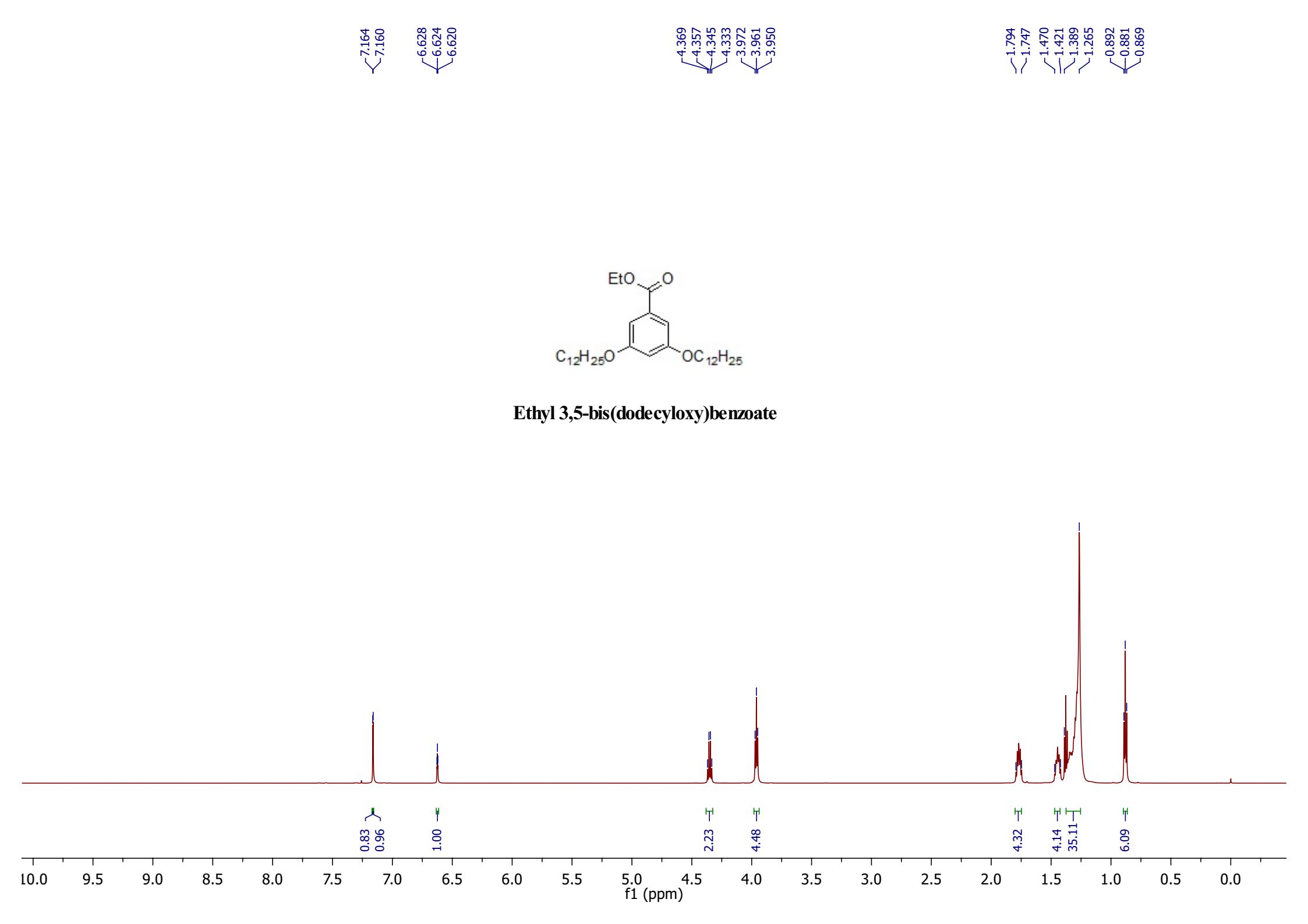
1f



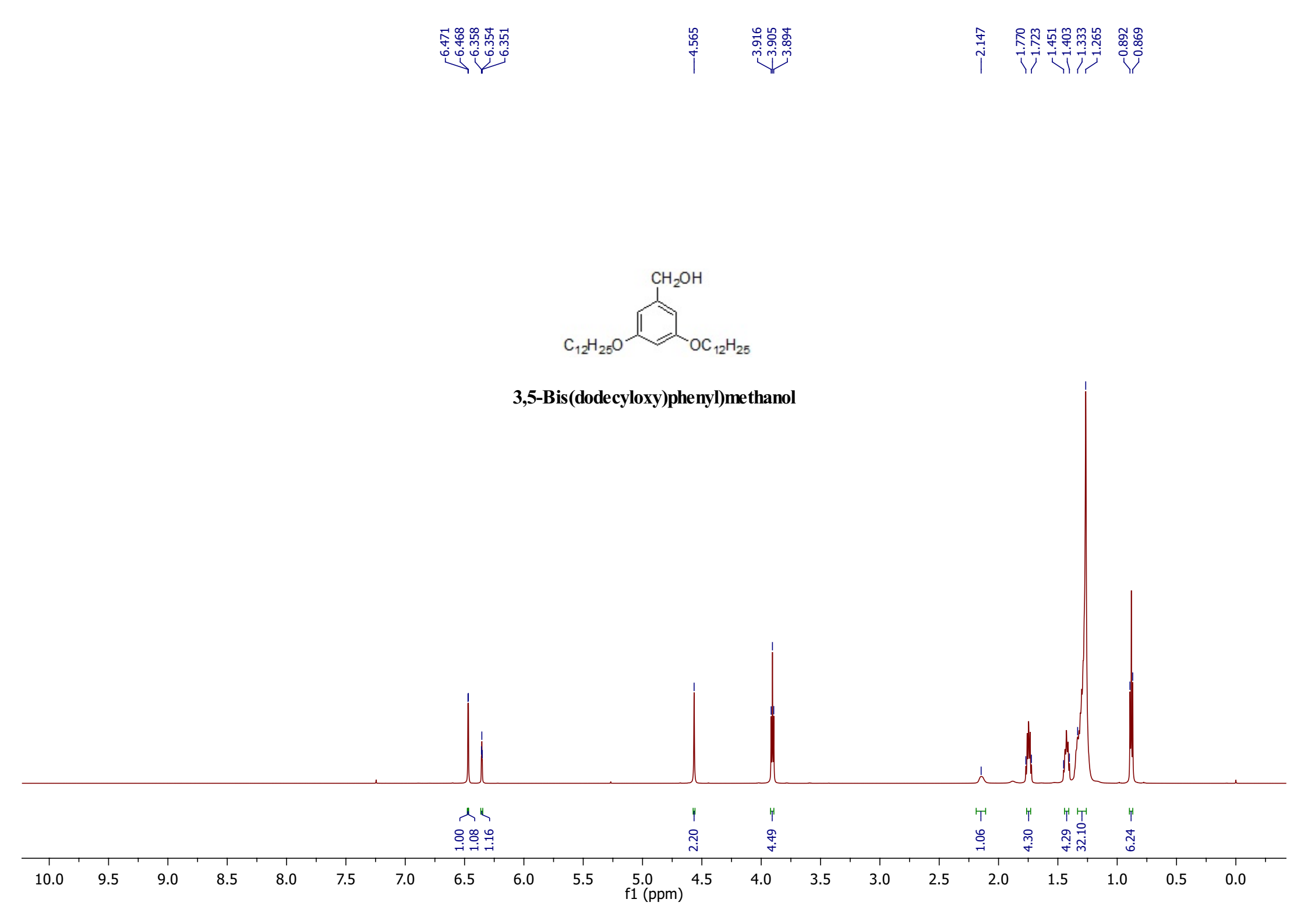
Ethyl 3,5-dihydroxybenzoate

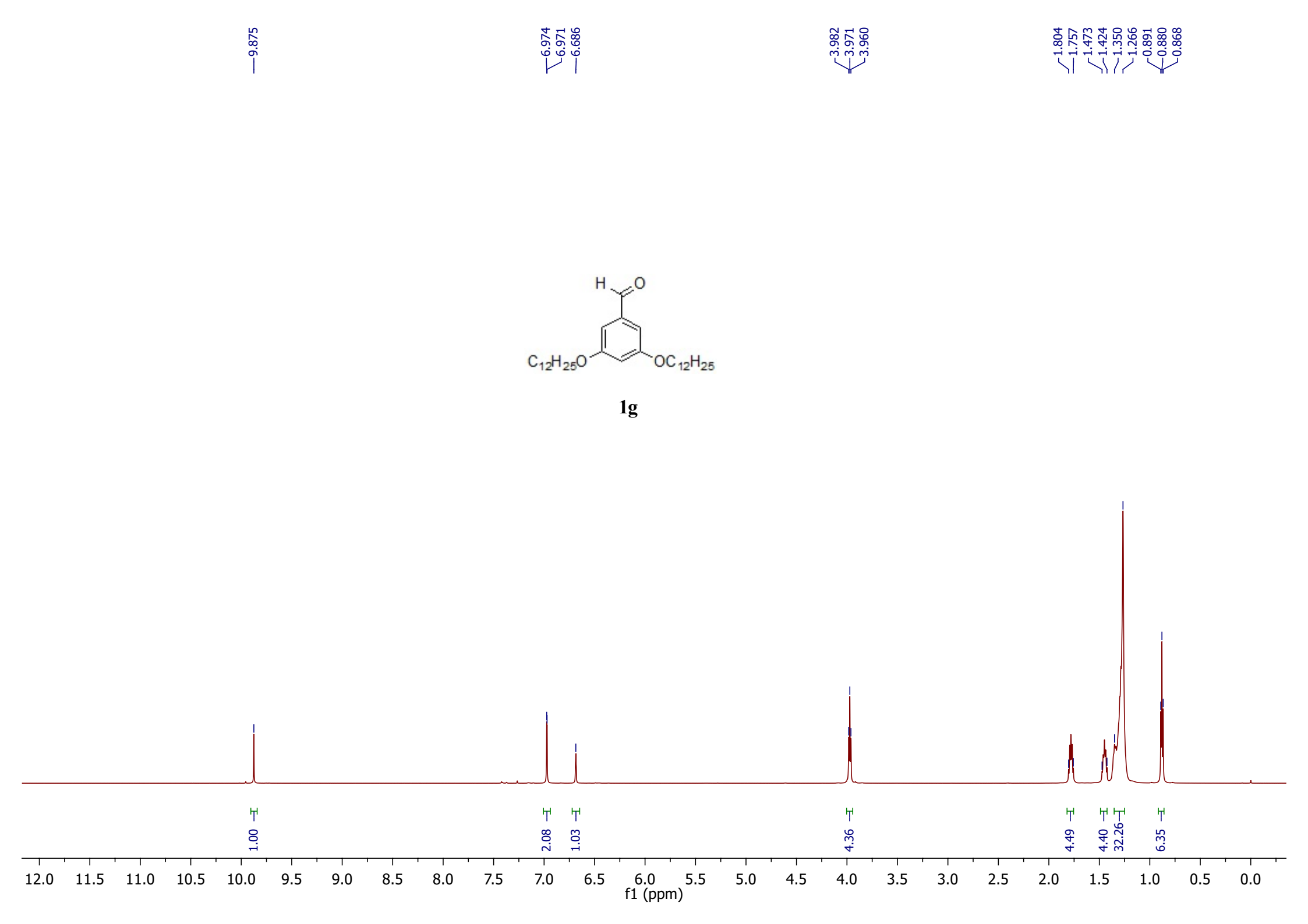


Ethyl 3,5-dihydroxybenzoate



Ethyl 3,5-bis(dodecyloxy)benzoate


6.471
6.468
6.358
6.354
6.351
4.565
3.916
3.905
3.894
2.147
1.770
1.723
1.451
1.403
1.333
1.265
0.892
0.869
CH2OH
C12H25O
OC12H25
3,5-Bis(dodecyloxy)phenyl)methanol
1.00
1.08
1.16
2.20
4.49
1.06
4.30
4.29
32.10
6.24
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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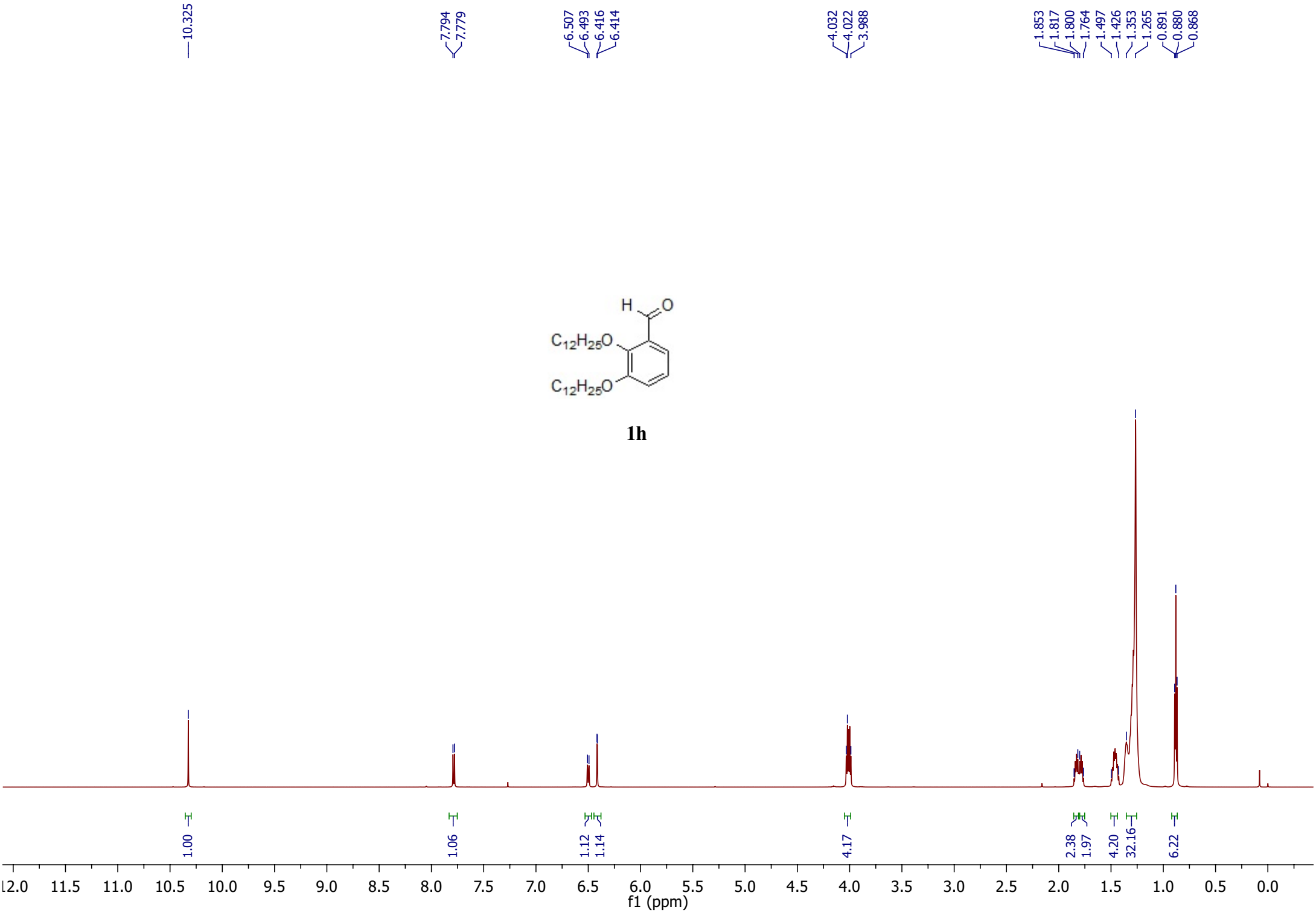
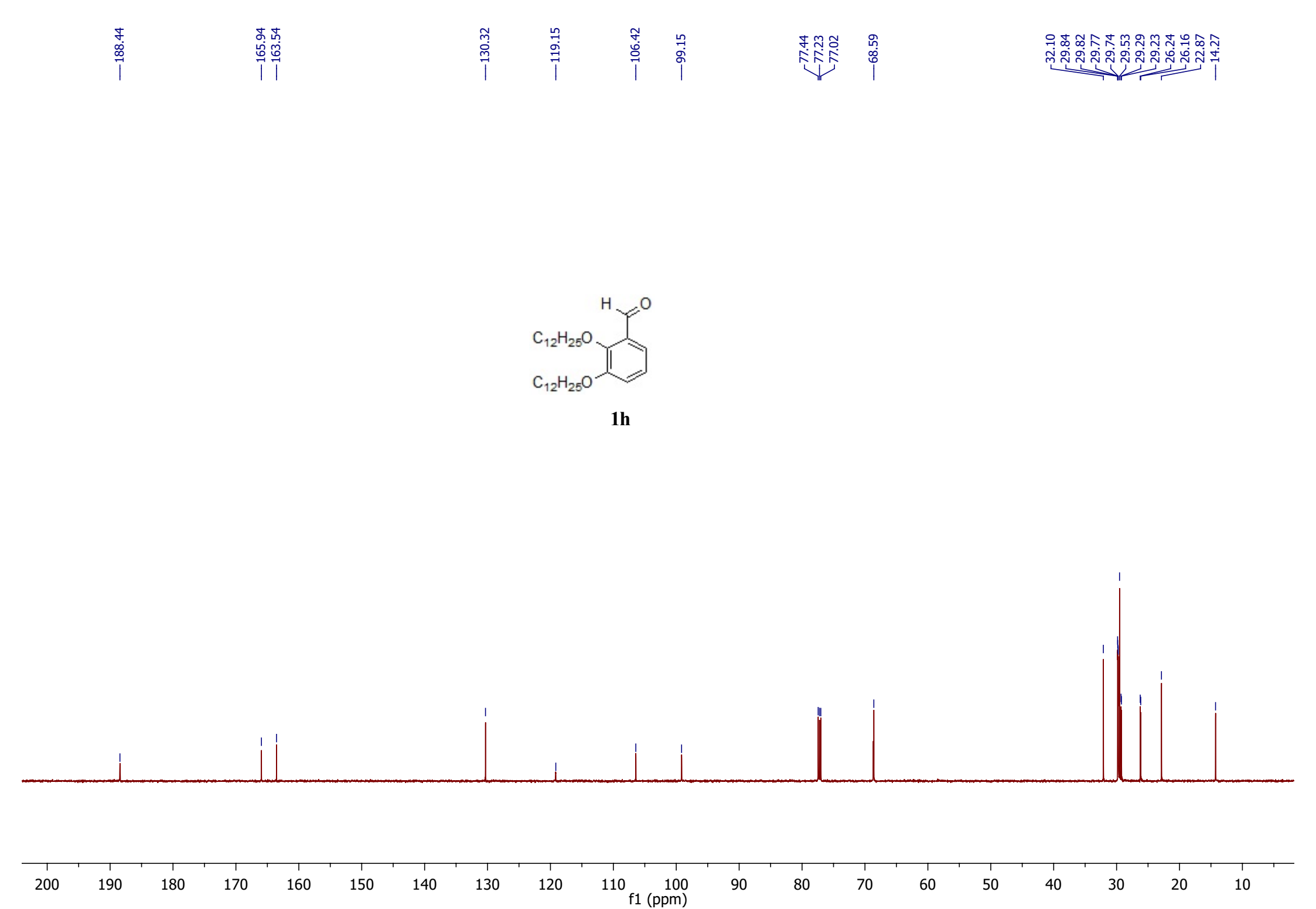
6.686
3.982
3.971
3.960
1.804
1.757
1.473
1.424
1.350
1.266
0.891
0.880
0.868
H
O
C12H25O
OC12H25
1.00
2.08
1.03
4.36
4.49
4.40
32.26
6.35
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

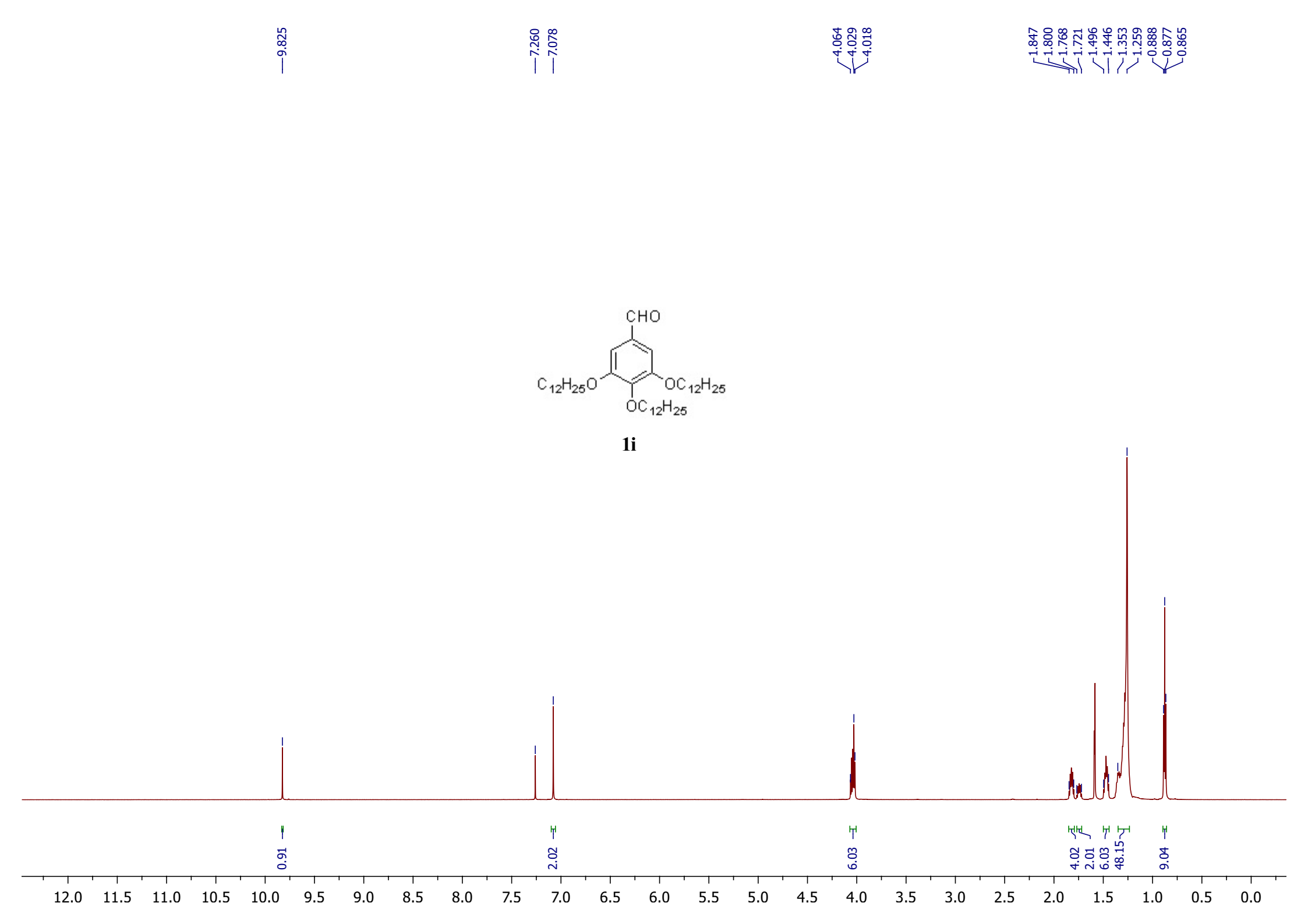
1g


10.325
7.794
7.779
6.507
6.493
6.416
6.414
4.032
4.022
3.988
1.853
1.817
1.800
1.764
1.497
1.426
1.353
1.265
0.891
0.880
0.868
H
O
$C_{12}H_{25}O$
$C_{12}H_{25}O$
1.00
1.06
1.12
1.14
4.17
2.38
1.97
4.20
32.16
6.22
f1 (ppm)

1h


188.44
165.94
163.54
130.32
119.15
106.42
99.15
77.44
77.23
77.02
68.59
32.10
29.84
29.82
29.77
29.74
29.53
29.29
29.23
26.24
26.16
22.87
14.27
H
O
C12H25O
C12H25O
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

1h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7.260
7.078
4.064
4.029
4.018
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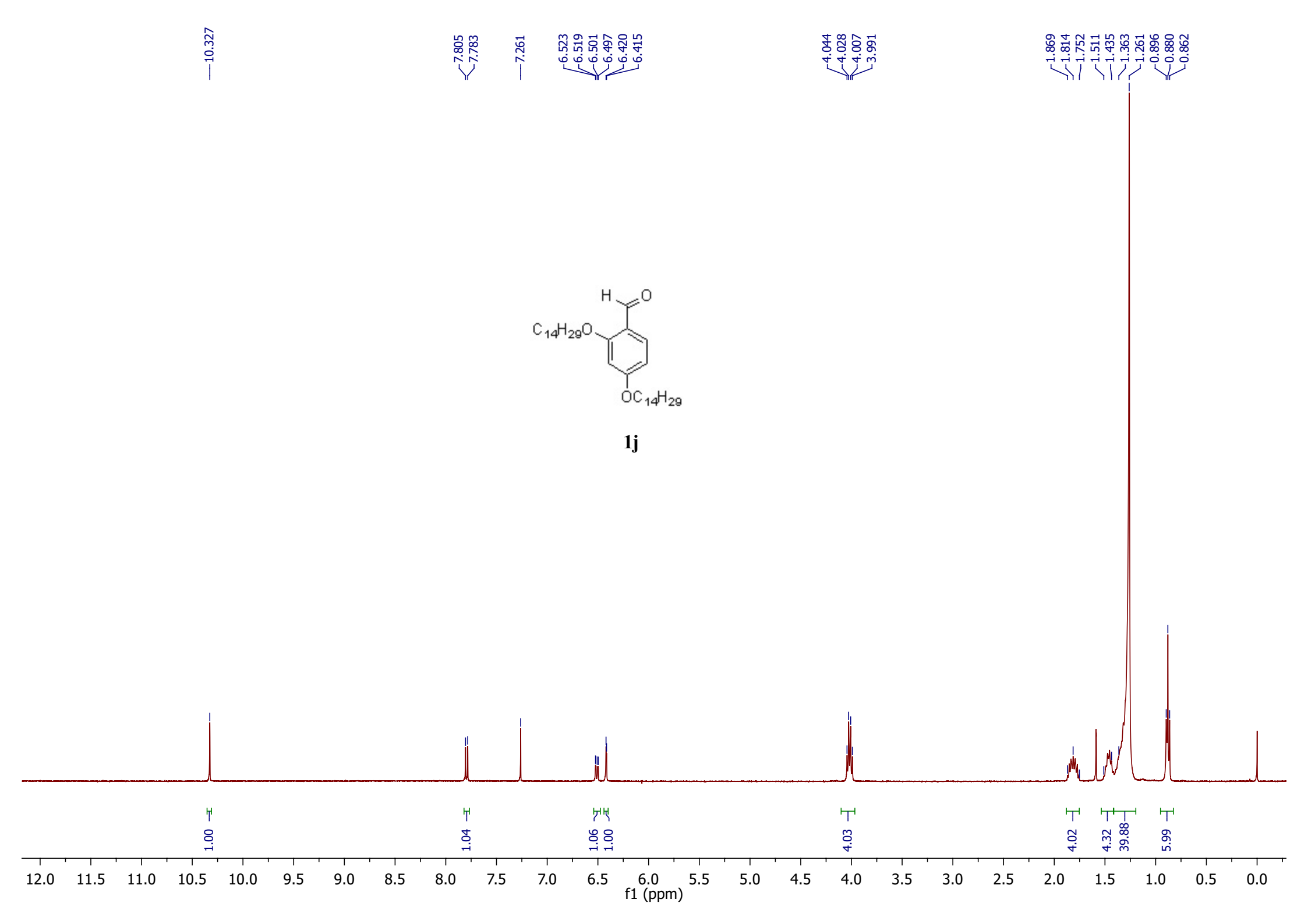
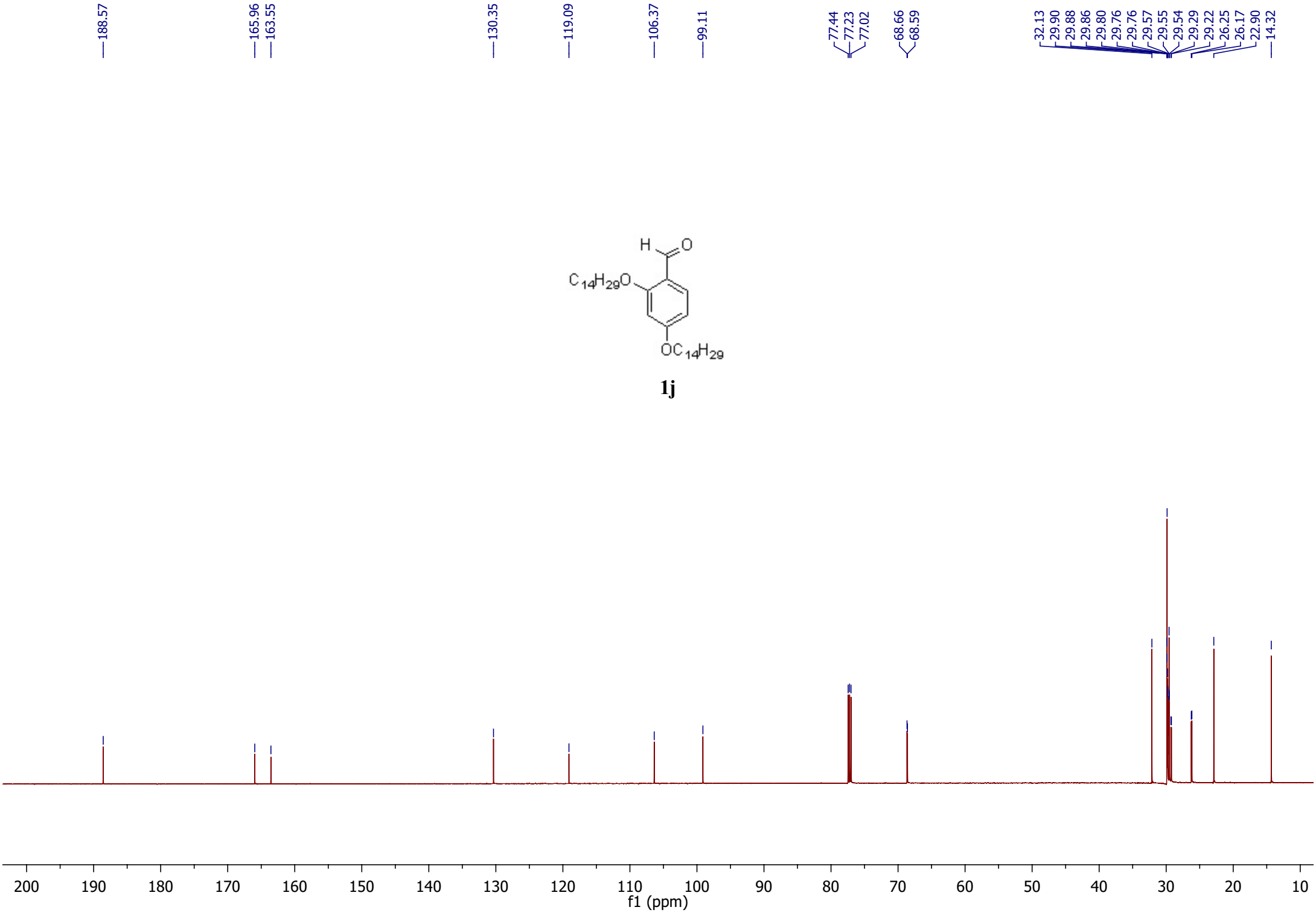
1.800
1.768
1.721
1.496
1.446
1.353
1.259
0.888
0.877
0.865
CHO
C12H25O
OC12H25
OC12H25
0.91
2.02
6.03
4.02
2.01
6.03
48.15
9.04
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0

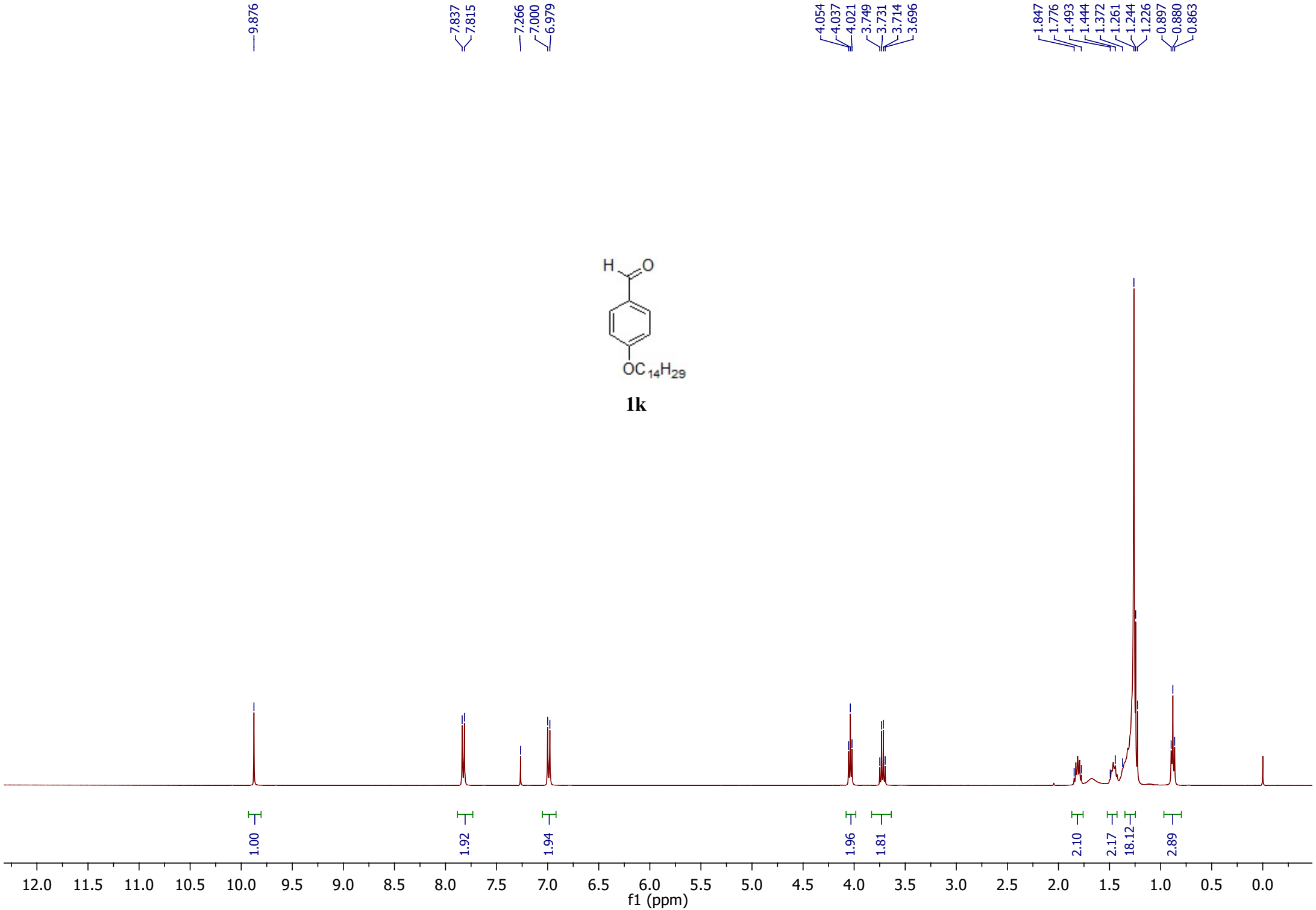
1i


10.327
7.805
7.783
7.261
6.523
6.519
6.501
6.497
6.420
6.415
4.044
4.028
4.007
3.991
1.869
1.814
1.752
1.511
1.435
1.363
1.261
0.896
0.880
0.862
H
O
C14H29O
OC14H29
1.00
1.04
1.06
1.00
4.03
4.02
4.32
39.88
5.99
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

1j


188.57
165.96
163.55
130.35
119.09
106.37
99.11
77.44
77.23
77.02
68.66
68.59
32.13
29.90
29.88
29.86
29.80
29.76
29.76
29.57
29.55
29.54
29.29
29.22
26.25
26.17
22.90
14.32
H
O
C14H29O
OC14H29
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

1j


9.876
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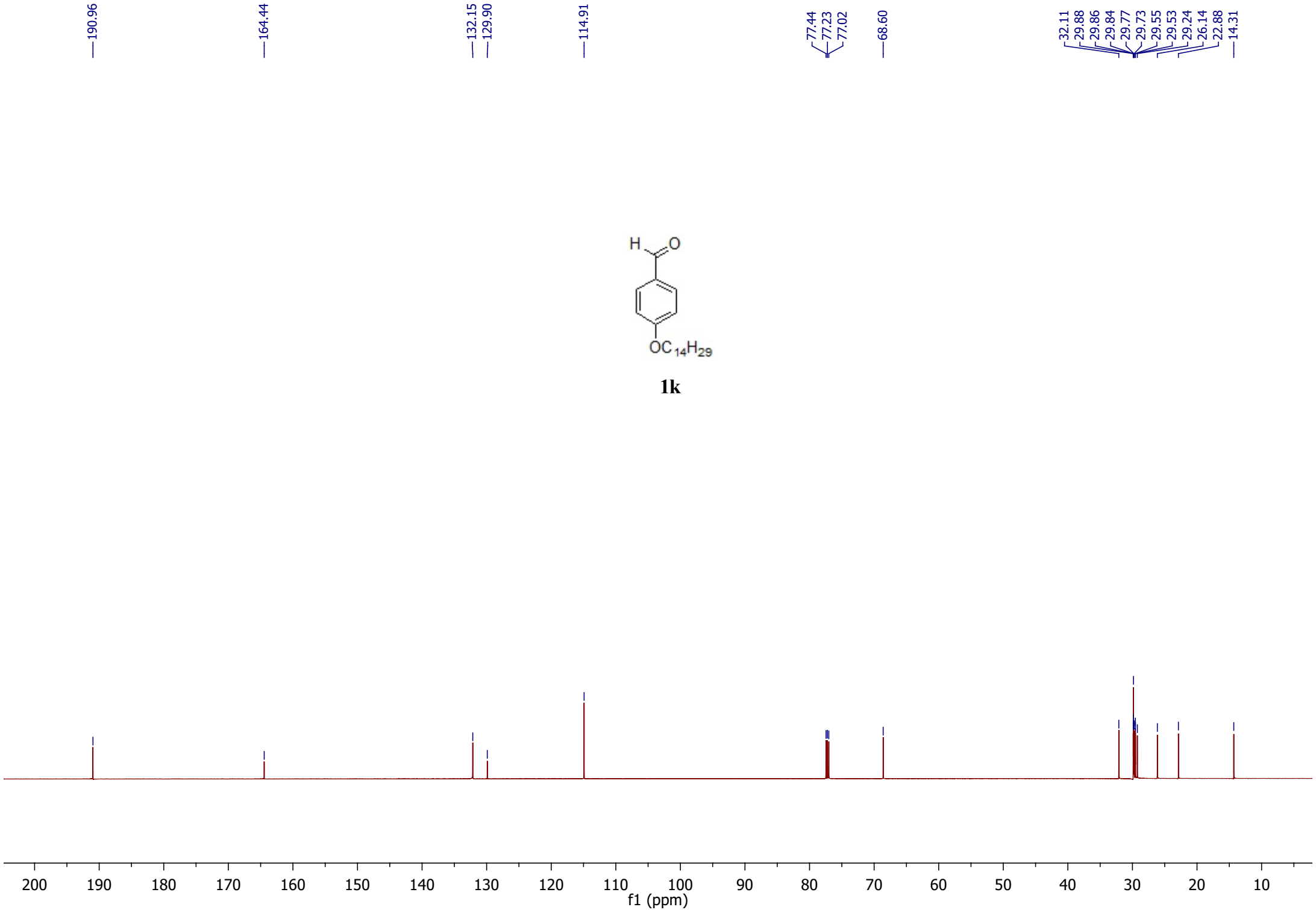
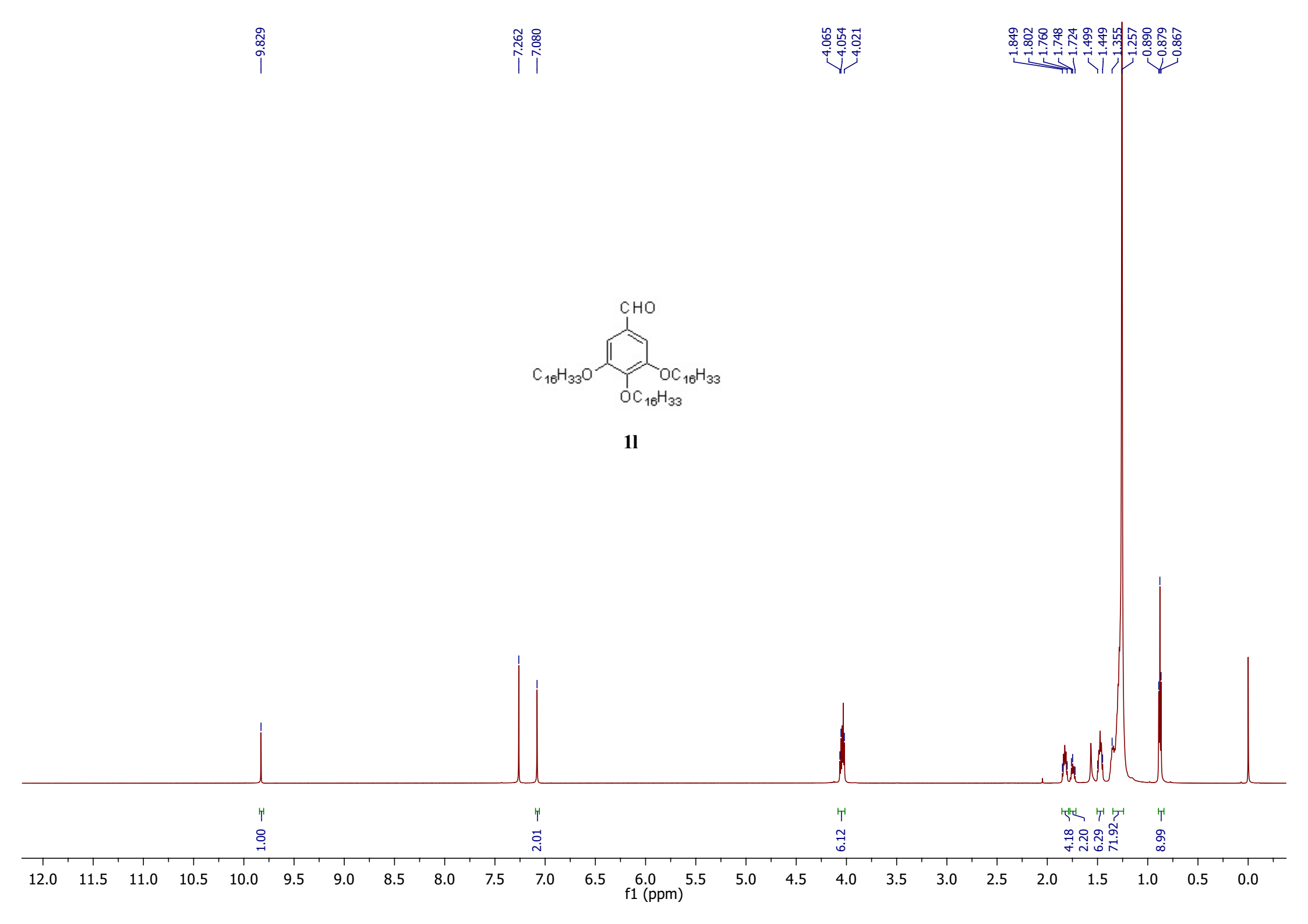
7.815
7.266
7.000
6.979
4.054
4.037
4.021
3.749
3.731
3.714
3.696
1.847
1.776
1.493
1.444
1.372
1.261
1.244
1.226
0.897
0.880
0.863
H
O
OC14H29
1.00
1.92
1.94
1.96
1.81
2.10
2.17
18.12
2.89
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

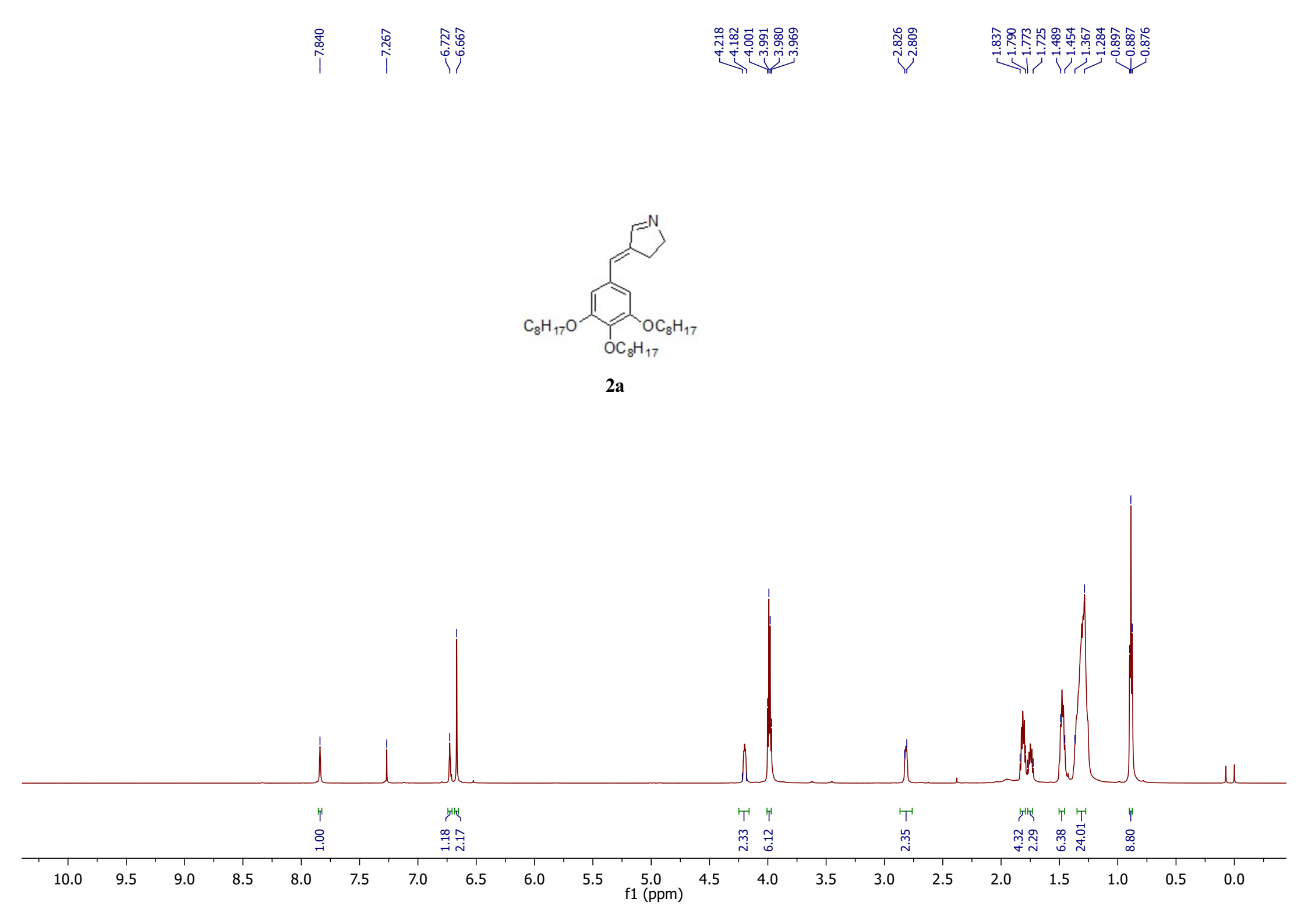
1k


190.96
164.44
132.15
129.90
114.91
77.44
77.23
77.02
68.60
32.11
29.88
29.86
29.84
29.77
29.73
29.55
29.53
29.24
26.14
22.88
14.31
H
O
OC14H29
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

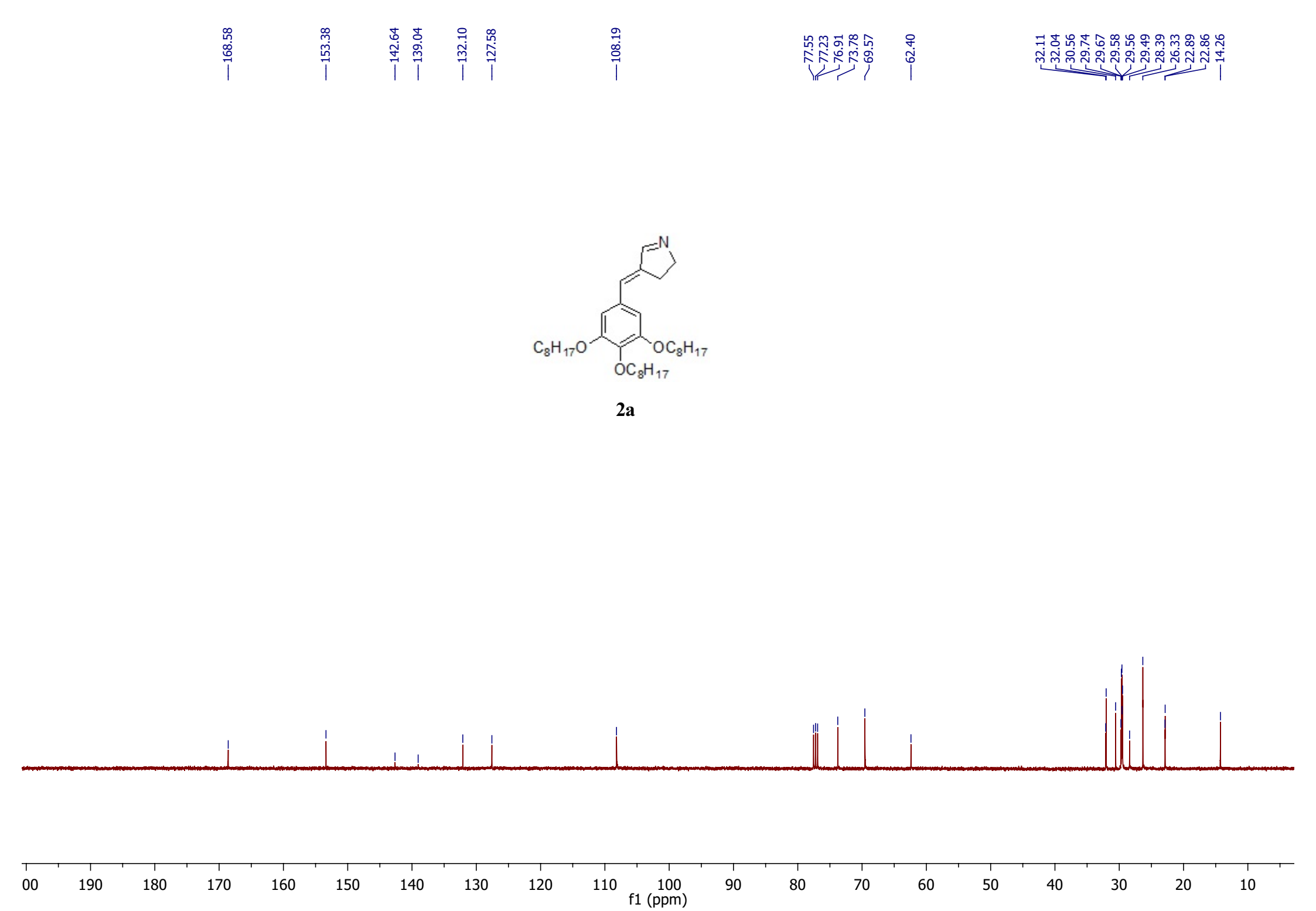
1k


9.829
7.262
7.080
4.065
4.054
4.021
1.849
1.802
1.760
1.748
1.724
1.499
1.449
1.355
1.257
0.890
0.879
0.867
CHO
C16H33O
OC16H33
OC16H33
1.00
2.01
6.12
4.18
2.20
6.29
71.92
8.99
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

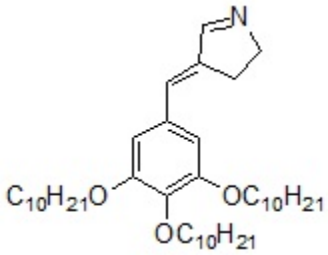
1l


7.840
7.267
6.727
6.667
4.218
4.182
4.001
3.991
3.980
3.969
2.826
2.809
1.837
1.790
1.773
1.725
1.489
1.454
1.367
1.284
0.897
0.887
0.876
N
C8H17O
OC8H17
OC8H17
1.00
1.18
2.17
2.33
6.12
2.35
4.32
2.29
6.38
24.01
8.80
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

2a

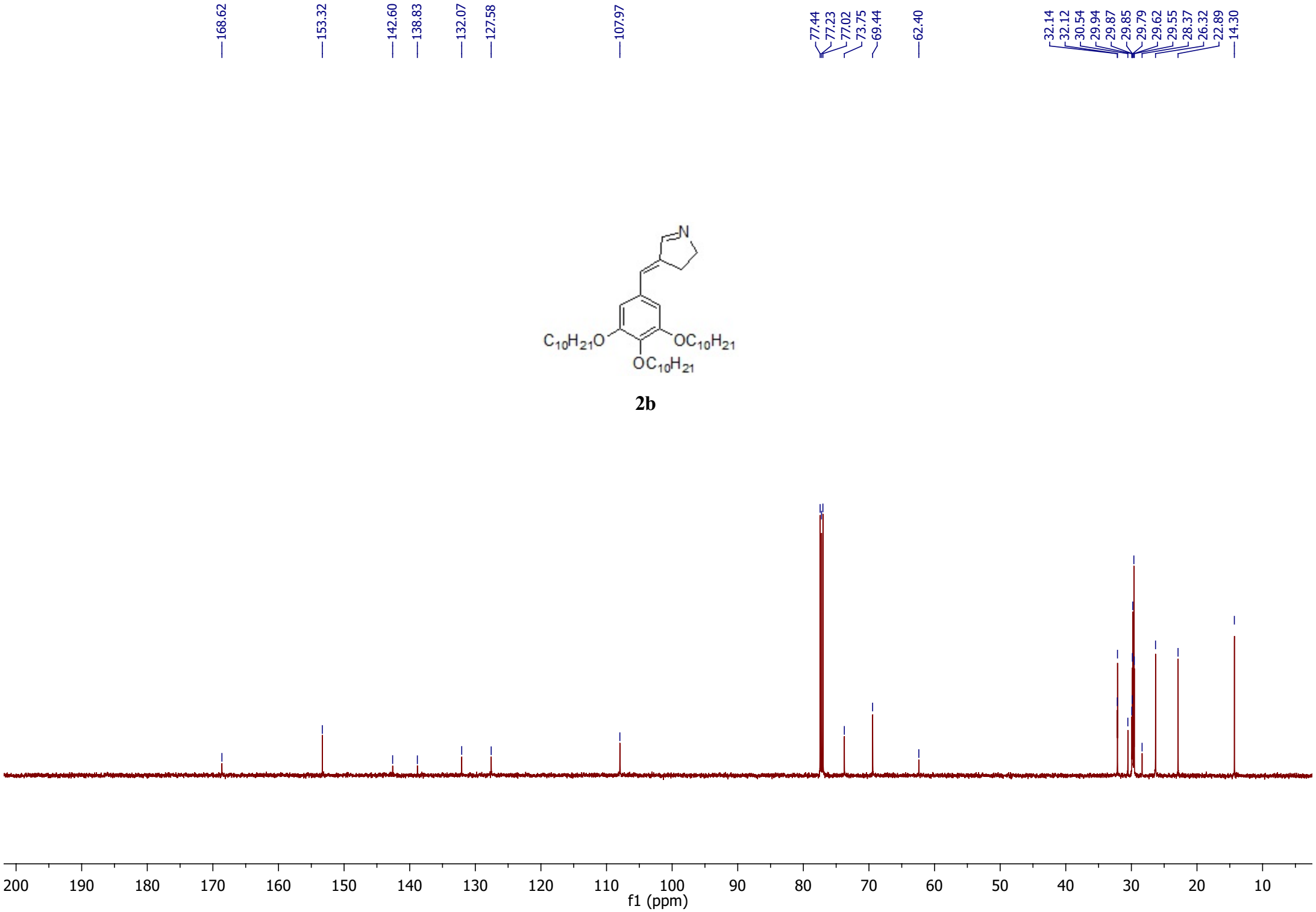

168.58
153.38
142.64
139.04
132.10
127.58
108.19
77.55
77.23
76.91
73.78
69.57
62.40
32.11
32.04
30.56
29.74
29.67
29.58
29.56
29.49
28.39
26.33
22.89
22.86
14.26
N
C8H17O
OC8H17
OC8H17
00
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

2a

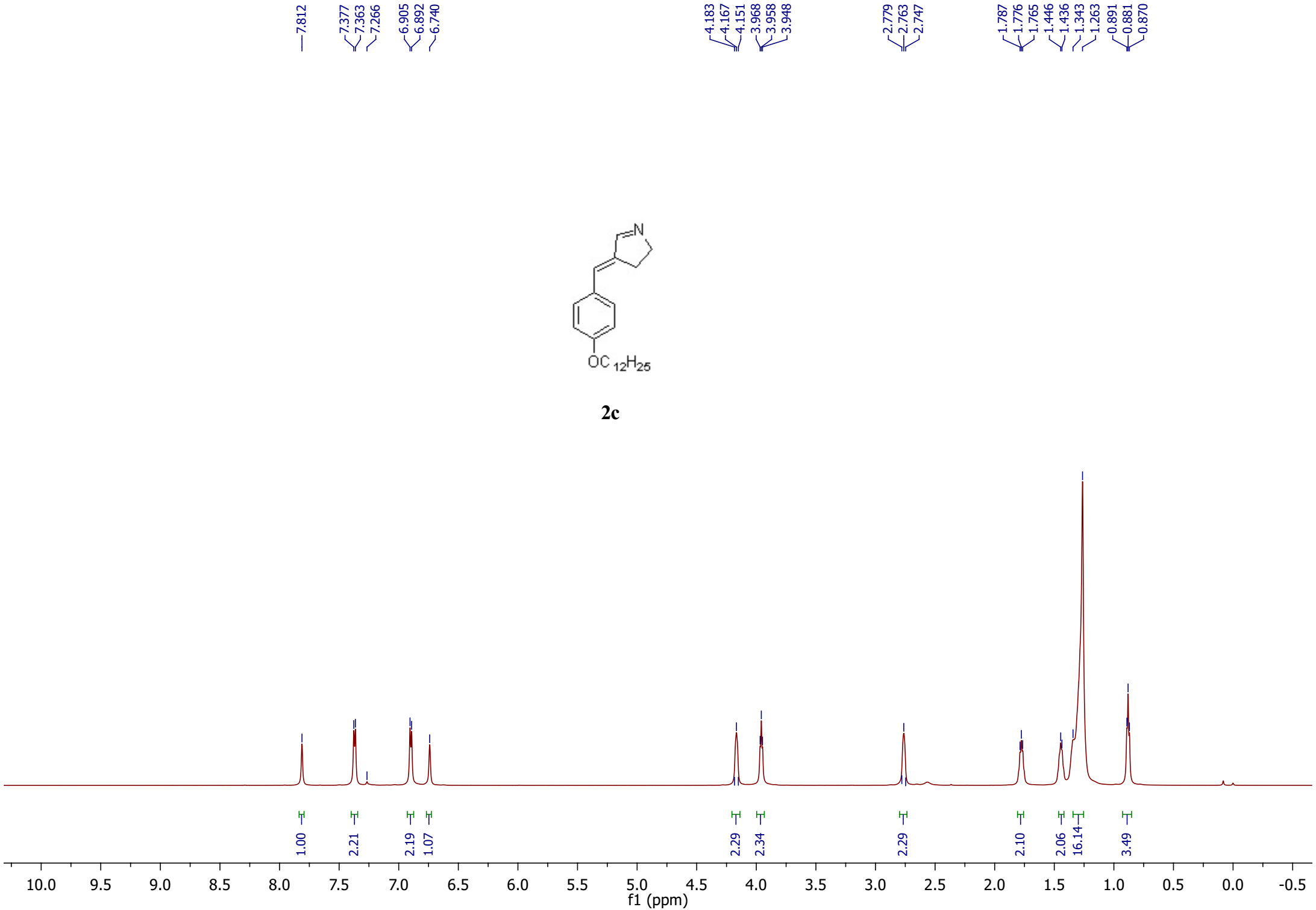

N
$C_{10}H_{21}O$
$OC_{10}H_{21}$
$OC_{10}H_{21}$

2b

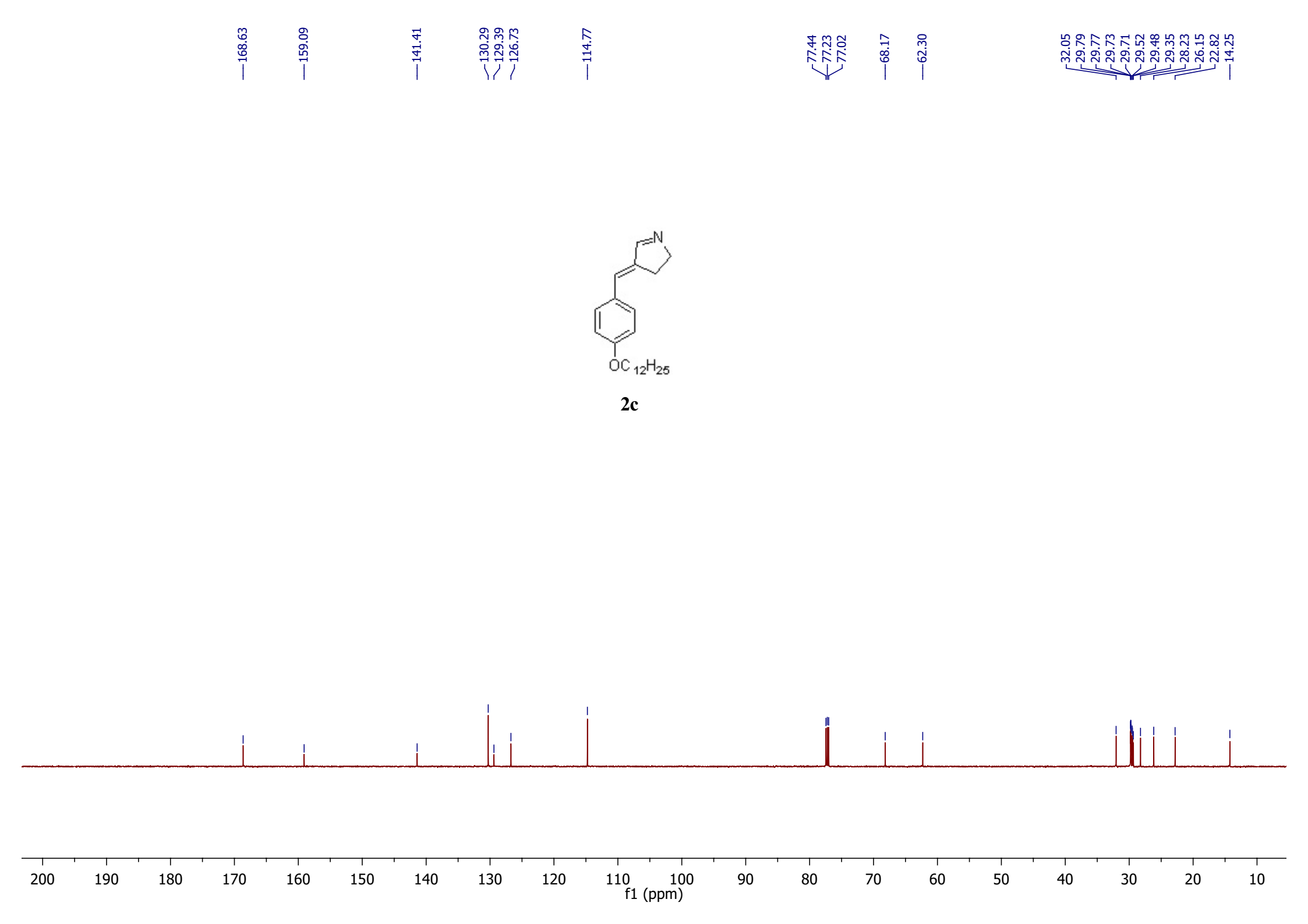
7.832
7.265
6.721
6.665
4.214
4.194
4.183
4.000
3.990
3.969
2.817
2.811
2.804
1.834
1.787
1.770
1.723
1.501
1.452
1.355
1.271
0.894
0.883
0.871
1.00
1.05
2.09
2.27
6.17
2.24
4.43
2.43
6.29
35.71
9.00
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0
f1 (ppm)


168.62
153.32
142.60
138.83
132.07
127.58
107.97
77.44
77.23
77.02
73.75
69.44
62.40
32.14
32.12
30.54
29.94
29.87
29.85
29.79
29.62
29.55
28.37
26.32
22.89
14.30
N
C10H21O
OC10H21
OC10H21
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

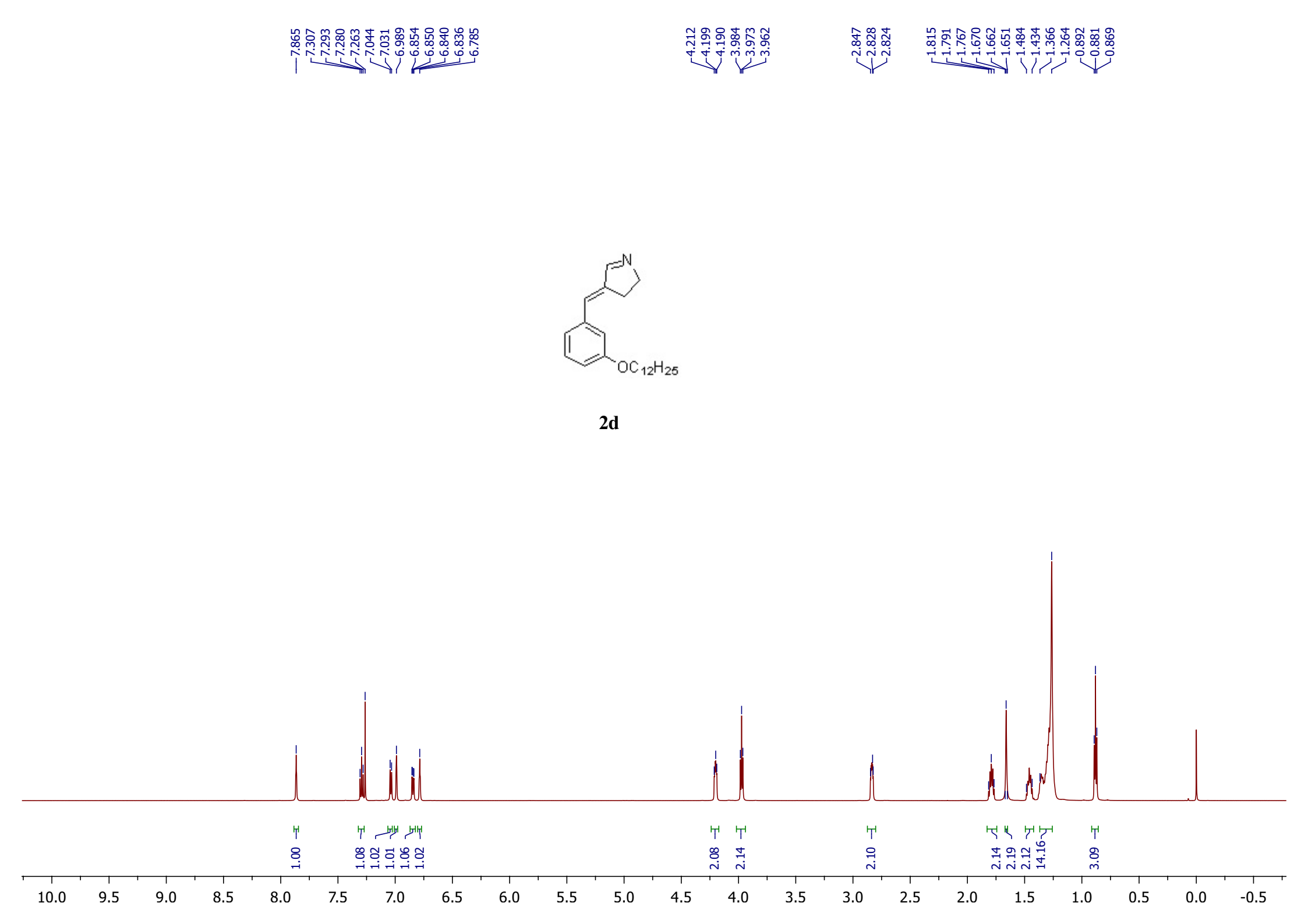
2b


7.812
7.377
7.363
7.266
6.905
6.892
6.740
4.183
4.167
4.151
3.968
3.958
3.948
2.779
2.763
2.747
1.787
1.776
1.765
1.446
1.436
1.343
1.263
0.891
0.881
0.870
N
OC12H25
1.00
2.21
2.19
1.07
2.29
2.34
2.29
2.10
2.06
16.14
3.49
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
f1 (ppm)

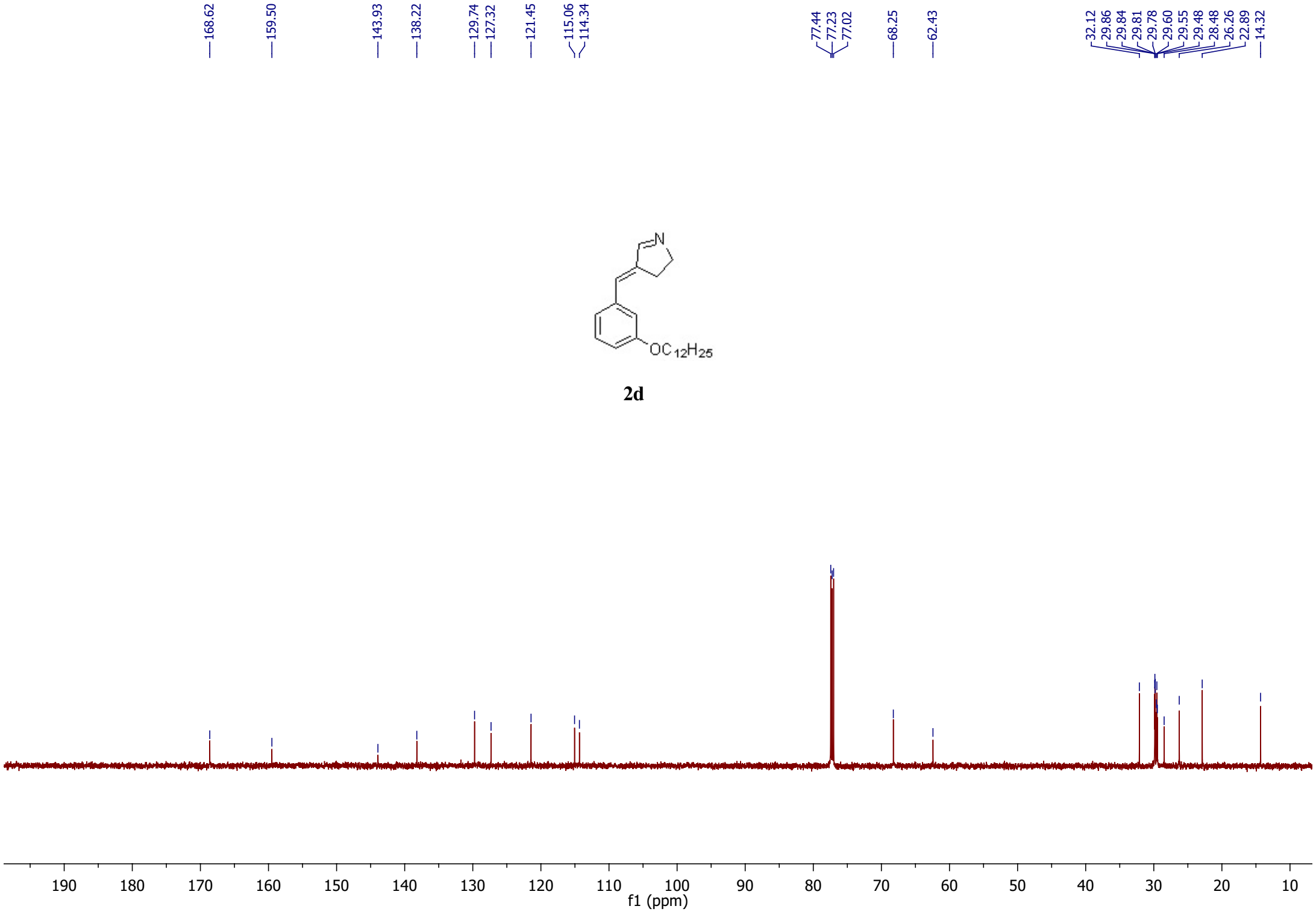
2c


168.63
159.09
141.41
130.29
129.39
126.73
114.77
77.44
77.23
77.02
68.17
62.30
32.05
29.79
29.77
29.73
29.71
29.52
29.48
29.35
28.23
26.15
22.82
14.25
N
OC 12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

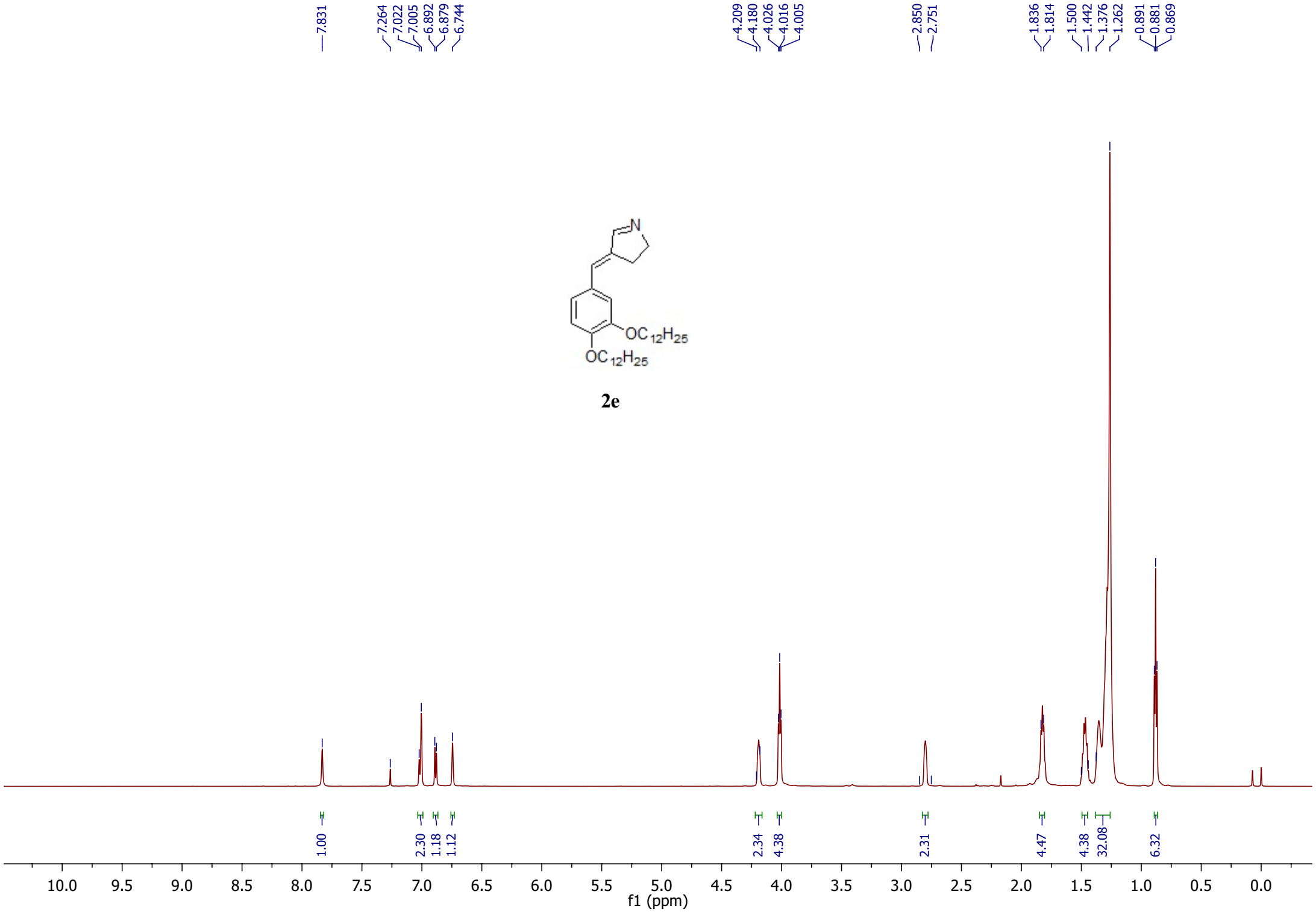
2c


7.865
7.307
7.293
7.280
7.263
7.044
7.031
6.989
6.854
6.850
6.840
6.836
6.785
4.212
4.199
4.190
3.984
3.973
3.962
2.847
2.828
2.824
1.815
1.791
1.767
1.670
1.662
1.651
1.484
1.434
1.366
1.264
0.892
0.881
0.869
N
OC12H25
1.00
1.08
1.02
1.01
1.06
1.02
2.08
2.14
2.10
2.14
2.19
2.12
14.16
3.09
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5

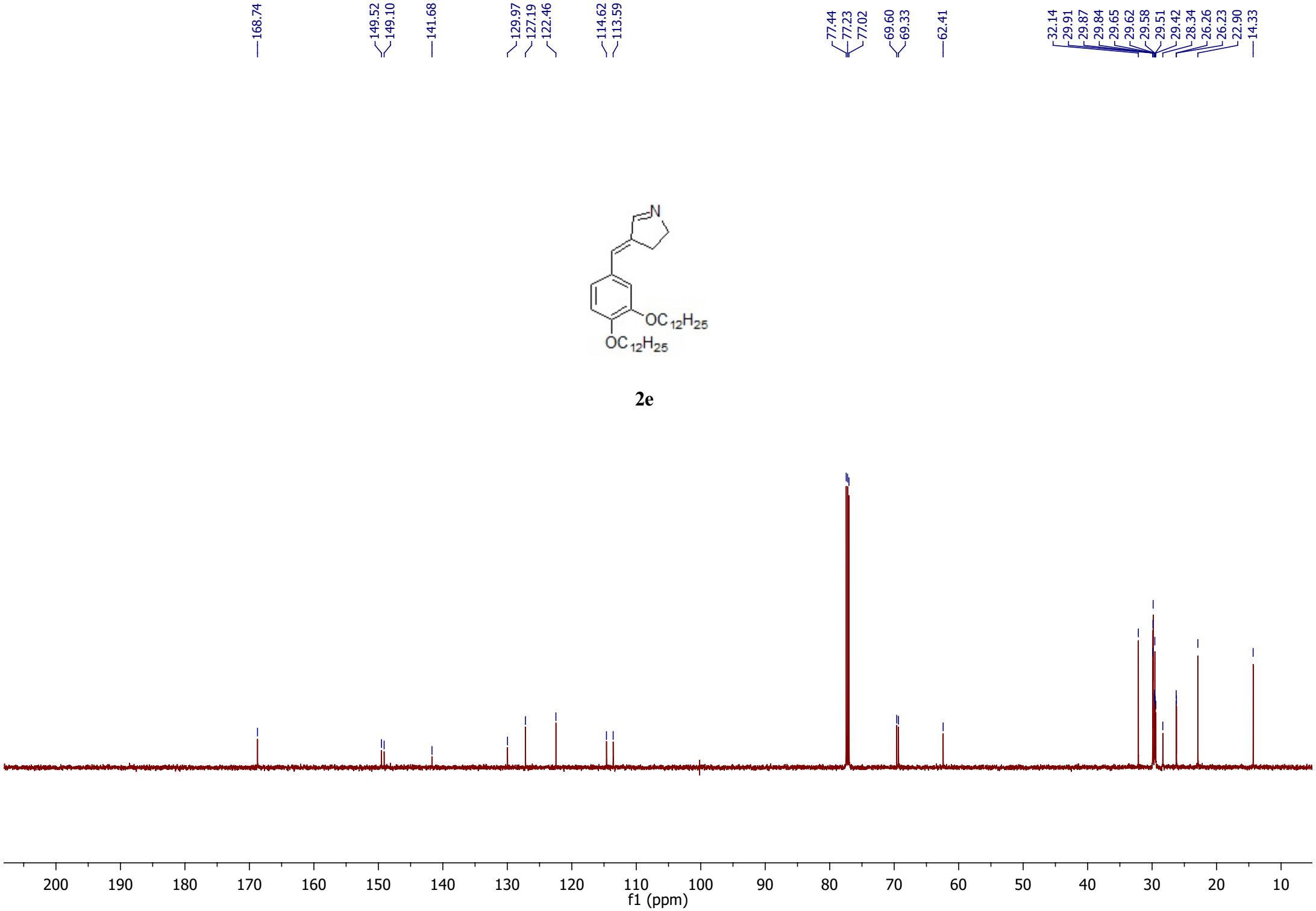
2d


168.62
159.50
143.93
138.22
129.74
127.32
121.45
115.06
114.34
77.44
77.23
77.02
68.25
62.43
32.12
29.86
29.84
29.81
29.78
29.60
29.55
29.48
28.48
26.26
22.89
14.32
N
OC12H25
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

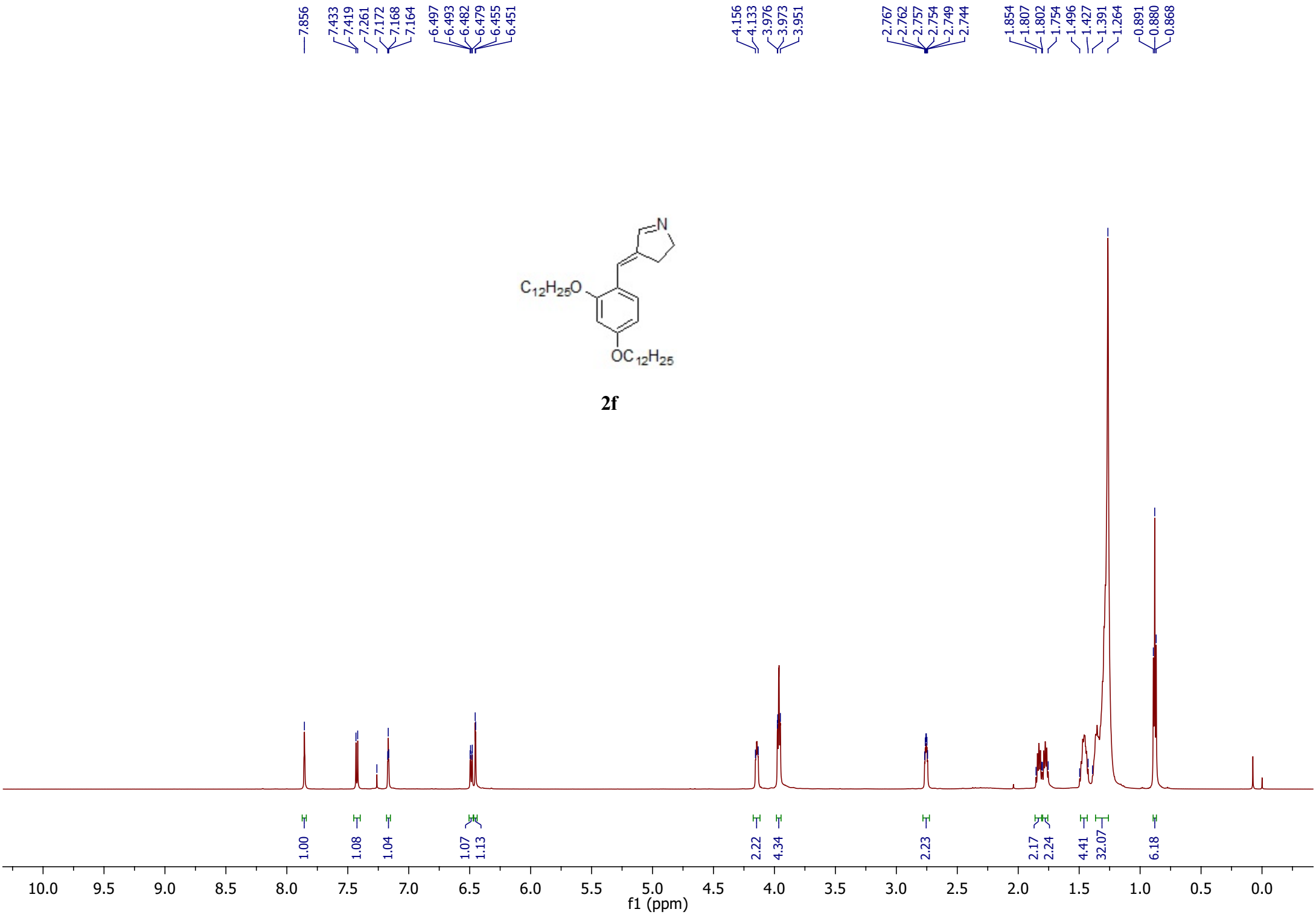
2d


7.831
7.264
7.022
7.005
6.892
6.879
6.744
4.209
4.180
4.026
4.016
4.005
2.850
2.751
1.836
1.814
1.500
1.442
1.376
1.262
0.891
0.881
0.869
N
OC12H25
OC12H25
1.00
2.30
1.18
1.12
2.34
4.38
2.31
4.47
4.38
32.08
6.32
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

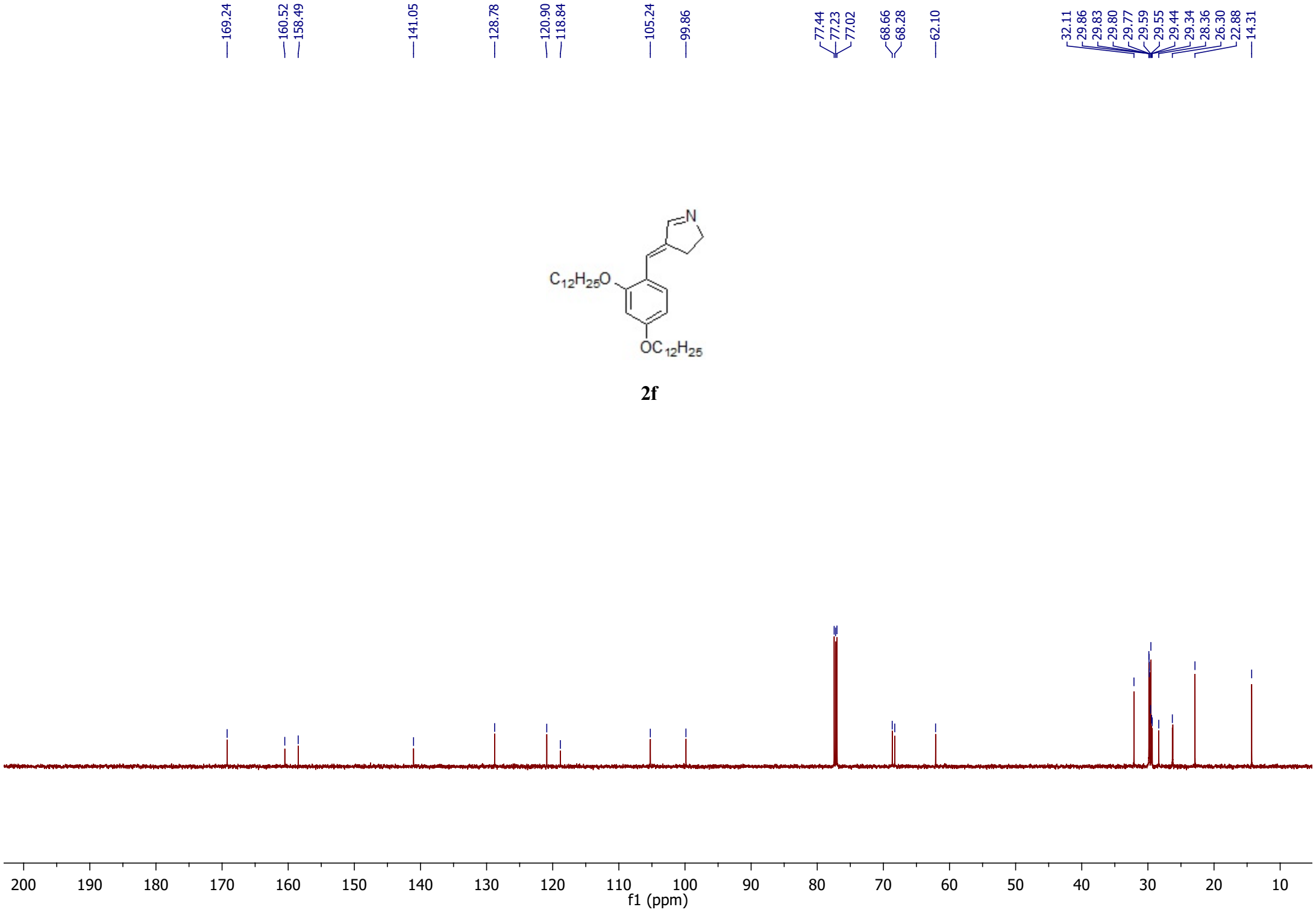
2e


168.74
149.52
149.10
141.68
129.97
127.19
122.46
114.62
113.59
77.44
77.23
77.02
69.60
69.33
62.41
32.14
29.91
29.87
29.84
29.65
29.62
29.58
29.51
29.42
28.34
26.26
26.23
22.90
14.33
N
OC12H25
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

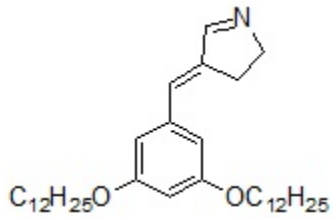
2e


7.856
7.433
7.419
7.261
7.172
7.168
7.164
6.497
6.493
6.482
6.479
6.455
6.451
4.156
4.133
3.976
3.973
3.951
2.767
2.762
2.757
2.754
2.749
2.744
1.854
1.807
1.802
1.754
1.496
1.427
1.391
1.264
0.891
0.880
0.868
N
C12H25O
OC12H25
1.00
1.08
1.04
1.07
1.13
2.22
4.34
2.23
2.17
2.24
4.41
32.07
6.18
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

2f

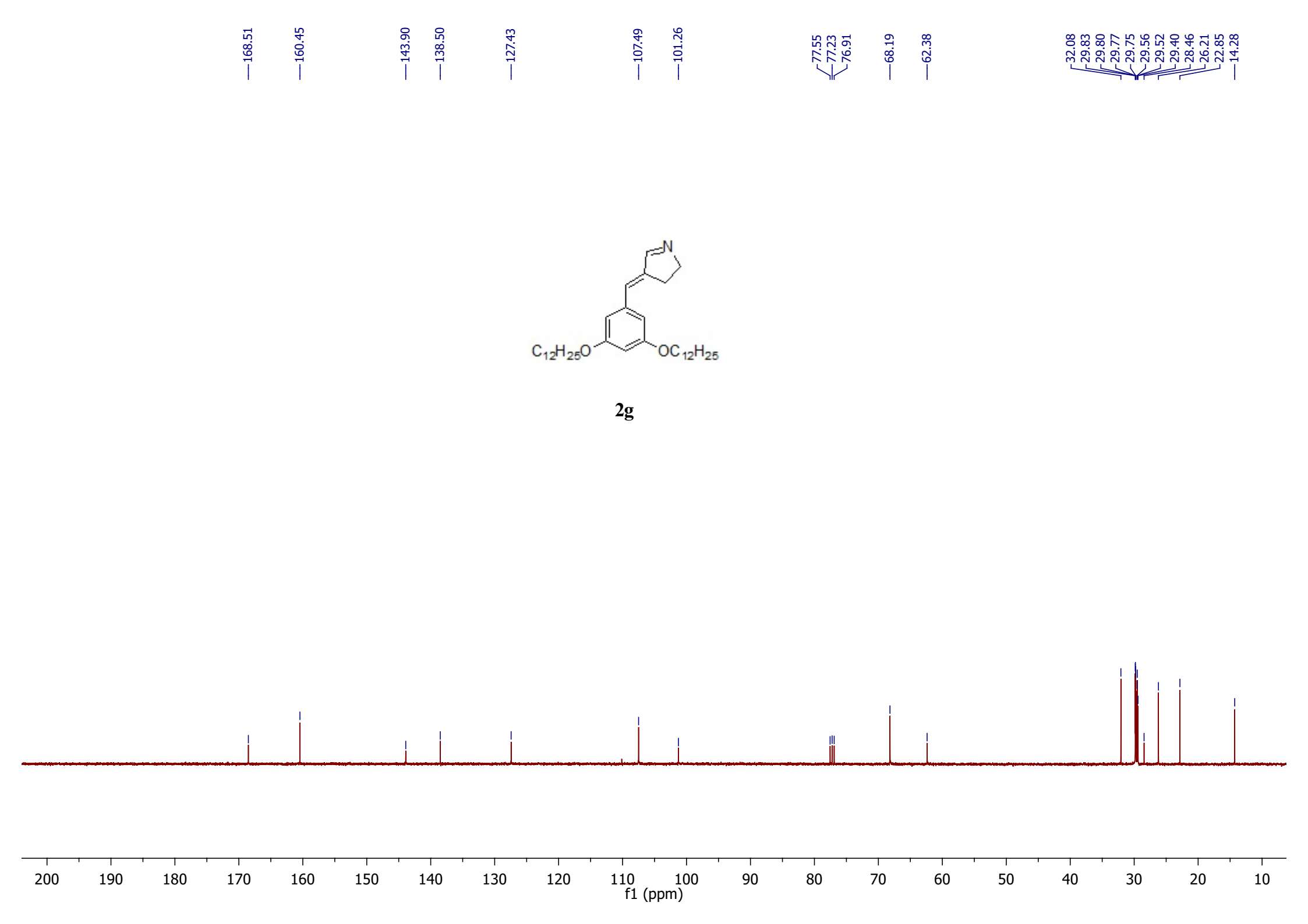

169.24
160.52
158.49
141.05
128.78
120.90
118.84
105.24
99.86
77.44
77.23
77.02
68.66
68.28
62.10
32.11
29.86
29.83
29.80
29.77
29.59
29.55
29.44
29.34
28.36
26.30
22.88
14.31
N
C12H25O
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

2f

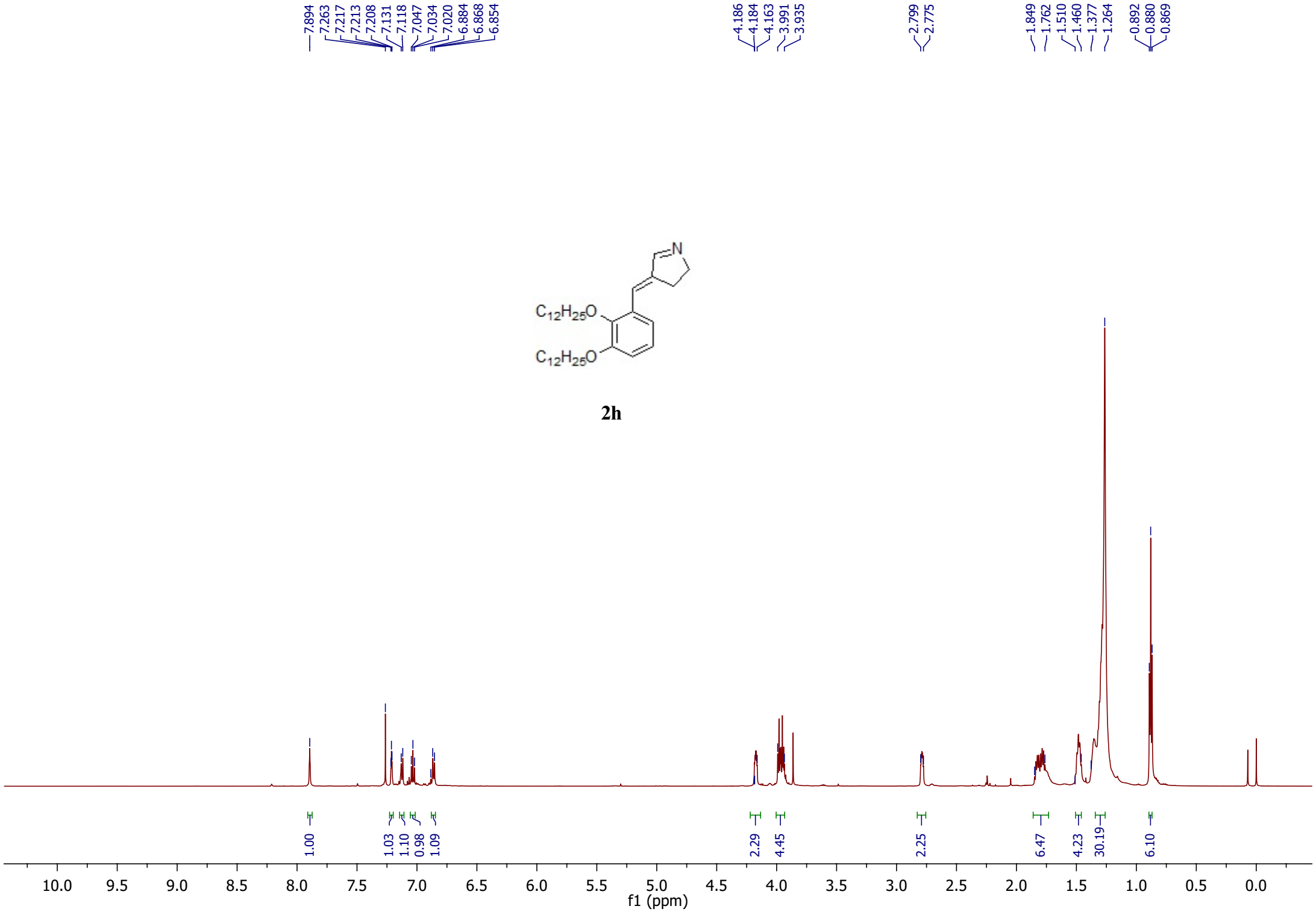

N
C12H25O
OC12H25

2g

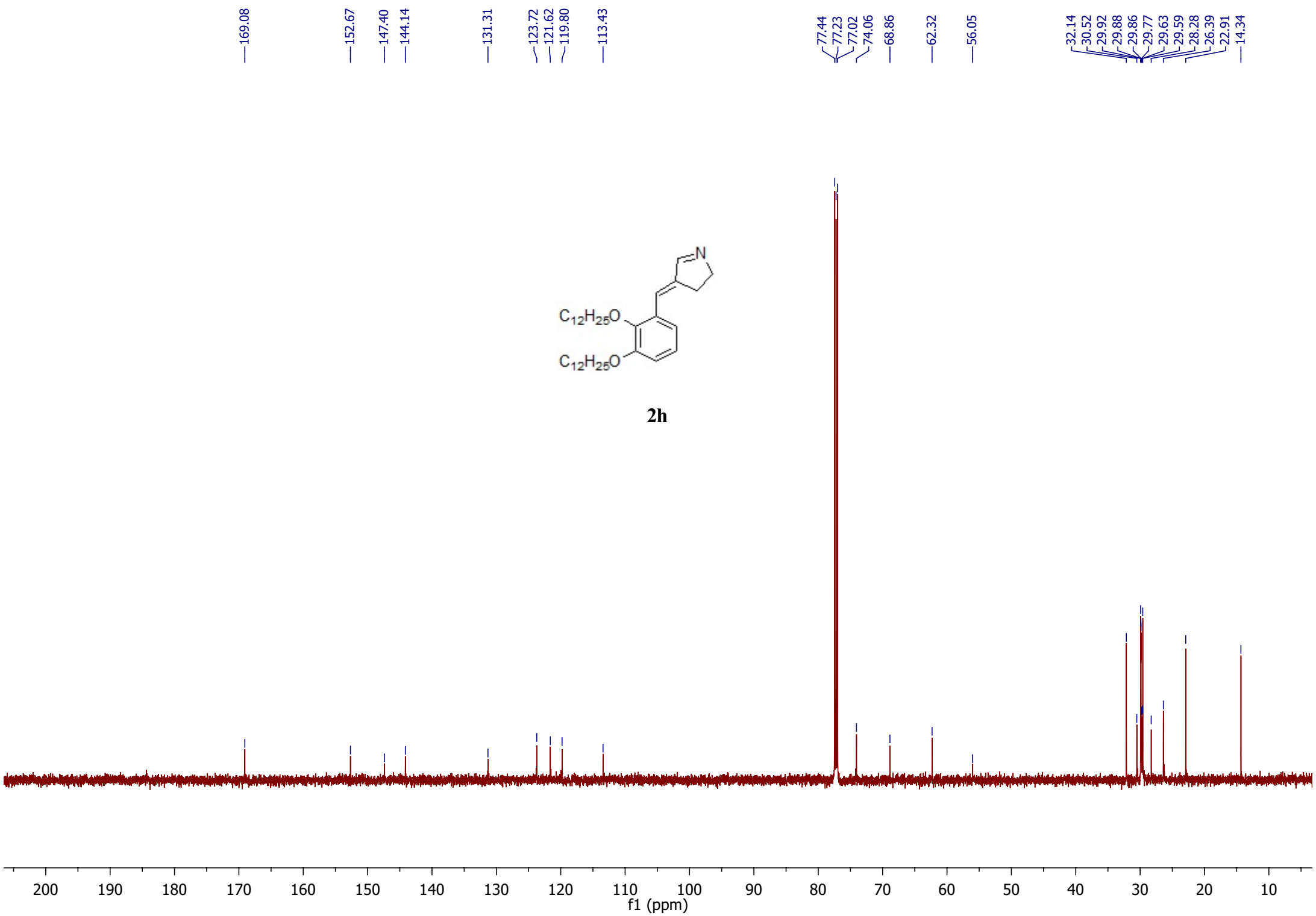
7.828
6.708
6.571
6.569
6.405
4.178
4.170
4.165
3.939
3.928
3.917
2.812
2.807
2.799
1.789
1.742
1.465
1.416
1.342
1.258
0.887
0.875
0.863
1.00
1.10
2.17
1.08
2.24
4.36
2.25
4.20
4.29
32.01
6.39
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


168.51
160.45
143.90
138.50
127.43
107.49
101.26
77.55
77.23
76.91
68.19
62.38
32.08
29.83
29.80
29.77
29.75
29.56
29.52
29.40
28.46
26.21
22.85
14.28
N
C12H25O
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

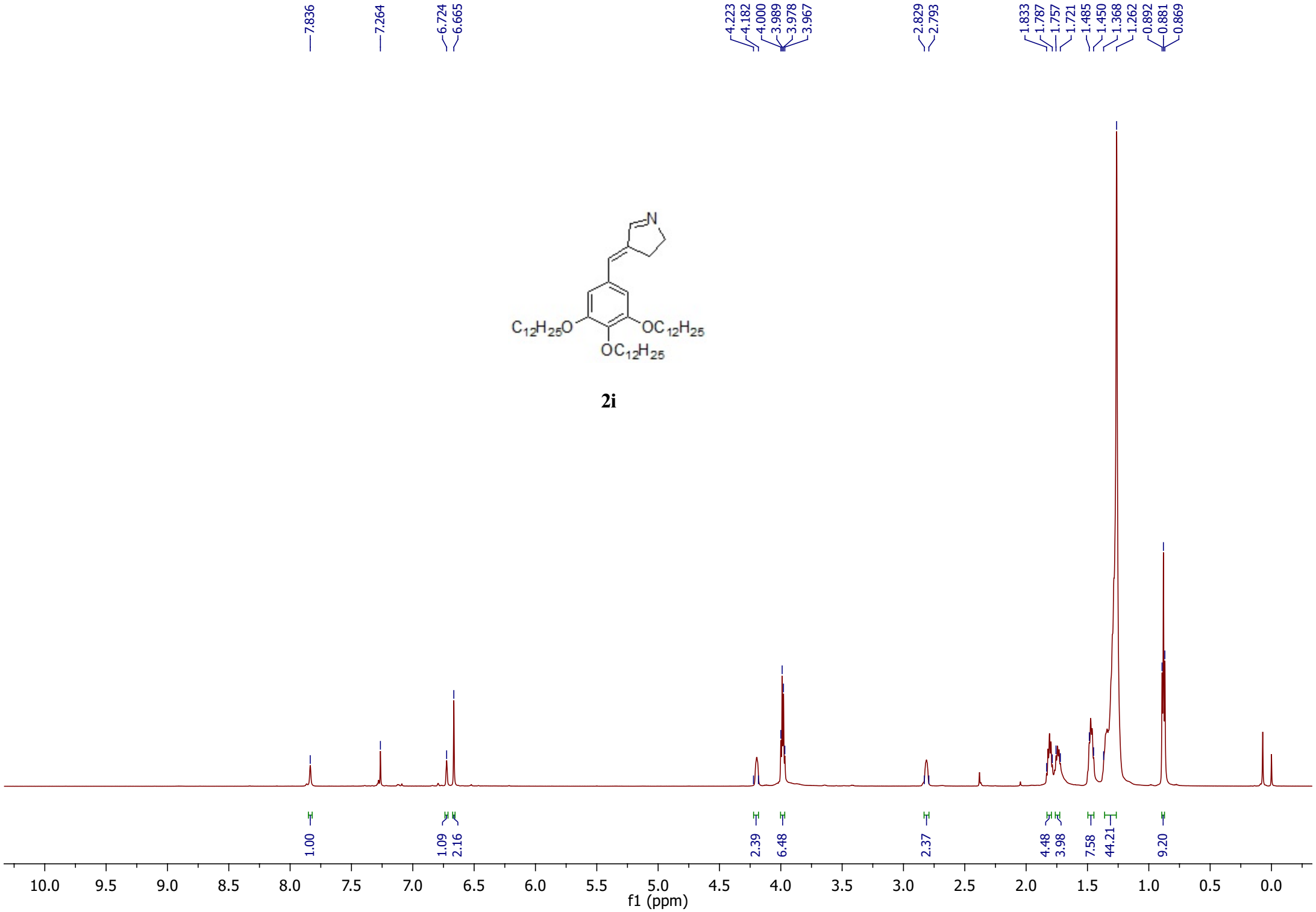
2g


7.894
7.263
7.217
7.213
7.208
7.131
7.118
7.047
7.034
7.020
6.884
6.868
6.854
4.186
4.184
4.163
3.991
3.935
2.799
2.775
1.849
1.762
1.510
1.460
1.377
1.264
0.892
0.880
0.869
N
C12H25O
C12H25O
1.00
1.03
1.10
0.98
1.09
2.29
4.45
2.25
6.47
4.23
30.19
6.10
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

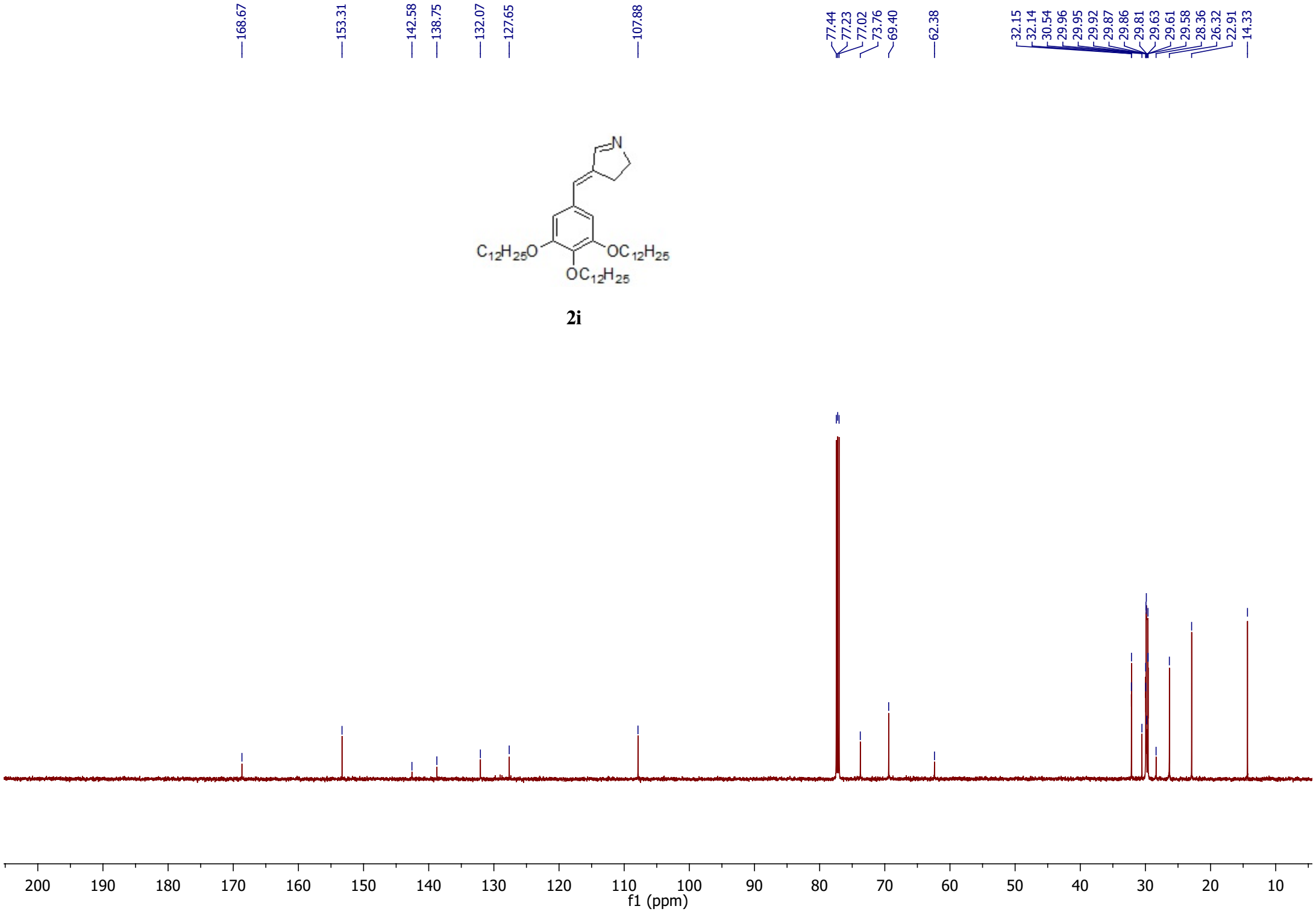
2h


169.08
152.67
147.40
144.14
131.31
123.72
121.62
119.80
113.43
77.44
77.23
77.02
74.06
68.86
62.32
56.05
32.14
30.52
29.92
29.88
29.86
29.77
29.63
29.59
28.28
26.39
22.91
14.34
N
C12H25O
C12H25O
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

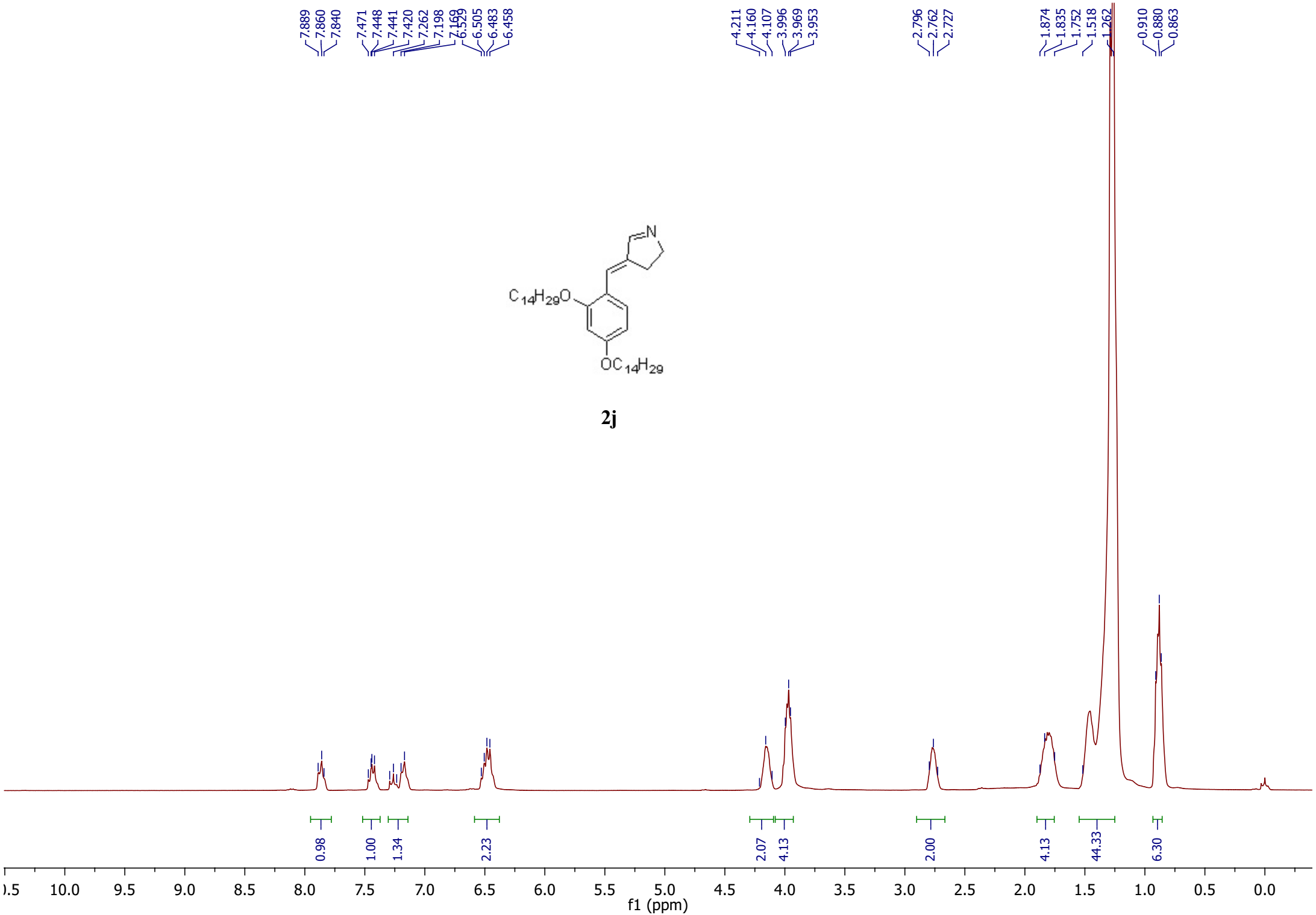
2h


7.836
7.264
6.724
6.665
4.223
4.182
4.000
3.989
3.978
3.967
2.829
2.793
1.833
1.787
1.757
1.721
1.485
1.450
1.368
1.262
0.892
0.881
0.869
N
C12H25O
OC12H25
OC12H25
1.00
1.09
2.16
2.39
6.48
2.37
4.48
3.98
7.58
44.21
9.20
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

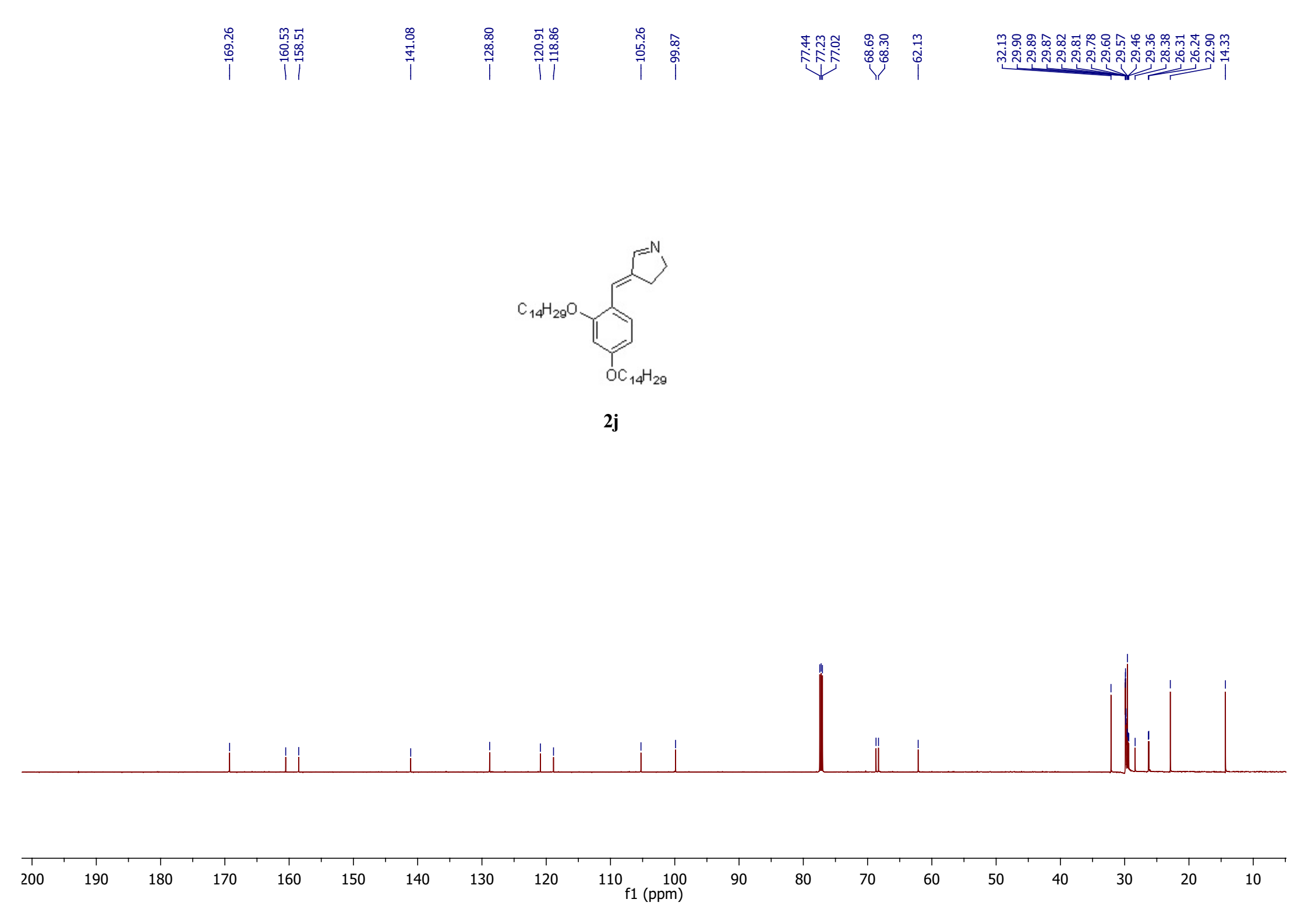
2i


168.67
153.31
142.58
138.75
132.07
127.65
107.88
77.44
77.23
77.02
73.76
69.40
62.38
32.15
32.14
30.54
29.96
29.95
29.92
29.87
29.86
29.81
29.63
29.61
29.58
28.36
26.32
22.91
14.33
N
C12H25O
OC12H25
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

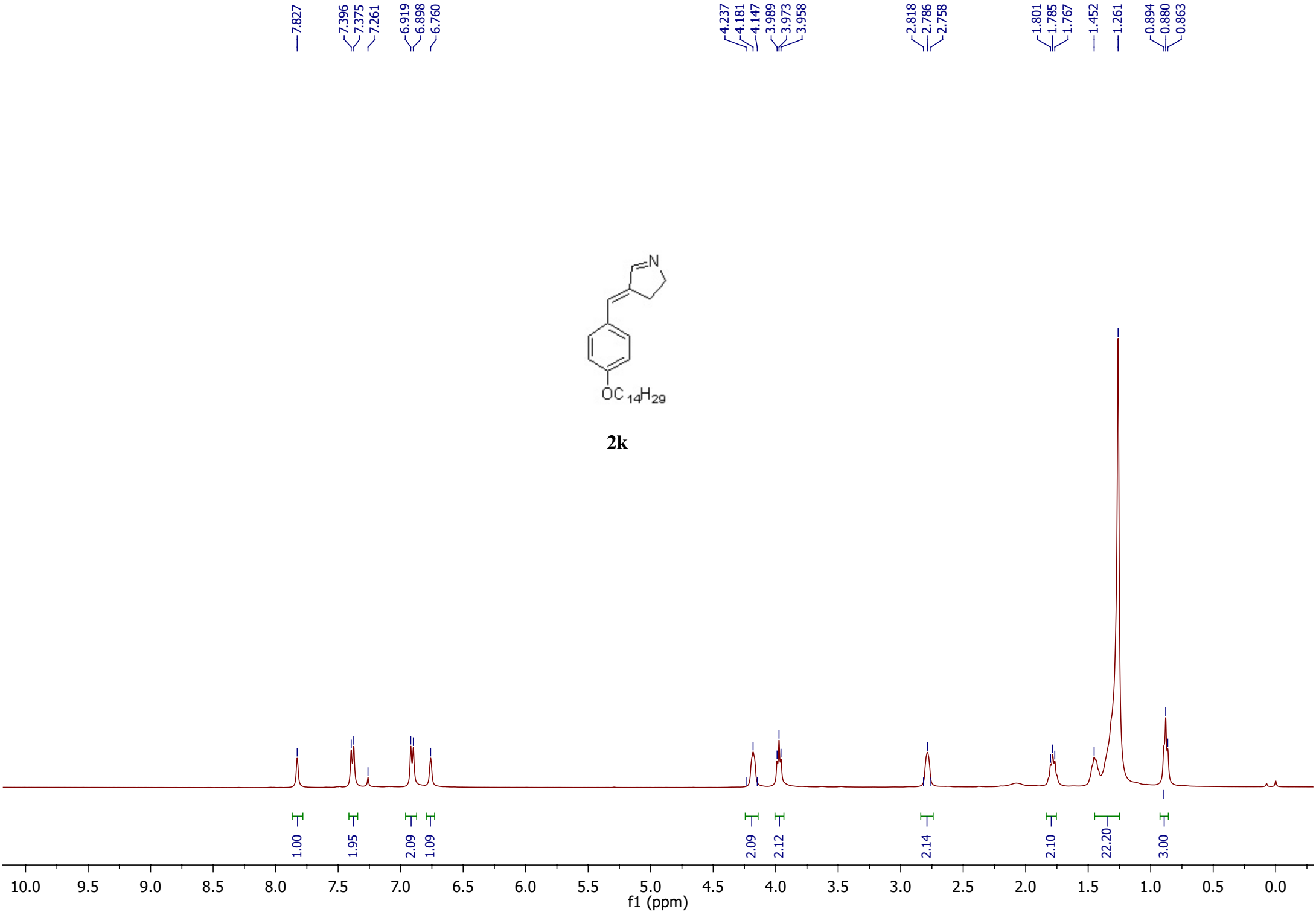
2i


7.889
7.860
7.840
7.471
7.448
7.441
7.420
7.262
7.198
7.169
6.529
6.505
6.483
6.458
4.211
4.160
4.107
3.996
3.969
3.953
2.796
2.762
2.727
1.874
1.835
1.752
1.518
1.262
0.910
0.880
0.863
N
C14H29O
OC14H29
0.98
1.00
1.34
2.23
2.07
4.13
2.00
4.13
44.33
6.30
f1 (ppm)

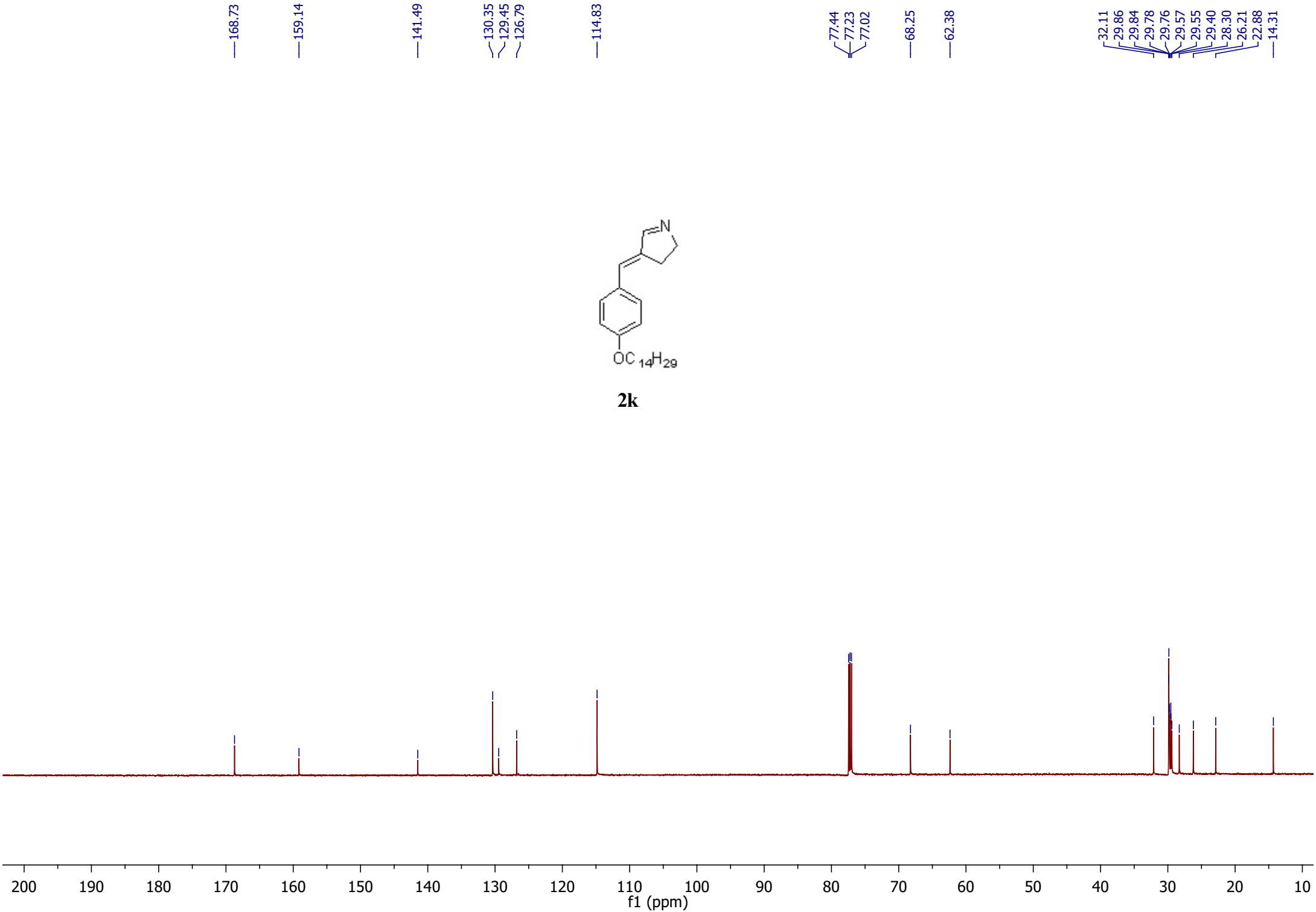
2j


169.26
160.53
158.51
141.08
128.80
120.91
118.86
105.26
99.87
77.44
77.23
77.02
68.69
68.30
62.13
32.13
29.90
29.89
29.87
29.82
29.81
29.78
29.60
29.57
29.46
29.36
28.38
26.31
26.24
22.90
14.33
N
C14H29O
OC14H29
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

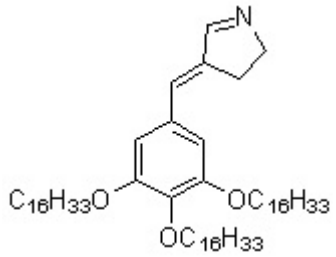
2j


7.827
7.396
7.375
7.261
6.919
6.898
6.760
4.237
4.181
4.147
3.989
3.973
3.958
2.818
2.786
2.758
1.801
1.785
1.767
1.452
1.261
0.894
0.880
0.863
N
OC 14H29
1.00
1.95
2.09
1.09
2.09
2.12
2.14
2.10
22.20
3.00
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

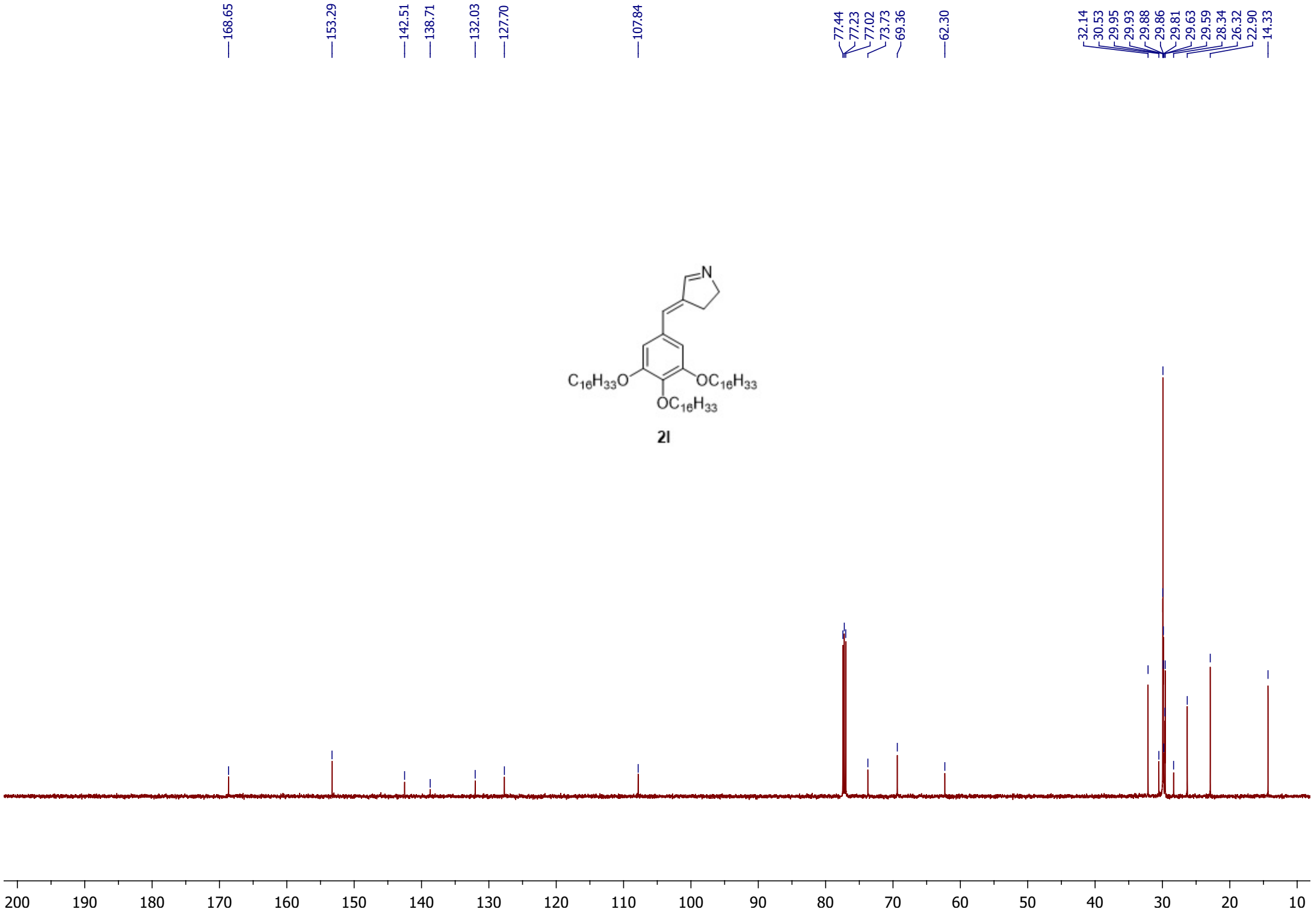
2k

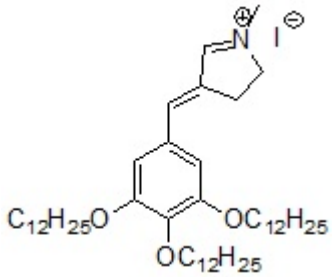

168.73
159.14
141.49
130.35
129.45
126.79
114.83
77.44
77.23
77.02
68.25
62.38
32.11
29.86
29.84
29.78
29.76
29.57
29.55
29.40
28.30
26.21
22.88
14.31
N
OC 14H29
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

2k



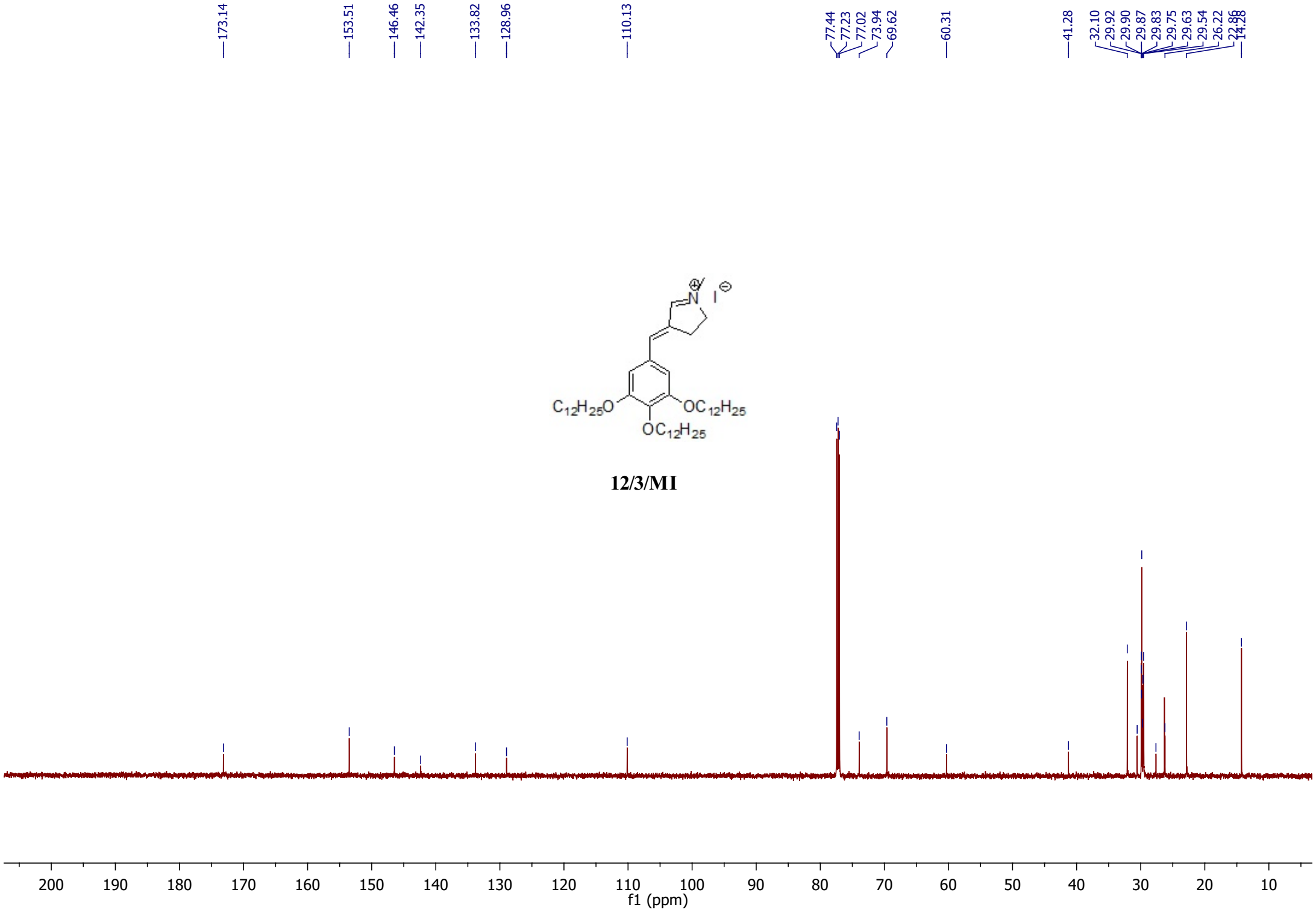
2l


168.65
153.29
142.51
138.71
132.03
127.70
107.84
77.44
77.23
77.02
73.73
69.36
62.30
32.14
30.53
29.95
29.93
29.88
29.86
29.81
29.63
29.59
28.34
26.32
22.90
14.33
N
C16H33O
OC16H33
OC16H33
2l
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10

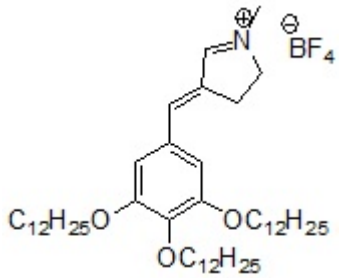

$C_{12}H_{25}O$
$OC_{12}H_{25}$
$OC_{12}H_{25}$
N
I

12/3/MI

9.800
7.743
7.269
6.724
4.416
4.394
4.050
4.028
3.967
3.945
3.853
3.370
3.351
1.827
1.791
1.759
1.712
1.494
1.445
1.355
1.264
0.892
0.880
0.868
1.00
1.00
2.10
2.06
2.09
4.22
3.07
2.05
4.27
2.18
6.46
47.93
9.04
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

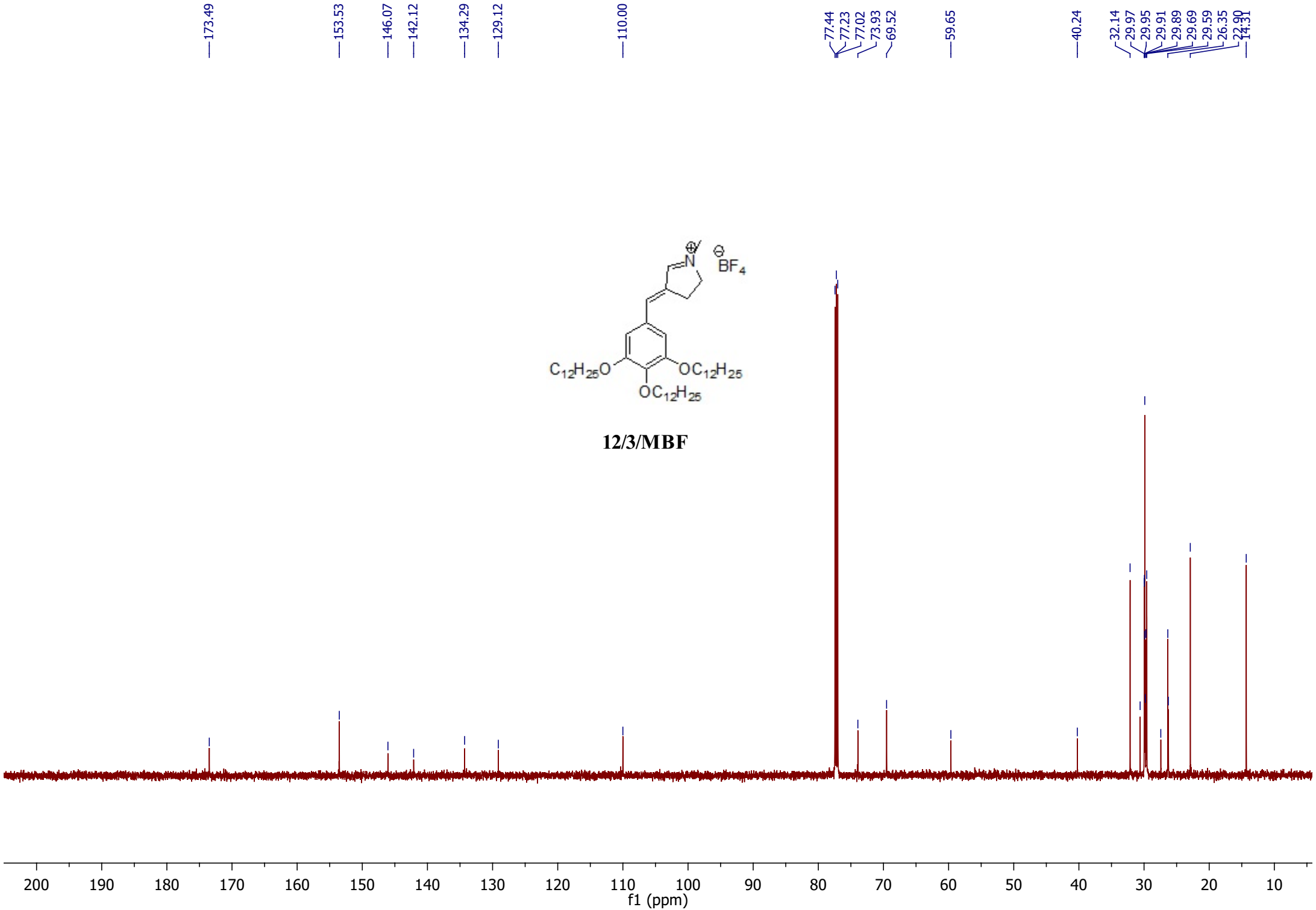

173.14
153.51
146.46
142.35
133.82
128.96
110.13
77.44
77.23
77.02
73.94
69.62
60.31
41.28
32.10
29.92
29.90
29.87
29.83
29.75
29.63
29.54
26.22
22.86
14.28
$C_{12}H_{25}O$
$OC_{12}H_{25}$
$OC_{12}H_{25}$
I
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

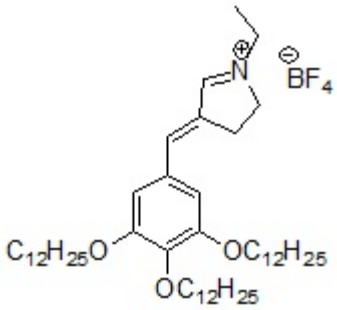
12/3/MI


N
BF4
C12H25O
OC12H25
OC12H25

12/3/MBF

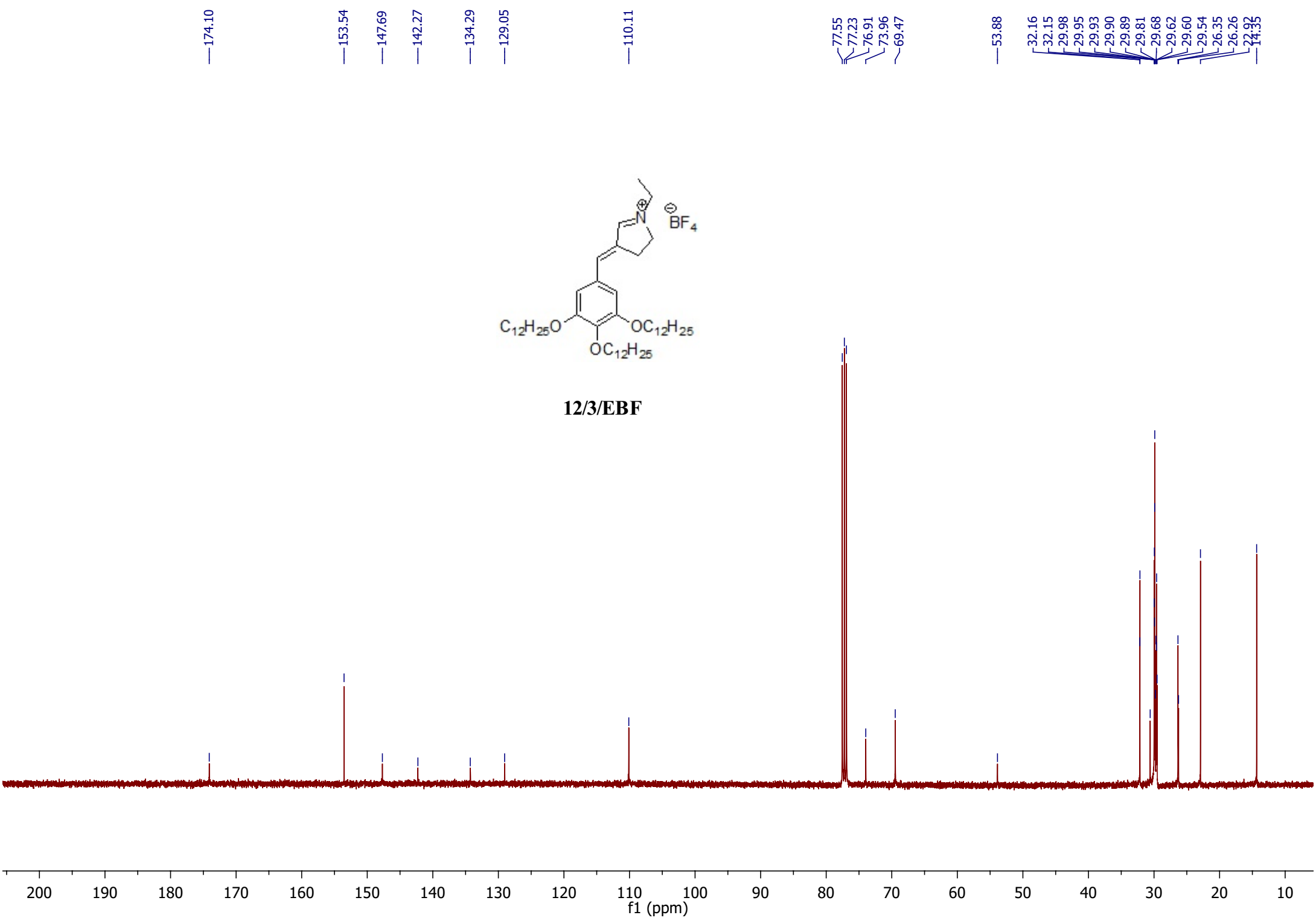
8.658
7.527
7.266
6.702
4.331
4.311
4.024
4.013
4.002
3.942
3.932
3.921
3.679
3.316
3.298
1.813
1.770
1.759
1.705
1.482
1.434
1.341
1.263
0.890
0.879
0.867
1.00
0.99
2.08
2.47
2.29
4.26
3.03
2.08
4.45
2.34
5.95
48.28
9.17
f1 (ppm)

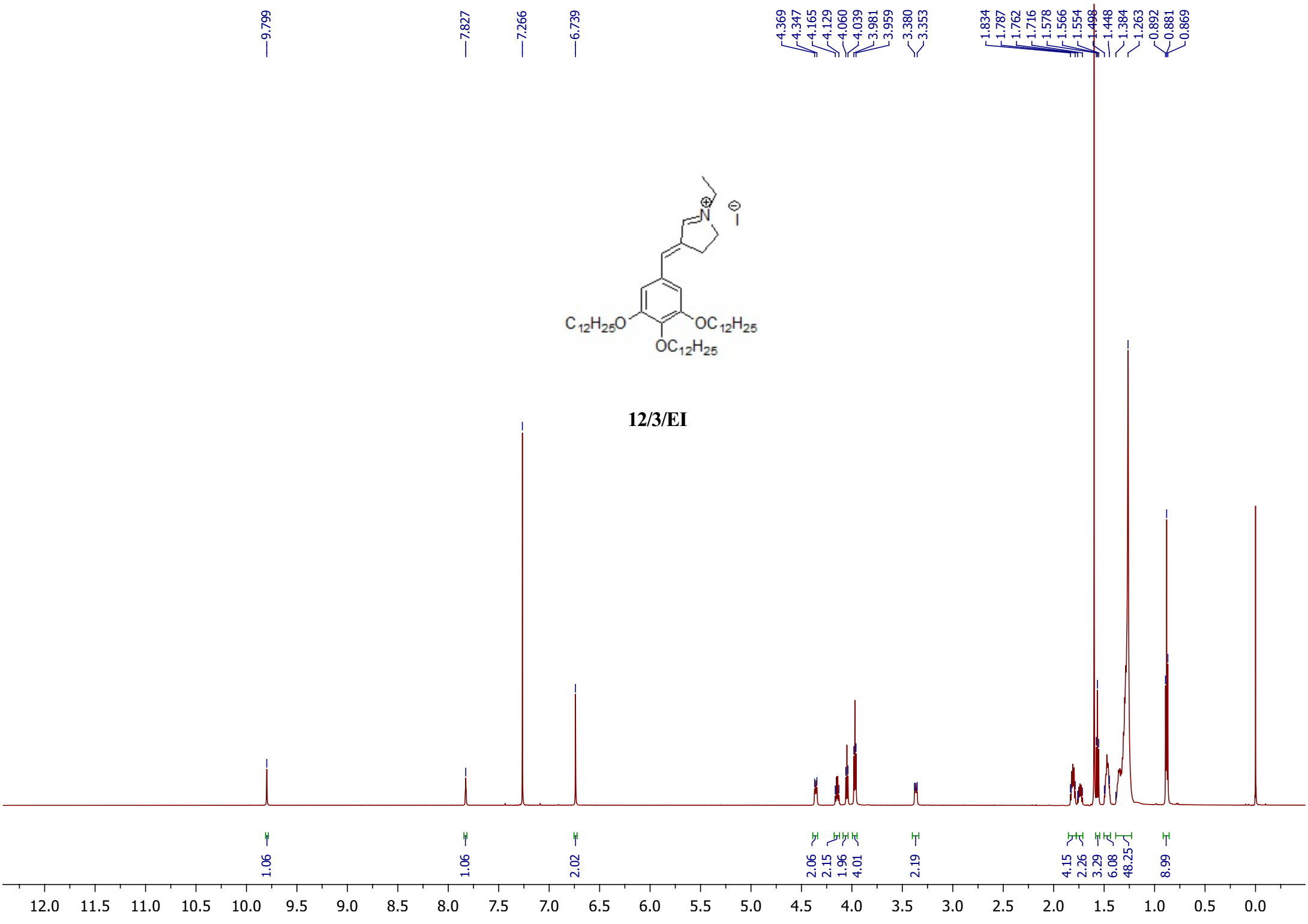

173.49
153.53
146.07
142.12
134.29
129.12
110.00
77.44
77.23
77.02
73.93
69.52
59.65
40.24
32.14
29.97
29.95
29.91
29.89
29.69
29.59
26.35
22.90
14.31
N
BF4
C12H25O
OC12H25
OC12H25
12/3/MBF
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)


BF4
C12H25O
OC12H25
OC12H25

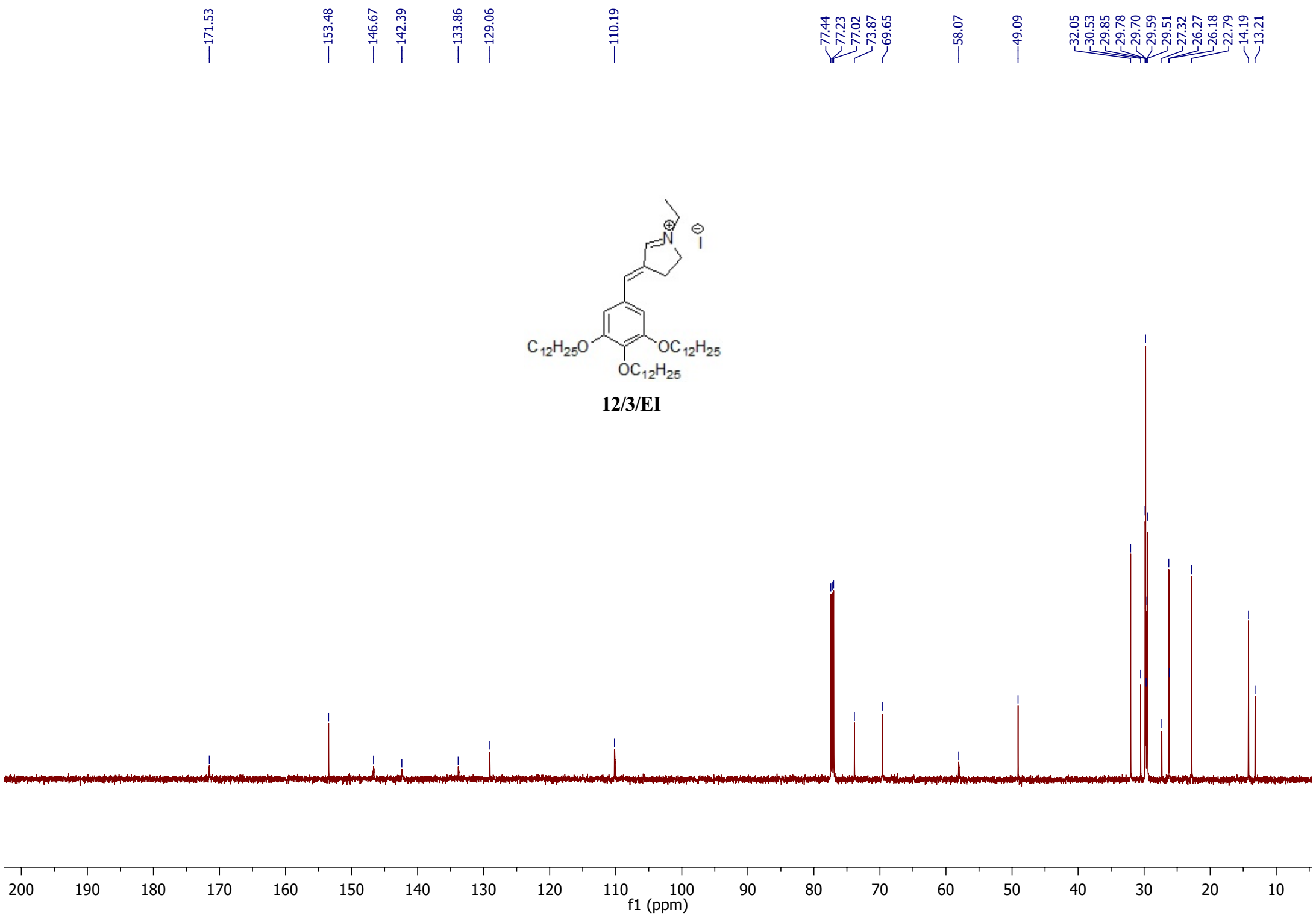
12/3/EBF

8.737
7.644
7.267
6.759
4.397
4.366
4.034
4.018
3.978
3.962
3.947
3.261
3.212
1.832
1.779
1.756
1.702
1.502
1.430
1.363
1.262
0.896
0.880
0.862
1.00
1.12
1.92
1.98
2.36
4.11
2.22
3.81
2.41
6.34
53.11
9.23
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

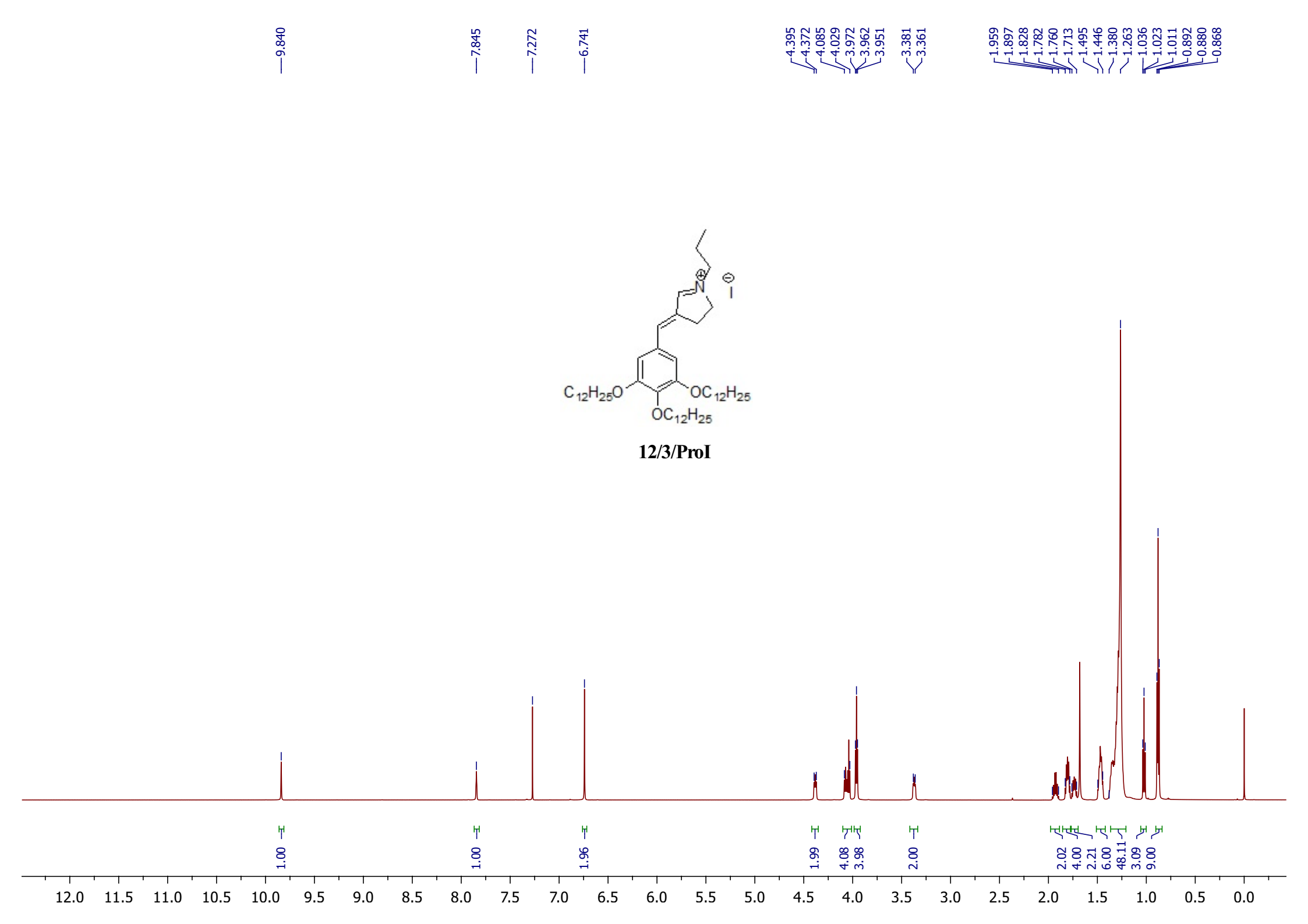

174.10
153.54
147.69
142.27
134.29
129.05
110.11
77.55
77.23
76.91
73.96
69.47
53.88
32.16
32.15
29.98
29.95
29.93
29.90
29.89
29.81
29.68
29.62
29.60
29.54
26.35
26.26
22.92
14.35
BF4
C12H25O
OC12H25
OC12H25
12/3/EBF
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)


9.799
7.827
7.266
6.739
4.369
4.347
4.165
4.129
4.060
4.039
3.981
3.959
3.380
3.353
1.834
1.787
1.762
1.716
1.578
1.566
1.554
1.498
1.448
1.384
1.263
0.892
0.881
0.869
C12H25O
OC12H25
OC12H25
I
1.06
1.06
2.02
2.06
2.15
1.96
4.01
2.19
4.15
2.26
3.29
6.08
48.25
8.99
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0

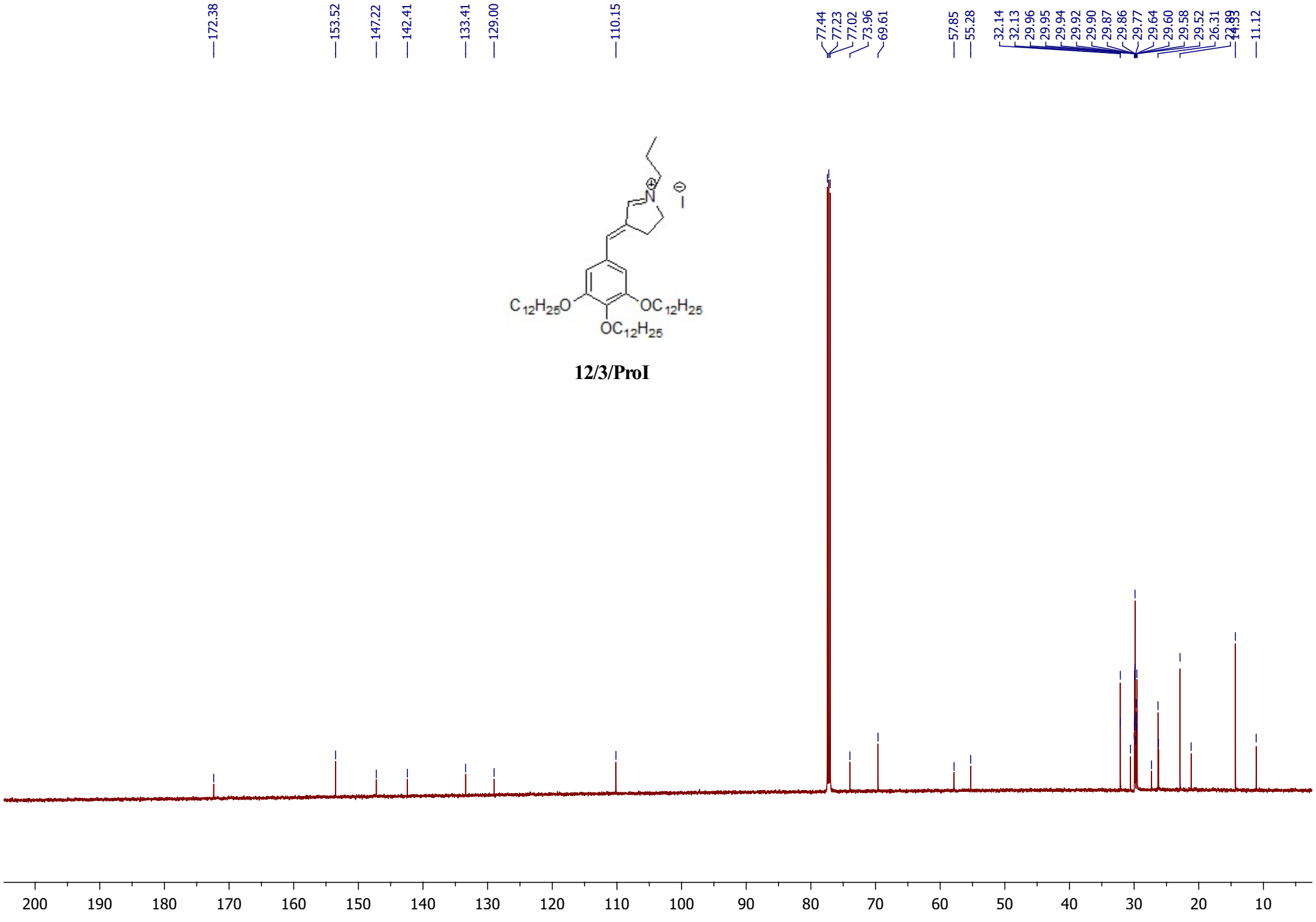
12/3/EI


171.53
153.48
146.67
142.39
133.86
129.06
110.19
77.44
77.23
77.02
73.87
69.65
58.07
49.09
32.05
30.53
29.85
29.78
29.70
29.59
29.51
27.32
26.27
26.18
22.79
14.19
13.21
C12H25O
OC12H25
OC12H25
I
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

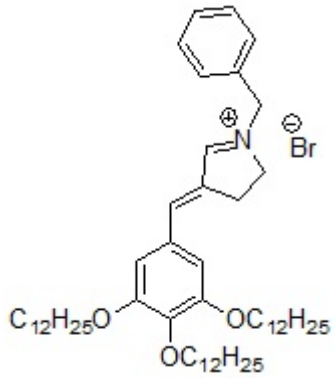
12/3/EI


9.840
7.845
7.272
6.741
4.395
4.372
4.085
4.029
3.972
3.962
3.951
3.381
3.361
1.959
1.897
1.828
1.782
1.760
1.713
1.495
1.446
1.380
1.263
1.036
1.023
1.011
0.892
0.880
0.868
C12H25O
OC12H25
OC12H25
I
1.00
1.00
1.96
1.99
4.08
3.98
2.00
2.02
4.00
2.21
6.00
48.11
3.09
9.00
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0

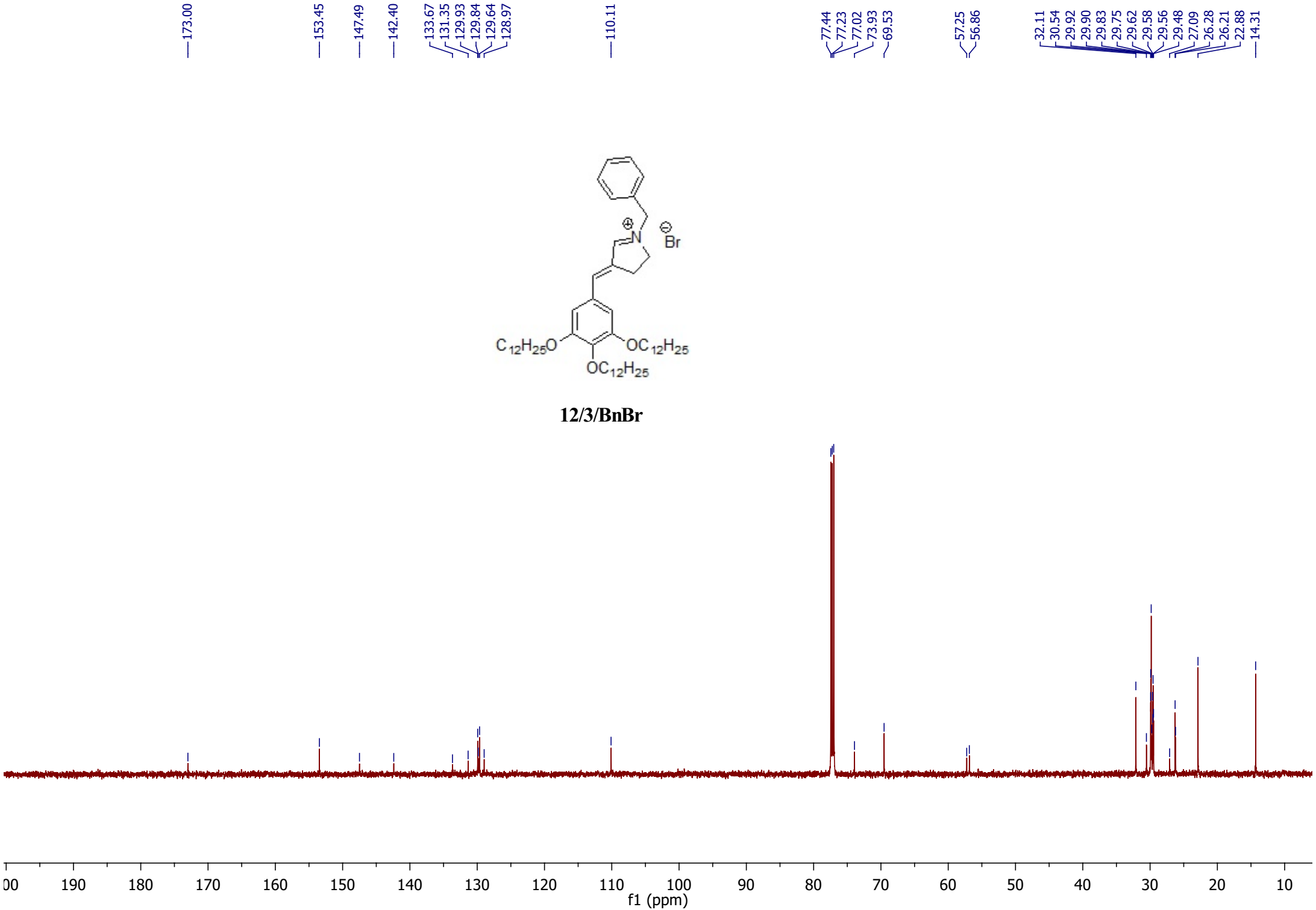
12/3/ProI


172.38
153.52
147.22
142.41
133.41
129.00
110.15
77.44
77.23
77.02
73.96
69.61
57.85
55.28
32.14
32.13
29.96
29.95
29.94
29.92
29.90
29.87
29.86
29.77
29.64
29.60
29.58
29.52
26.31
22.89
14.33
11.12
C12H25O
OC12H25
OC12H25
I
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10

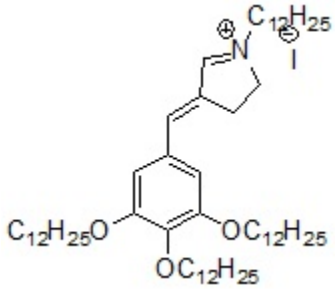
12/3/ProI



12/3/BnBr

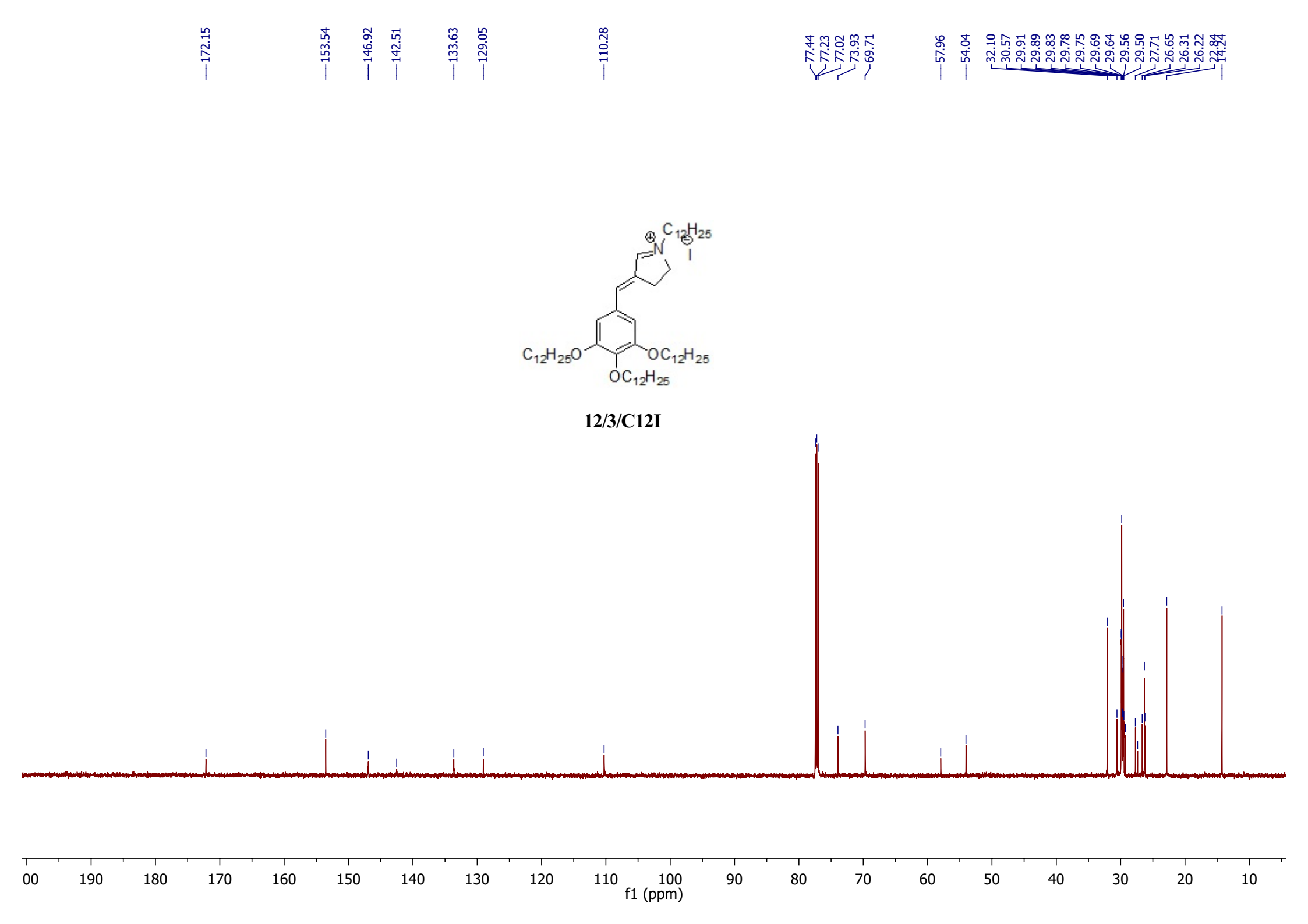

173.00
153.45
147.49
142.40
133.67
131.35
129.93
129.84
129.64
128.97
110.11
77.44
77.23
77.02
73.93
69.53
57.25
56.86
32.11
30.54
29.92
29.90
29.83
29.75
29.62
29.58
29.56
29.48
27.09
26.28
26.21
22.88
14.31
N
Br
C12H25O
OC12H25
OC12H25
f1 (ppm)

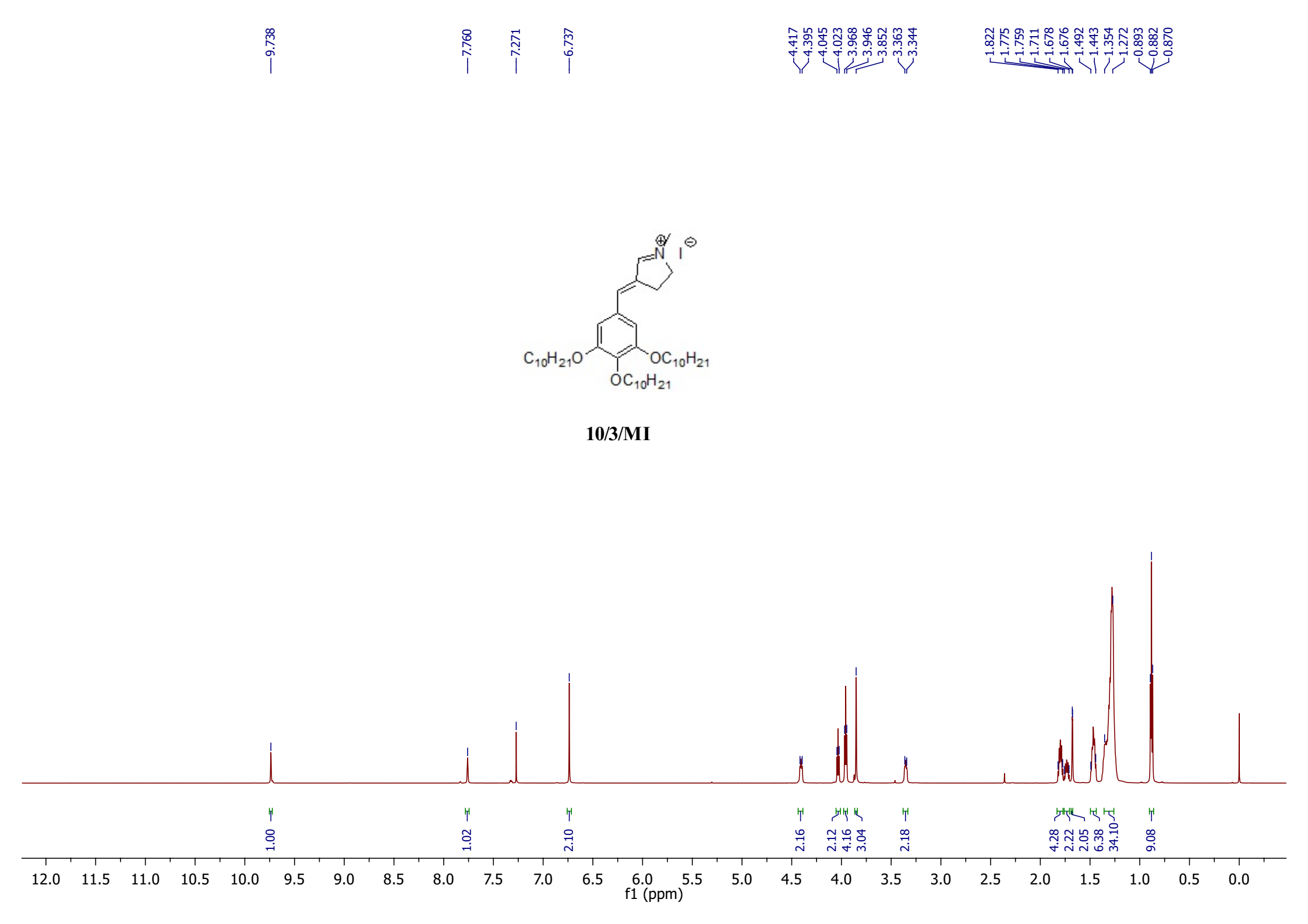
12/3/BnBr


C12H25
N
I
C12H25O
OC12H25
OC12H25

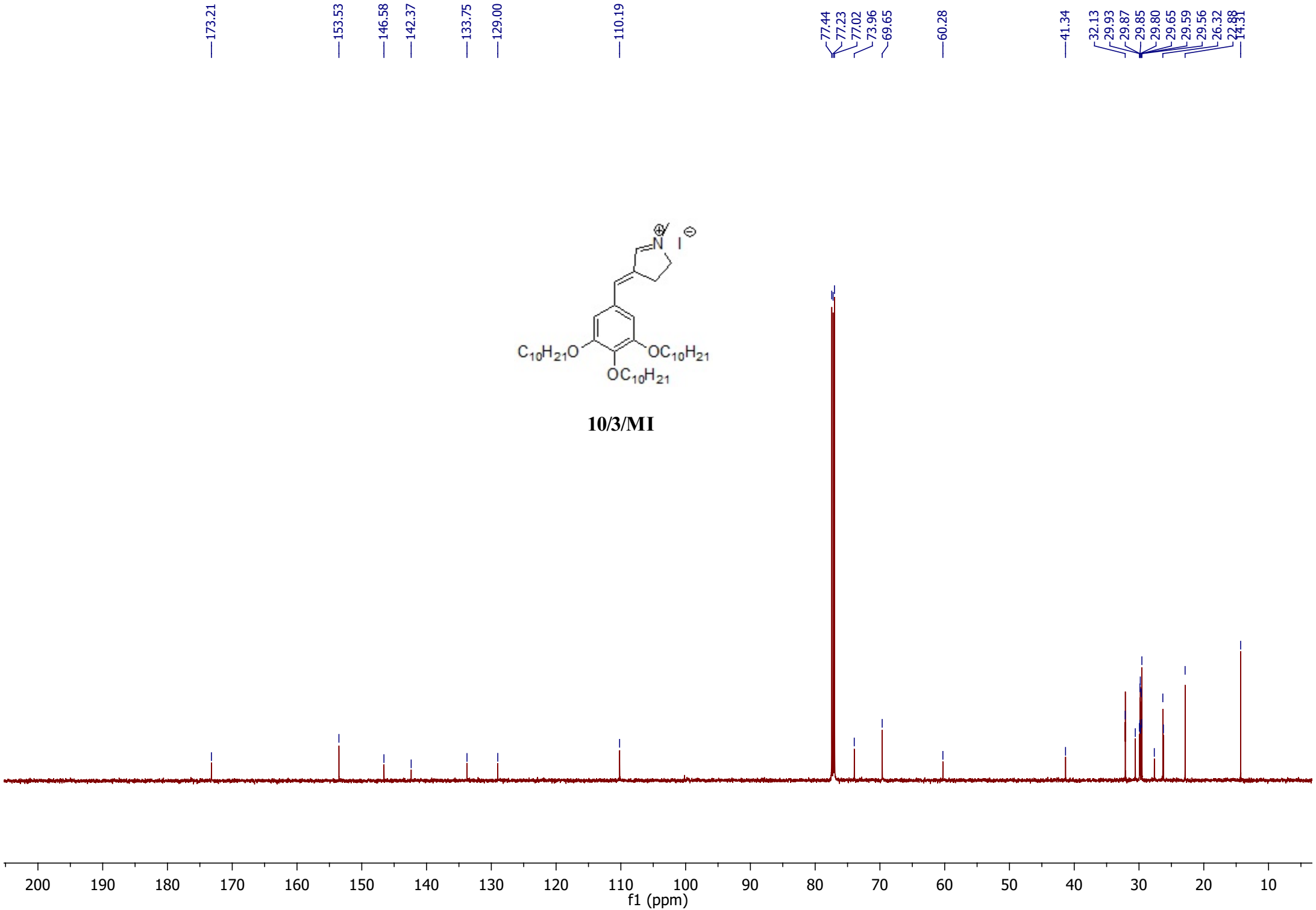
12/3/C12I

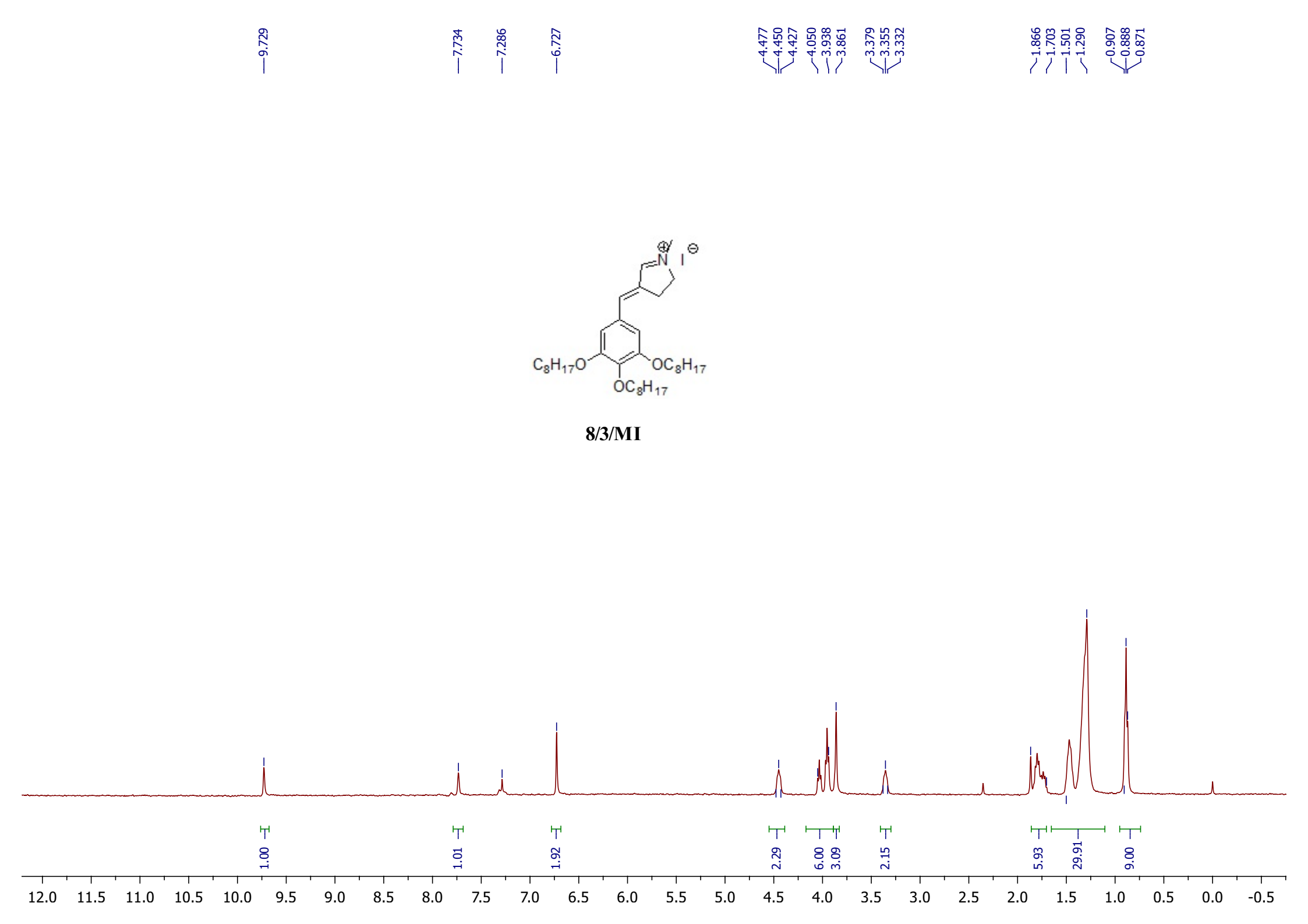
9.770
7.841
7.281
6.741
4.420
4.377
4.102
4.090
4.078
4.043
4.032
4.022
3.968
3.958
3.948
3.374
3.341
1.855
1.713
1.494
1.471
1.267
1.243
0.892
0.881
0.870
1.00
1.01
2.08
2.08
2.21
2.17
4.29
2.06
12.15
70.93
8.99
12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)


172.15
153.54
146.92
142.51
133.63
129.05
110.28
77.44
77.23
77.02
73.93
69.71
57.96
54.04
32.10
30.57
29.91
29.89
29.83
29.78
29.75
29.69
29.64
29.56
29.50
27.71
26.65
26.31
26.22
22.84
14.24
C12H25
N
I
C12H25O
OC12H25
OC12H25
12/3/C12I
f1 (ppm)

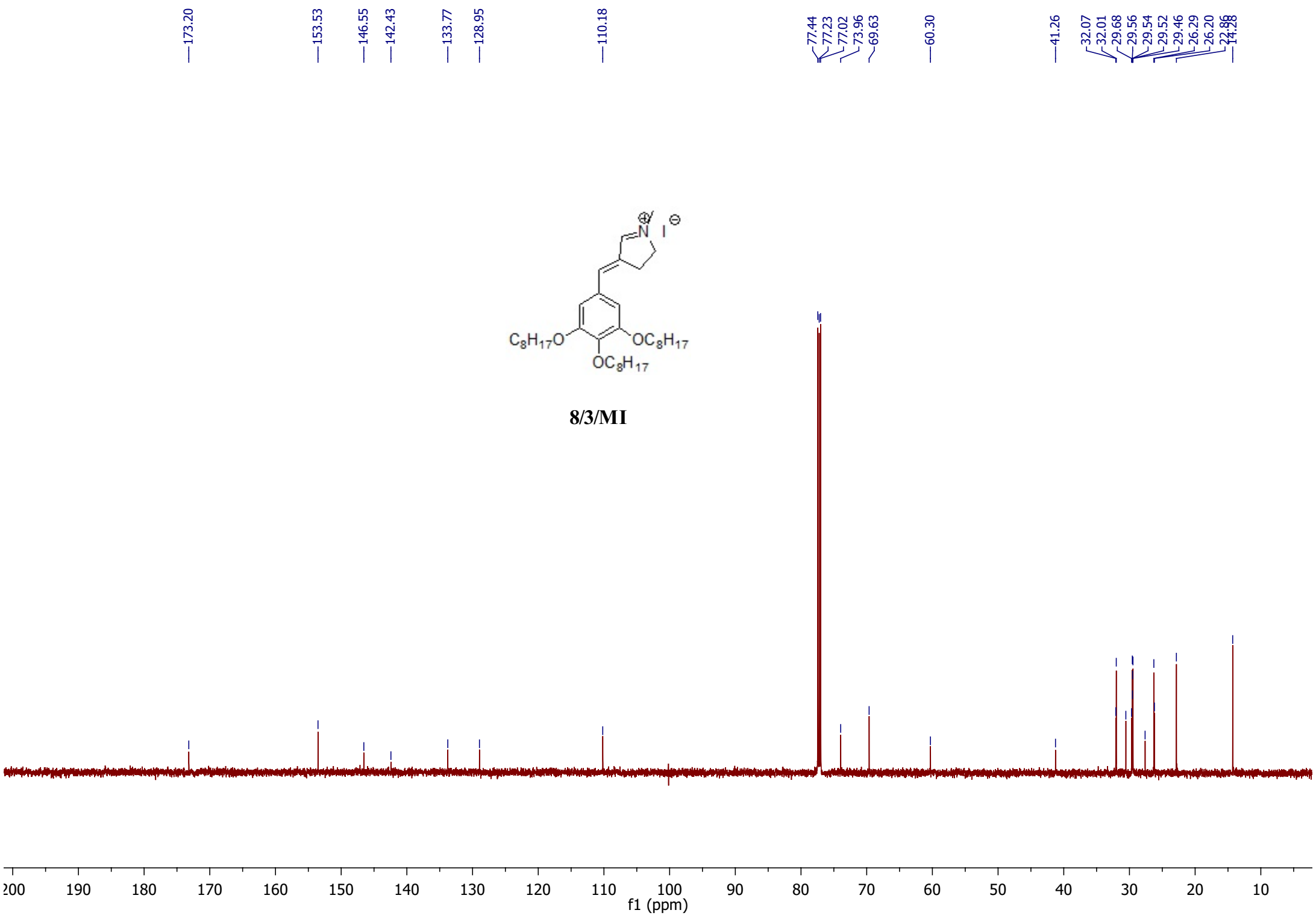

9.738
7.760
7.271
6.737
4.417
4.395
4.045
4.023
3.968
3.946
3.852
3.363
3.344
1.822
1.775
1.759
1.711
1.678
1.676
1.492
1.443
1.354
1.272
0.893
0.882
0.870
$C_{10}H_{21}O$
$OC_{10}H_{21}$
$OC_{10}H_{21}$
I
1.00
1.02
2.10
2.16
2.12
4.16
3.04
2.18
4.28
2.22
2.05
6.38
34.10
9.08
12.0 11.5 11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)

10/3/MI

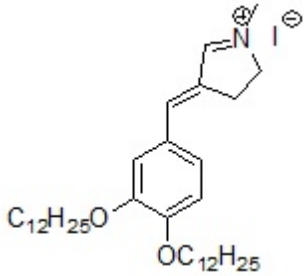

173.21
153.53
146.58
142.37
133.75
129.00
110.19
77.44
77.23
77.02
73.96
69.65
60.28
41.34
32.13
29.93
29.87
29.85
29.80
29.65
29.59
29.56
26.32
22.88
14.31
N
I
C10H21O
OC10H21
OC10H21
10/3/MI
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)


9.729
7.734
7.286
6.727
4.477
4.450
4.427
4.050
3.938
3.861
3.379
3.355
3.332
1.866
1.703
1.501
1.290
0.907
0.888
0.871
$C_8H_{17}O$
OC_8H_{17}
OC_8H_{17}
I
1.00
1.01
1.92
2.29
6.00
3.09
2.15
5.93
29.91
9.00
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5

8/3/MI

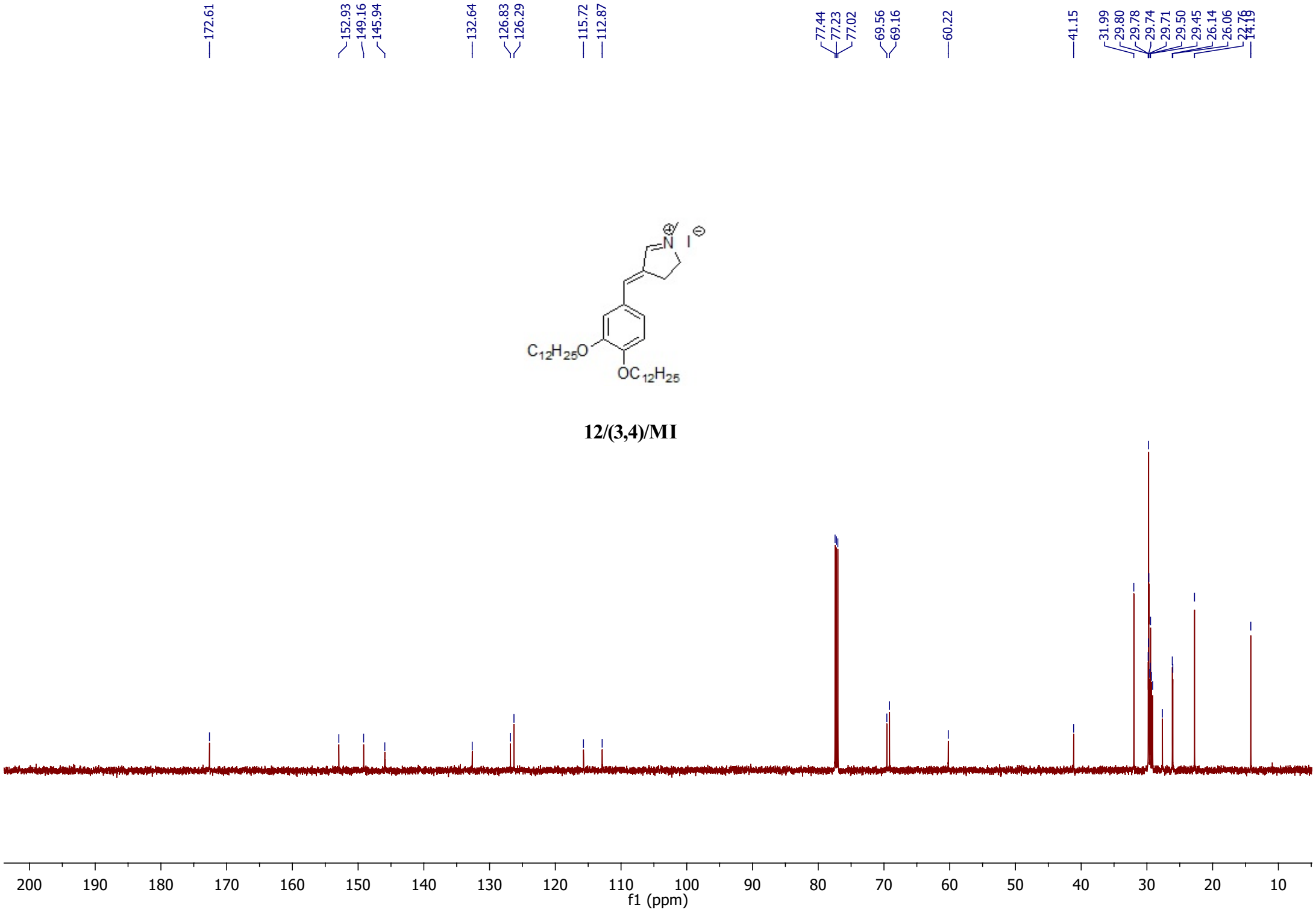

173.20
153.53
146.55
142.43
133.77
128.95
110.18
77.44
77.23
77.02
73.96
69.63
60.30
41.26
32.07
32.01
29.68
29.56
29.54
29.52
29.46
26.29
26.20
22.86
14.28
$C_8H_{17}O$
OC_8H_{17}
OC_8H_{17}
I
f1 (ppm)

8/3/MI

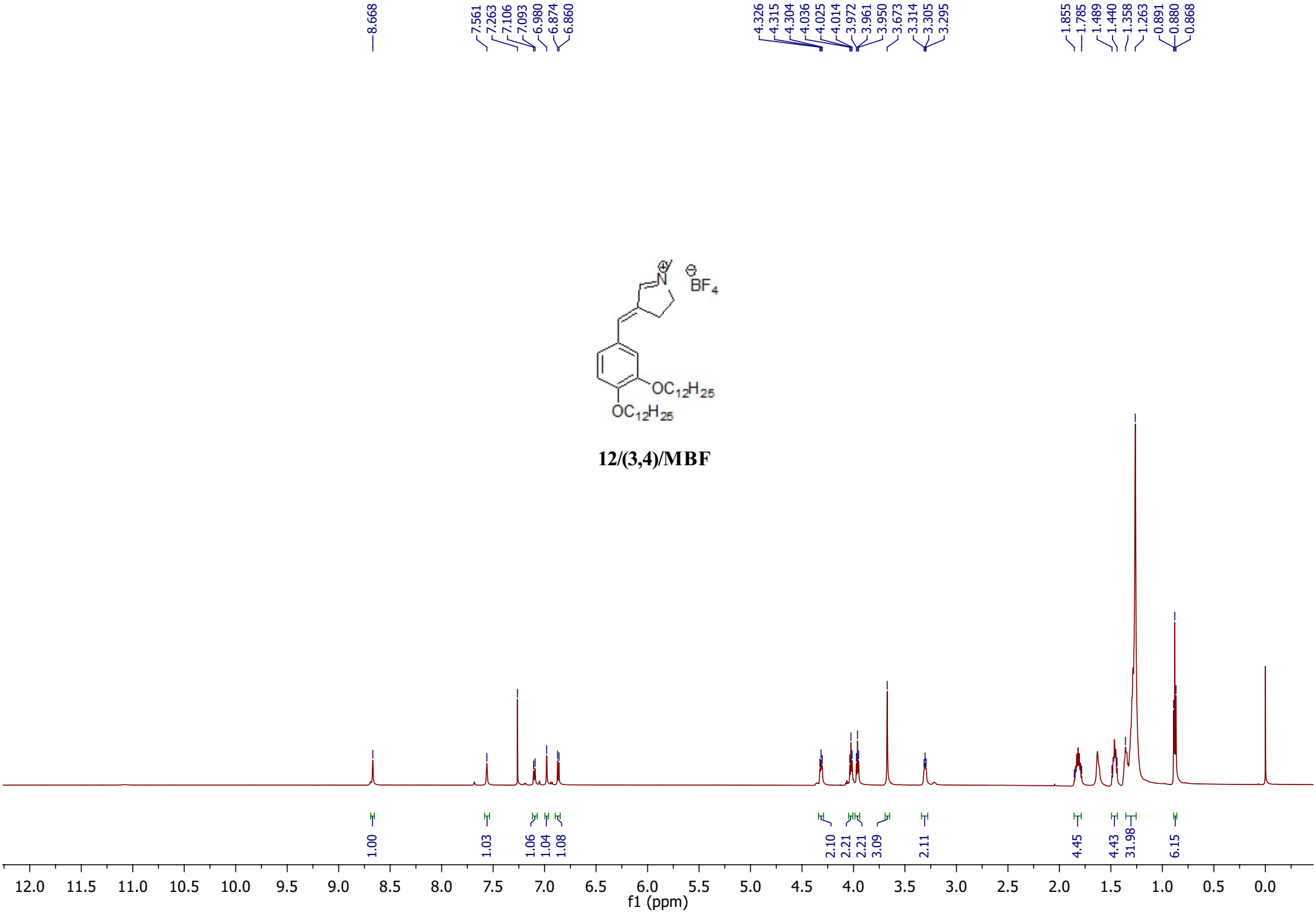

N
I
C12H25O
OC12H25

12/(3,4)/MI

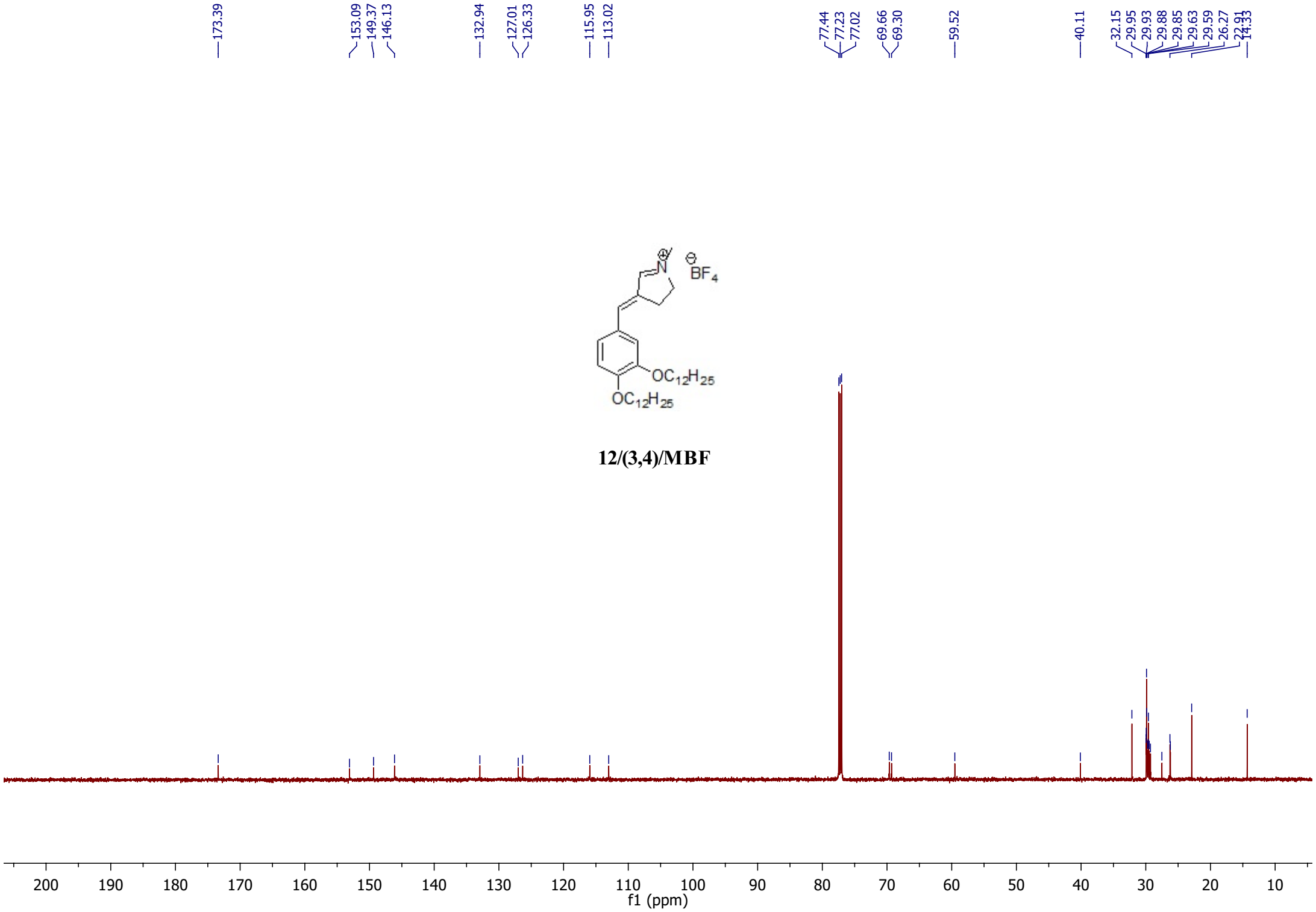
9.650
7.768
7.148
7.134
7.007
7.005
6.895
6.881
4.420
4.398
4.049
4.027
3.988
3.966
3.831
3.348
3.328
1.861
1.793
1.493
1.446
1.362
1.265
0.891
0.880
0.869
1.00
1.02
1.04
1.05
1.07
2.06
2.12
2.15
3.16
2.11
4.35
4.30
32.24
6.10
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


172.61
152.93
149.16
145.94
132.64
126.83
126.29
115.72
112.87
77.44
77.23
77.02
69.56
69.16
60.22
41.15
31.99
29.80
29.78
29.74
29.71
29.50
29.45
26.14
26.06
22.76
14.19
N
I
C12H25O
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

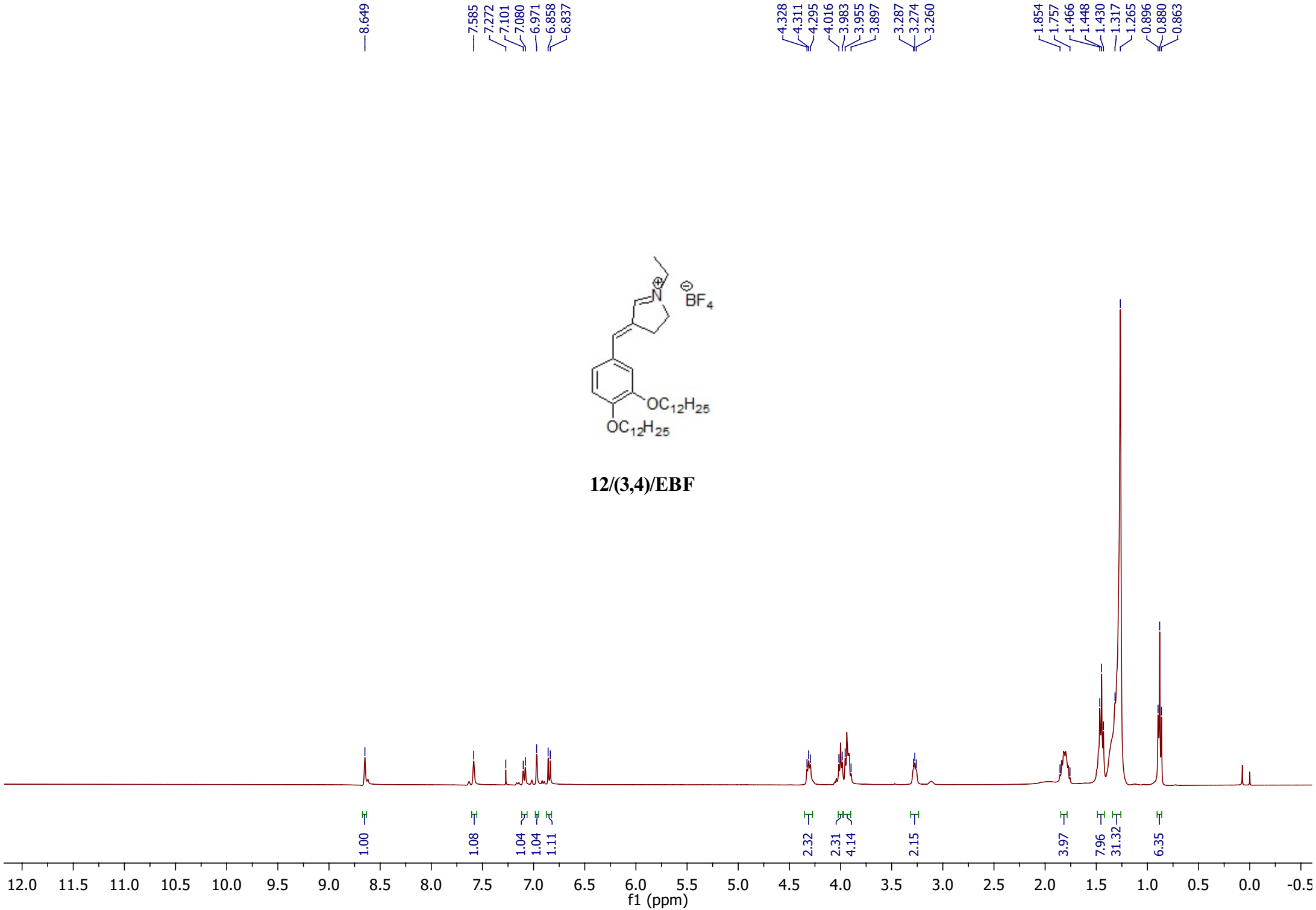
12/(3,4)/MI


8.668
7.561
7.263
7.106
7.093
6.980
6.874
6.860
4.326
4.315
4.304
4.036
4.025
4.014
3.972
3.961
3.950
3.673
3.314
3.305
3.295
1.855
1.785
1.489
1.440
1.358
1.263
0.891
0.880
0.868
BF4
OC12H25
OC12H25
1.00
1.03
1.06
1.04
1.08
2.10
2.21
2.21
3.09
2.11
4.45
4.43
31.98
6.15
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

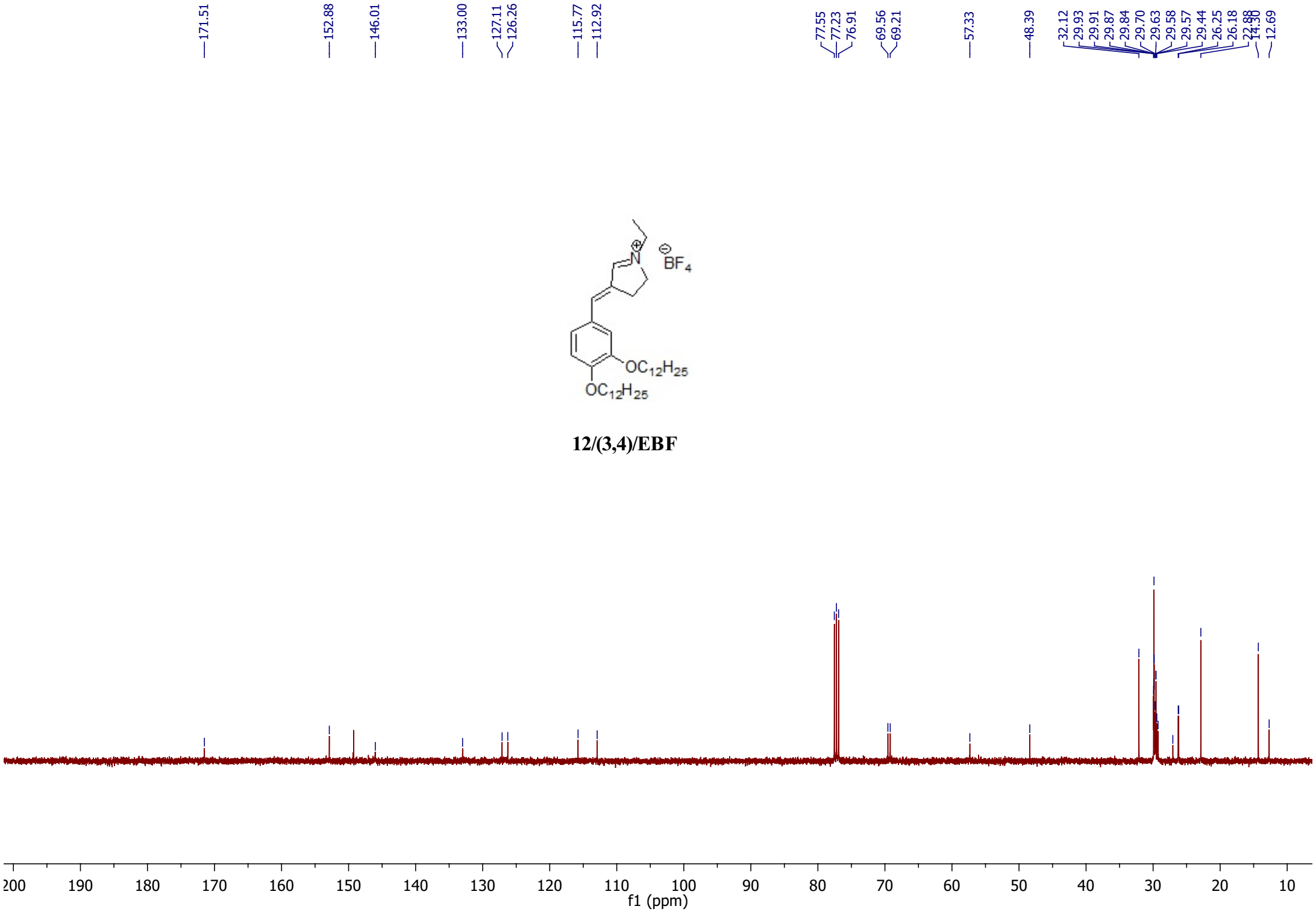
12/(3,4)/MBF


173.39
153.09
149.37
146.13
132.94
127.01
126.33
115.95
113.02
77.44
77.23
77.02
69.66
69.30
59.52
40.11
32.15
29.95
29.93
29.88
29.85
29.63
29.59
26.27
22.91
14.33
BF4
OC12H25
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

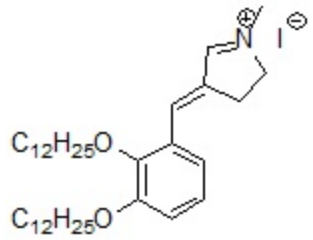
12/(3,4)/MBF


8.649
7.585
7.272
7.101
7.080
6.971
6.858
6.837
4.328
4.311
4.295
4.016
3.983
3.955
3.897
3.287
3.274
3.260
1.854
1.757
1.466
1.448
1.430
1.317
1.265
0.896
0.880
0.863
BF4
OC12H25
OC12H25
1.00
1.08
1.04
1.04
1.11
2.32
2.31
4.14
2.15
3.97
7.96
31.32
6.35
f1 (ppm)

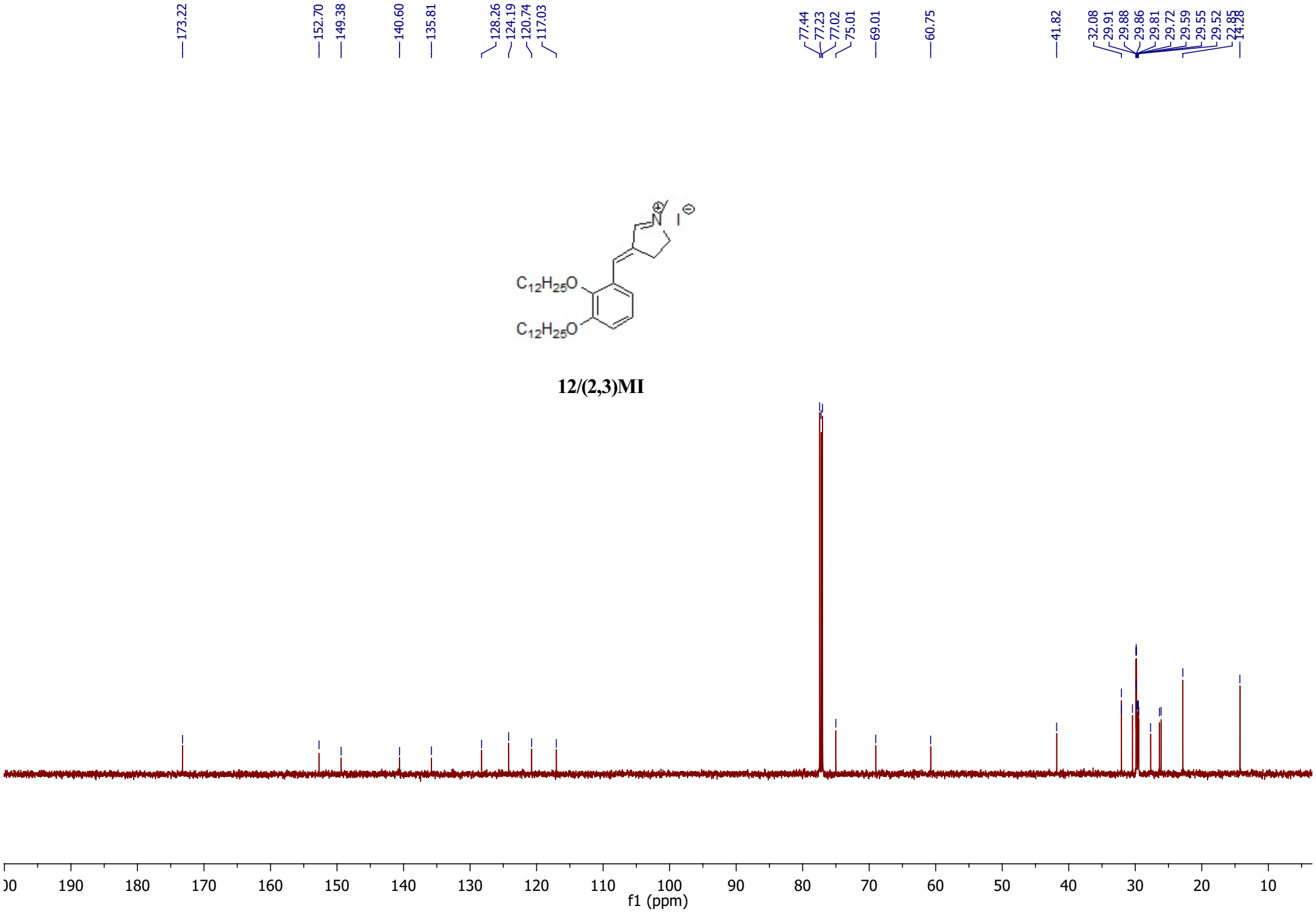
12/(3,4)/EBF


171.51
152.88
146.01
133.00
127.11
126.26
115.77
112.92
77.55
77.23
76.91
69.56
69.21
57.33
48.39
32.12
29.93
29.91
29.87
29.84
29.70
29.63
29.58
29.57
29.44
26.25
26.18
14.30
12.69
BF4
OC12H25
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

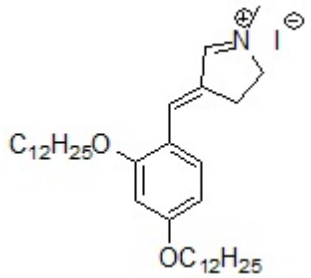
12/(3,4)/EBF



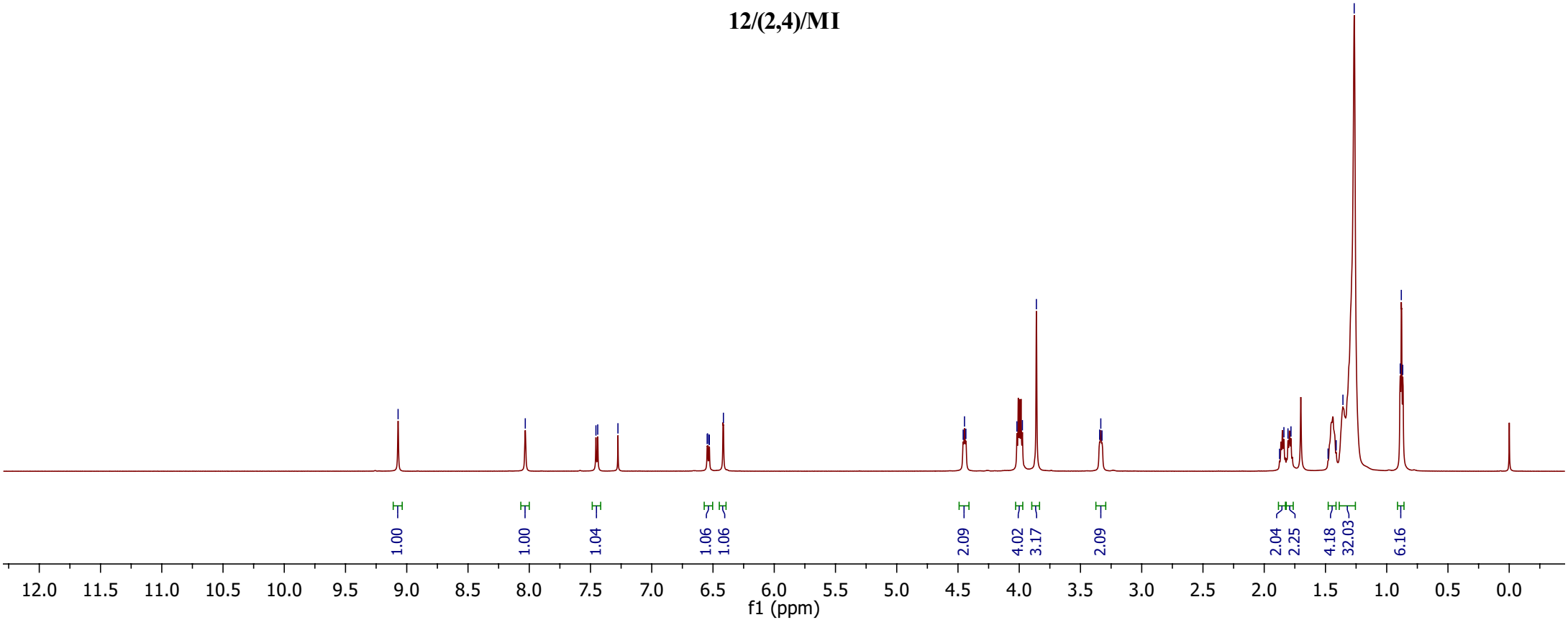
12/(2,3)MI

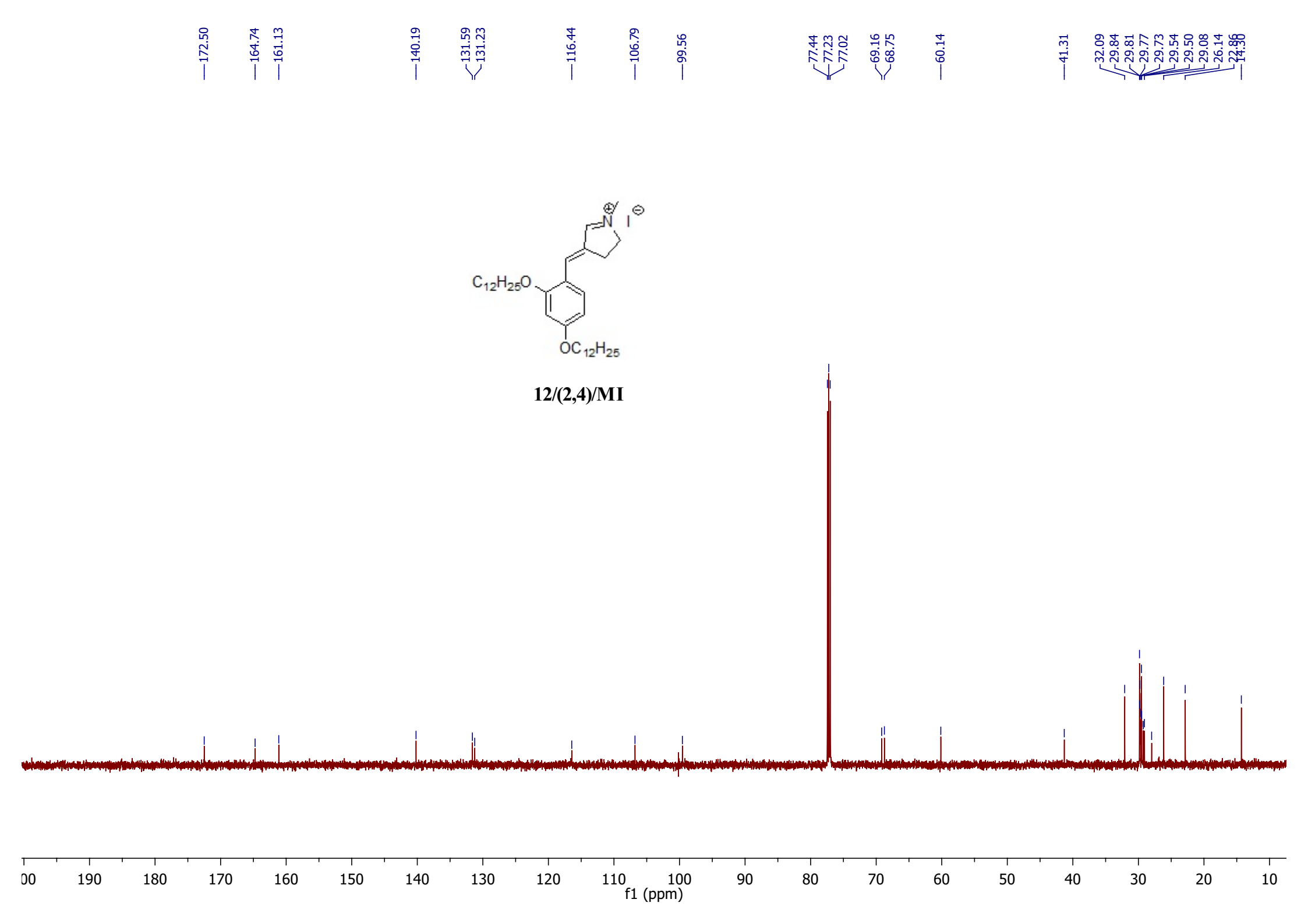

173.22
152.70
149.38
140.60
135.81
128.26
124.19
120.74
117.03
77.44
77.23
77.02
75.01
69.01
60.75
41.82
32.08
29.91
29.88
29.86
29.81
29.72
29.59
29.55
29.52
22.85
14.28
N
I
C12H25O
C12H25O
f1 (ppm)

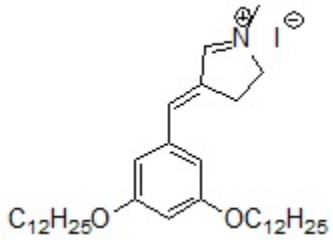
12/(2,3)MI


N
I
C12H25O
OC12H25

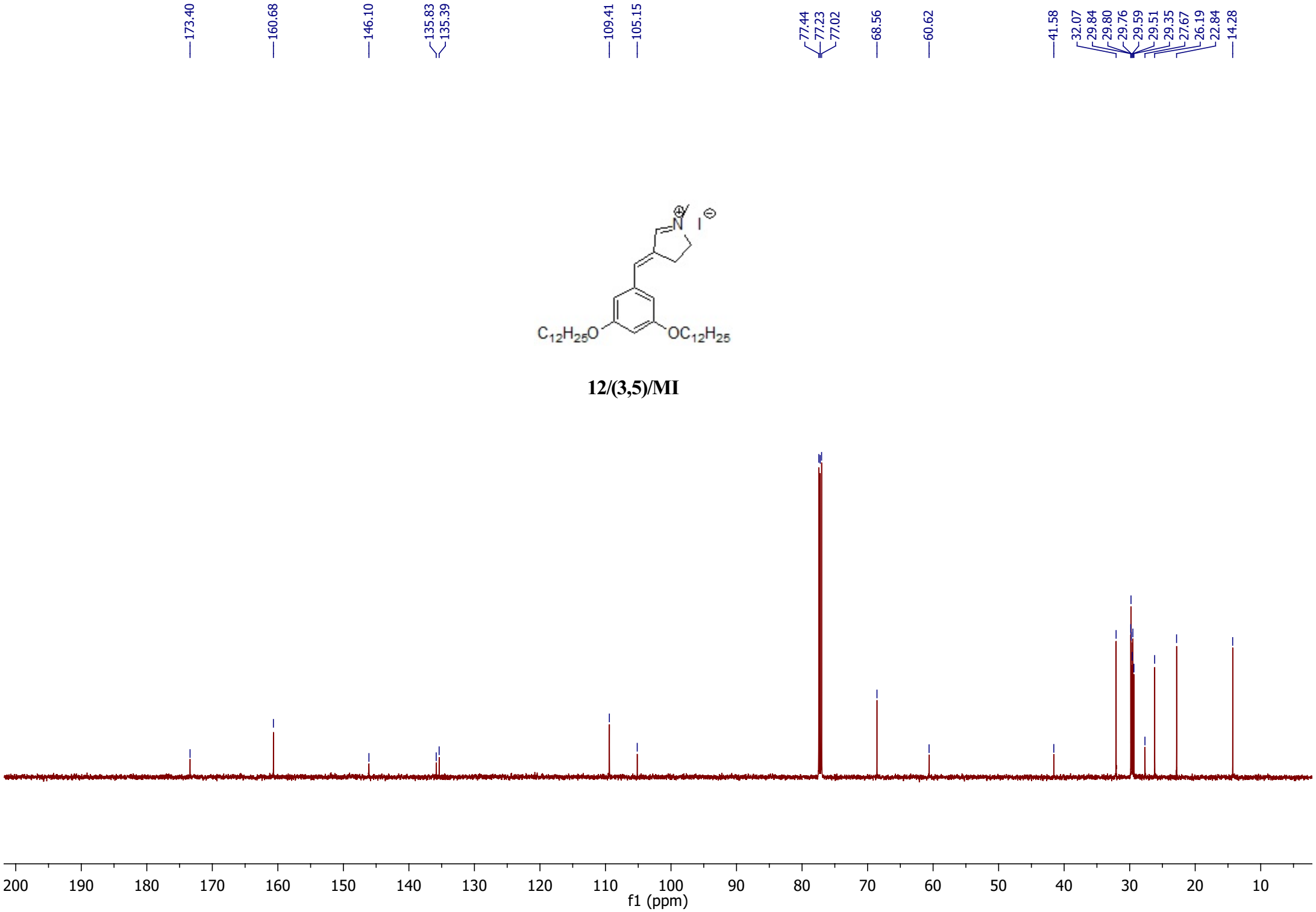
12/(2,4)/MI


9.071
8.032
7.456
7.441
7.276
6.547
6.545
6.533
6.530
6.415
4.458
4.447
4.436
4.019
3.974
3.860
3.344
3.334
3.324
1.875
1.839
1.806
1.782
1.413
1.357
0.881
0.869
1.00
1.00
1.04
1.06
1.06
2.09
4.02
3.17
2.09
2.04
2.25
4.18
32.03
6.16
f1 (ppm)

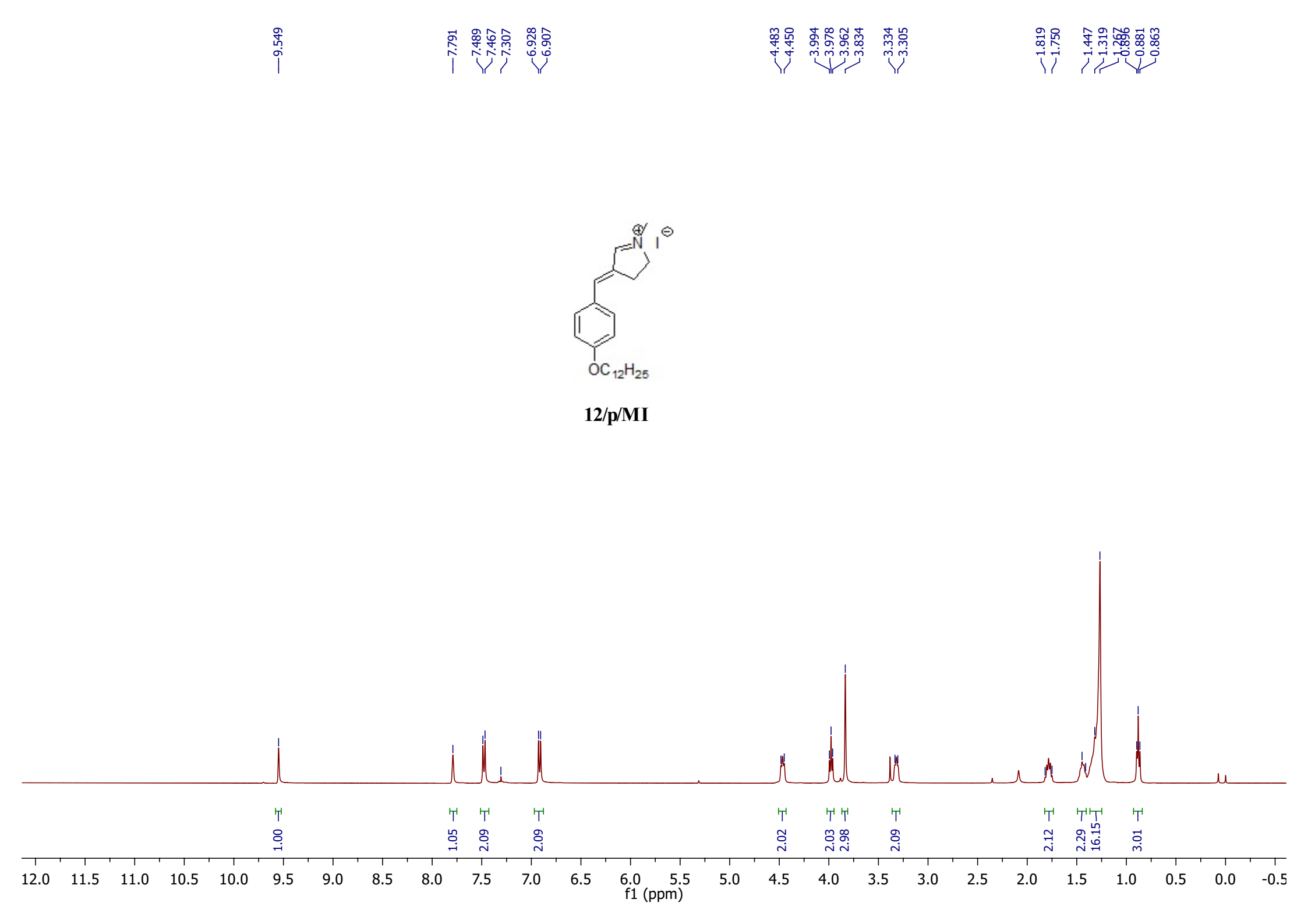

172.50
164.74
161.13
140.19
131.59
131.23
116.44
106.79
99.56
77.44
77.23
77.02
69.16
68.75
60.14
41.31
32.09
29.84
29.81
29.77
29.73
29.54
29.50
29.08
26.14
22.86
14.30
N
I
C12H25O
OC12H25
12/(2,4)/MI
f1 (ppm)



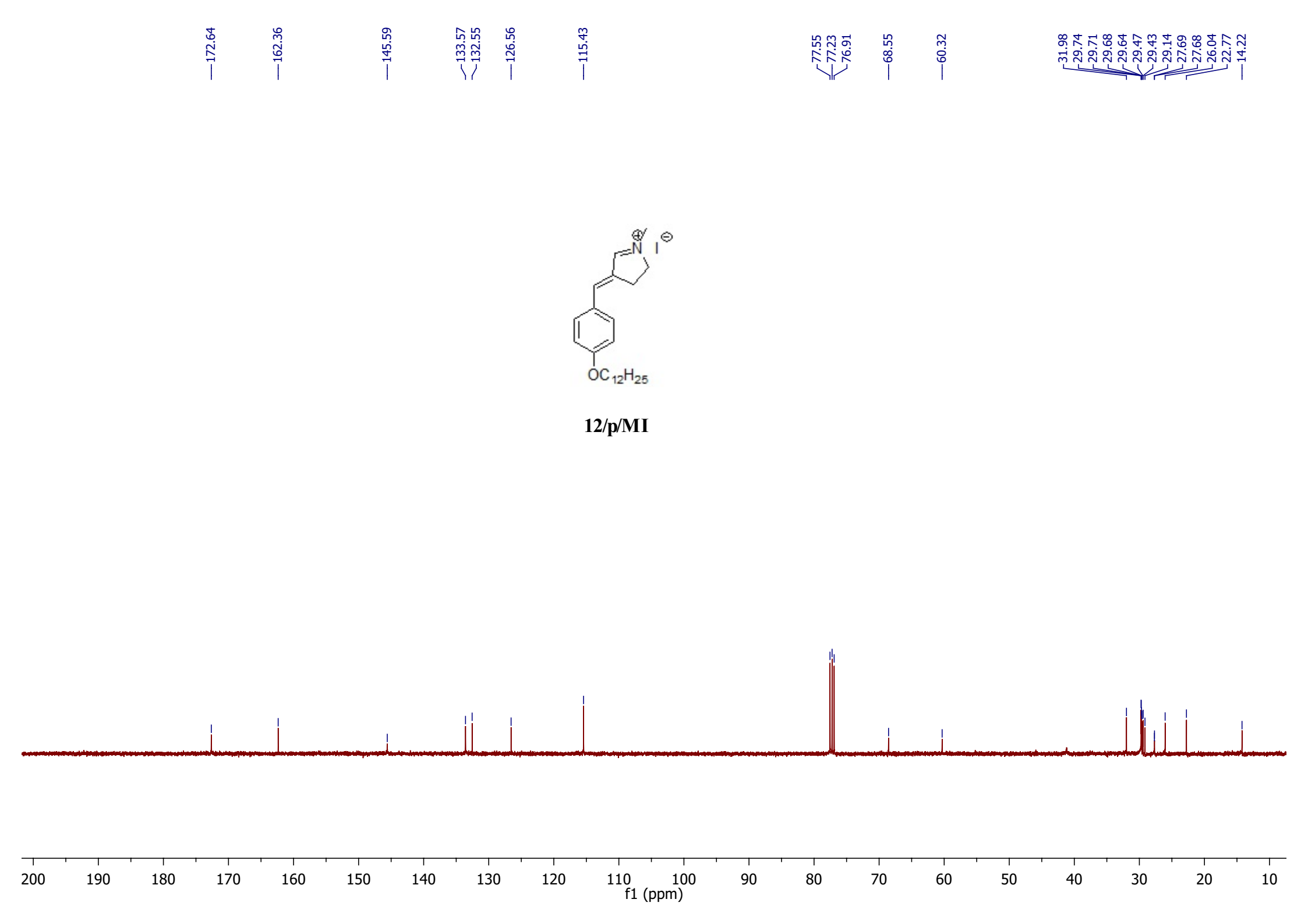
12/(3,5)/MI


173.40
160.68
146.10
135.83
135.39
109.41
105.15
77.44
77.23
77.02
68.56
60.62
41.58
32.07
29.84
29.80
29.76
29.59
29.51
29.35
27.67
26.19
22.84
14.28
$C_{12}H_{25}O$
$OC_{12}H_{25}$
I
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

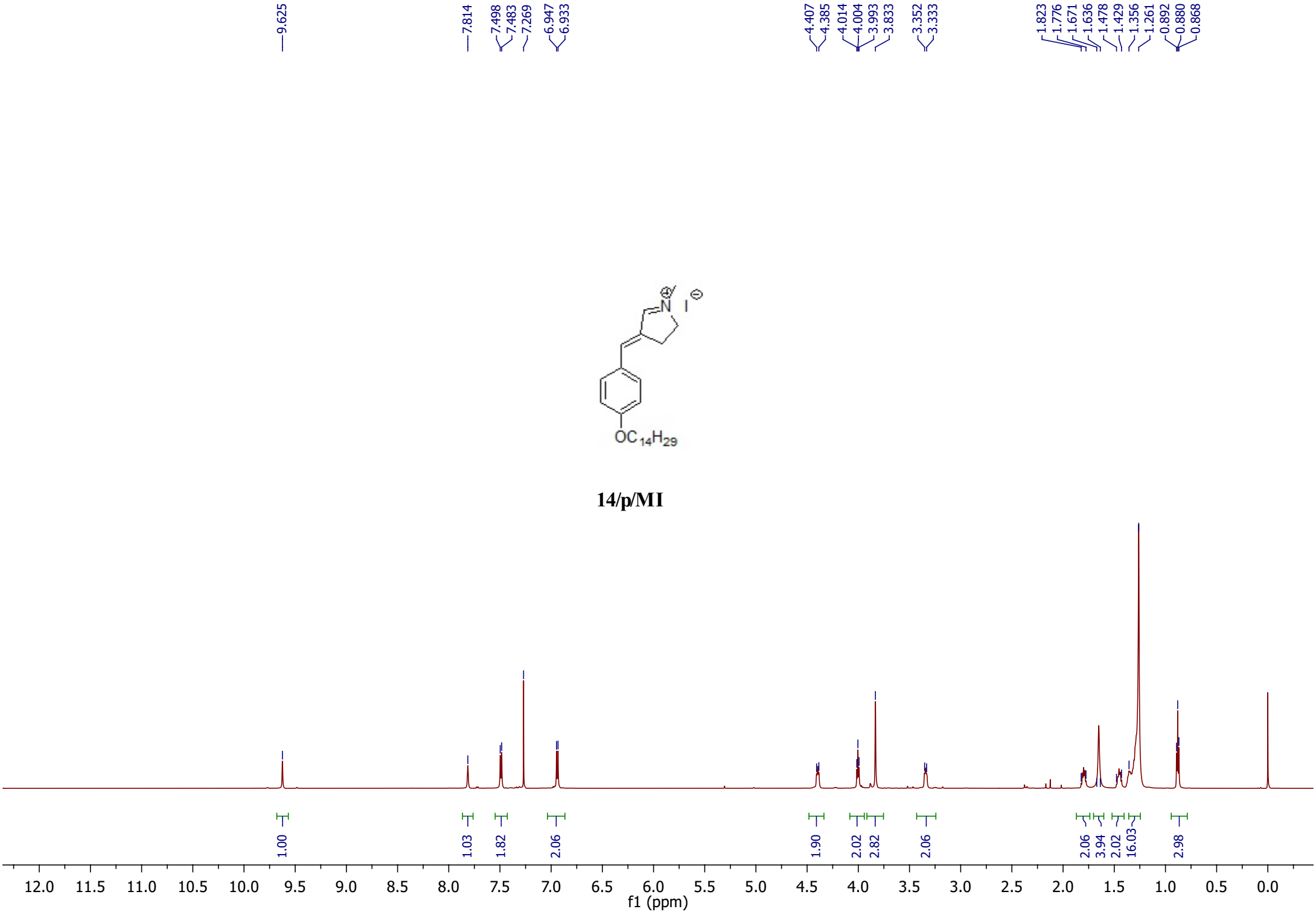
12/(3,5)/MI


9.549
7.791
7.489
7.467
7.307
6.928
6.907
4.483
4.450
3.994
3.978
3.962
3.834
3.334
3.305
1.819
1.750
1.447
1.319
1.267
0.896
0.881
0.863
N
I
OC12H25
1.00
1.05
2.09
2.09
2.02
2.03
2.98
2.09
2.12
2.29
16.15
3.01
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
f1 (ppm)

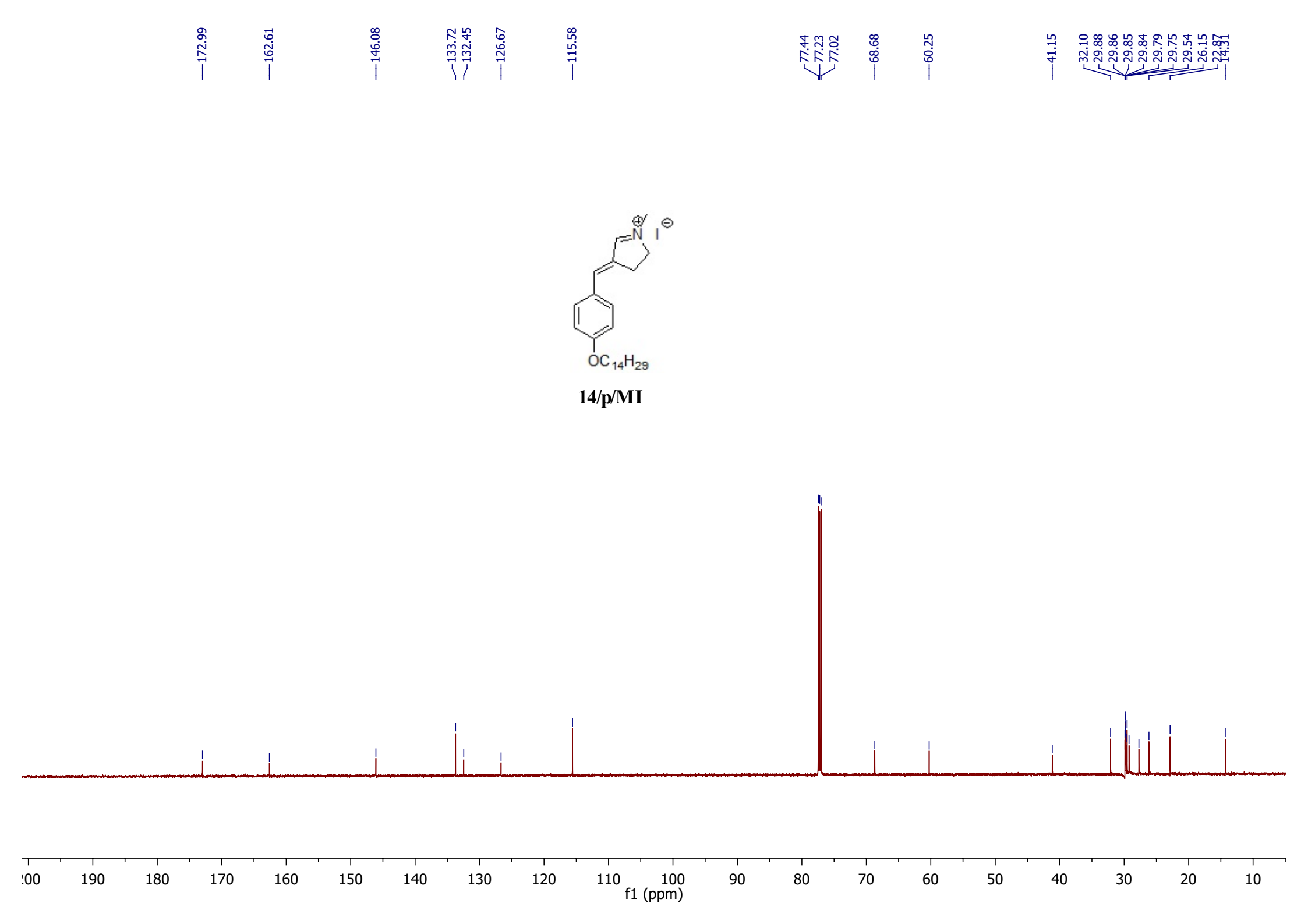
12/p/MI


172.64
162.36
145.59
133.57
132.55
126.56
115.43
77.55
77.23
76.91
68.55
60.32
31.98
29.74
29.71
29.68
29.64
29.47
29.43
29.14
27.69
27.68
26.04
22.77
14.22
N
I
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

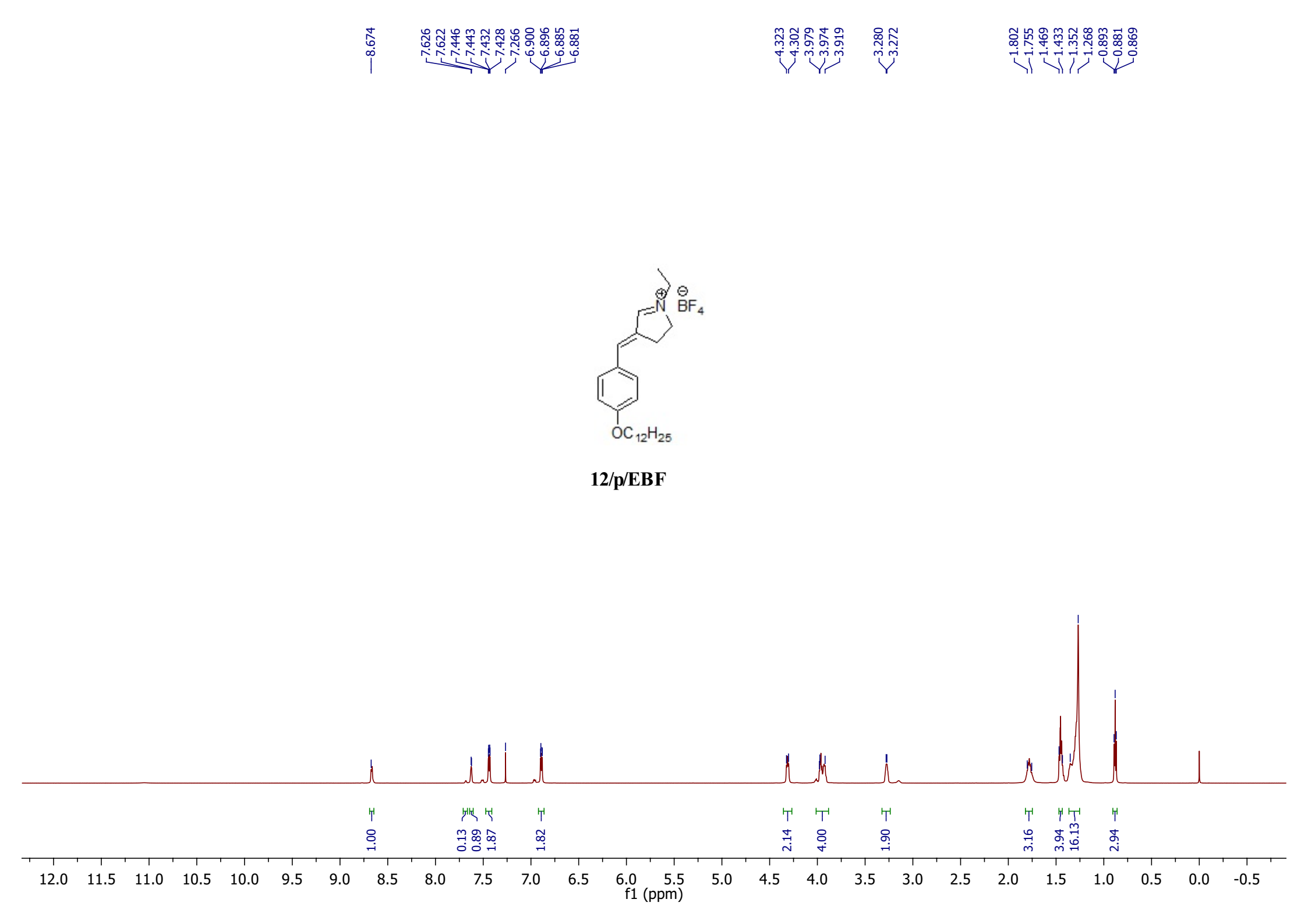
12/p/MI


9.625
7.814
7.498
7.483
7.269
6.947
6.933
4.407
4.385
4.014
4.004
3.993
3.833
3.352
3.333
1.823
1.776
1.671
1.636
1.478
1.429
1.356
1.261
0.892
0.880
0.868
N
I
OC14H29
1.00
1.03
1.82
2.06
1.90
2.02
2.82
2.06
2.06
3.94
2.02
16.03
2.98
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

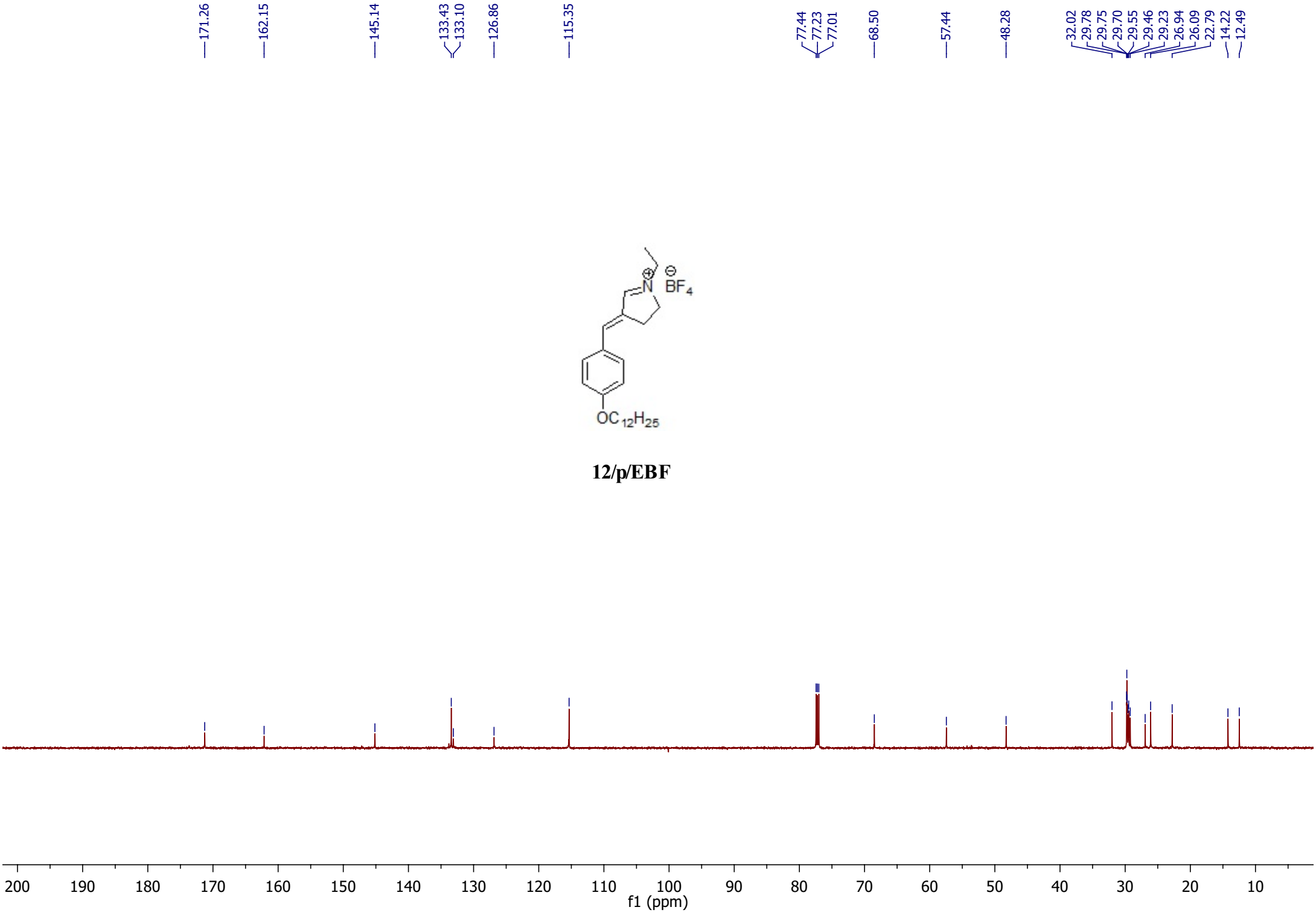
14/p/MI


172.99
162.61
146.08
133.72
132.45
126.67
115.58
77.44
77.23
77.02
68.68
60.25
41.15
32.10
29.88
29.86
29.85
29.84
29.79
29.75
29.54
26.15
22.87
14.31
N
I
OC14H29
f1 (ppm)

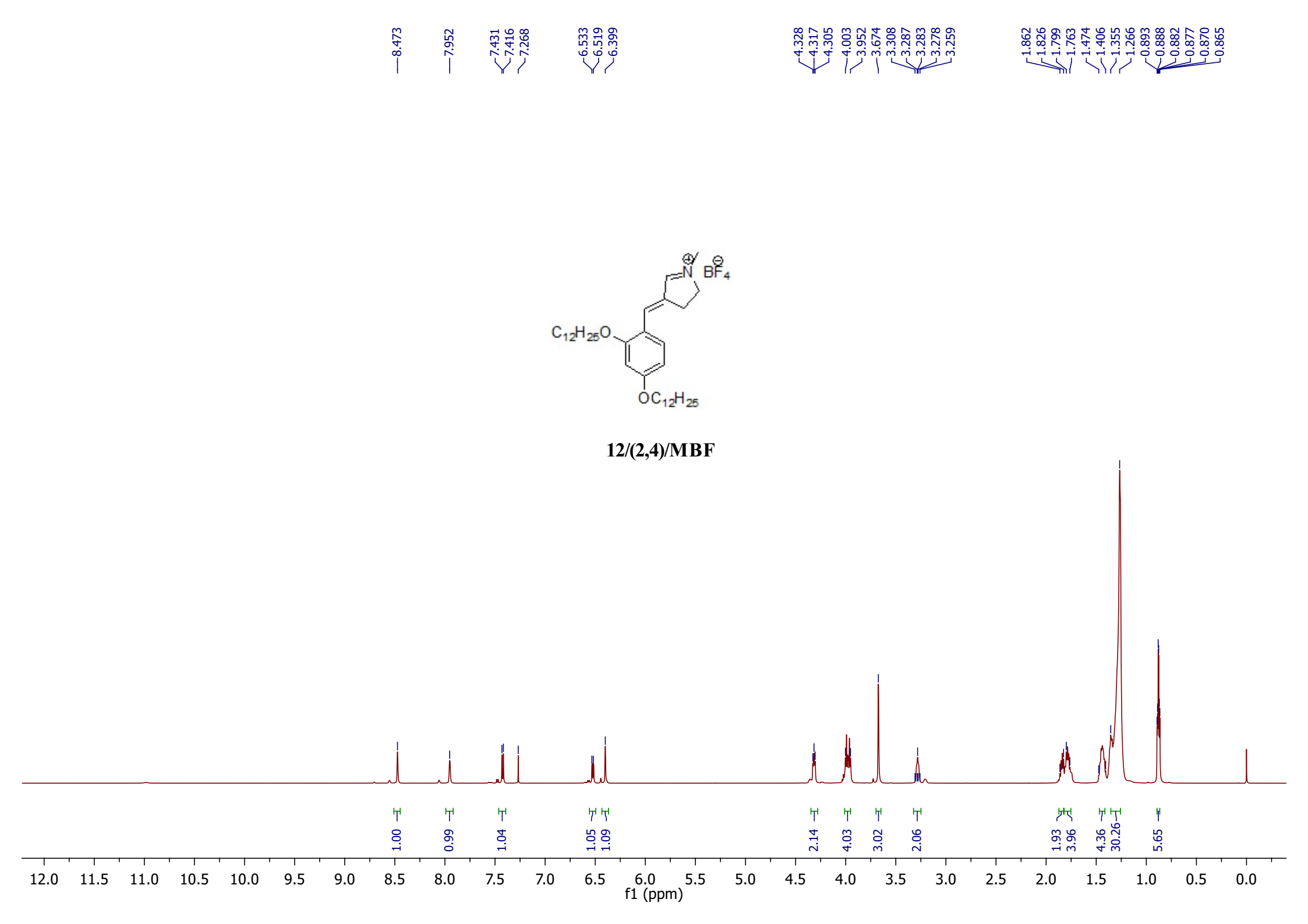
14/p/MI


8.674
7.626
7.622
7.446
7.443
7.432
7.428
7.266
6.900
6.896
6.885
6.881
4.323
4.302
3.979
3.974
3.919
3.280
3.272
1.802
1.755
1.469
1.433
1.352
1.268
0.893
0.881
0.869
N
BF4
OC12H25
1.00
0.13
0.89
1.87
1.82
2.14
4.00
1.90
3.16
3.94
16.13
2.94
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
f1 (ppm)

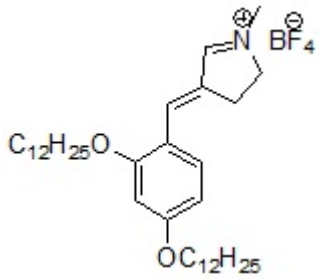
12/p/EBF


171.26
162.15
145.14
133.43
133.10
126.86
115.35
77.44
77.23
77.01
68.50
57.44
48.28
32.02
29.78
29.75
29.70
29.55
29.46
29.23
26.94
26.09
22.79
14.22
12.49
N
BF4
OC12H25
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

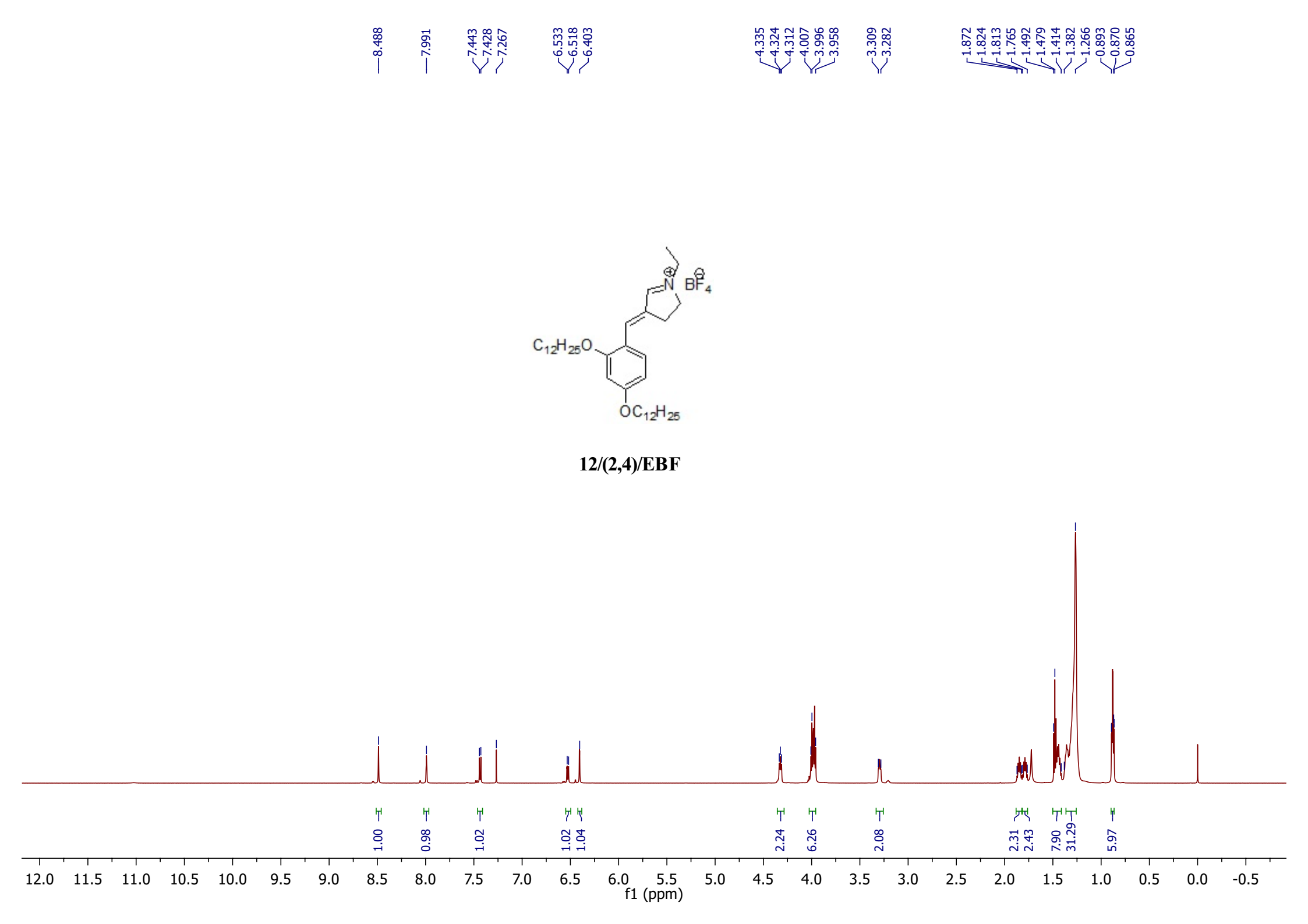
12/p/EBF


8.473
7.952
7.431
7.416
7.268
6.533
6.519
6.399
4.328
4.317
4.305
4.003
3.952
3.674
3.308
3.287
3.283
3.278
3.259
1.862
1.826
1.799
1.763
1.474
1.406
1.355
1.266
0.893
0.888
0.882
0.877
0.870
0.865
$C_{12}H_{25}O$
$OC_{12}H_{25}$
BF_4^-
1.00
0.99
1.04
1.05
1.09
2.14
4.03
3.02
2.06
1.93
3.96
4.36
30.26
5.65
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

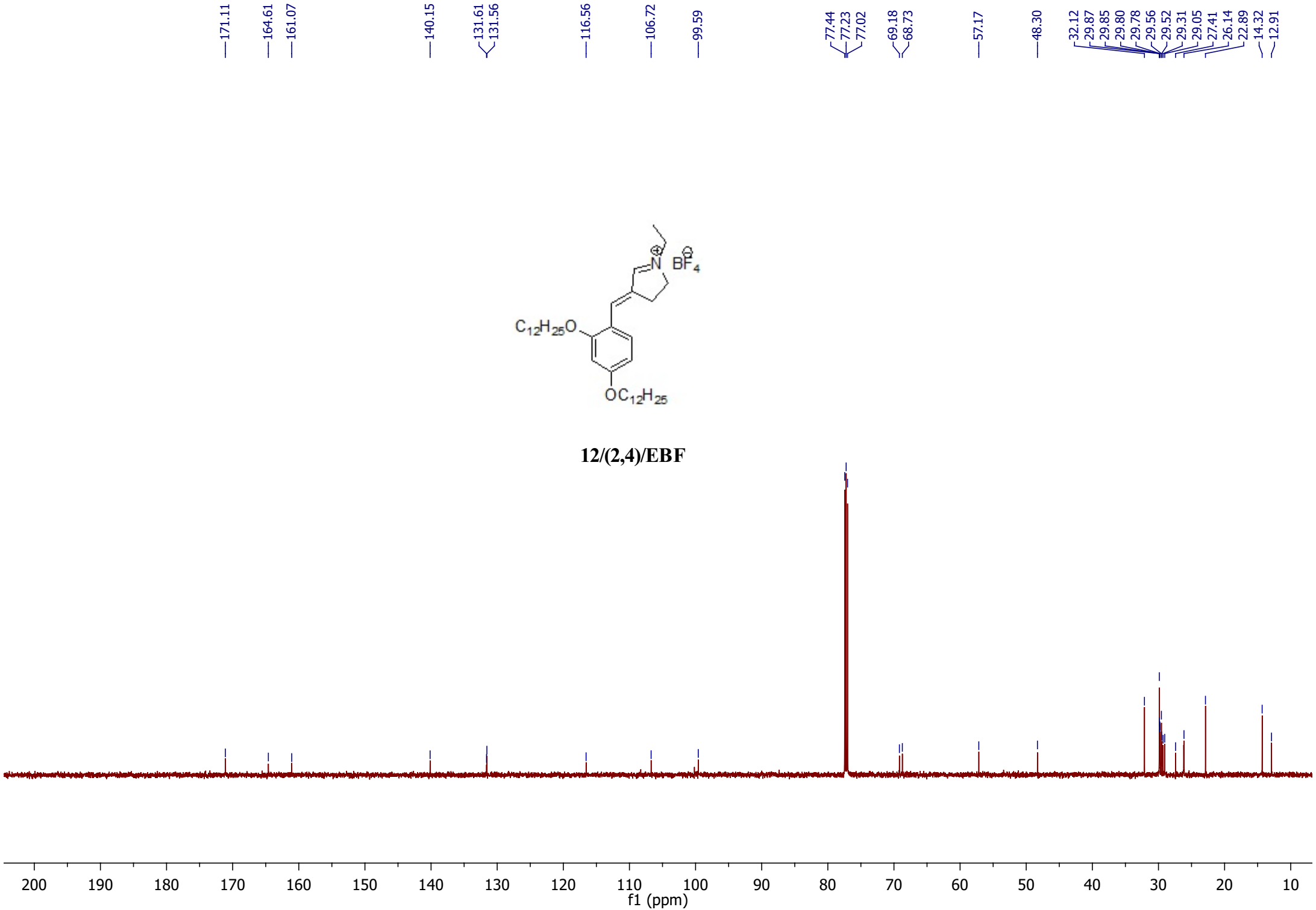
12/(2,4)/MBF

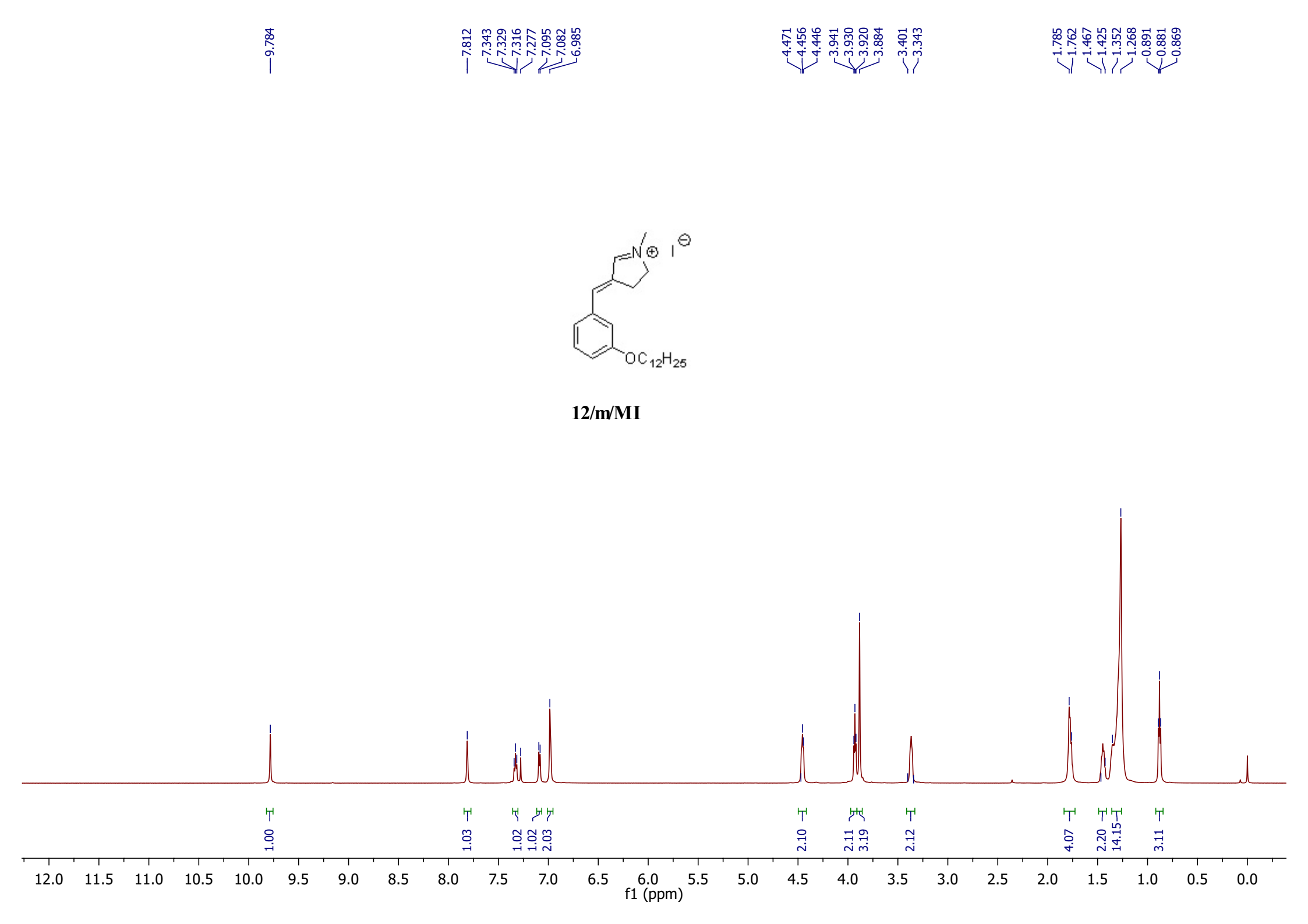


12/(2,4)/MBF

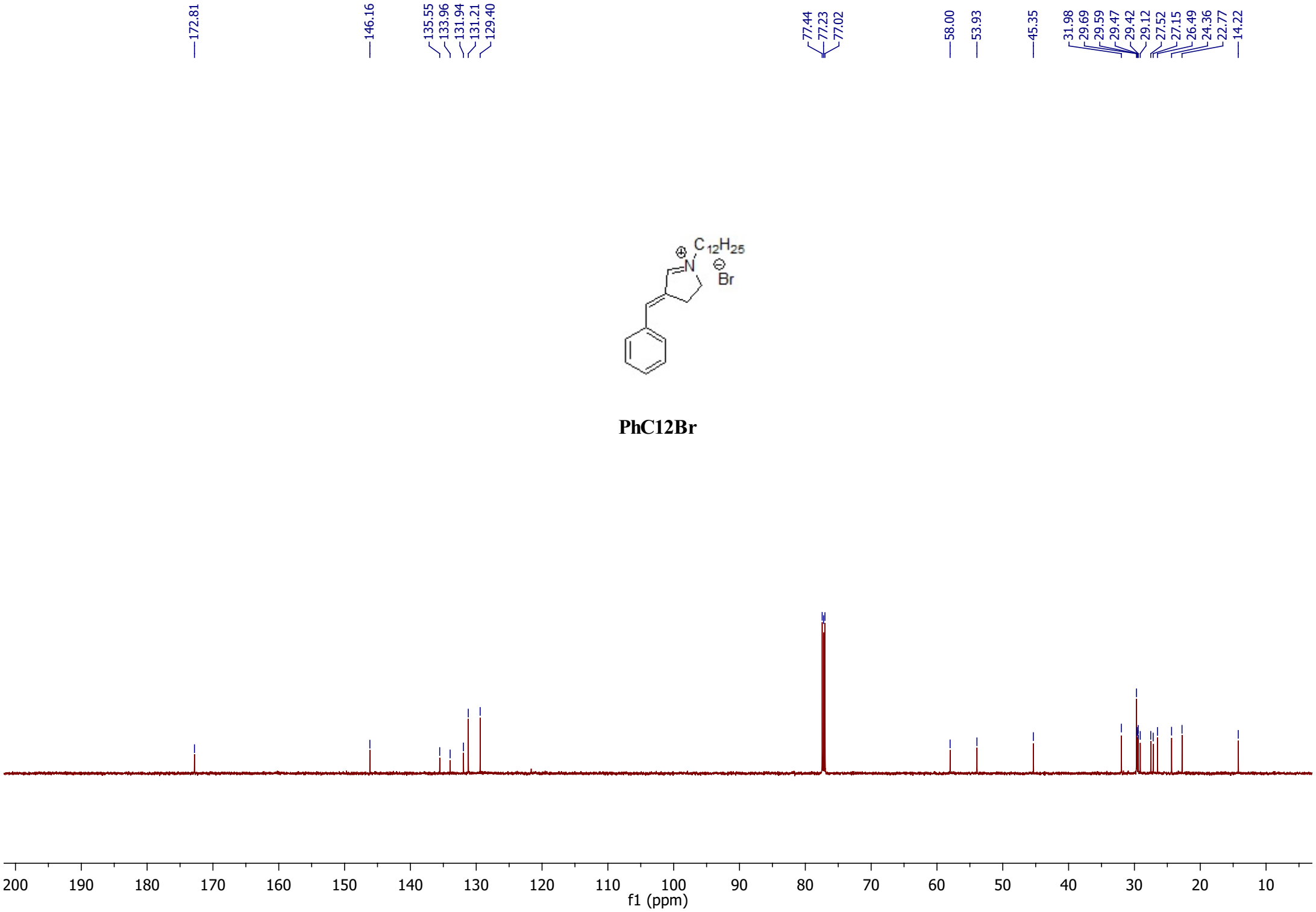

8.488
7.991
7.443
7.428
7.267
6.533
6.518
6.403
4.335
4.324
4.312
4.007
3.996
3.958
3.309
3.282
1.872
1.824
1.813
1.765
1.492
1.479
1.414
1.382
1.266
0.893
0.870
0.865
N
BF4
C12H25O
OC12H25
1.00
0.98
1.02
1.02
1.04
2.24
6.26
2.08
2.31
2.43
7.90
31.29
5.97
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
f1 (ppm)

12/(2,4)/EBF

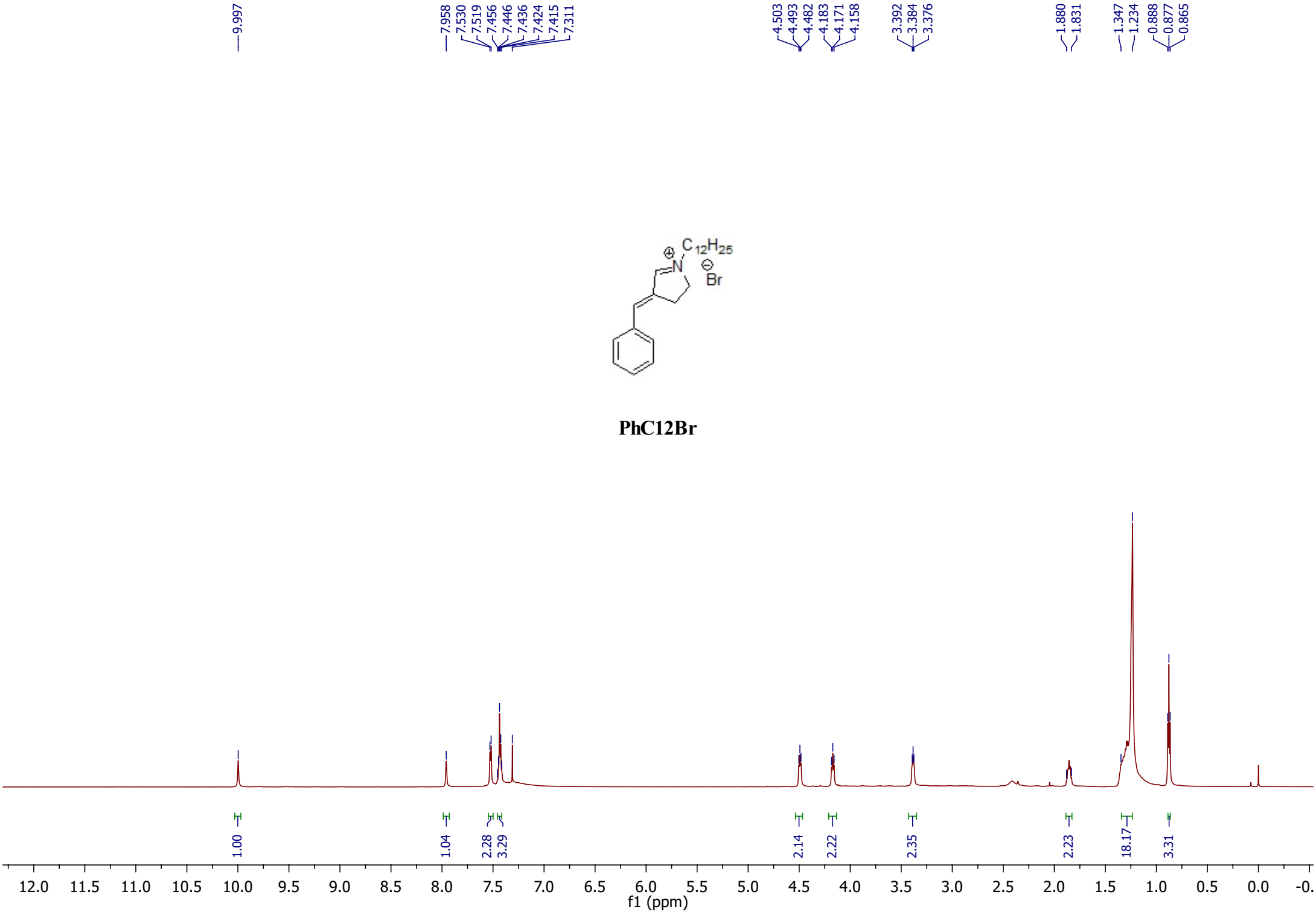

171.11
164.61
161.07
140.15
131.61
131.56
116.56
106.72
99.59
77.44
77.23
77.02
69.18
68.73
57.17
48.30
32.12
29.87
29.85
29.80
29.78
29.56
29.52
29.31
29.05
27.41
26.14
22.89
14.32
12.91
N
BF4
C12H25O
OC12H25
12/(2,4)/EBF
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)


9.784
7.812
7.343
7.329
7.316
7.277
7.095
7.082
6.985
4.471
4.456
4.446
3.941
3.930
3.920
3.884
3.401
3.343
1.785
1.762
1.467
1.425
1.352
1.268
0.891
0.881
0.869
N
I
OC12H25
1.00
1.03
1.02
1.02
2.03
2.10
2.11
3.19
2.12
4.07
2.20
14.15
3.11
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

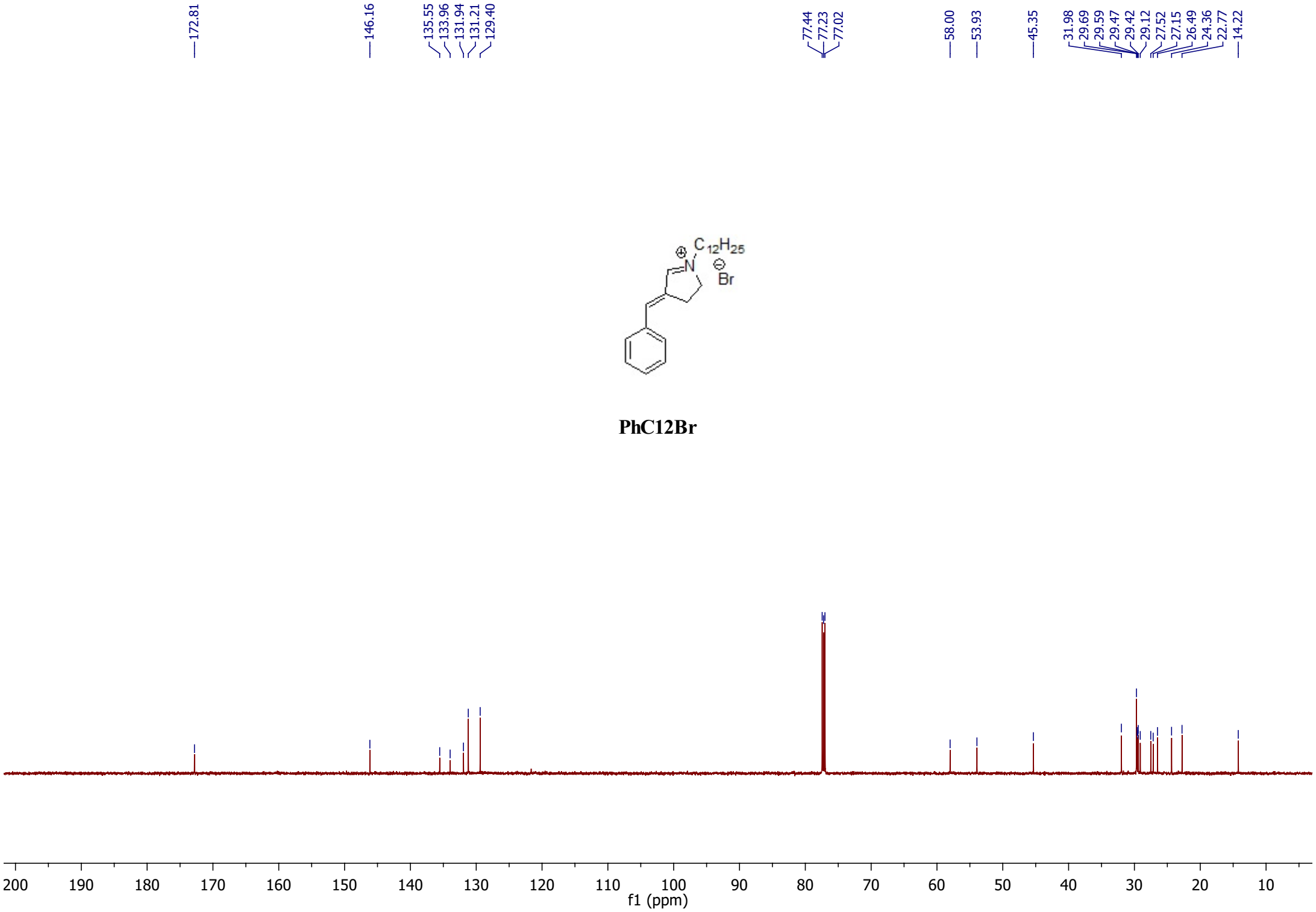
12/m/MI


172.81
146.16
135.55
133.96
131.94
131.21
129.40
77.44
77.23
77.02
58.00
53.93
45.35
31.98
29.69
29.59
29.47
29.42
29.12
27.52
27.15
26.49
24.36
22.77
14.22
C12H25
N
Br
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

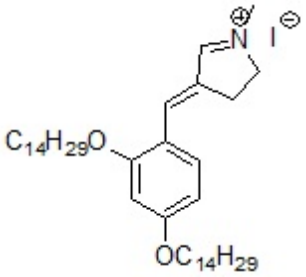
PhC12Br


9.997
7.958
7.530
7.519
7.456
7.446
7.436
7.424
7.415
7.311
4.503
4.493
4.482
4.183
4.171
4.158
3.392
3.384
3.376
1.880
1.831
1.347
1.234
0.888
0.877
0.865
C12H25
N
Br
1.00
1.04
2.28
3.29
2.14
2.22
2.35
2.23
18.17
3.31
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.
f1 (ppm)

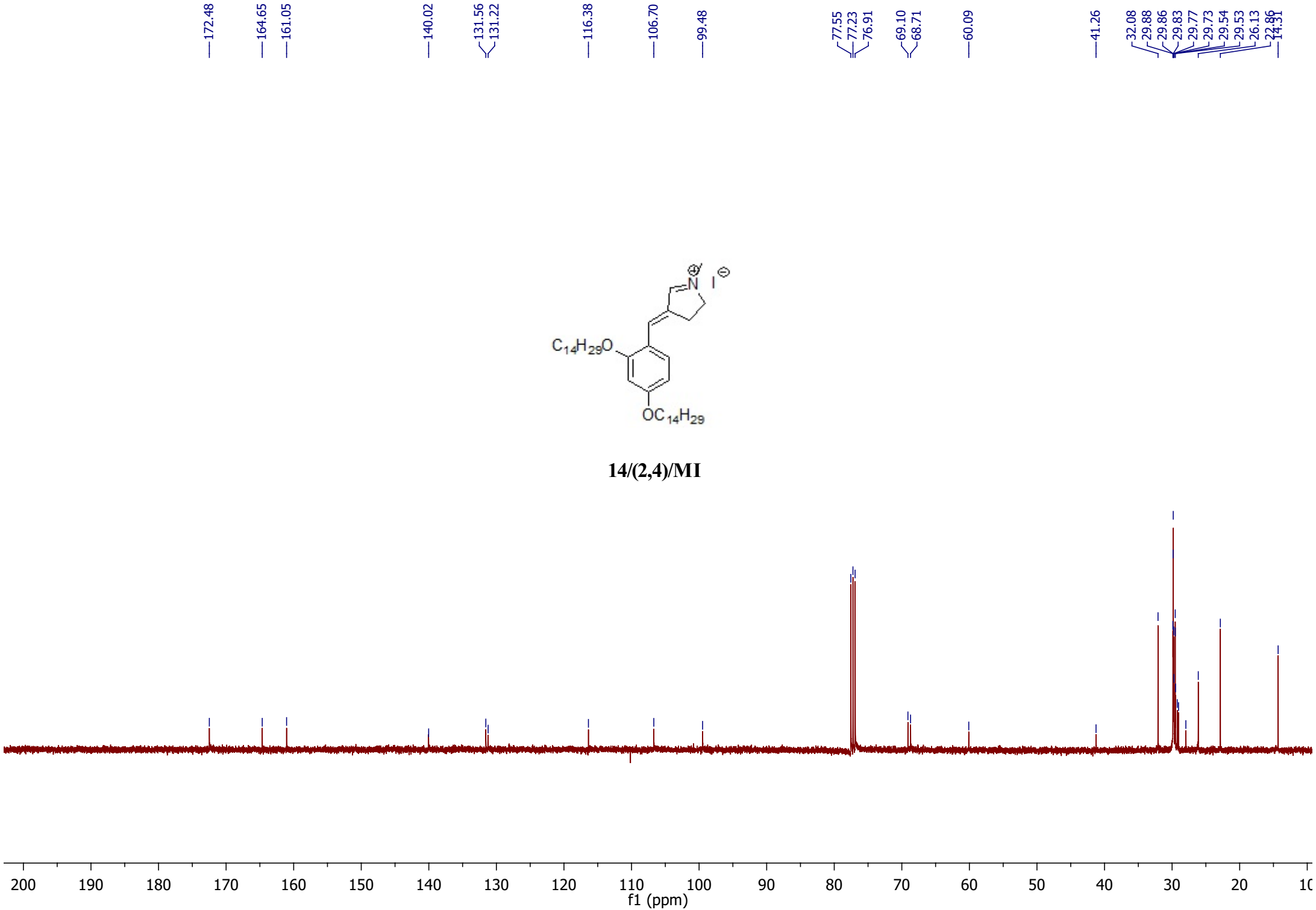
PhC12Br


172.81
146.16
135.55
133.96
131.94
131.21
129.40
77.44
77.23
77.02
58.00
53.93
45.35
31.98
29.69
29.59
29.47
29.42
29.12
27.52
27.15
26.49
24.36
22.77
14.22
C12H25
N
Br
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

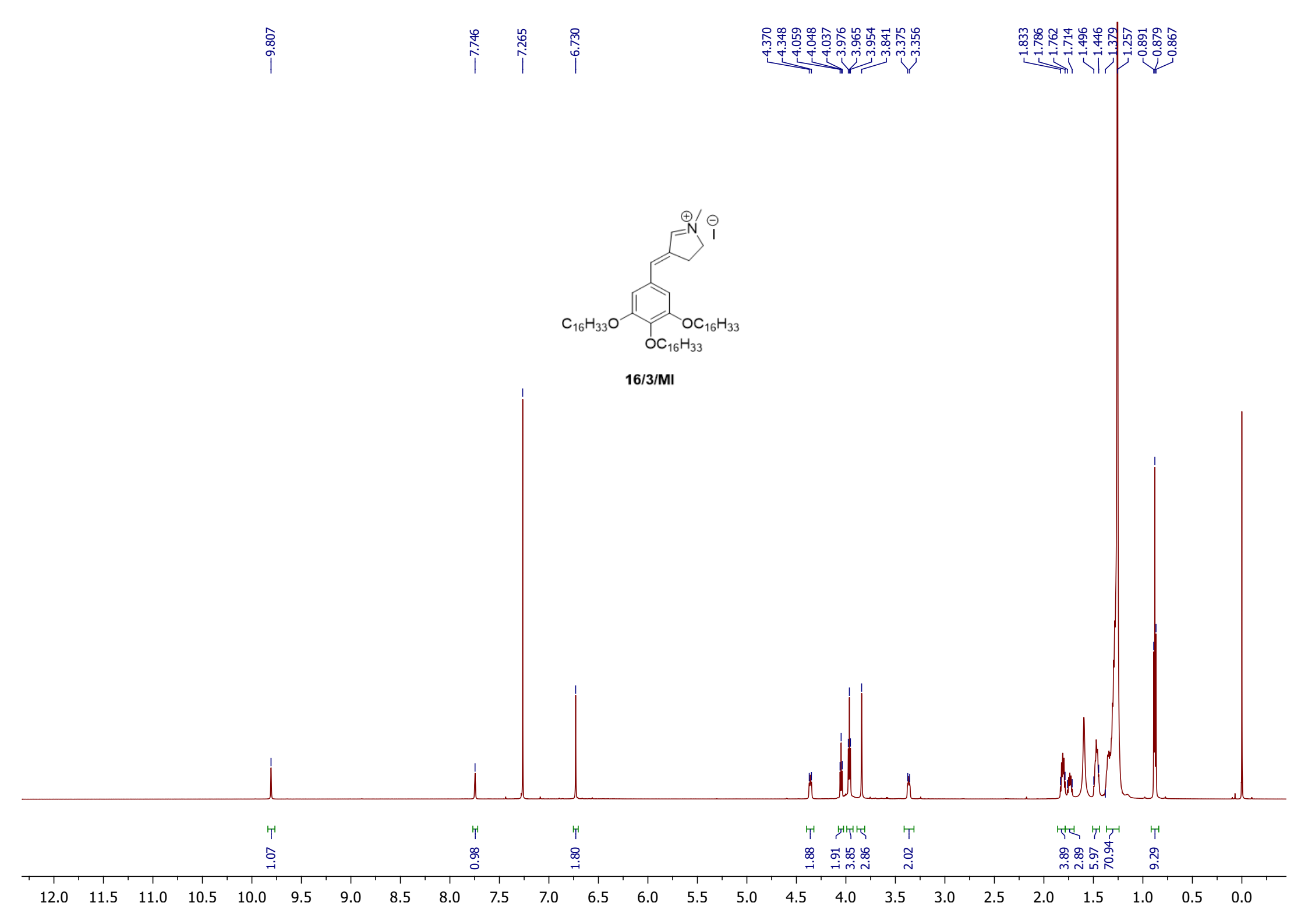
PhC12Br

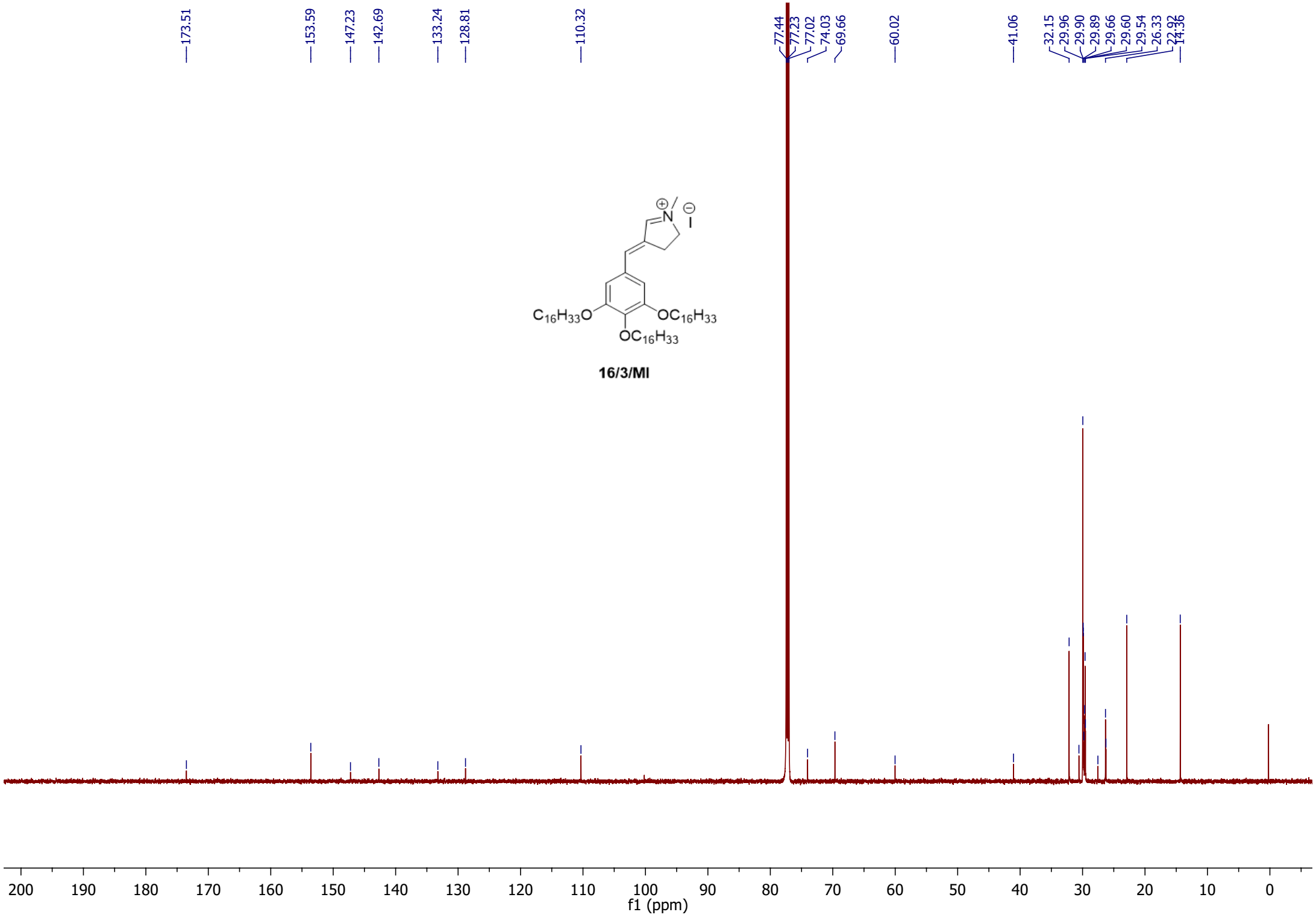


14/(2,4)/MI


172.48
164.65
161.05
140.02
131.56
131.22
116.38
106.70
99.48
77.55
77.23
76.91
69.10
68.71
60.09
41.26
32.08
29.88
29.86
29.83
29.77
29.73
29.54
29.53
26.13
22.86
14.31
C14H29O
OC14H29
I
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

14/(2,4)/MI


9.807
7.746
7.265
6.730
4.370
4.348
4.059
4.048
4.037
3.976
3.965
3.954
3.841
3.375
3.356
1.833
1.786
1.762
1.714
1.496
1.446
1.379
1.257
0.891
0.879
0.867
C16H33O
OC16H33
OC16H33
I
16/3/MI
1.07
0.98
1.80
1.88
1.91
3.85
2.86
2.02
3.89
2.89
5.97
70.94
9.29
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0


173.51
153.59
147.23
142.69
133.24
128.81
110.32
77.44
77.23
77.02
74.03
69.66
60.02
41.06
32.15
29.96
29.90
29.89
29.66
29.60
29.54
26.33
22.92
14.36
C16H33O
OC16H33
OC16H33
I
16/3/MI
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
f1 (ppm)