

Electronic Supplementary Information

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Contents

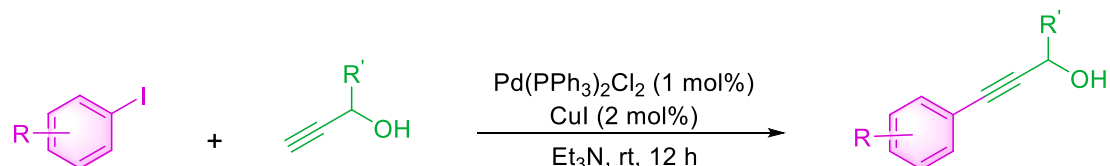
General Information	2
Experimental Sections	3
Control Experiments	4
Characterization Data of Products	15
References	30
NMR and HRMS Spectra Copies of Products	31

General Information

All reagents were commercially available and used without any further purification. Unless otherwise stated, all experiments were conducted in a seal tube under argon atmosphere. Reactions were monitored by TLC or GC-MS analysis. Flash column chromatography was performed over silica gel (200-300 mesh). ^1H NMR, ^{13}C NMR and ^{19}F NMR spectra were recorded in CDCl_3 on Nuclear Magnetic Resonance spectrometer (400 MHz for ^1H or 600 MHz for ^1H , 150 MHz for ^{13}C , 376 MHz for ^{19}F) at room temperature. Chemical shifts were reported in ppm on the scale relative to CDCl_3 ($\delta = 7.26$ for ^1H NMR, $\delta = 77.00$ for ^{13}C NMR) as an internal reference. Coupling constants (J) were reported in Hertz (Hz). High resolution mass spectra were recorded using ZAB-HS Bifocal high-resolution mass spectrometer.

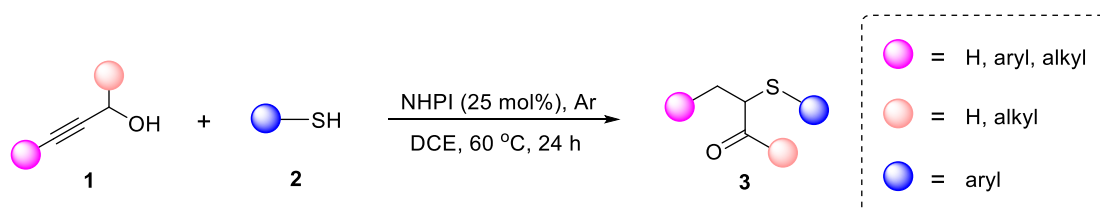
Experimental Sections

1. Synthesis of propargylic alcohols^[1]



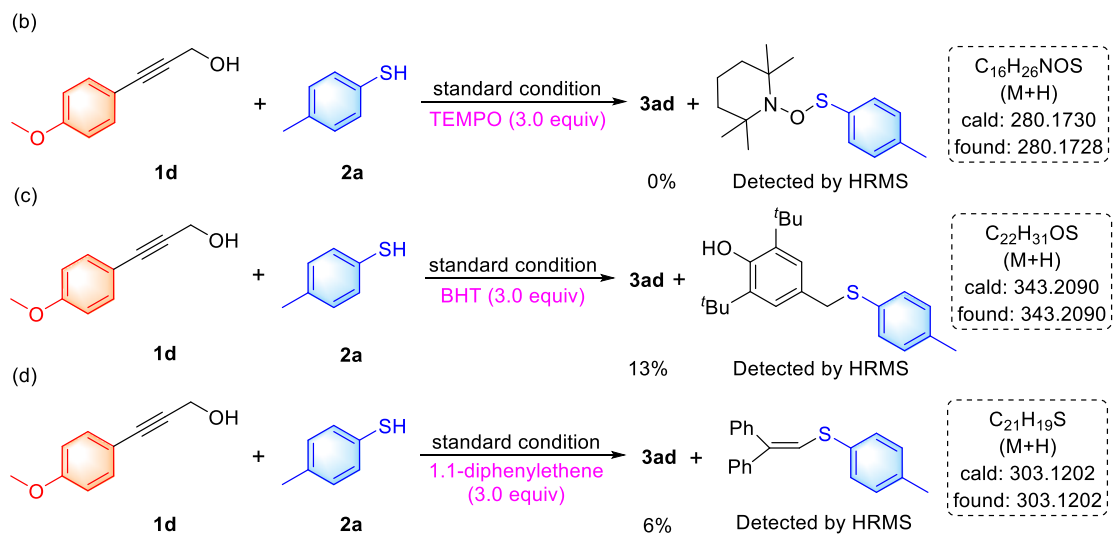
To a 50 mL dry flask equipped with stirring bar was added iodobenzene (1.71 g, 8.4 mmol, 1.2 equiv), Pd(PPh₃)₂Cl₂ (49.1 mg, 0.07 mmol, 1 mol%), CuI (26.7 mg, 0.14 mmol, 2 mol%), Et₃N (8 mL) and stirred for 5 minutes at room temperature. Then propargyl alcohol (392.4 mg, 7.0 mmol, 1.0 equiv) was added and reacted for 12 h. Reaction mixture was filtered through filter paper, solids were washed with ethyl acetate and the combined filtrates were concentrated in vacuo. The target product was purified by column chromatography (PE:EA=5:1).

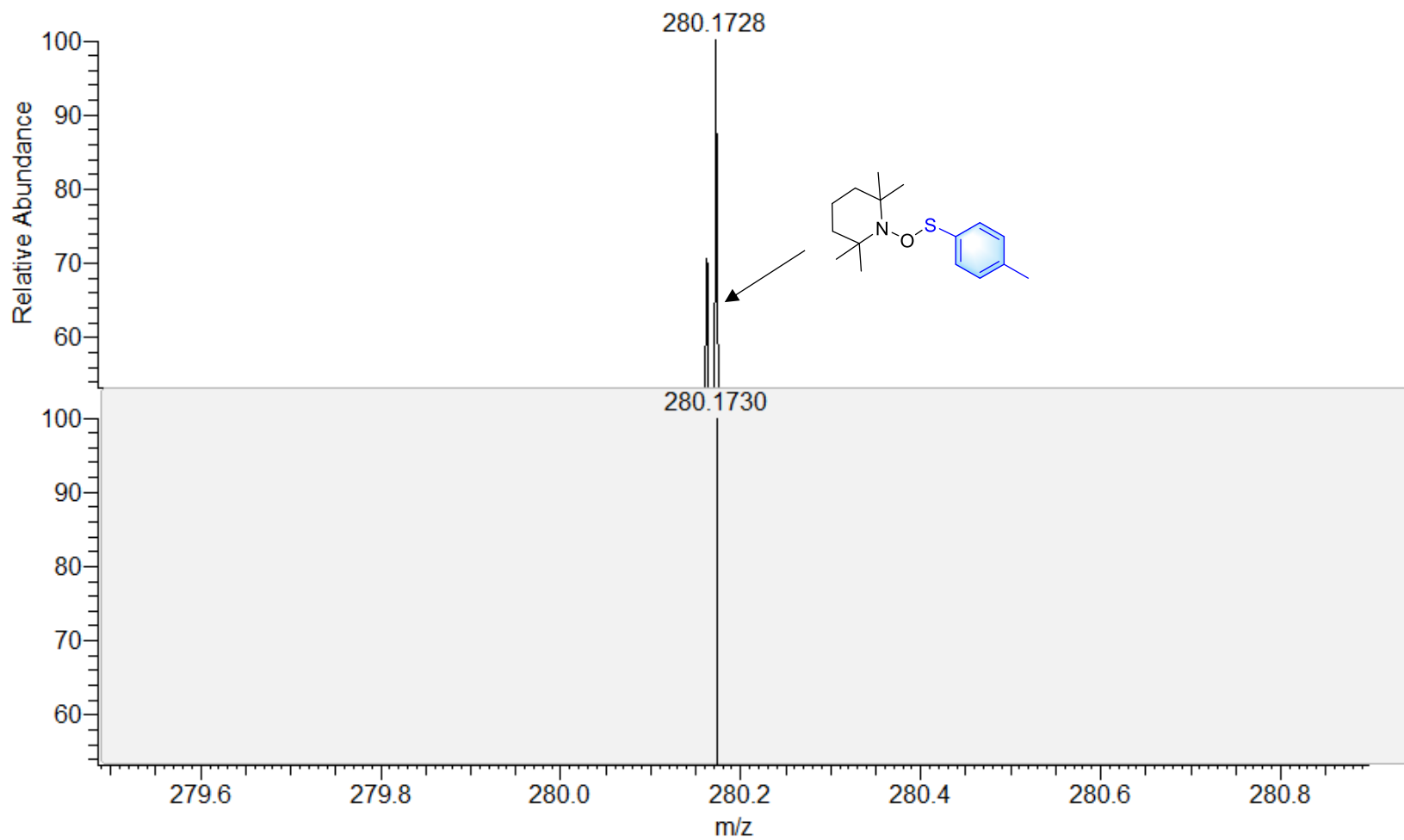
2. General procedures for reactions



Propargylic alcohols **1** (0.2 mmol, 1.0 equiv), aryl thiols **2** (0.2 mmol, 1.0 equiv), N-hydroxyphthalimide (0.05 mmol, 25% mmol) and dichloroethane (2 mL) were added to a Schlenk tube and reacted at 60 °C for 24 h in the argon atmosphere. After the reaction was completed by TLC, the reaction solution was cooled to room temperature. An appropriate amount of anhydrous sodium sulfate was added to the reaction solution, dried and concentrated by evaporation. The purification was carried out by column chromatography (PE:EA=20:1) to obtain the target product **3**.

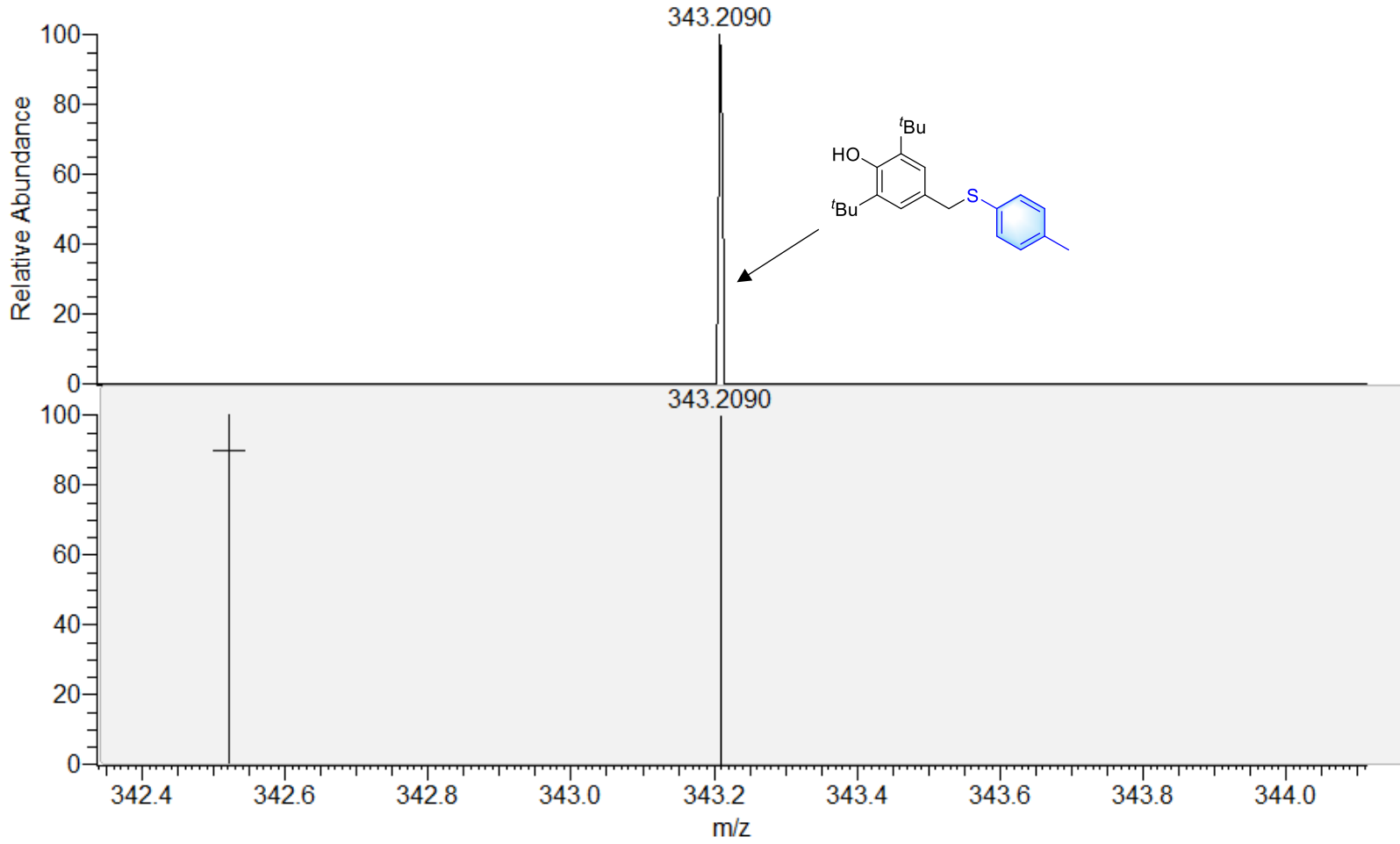
Control Experiments





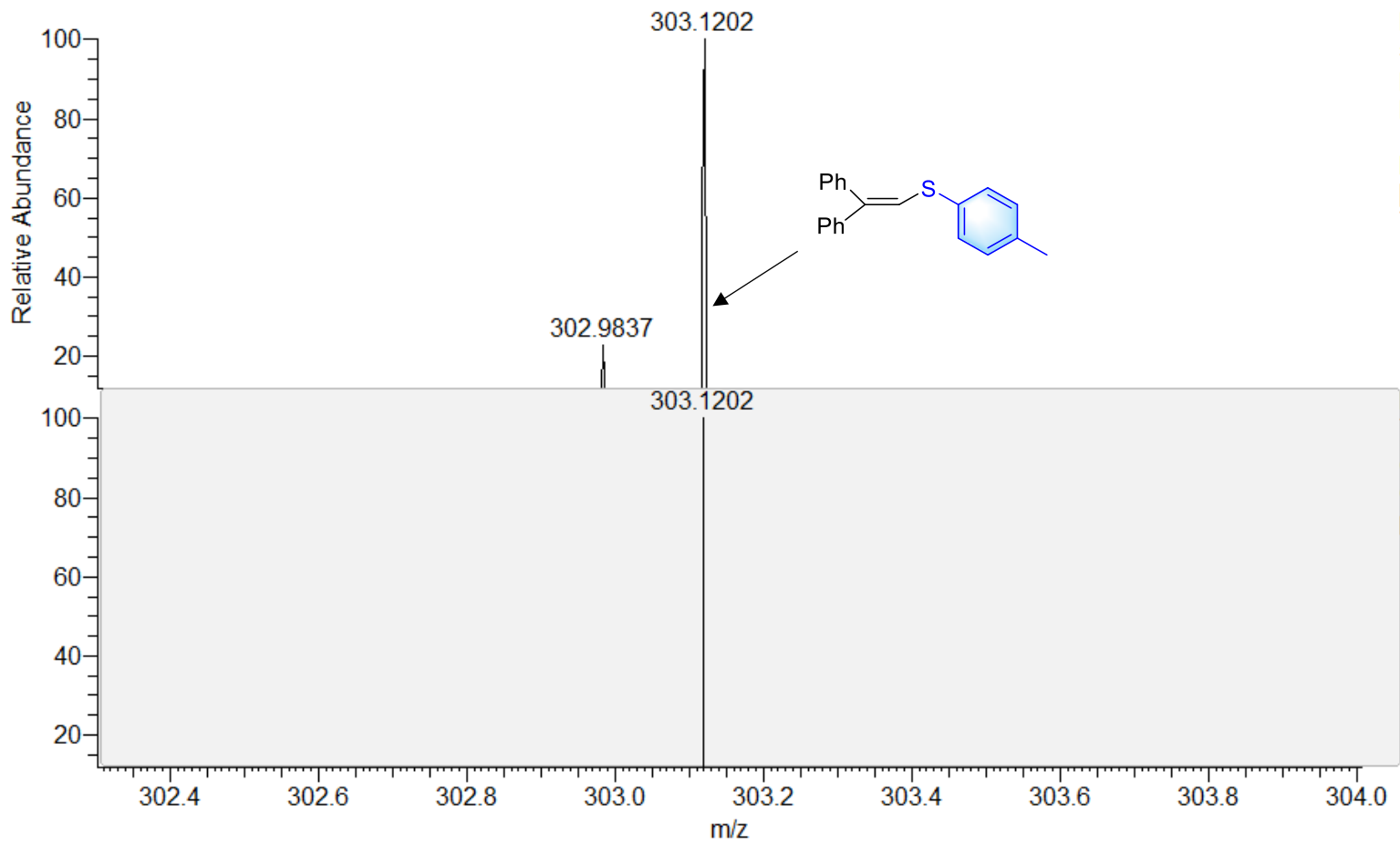
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pa Chrg 1



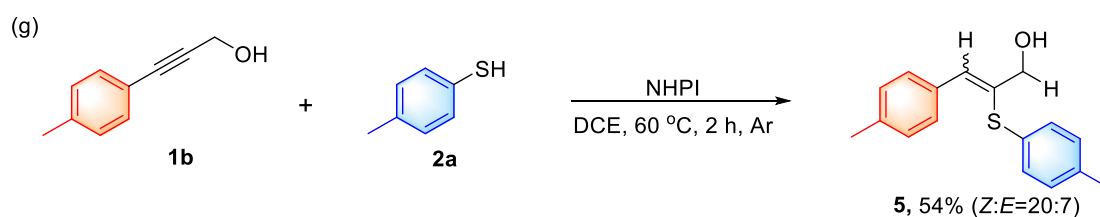
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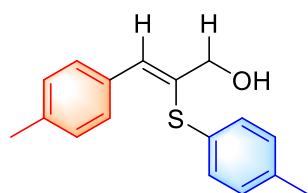


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pa Chrg 1



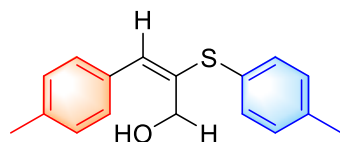
3-(*p*-tolyl)prop-2-yn-1-ol **1b** (0.6 mmol), 4-toluenethiol **2a** (0.6 mmol) and NHPI (25 mol%) were treated in 2.0 mL DCE solvent at 60 °C for 2 h in the argon atmosphere. Column chromatographic purification afforded the *Z*- and *E*- isomers of **5** (87.1 mg., 0.32 mmol, 54%) as a yellow oil (*Z*:*E* = 20:7).



(*Z*)-3-(*p*-tolyl)-2-(*p*-tolylthio)prop-2-en-1-ol (*Z*)-5

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.57 (d, $J = 8.4$ Hz, 2H), 7.30 (d, $J = 8.0$ Hz, 2H), 7.18 (d, $J = 8.0$ Hz, 2H), 7.12-7.10 (m, 2H), 7.06 (s, 1H), 4.18 (s, 2H), 2.38 (s, 3H), 2.34 (s, 3H), 2.18 (s, 1H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 137.7, 137.3, 133.2, 133.0, 132.4, 131.1, 129.9, 129.5, 129.4, 128.9, 66.3, 21.3, 21.1.

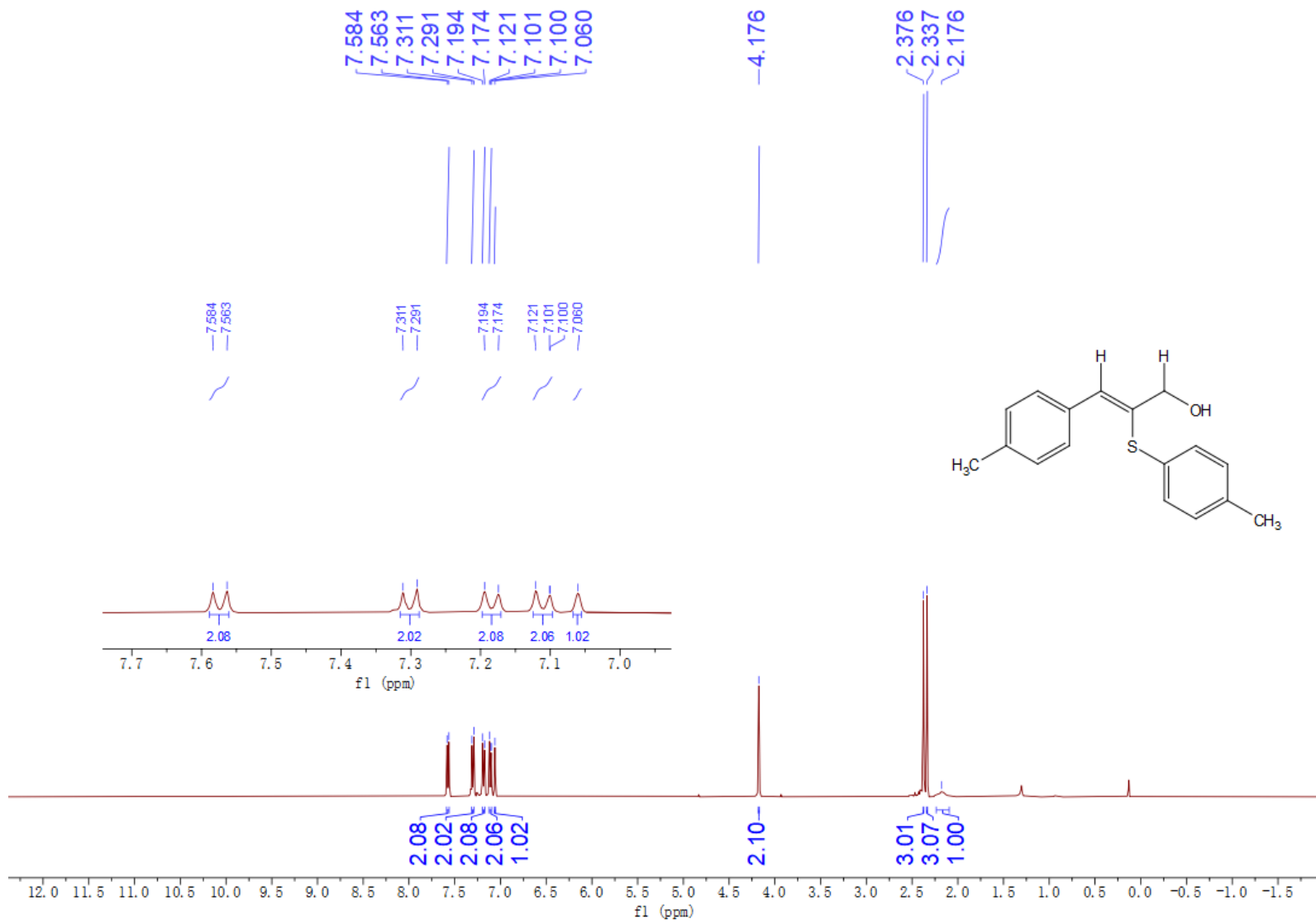
ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{17}\text{H}_{19}\text{OS}$ 271.1151, found 271.1151.

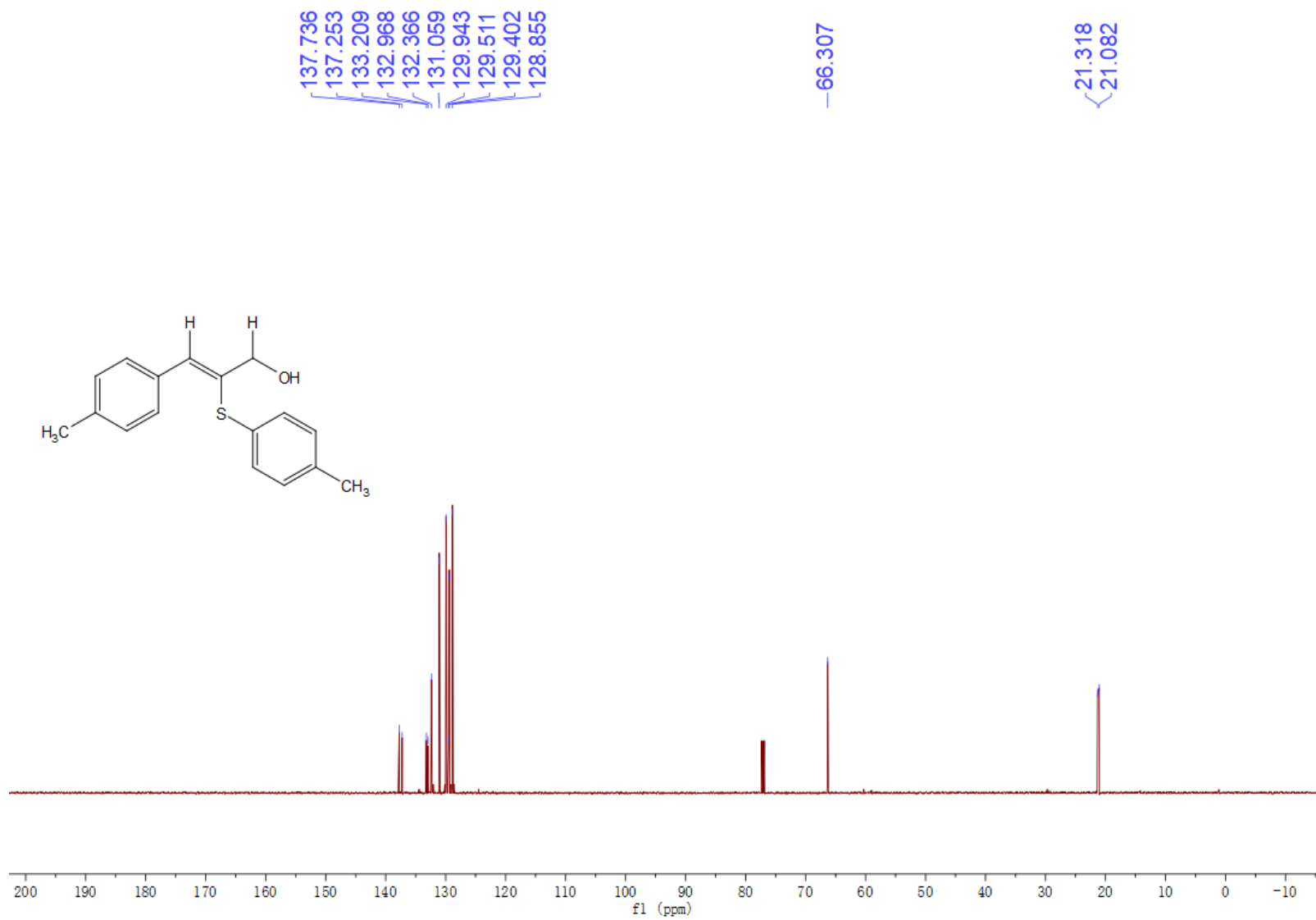


(*E*)-3-(*p*-tolyl)-2-(*p*-tolylthio)prop-2-en-1-ol (*E*)-5

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 7.37 (d, $J = 8.0$ Hz, 2H), 7.23 (d, $J = 8.0$ Hz, 2H), 7.16 (d, $J = 8.0$ Hz, 4H), 6.85 (s, 1H), 4.32 (s, 2H), 2.35 (s, 6H), 2.05 (s, 1H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 137.8, 137.6, 136.4, 134.5, 133.2, 132.0, 130.1, 129.7, 129.2, 128.6, 60.3, 21.2, 21.1.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{17}\text{H}_{19}\text{OS}$ 271.1151, found 271.1149.

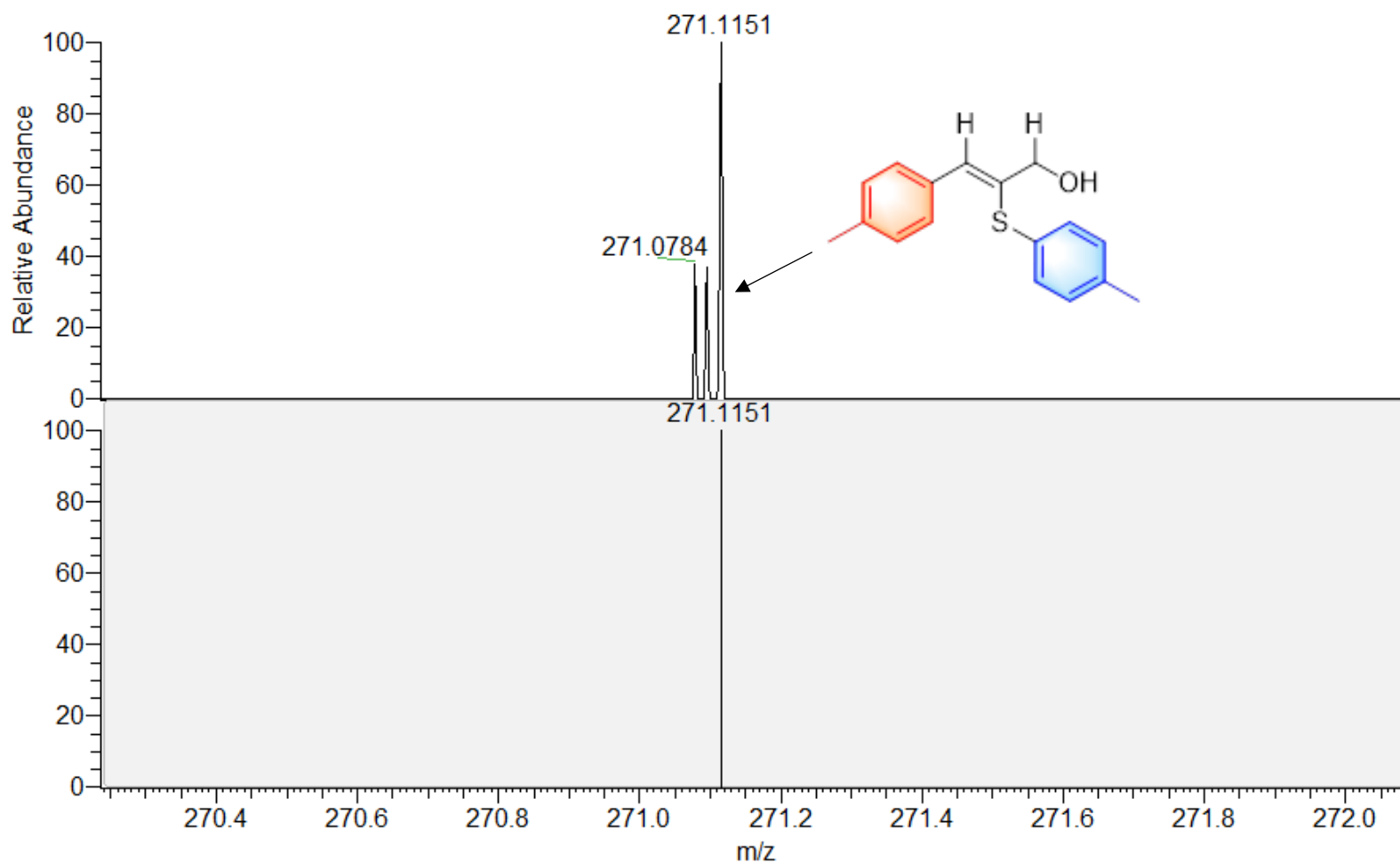


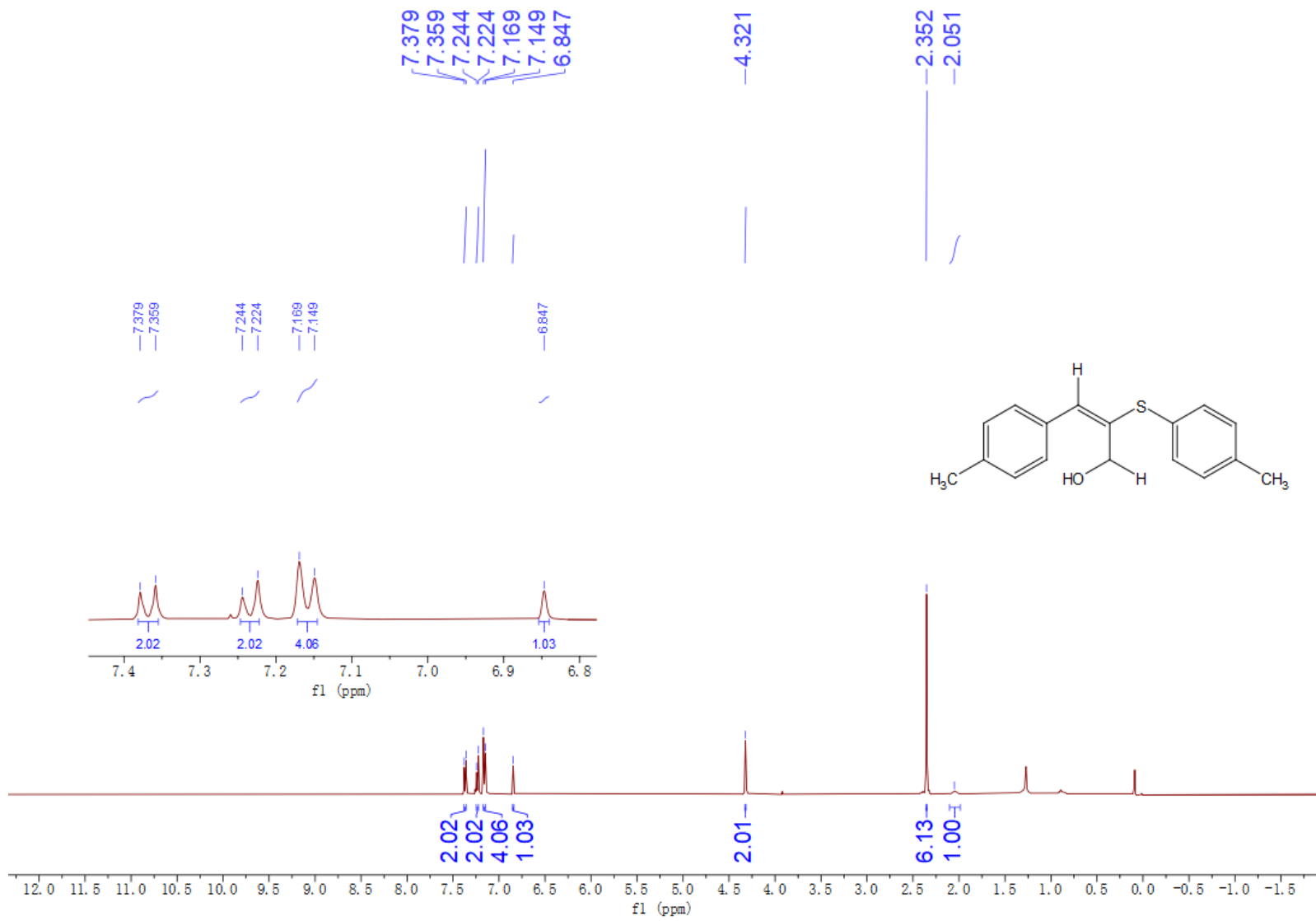


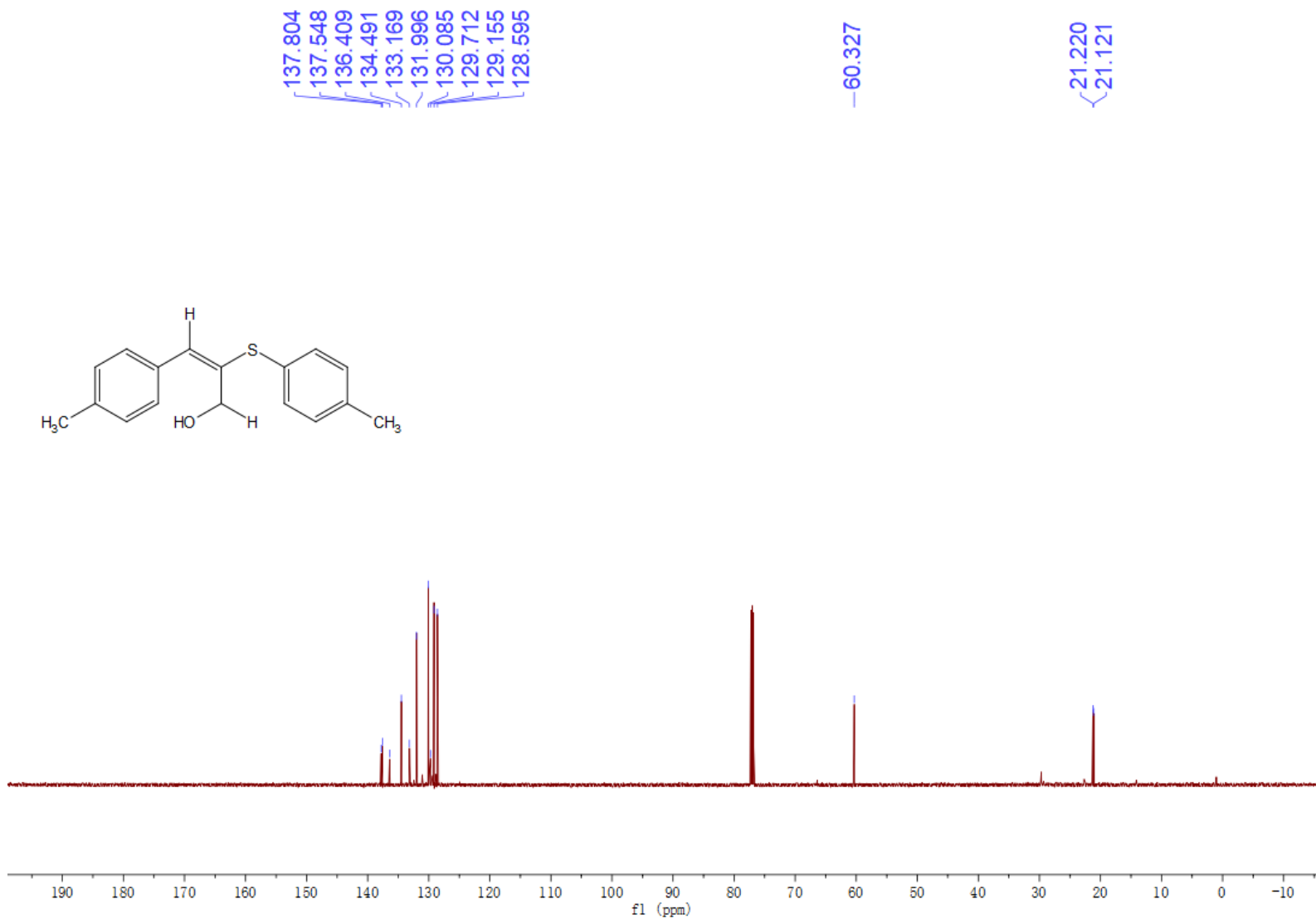


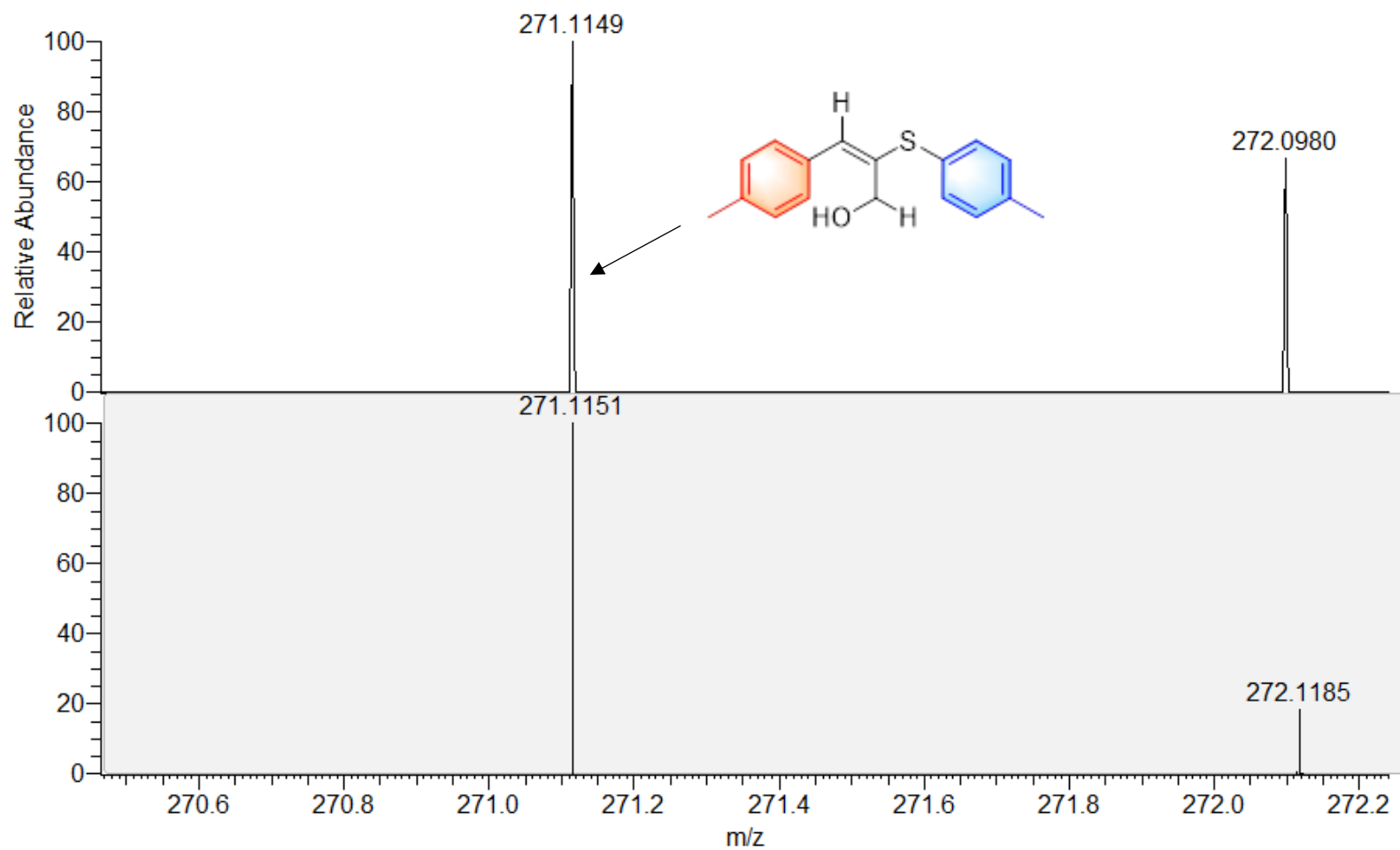
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pa Chrg 1





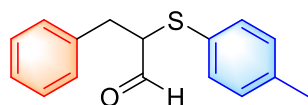




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pa Chrg 1

Characterization Data of Products

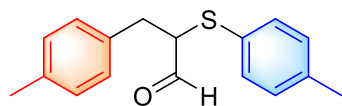


3-phenyl-2-(*p*-tolylthio)propanal (3aa)

Yellow oil, 43.2 mg, 84% yield, PE:EA=20:1.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 9.48 (d, $J = 3.2$ Hz, 1H), 7.32-7.22 (m, 7H), 7.12 (d, $J = 8.0$ Hz, 2H), 3.78-3.73 (m, 1H), 3.17 (dd, $J = 14.4, 8.0$ Hz, 1H), 2.96 (dd, $J = 14.6, 6.6$ Hz, 1H), 2.34 (s, 3H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 193.9, 138.9, 137.4, 134.1, 130.0, 129.1, 128.6, 127.4, 126.9, 58.3, 34.1, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{16}\text{H}_{17}\text{OS}$ 257.0995, found 257.0998.

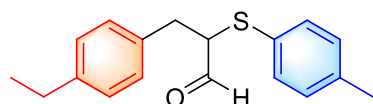


3-(*p*-tolyl)-2-(*p*-tolylthio)propanal (3ab)

Yellow oil, 42.4 mg, 78% yield, PE:EA=20:1.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 9.44 (d, $J = 3.6$ Hz, 1H), 7.27 (d, $J = 8.4$ Hz, 2H), 7.10 (d, $J = 4.8$ Hz, 6H), 3.75-3.70 (m, 1H), 3.11 (dd, $J = 14.4, 8.4$ Hz, 1H), 2.92 (dd, $J = 14.4, 6.8$ Hz, 1H), 2.32 (s, 6H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 194.1, 138.8, 136.5, 134.2, 134.0, 130.0, 129.3, 128.9, 127.4, 58.3, 33.7, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{17}\text{H}_{19}\text{OS}$ 271.1151, found 271.1151.

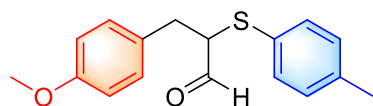


3-(4-ethylphenyl)-2-(*p*-tolylthio)propanal (3ac)

Yellow oil, 44.0 mg, 77% yield, PE:EA=20:1.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 9.45 (d, $J = 3.6$ Hz, 1H), 7.27 (d, $J = 8.0$ Hz, 2H), 7.14-7.10 (m, 6H), 3.76-3.72 (m, 1H), 3.13 (dd, $J = 14.4, 8.4$ Hz, 1H), 2.93 (dd, $J = 14.4, 6.8$ Hz, 1H), 2.63 (dd, $J = 15.2, 7.6$ Hz, 2H), 2.33 (s, 3H), 1.23 (t, $J = 7.6$ Hz, 3H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 194.1, 142.9, 138.8, 134.4, 134.0, 130.0, 129.0, 128.1, 127.5, 58.3, 33.8, 28.4, 21.2, 15.5.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{18}\text{H}_{21}\text{OS}$ 285.1308, found 285.1308.

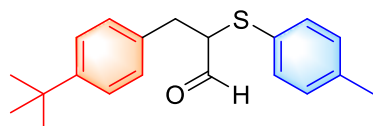


3-(4-methoxyphenyl)-2-(*p*-tolylthio)propanal (3ad)

Yellow oil, 46.6 mg, 81% yield, PE:EA=20:1.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 9.45 (d, $J = 3.6$ Hz, 1H), 7.28 (d, $J = 8.0$ Hz, 2H), 7.15-7.10 (m, 4H), 6.84 (d, $J = 8.4$ Hz, 2H), 3.79 (s, 3H), 3.73-3.69 (m, 1H), 3.10 (dd, $J = 14.4, 8.4$ Hz, 1H), 2.91 (dd, $J = 14.4, 6.8$ Hz, 1H), 2.33 (s, 3H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 194.2, 158.5, 138.8, 134.0, 130.1, 130.0, 129.3, 127.5, 114.0, 58.5, 55.2, 33.4, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{17}\text{H}_{19}\text{O}_2\text{S}$ 287.1100, found 287.1098.

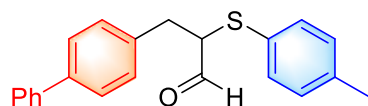


3-(4-(*tert*-butyl)phenyl)-2-(*p*-tolylthio)propanal (3ae)

Yellow oil, 50.0 mg, 80% yield, PE:EA=20:1.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 9.46 (d, $J = 3.6$ Hz, 1H), 7.33 (d, $J = 8.4$ Hz, 2H), 7.28 (d, $J = 8.0$ Hz, 2H), 7.15 (d, $J = 8.4$ Hz, 2H), 7.11 (d, $J = 7.6$ Hz, 2H), 3.77-3.73 (m, 1H), 3.13 (dd, $J = 14.4, 8.4$ Hz, 1H), 2.94 (dd, $J = 14.4, 6.4$ Hz, 1H), 2.33 (s, 3H), 1.31 (s, 9H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 194.1, 149.7, 138.8, 134.2, 134.0, 130.0, 128.7, 127.5, 125.5, 58.2, 34.4, 33.7, 31.3, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{20}\text{H}_{25}\text{OS}$ 313.1621, found 313.1618.

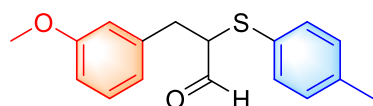


3-([1,1'-biphenyl]-4-yl)-2-(*p*-tolylthio)propanal (3af)

Yellow oil, 50.0 mg, 75% yield, PE:EA=20:1.

$^1\text{H NMR}$ (400 MHz, CDCl_3) δ 9.51 (d, $J = 3.6$ Hz, 1H), 7.56 (dd, $J = 16.4, 7.6$ Hz, 4H), 7.44 (t, $J = 7.2$ Hz, 2H), 7.35 (t, $J = 7.6$ Hz, 1H), 7.30 (d, $J = 7.6$ Hz, 4H), 7.13 (d, $J = 8.0$ Hz, 2H), 3.79 (td, $J = 7.6, 3.2$ Hz, 1H), 3.21 (dd, $J = 14.4, 8.0$ Hz, 1H), 3.00 (dd, $J = 14.4, 6.8$ Hz, 1H), 2.34 (s, 3H). $^{13}\text{C NMR}$ (150 MHz, CDCl_3) δ 194.0, 140.7, 139.8, 139.0, 136.4, 134.2, 130.0, 129.5, 128.7, 127.3, 127.3, 127.2, 127.0, 58.3, 33.8, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{Na}]^+$ calcd for $\text{C}_{22}\text{H}_{20}\text{OSNa}$ 355.1127, found 355.1123.

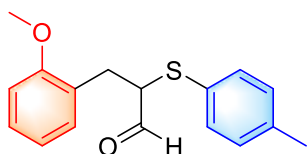


3-(3-methoxyphenyl)-2-(*p*-tolylthio)propanal (3ag)

Yellow oil, 45.4 mg, 79% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.46 (d, *J* = 3.2 Hz, 1H), 7.29-7.20 (m, 3H), 7.11 (d, *J* = 8.0 Hz, 2H), 6.82-6.77 (m, 3H), 3.79 (s, 3H), 3.75 (td, *J* = 7.2, 3.6 Hz, 1H), 3.13 (dd, *J* = 14.4, 8.4 Hz, 1H), 2.93 (dd, *J* = 14.4, 6.4 Hz, 1H), 2.33 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.9, 159.7, 138.9, 138.9, 134.1, 130.0, 129.6, 127.3, 121.4, 114.9, 112.2, 58.1, 55.2, 34.2, 21.2.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₇H₁₉O₂S 287.1100, found 287.1099.

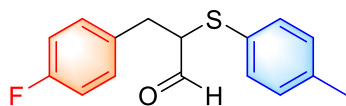


3-(2-methoxyphenyl)-2-(*p*-tolylthio)propanal (3ah)

Yellow oil, 44.7 mg, 78% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.42 (d, *J* = 4.4 Hz, 1H), 7.30-7.22 (m, 3H), 7.17 (dd, *J* = 7.6, 1.6 Hz, 1H), 7.10 (d, *J* = 8.0 Hz, 2H), 6.92-6.84 (m, 2H), 3.88-3.84 (m, 1H), 3.81 (s, 3H), 3.17 (dd, *J* = 13.8, 8.6 Hz, 1H), 2.97 (dd, *J* = 13.8, 6.2 Hz, 1H), 2.33 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 194.4, 157.4, 138.5, 133.6, 131.1, 129.9, 128.4, 128.1, 125.5, 120.5, 110.3, 56.8, 55.1, 29.8, 21.1.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₇H₁₉O₂S 287.1100, found 287.1100.

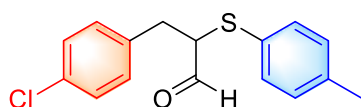


3-(4-fluorophenyl)-2-(*p*-tolylthio)propanal (3ai)

Yellow oil, 36.3 mg, 66% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.48 (d, *J* = 3.2 Hz, 1H), 7.27-7.25 (m, 2H), 7.19-7.16 (m, 2H), 7.11 (d, *J* = 8.0 Hz, 2H), 6.99 (t, *J* = 8.4 Hz, 2H), 3.69 (td, *J* = 7.2, 3.2 Hz, 1H), 3.13 (dd, *J* = 14.4, 8.0 Hz, 1H), 2.91 (dd, *J* = 14.4, 6.8 Hz, 1H), 2.33 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.8, 161.8 (d, *J*_{C-F} = 243.8 Hz), 139.1, 134.2, 133.1 (d, *J*_{C-F} = 3.2 Hz), 130.6 (d, *J*_{C-F} = 8.0 Hz), 130.0, 127.1, 115.4 (d, *J*_{C-F} = 21.2 Hz), 58.4 (d, *J*_{C-F} = 0.9 Hz), 33.3, 21.1. **¹⁹F NMR (376 MHz, CDCl₃)** δ -115.89 (m).

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₆H₁₆FOS 275.0900, found 275.0900.

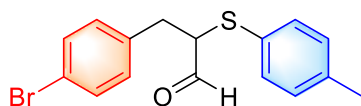


3-(4-chlorophenyl)-2-(*p*-tolylthio)propanal (3aj)

Yellow oil, 40.8 mg, 70% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.49 (d, *J* = 2.8 Hz, 1H), 7.28-7.25 (m, 4H), 7.13 (dd, *J* = 13.8, 8.2 Hz, 4H), 3.69 (td, *J* = 7.6, 2.8 Hz, 1H), 3.13 (dd, *J* = 14.4, 8.0 Hz, 1H), 2.89 (dd, *J* = 14.4, 6.8 Hz, 1H), 2.33 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.7, 139.1, 135.9, 134.3, 132.7, 130.5, 130.1, 128.7, 127.0, 58.2, 33.4, 21.2.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₆H₁₆ClOS 291.0605, found 291.0610.

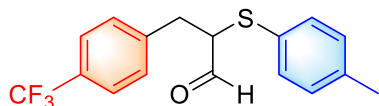


3-(4-bromophenyl)-2-(*p*-tolylthio)propanal (3ak)

Yellow oil, 49.0 mg, 73% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.49 (d, *J* = 2.8 Hz, 1H), 7.42 (d, *J* = 8.4 Hz, 2H), 7.26 (d, *J* = 8.0 Hz, 2H), 7.10 (t, *J* = 8.4 Hz, 4H), 3.69 (td, *J* = 7.6, 2.8 Hz, 1H), 3.11 (dd, *J* = 14.4, 8.0 Hz, 1H), 2.88 (dd, *J* = 14.4, 6.8 Hz, 1H), 2.33 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.6, 139.1, 136.5, 134.3, 131.7, 130.9, 130.1, 126.9, 120.8, 58.1, 33.4, 21.2.

ESI-HRMS: *m/z* [M+ Na]⁺ calcd for C₁₆H₁₅BrOSNa 356.9919, found 356.9917.

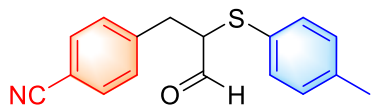


2-(*p*-tolylthio)-3-(4-(trifluoromethyl)phenyl)propanal (3al)

Yellow oil, 40.7 mg, 63% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.53 (d, *J* = 2.8 Hz, 1H), 7.56 (d, *J* = 8.0 Hz, 2H), 7.34 (d, *J* = 8.0 Hz, 2H), 7.26 (d, *J* = 8.0 Hz, 2H), 7.12 (d, *J* = 7.6 Hz, 2H), 3.73 (td, *J* = 7.6, 2.8 Hz, 1H), 3.22 (dd, *J* = 14.4, 7.6 Hz, 1H), 2.97 (dd, *J* = 14.4, 7.2 Hz, 1H), 2.33 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.4, 141.7 (d, *J*_{C-F} = 1.1 Hz), 139.3, 134.4, 130.1, 129.5, 129.2 (d, *J*_{C-F} = 32.3 Hz), 126.7, 125.5 (dd, *J*_{C-F} = 7.5, 3.8 Hz), 124.1 (d, *J*_{C-F} = 270.5 Hz), 58.0, 33.7, 21.2. **¹⁹F NMR (376 MHz, CDCl₃)** δ -62.49 (s).

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₇H₁₆F₃OS 325.0868, found 325.0864.



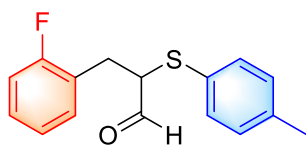
4-(3-oxo-2-(*p*-tolylthio)propyl)benzonitrile (3am)

Yellow oil, 34.5 mg, 61% yield, PE:EA=10:1.

¹H NMR (400 MHz, CDCl₃) δ 9.54-9.53 (m, 1H), 7.59 (d, *J* = 8.0 Hz, 2H), 7.33 (d, *J* = 7.6 Hz, 2H), 7.24 (d, *J* = 8.0 Hz, 2H), 7.12 (d, *J* = 7.6 Hz, 2H), 3.71 (td, *J* = 7.2, 2.0 Hz, 1H), 3.21 (dd, *J* = 14.6, 7.8 Hz, 1H), 2.95 (dd, *J* = 14.6, 7.0 Hz, 1H), 2.33 (s, 3H).

^{13}C NMR (150 MHz, CDCl_3) δ 193.2, 143.2, 139.5, 134.5, 132.3, 130.1, 130.0, 129.8, 128.5, 126.5, 118.7, 110.8, 57.7, 33.9, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{17}\text{H}_{16}\text{NOS}$ 282.0947, found 282.0948.

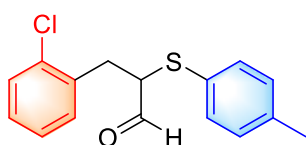


3-(2-fluorophenyl)-2-(*p*-tolylthio)propanal (3an)

Yellow oil, 35.6 mg, 65% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 9.50 (d, $J = 3.2$ Hz, 1H), 7.28-7.21 (m, 4H), 7.12-7.03 (m, 4H), 3.81 (td, $J = 7.2, 2.8$ Hz, 1H), 3.18 (dd, $J = 14.4, 8.0$ Hz, 1H), 2.99 (dd, $J = 14.2, 7.0$ Hz, 1H), 2.33 (s, 3H). ^{13}C NMR (150 MHz, CDCl_3) δ 193.7, 161.2 (d, $J_{\text{C-F}} = 244.2$ Hz), 139.0, 134.2, 131.6 (d, $J_{\text{C-F}} = 4.4$ Hz), 130.0, 129.9 (d, $J_{\text{C-F}} = 3.5$ Hz), 128.8 (d, $J_{\text{C-F}} = 8.1$ Hz), 127.2, 124.1 (d, $J_{\text{C-F}} = 3.6$ Hz), 115.4 (d, $J_{\text{C-F}} = 21.8$ Hz), 57.0 (d, $J_{\text{C-F}} = 1.5$ Hz), 27.9 (d, $J_{\text{C-F}} = 2.1$ Hz), 21.2. ^{19}F NMR (376 MHz, CDCl_3) δ -117.22 (m).

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{16}\text{H}_{16}\text{FOS}$ 275.0900, found 275.0900.

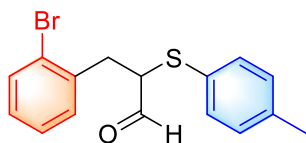


3-(2-chlorophenyl)-2-(*p*-tolylthio)propanal (3ao)

Yellow oil, 39.6 mg, 68% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 9.51 (d, $J = 2.8$ Hz, 1H), 7.37-7.35 (m, 1H), 7.29-7.26 (m, 3H), 7.21-7.18 (m, 2H), 7.11 (d, $J = 8.0$ Hz, 2H), 3.91-3.87 (m, 1H), 3.28 (dd, $J = 14.4, 8.0$ Hz, 1H), 3.07 (dd, $J = 14.4, 6.8$ Hz, 1H), 2.33 (s, 3H). ^{13}C NMR (150 MHz, CDCl_3) δ 193.5, 139.0, 135.2, 134.2, 134.1, 131.8, 130.0, 129.9, 129.6, 128.4, 126.8, 56.5, 32.2, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{16}\text{H}_{16}\text{ClOS}$ 291.0605, found 291.0605.



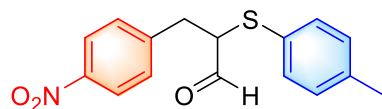
3-(2-bromophenyl)-2-(*p*-tolylthio)propanal (3ap)

Yellow oil, 48.4 mg, 72% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 9.52 (d, $J = 2.8$ Hz, 1H), 7.55 (d, $J = 8.0$ Hz, 1H), 7.30-7.24 (m, 4H), 7.11 (d, $J = 8.0$ Hz, 3H), 3.91 (td, $J = 8.0, 2.8$ Hz, 1H), 3.29 (dd, $J = 14.4, 8.0$ Hz, 1H), 3.08 (dd, $J = 14.4, 6.4$ Hz, 1H), 2.33 (s, 3H). ^{13}C NMR (150 MHz, CDCl_3)

δ 193.4, 139.0, 136.9, 134.3, 133.0, 131.9, 130.0, 129.9, 128.7, 127.5, 124.6, 56.6, 34.6, 21.2.

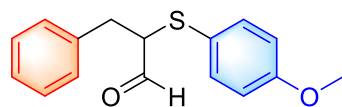
ESI-HRMS: m/z $[M+Na]^+$ calcd for $C_{16}H_{15}BrOSNa$ 356.9919, found 356.9917.



3-(4-nitrophenyl)-2-(*p*-tolylthio)propanal (3aq)

< 5% yield.

ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{16}H_{16}NO_3S$ 302.0845, found 302.0847.

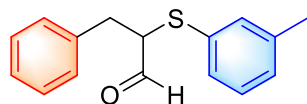


2-((4-methoxyphenyl)thio)-3-phenylpropanal (3ba)

Yellow oil, 43.6 mg, 80% yield, PE:EA=20:1.

1H NMR (400 MHz, $CDCl_3$) δ 9.48 (d, $J = 3.2$ Hz, 1H), 7.34-7.29 (m, 4H), 7.26-7.21 (m, 3H), 6.85-6.82 (m, 2H), 3.79 (s, 3H), 3.70-3.66 (m, 1H), 3.14 (dd, $J = 14.6, 8.2$ Hz, 1H), 2.93 (dd, $J = 14.4, 6.4$ Hz, 1H). **^{13}C NMR (150 MHz, $CDCl_3$)** δ 193.8, 160.4, 137.5, 136.8, 132.6, 129.1, 128.6, 126.8, 120.9, 114.8, 58.8, 55.3, 34.0.

ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{16}H_{17}O_2S$ 273.0944, found 273.0944.

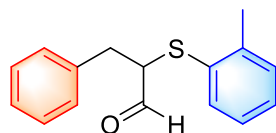


3-phenyl-2-(*m*-tolylthio)propanal (3bb)

Light Yellow oil, 40.0 mg, 78% yield, PE:EA=20:1.

1H NMR (400 MHz, $CDCl_3$) δ 9.48 (d, $J = 3.6$ Hz, 1H), 7.32 (d, $J = 7.6$ Hz, 2H), 7.28-7.25 (m, 3H), 7.20-7.18 (m, 3H), 7.12-7.10 (m, 1H), 3.82 (td, $J = 7.2, 3.6$ Hz, 1H), 3.20 (dd, $J = 14.4, 8.0$ Hz, 1H), 2.98 (dd, $J = 14.4, 6.8$ Hz, 1H), 2.33 (s, 3H). **^{13}C NMR (150 MHz, $CDCl_3$)** δ 194.1, 139.0, 137.3, 133.8, 131.2, 130.2, 129.3, 129.1, 129.0, 128.6, 126.9, 58.0, 34.3, 21.2.

ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{16}H_{17}OS$ 257.0995, found 257.0993.

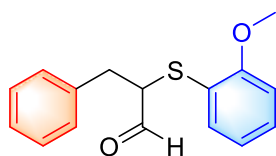


3-phenyl-2-(*o*-tolylthio)propanal (3bc)

Light Yellow oil, 39.6 mg, 77% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.42 (d, *J* = 4.4 Hz, 1H), 7.35-7.30 (m, 3H), 7.27-7.23 (m, 3H), 7.21-7.19 (m, 2H), 7.16-7.11 (m, 1H), 3.81-3.77 (m, 1H), 3.24 (dd, *J* = 14.2, 8.2 Hz, 1H), 3.03 (dd, *J* = 14.2, 7.0 Hz, 1H), 2.38 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 194.1, 140.4, 137.0, 133.4, 131.3, 130.7, 129.1, 128.7, 128.4, 127.0, 126.7, 57.7, 34.5, 20.8.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₆H₁₇OS 257.0995, found 257.0995.

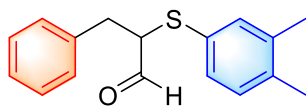


2-((2-methoxyphenyl)thio)-3-phenylpropanal (3bd)

Yellow oil, 43.2 mg, 79% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.46 (d, *J* = 3.6 Hz, 1H), 7.38 (dd, *J* = 7.6, 1.6 Hz, 1H), 7.33-7.29 (m, 3H), 7.26-7.22 (m, 3H), 6.91-6.87 (m, 2H), 3.87 (s, 1H), 3.85 (s, 3H), 3.20 (dd, *J* = 14.4, 8.0 Hz, 1H), 2.95 (dd, *J* = 14.4, 6.8 Hz, 1H). **¹³C NMR (150 MHz, CDCl₃)** δ 194.9, 159.3, 137.5, 135.4, 130.4, 129.1, 128.5, 126.8, 121.0, 119.2, 111.1, 56.4, 55.6, 34.2.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₆H₁₇O₂S 273.0944, found 273.0944.

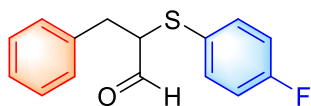


2-((3,4-dimethylphenyl)thio)-3-phenylpropanal (3be)

Yellow oil, 40.1 mg, 74% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.41 (d, *J* = 4.0 Hz, 1H), 7.31 (d, *J* = 7.2 Hz, 2H), 7.25-7.22 (m, 4H), 7.04 (s, 1H), 6.94 (d, *J* = 7.6 Hz, 1H), 3.73-3.68 (m, 1H), 3.21 (dd, *J* = 14.4, 8.4 Hz, 1H), 3.01 (dd, *J* = 14.4, 6.8 Hz, 1H), 2.35 (s, 3H), 2.29 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.9, 140.9, 138.9, 137.2, 134.6, 131.6, 129.1, 128.6, 127.5, 127.4, 126.9, 58.2, 34.5, 21.0, 20.8.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₇H₁₉OS 271.1151, found 271.1151.



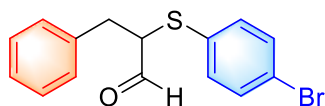
2-((4-fluorophenyl)thio)-3-phenylpropanal (3bf)

Yellow oil, 32.2 mg, 62% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.47 (d, *J* = 3.6 Hz, 1H), 7.37-7.30 (m, 4H), 7.27-7.25 (m, 1H), 7.22-7.20 (m, 2H), 7.02-6.98 (m, 2H), 3.76-3.71 (m, 1H), 3.16 (dd, *J* = 14.4,

8.0 Hz, 1H), 2.95 (dd, $J = 14.6, 7.0$ Hz, 1H). ^{13}C NMR (150 MHz, CDCl_3) δ 193.6, 163.1 (d, $J_{\text{C-F}} = 248.4$ Hz), 137.1, 136.4 (d, $J_{\text{C-F}} = 8.4$ Hz), 129.1, 128.7, 127.0, 126.1 (d, $J_{\text{C-F}} = 3.3$ Hz), 116.4 (d, $J_{\text{C-F}} = 21.9$ Hz), 58.5, 34.1. ^{19}F NMR (376 MHz, CDCl_3) δ -111.71 (m).

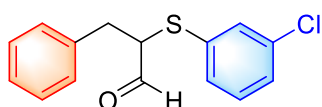
ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{15}\text{H}_{14}\text{FOS}$ 261.0744, found 261.0744.



2-((4-bromophenyl)thio)-3-phenylpropanal (3bg)^[2]

Yellow oil, 47.0 mg, 71% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 9.45 (d, $J = 3.6$ Hz, 1H), 7.43-7.40 (m, 2H), 7.31 (d, $J = 7.6$ Hz, 2H), 7.27-7.25 (m, 1H), 7.21 (d, $J = 8.4$ Hz, 4H), 3.81-3.77 (m, 1H), 3.18 (dd, $J = 14.4, 8.0$ Hz, 1H), 2.96 (dd, $J = 14.4, 7.2$ Hz, 1H). ^{13}C NMR (150 MHz, CDCl_3) δ 193.7, 136.8, 134.7, 132.3, 130.5, 129.1, 128.7, 127.1, 122.9, 57.9, 34.2.

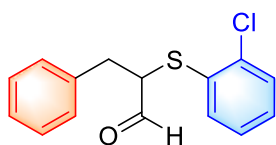


2-((3-chlorophenyl)thio)-3-phenylpropanal (3bh)

Yellow oil, 37.7 mg, 68% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 9.46 (d, $J = 3.6$ Hz, 1H), 7.34-7.31 (m, 2H), 7.28-7.22 (m, 7H), 3.85 (td, $J = 7.6, 3.6$ Hz, 1H), 3.21 (dd, $J = 14.4, 8.0$ Hz, 1H), 2.99 (dd, $J = 14.4, 7.2$ Hz, 1H). ^{13}C NMR (150 MHz, CDCl_3) δ 193.8, 136.8, 134.8, 133.7, 132.3, 130.7, 130.2, 129.1, 128.7, 128.4, 127.1, 57.8, 34.3.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{15}\text{H}_{14}\text{ClOS}$ 277.0448, found 277.0449.

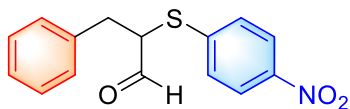


2-((2-chlorophenyl)thio)-3-phenylpropanal (3bi)

Yellow oil, 35.9 mg, 65% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 9.42 (d, $J = 4.4$ Hz, 1H), 7.43-7.38 (m, 2H), 7.34-7.30 (m, 2H), 7.27-7.19 (m, 5H), 3.97-3.92 (m, 1H), 3.24 (dd, $J = 14.2, 8.6$ Hz, 1H), 3.09 (dd, $J = 14.4, 6.8$ Hz, 1H). ^{13}C NMR (150 MHz, CDCl_3) δ 194.1, 136.7, 136.6, 133.7, 131.4, 130.2, 129.3, 129.1, 128.7, 127.4, 127.1, 56.7, 34.5.

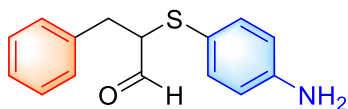
ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{15}\text{H}_{14}\text{ClOS}$ 277.0448, found 277.0448.



2-((4-nitrophenyl)thio)-3-phenylpropanal (3bj)

< 5% yield.

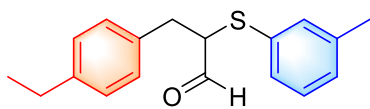
ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{15}H_{14}NO_3S$ 288.0689, found 288.0688.



2-((4-aminophenyl)thio)-3-phenylpropanal (3bk)

< 5% yield.

ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{15}H_{16}NOS$ 258.0947, found 258.0947.

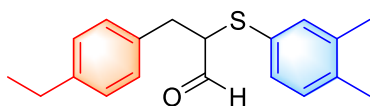


3-(4-ethylphenyl)-2-(*m*-tolylthio)propanal (3ca)

Yellow oil, 43.7 mg, 77% yield, PE:EA=20:1.

1H NMR (400 MHz, $CDCl_3$) δ 9.46 (d, $J = 3.6$ Hz, 1H), 7.19-7.18 (m, 8H), 3.83-3.78 (m, 1H), 3.16 (dd, $J = 14.4, 8.0$ Hz, 1H), 2.96 (dd, $J = 14.6, 6.6$ Hz, 1H), 2.64 (dd, $J = 15.2, 7.6$ Hz, 2H), 2.32 (s, 3H), 1.24 (t, $J = 7.6$ Hz, 3H). **^{13}C NMR (150 MHz, $CDCl_3$)** δ 194.3, 142.9, 139.0, 134.3, 133.7, 131.3, 130.1, 129.2, 129.0, 129.0, 128.1, 58.0, 33.9, 28.5, 21.2, 15.5.

ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{18}H_{21}OS$ 285.1308, found 285.1305.

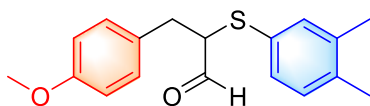


2-((3,4-dimethylphenyl)thio)-3-(4-ethylphenyl)propanal (3cb)

Yellow oil, 41.9 mg, 70% yield, PE:EA=20:1.

1H NMR (400 MHz, $CDCl_3$) δ 9.39-9.37 (m, 1H), 7.26-7.22 (m, 1H), 7.13 (s, 4H), 7.02 (s, 1H), 6.93 (d, $J = 7.6$ Hz, 1H), 3.71-3.66 (m, 1H), 3.16 (dd, $J = 14.4, 8.4$ Hz, 1H), 2.98 (dd, $J = 14.4, 6.4$ Hz, 1H), 2.62 (dd, $J = 15.2, 7.6$ Hz, 2H), 2.35 (s, 3H), 2.28 (s, 3H), 1.24-1.20 (m, 3H). **^{13}C NMR (150 MHz, $CDCl_3$)** δ 194.1, 142.9, 140.8, 138.8, 134.5, 134.3, 131.5, 129.0, 128.1, 127.4, 58.1, 34.1, 28.4, 21.0, 20.8, 15.5.

ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{19}H_{23}OS$ 299.1464, found 299.1464.

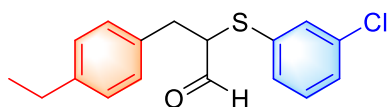


2-((3,4-dimethylphenyl)thio)-3-(4-methoxyphenyl)propanal (3cc)

Yellow oil, 43.9 mg, 73% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.38 (d, *J* = 4.0 Hz, 1H), 7.26-7.23 (m, 1H), 7.15-7.13 (m, 2H), 7.03-7.02 (m, 1H), 6.95-6.92 (m, 1H), 6.85-6.83 (m, 2H), 3.79 (s, 3H), 3.69-3.64 (m, 1H), 3.13 (dd, *J* = 14.4, 8.4 Hz, 1H), 2.95 (dd, *J* = 14.4, 6.8 Hz, 1H), 2.35 (s, 3H), 2.28 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 194.2, 158.5, 140.8, 138.8, 134.5, 131.6, 130.1, 129.1, 127.5, 127.4, 114.0, 58.3, 55.2, 33.7, 21.0, 20.8.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₈H₂₀O₂SK 339.0816, found 339.0816.

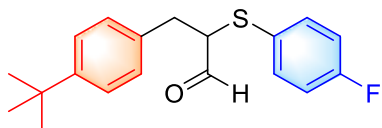


2-((3-chlorophenyl)thio)-3-(4-ethylphenyl)propanal (3cd)

Yellow oil, 41.8 mg, 69% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.45 (d, *J* = 3.6 Hz, 1H), 7.34-7.33 (m, 1H), 7.25-7.21 (m, 2H), 7.18-7.13 (m, 5H), 3.86-3.82 (m, 1H), 3.18 (dd, *J* = 14.2, 8.2 Hz, 1H), 2.97 (dd, *J* = 14.4, 6.8 Hz, 1H), 2.64 (dd, *J* = 15.2, 7.6 Hz, 2H), 1.24 (t, *J* = 7.6 Hz, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 194.0, 143.1, 134.7, 133.9, 133.8, 132.2, 130.5, 130.1, 129.0, 128.3, 128.2, 57.8, 33.9, 28.5, 15.5.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₇H₁₈ClOS 305.0761, found 305.0768.

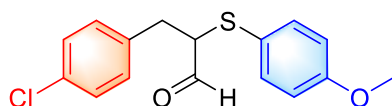


3-(4-(*tert*-butyl)phenyl)-2-((4-fluorophenyl)thio)propanal (3ce)

Yellow oil, 40.0 mg, 63% yield, PE:EA=20:1.

¹H NMR (600 MHz, CDCl₃) δ 9.45 (d, *J* = 3.6 Hz, 1H), 7.36-7.31 (m, 4H), 7.13 (d, *J* = 8.4 Hz, 2H), 7.00-6.97 (m, 2H), 3.74-3.71 (m, 1H), 3.12 (dd, *J* = 14.4, 8.4 Hz, 1H), 2.92 (dd, *J* = 14.4, 6.6 Hz, 1H), 1.30 (s, 9H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.8, 163.1 (d, *J*_{C-F} = 248.3 Hz), 149.9, 136.3 (d, *J*_{C-F} = 8.4 Hz), 133.9, 128.7, 126.2 (d, *J*_{C-F} = 3.3 Hz), 125.6, 116.4 (d, *J*_{C-F} = 21.9 Hz), 58.5, 34.4, 33.7, 31.3. **¹⁹F NMR (376 MHz, CDCl₃)** δ -111.91 (m).

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₉H₂₂FOS 317.1370, found 317.1368.

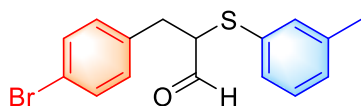


3-(4-chlorophenyl)-2-((4-methoxyphenyl)thio)propanal (3cf)

Yellow oil, 39.2 mg, 64% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.49 (d, *J* = 2.8 Hz, 1H), 7.32-7.26 (m, 4H), 7.15-7.13 (m, 2H), 6.84-6.82 (m, 2H), 3.79 (s, 3H), 3.64-3.60 (m, 1H), 3.09 (dd, *J* = 14.4, 8.0 Hz, 1H), 2.87 (dd, *J* = 14.4, 6.8 Hz, 1H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.5, 160.5, 136.9, 136.0, 132.7, 130.5, 128.7, 120.5, 114.8, 58.6, 55.3, 33.2.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₆H₁₆ClO₂S 307.0554, found 307.0553.

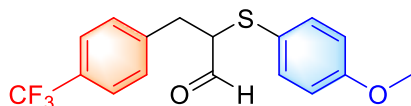


3-(4-bromophenyl)-2-(*m*-tolylthio)propanal (3cg)

Yellow oil, 43.7 mg, 65% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.49 (d, *J* = 2.8 Hz, 1H), 7.44-7.42 (m, 2H), 7.18-7.16 (m, 3H), 7.12-7.09 (m, 3H), 3.75 (td, *J* = 7.2, 2.8 Hz, 1H), 3.15 (dd, *J* = 14.4, 7.6 Hz, 1H), 2.90 (dd, *J* = 14.4, 7.2 Hz, 1H), 2.32 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.9, 139.1, 136.4, 134.0, 131.7, 130.9, 130.8, 130.5, 129.5, 129.1, 120.8, 57.9, 33.6, 21.2.

ESI-HRMS: *m/z* [M+ Na]⁺ calcd for C₁₆H₁₅BrOSNa 356.9919, found 356.9921.

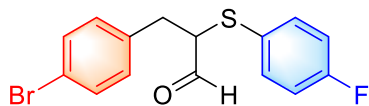


2-((4-methoxyphenyl)thio)-3-(4-(trifluoromethyl)phenyl)propanal (3ch)

Yellow oil, 40.6 mg, 60% yield, PE:EA=20:1.

¹H NMR (600 MHz, CDCl₃) δ 9.52 (d, *J* = 2.4 Hz, 1H), 7.55 (d, *J* = 7.8 Hz, 2H), 7.33-7.29 (m, 4H), 6.83 (d, *J* = 8.4 Hz, 2H), 3.79 (s, 3H), 3.66 (td, *J* = 7.2, 1.8 Hz, 1H), 3.18 (dd, *J* = 14.4, 7.8 Hz, 1H), 2.94 (dd, *J* = 14.7, 6.9 Hz, 1H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.2, 160.6, 141.8 (d, *J*_{C-F} = 0.9 Hz), 137.0, 132.6, 129.5, 125.5 (dd, *J*_{C-F} = 7.4, 3.7 Hz), 124.1 (d, *J*_{C-F} = 270.6 Hz), 120.3, 114.9, 58.3, 55.3, 33.6. **¹⁹F NMR (376 MHz, CDCl₃)** δ -62.49 (s).

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₇H₁₆F₃O₂S 341.0818, found 341.0818.



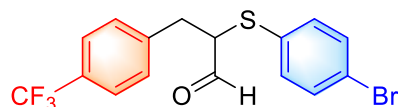
3-(4-bromophenyl)-2-((4-fluorophenyl)thio)propanal (3ci)

Yellow oil, 41.3 mg, 61% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.48 (d, *J* = 2.8 Hz, 1H), 7.43 (d, *J* = 8.0 Hz, 2H), 7.36-7.33 (m, 2H), 7.08 (d, *J* = 8.0 Hz, 2H), 7.02-6.98 (m, 2H), 3.70-3.66 (m, 1H), 3.10 (dd, *J* = 14.6, 7.8 Hz, 1H), 2.87 (dd, *J* = 14.4, 6.8 Hz, 1H). **¹³C NMR (150 MHz, CDCl₃)** δ 193.3, 163.2 (d, *J*_{C-F} = 248.7 Hz), 136.6 (d, *J*_{C-F} = 8.6 Hz), 136.1, 131.7, 130.8, 125.6

(d, $J_{C-F} = 3.5$ Hz), 120.9, 116.5 (d, $J_{C-F} = 21.9$ Hz), 58.2 (d, $J_{C-F} = 0.6$ Hz), 33.4. ^{19}F NMR (376 MHz, CDCl_3) δ -111.38 (m).

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{15}\text{H}_{13}\text{BrFOS}$ 338.9849, found 338.9849.

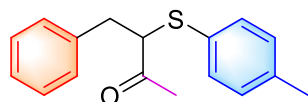


2-((4-bromophenyl)thio)-3-(4-(trifluoromethyl)phenyl)propanal (3cj)

Yellow oil, 45.4 mg, 58% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 9.50 (d, $J = 2.4$ Hz, 1H), 7.57 (d, $J = 8.0$ Hz, 2H), 7.43 (d, $J = 7.6$ Hz, 2H), 7.33 (d, $J = 7.6$ Hz, 2H), 7.21 (d, $J = 8.0$ Hz, 2H), 3.80-3.76 (m, 1H), 3.24 (dd, $J = 14.4, 7.6$ Hz, 1H), 2.98 (dd, $J = 14.4, 7.2$ Hz, 1H). ^{13}C NMR (150 MHz, CDCl_3) δ 193.1, 141.1 (d, $J_{C-F} = 1.7$ Hz), 135.1, 132.5, 132.3 (d, $J_{C-F} = 19.7$ Hz), 131.1 (d, $J_{C-F} = 6.9$ Hz), 129.8, 129.5, 125.6 (dd, $J_{C-F} = 7.2, 3.6$ Hz), 123.3, 57.6, 33.8. ^{19}F NMR (376 MHz, CDCl_3) δ -62.50 (s).

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{16}\text{H}_{13}\text{BrF}_3\text{OS}$ 388.9817, found 388.9818.

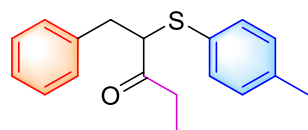


4-phenyl-3-(p-tolylthio)butan-2-one (3da)

Yellow oil, 41.9 mg, 78% yield, PE:EA=20:1.

^1H NMR (600 MHz, CDCl_3) δ 7.29-7.21 (m, 5H), 7.18 (d, $J = 7.2$ Hz, 2H), 7.10 (d, $J = 7.8$ Hz, 2H), 3.83 (t, $J = 7.8$ Hz, 1H), 3.14 (dd, $J = 14.1, 8.7$ Hz, 1H), 2.97 (dd, $J = 14.1, 6.3$ Hz, 1H), 2.33 (s, 3H), 2.20 (s, 3H). ^{13}C NMR (150 MHz, CDCl_3) δ 204.1, 138.7, 138.2, 133.8, 129.9, 129.1, 128.5, 127.7, 126.7, 58.9, 36.5, 27.9, 21.2.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{17}\text{H}_{19}\text{OS}$ 271.1151, found 271.1151.

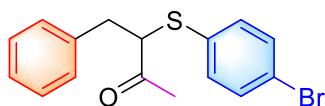


1-phenyl-2-(p-tolylthio)pentan-3-one (3db)

Yellow oil, 42.5 mg, 75% yield, PE:EA=20:1.

^1H NMR (400 MHz, CDCl_3) δ 7.29-7.20 (m, 5H), 7.16 (d, $J = 6.8$ Hz, 2H), 7.11 (d, $J = 8.4$ Hz, 2H), 3.85-3.82 (m, 1H), 3.16 (dd, $J = 14.0, 8.8$ Hz, 1H), 2.97 (dd, $J = 14.0, 6.4$ Hz, 1H), 2.74-2.59 (m, 2H), 2.33 (s, 3H), 0.96 (t, $J = 7.6$ Hz, 3H). ^{13}C NMR (150 MHz, CDCl_3) δ 206.8, 138.7, 138.4, 133.9, 129.9, 129.1, 128.8, 128.5, 126.6, 57.4, 36.8, 34.3, 21.2, 7.9.

ESI-HRMS: m/z $[\text{M}+\text{H}]^+$ calcd for $\text{C}_{18}\text{H}_{21}\text{OS}$ 285.1308, found 285.1309.

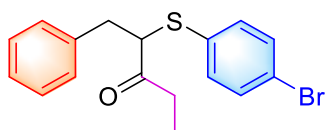


3-((4-bromophenyl)thio)-4-phenylbutan-2-one (3dc)^[2]

Yellow oil, 47.1 mg, 70% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 7.39-7.34 (m, 3H), 7.28-7.23 (m, 2H), 7.17-7.15 (m, 4H), 3.84 (t, *J* = 7.2 Hz, 1H), 3.13 (dd, *J* = 14.2, 8.2 Hz, 1H), 2.94 (dd, *J* = 14.2, 7.0 Hz, 1H), 2.18 (s, 3H). ¹³C NMR (150 MHz, CDCl₃) δ 203.8, 137.7, 134.5, 132.2, 130.9, 129.0, 128.6, 126.9, 122.7, 58.6, 36.5, 27.7.

ESI-HRMS: *m/z* [M+ Na]⁺ calcd for C₁₆H₁₅BrOSNa 356.9919, found 356.9919.

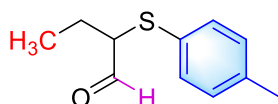


2-((4-bromophenyl)thio)-1-phenylpentan-3-one (3dd)

Yellow oil, 47.0 mg, 67% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 7.42-7.38 (m, 3H), 7.29-7.26 (m, 2H), 7.19-7.14 (m, 4H), 3.86 (dd, *J* = 8.4, 6.8 Hz, 1H), 3.16 (dd, *J* = 14.0, 8.8 Hz, 1H), 2.96 (dd, *J* = 14.0, 6.8 Hz, 1H), 2.72-2.59 (m, 1H), 2.39-2.29 (m, 1H), 0.97 (t, *J* = 7.6 Hz, 3H). ¹³C NMR (150 MHz, CDCl₃) δ 206.6, 137.9, 134.8, 133.0, 132.2, 129.1, 128.6, 126.8, 122.7, 57.7, 36.8, 34.1, 7.9.

ESI-HRMS: *m/z* [M+ Na]⁺ calcd for C₁₇H₁₇BrOSNa 371.0076, found 371.0076.

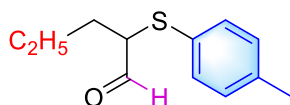


2-(*p*-tolylthio)butanal (3de)

Light Yellow oil, 22.5 mg, 58% yield, PE:EA=20:1.

¹H NMR (600 MHz, CDCl₃) δ 9.38 (d, *J* = 3.6 Hz, 1H), 7.29-7.27 (m, 2H), 7.10 (d, *J* = 7.8 Hz, 2H), 3.36 (td, *J* = 7.2, 4.2 Hz, 1H), 2.31 (s, 3H), 1.85-1.80 (m, 1H), 1.70-1.65 (m, 1H), 1.08 (t, *J* = 7.2 Hz, 3H). ¹³C NMR (150 MHz, CDCl₃) δ 195.2, 138.6, 133.7, 129.9, 127.7, 59.0, 21.2, 21.1, 11.6.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₁H₁₅OS 195.0838, found 195.0838.

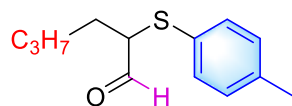


2-(*p*-tolylthio)pentanal (3df)

Light Yellow oil, 22.1 mg, 53% yield, PE:EA=20:1.

¹H NMR (600 MHz, CDCl₃) δ 9.36 (d, *J* = 4.2 Hz, 1H), 7.28-7.26 (m, 2H), 7.10-7.08 (m, 2H), 3.44 (td, *J* = 7.2, 4.2 Hz, 1H), 2.31 (s, 3H), 1.84-1.68 (m, 2H), 1.61-1.45 (m, 2H), 0.95 (t, *J* = 7.2 Hz, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 195.2, 138.6, 133.6, 132.5, 129.9, 57.0, 29.7, 21.1, 20.2, 13.7.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₂H₁₇OS 209.0995, found 209.0995.

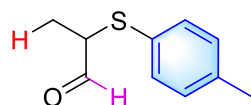


2-(*p*-tolylthio)hexanal (3dg)

Light Yellow oil, 23.1 mg, 52% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.36 (d, *J* = 4.4 Hz, 1H), 7.28 (d, *J* = 8.0 Hz, 2H), 7.10 (d, *J* = 7.6 Hz, 2H), 3.43 (td, *J* = 7.2, 4.4 Hz, 1H), 2.32 (s, 3H), 1.81-1.74 (m, 1H), 1.67-1.61 (m, 1H), 1.57-1.48 (m, 2H), 1.38-1.35 (m, 2H), 0.92 (t, *J* = 6.8 Hz, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 195.2, 138.5, 133.6, 129.9, 127.8, 57.3, 29.0, 27.4, 22.4, 21.1, 13.8.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₃H₁₉OS 223.1151, found 223.1151.

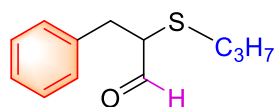


2-(*p*-tolylthio)propanal (3dh)

Light Yellow oil, 18.1 mg, 50% yield, PE:EA=20:1.

¹H NMR (400 MHz, CDCl₃) δ 9.75 (d, *J* = 1.2 Hz, 1H), 7.28-7.26 (m, 2H), 7.12 (d, *J* = 8.0 Hz, 2H), 3.13 (t, *J* = 7.2 Hz, 1H), 2.73 (td, *J* = 7.2, 1.2 Hz, 3H), 2.32 (s, 3H). **¹³C NMR (150 MHz, CDCl₃)** δ 200.4, 137.0, 131.1, 131.0, 129.9, 43.3, 27.2, 21.0.

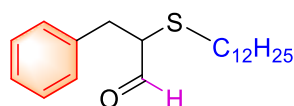
ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₀H₁₃OS 181.0682, found 181.0682.



3-phenyl-2-(propylthio)propanal (3di)

< 5% yield.

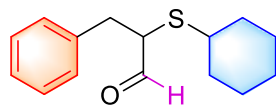
ESI-HRMS: *m/z* [M+H]⁺ calcd for C₁₂H₁₇OS 209.0995, found 209.0993.



2-(dodecylthio)-3-phenylpropanal (3dj)

< 5% yield.

ESI-HRMS: *m/z* [M+H]⁺ calcd for C₂₁H₃₅OS 335.2403, found 335.2403.



2-(cyclohexylthio)-3-phenylpropanal (3dk)

< 5% yield.

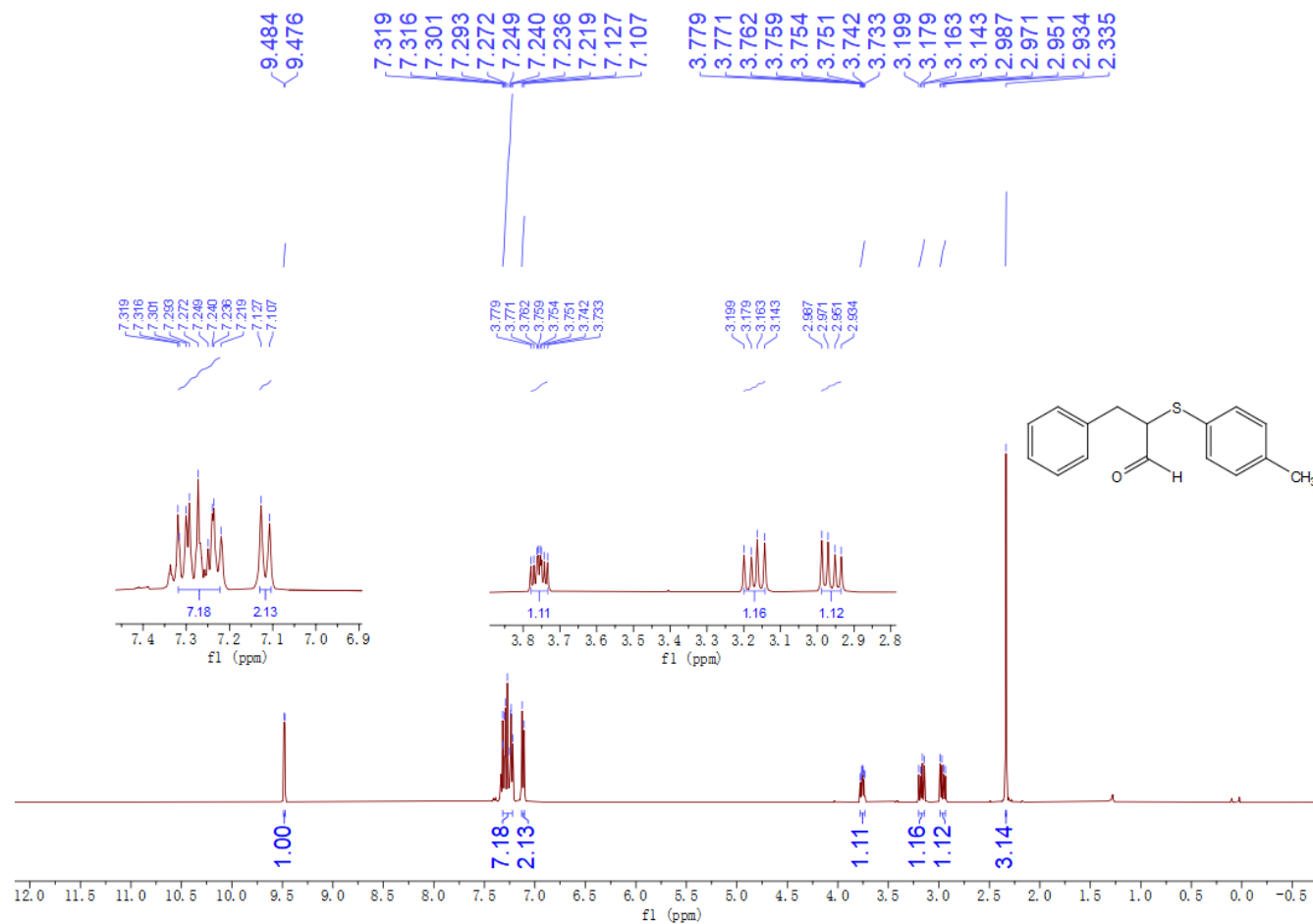
ESI-HRMS: m/z $[M+H]^+$ calcd for $C_{15}H_{21}OS$ 249.1308, found 249.1308.

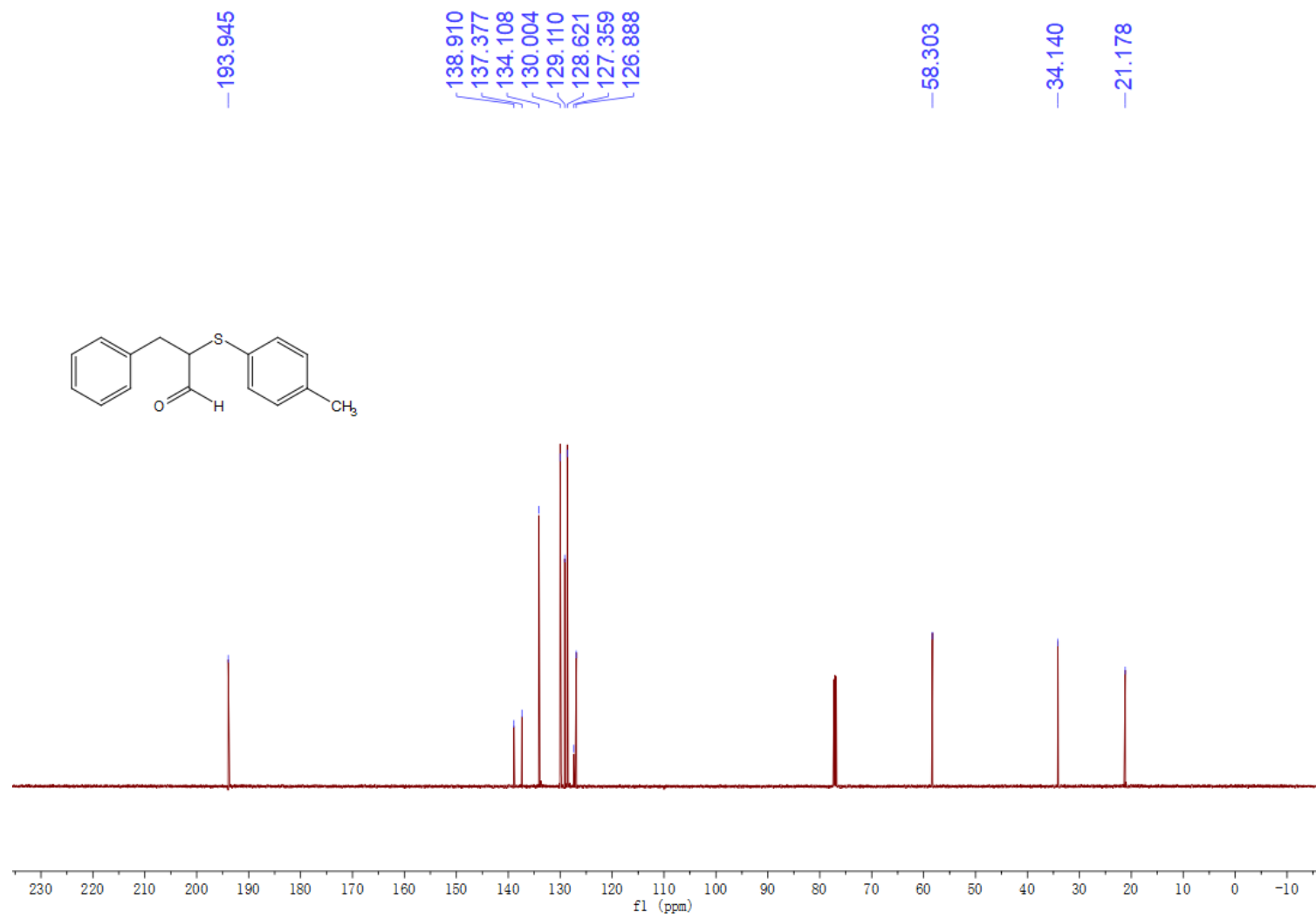
References

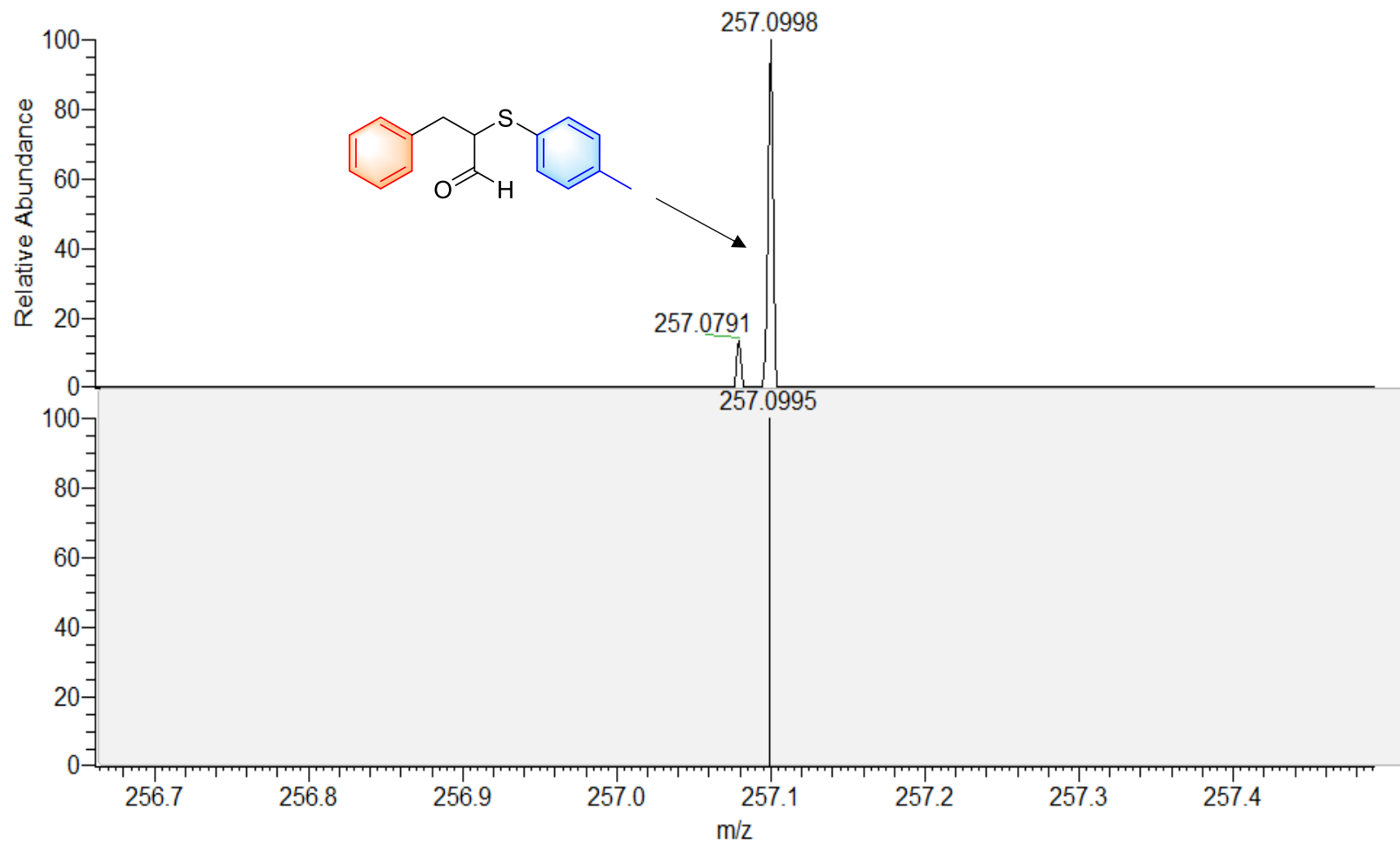
- [1] N. Cabrera-Lobera, M. T. Quirós, W. W. Brennessel, M. L. Neidig, E. Buñuel, D. J. Cárdenas, *Org. Lett.*, 2019, **21**, 6552–6556.
- [2] S. Biswas, C. Dahlstrand, R. A. Watile, M. Kalek, F. Himo, J. S. M. Samec, *Chem. Eur. J.*, 2013, **19**, 17939-17950.

NMR and HRMS Spectra Copies of Products

3-phenyl-2-(*p*-tolylthio)propanal (3aa)



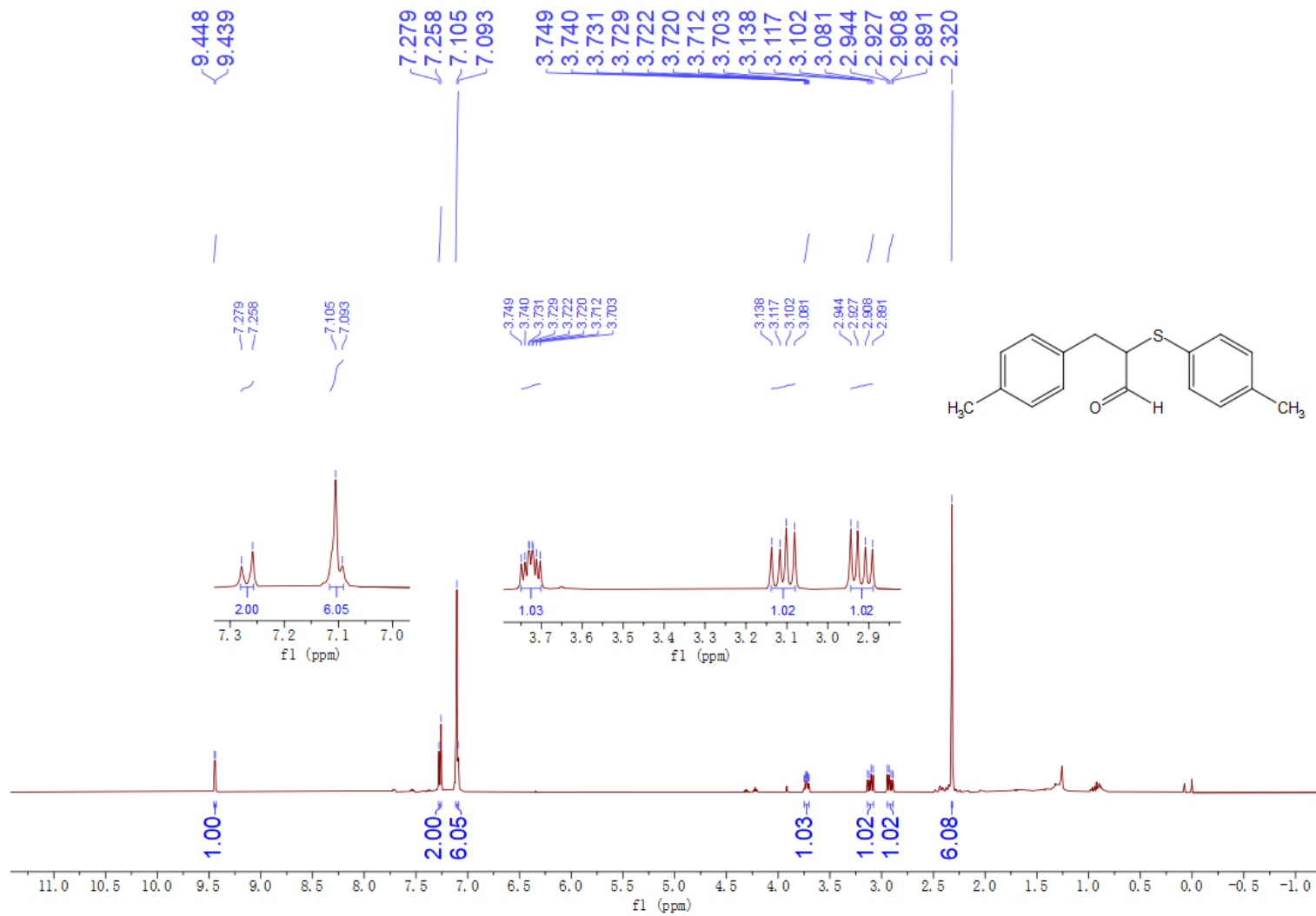


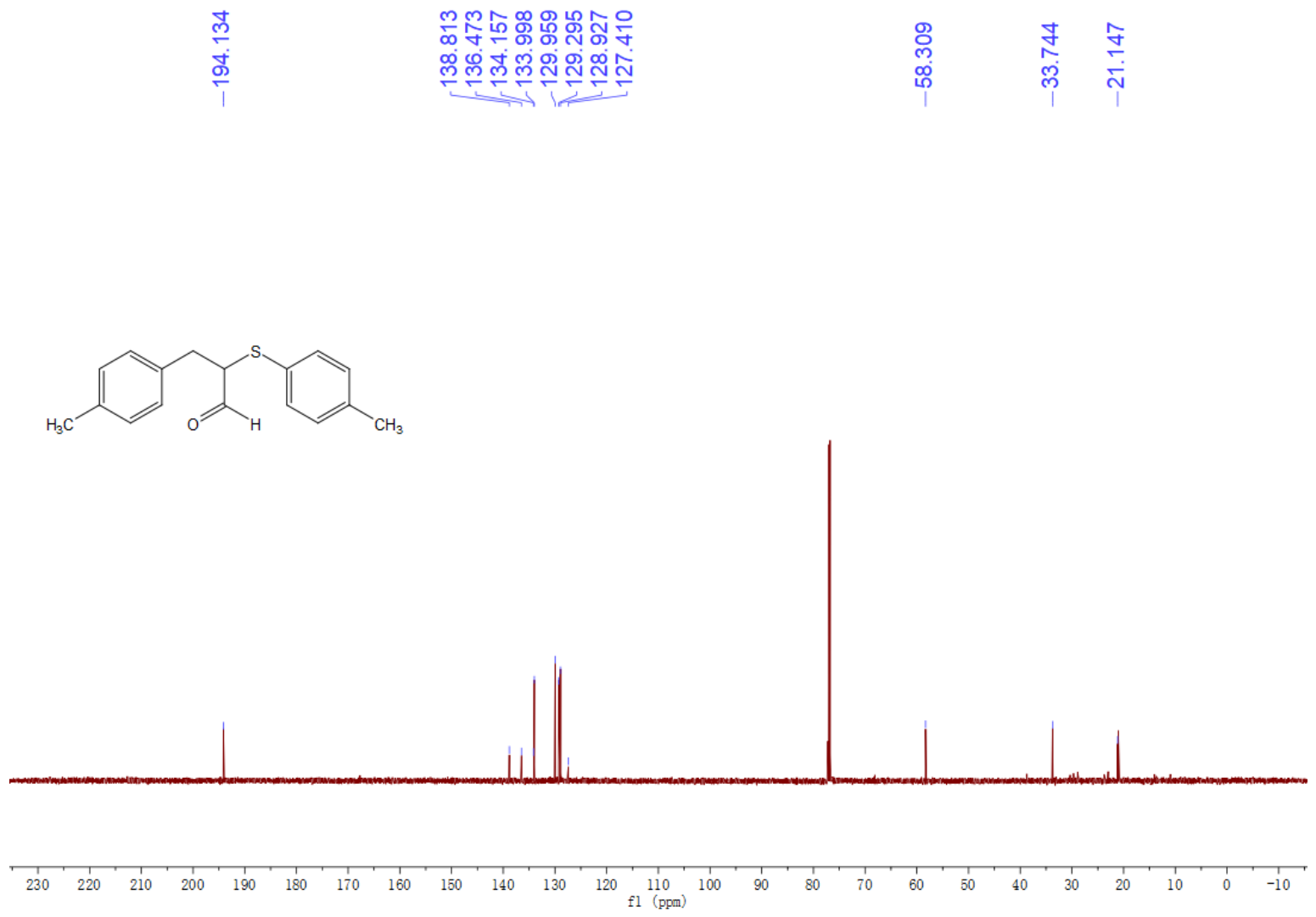


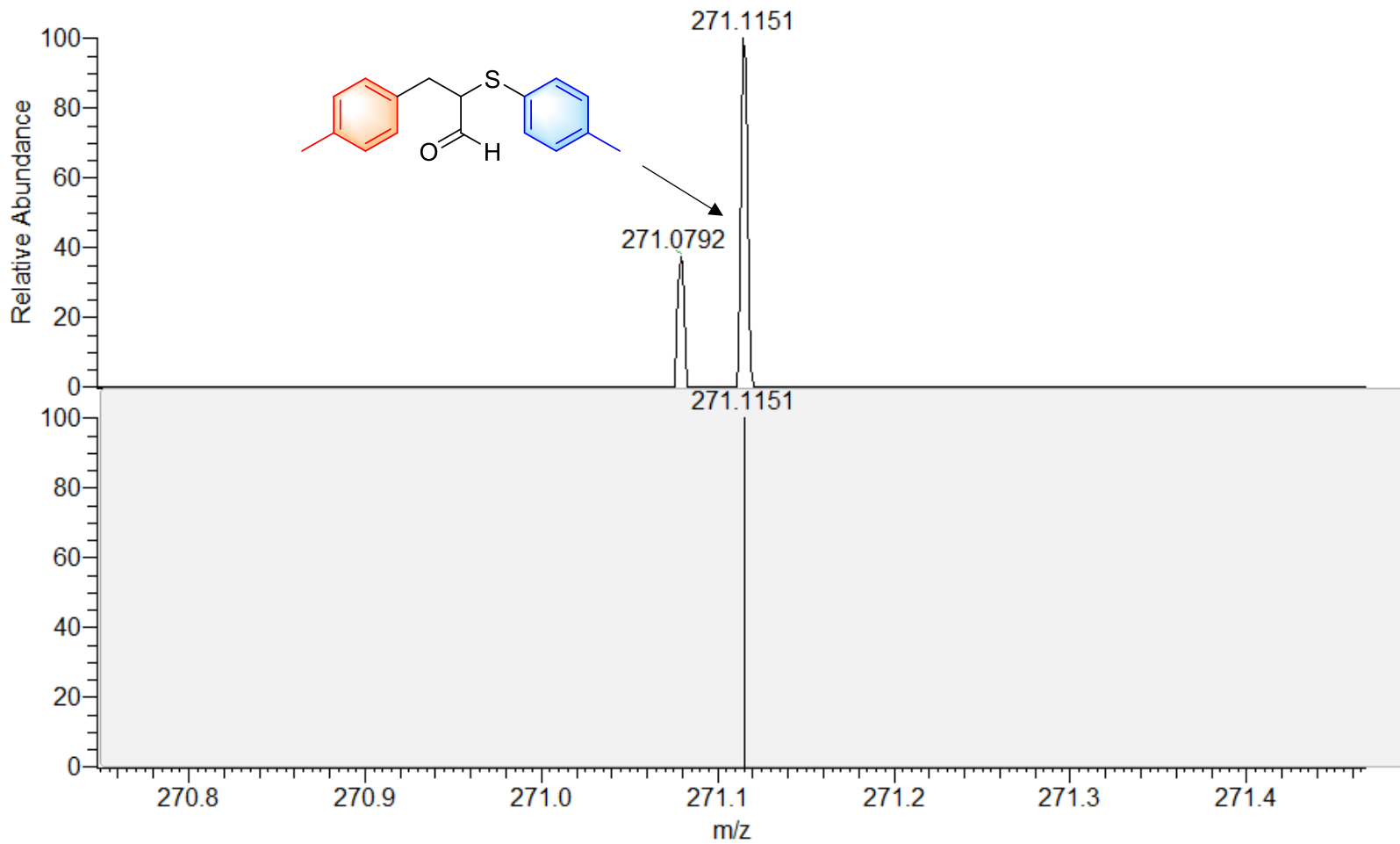
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Full lock ms
[50.0000-500.3000]

NL:
7.96E5
C₁₆ H₁₆ OS +H:
C₁₆ H₁₇ O₁ S₁
pa Chrg 1

3-(*p*-tolyl)-2-(*p*-tolylthio)propanal (3ab)



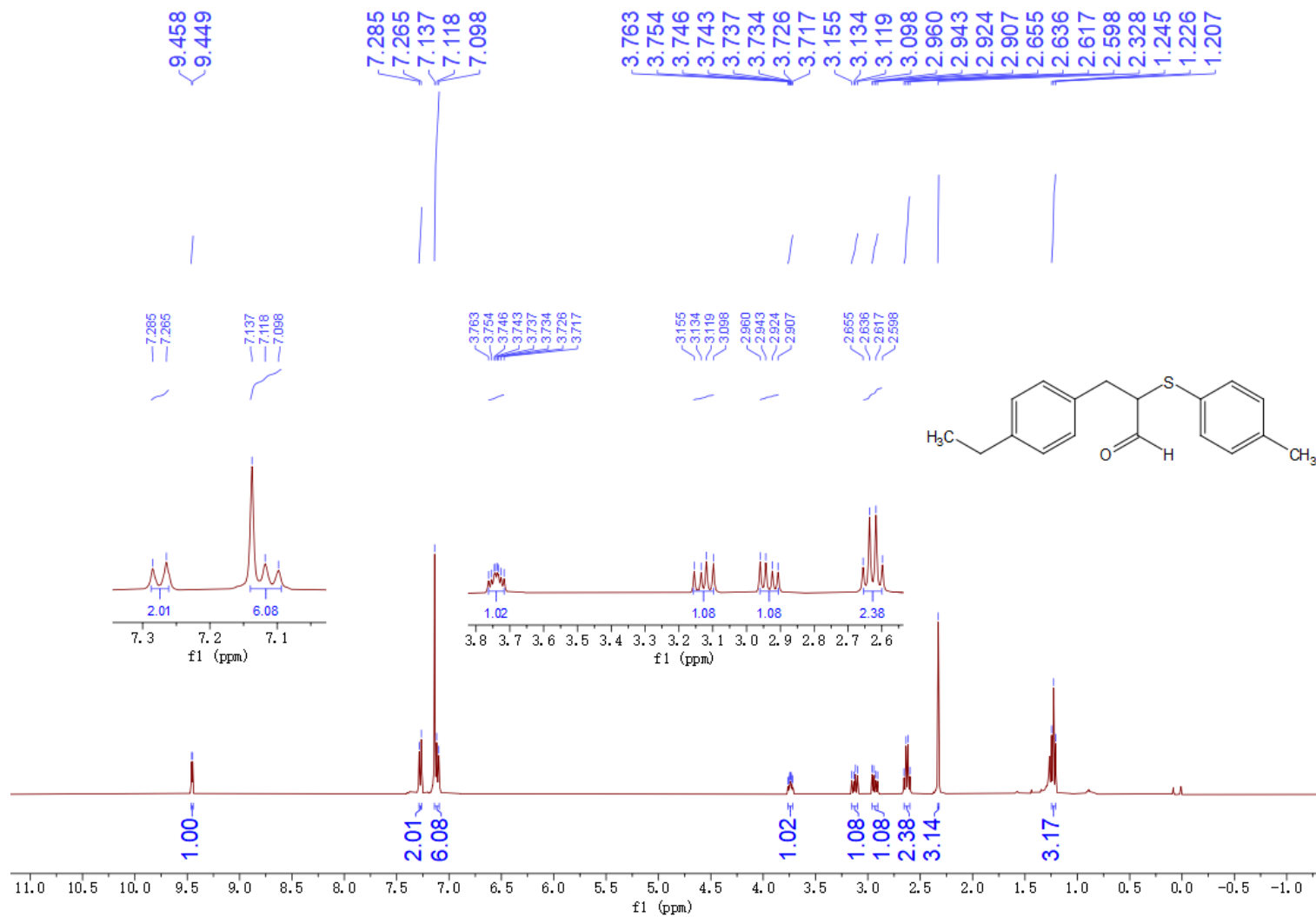


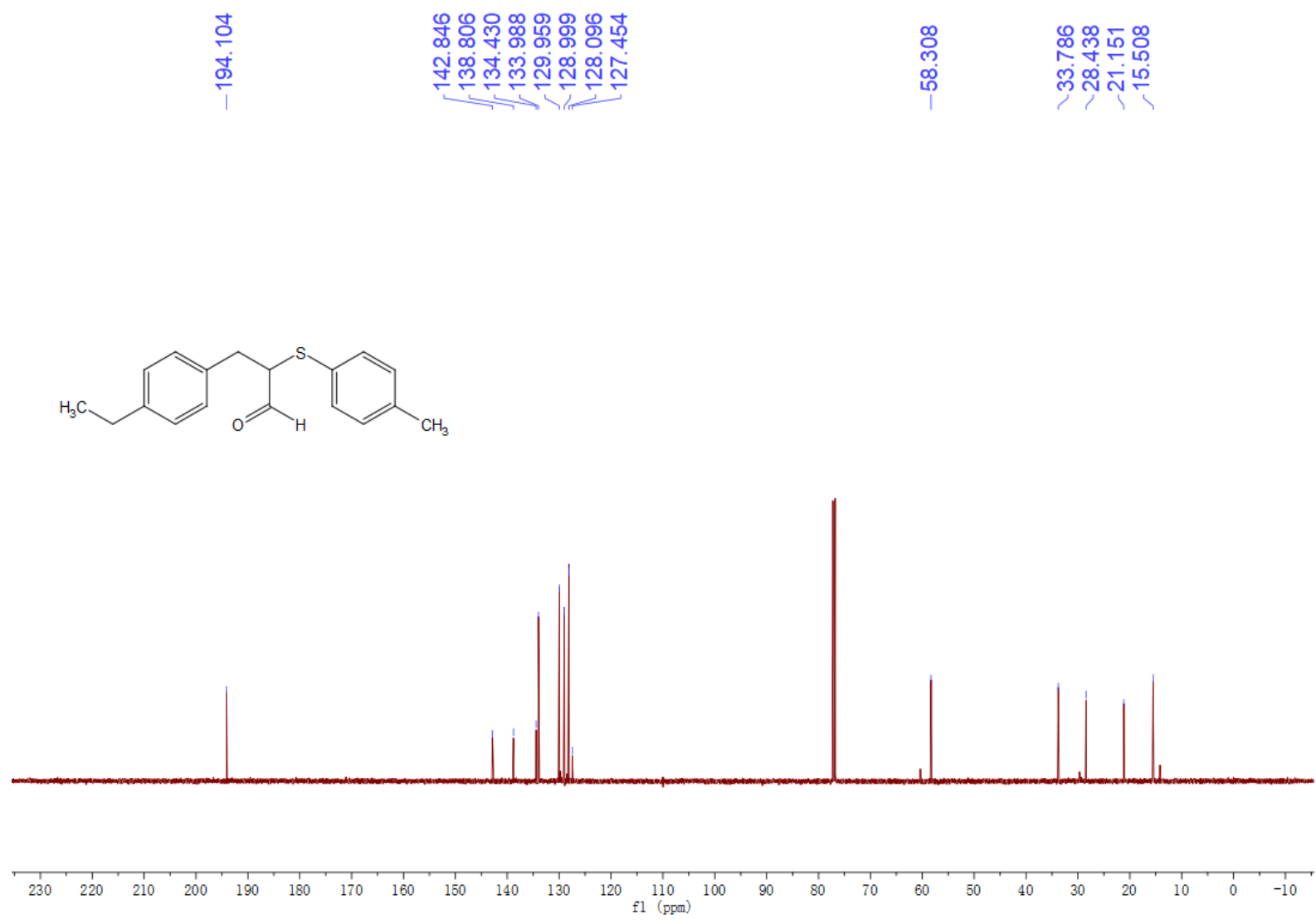


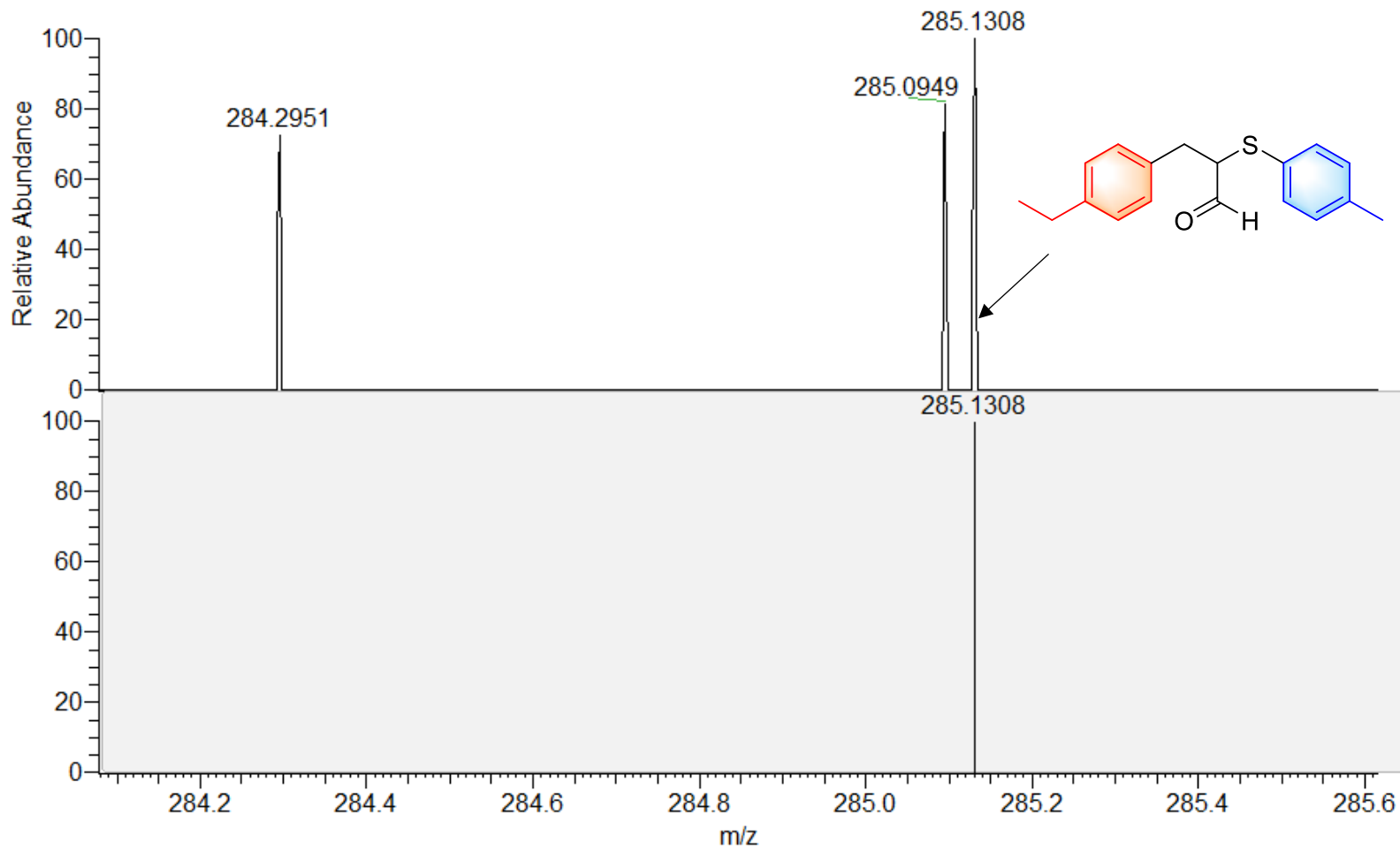
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NL:
7.87E5
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C₁₇ H₁₉ O₁ S₁
pa Chrg 1

3-(4-ethylphenyl)-2-(*p*-tolylthio)propanal (3ac)



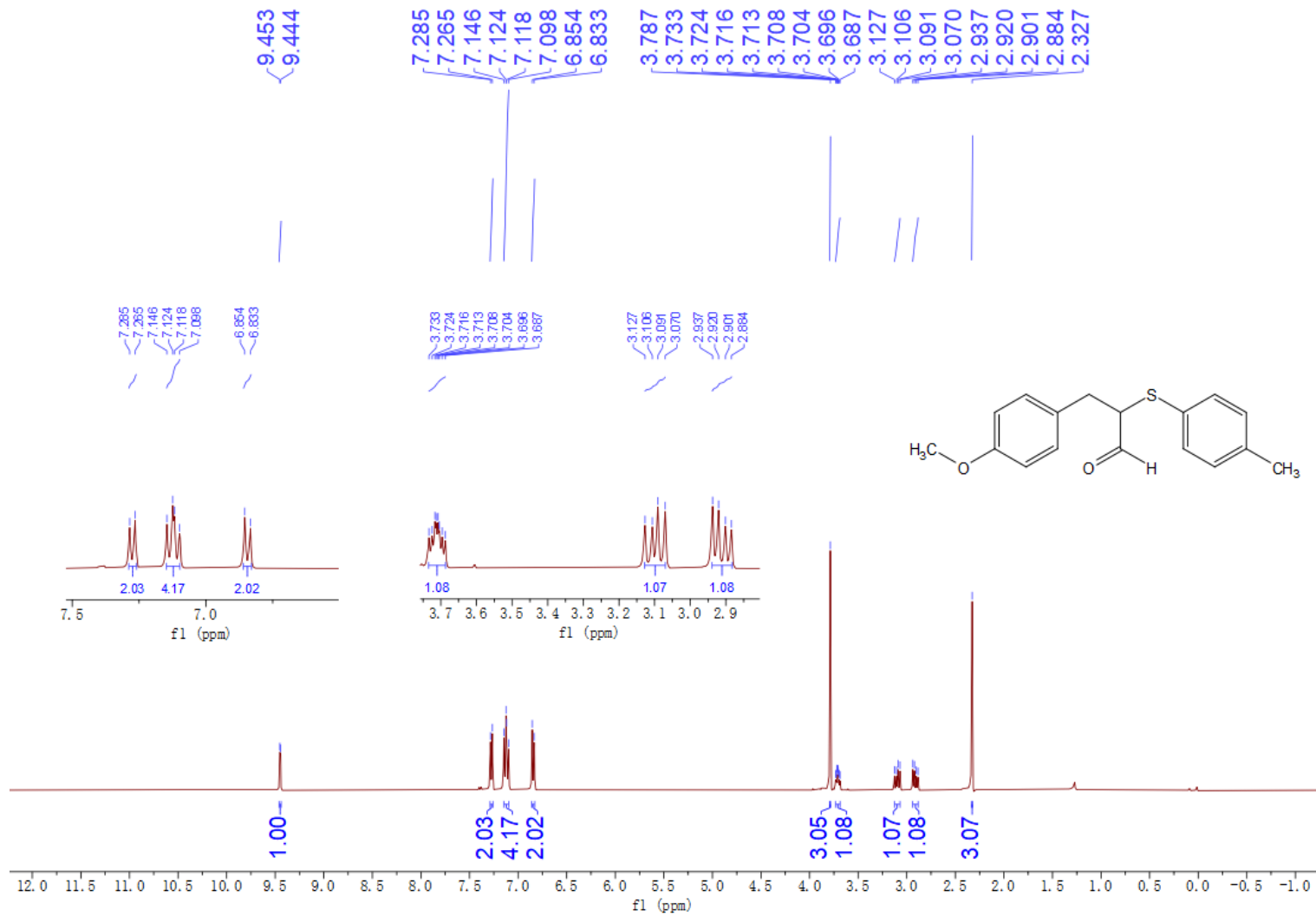


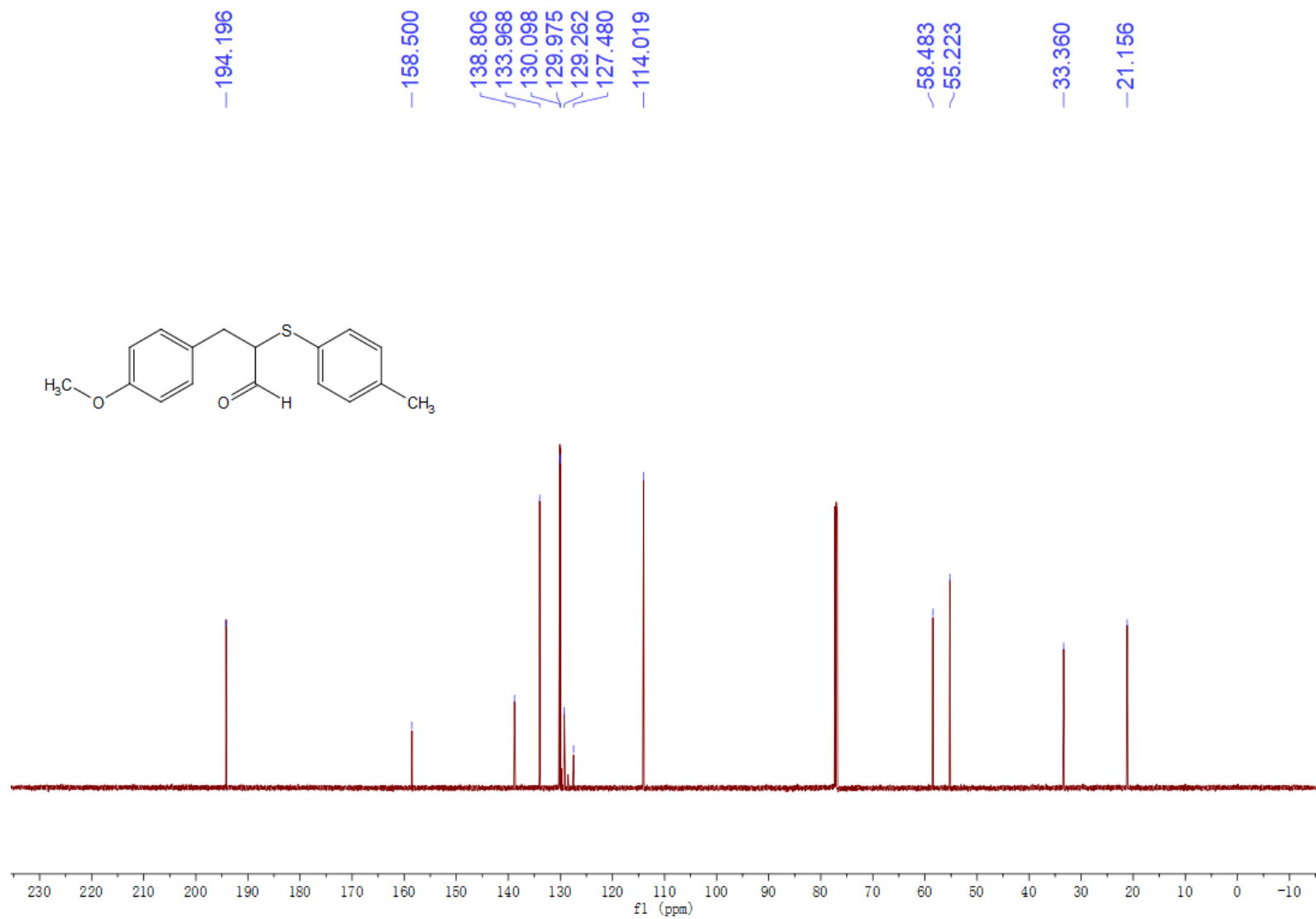


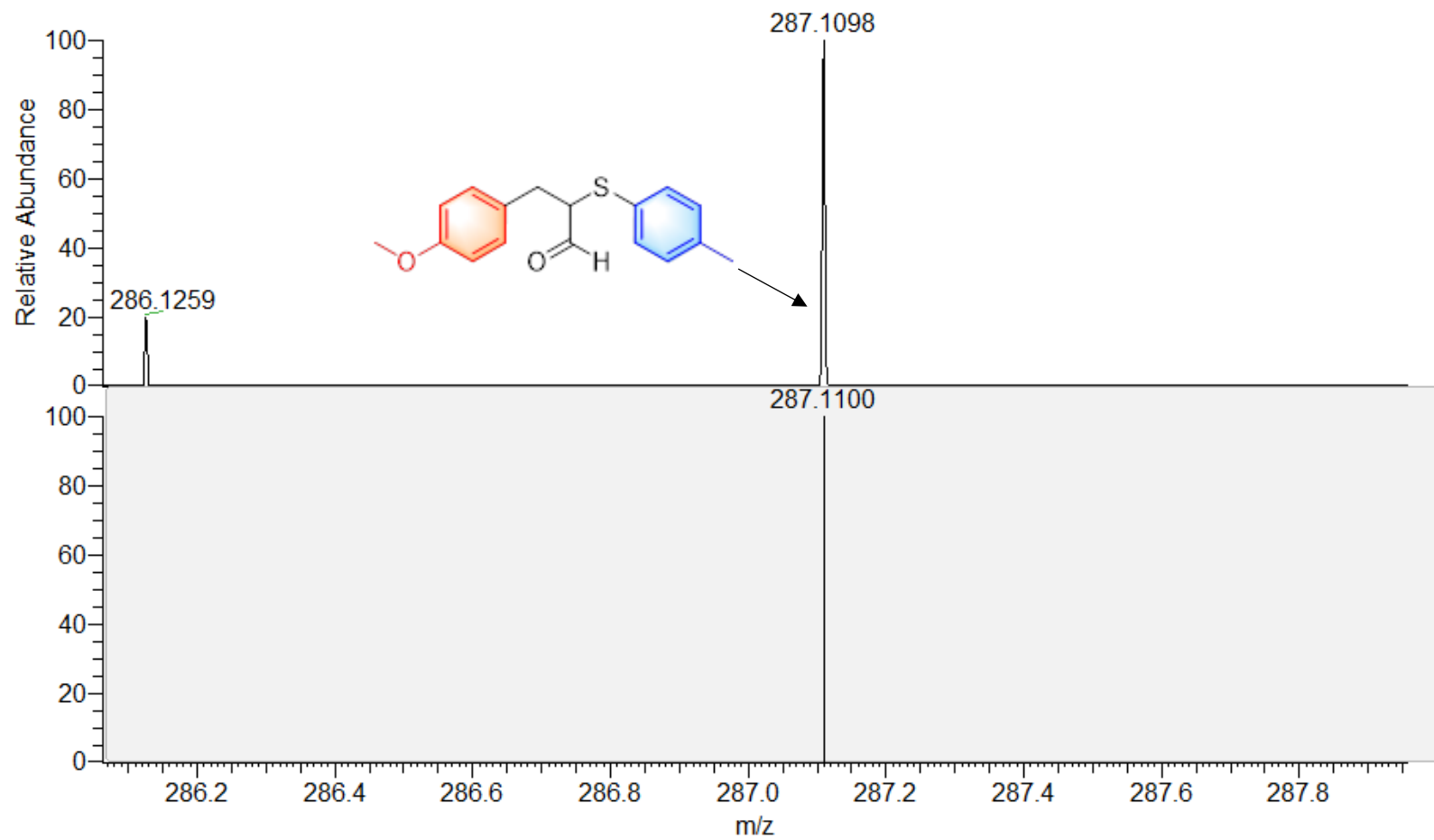
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NL:
 7.78E5
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 pa Chrg 1

3-(4-methoxyphenyl)-2-(*p*-tolylthio)propanal (3ad)



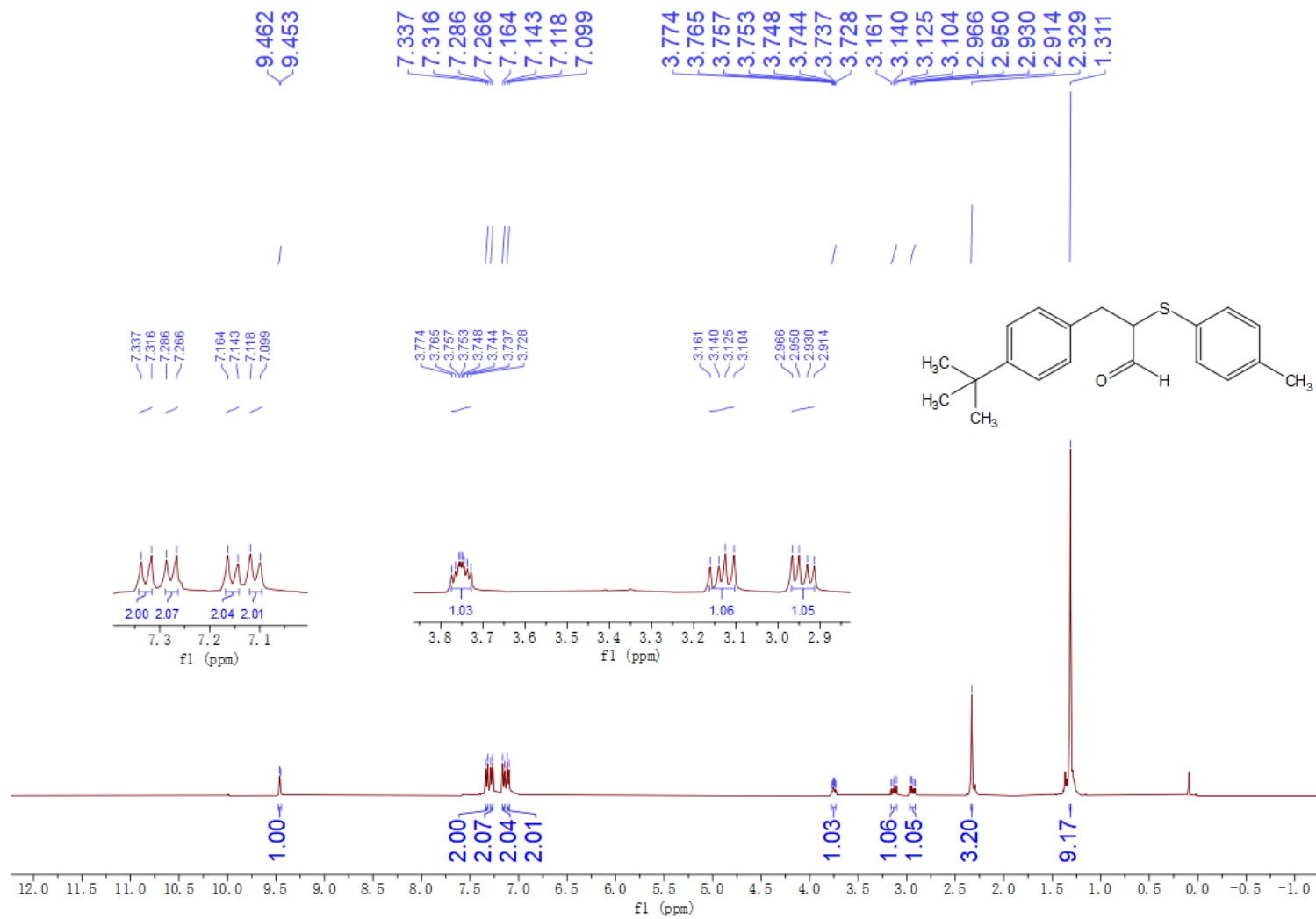


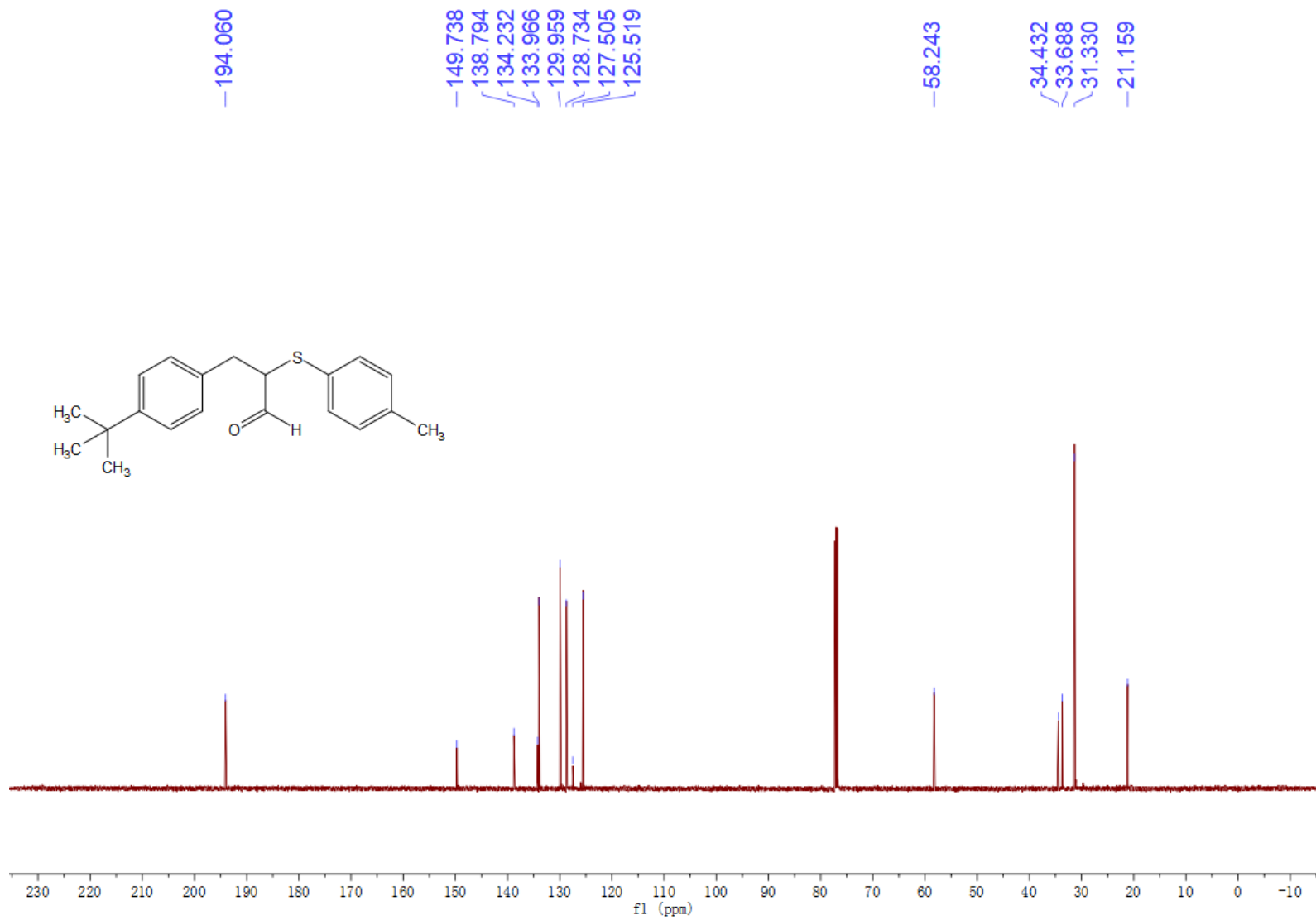


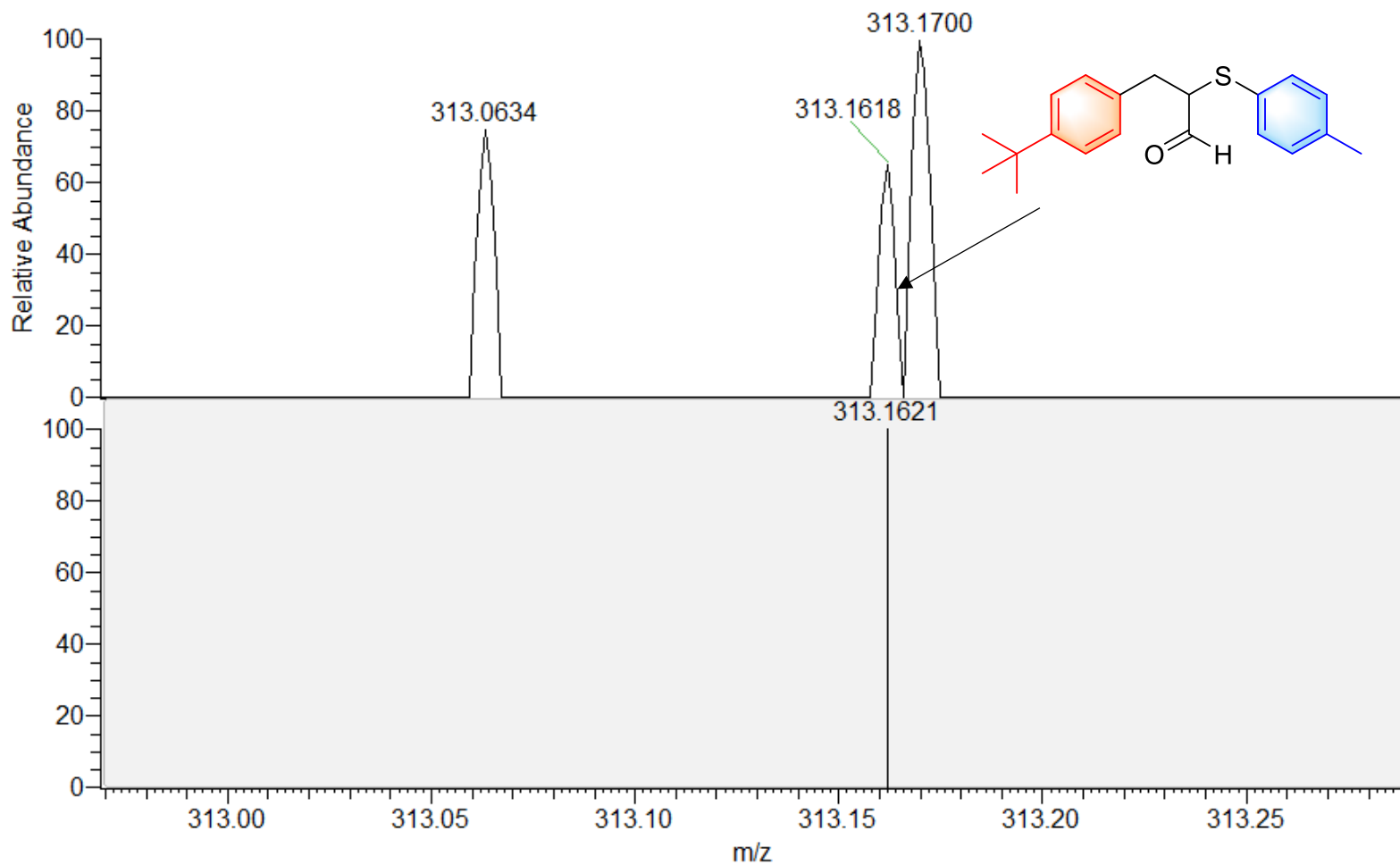
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DZHY-MOUDAN-
M7#1 RT: 0.00 AV:
1 T: FTMS + p ESI
Full lock ms
[60.0000-750.0000]

NL:
7.85E5
C₁₇ H₁₈ O₂ S +H:
C₁₇ H₁₉ O₂ S₁
pa Chrg 1

3-(4-(*tert*-butyl)phenyl)-2-(*p*-tolylthio)propanal (3ae)



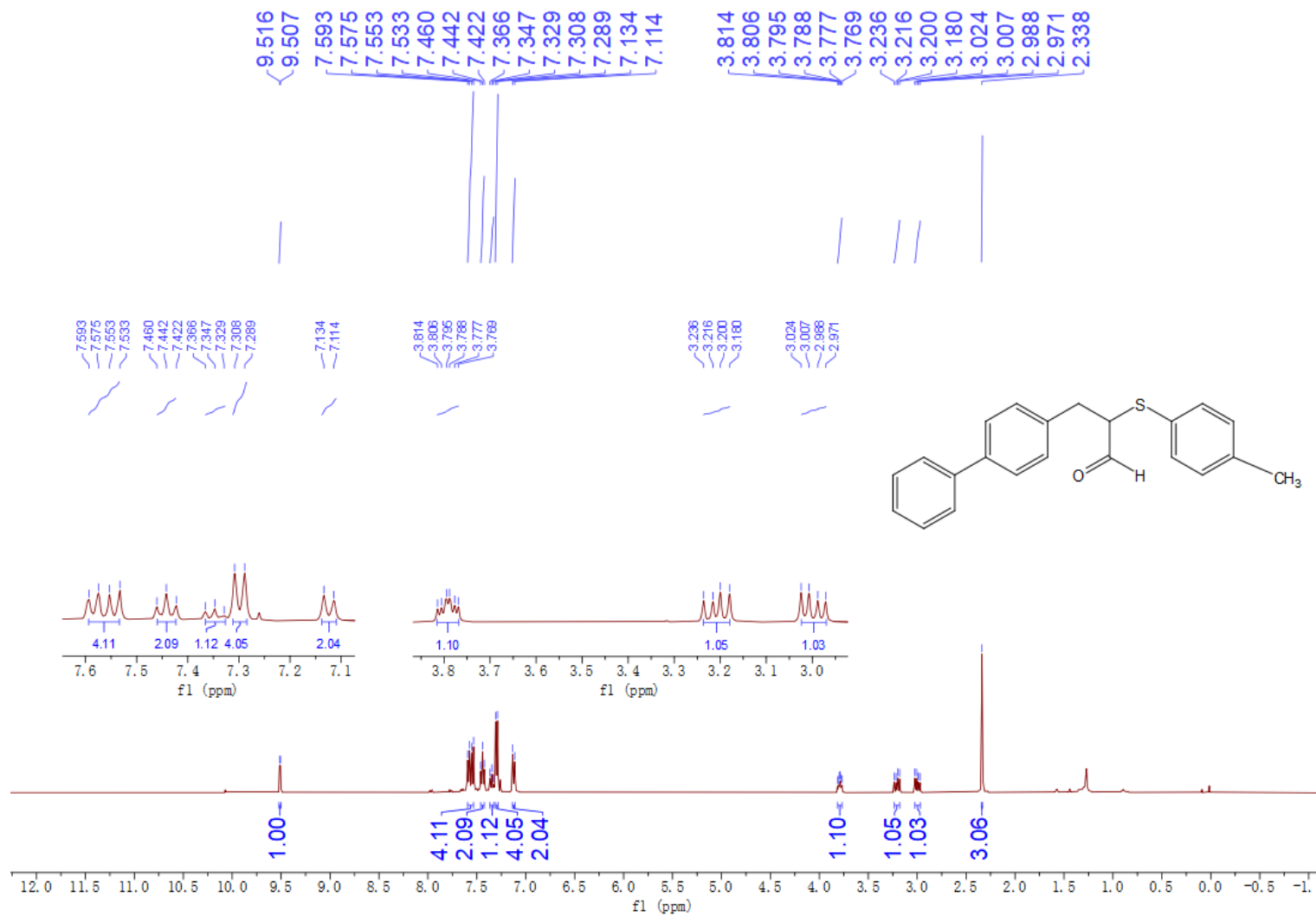


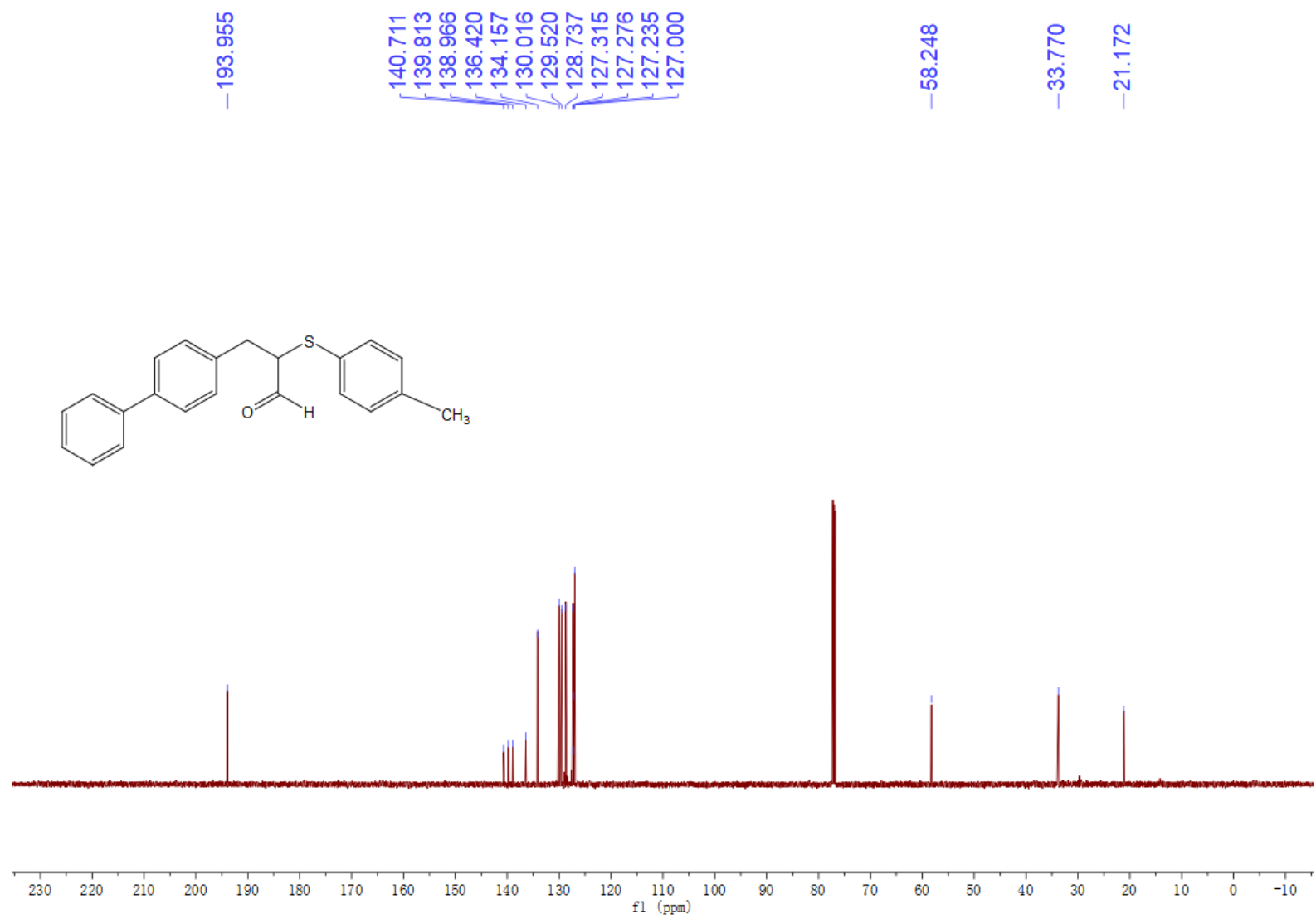


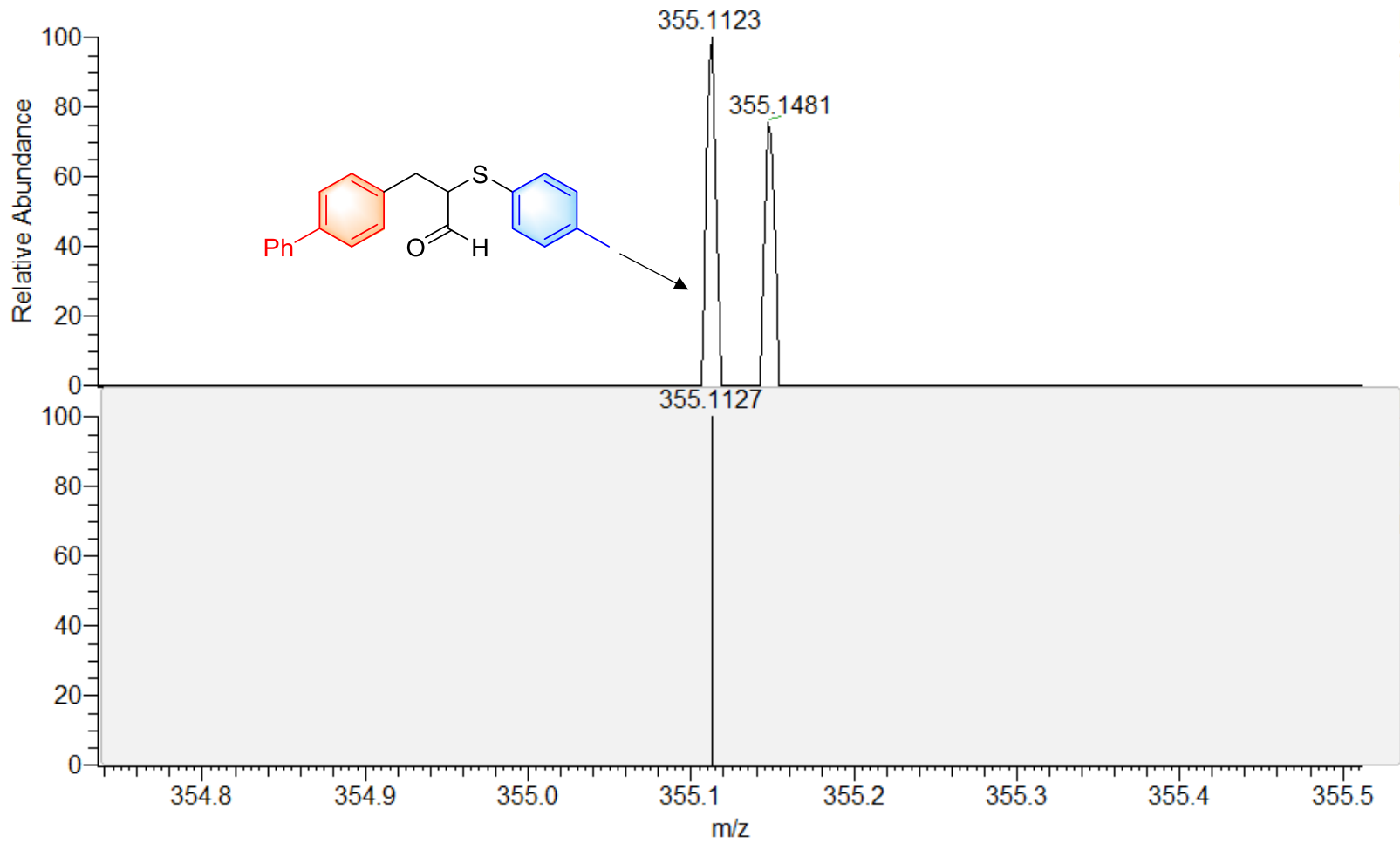
NL:
 1.37E5
 MOUDAN-M8#66
 RT: 0.29 AV: 1 T:
 FTMS + p ESI Full
 lock ms
 [75.0000-750.0000]

NL:
 7.61E5
 C₂₀ H₂₄ OS +H:
 C₂₀ H₂₅ O₁ S₁
 pa Chrg 1

3-([1,1'-biphenyl]-4-yl)-2-(*p*-tolylthio)propanal (3af)



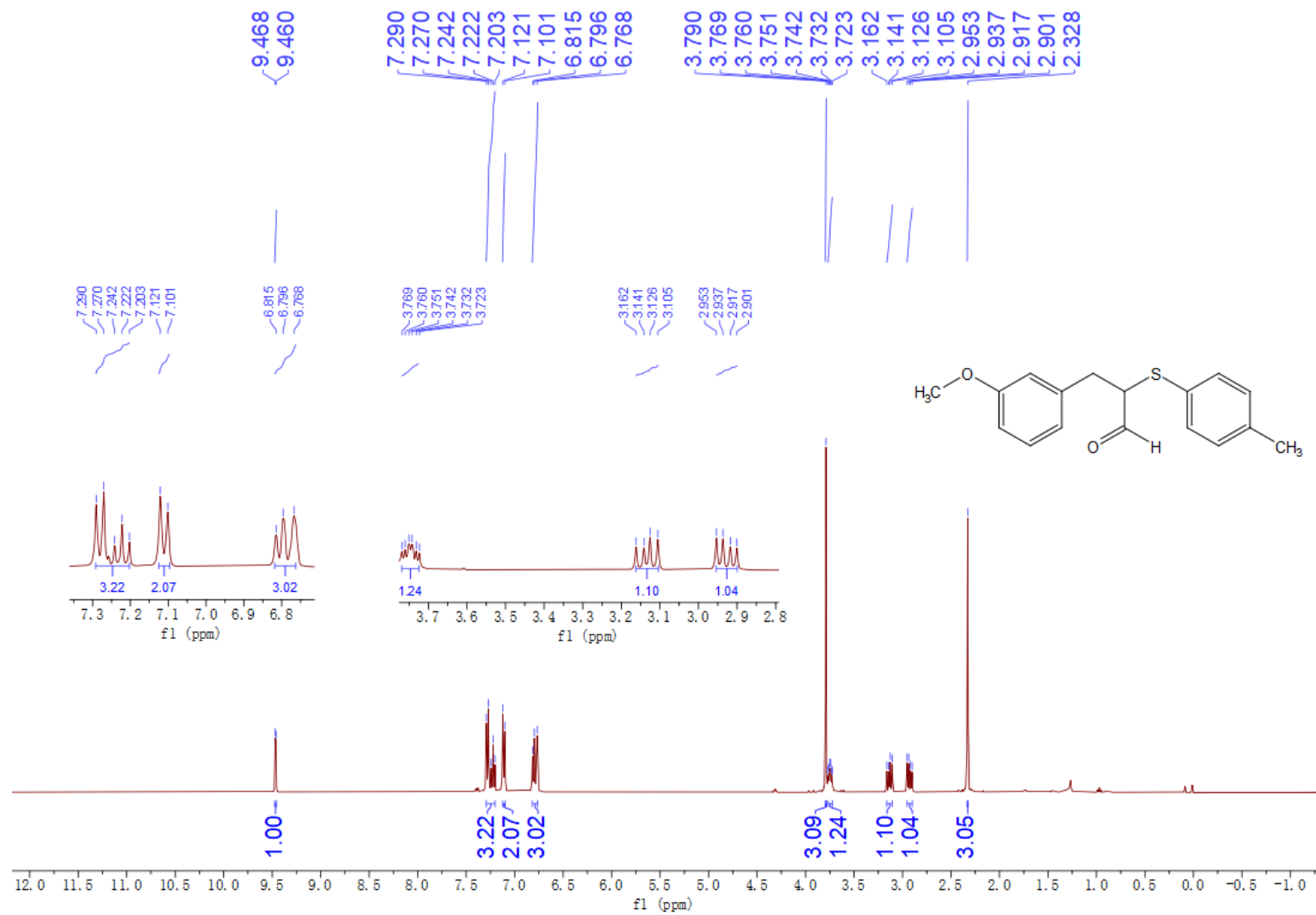


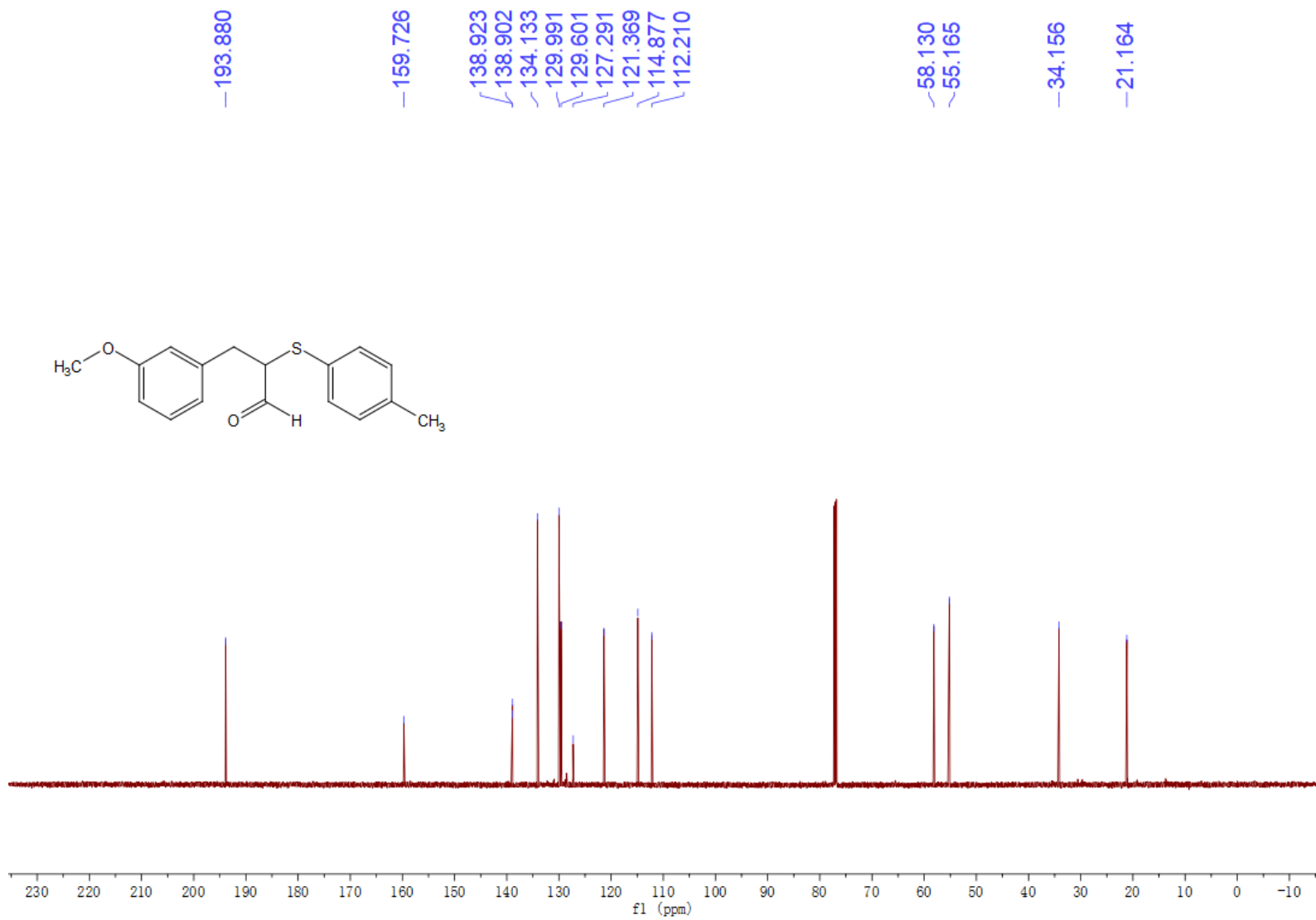


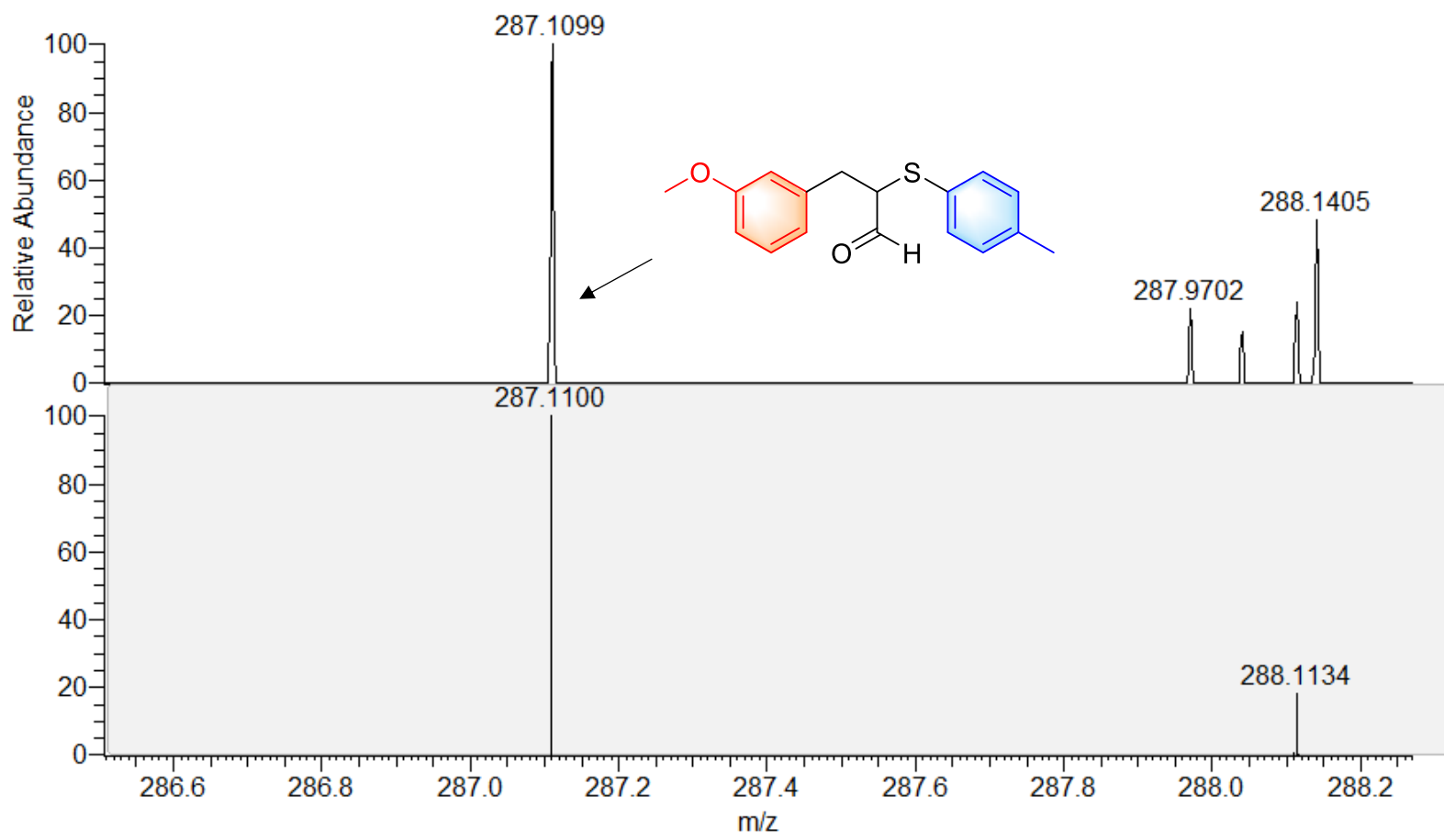
NL:
2.28E5
MOUDAN-M8#52
RT: 0.23 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

NL:
7.46E5
C₂₂ H₂₀ OS +Na:
C₂₂ H₂₀ O₁ S₁ Na₁
pa Chrg 1

3-(3-methoxyphenyl)-2-(*p*-tolylthio)propanal (3ag)



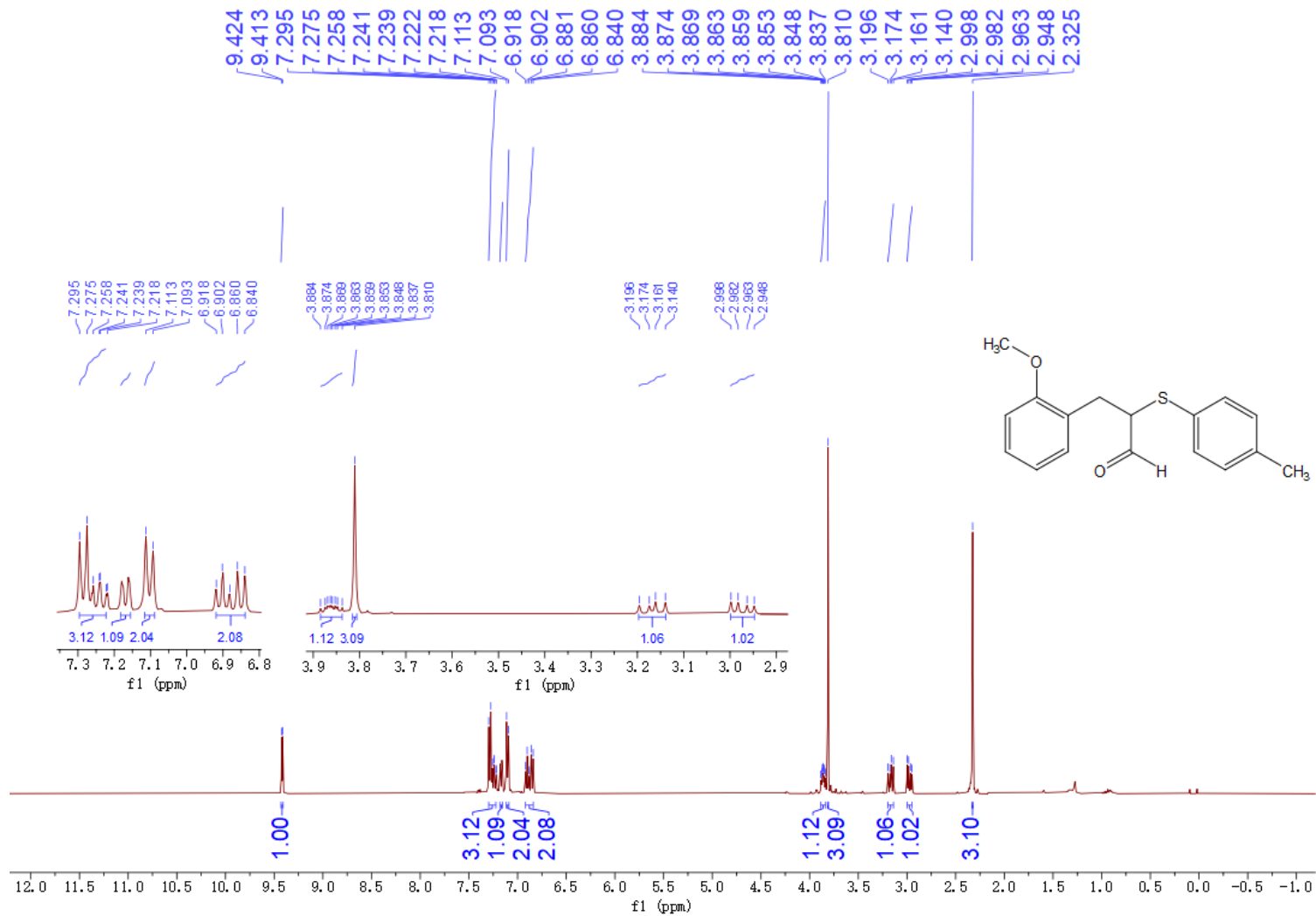


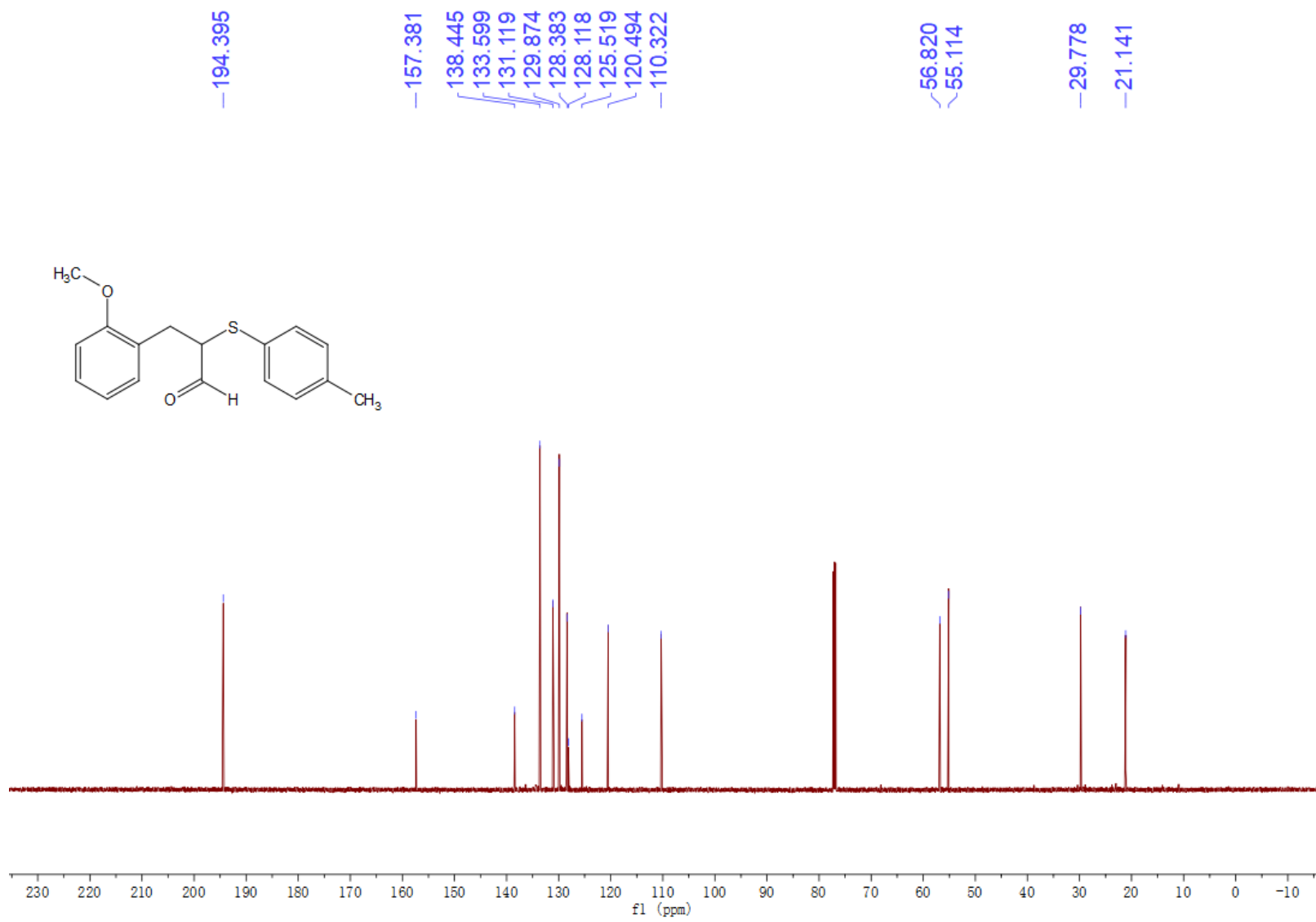


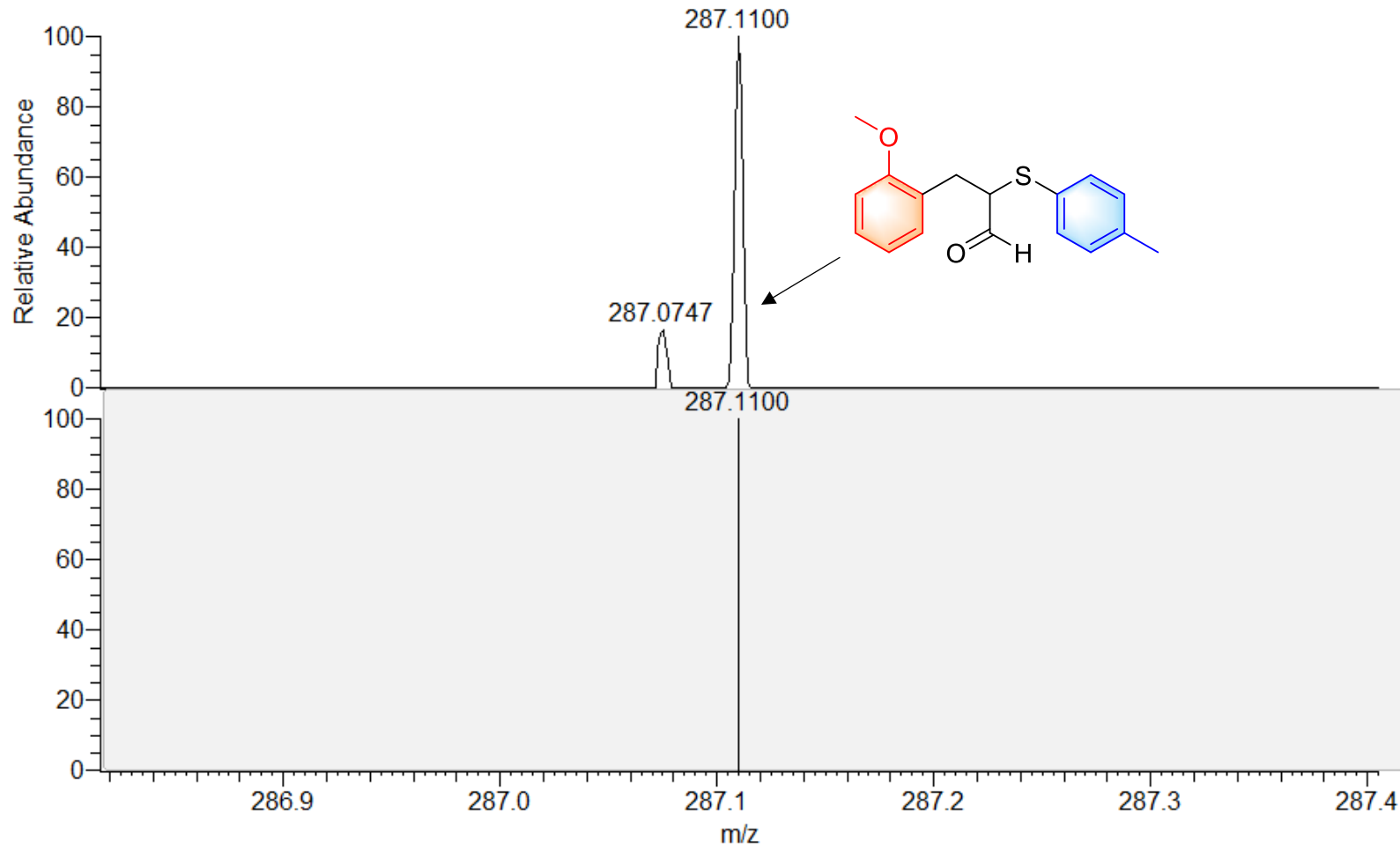
NL:
 2.66E6
 DZHY-MOUDAN-
 M7#3 RT: 0.01 AV:
 1 T: FTMS + p ESI
 Full lock ms
 [60.0000-750.0000]

NL:
 7.85E5
 C₁₇ H₁₈ O₂ S +H:
 C₁₇ H₁₉ O₂ S₁
 pa Chrg 1

3-(2-methoxyphenyl)-2-(*p*-tolylthio)propanal (3ah)



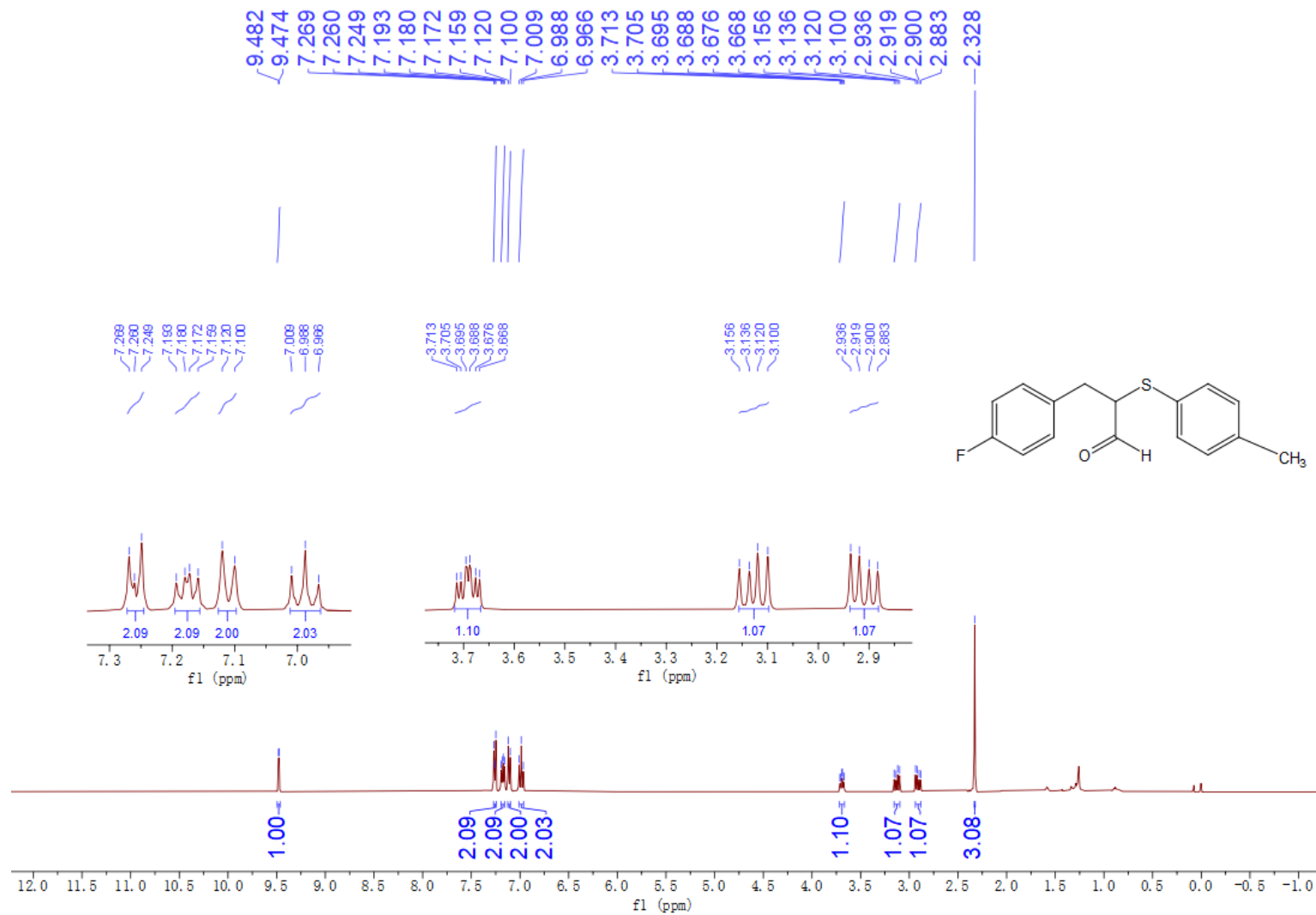


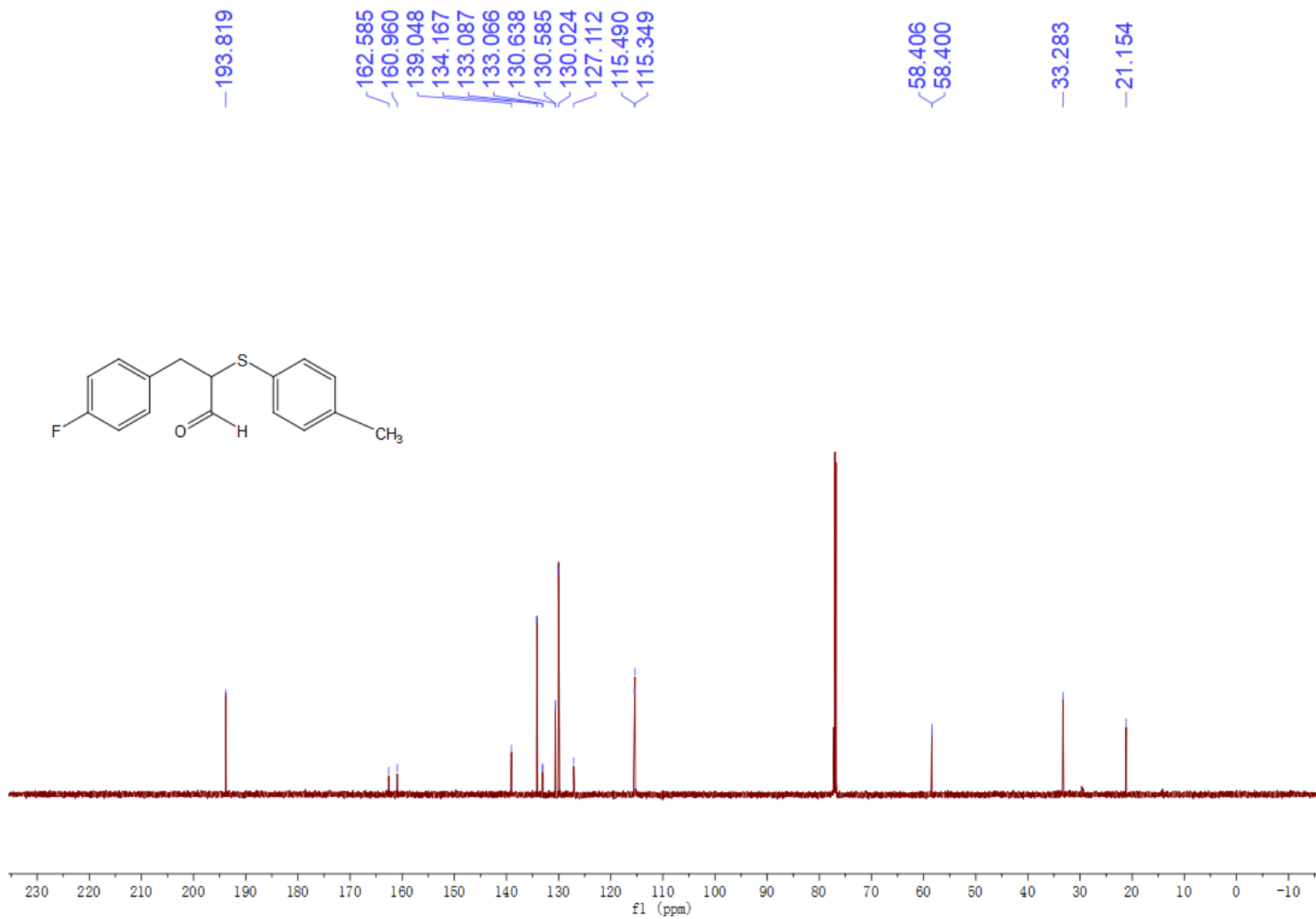


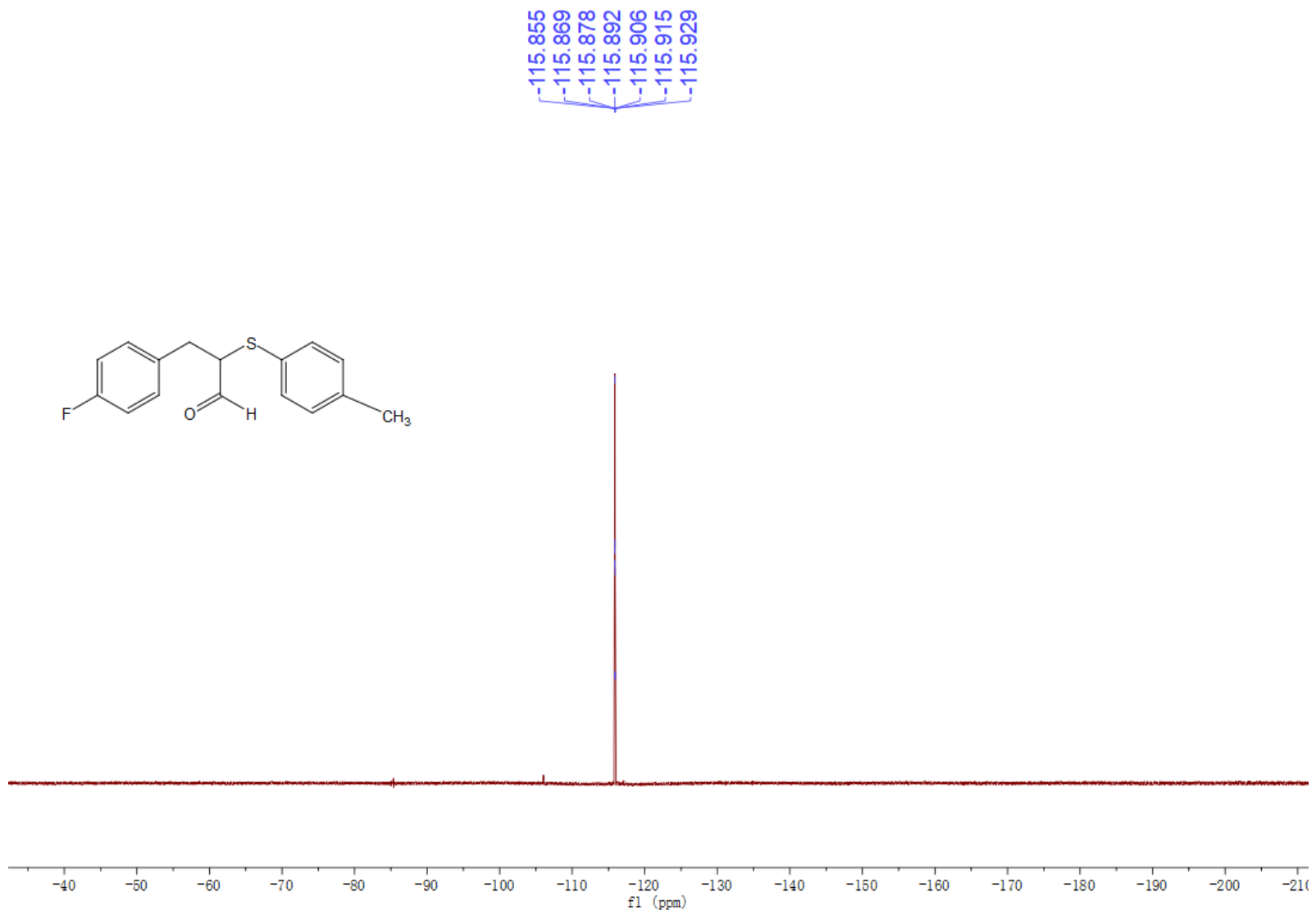
NL:
5.49E5
MOUDAN-M8#70
RT: 0.31 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

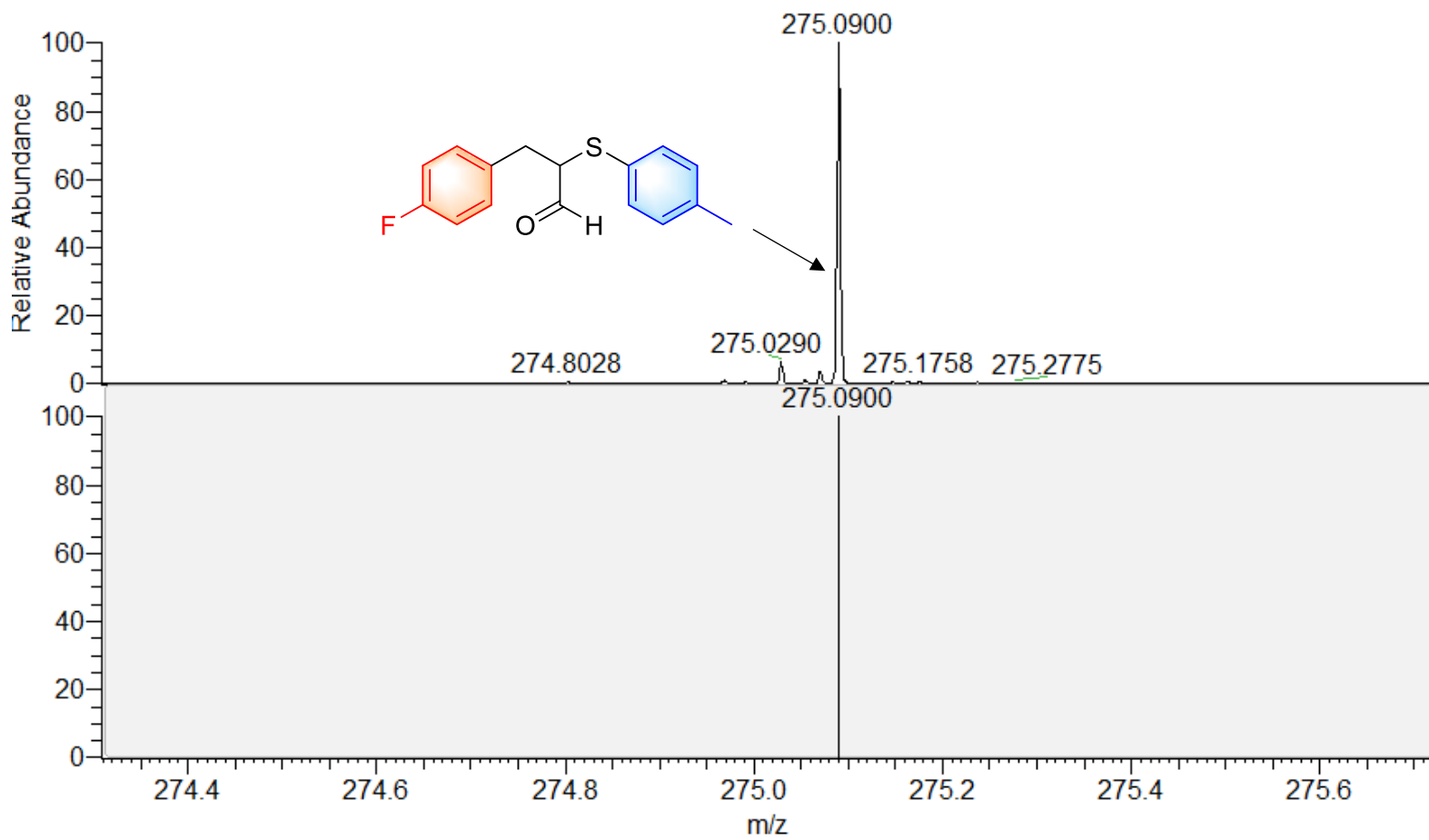
NL:
7.85E5
C₁₇ H₁₈ O₂ S +H:
C₁₇ H₁₉ O₂ S₁
pa Chrg 1

3-(4-fluorophenyl)-2-(*p*-tolylthio)propanal (3ai)





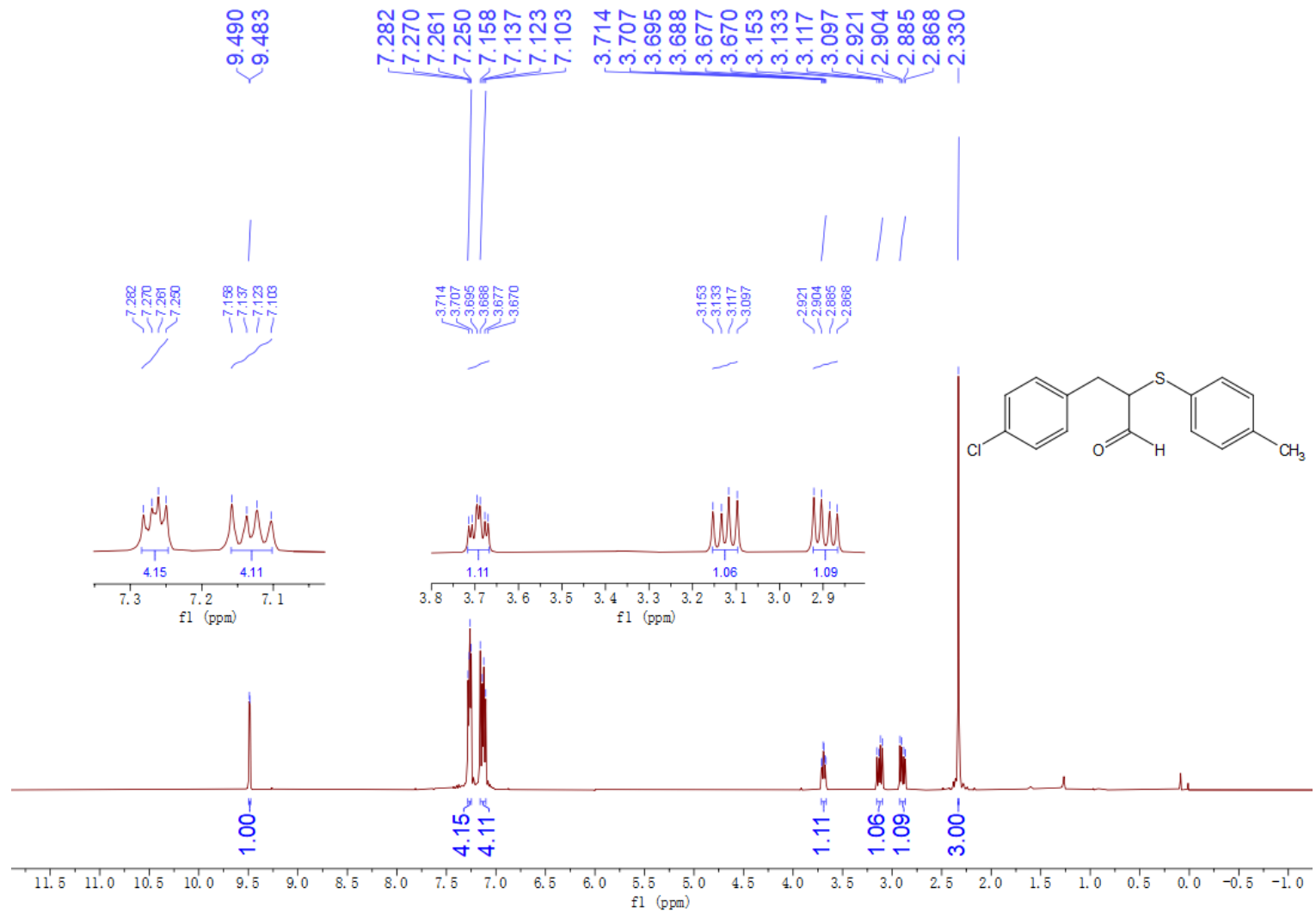


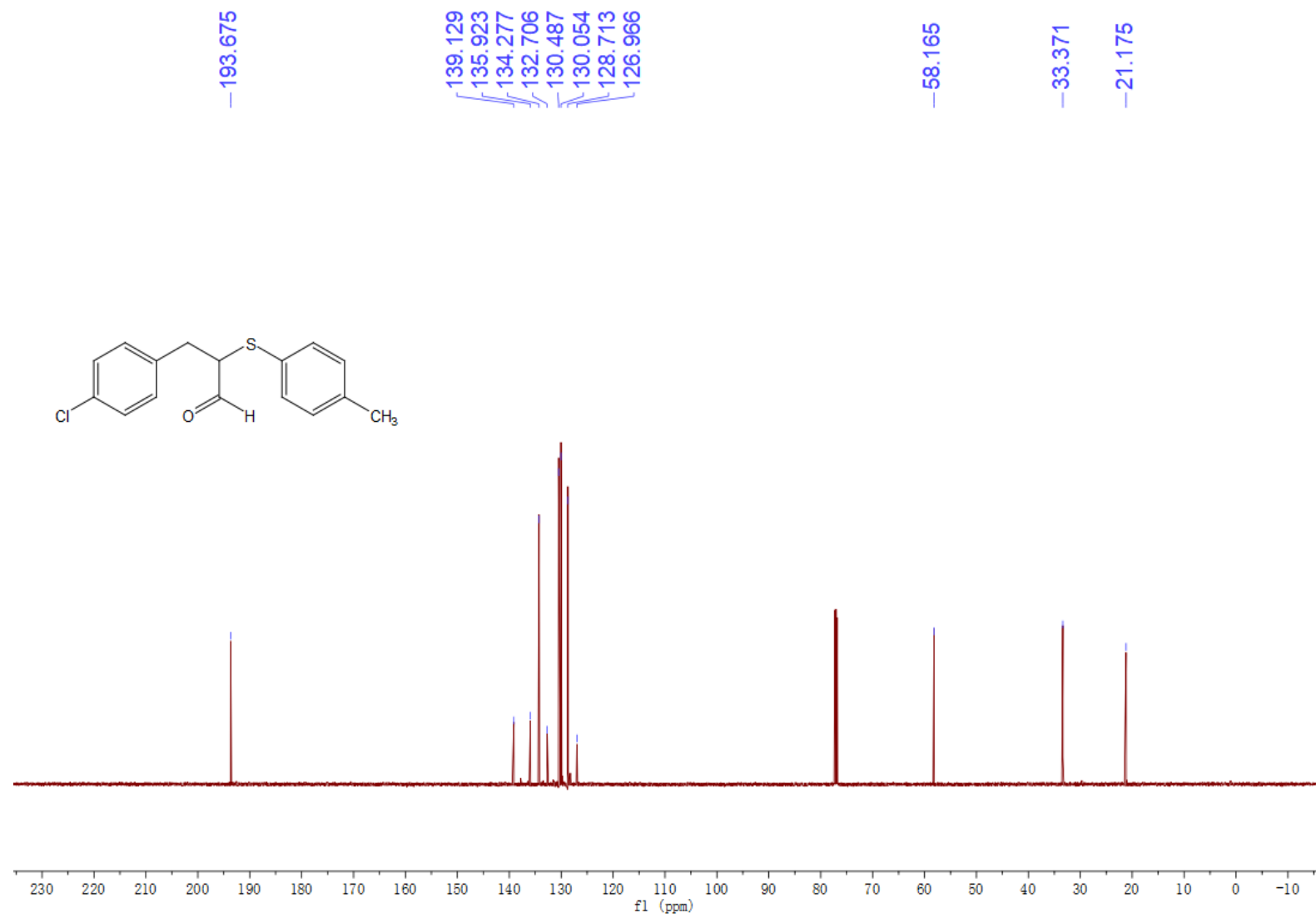


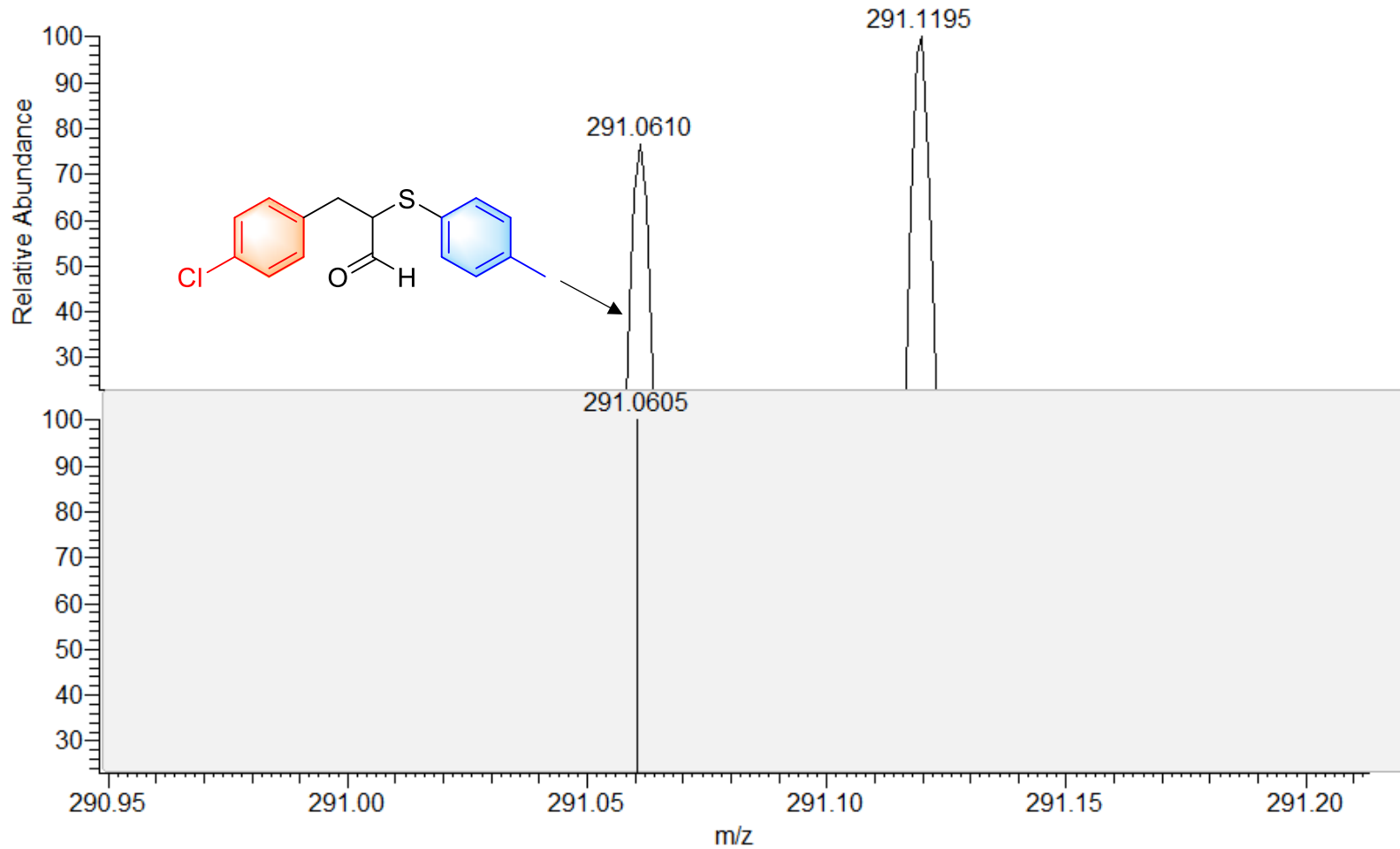
NL:
5.93E5
MOUDAN-M8#1
RT: 0.00 AV: 1 T:
FTMS + p ESI SIM
lock ms
[256.3000-
286.3000]

NL:
7.96E5
C₁₆ H₁₅ FOS +H:
C₁₆ H₁₆ F₁ O₁ S₁
pa Chrg 1

3-(4-chlorophenyl)-2-(*p*-tolylthio)propanal (3aj)



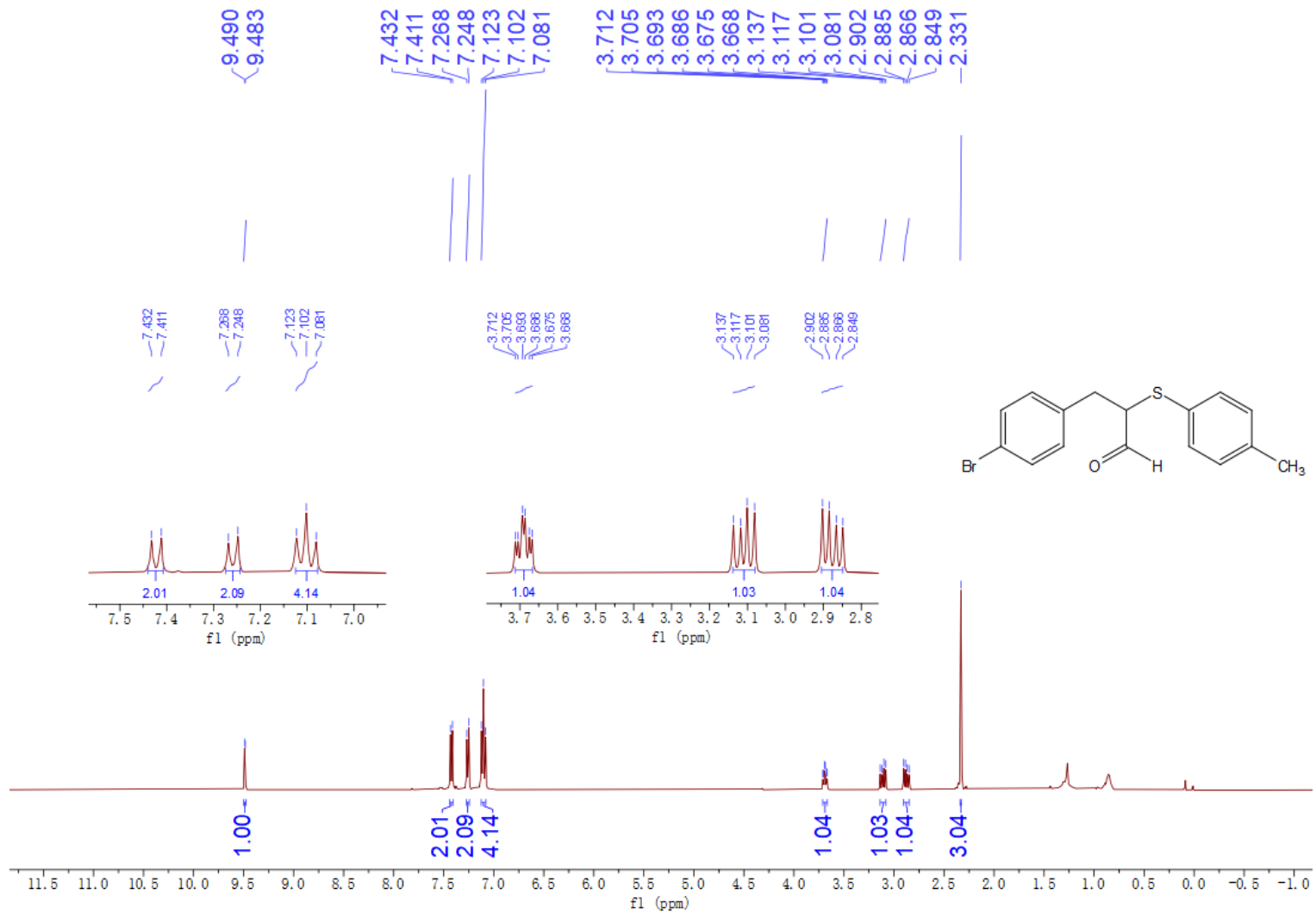


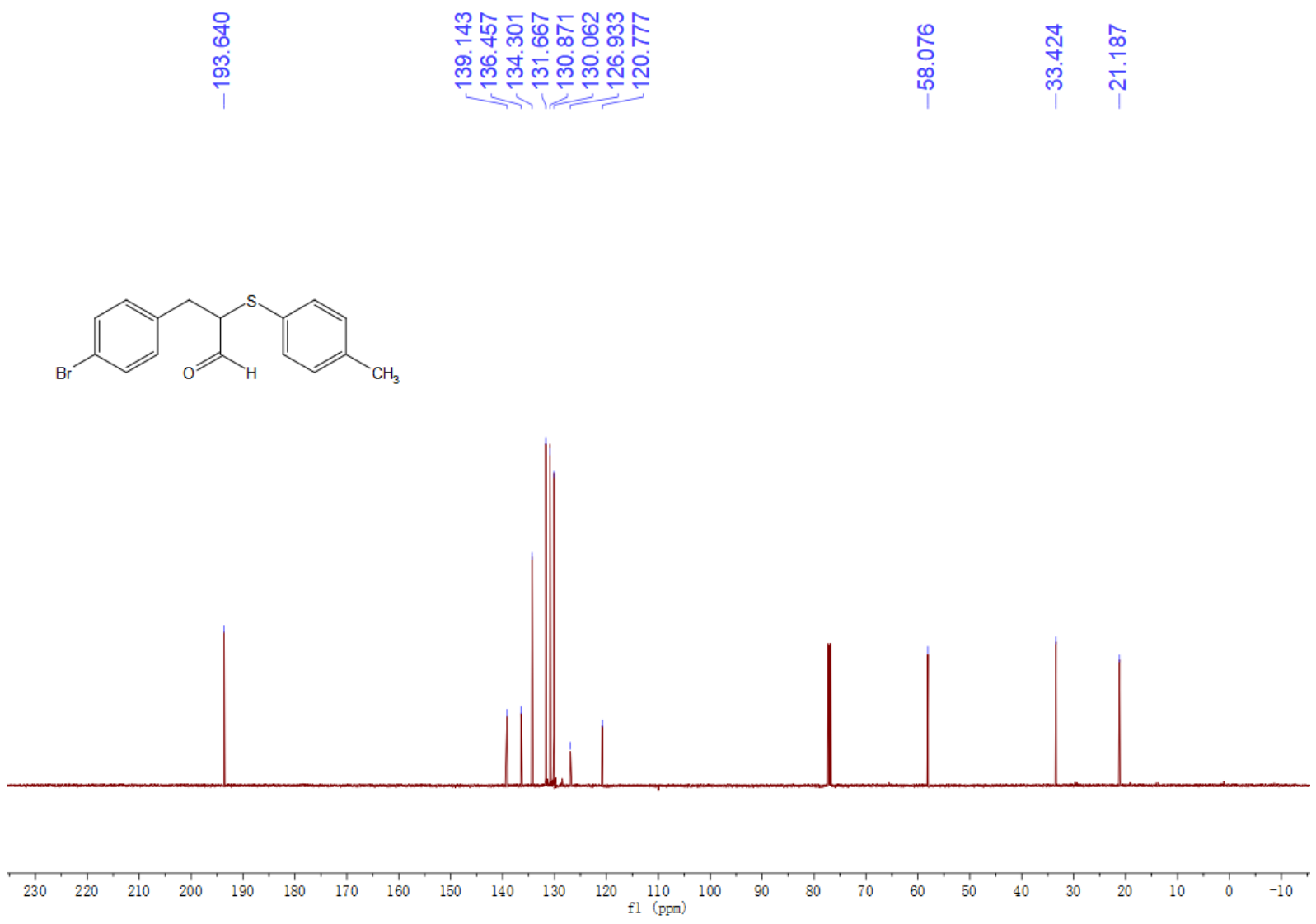


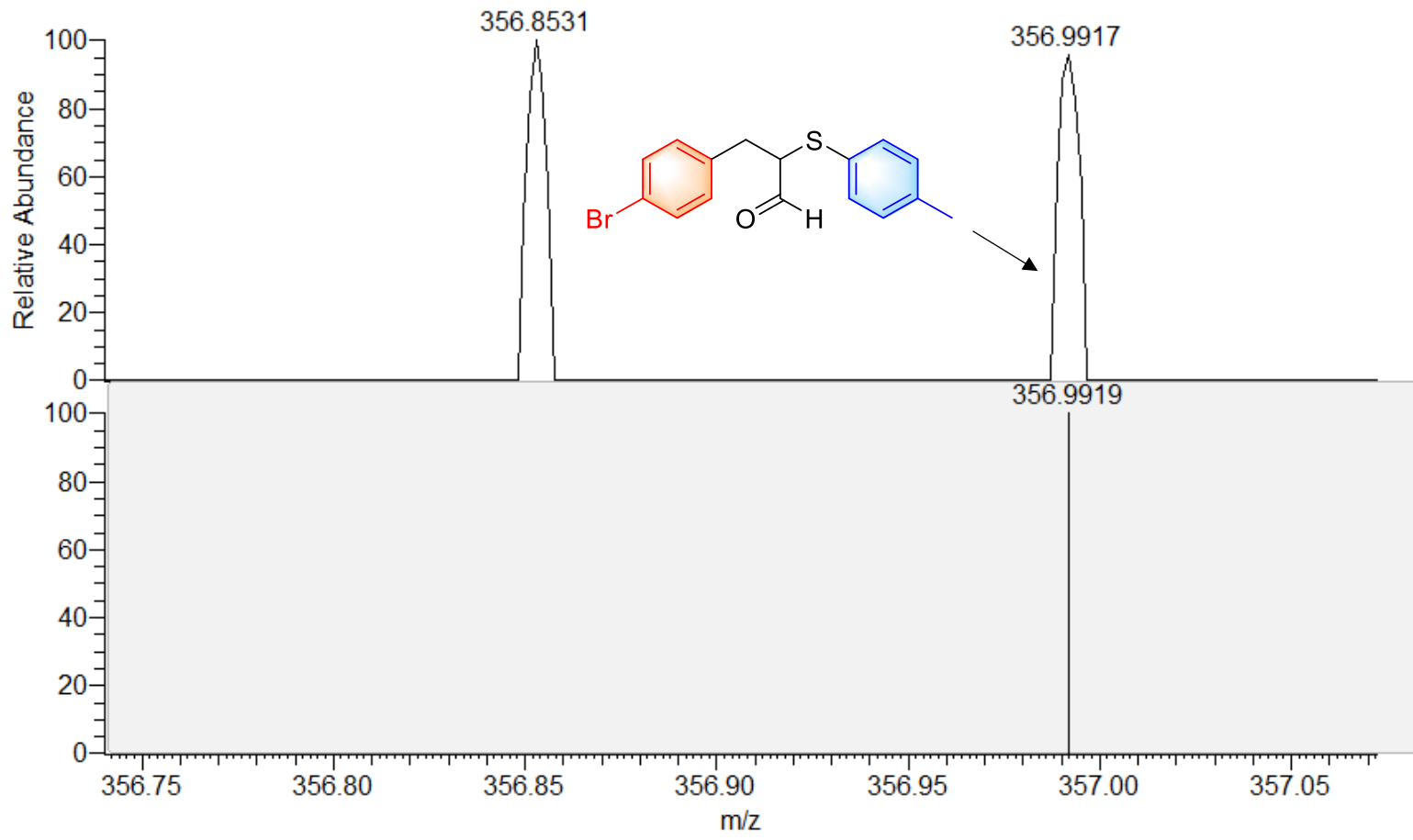
NL:
6.32E5
DZHY-MOUDAN-
M7#6 RT: 0.03 AV:
1 T: FTMS + p ESI
Full lock ms
[60.0000-750.0000]

NL:
6.03E5
C₁₆ H₁₅ ClOS +H:
C₁₆ H₁₆ Cl₁ O₁ S₁
pa Chrg 1

3-(4-bromophenyl)-2-(*p*-tolylthio)propanal (3ak)



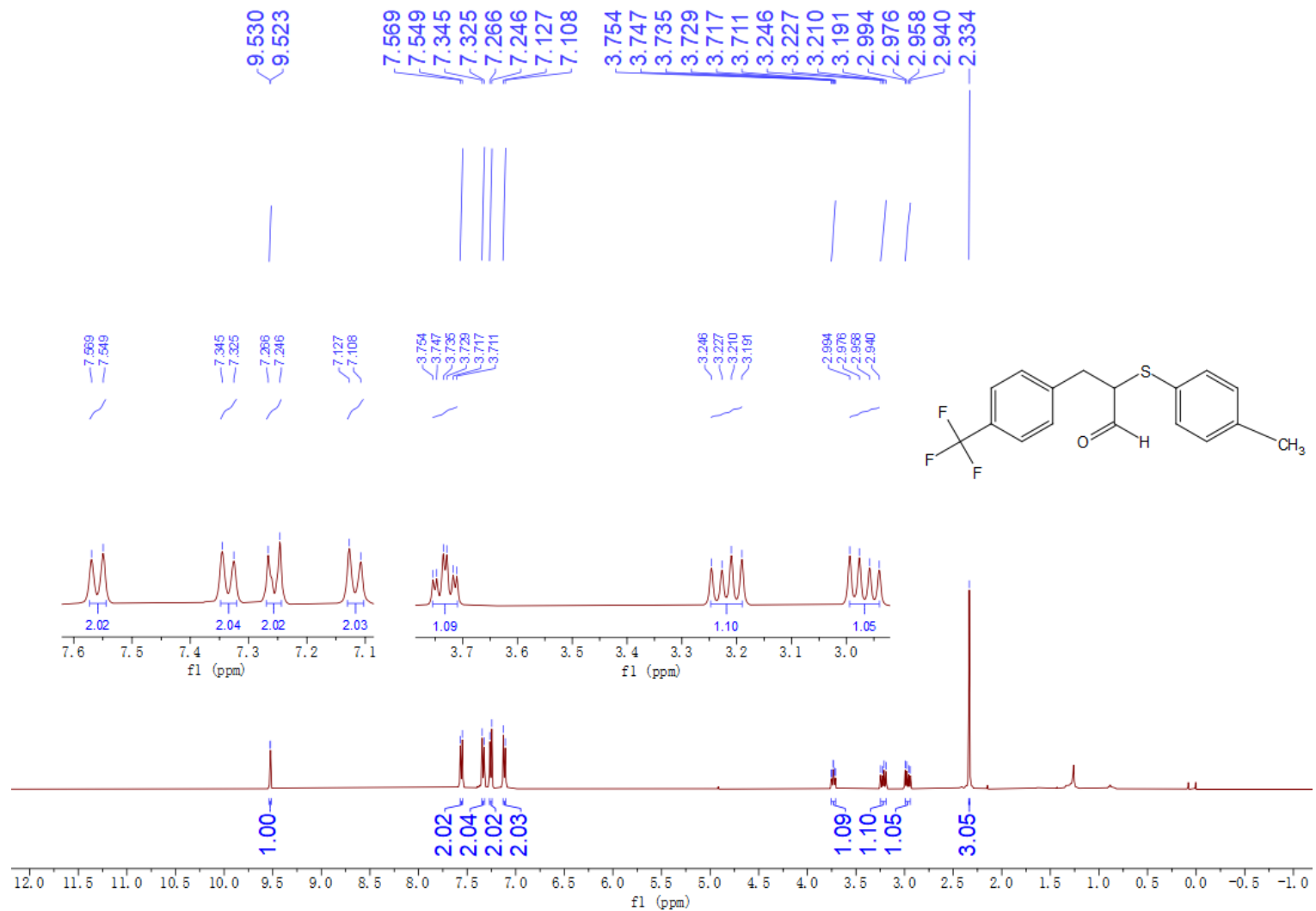


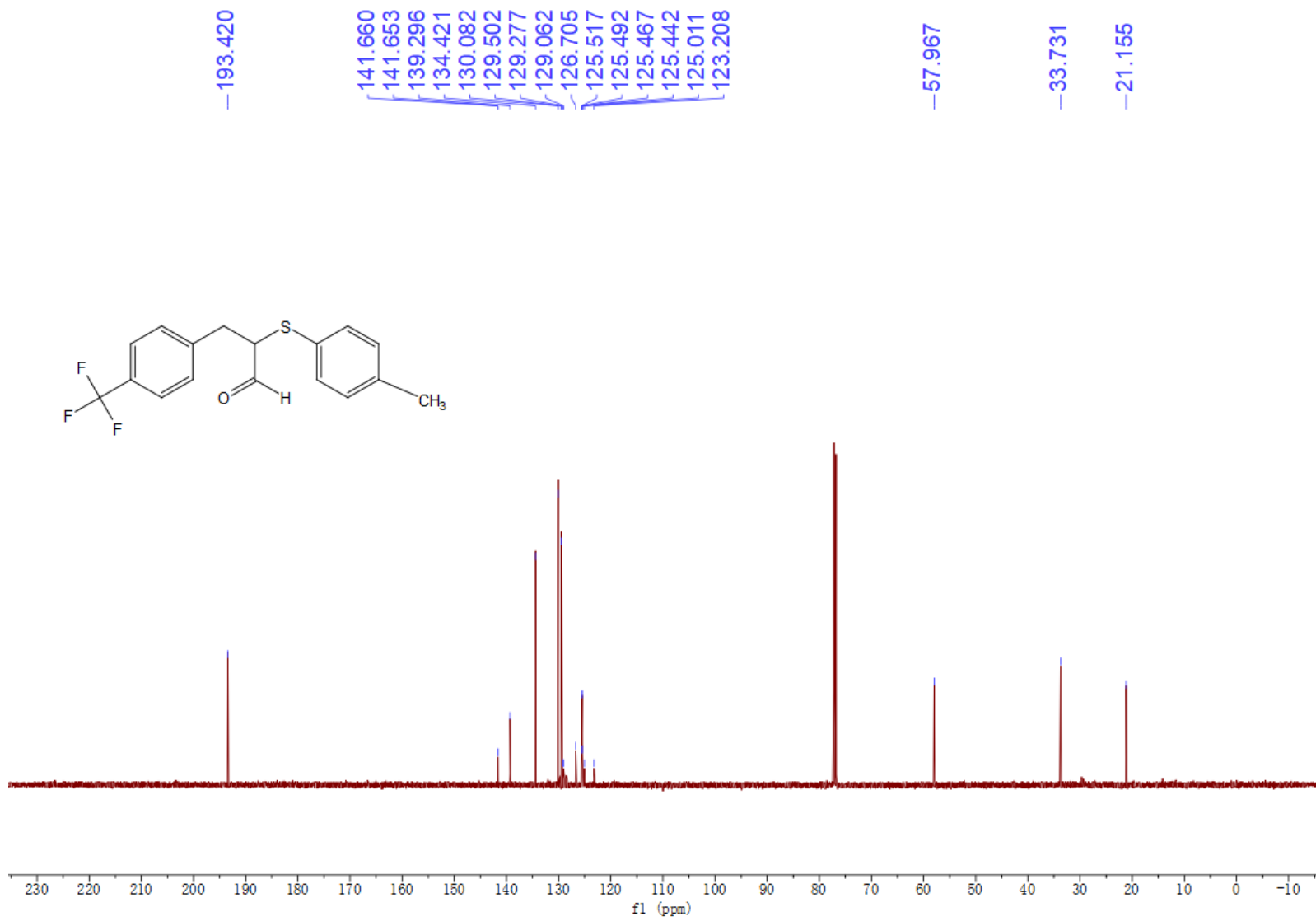


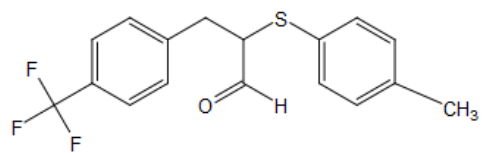
NL:
3.82E5
DZHY-MOUDAN-M7#29
RT: 0.13 AV: 1 T:
FTMS + p ESI Full lock
ms [60.0000-750.0000]

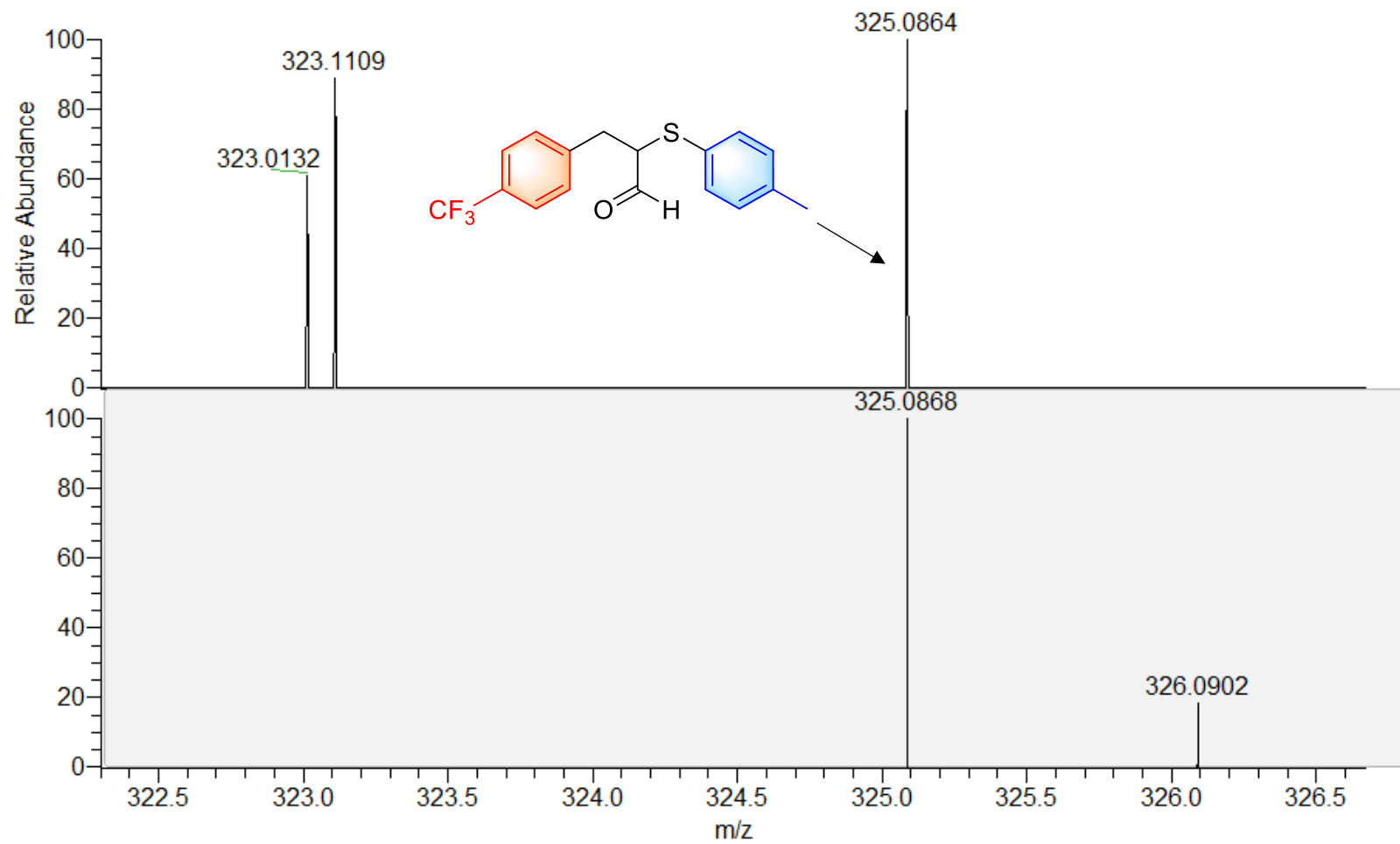
NL:
4.03E5
C₁₆ H₁₅ BrOS +Na:
C₁₆ H₁₅ Br₁ O₁ S₁ Na₁
pa Chrg 1

2-(*p*-tolylthio)-3-(4-(trifluoromethyl)phenyl)propanal (3a)





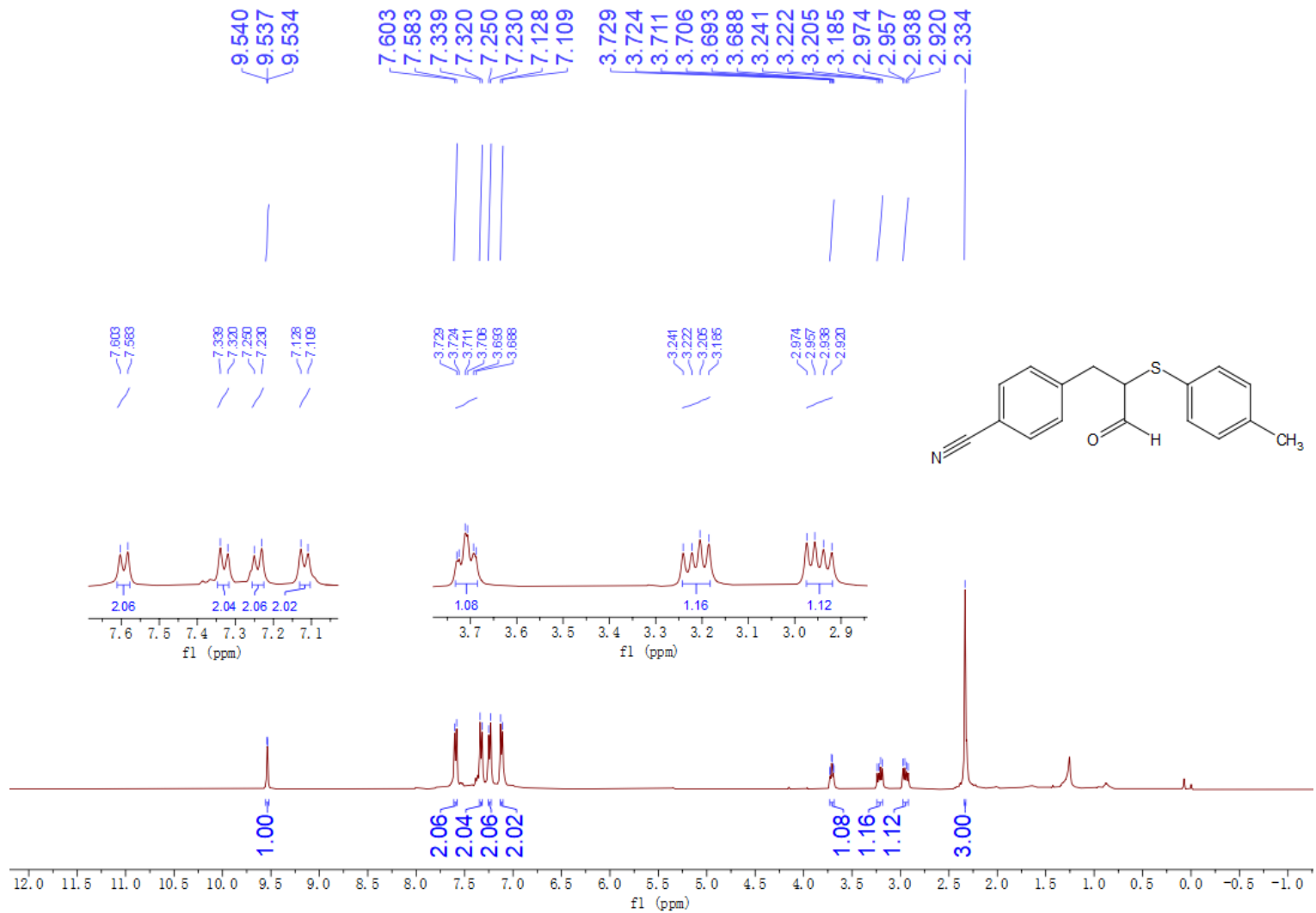


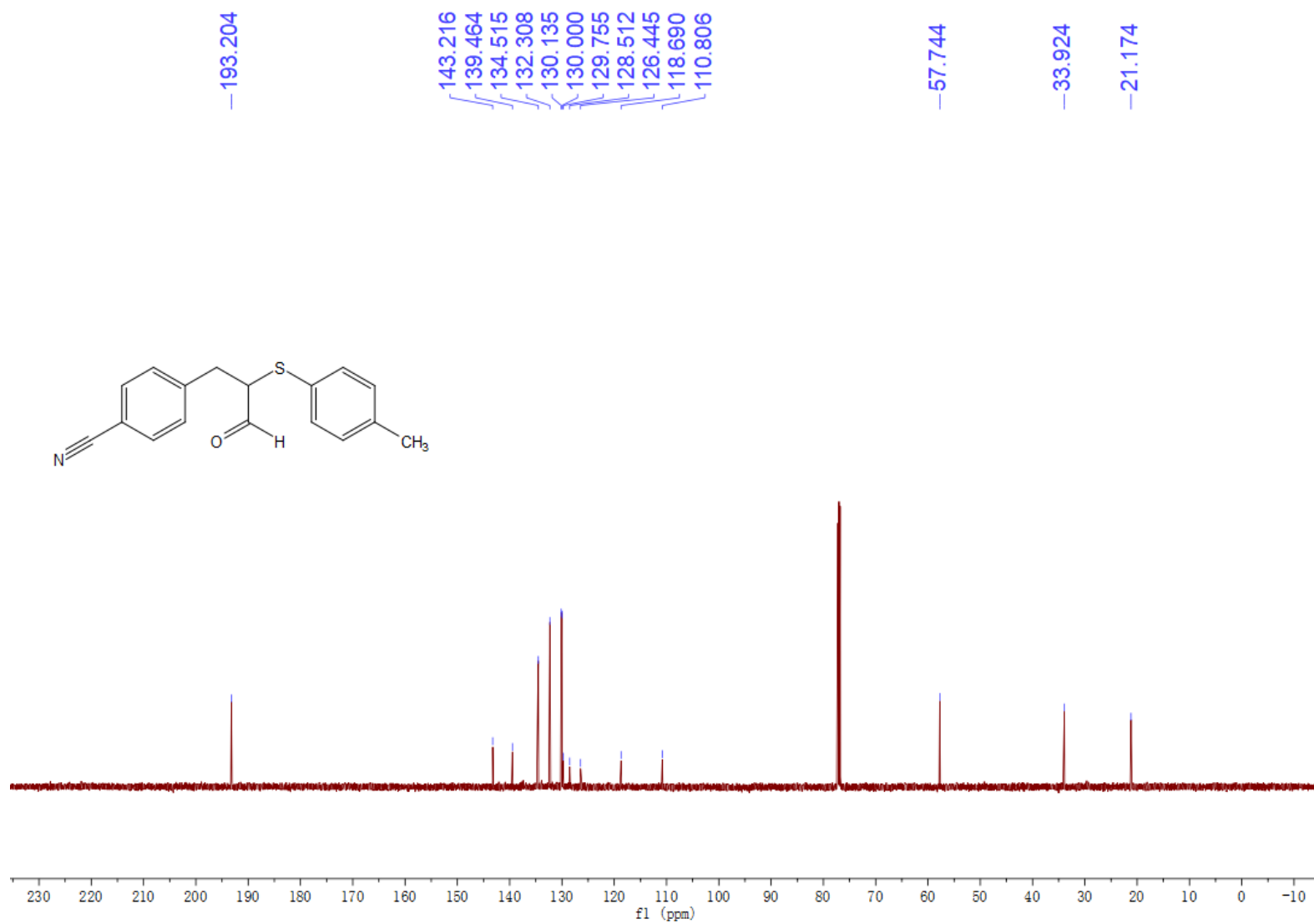


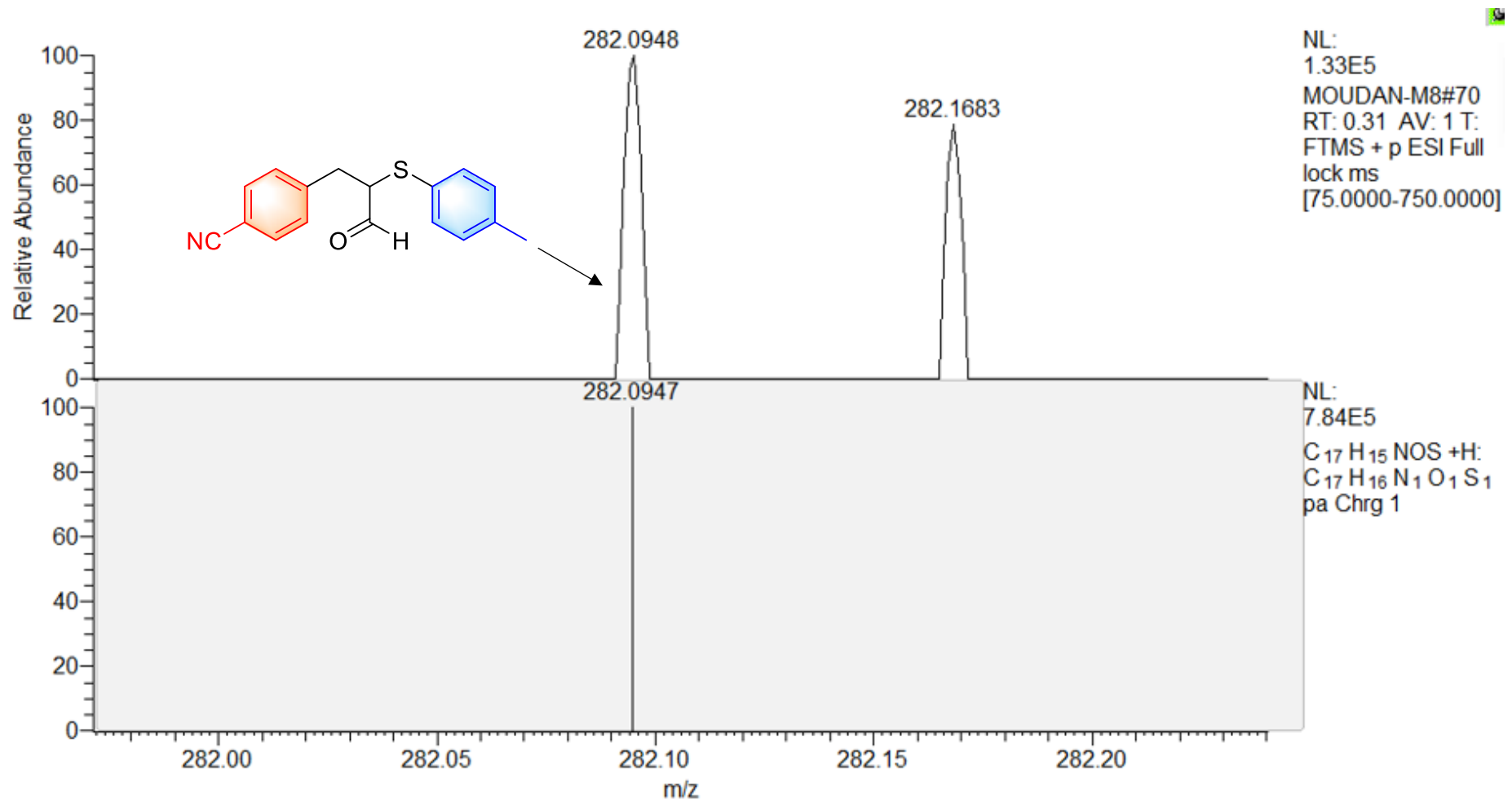
NL:
2.00E5
MOUDAN-M8#39
RT: 0.17 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

NL:
7.87E5
C₁₇ H₁₅ F₃ OS +H:
C₁₇ H₁₆ F₃ O₁ S₁
pa Chrg 1

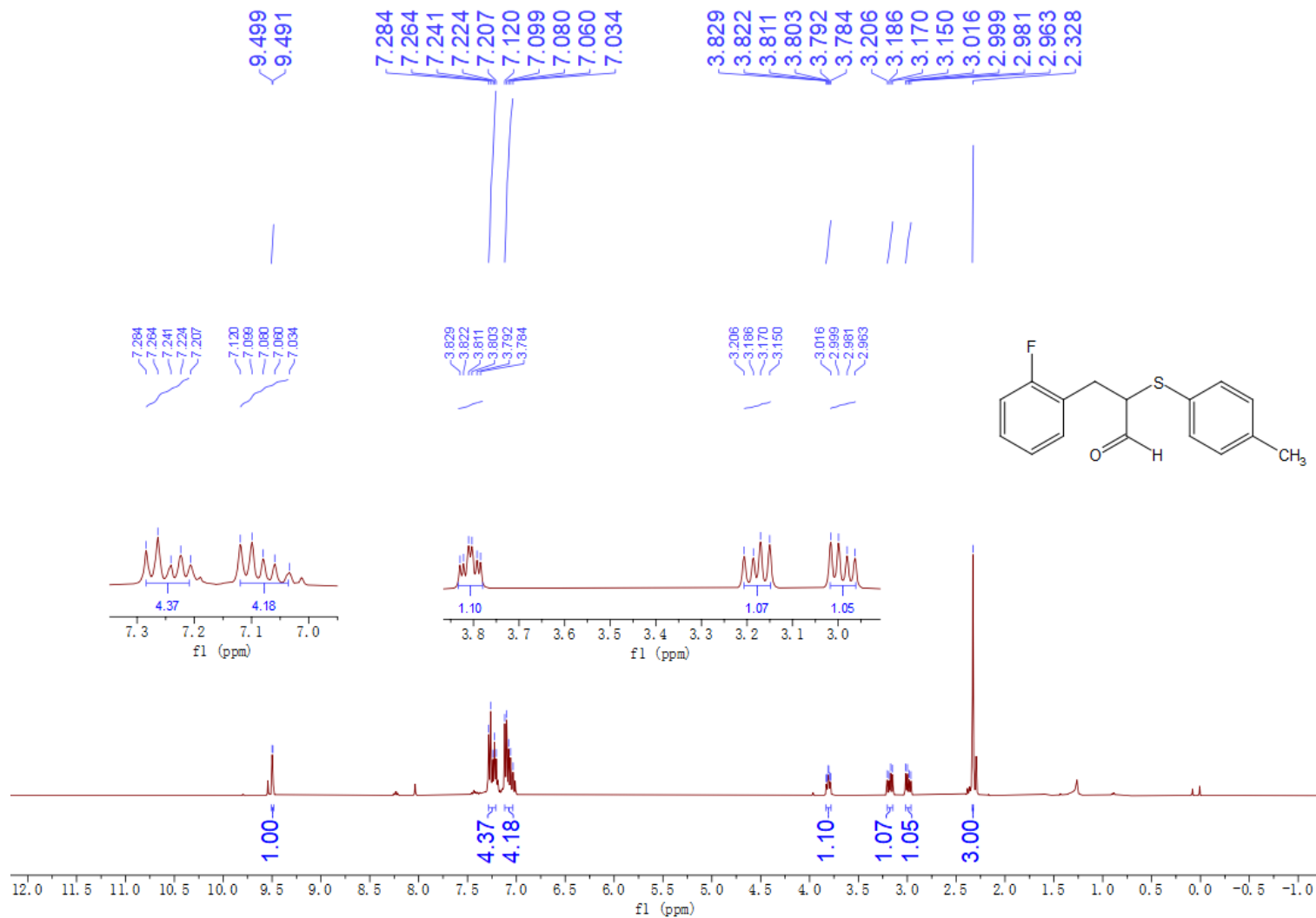
4-(3-oxo-2-(*p*-tolylthio)propyl)benzonitrile (3am)

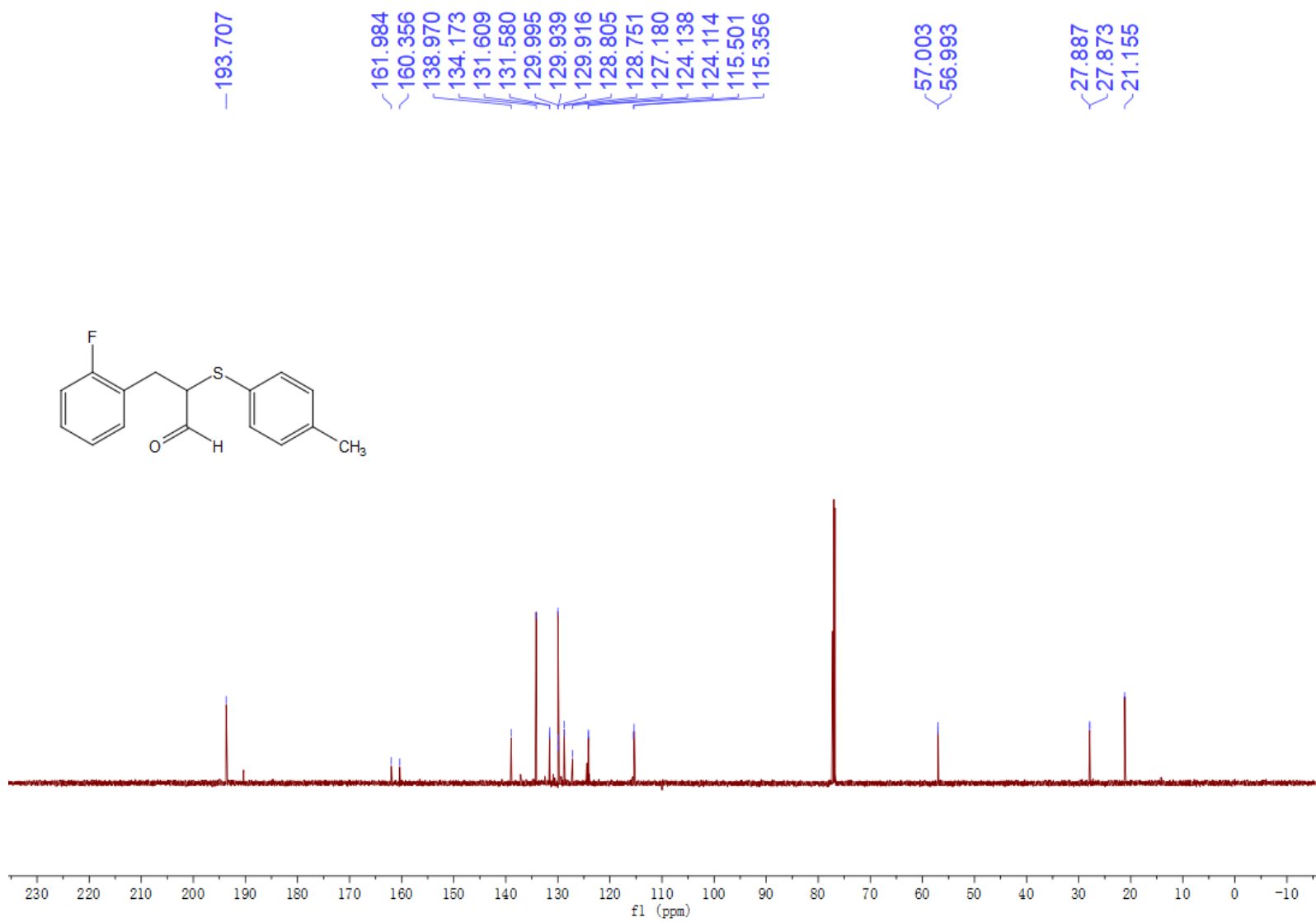


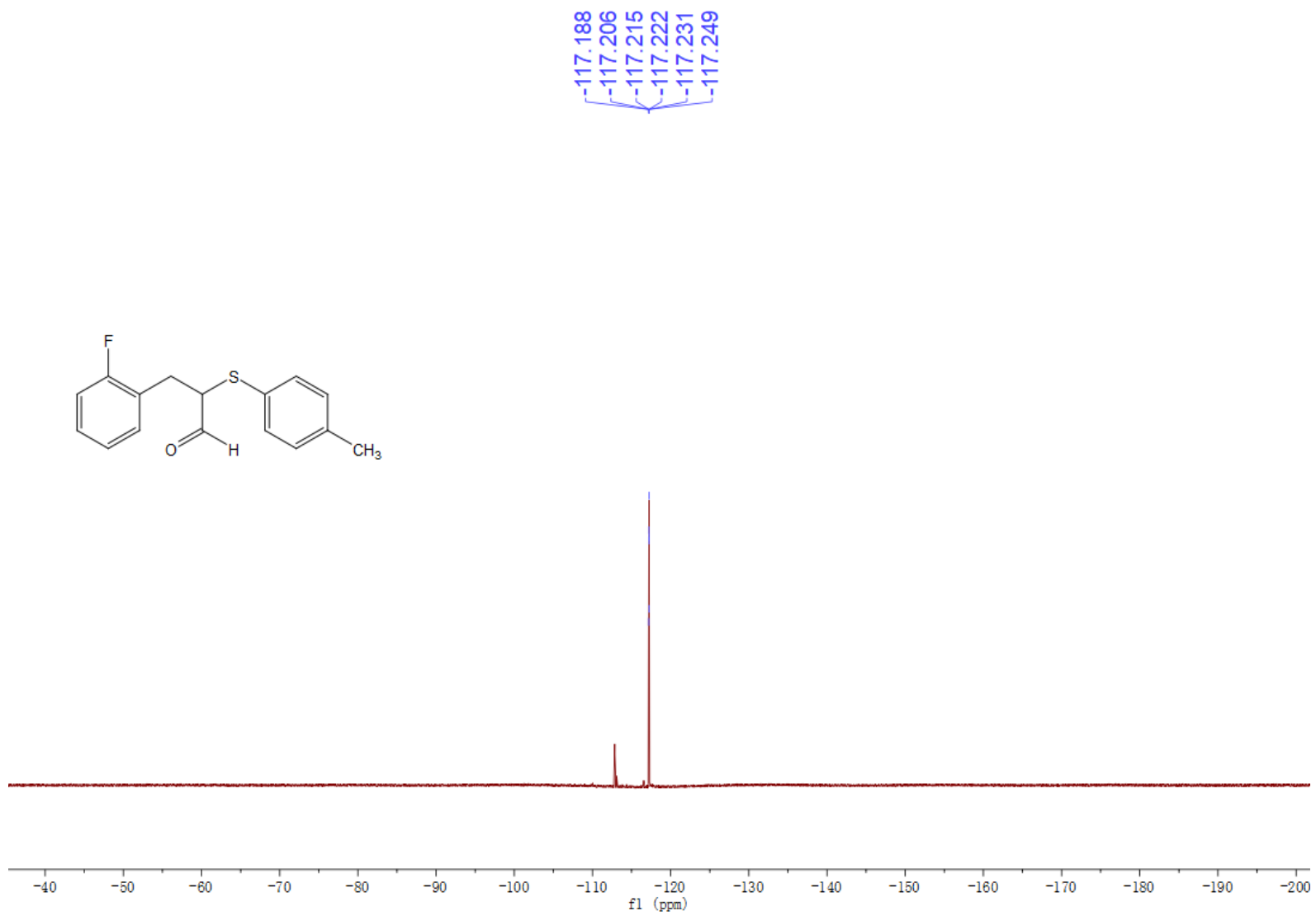


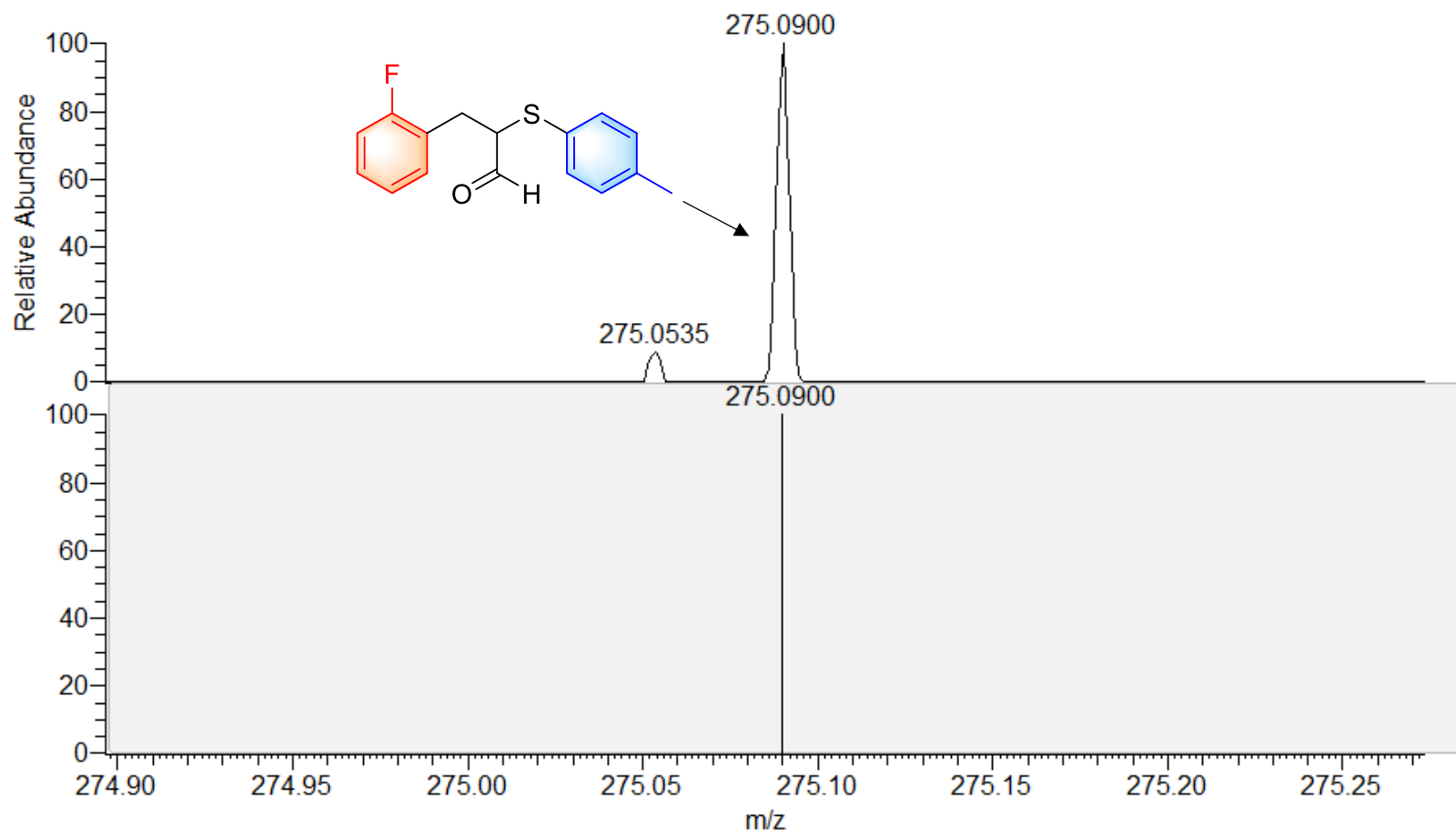


3-(2-fluorophenyl)-2-(*p*-tolylthio)propanal (3an)





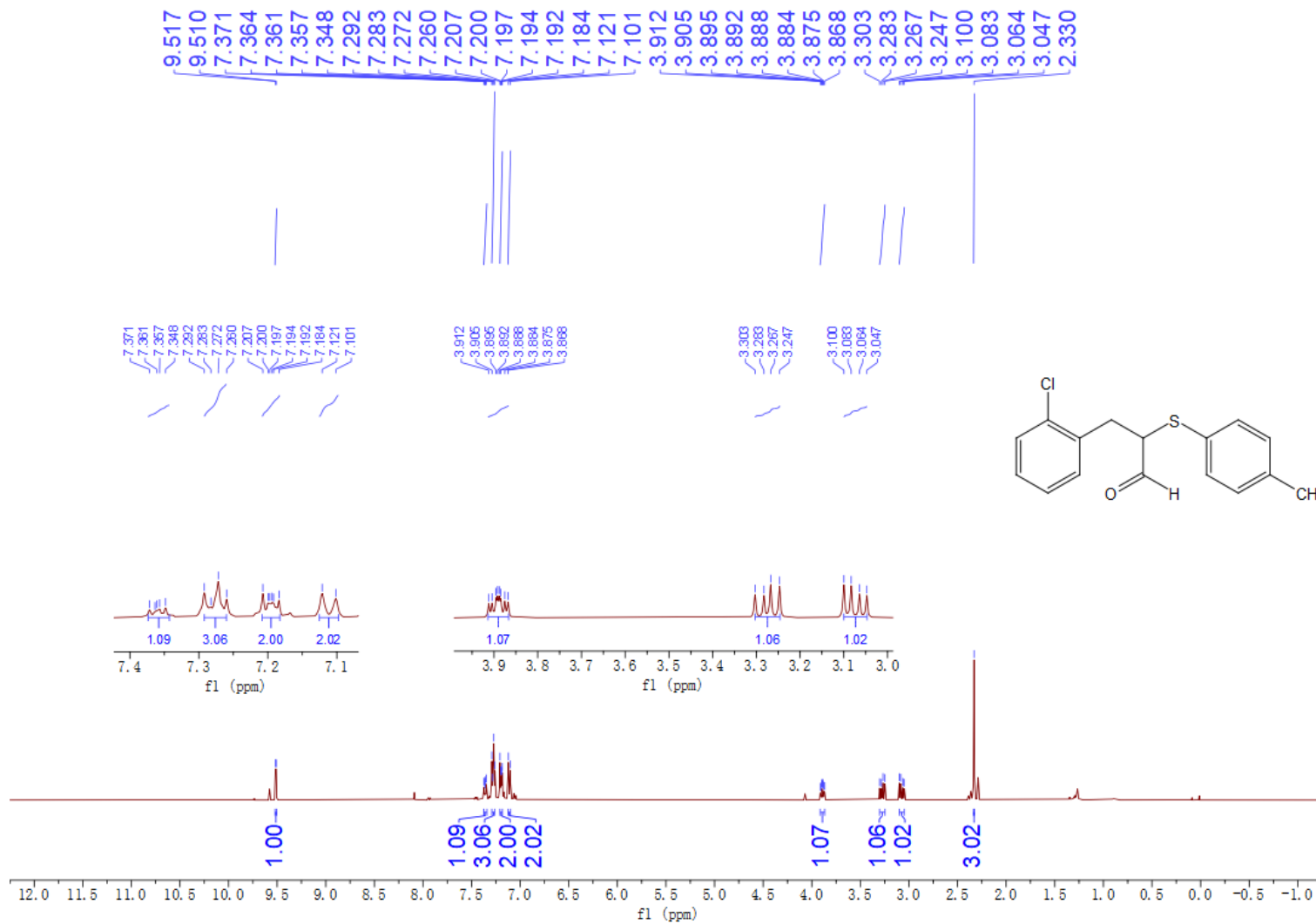


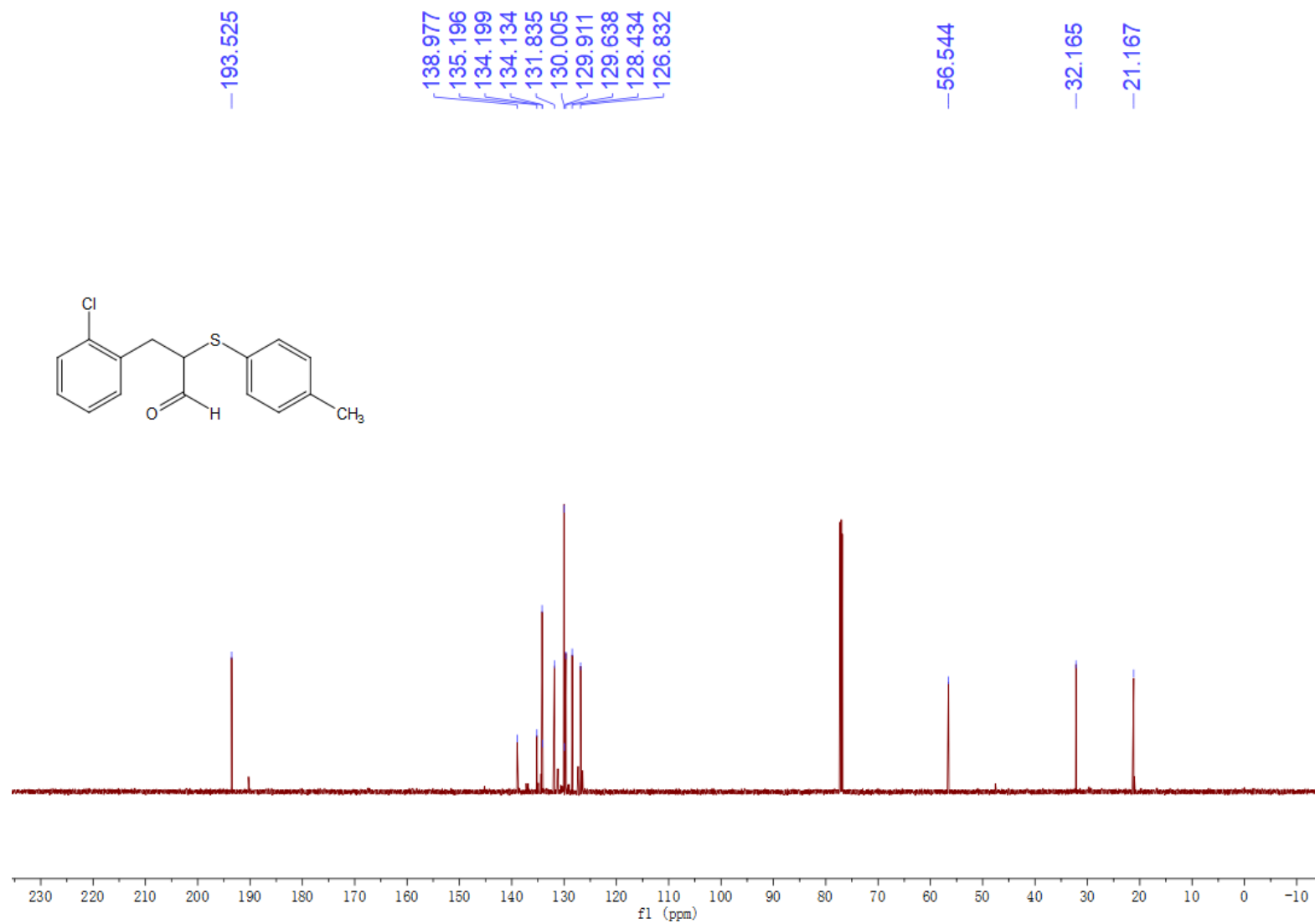


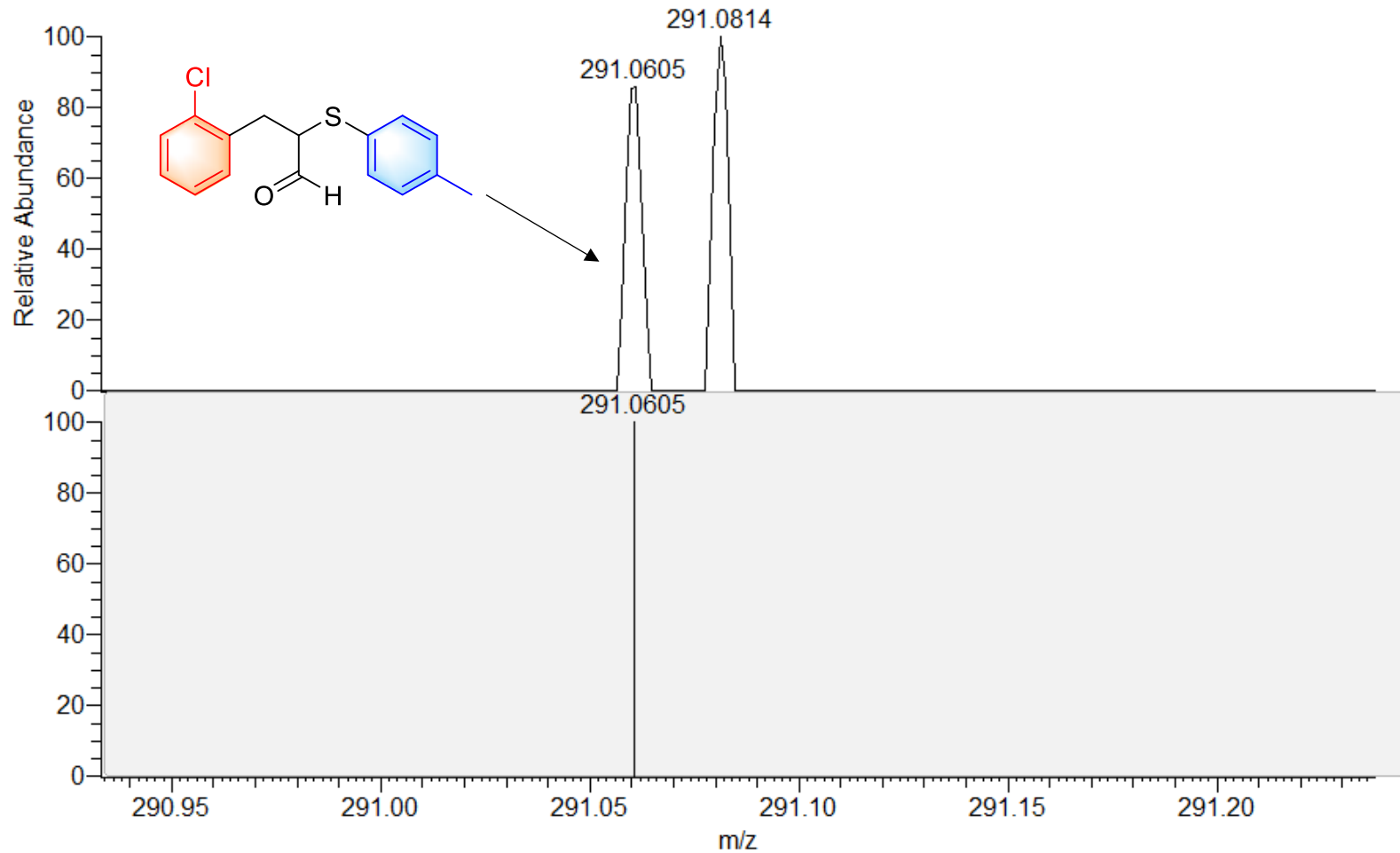
NL:
1.64E6
MOUDAN-M8#36
RT: 0.16 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

NL:
7.96E5
C₁₆ H₁₅ FOS +H:
C₁₆ H₁₆ F₁ O₁ S₁
pa Chrg 1

3-(2-chlorophenyl)-2-(*p*-tolylthio)propanal (3ao)



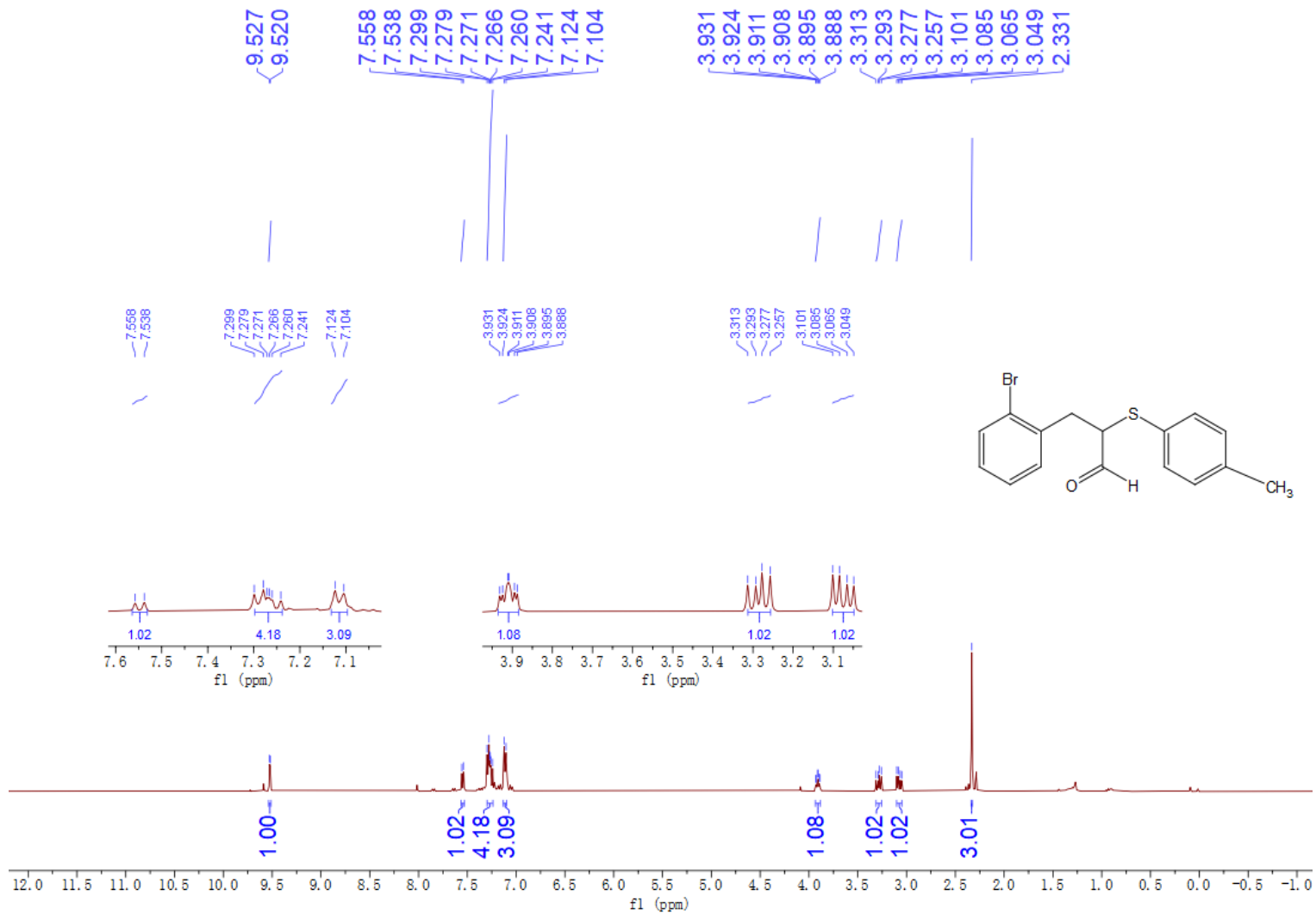


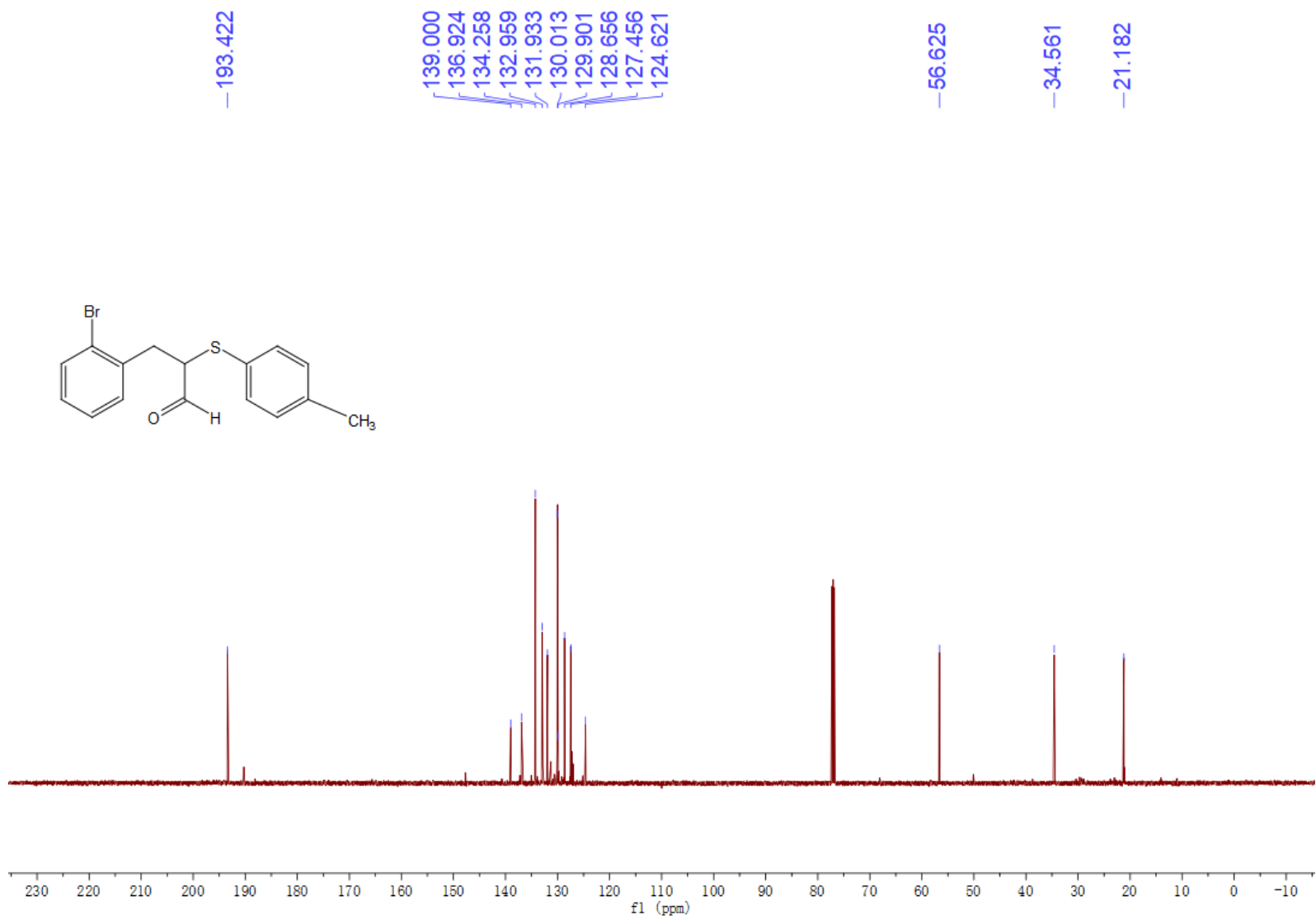


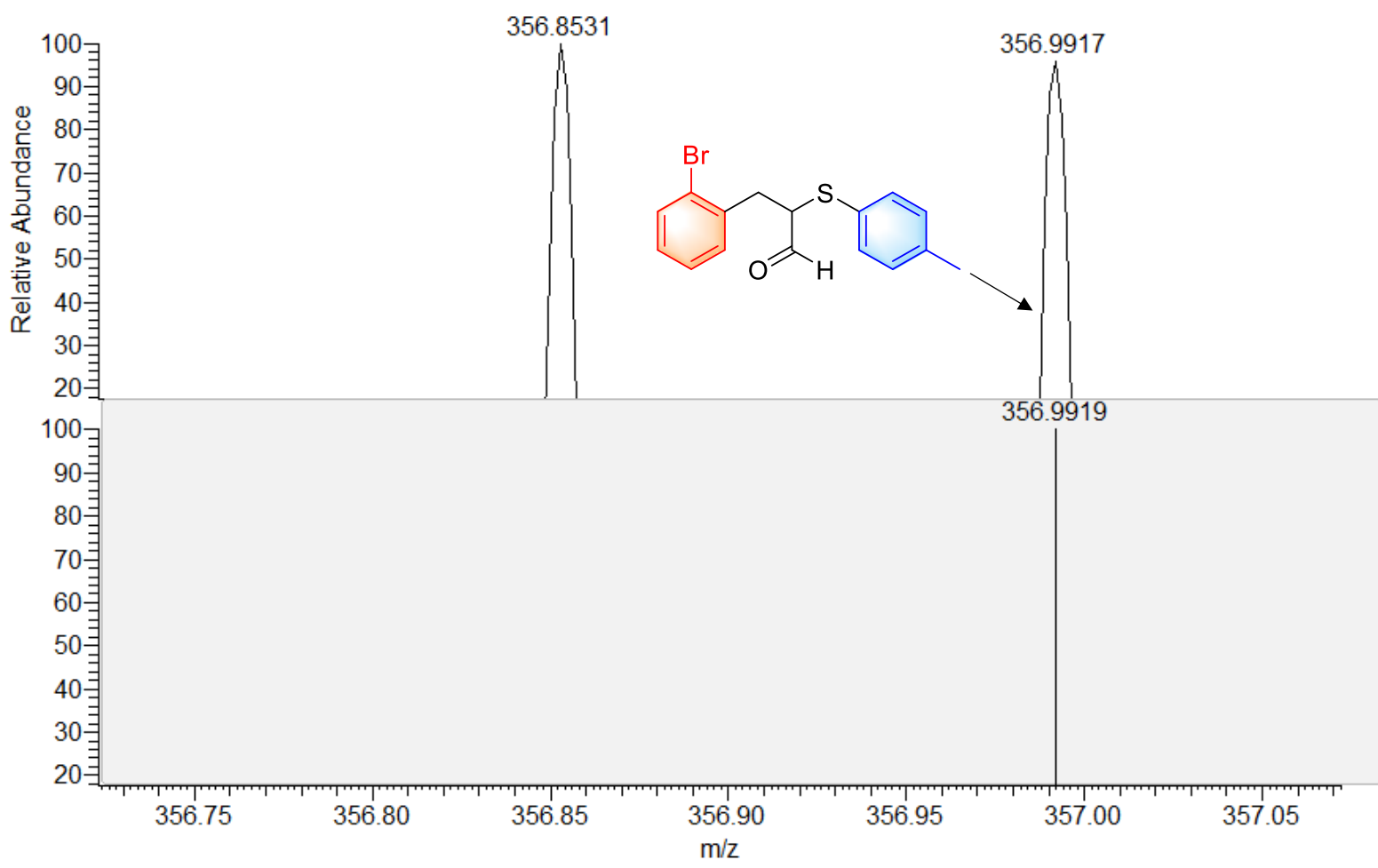
NL:
5.26E5
DZHY-MOUDAN-
M7#28 RT: 0.12 AV:
1 T: FTMS + p ESI
Full lock ms
[60.0000-750.0000]

NL:
6.03E5
C₁₆ H₁₅ ClOS +H:
C₁₆ H₁₆ Cl₁ O₁ S₁
pa Chrg 1

3-(2-bromophenyl)-2-(*p*-tolylthio)propanal (3ap)



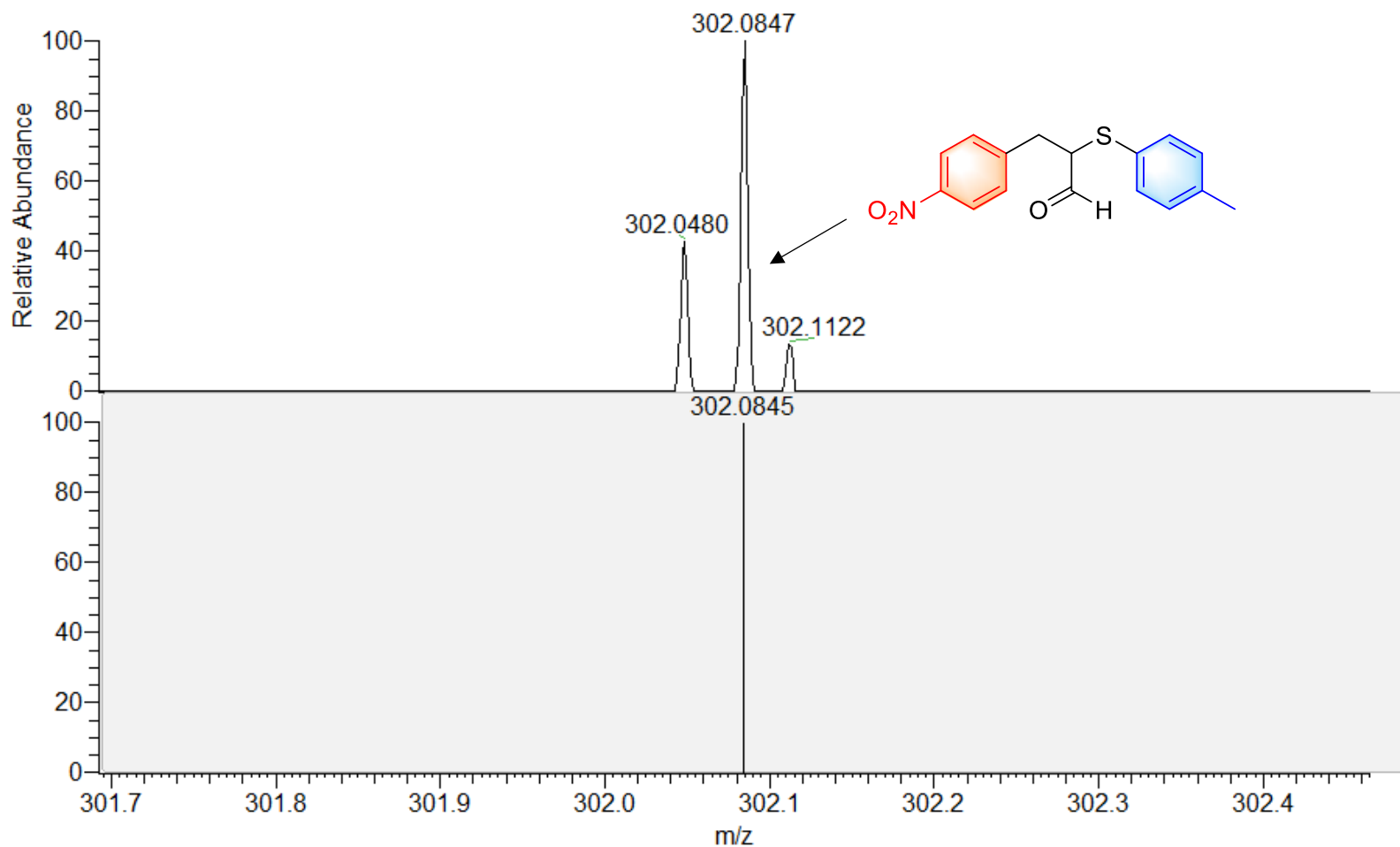




NL:
3.82E5
DZHY-MOUDAN-M7#29
RT: 0.13 AV: 1 T:
FTMS + p ESI Full lock
ms [60.0000-750.0000]

NL:
4.03E5
C₁₆ H₁₅ BrOS +Na:
C₁₆ H₁₅ Br₁ O₁ S₁ Na₁
pa Chrg 1

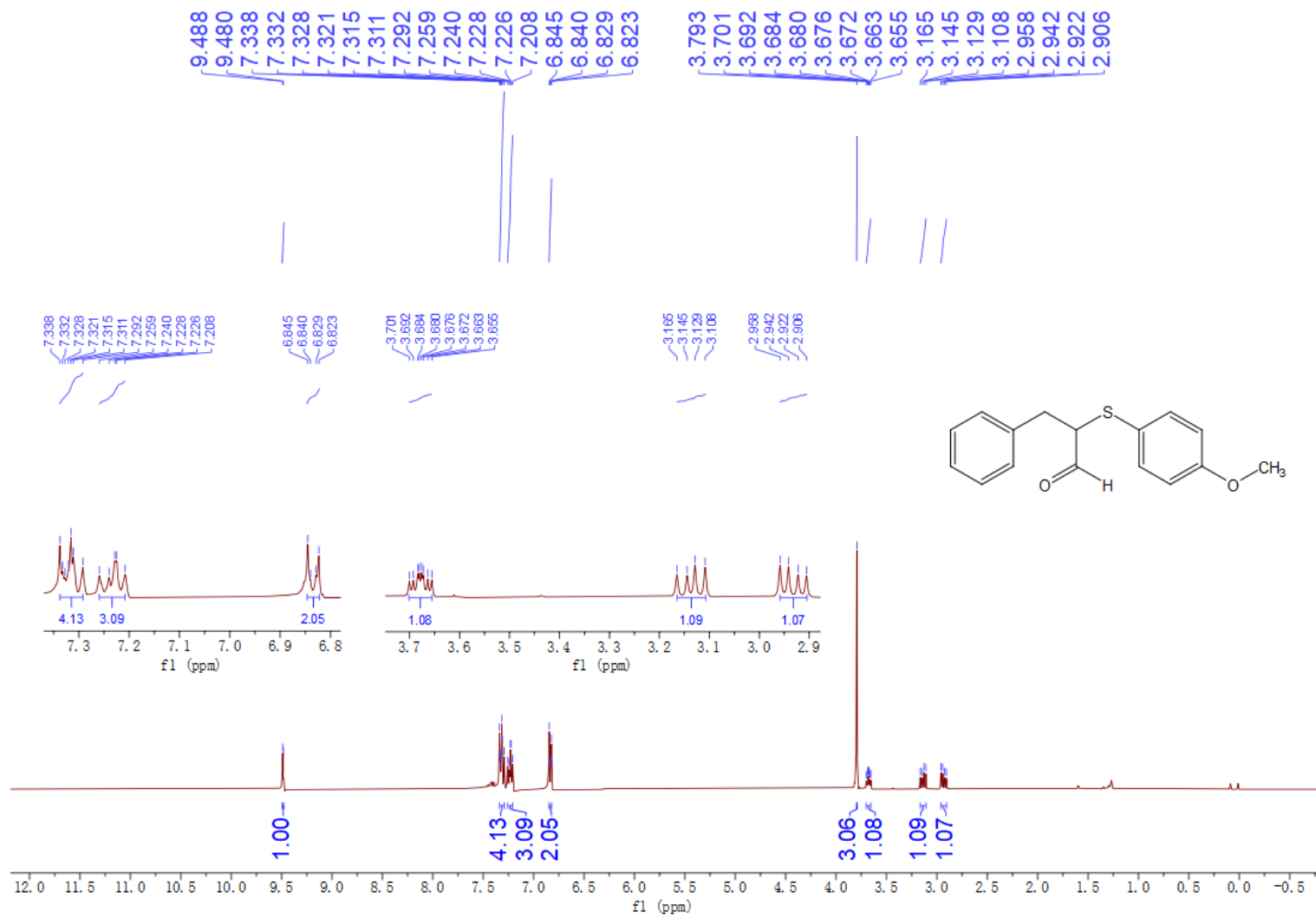
3-(4-nitrophenyl)-2-(*p*-tolylthio)propanal (3aq)

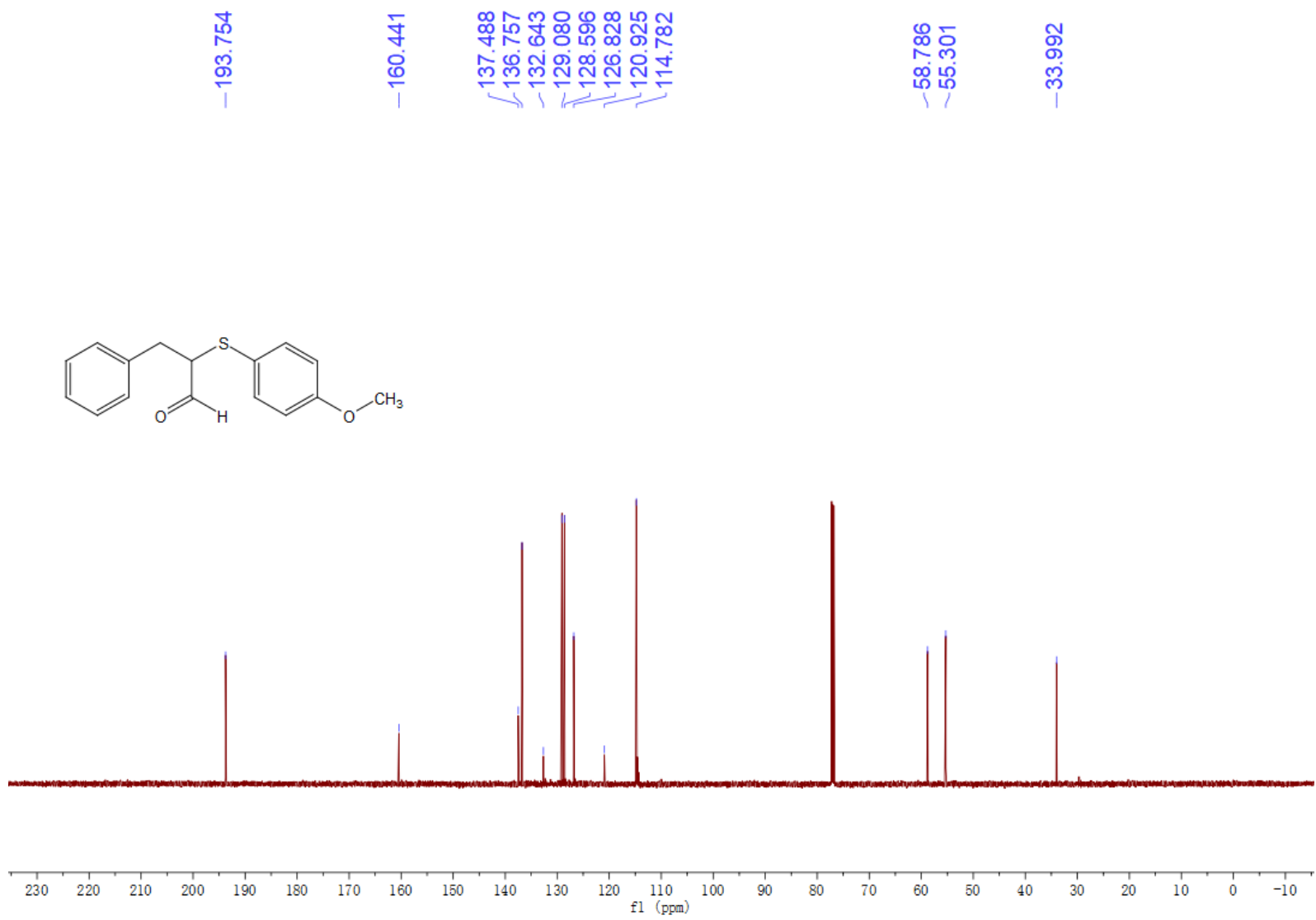


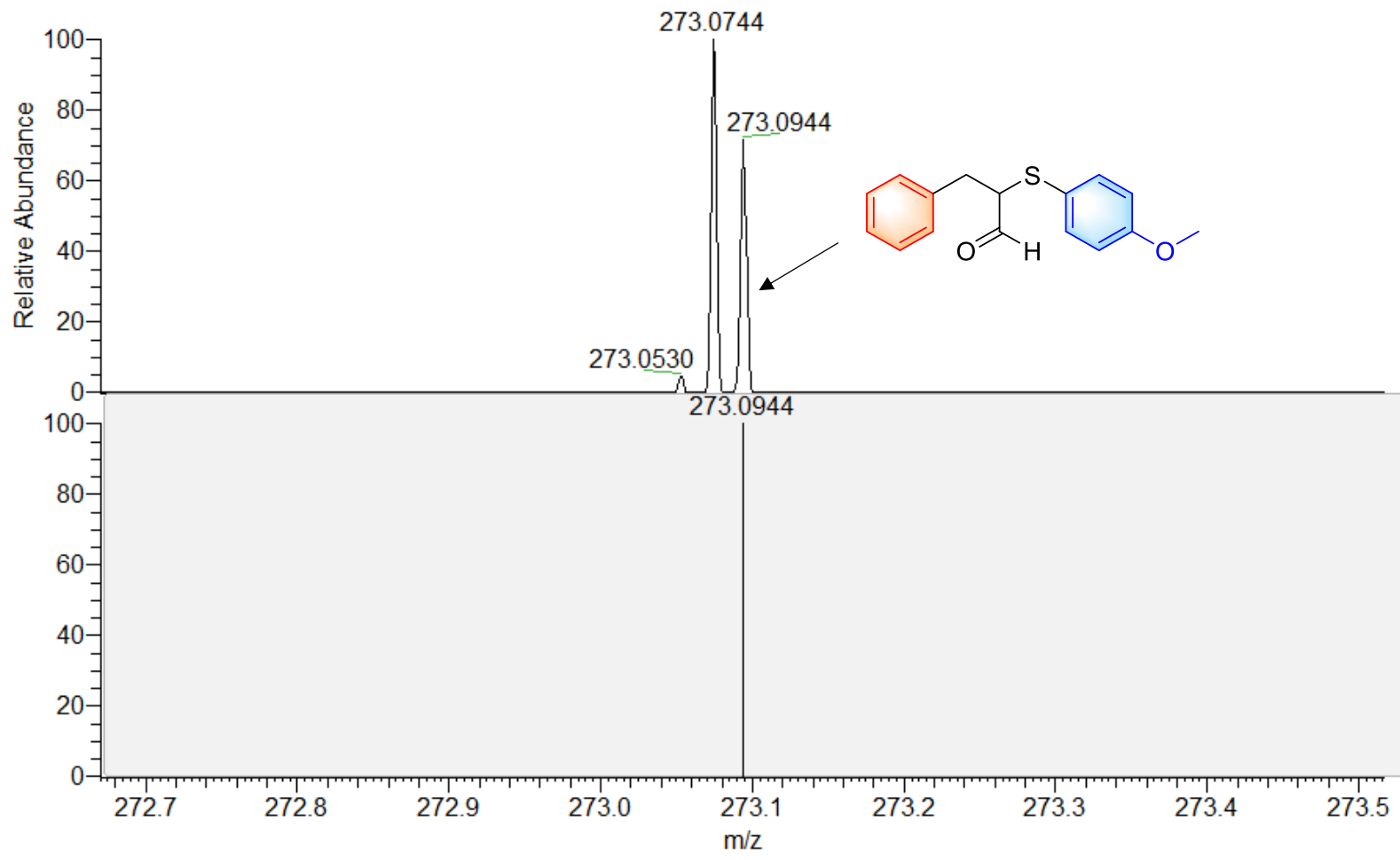
NL:
3.32E5
MOUDAN-M9#1
RT: 0.00 AV: 1 T:
FTMS + p ESI Full
lock ms
[100.0000-
750.0000]

NL:
7.89E5
C₁₆ H₁₅ NO₃ S +H:
C₁₆ H₁₆ N₁ O₃ S₁
pa Chrg 1

2-((4-methoxyphenyl)thio)-3-phenylpropanal (3ba)



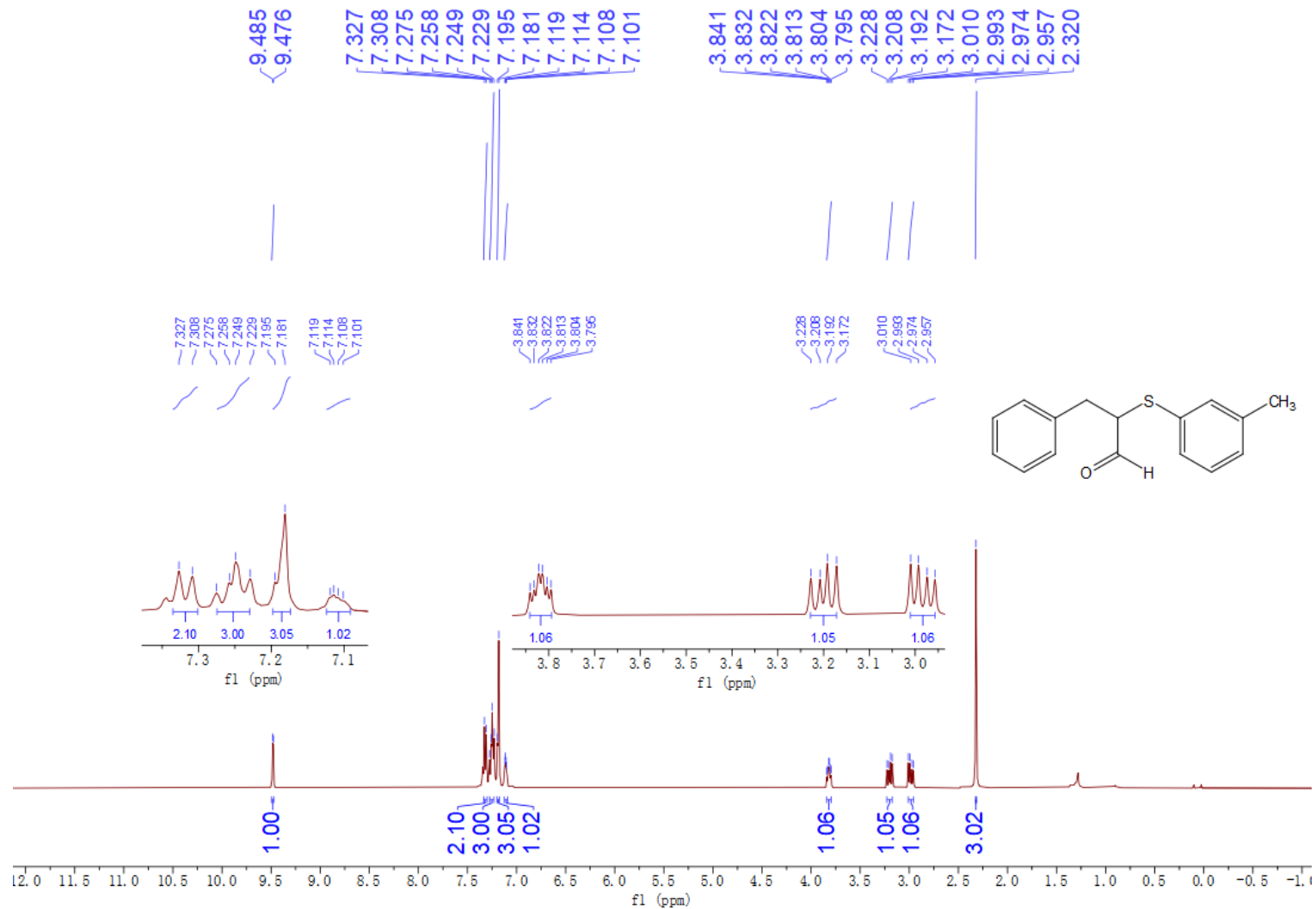


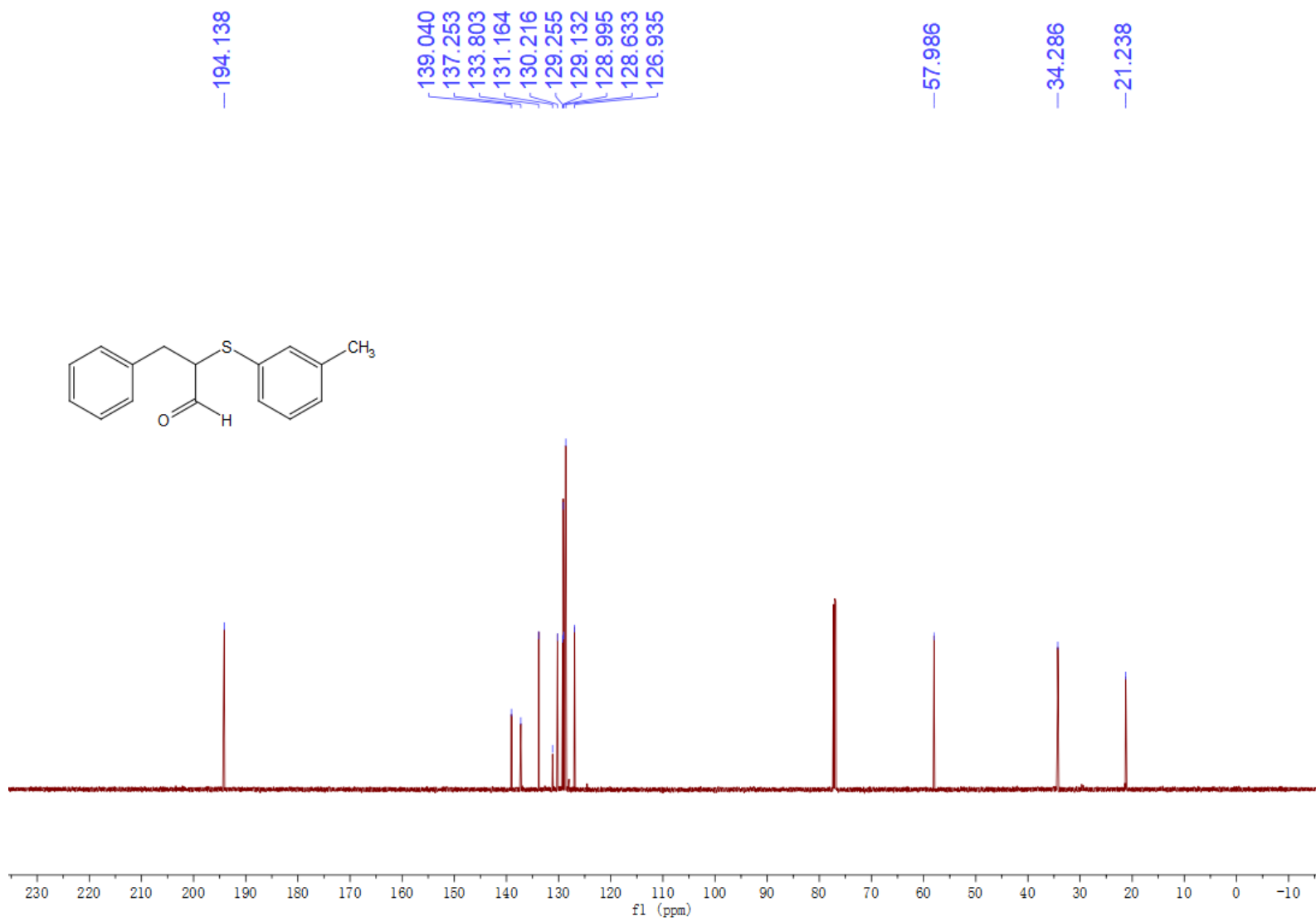


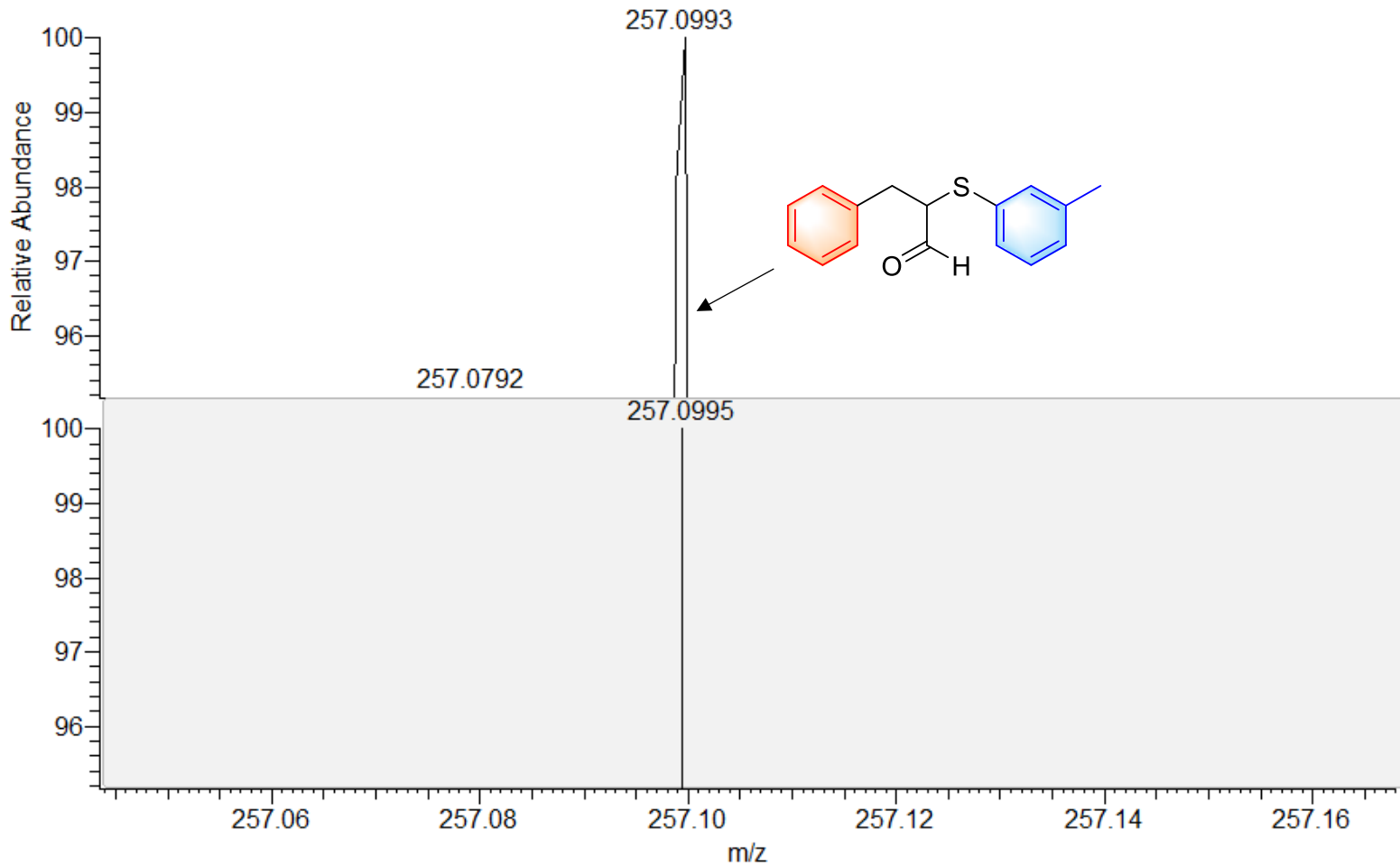
NL:
2.30E6
MOUDAN-M8#53
RT: 0.24 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

NL:
7.94E5
C₁₆ H₁₆ O₂ S +H:
C₁₆ H₁₇ O₂ S₁
pa Chrg 1

3-phenyl-2-(*m*-tolylthio)propanal (3bb)



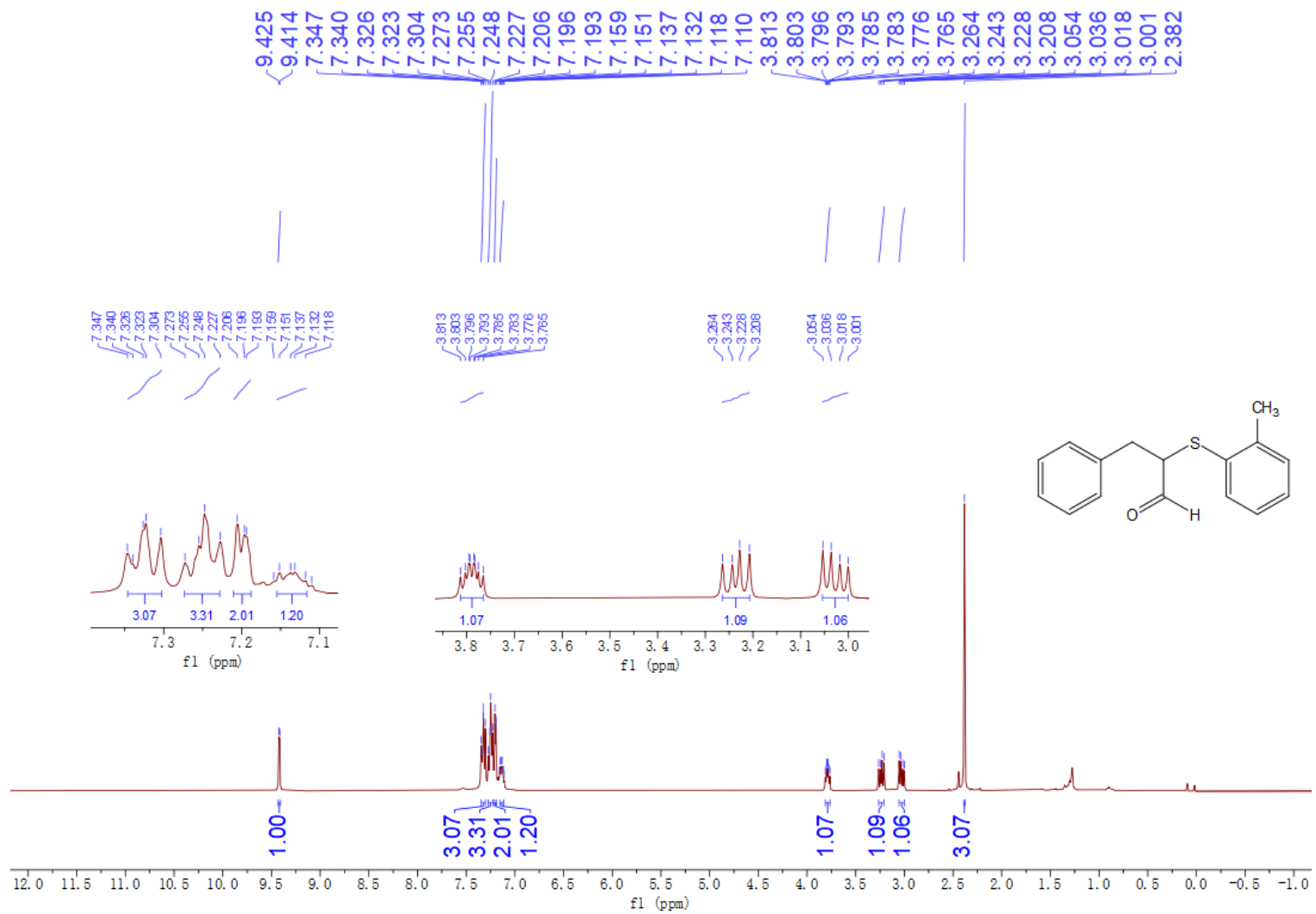


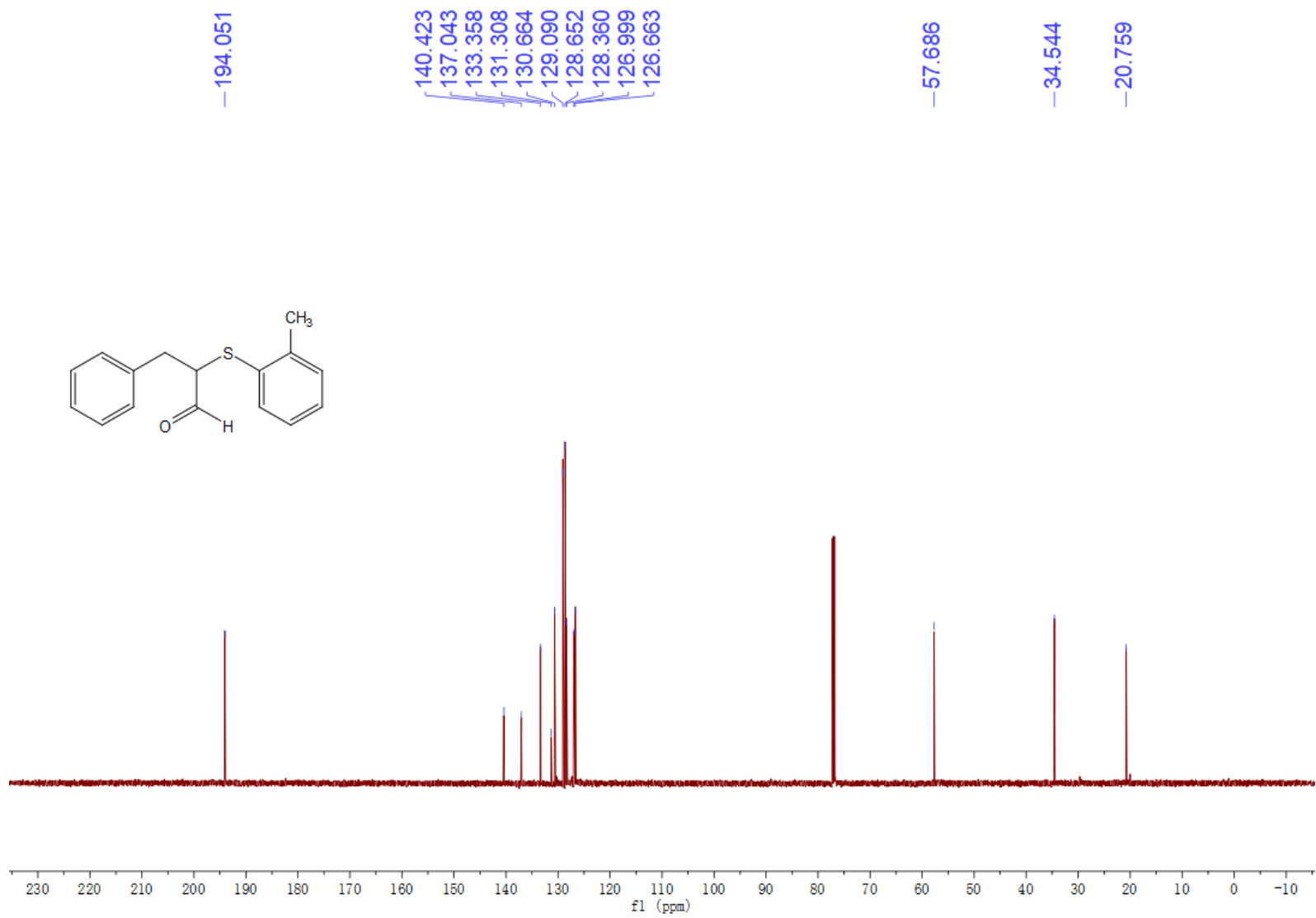


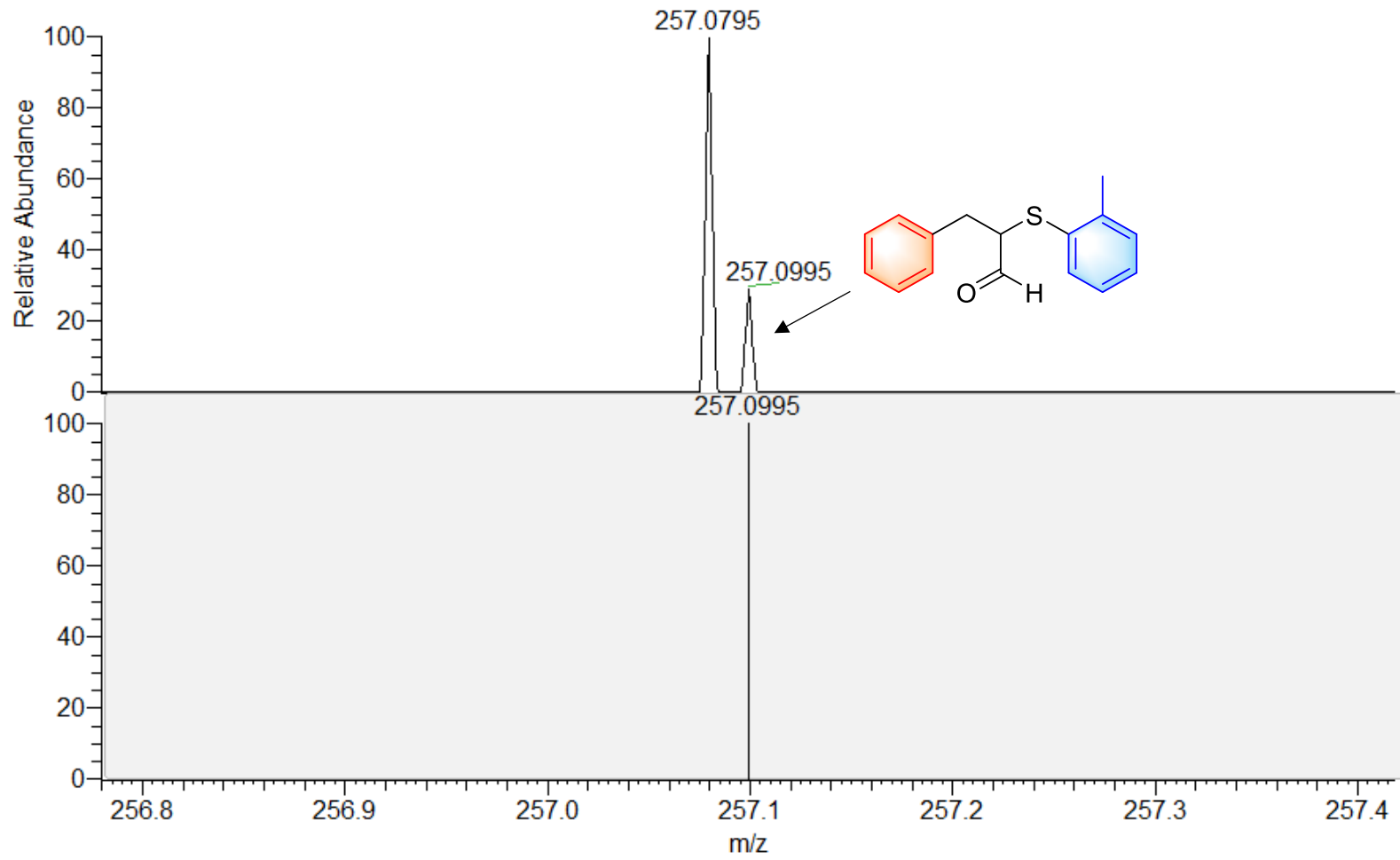
NL:
7.84E5
DZHY-MOUDAN-
M7#8 RT: 0.04 AV:
1 T: FTMS + p ESI
Full lock ms
[60.0000-750.0000]

NL:
7.96E5
C₁₆ H₁₆ OS +H:
C₁₆ H₁₇ O₁ S₁
pa Chrg 1

3-phenyl-2-(*o*-tolylthio)propanal (3bc)



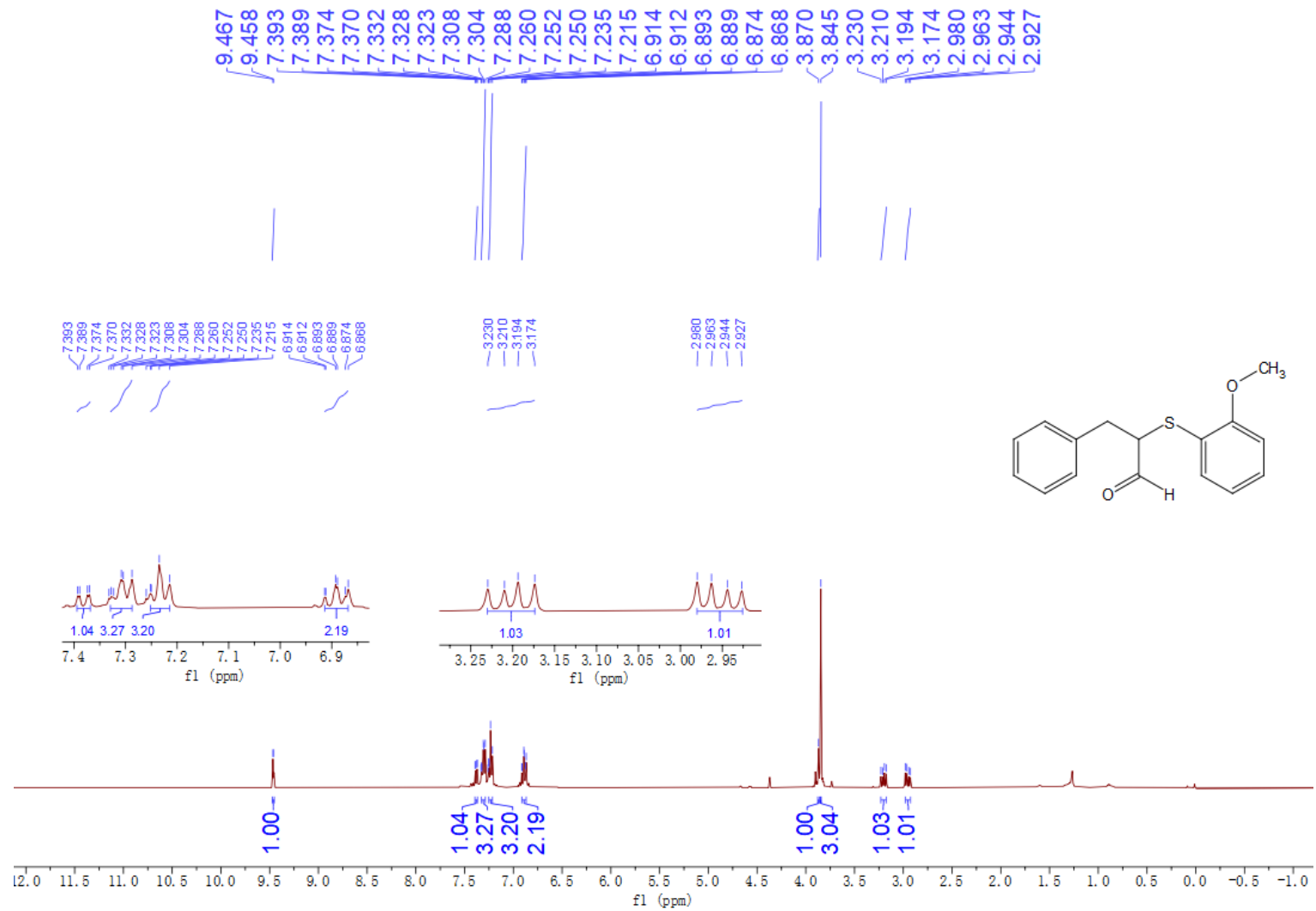


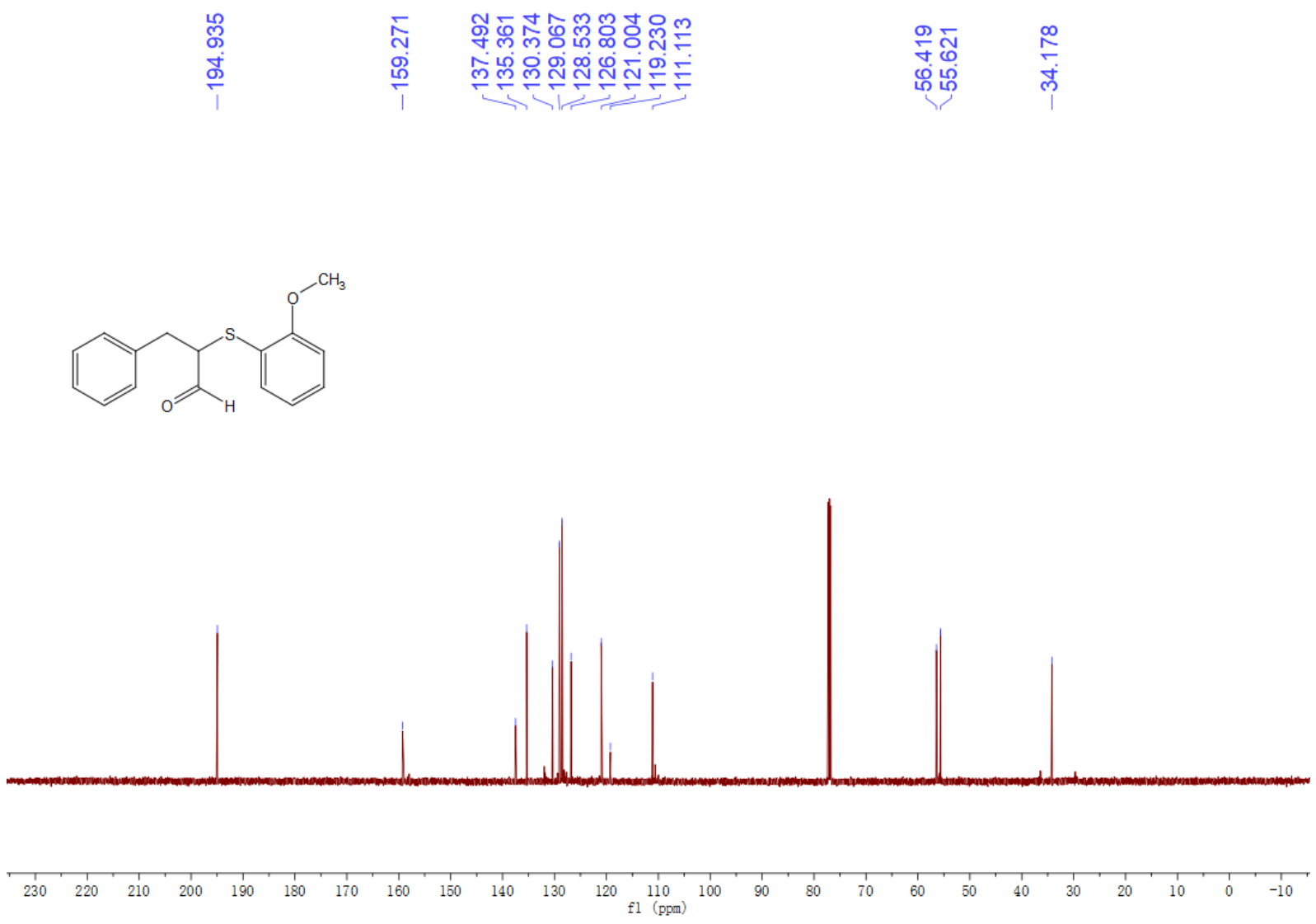


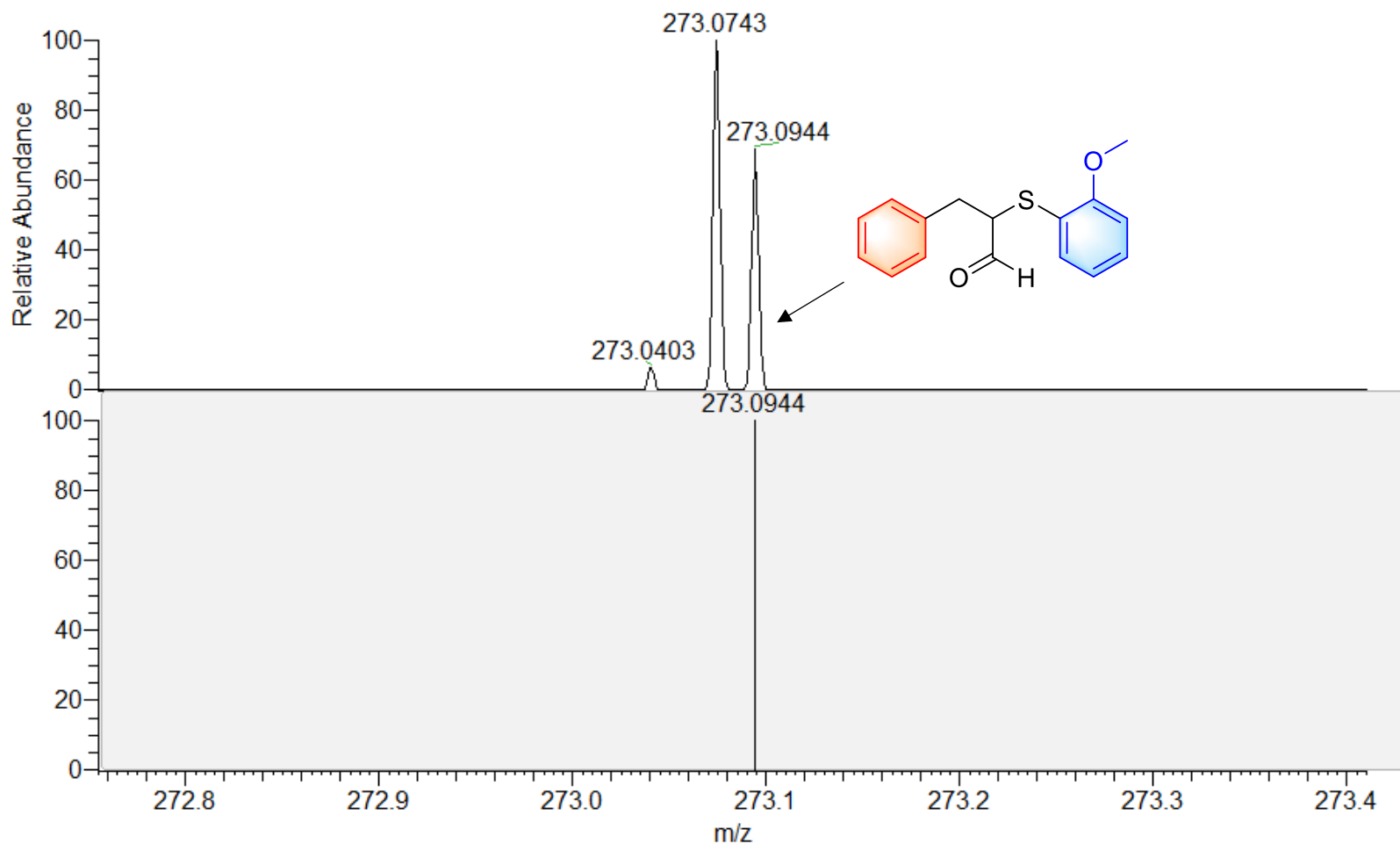
NL:
1.60E6
MOUDAN-M8#97
RT: 0.43 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

NL:
7.96E5
C₁₆ H₁₆ OS +H:
C₁₆ H₁₇ O₁ S₁
pa Chrg 1

2-((2-methoxyphenyl)thio)-3-phenylpropanal (3bd)



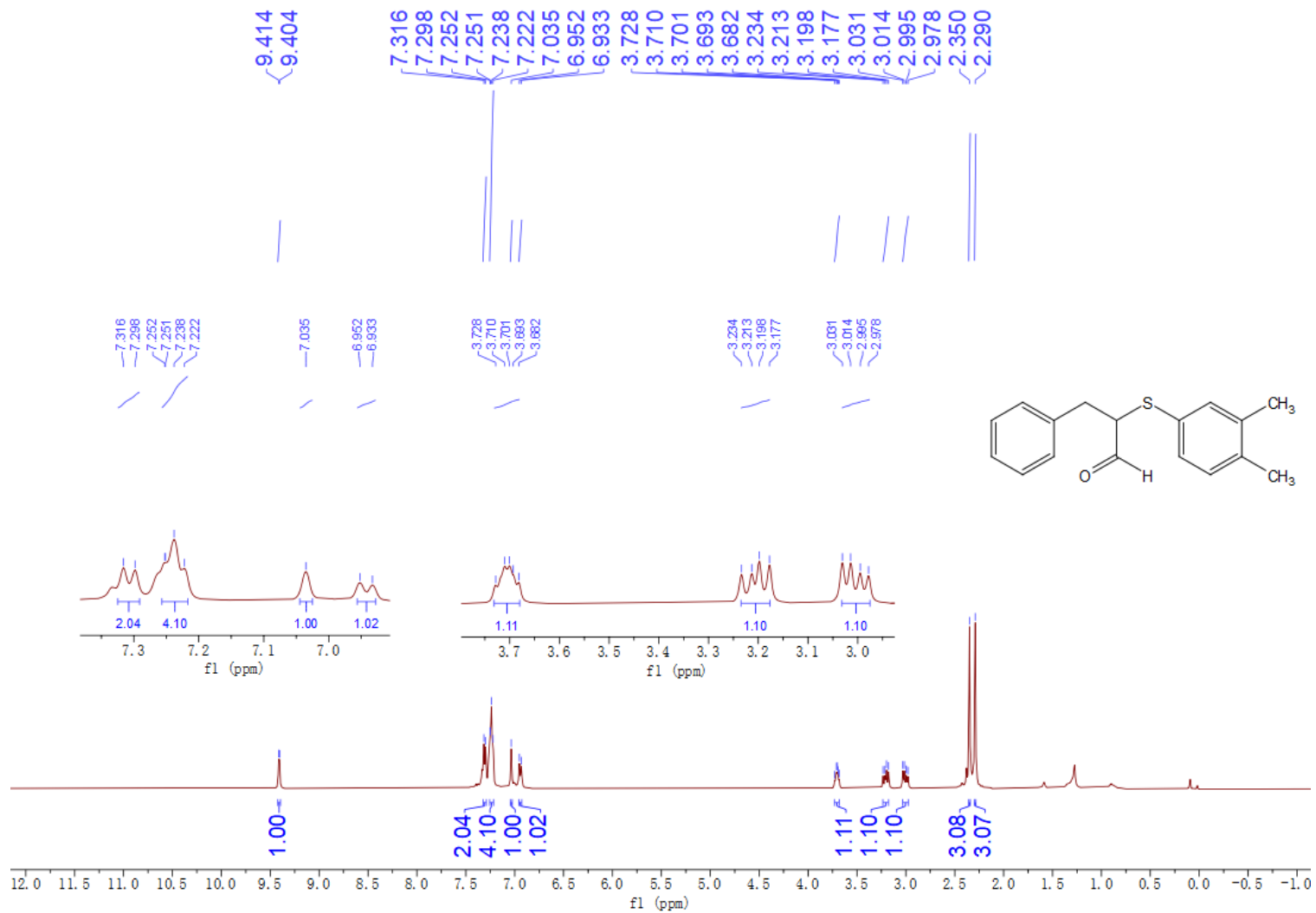


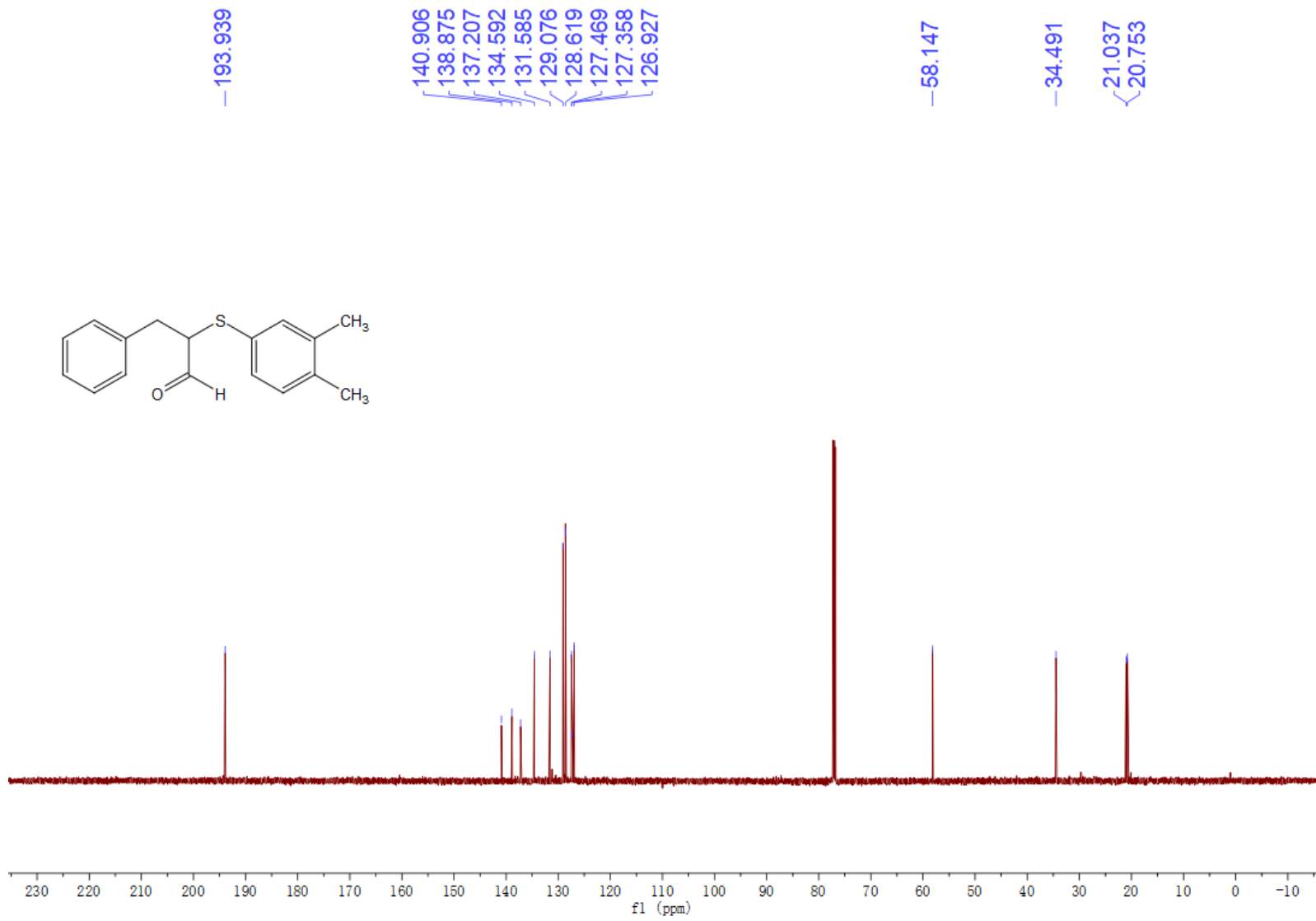


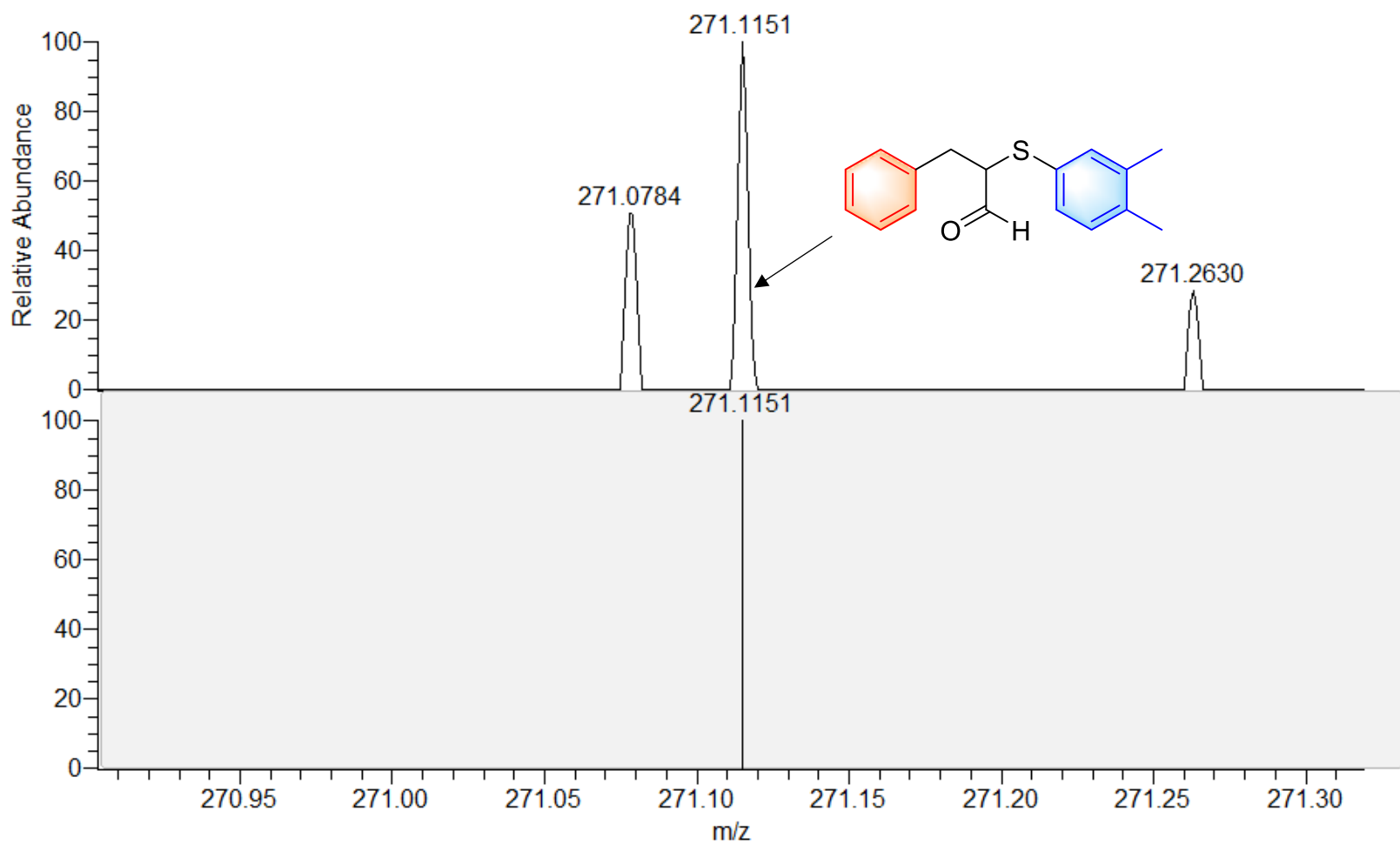
NL:
1.83E6
MOUDAN-M8#55
RT: 0.25 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

NL:
7.94E5
C₁₆ H₁₆ O₂ S +H:
C₁₆ H₁₇ O₂ S₁
pa Chrg 1

2-((3,4-dimethylphenyl)thio)-3-phenylpropanal (3be)



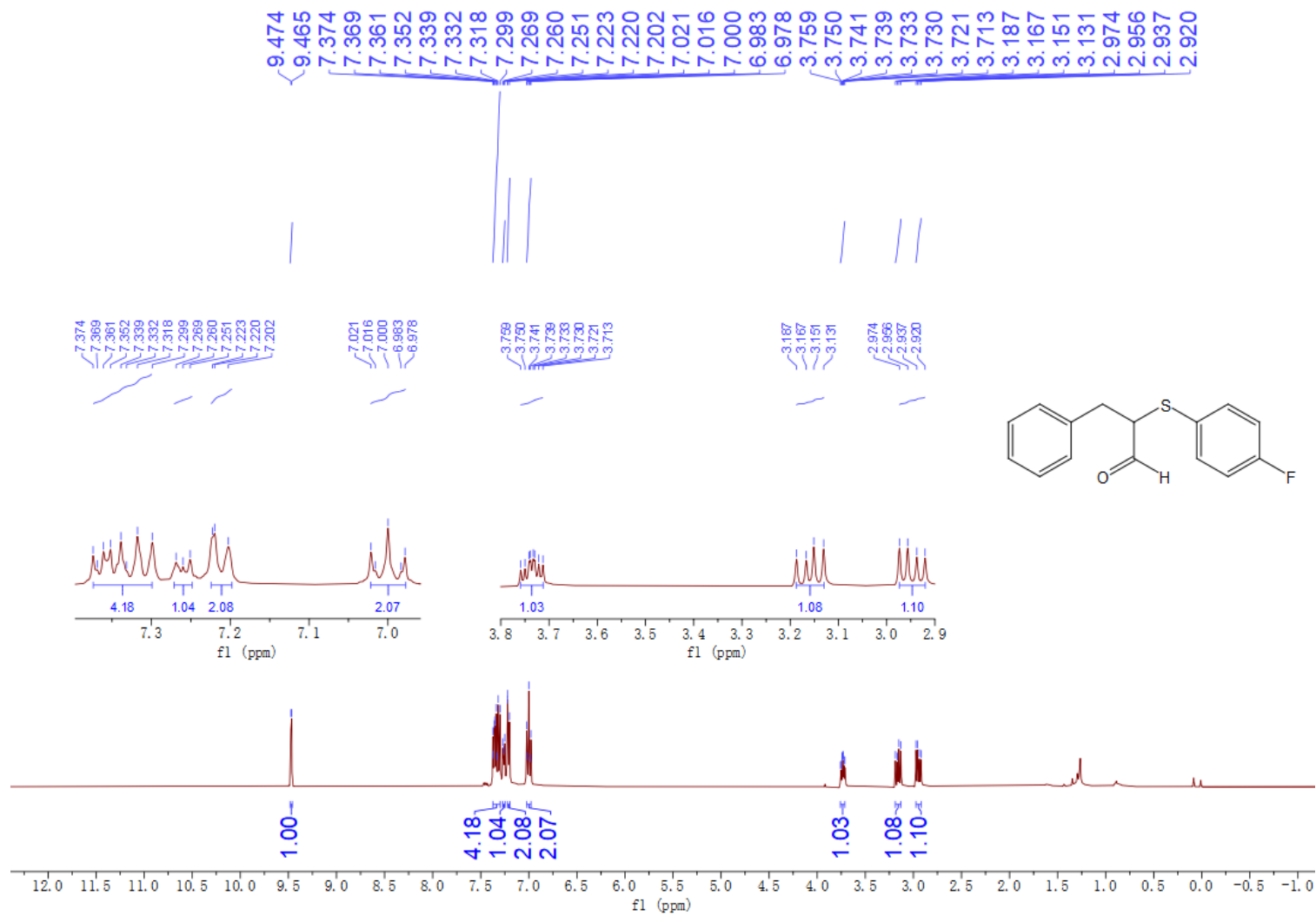


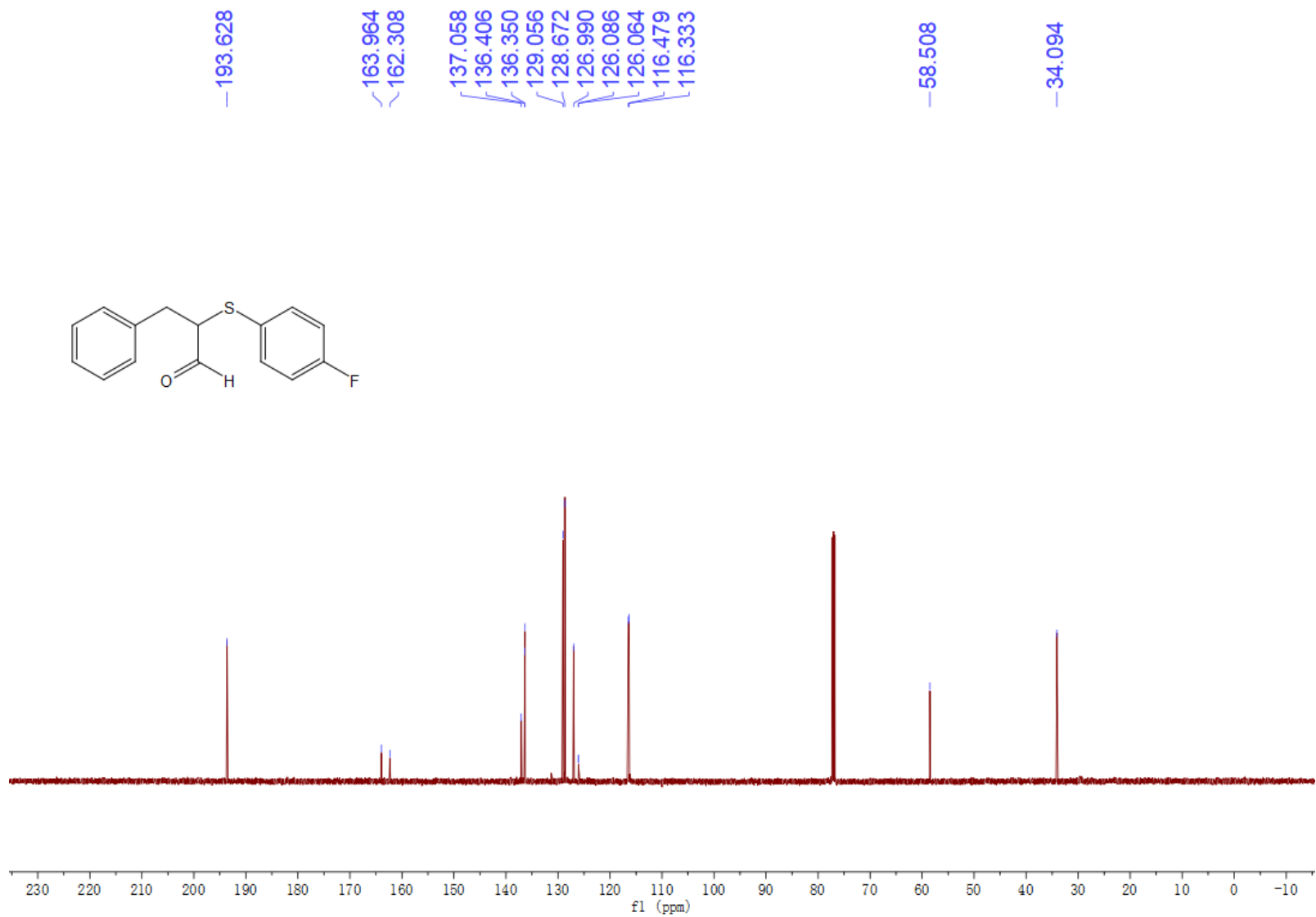


NL:
4.16E5
MOUDAN-M8#87
RT: 0.39 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

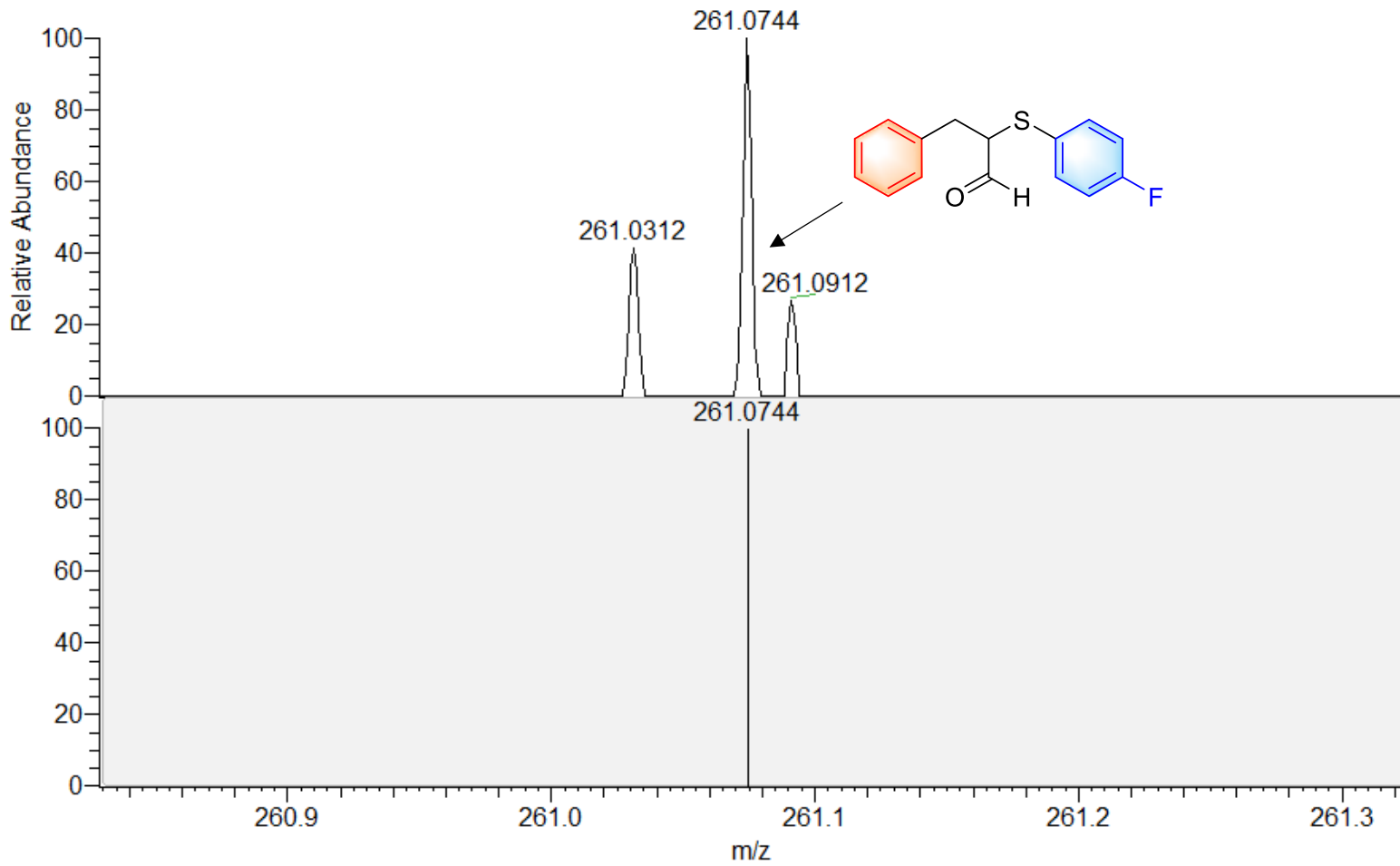
NL:
7.87E5
C₁₇ H₁₈ OS +H:
C₁₇ H₁₉ O₁ S₁
pa Chrg 1

2-((4-fluorophenyl)thio)-3-phenylpropanal (3bf)





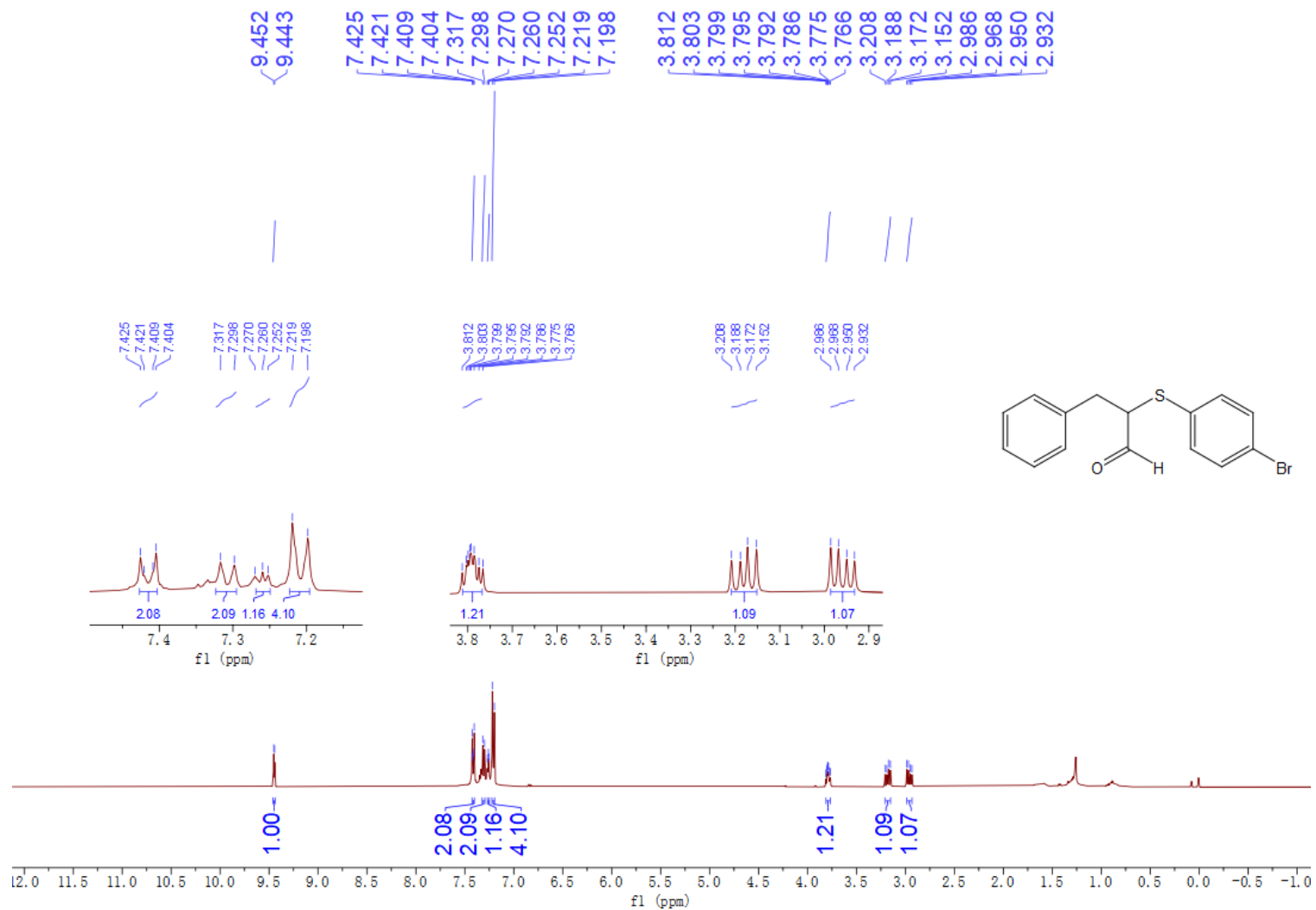


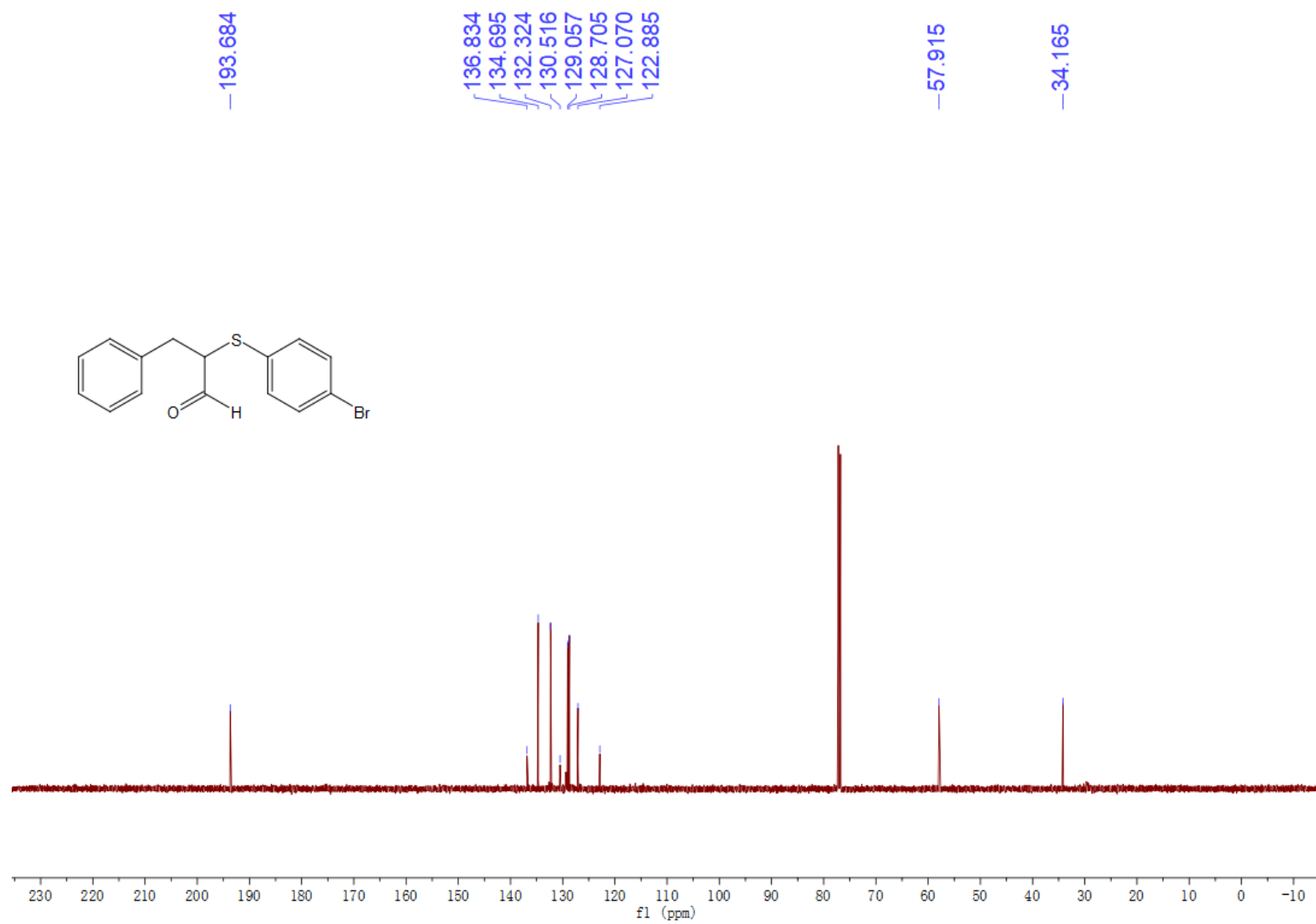


NL:
4.99E5
MOUDAN-M8#39
RT: 0.17 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

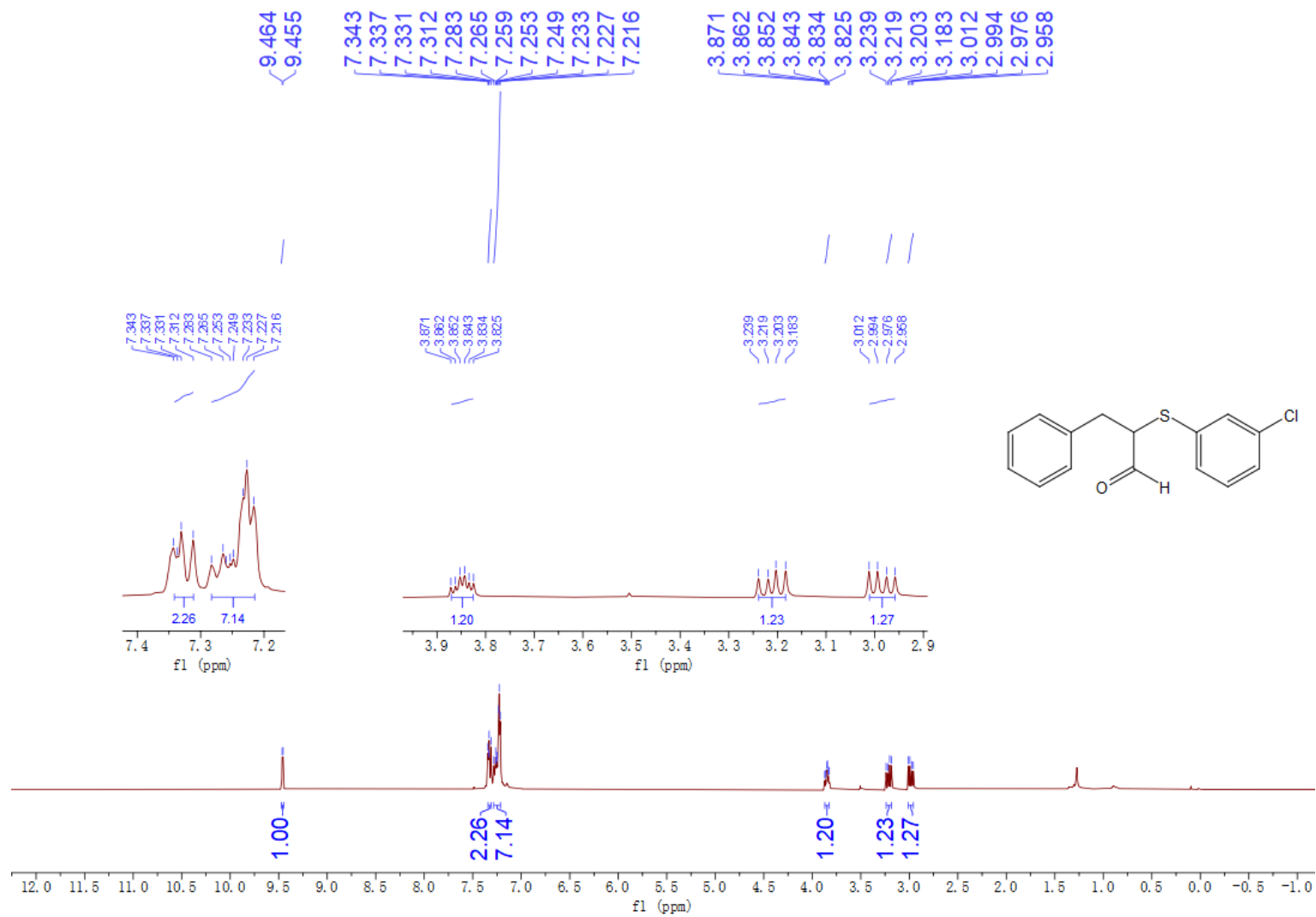
NL:
8.05E5
C₁₅ H₁₃ FOS +H:
C₁₅ H₁₄ F₁ O₁ S₁
pa Chrg 1

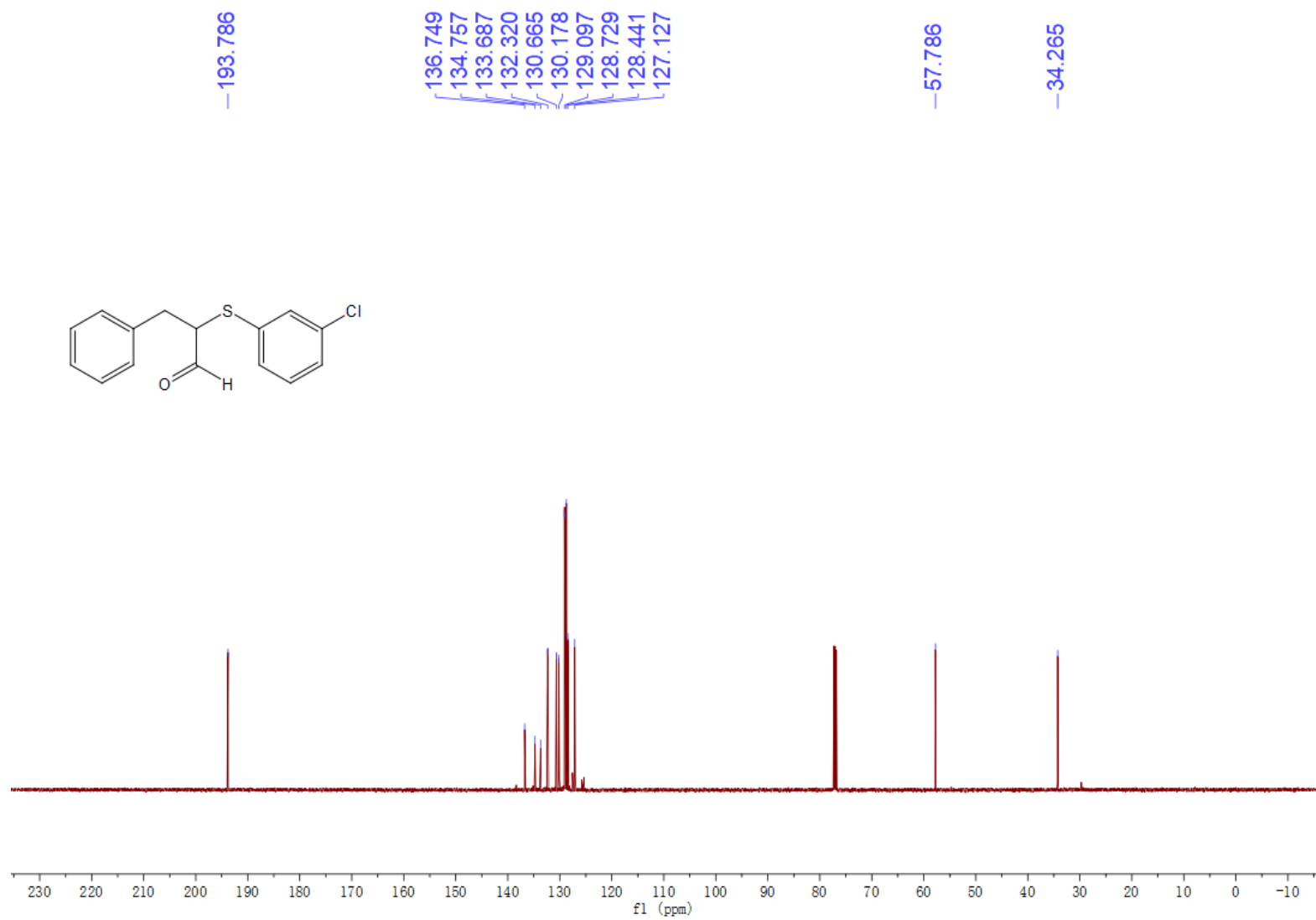
2-((4-bromophenyl)thio)-3-phenylpropanal (3bg)

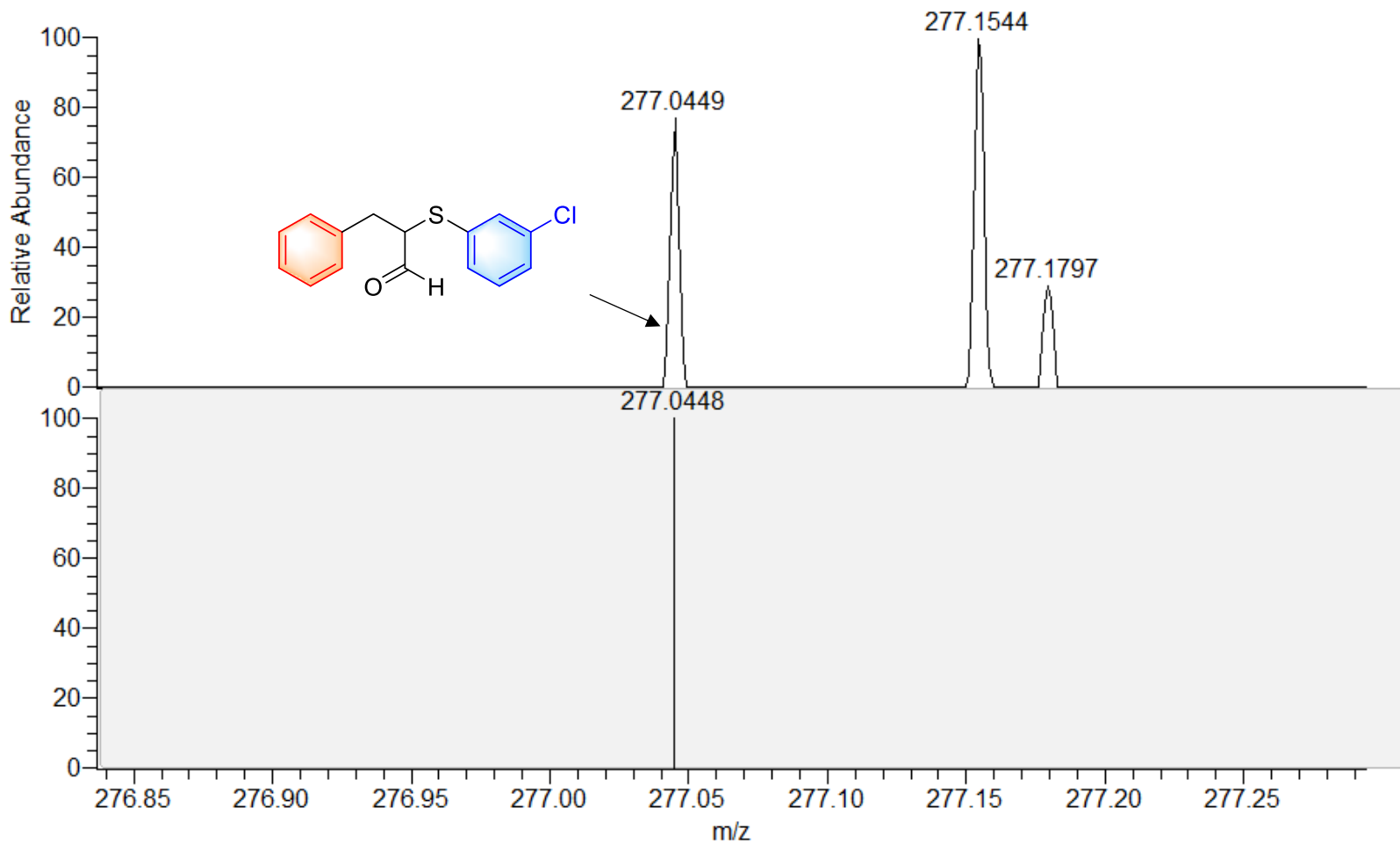




2-((3-chlorophenyl)thio)-3-phenylpropanal (3bh)



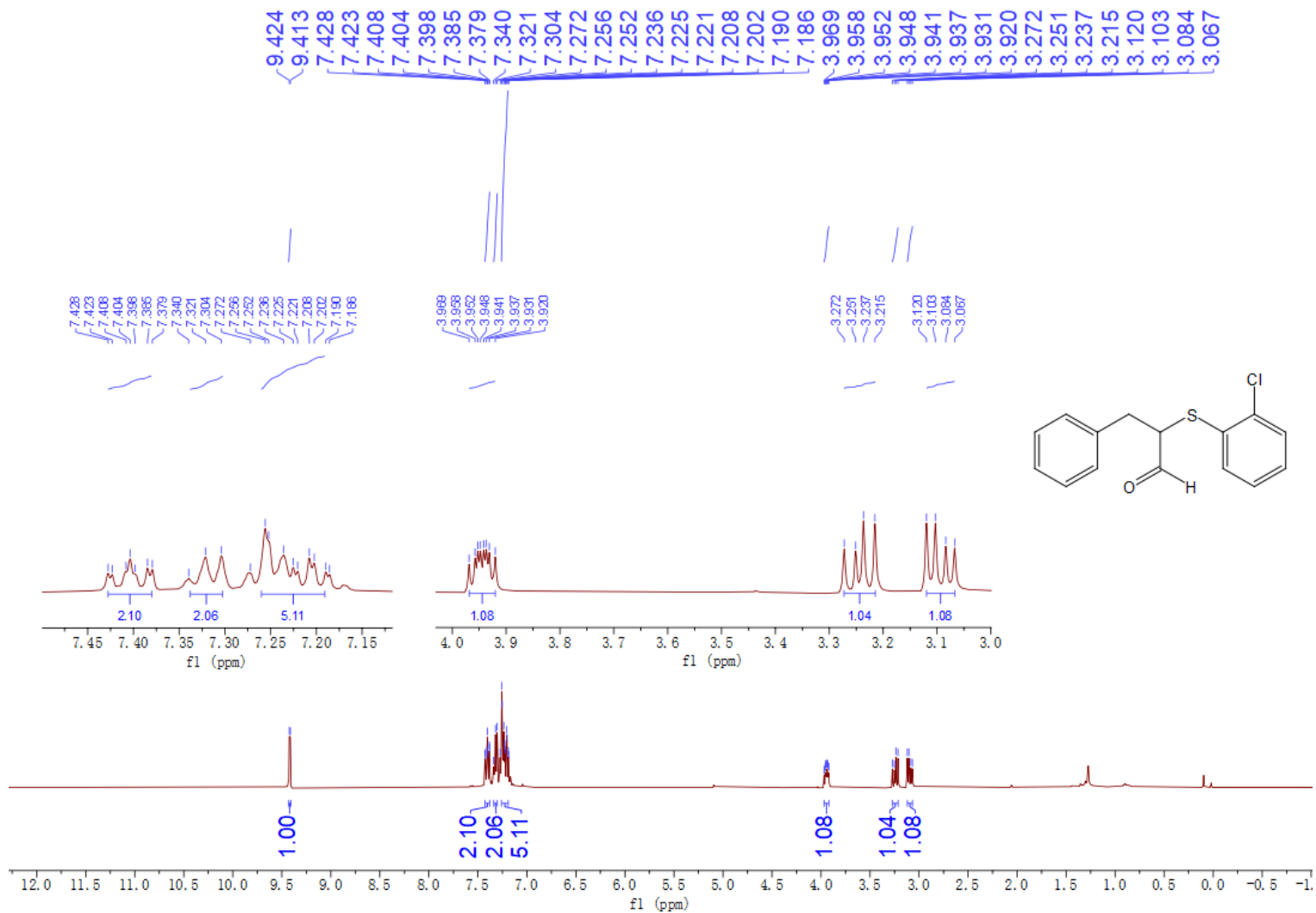


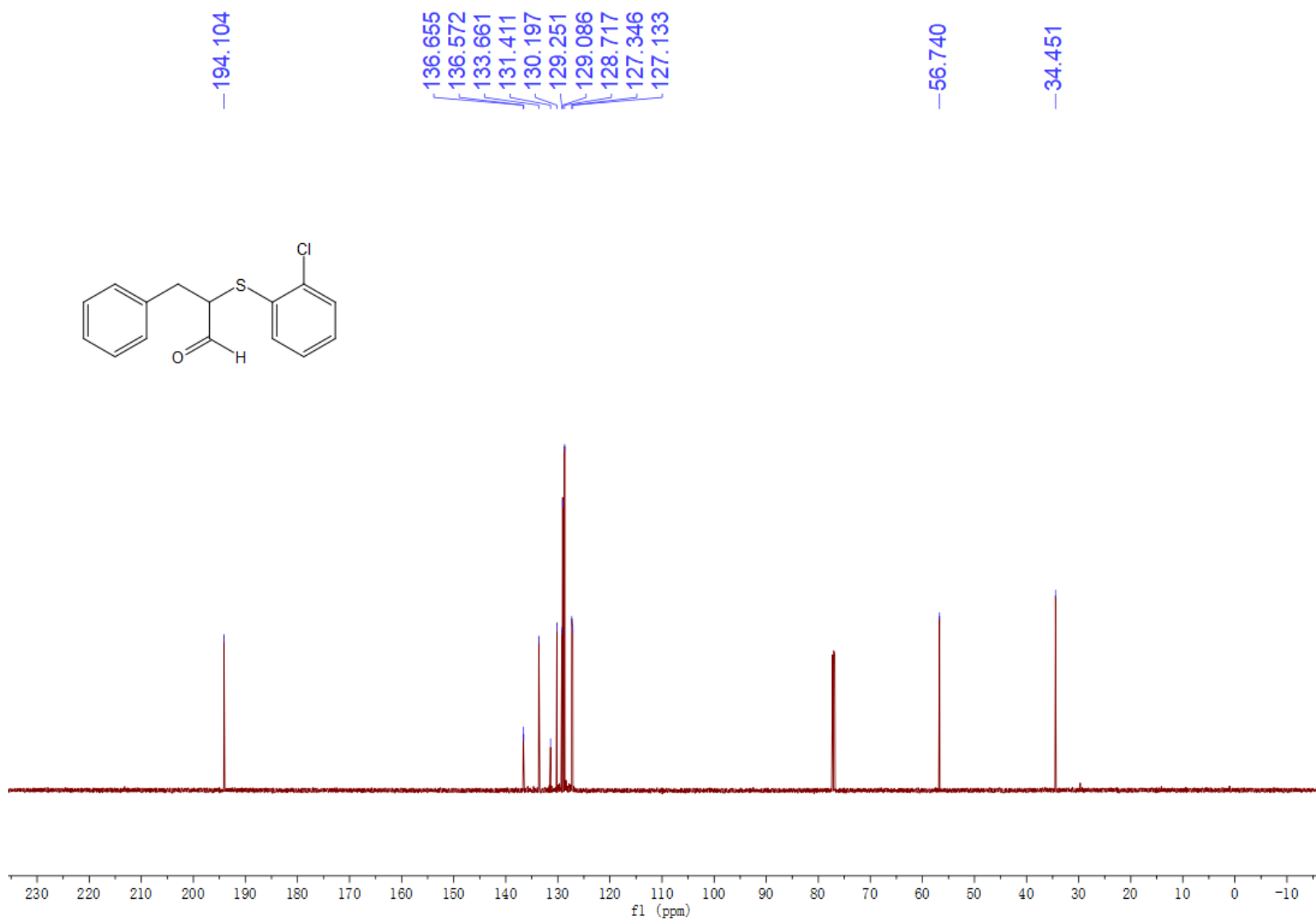


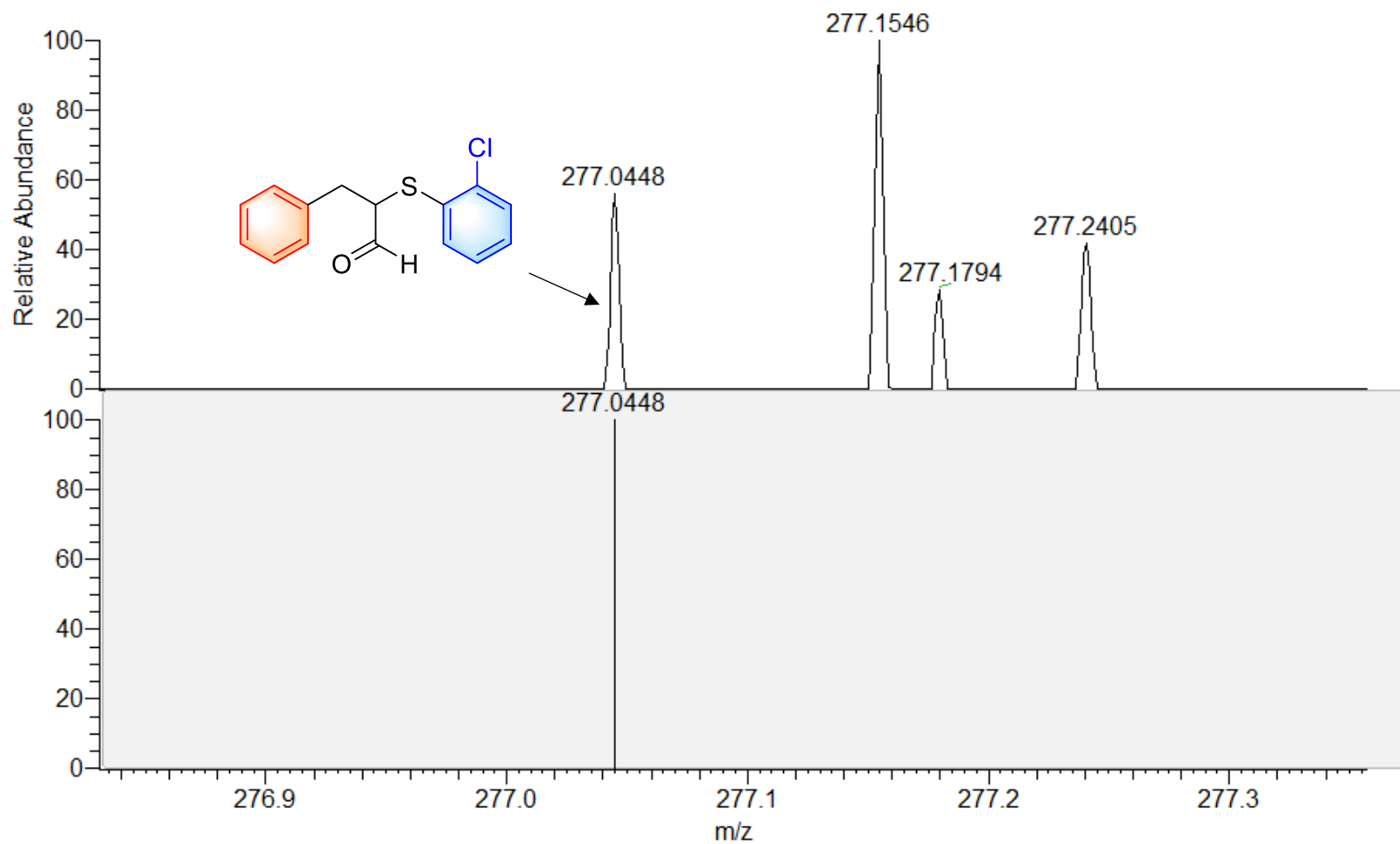
NL:
1.91E5
MOUDAN-M9#17
RT: 0.08 AV: 1 T:
FTMS + p ESI Full
lock ms
[100.0000-
750.0000]

NL:
6.10E5
C₁₅ H₁₃ ClOS +H:
C₁₅ H₁₄ Cl₁ O₁ S₁
pa Chrg 1

2-((2-chlorophenyl)thio)-3-phenylpropanal (3bi)



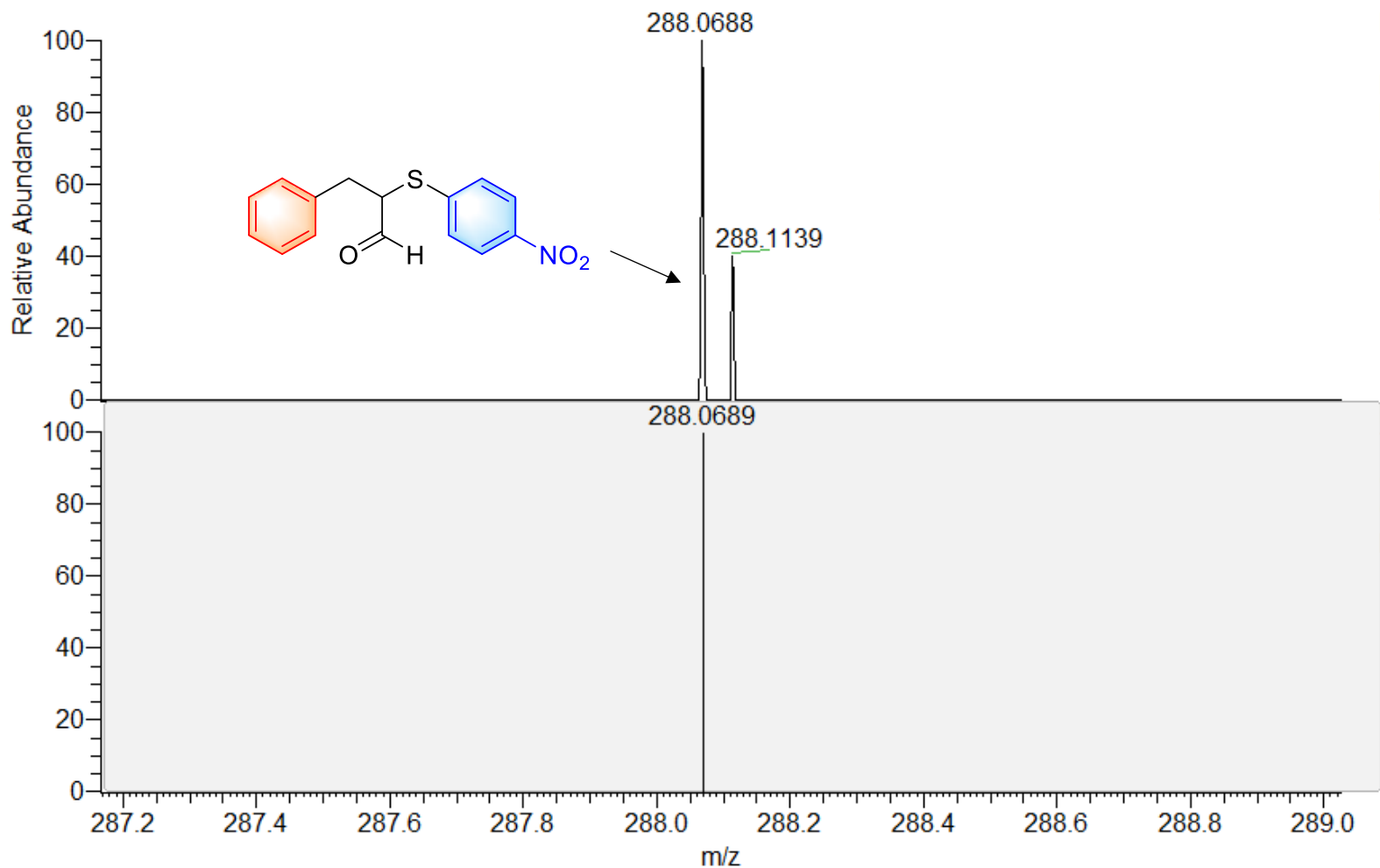




NL:
1.97E5
MOUDAN-M9#9
RT: 0.04 AV: 1 T:
FTMS + p ESI Full
lock ms
[100.0000-
750.0000]

NL:
6.10E5
C₁₅ H₁₃ ClOS +H:
C₁₅ H₁₄ Cl₁ O₁ S₁
pa Chrg 1

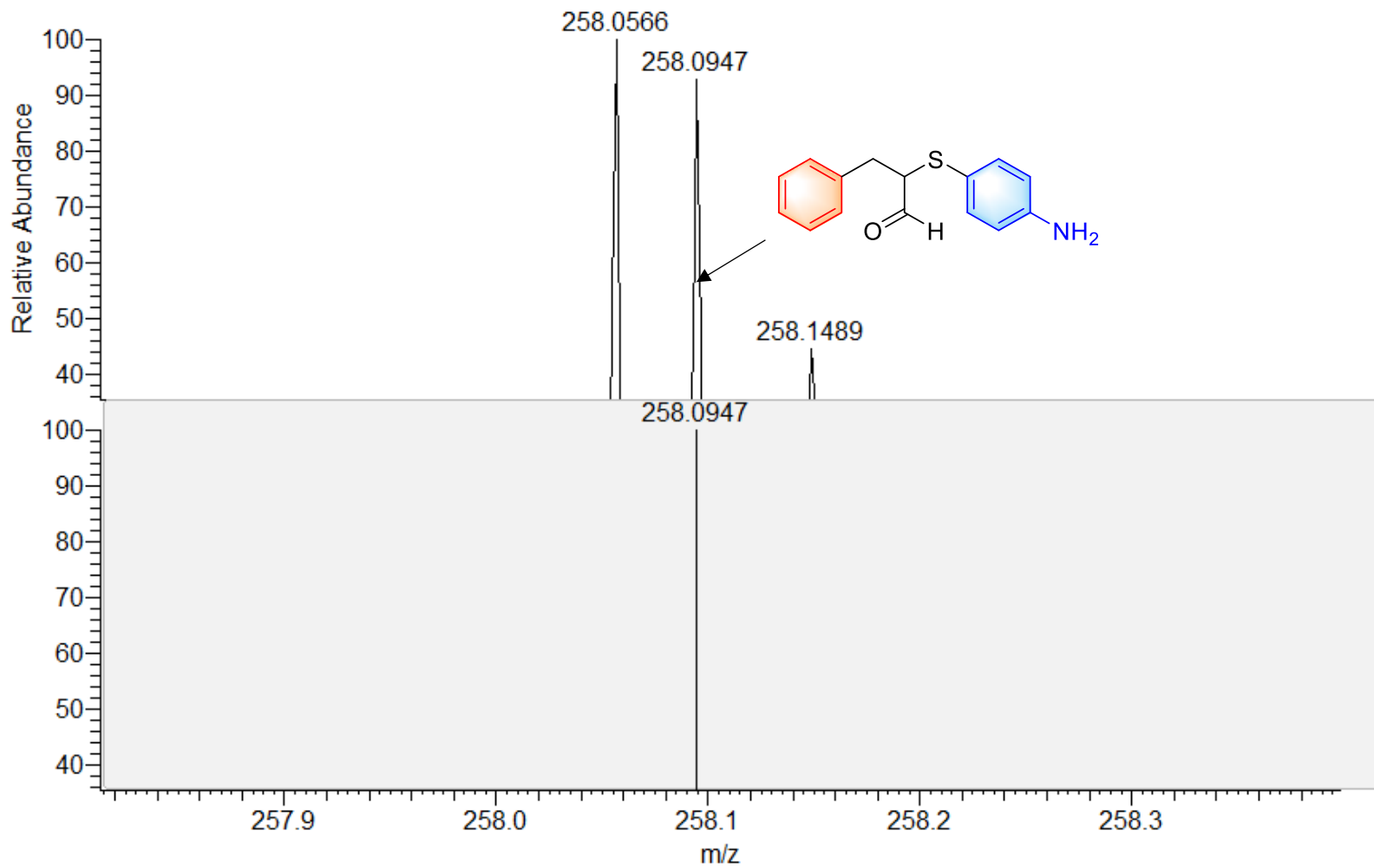
2-((4-nitrophenyl)thio)-3-phenylpropanal (3bj)



NL:
1.35E5
MOUDAN-M9#57
RT: 0.25 AV: 1 T:
FTMS + p ESI Full
lock ms
[100.0000-
750.0000]

NL:
7.98E5
C₁₅ H₁₃ NO₃ S +H:
C₁₅ H₁₄ N₁ O₃ S₁
pa Chrg 1

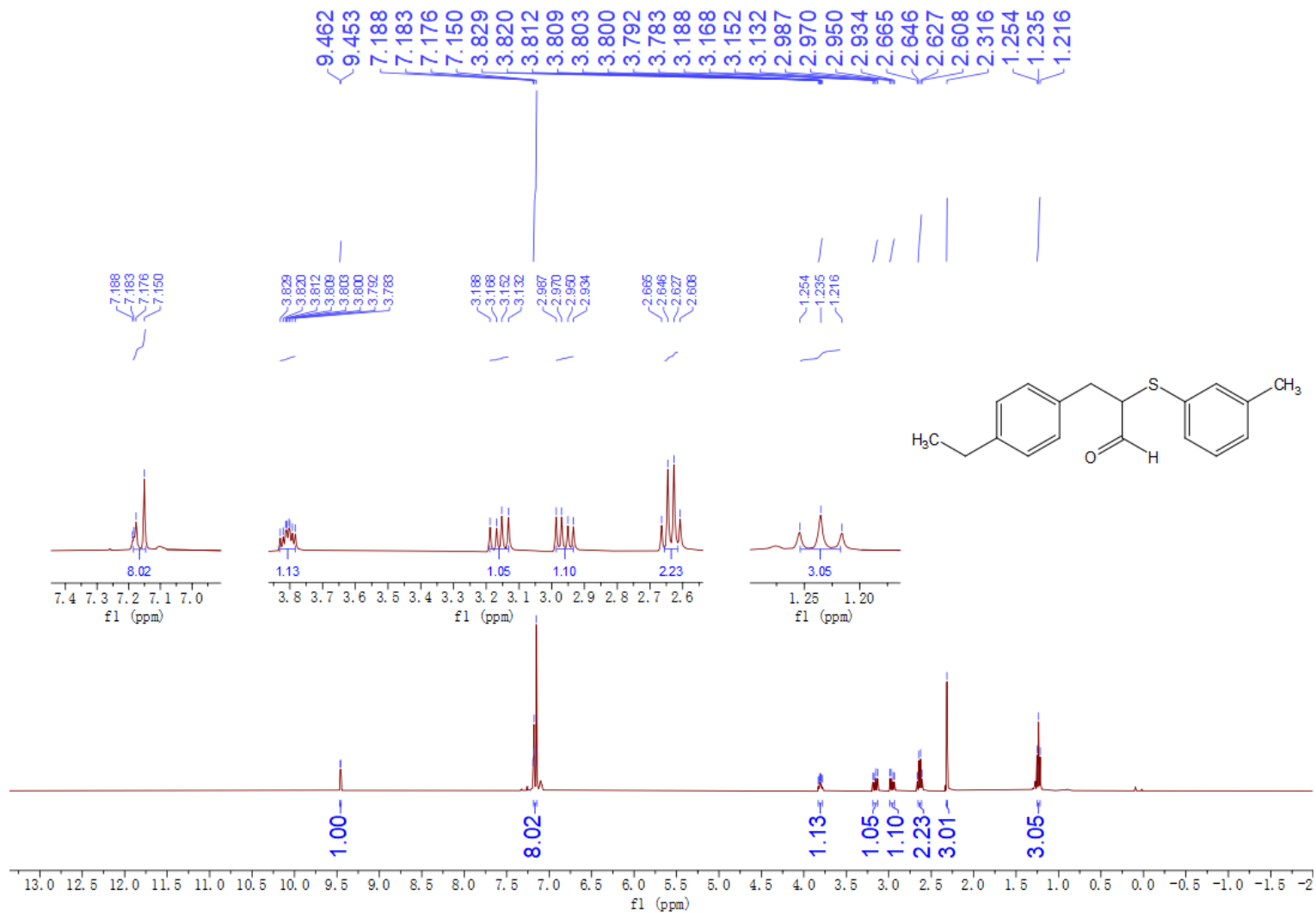
2-((4-aminophenyl)thio)-3-phenylpropanal (3bk)

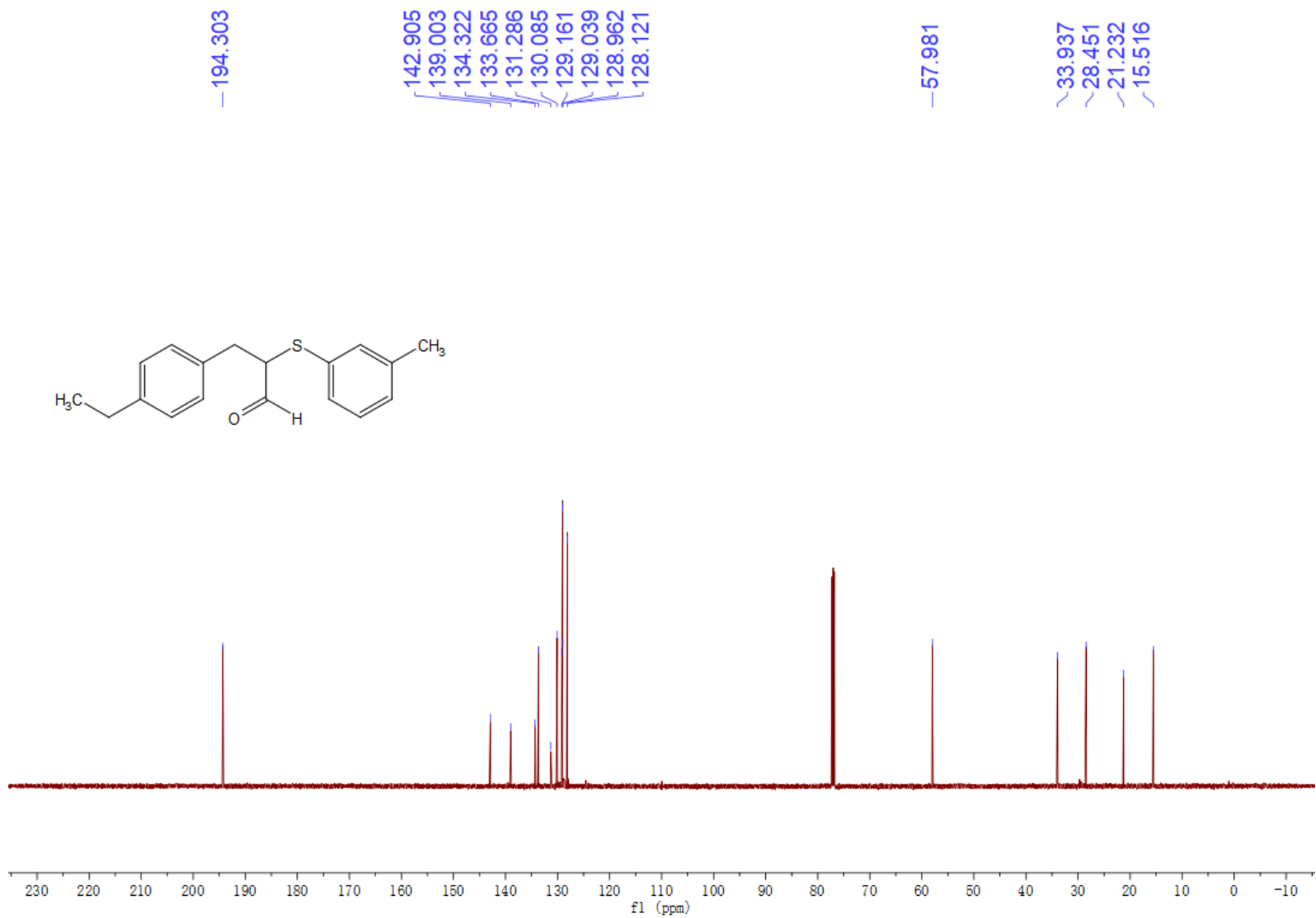


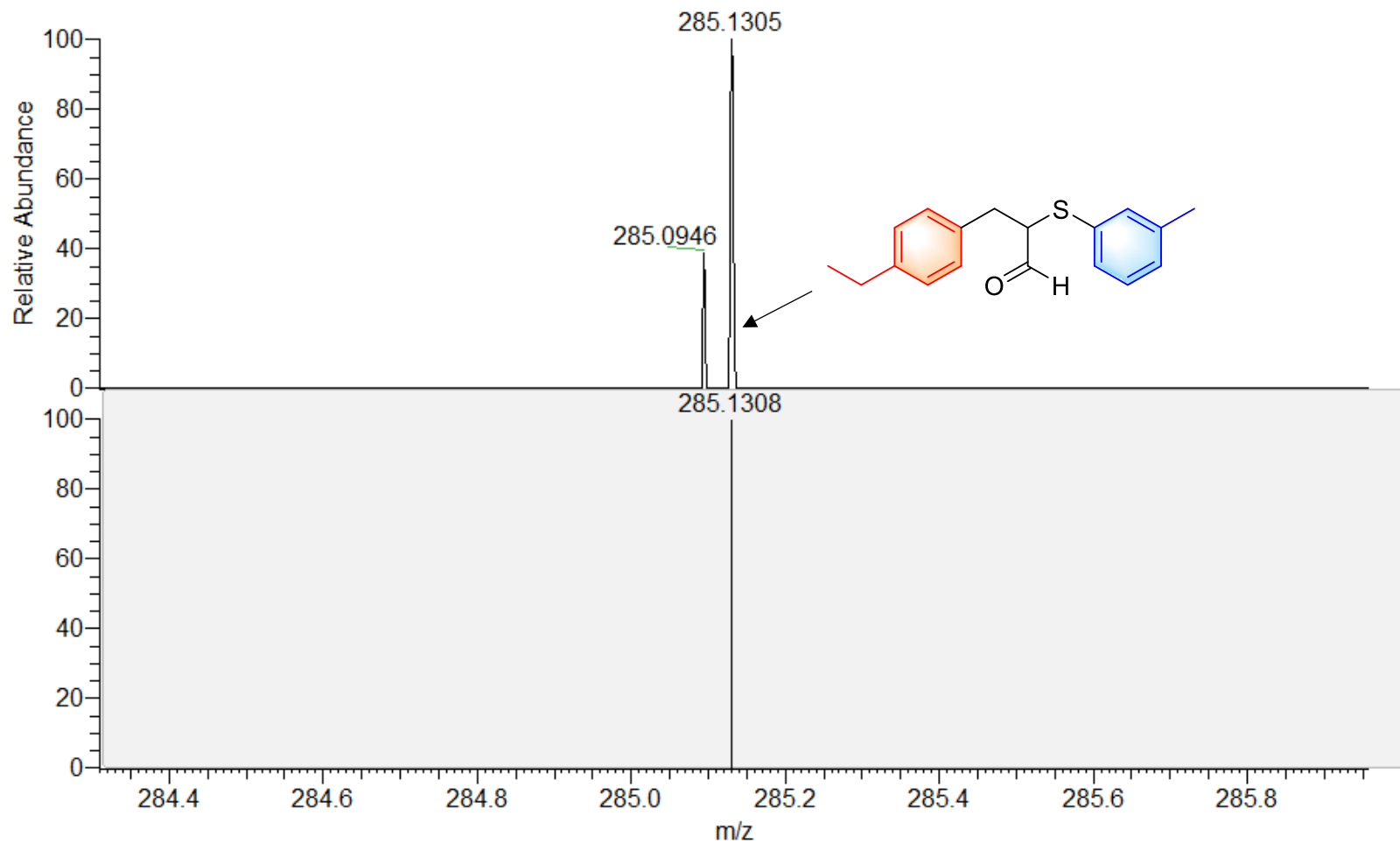
NL:
2.33E5
MOUDAN-M9#57
RT: 0.25 AV: 1 T:
FTMS + p ESI Full
lock ms
[100.0000-
750.0000]

NL:
8.01E5
C₁₅ H₁₅ NOS +H:
C₁₅ H₁₆ N₁ O₁ S₁
pa Chrg 1

3-(4-ethylphenyl)-2-(*m*-tolylthio)propanal (3ca)



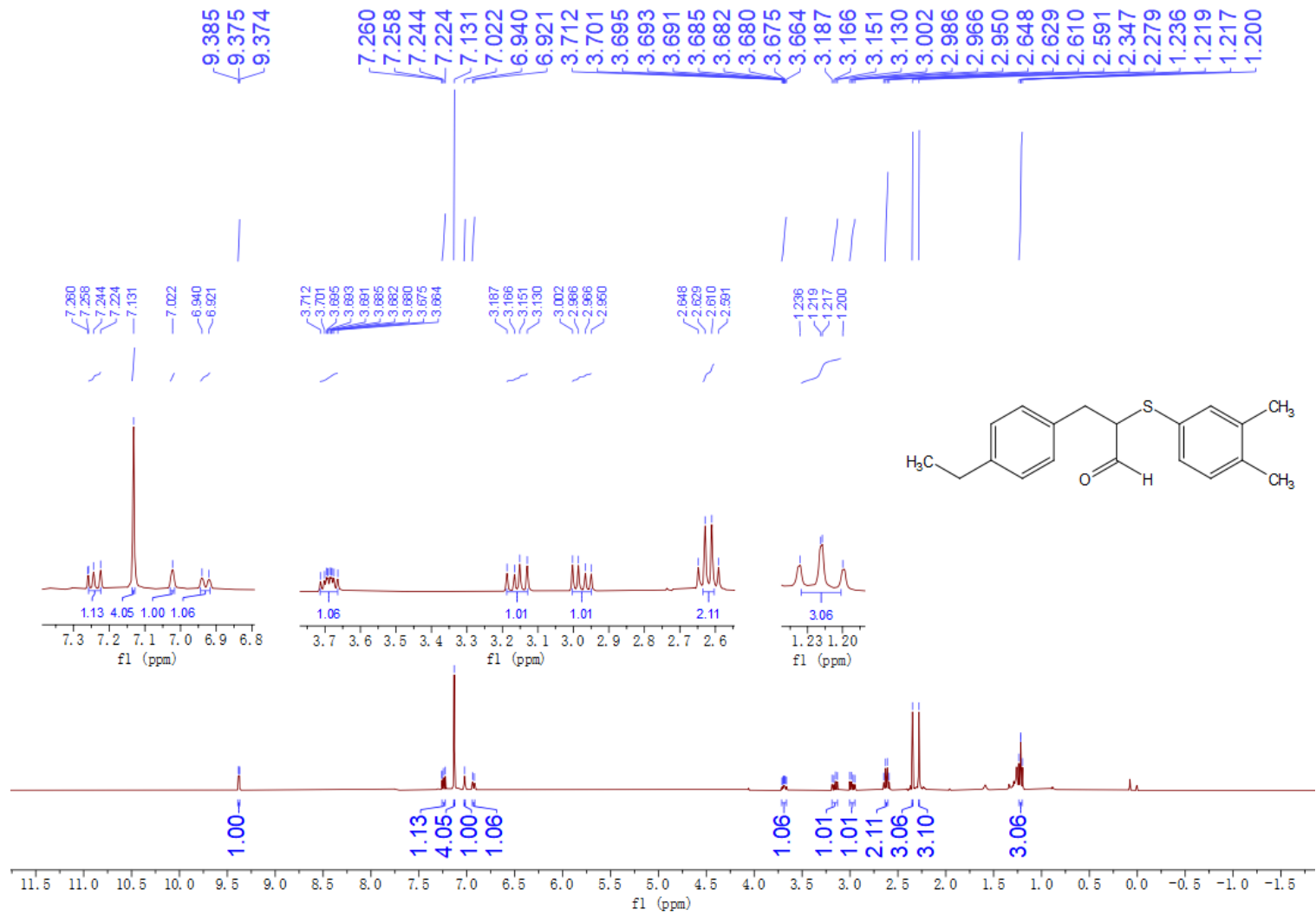


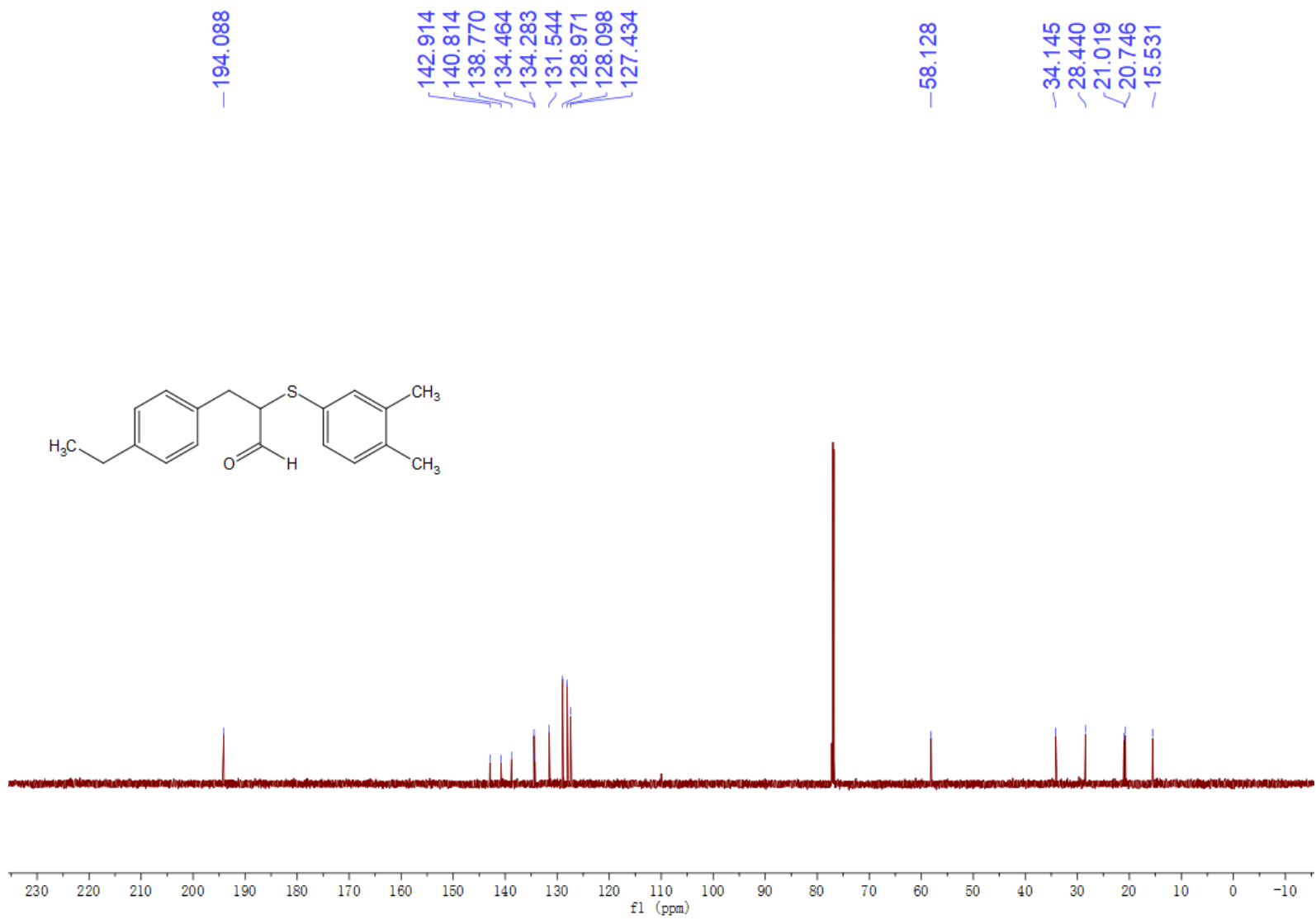


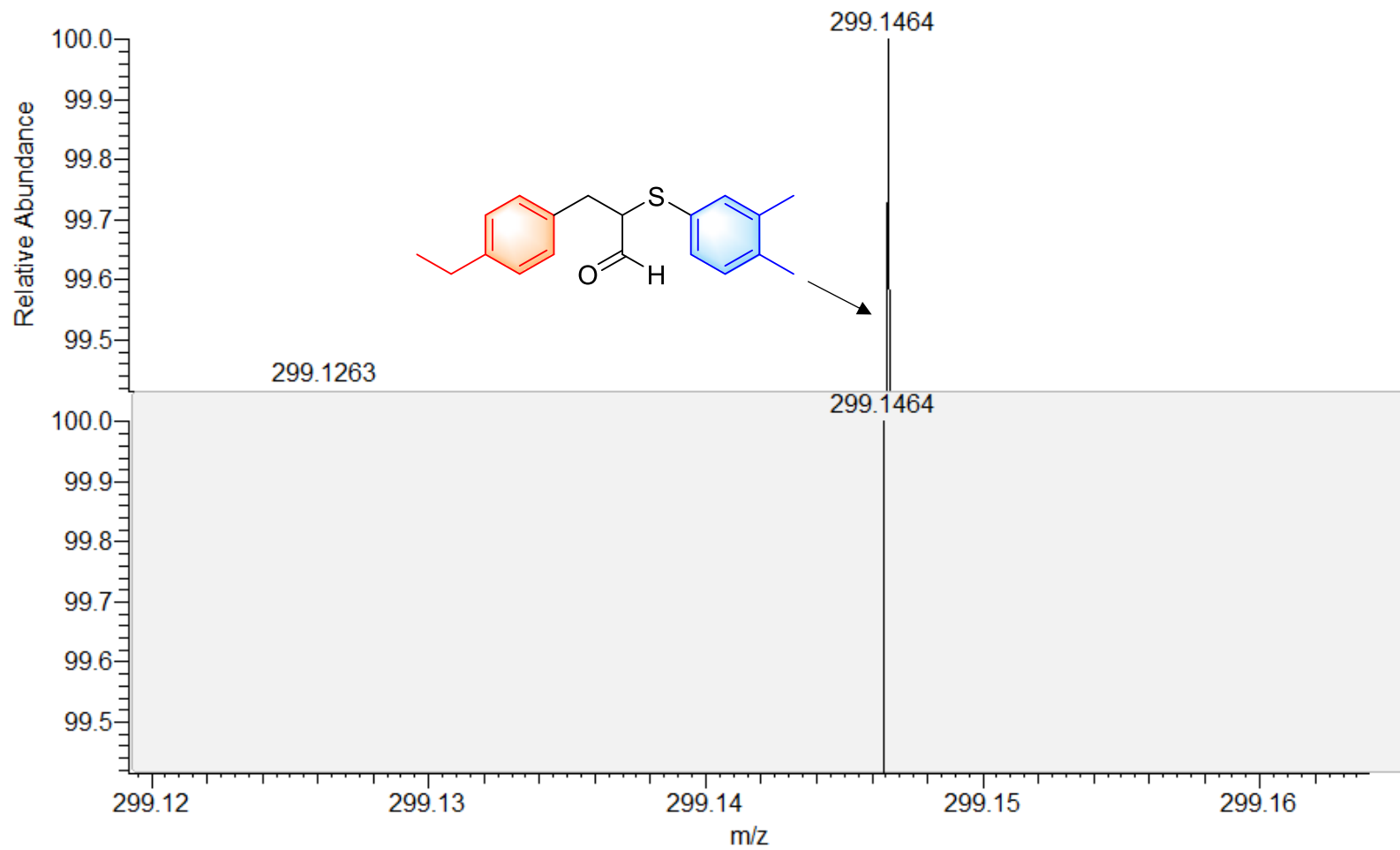
NL:
3.53E5
MOUDAN-M8#52
RT: 0.23 AV: 1 T:
FTMS + p ESI Full
lock ms
[75.0000-750.0000]

NL:
7.78E5
C₁₈ H₂₀ OS +H:
C₁₈ H₂₁ O₁ S₁
pa Chrg 1

2-((3,4-dimethylphenyl)thio)-3-(4-ethylphenyl)propanal (3cb)



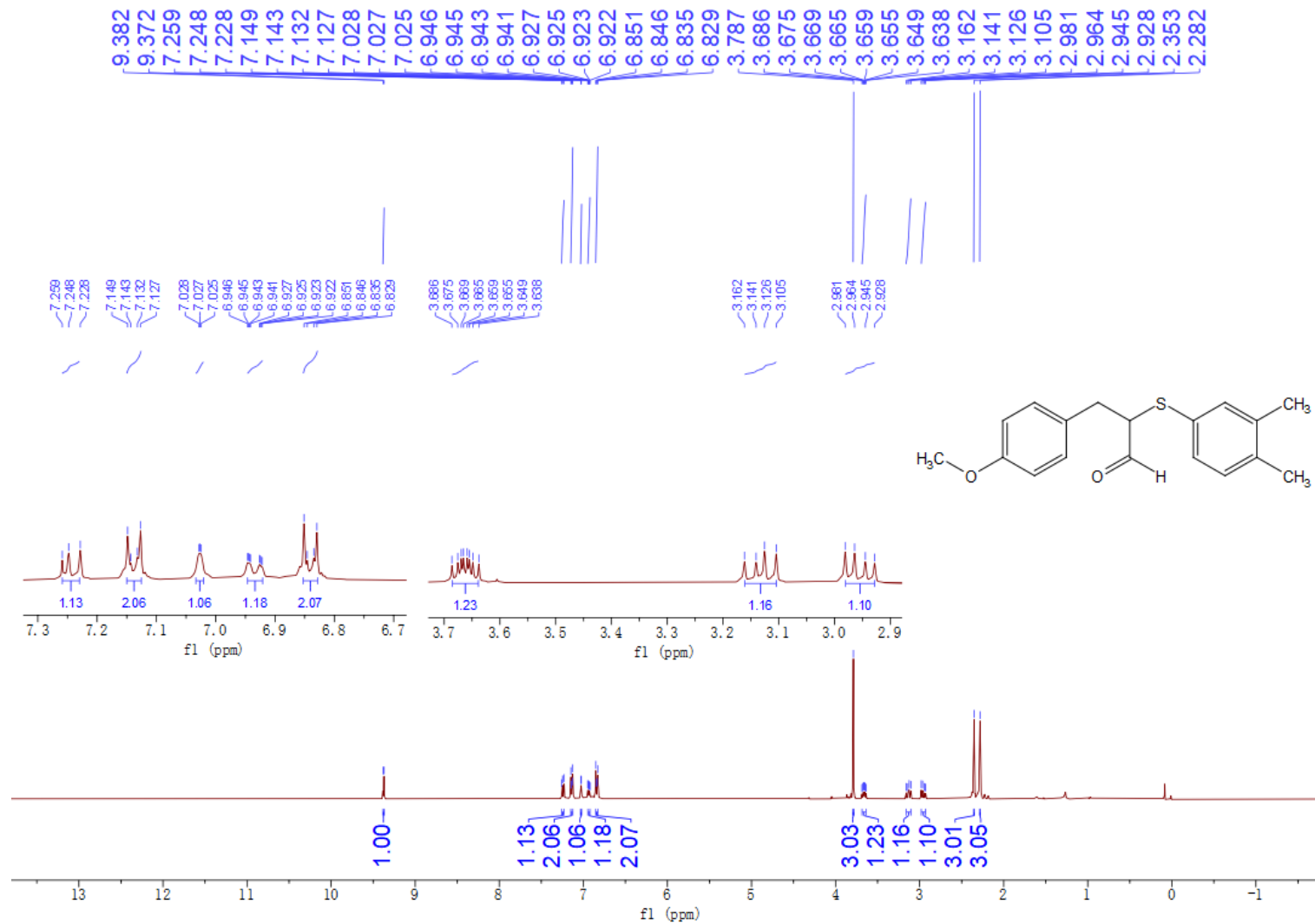


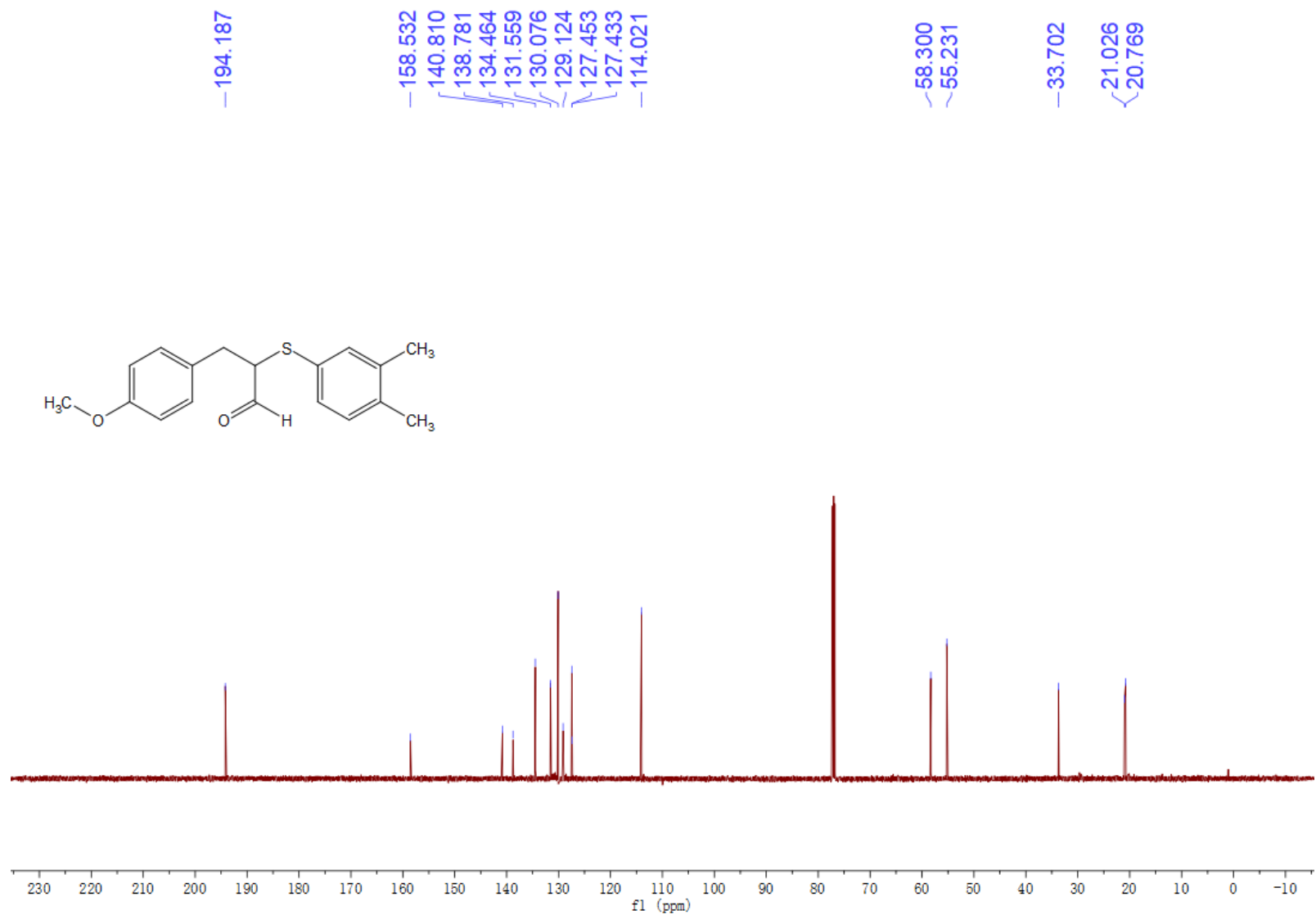


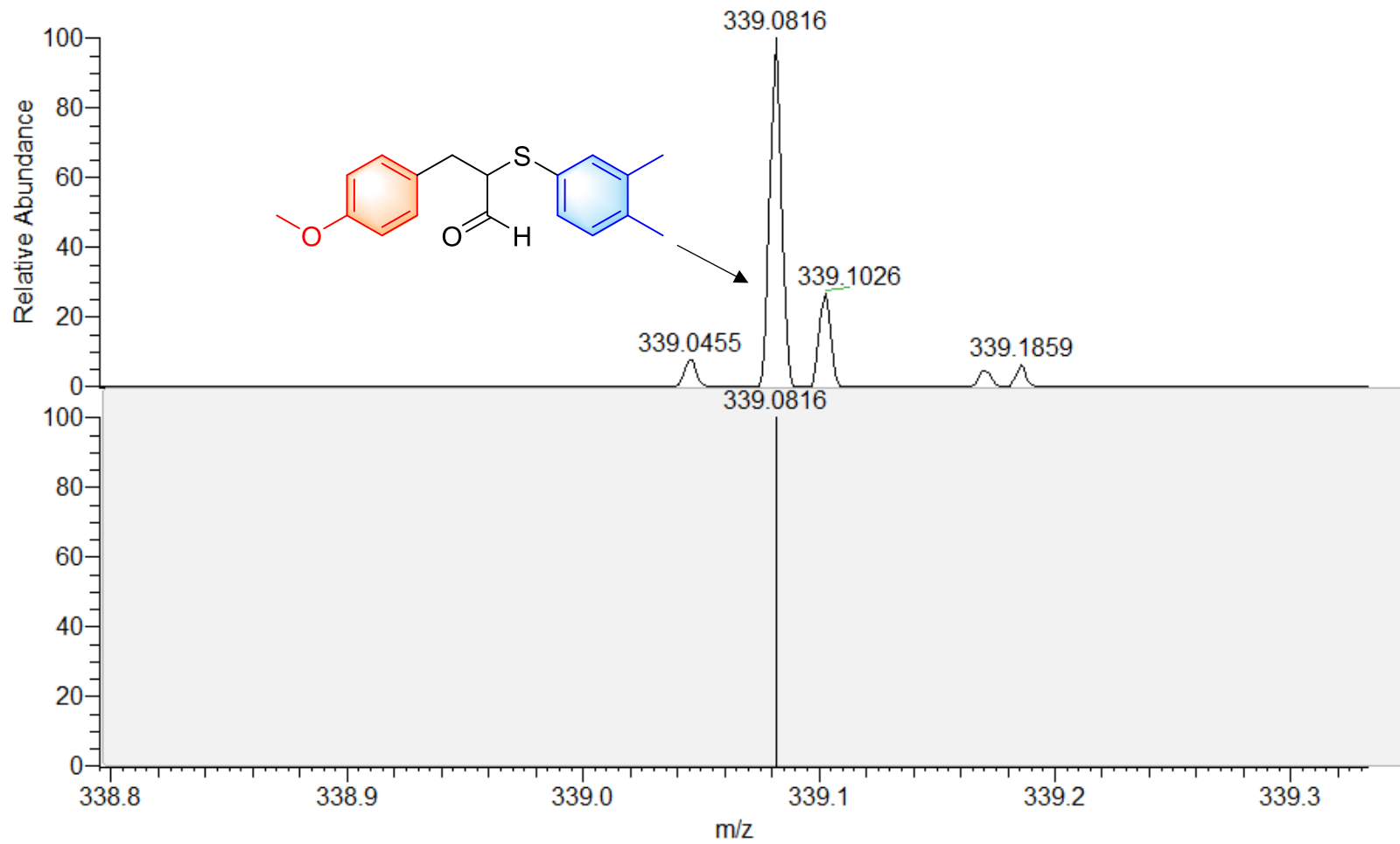
NL:
1.68E5
MOUDAN-M24#5
RT: 0.02 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
7.70E5
C₁₉ H₂₂ OS +H:
C₁₉ H₂₃ O₁ S₁
pa Chrg 1

2-((3,4-dimethylphenyl)thio)-3-(4-methoxyphenyl)propanal (3cc)



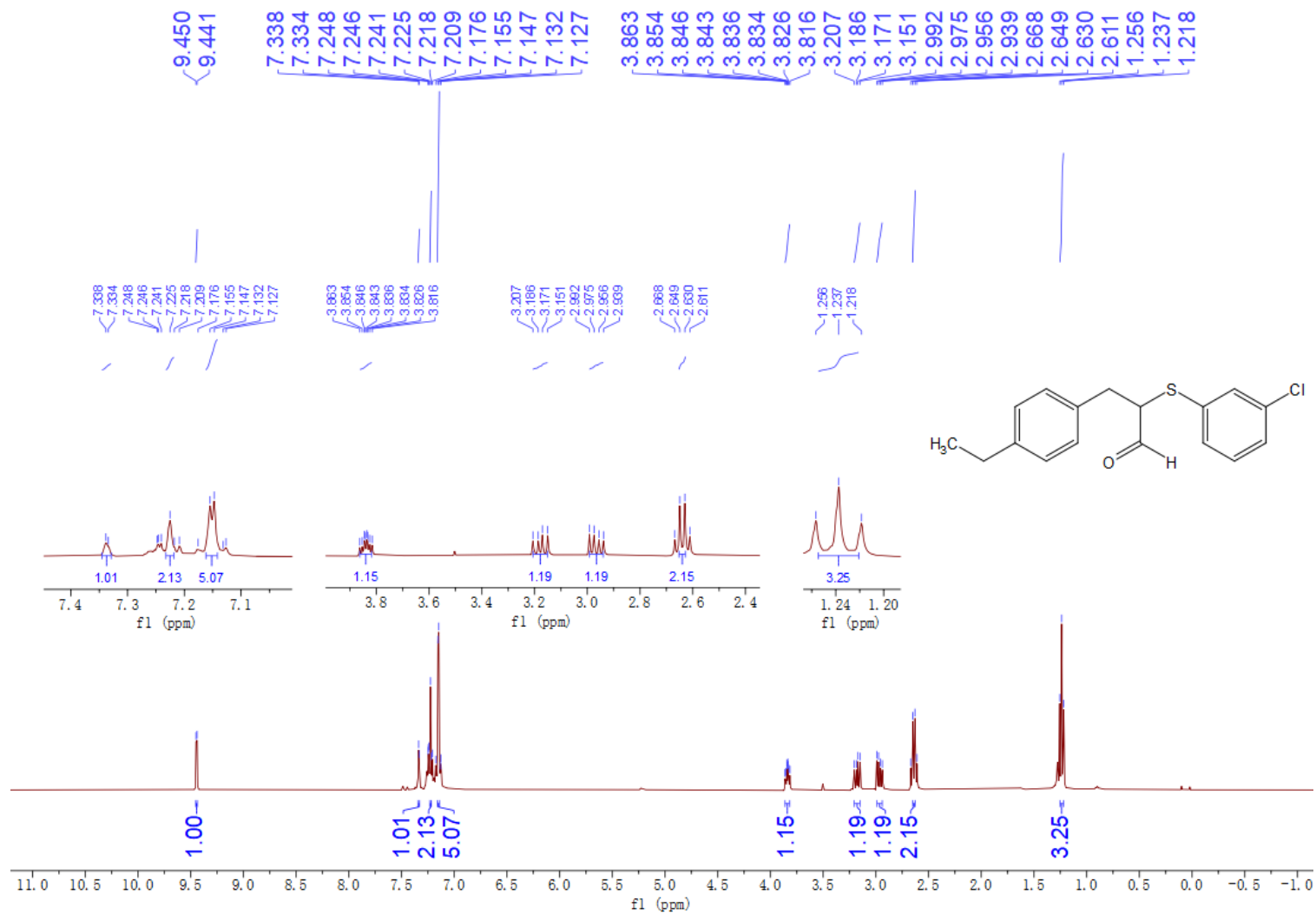


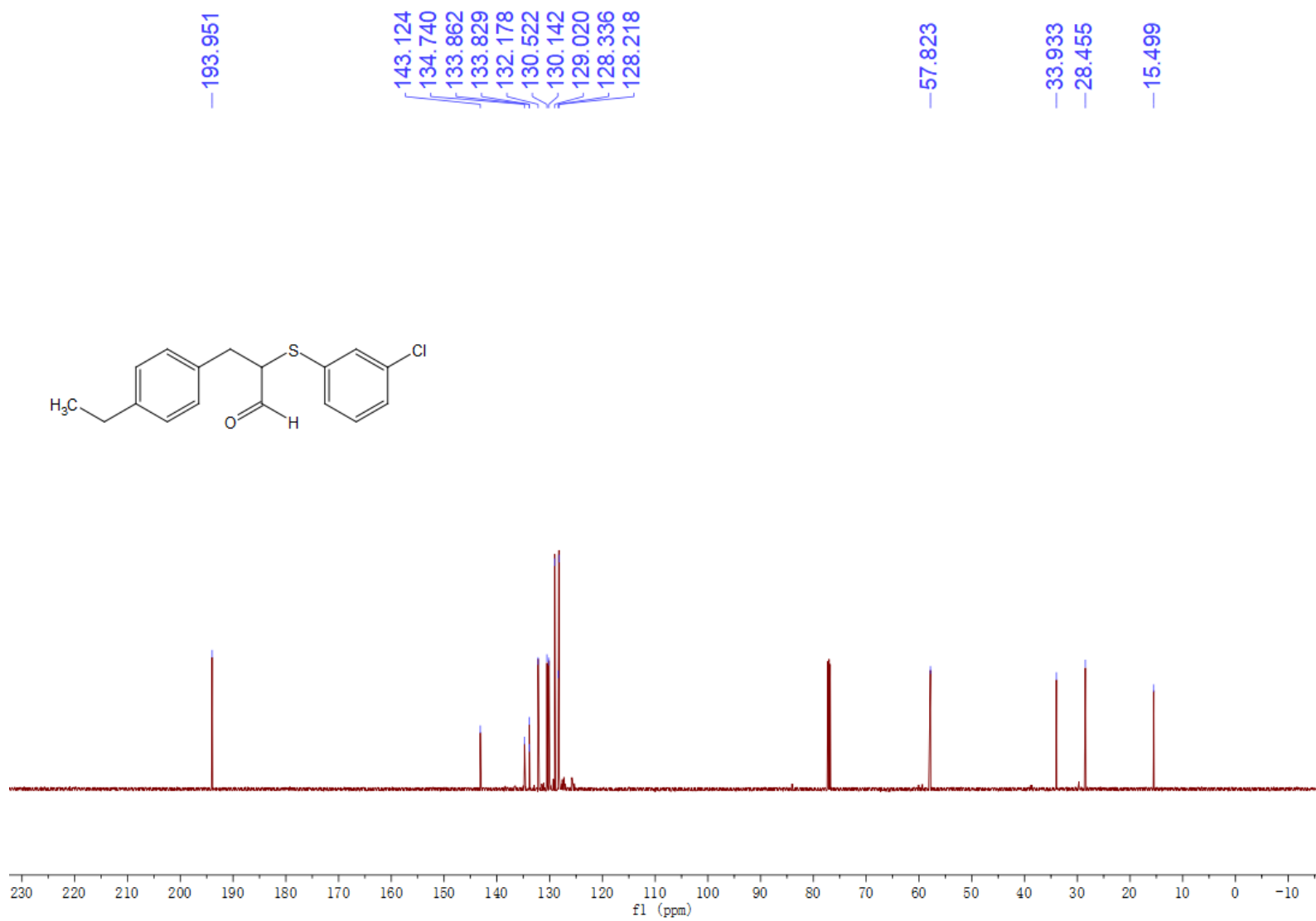


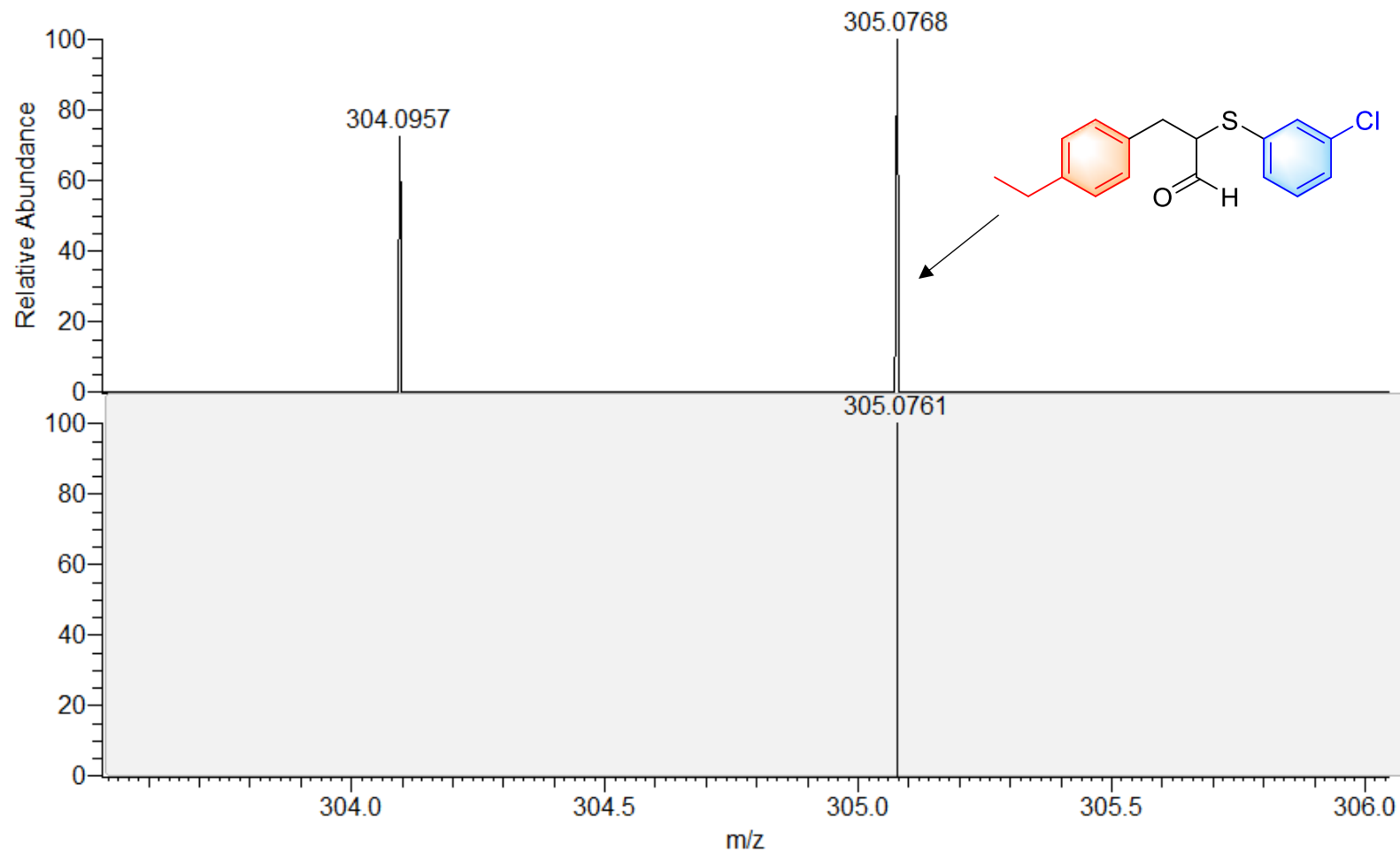
NL:
3.69E6
MOUDAN-M24#1
RT: 0.00 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
7.24E5
C₁₈ H₂₀ O₂ S +K:
C₁₈ H₂₀ O₂ S₁ K₁
pa Chrg 1

2-((3-chlorophenyl)thio)-3-(4-ethylphenyl)propanal (3cd)



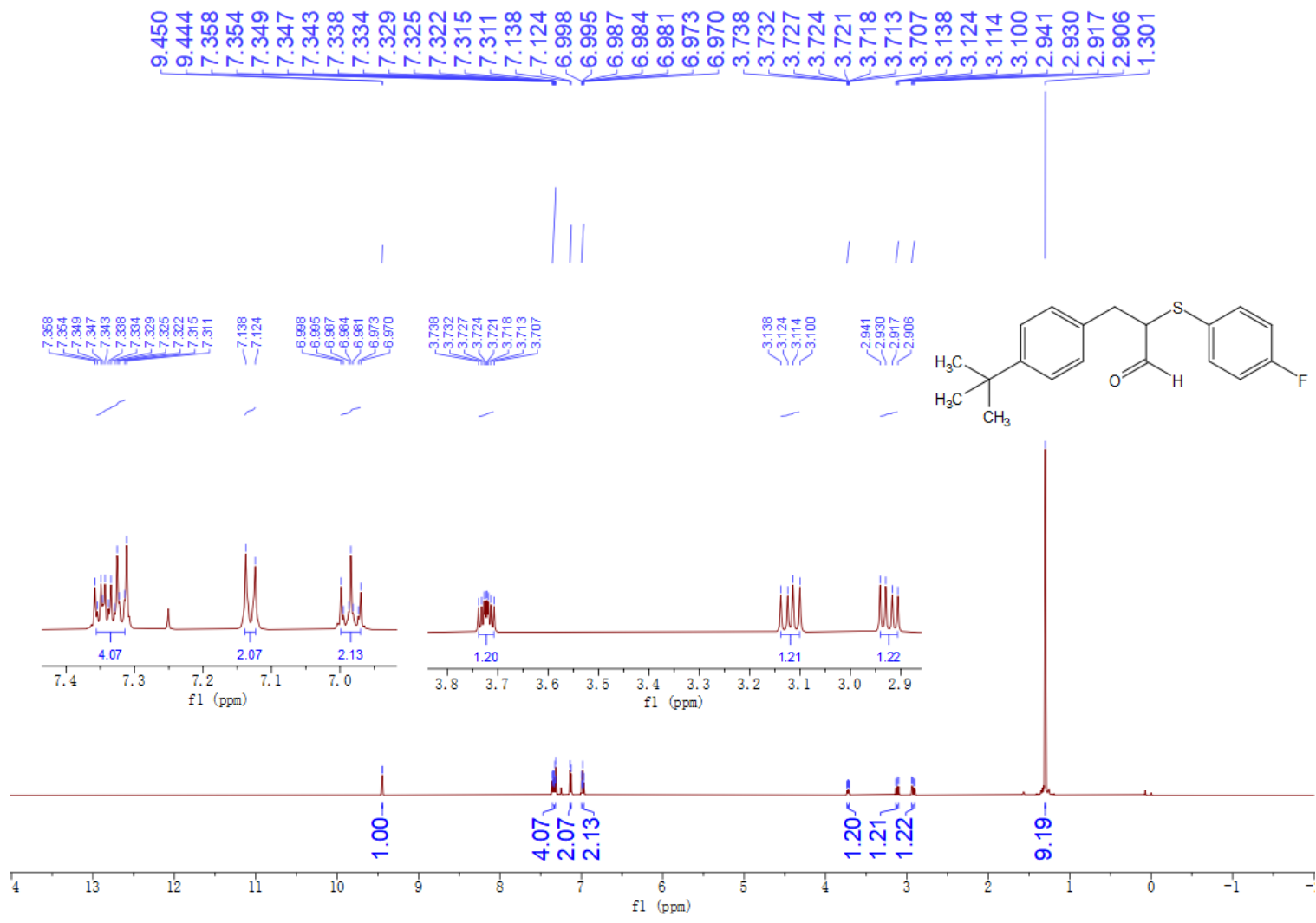


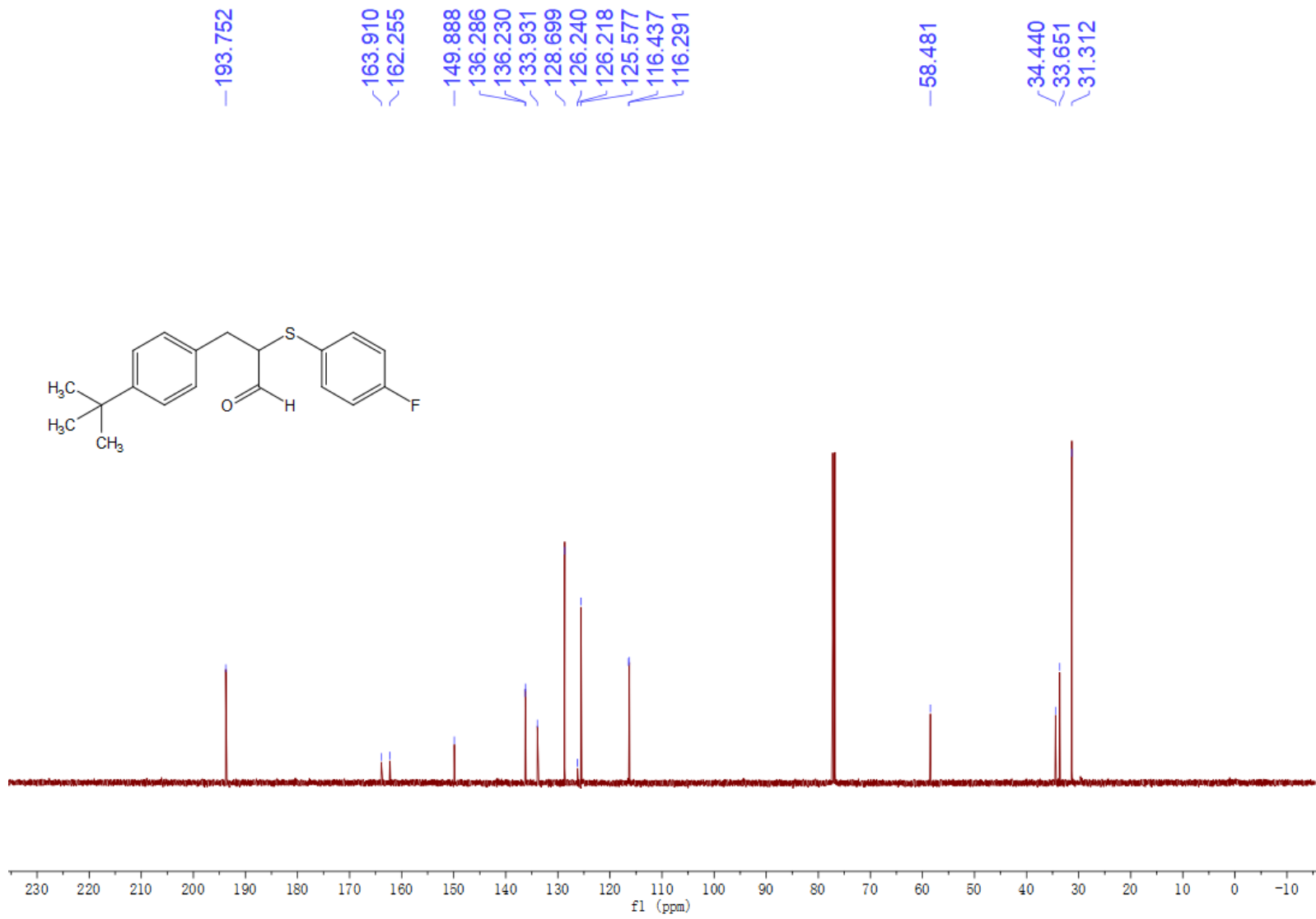


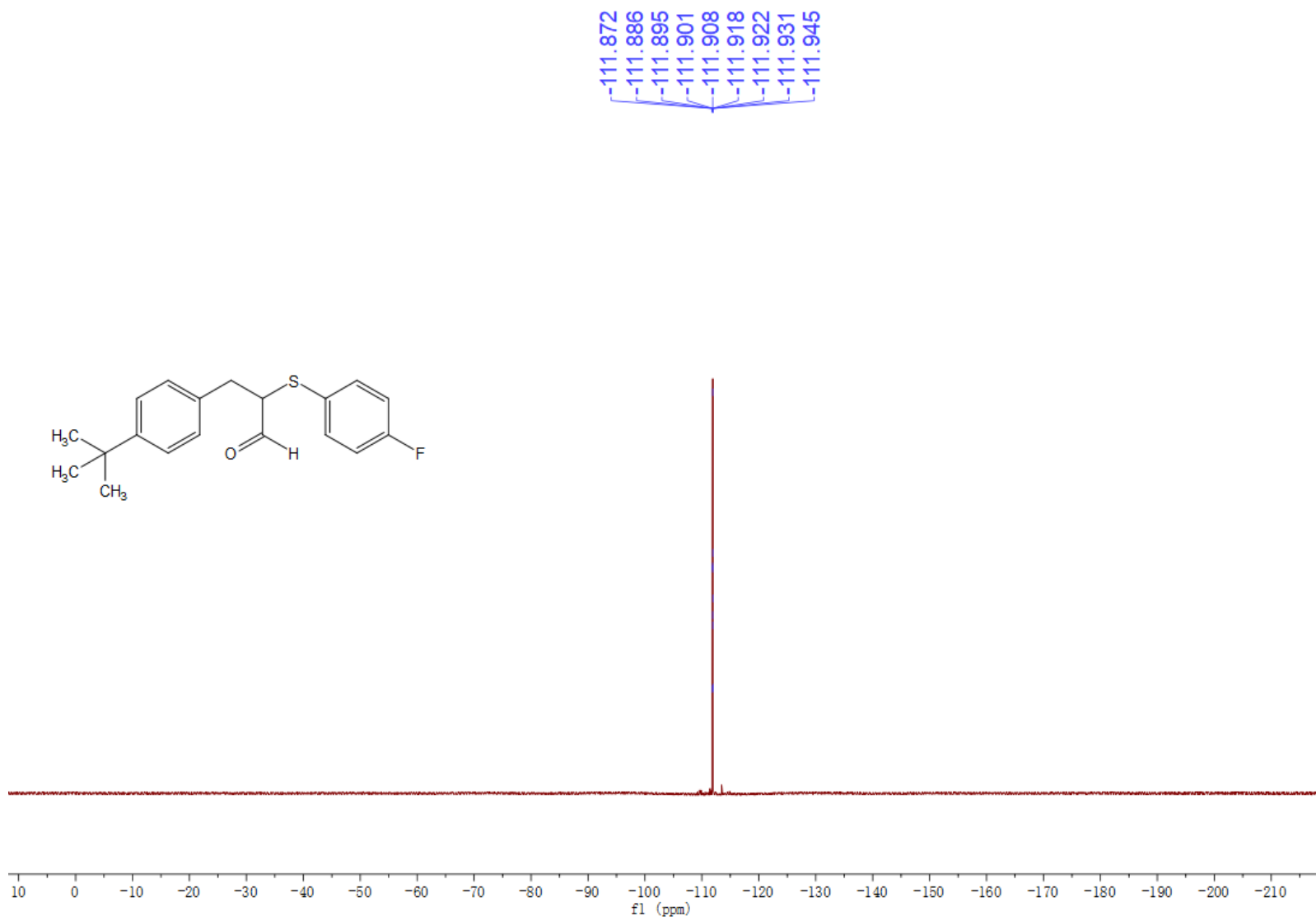
NL:
1.51E5
MOUDAN-M22#1
RT: 0.00 AV: 1 T:
FTMS + p ESI Full
ms
[60.0000-900.0000]

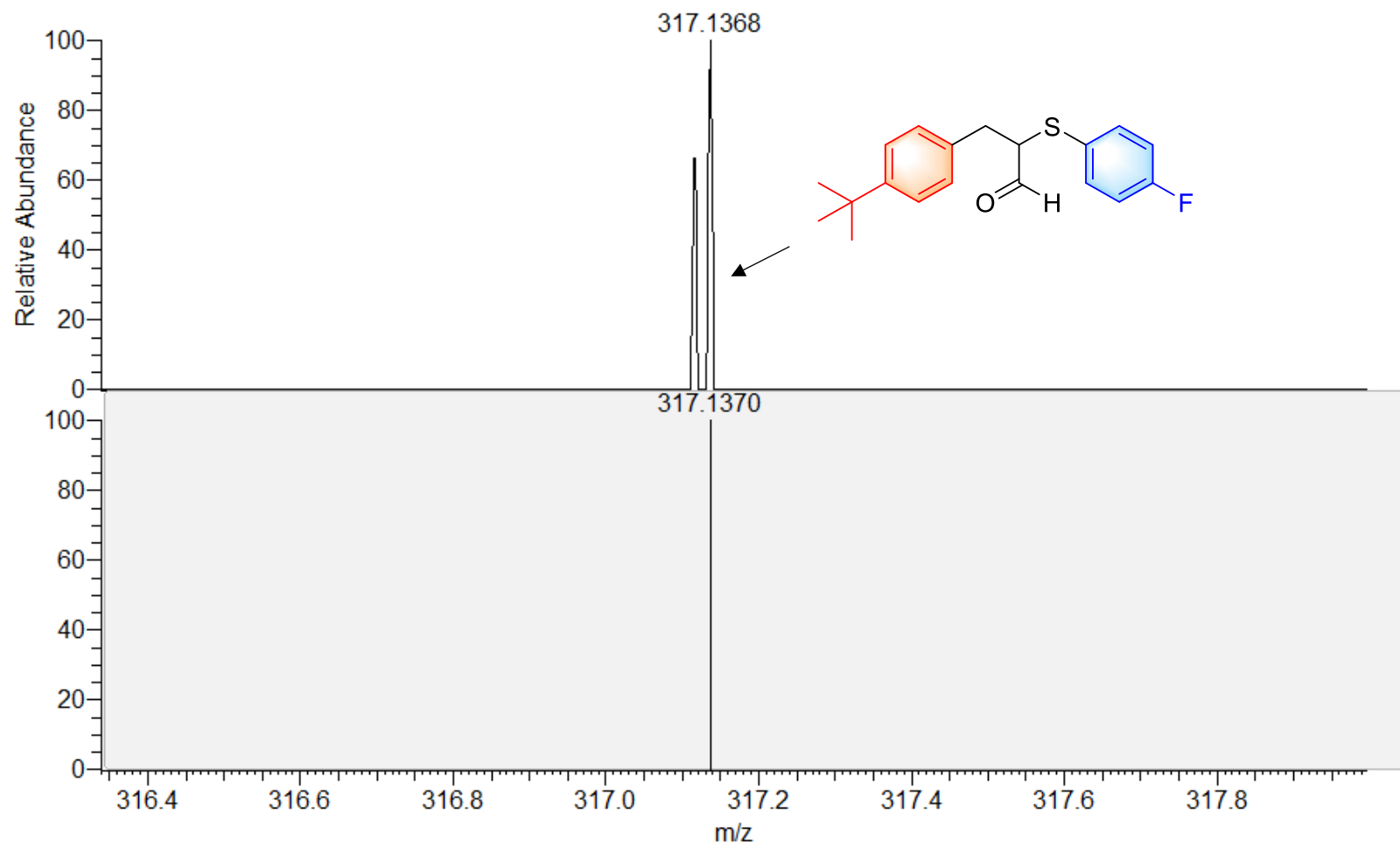
NL:
5.96E5
C₁₇ H₁₇ ClOS +H:
C₁₇ H₁₈ Cl₁ O₁ S₁
pa Chrg 1

3-(4-(*tert*-butyl)phenyl)-2-((4-fluorophenyl)thio)propanal (3ce)





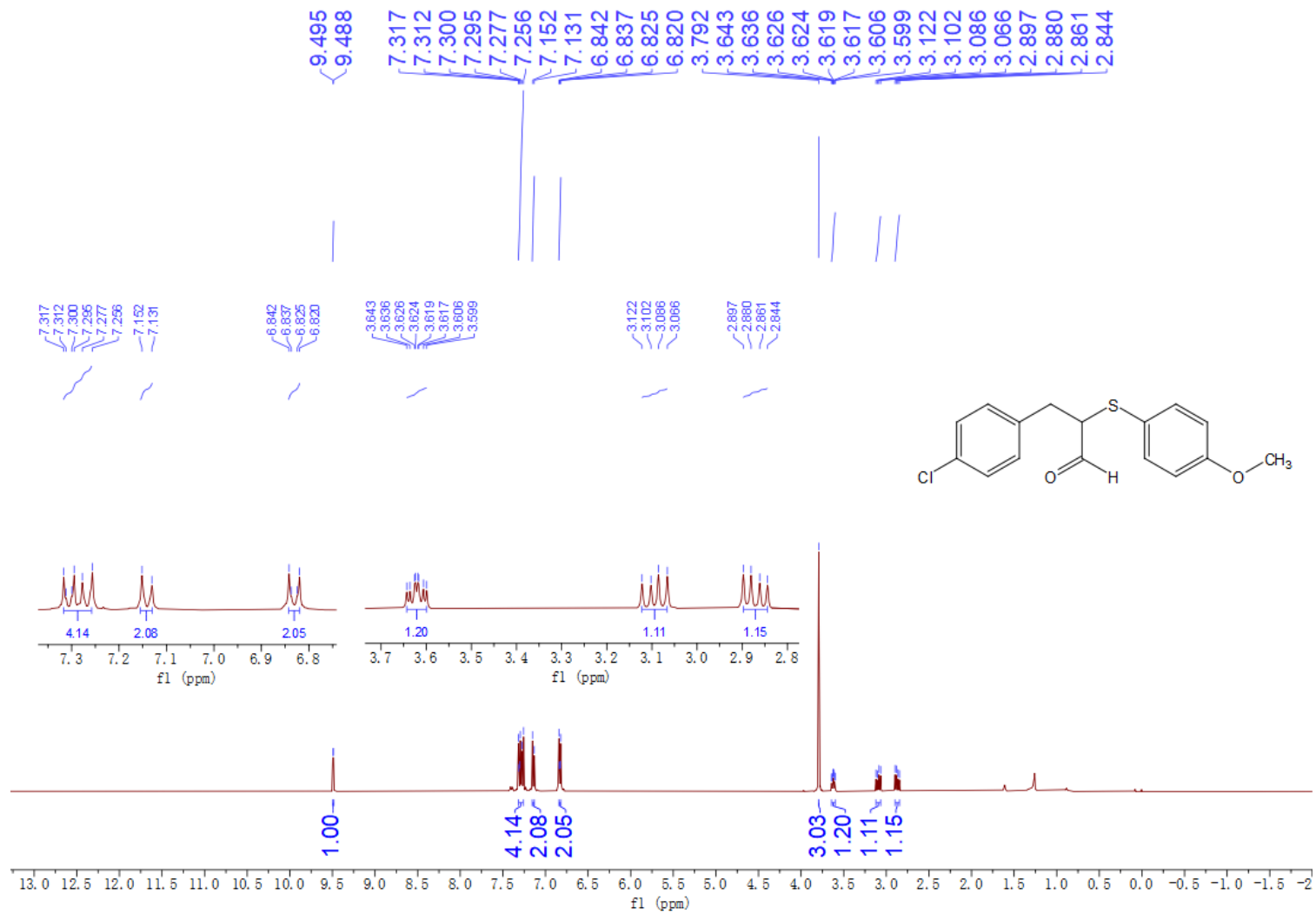


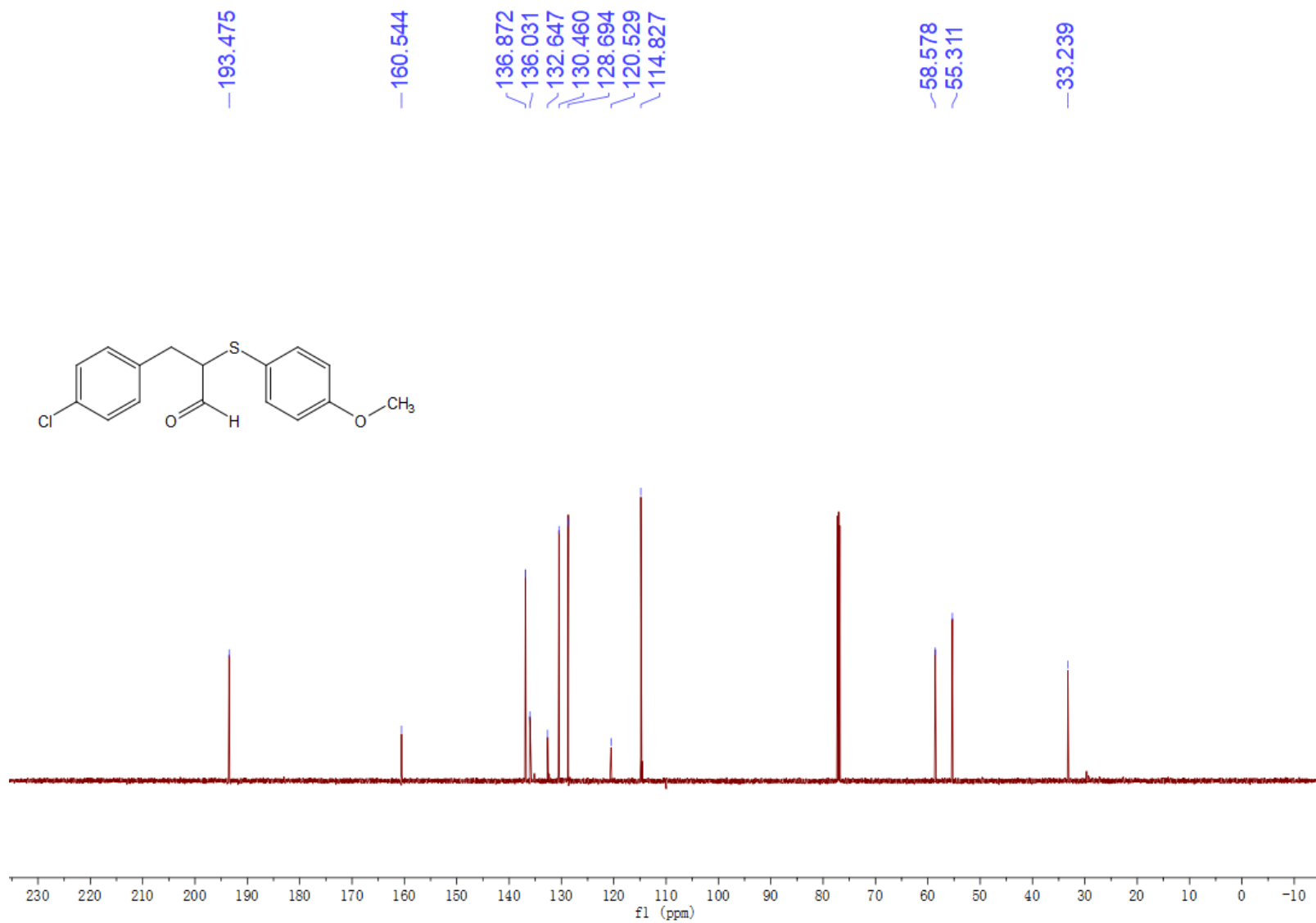


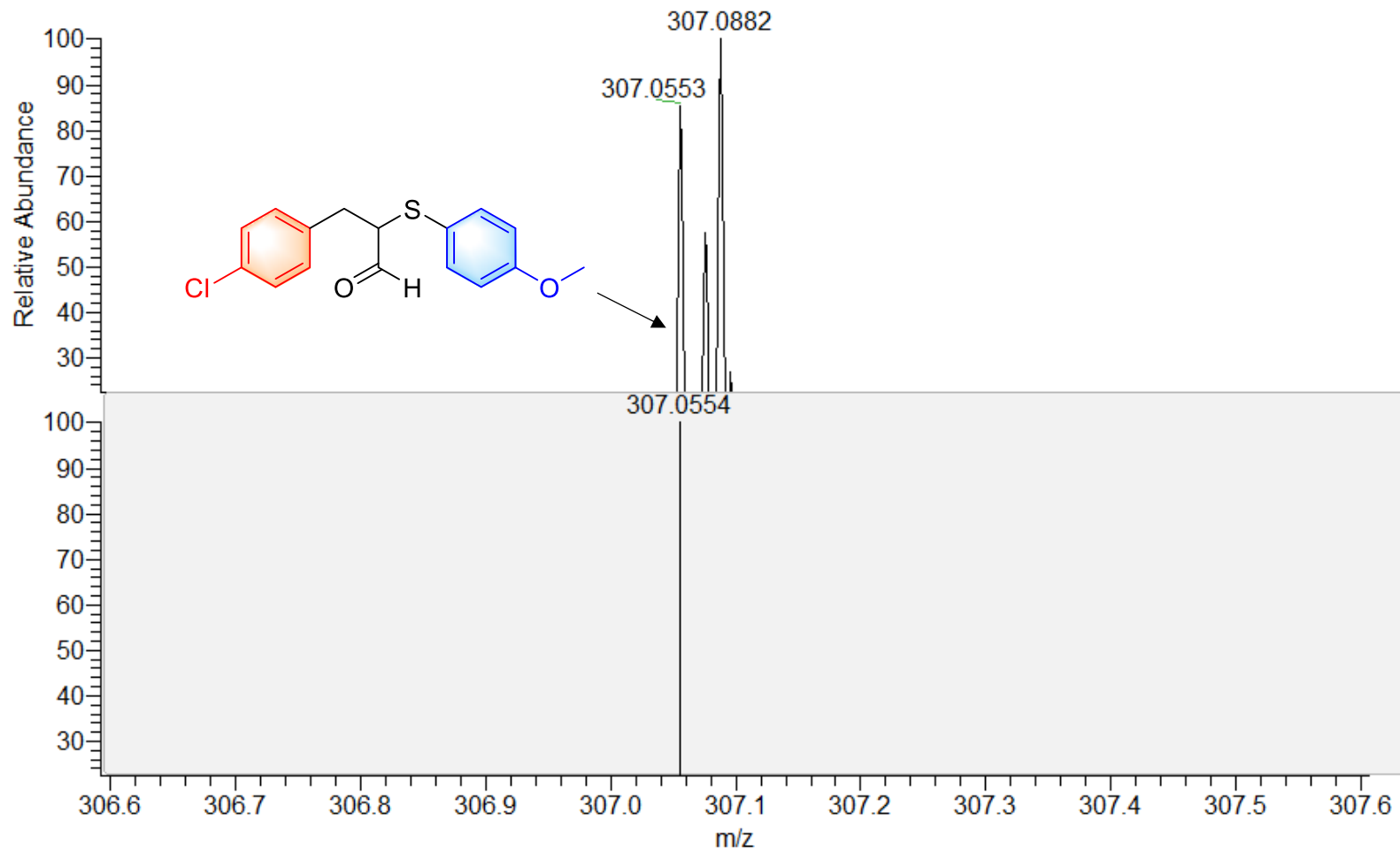
NL:
1.45E5
MOUDAN-M19#38
RT: 0.17 AV: 1 T:
FTMS + p ESI Full
lock ms
[100.0000-
900.0000]

NL:
7.70E5
C₁₉ H₂₁ FOS +H:
C₁₉ H₂₂ F₁ O₁ S₁
pa Chrg 1

3-(4-chlorophenyl)-2-((4-methoxyphenyl)thio)propanal (3cf)





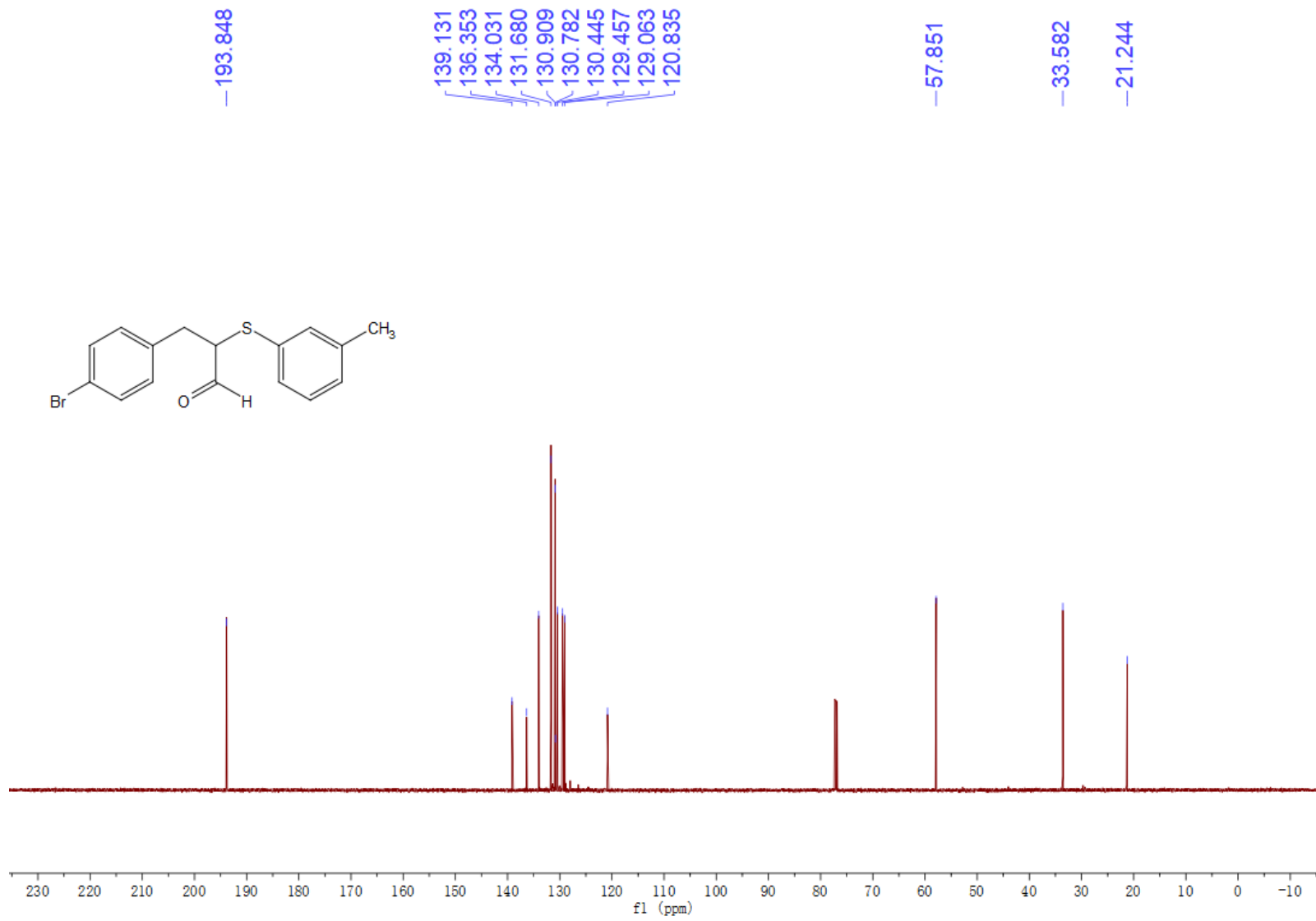


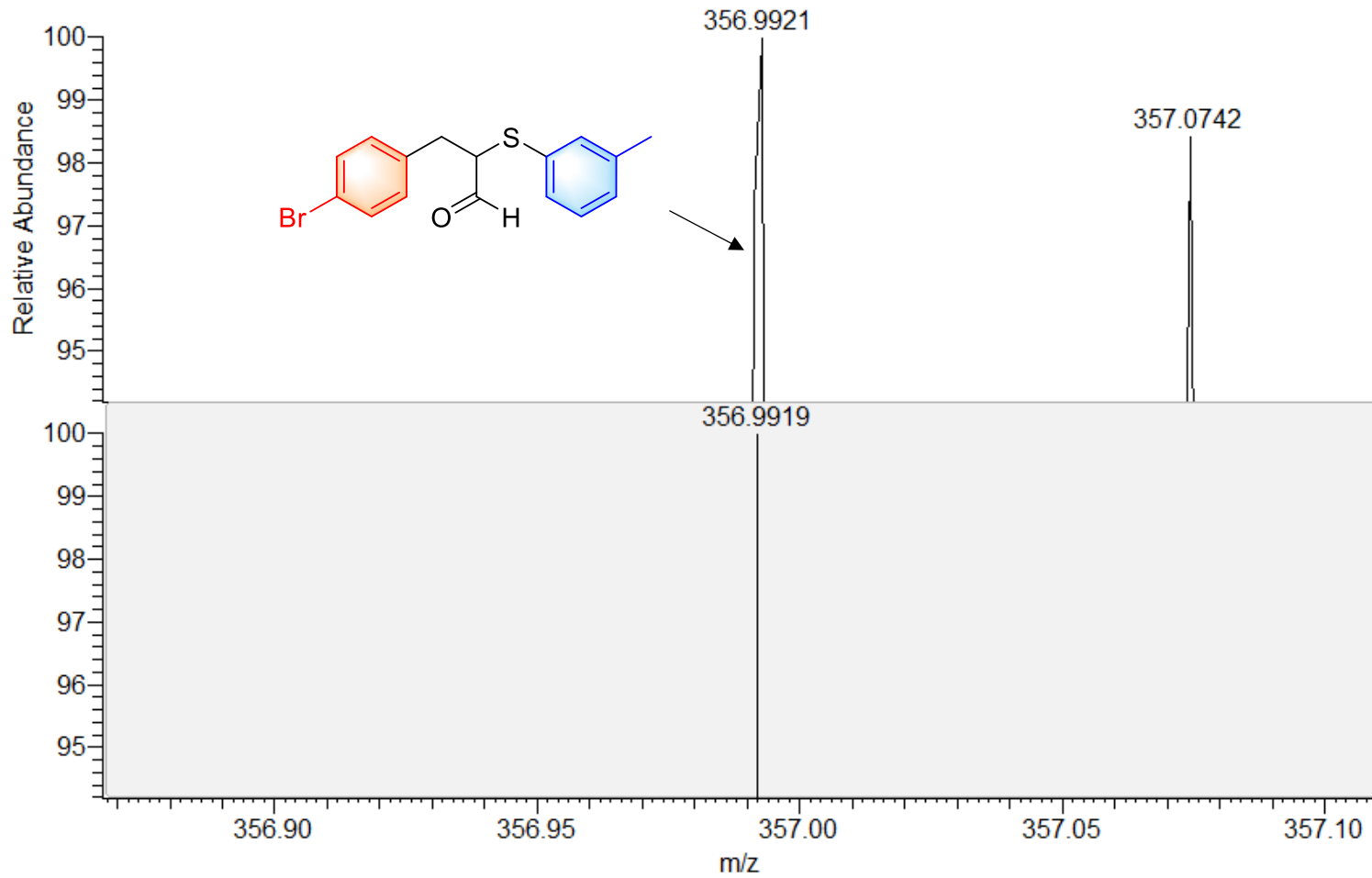
NL:
2.08E6
DZHY-MOUDAN-
M7#58 RT: 0.26 AV:
1 T: FTMS + p ESI
Full lock ms
[60.0000-750.0000]

NL:
6.02E5
C₁₆ H₁₅ ClO₂ S +H:
C₁₆ H₁₆ Cl₁ O₂ S₁
pa Chrg 1

3-(4-bromophenyl)-2-(*m*-tolylthio)propanal (3cg)



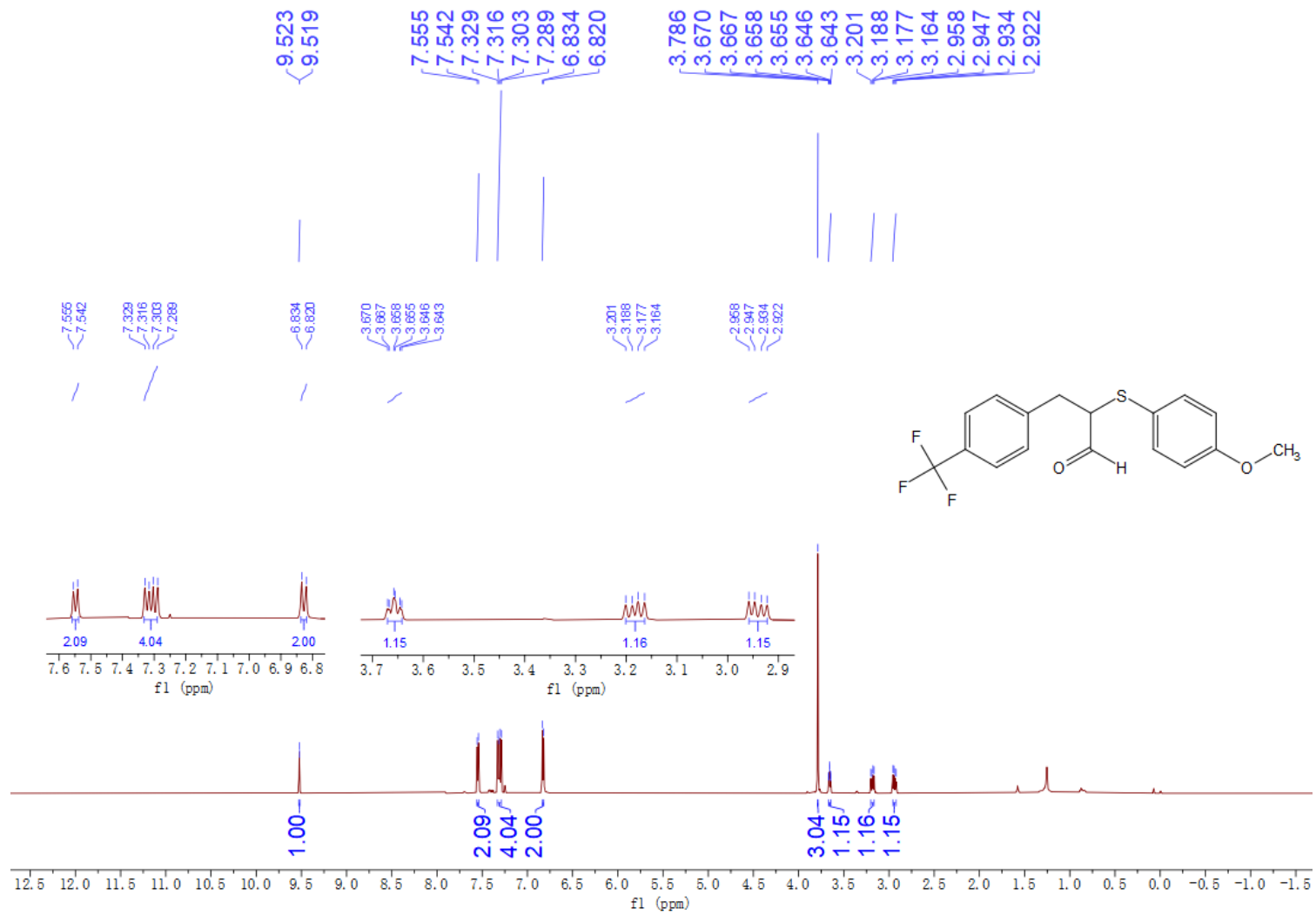


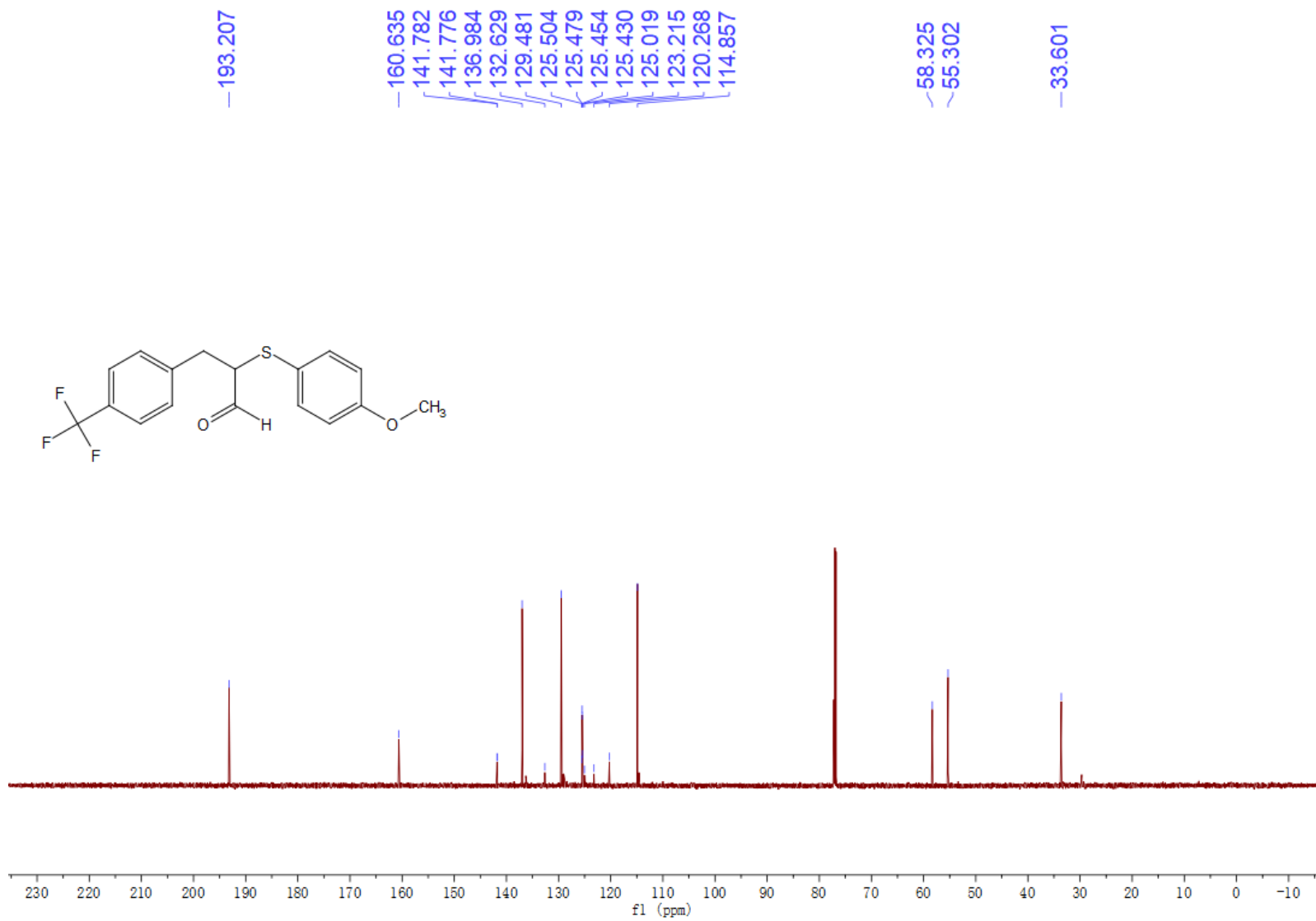


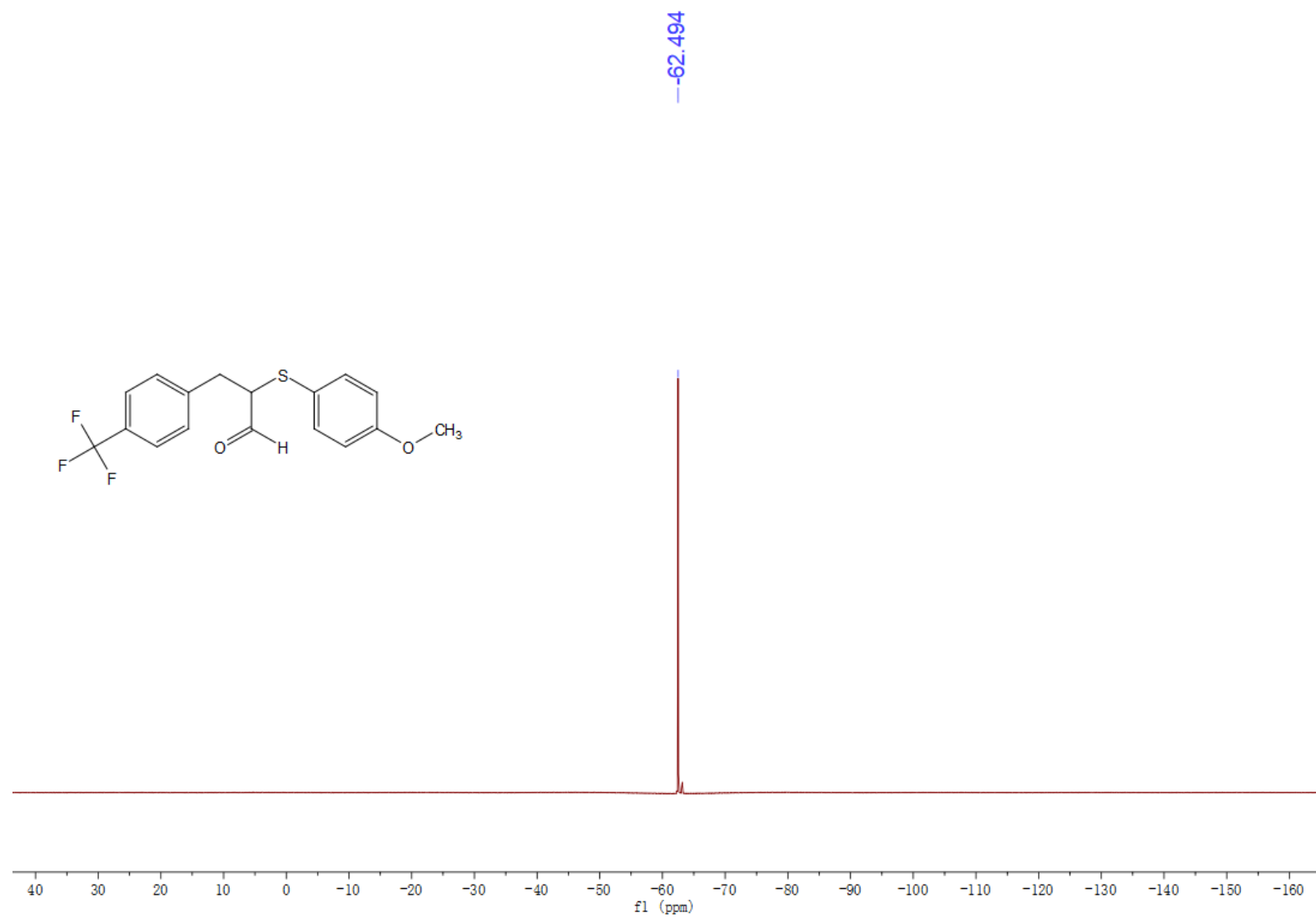
NL:
1.16E5
MOUDAN-M24#97 RT:
0.43 AV: 1 T: FTMS + p
ESI Full lock ms
[60.0000-900.0000]

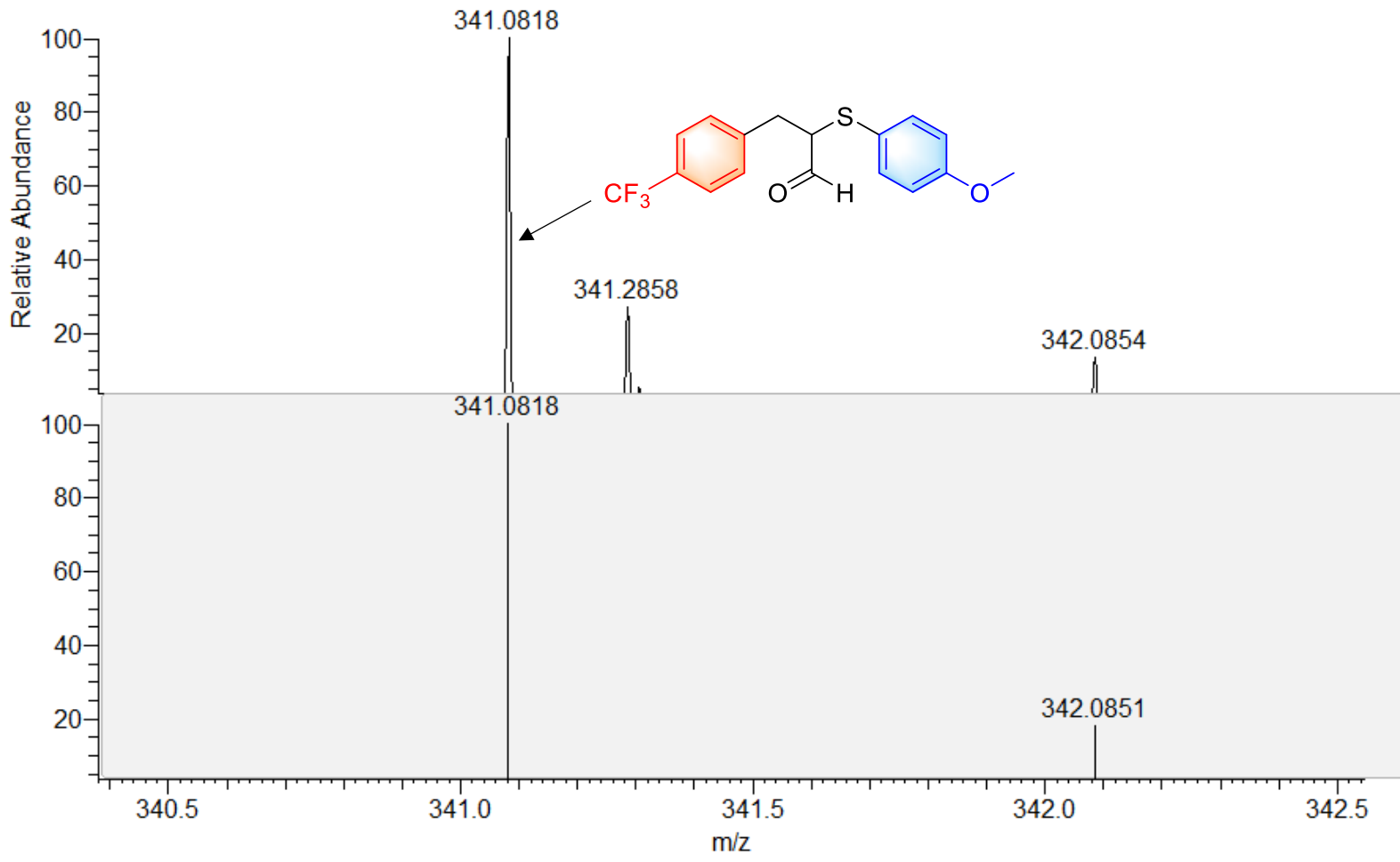
NL:
4.03E5
C₁₆ H₁₅ BrOS +Na:
C₁₆ H₁₅ Br₁ O₁ S₁ Na₁
pa Chrg 1

2-((4-methoxyphenyl)thio)-3-(4-(trifluoromethyl)phenyl)propanal (3ch)





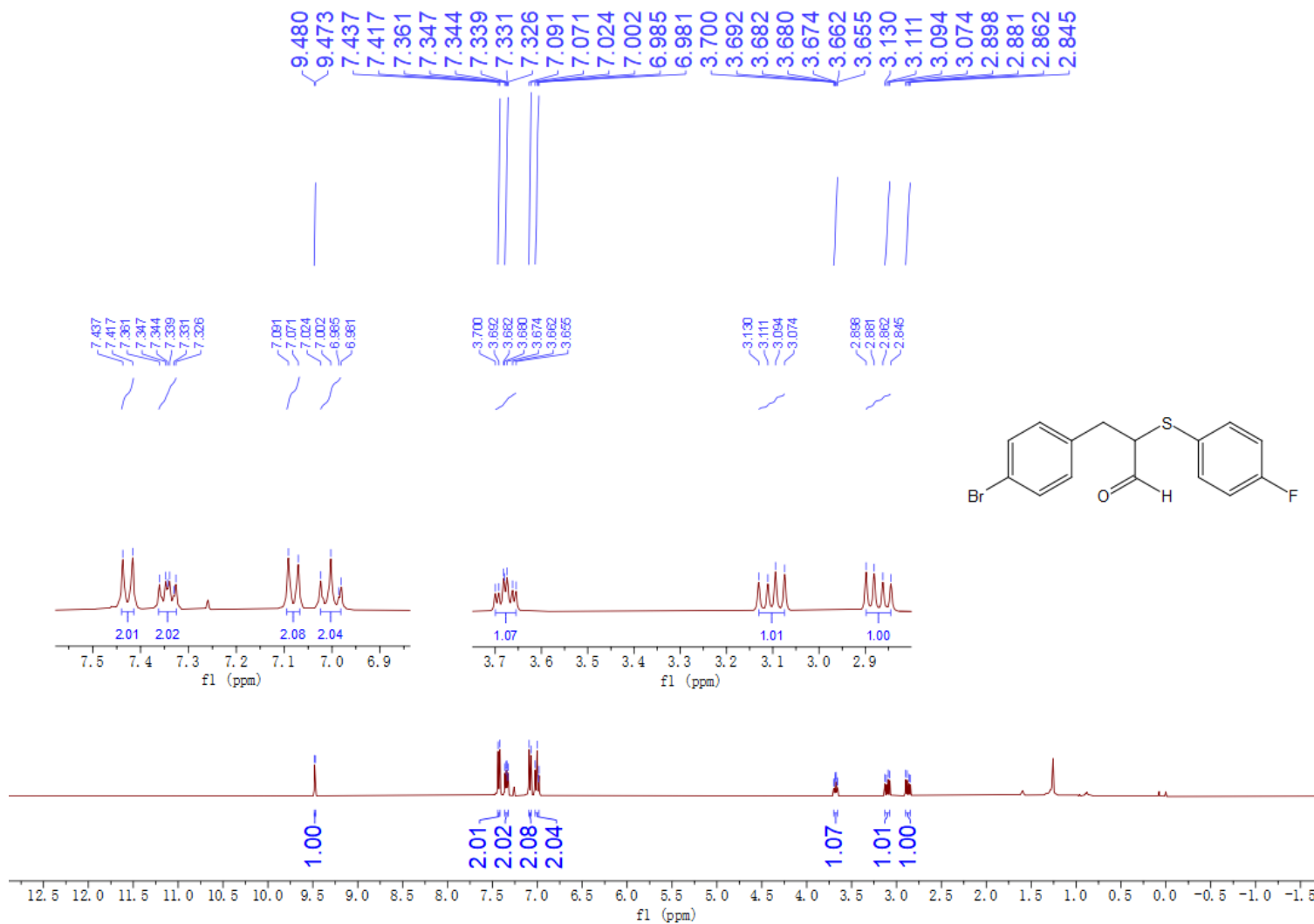


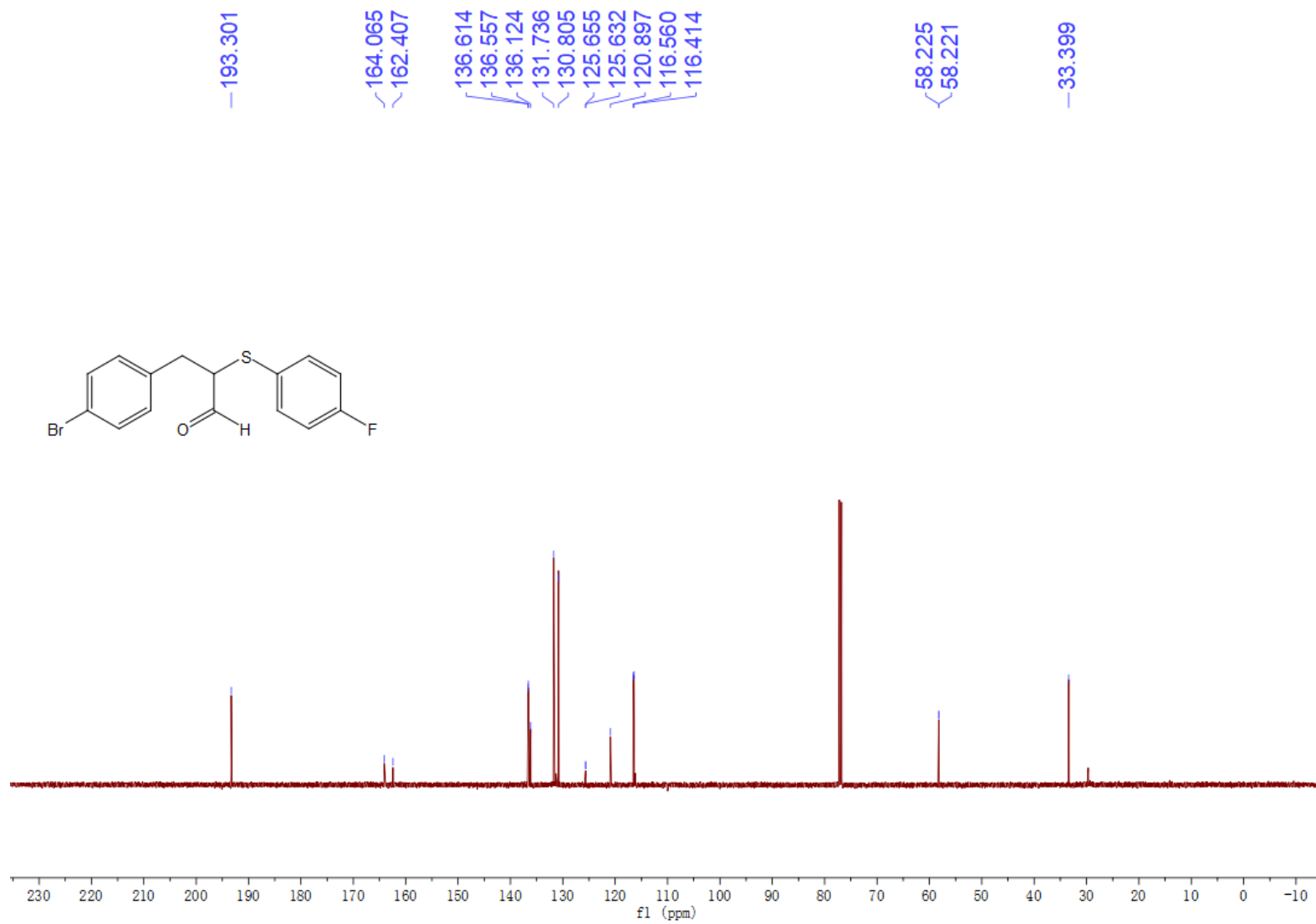


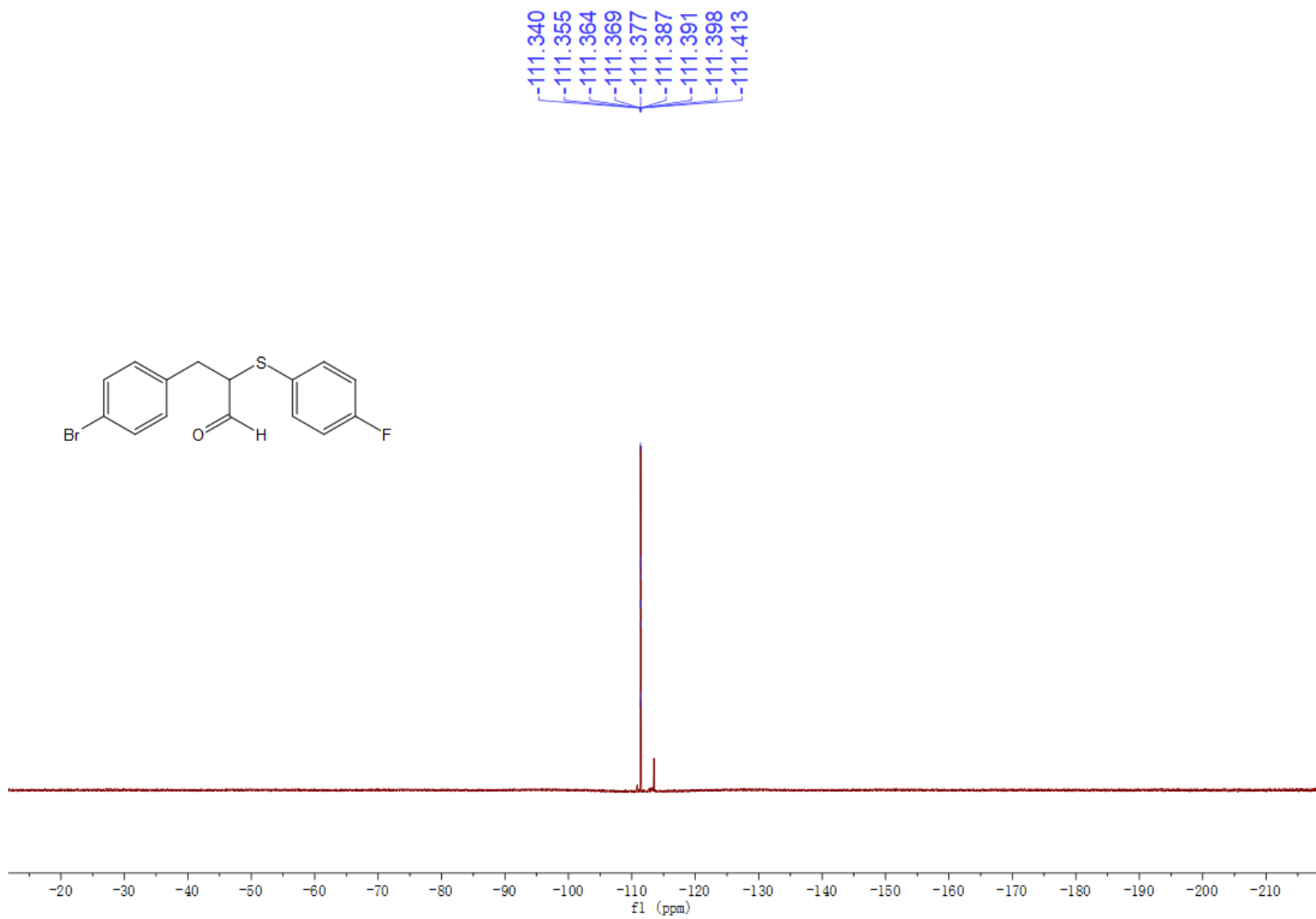
NL:
3.42E6
MOUDAN-M32#80
RT: 0.36 AV: 1 T:
FTMS + p ESI Full
lock ms
[66.7000-1000.0000]

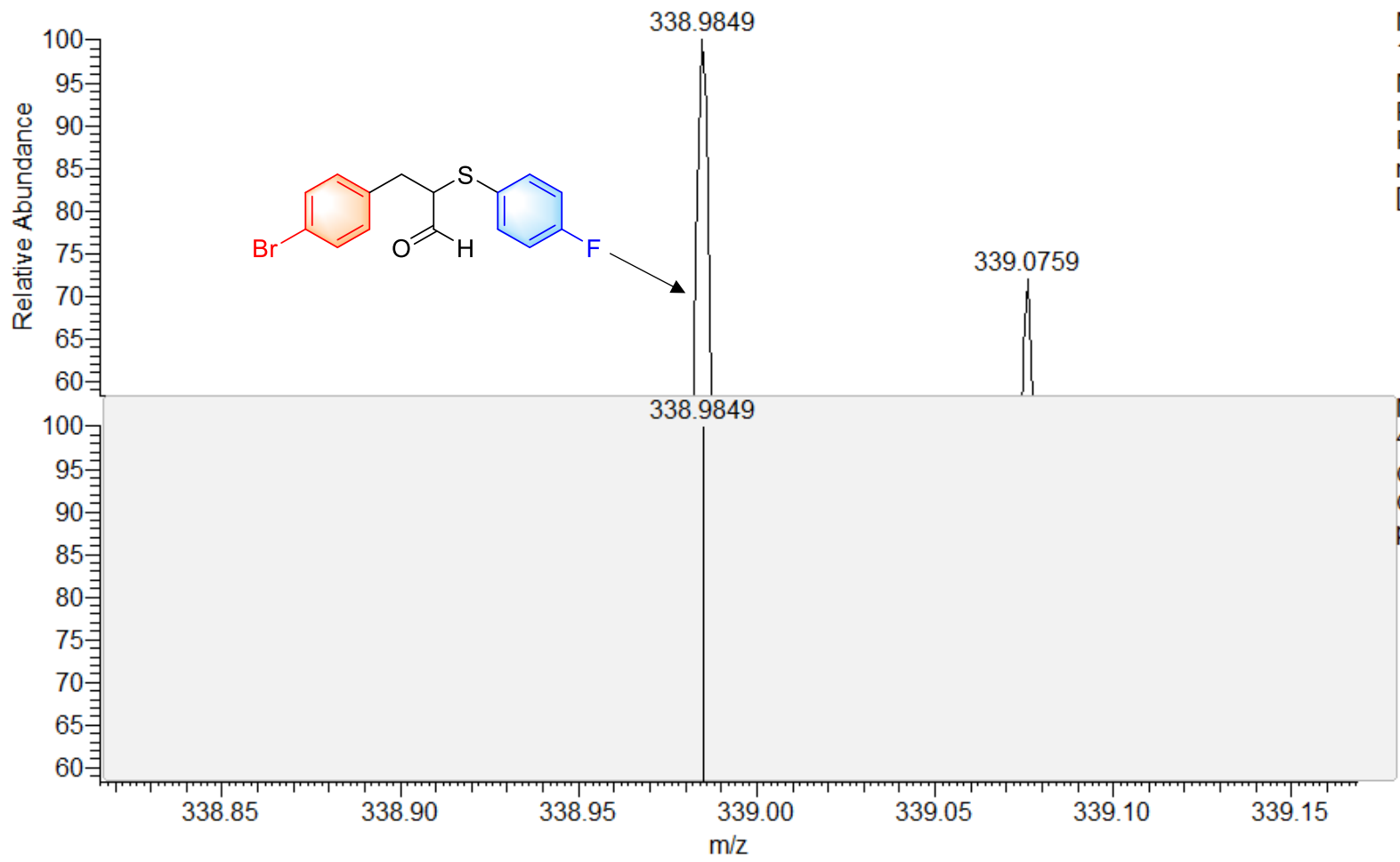
NL:
7.85E5
C₁₇ H₁₅ F₃ O₂ S +H:
C₁₇ H₁₆ F₃ O₂ S₁
pa Chrg 1

3-(4-bromophenyl)-2-((4-fluorophenyl)thio)propanal (3ci)





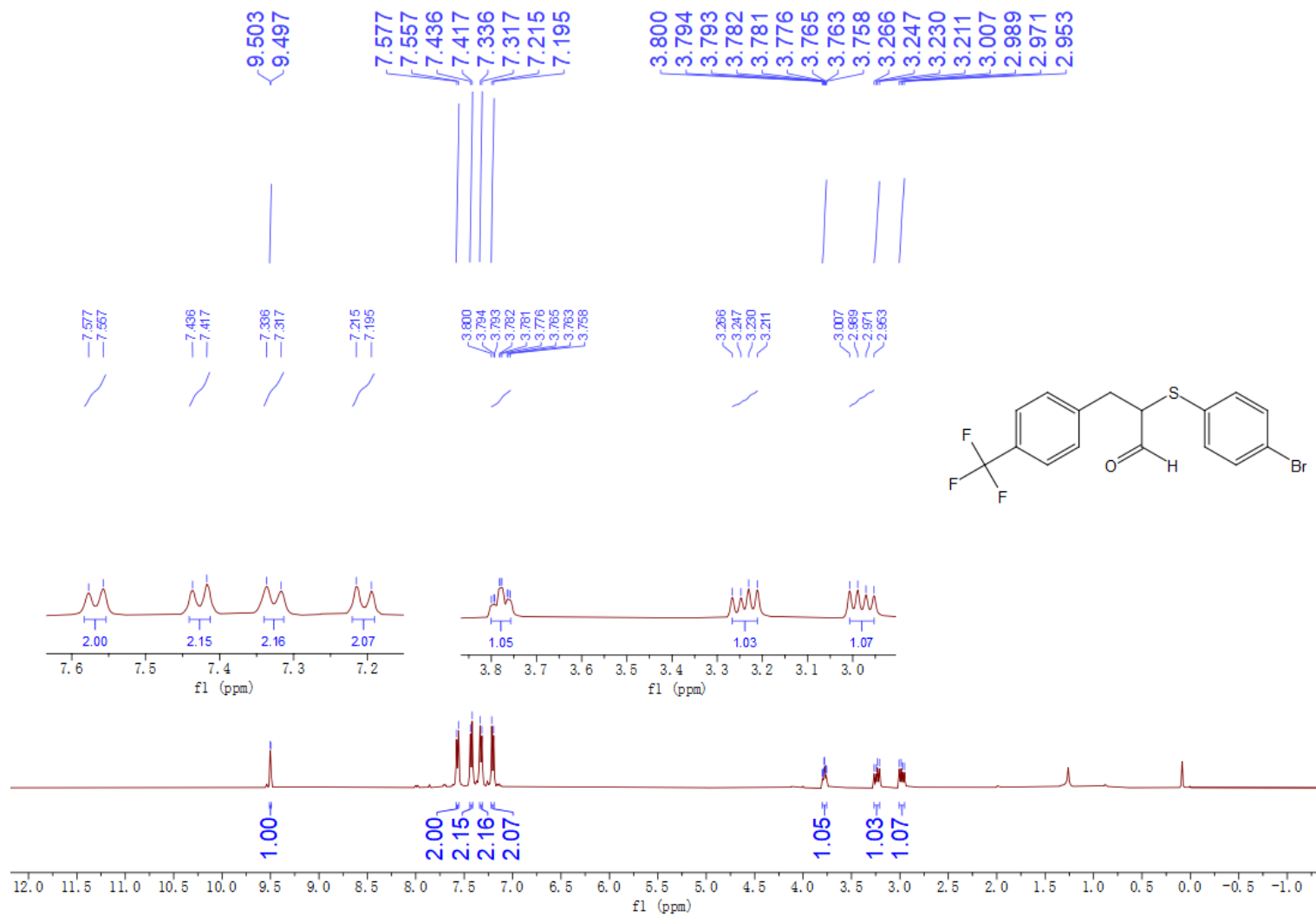


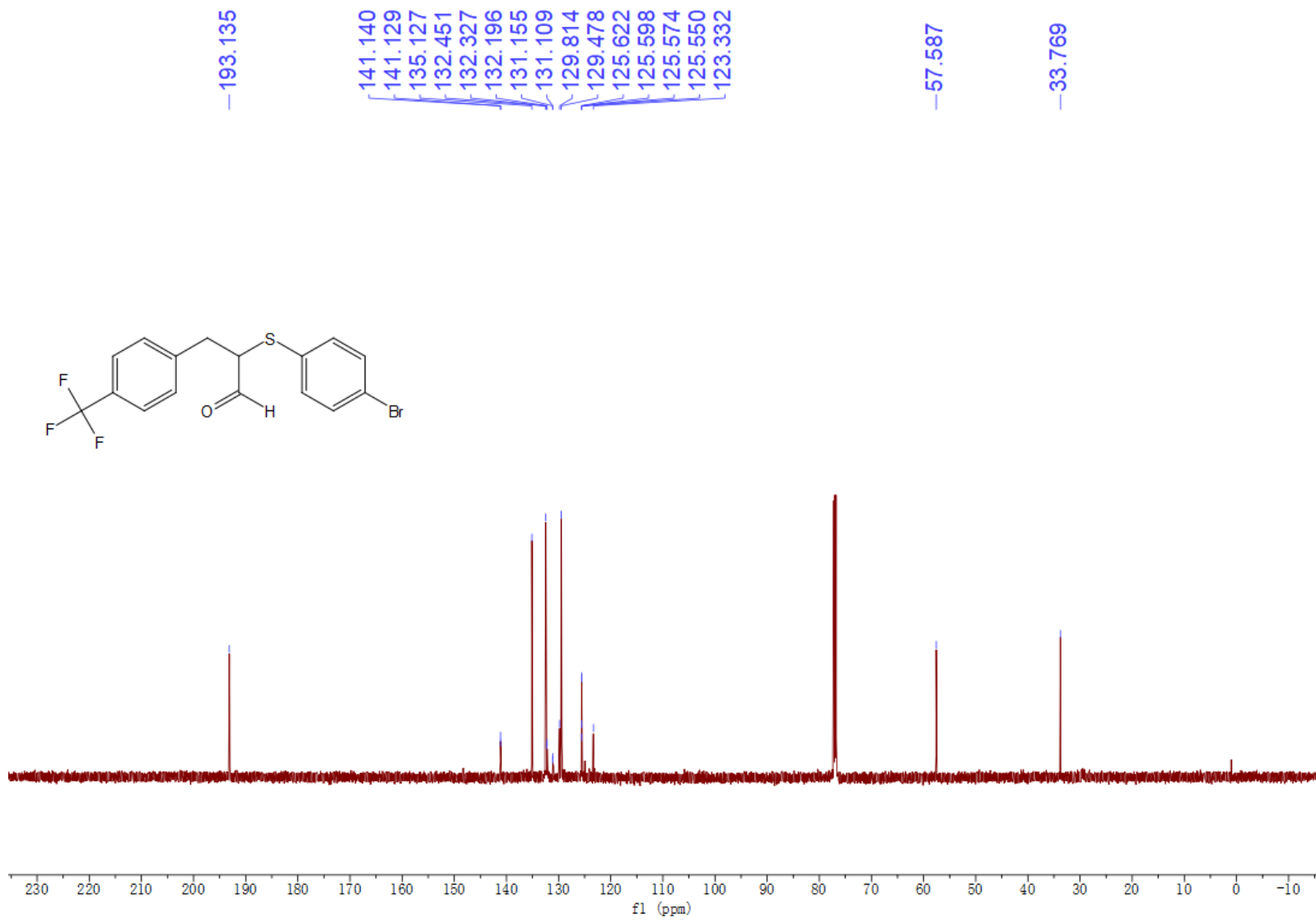


NL:
1.41E5
MOUDAN-M27#38
RT: 0.17 AV: 1 T:
FTMS + p ESI Full lock
ms
[66.7000-1000.0000]

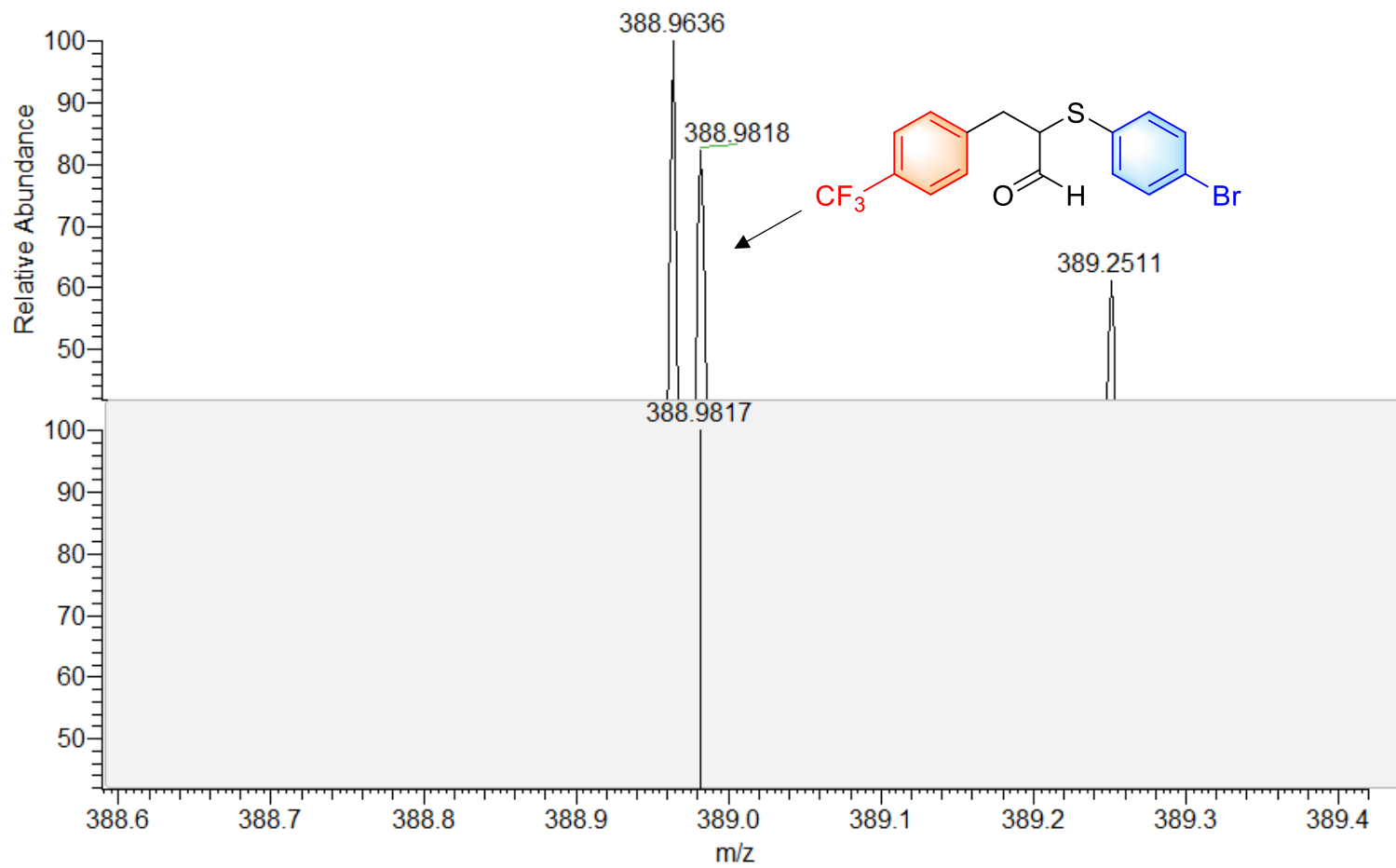
NL:
4.08E5
C₁₅ H₁₂ BrFOS +H:
C₁₅ H₁₃ Br₁ F₁ O₁ S₁
pa Chrg 1

2-((4-bromophenyl)thio)-3-(4-(trifluoromethyl)phenyl)propanal (3cj)





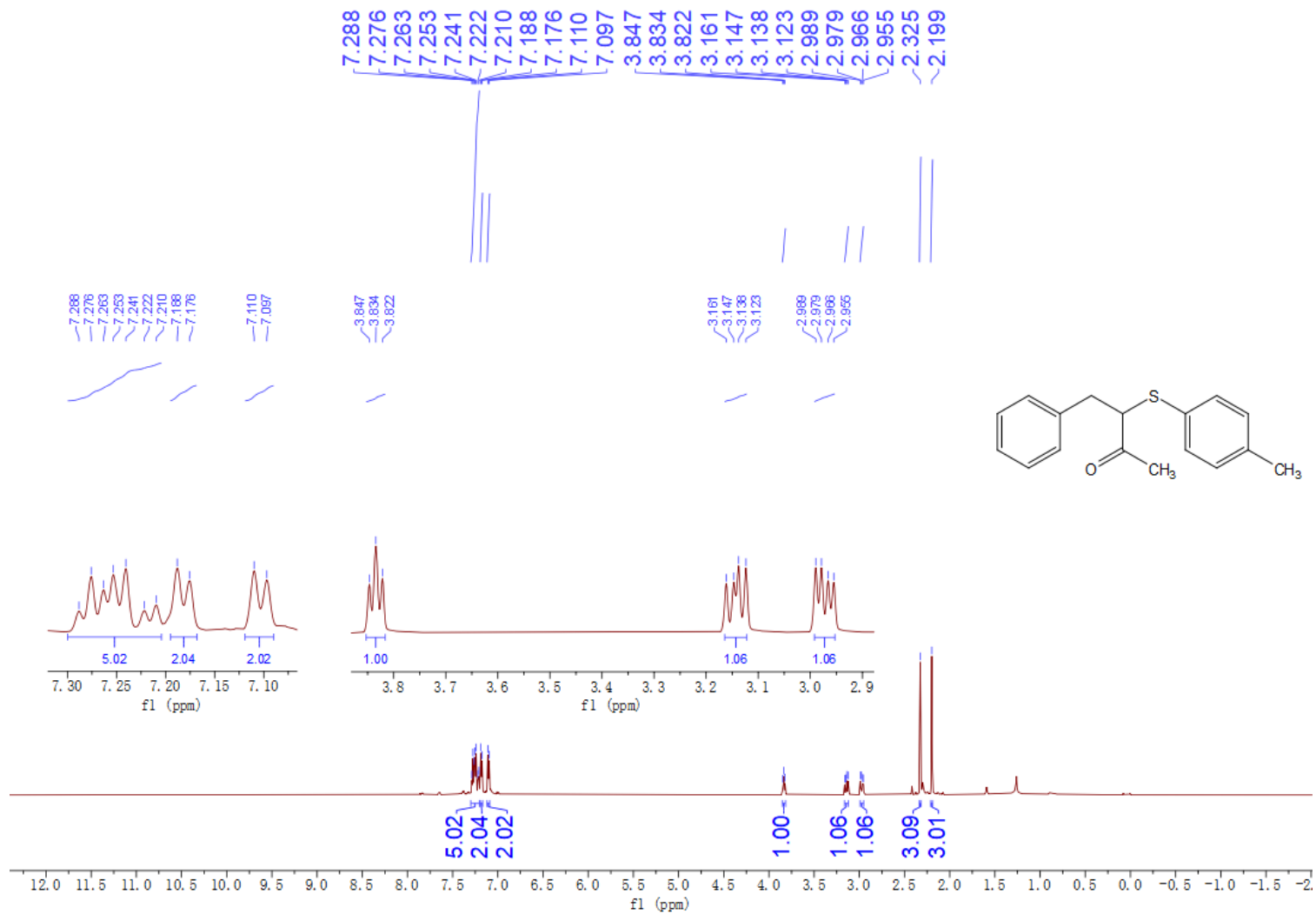


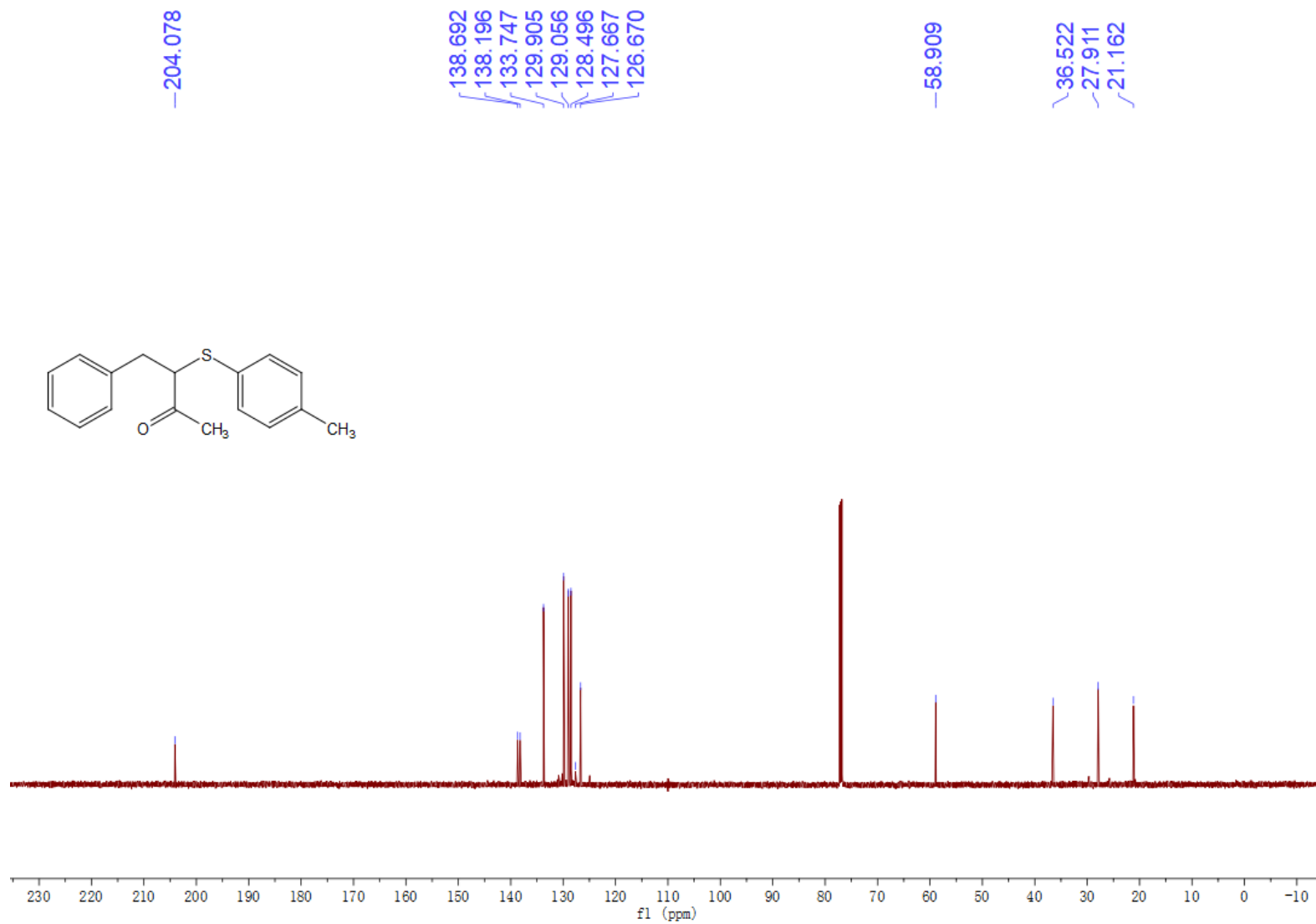


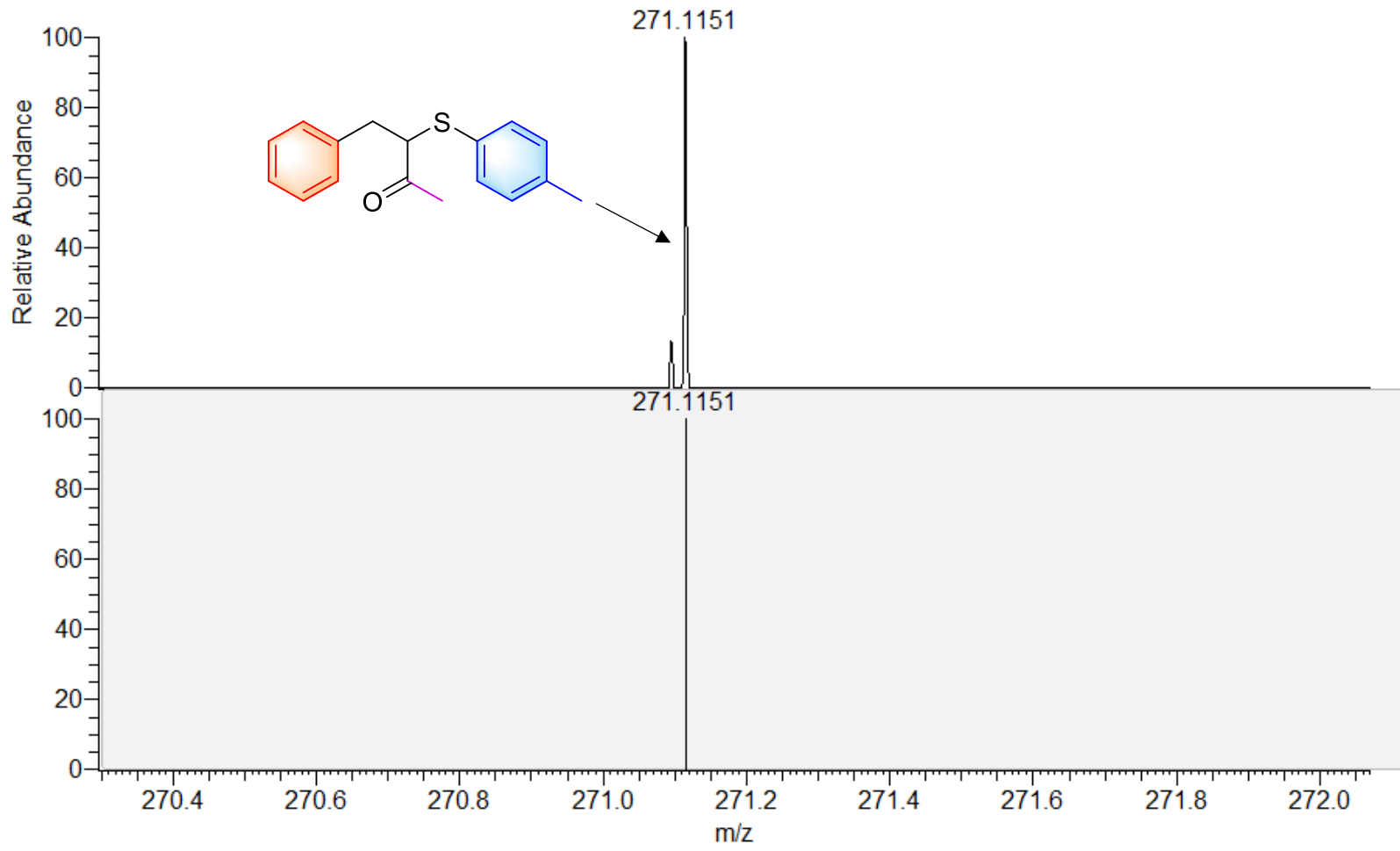
NL:
 3.17E5
 MOUDAN-M29#36
 RT: 0.16 AV: 1 T:
 FTMS + p ESI Full lock
 ms
 [50.0000-750.0000]

NL:
 4.04E5
 C₁₆ H₁₂ BrF₃ OS +H:
 C₁₆ H₁₃ Br₁ F₃ O₁ S₁
 pa Chrg 1

4-phenyl-3-(*p*-tolylthio)butan-2-one (3da)





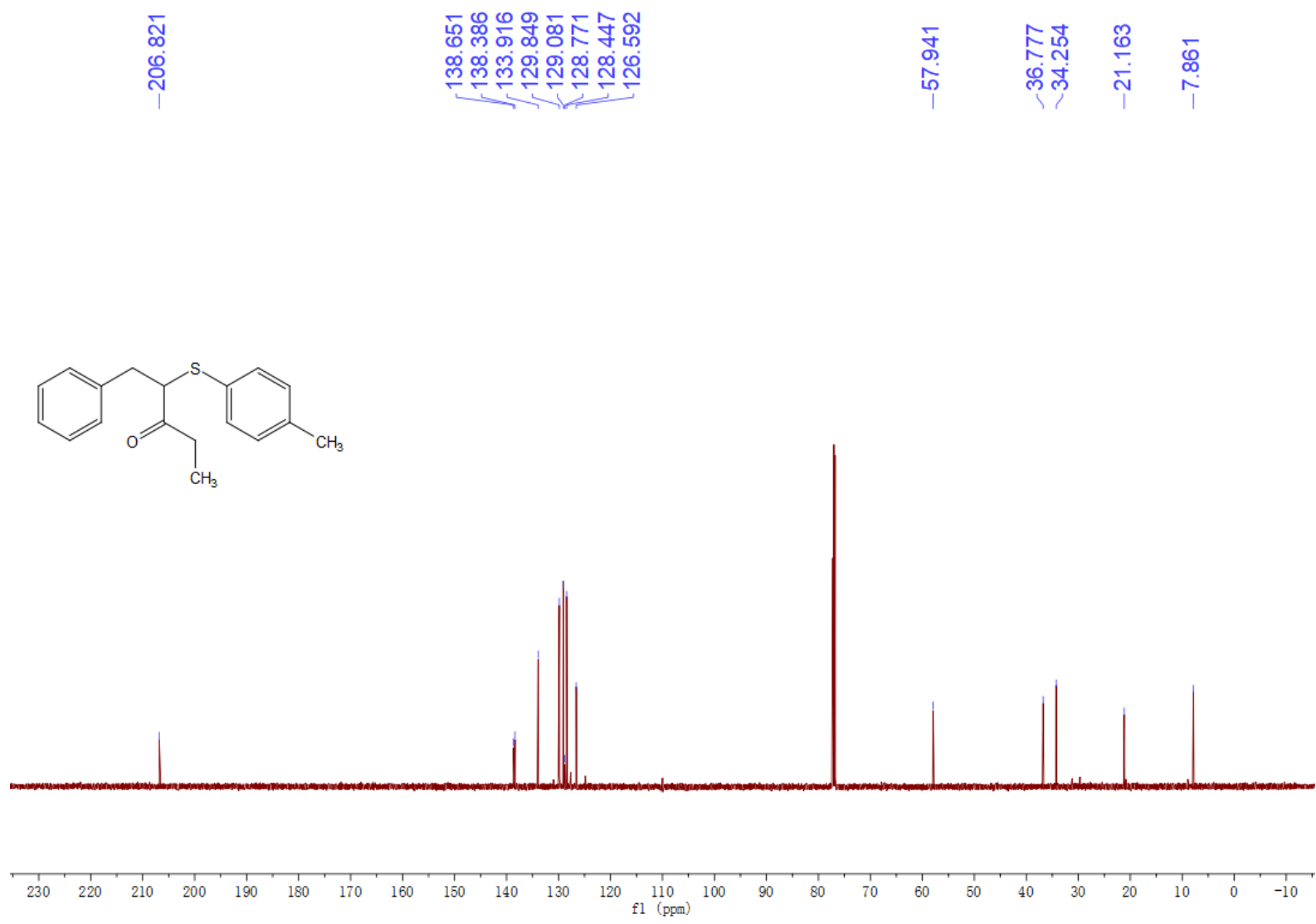


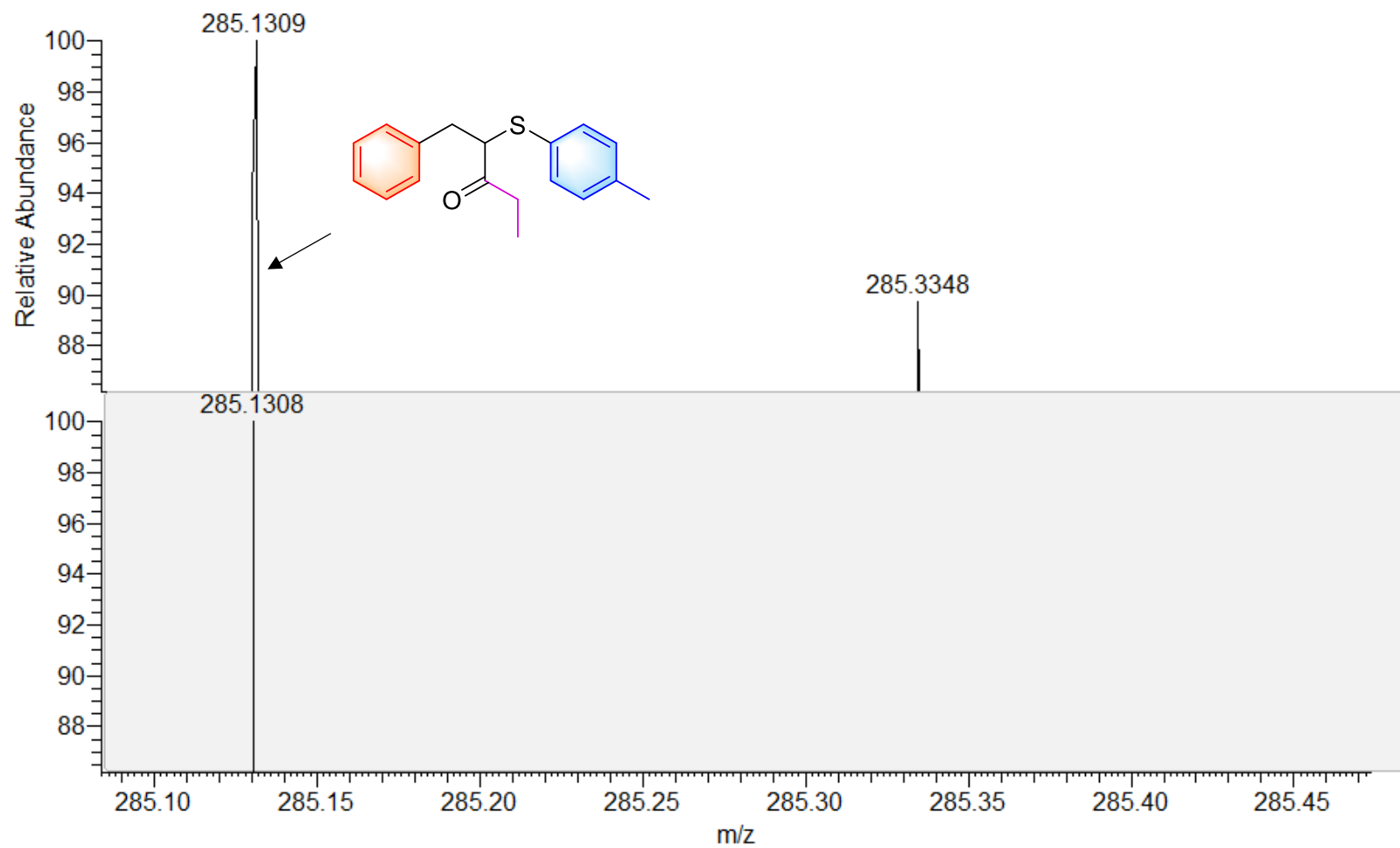
NL:
8.76E5
MOUDAN-M24#23
RT: 0.10 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
7.87E5
C₁₇ H₁₈ OS +H:
C₁₇ H₁₉ O₁ S₁
pa Chrg 1

1-phenyl-2-(*p*-tolylthio)pentan-3-one (3db)



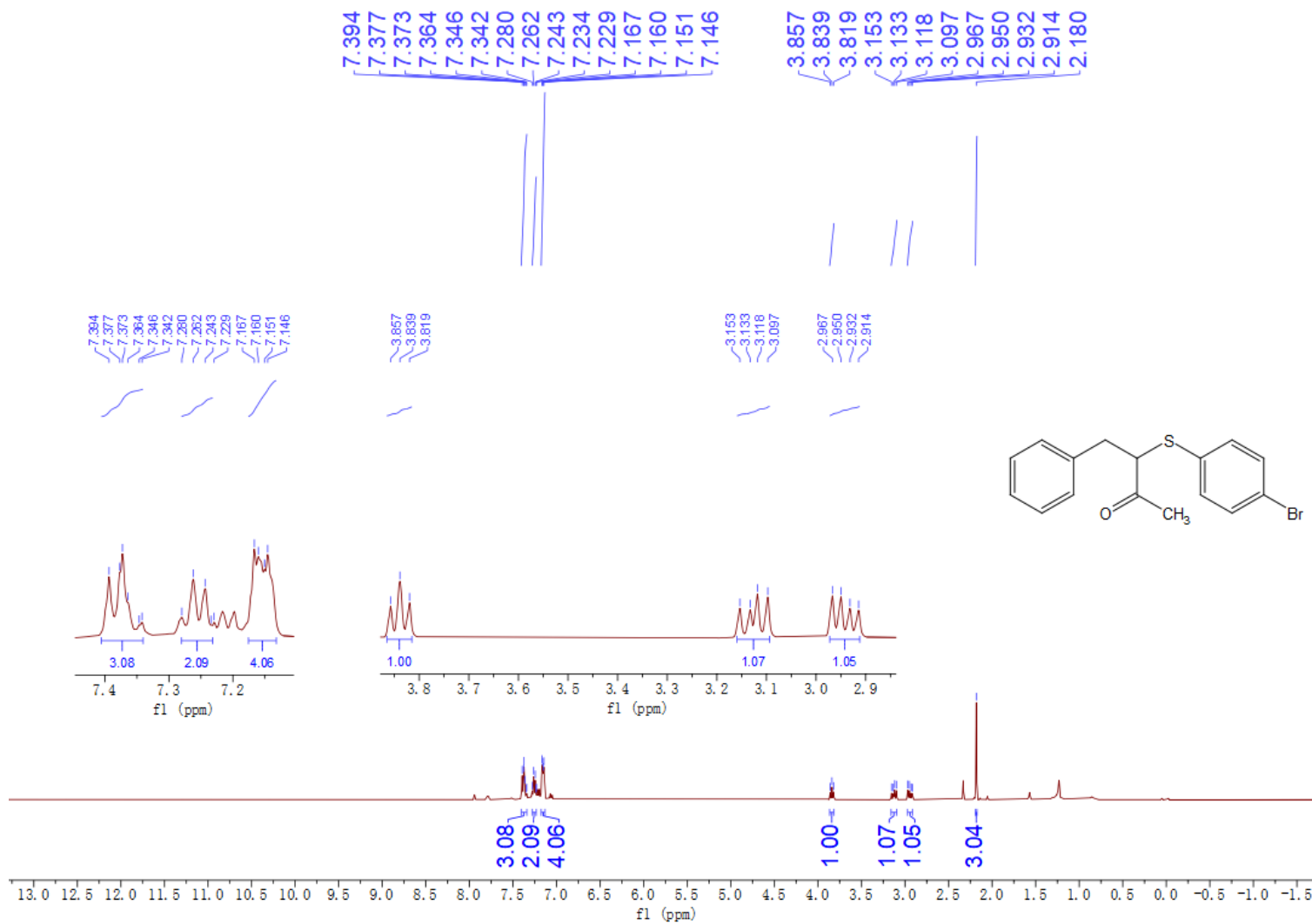


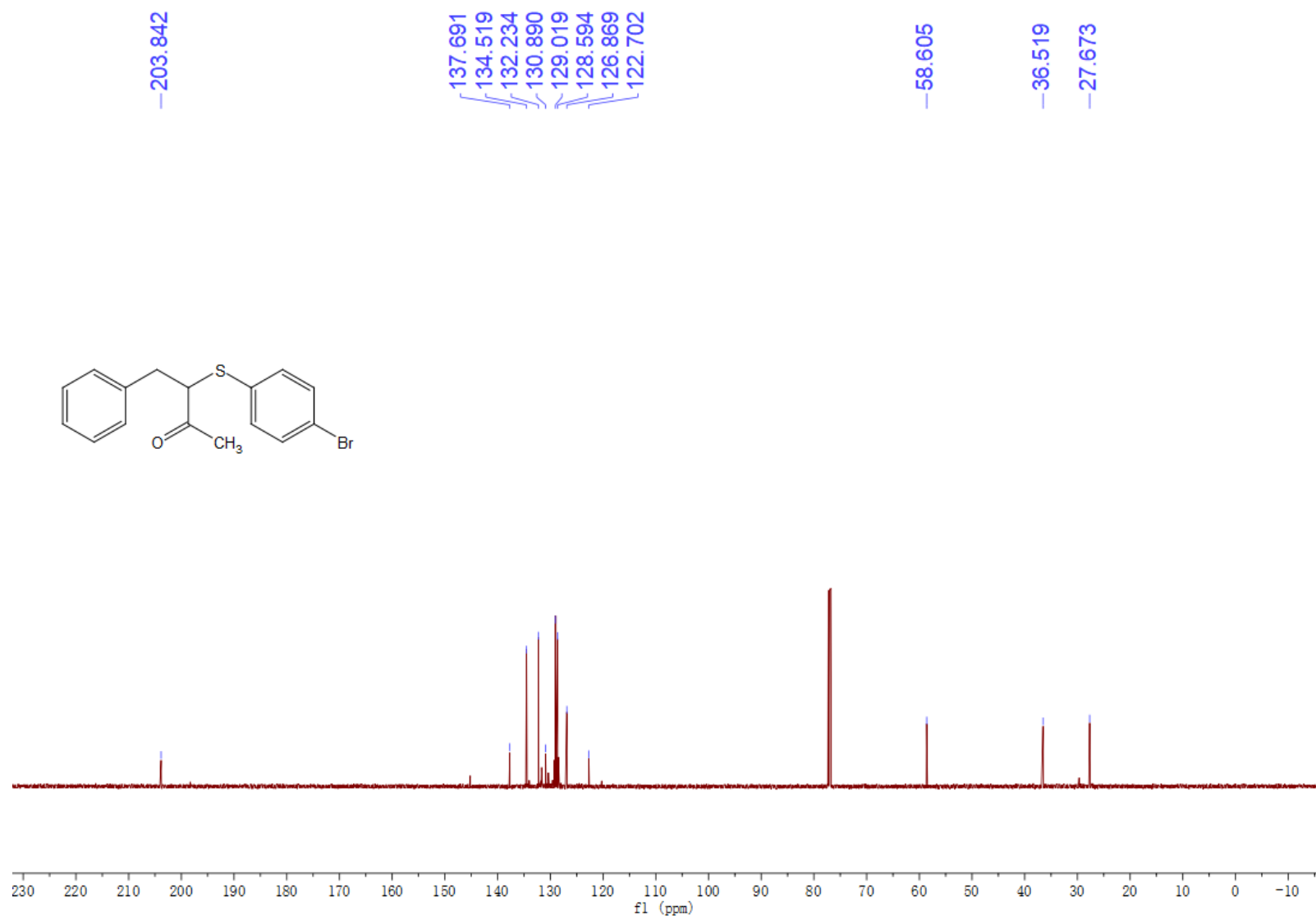


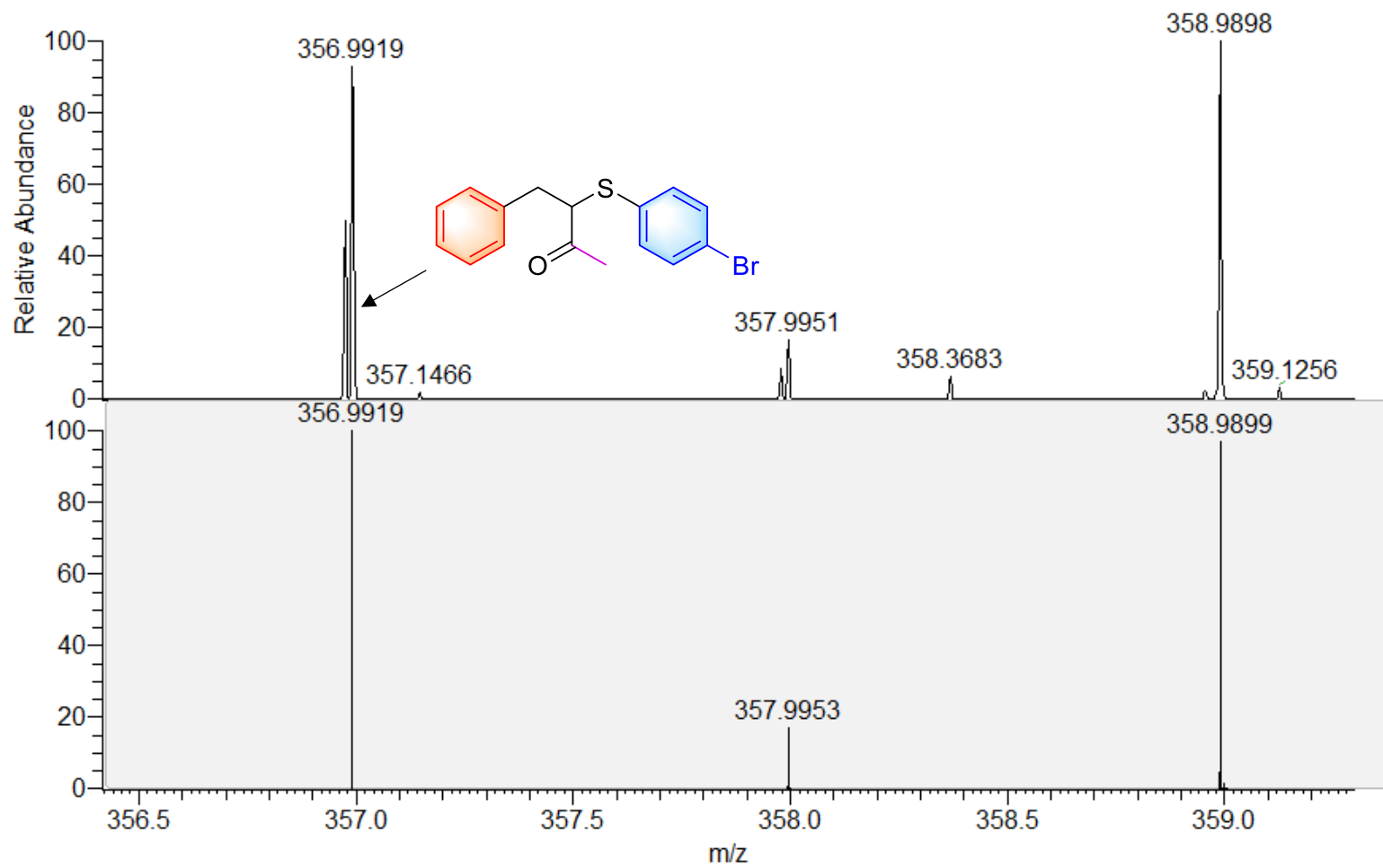
NL:
8.06E4
MOUDAN-M20#13
RT: 0.06 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
7.78E5
C₁₈ H₂₀ OS +H:
C₁₈ H₂₁ O₁ S₁
pa Chrg 1

3-((4-bromophenyl)thio)-4-phenylbutan-2-one (3dc)



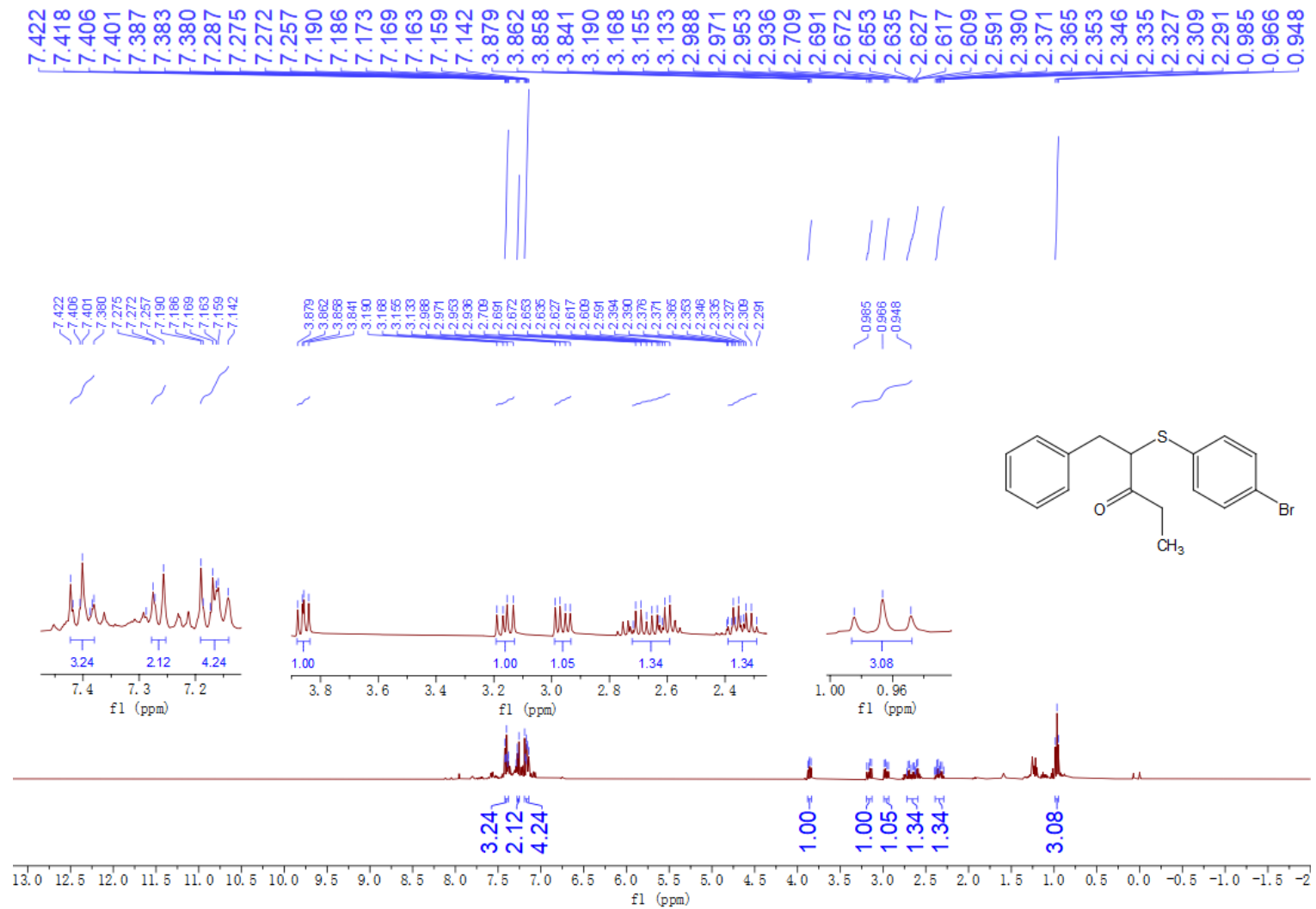


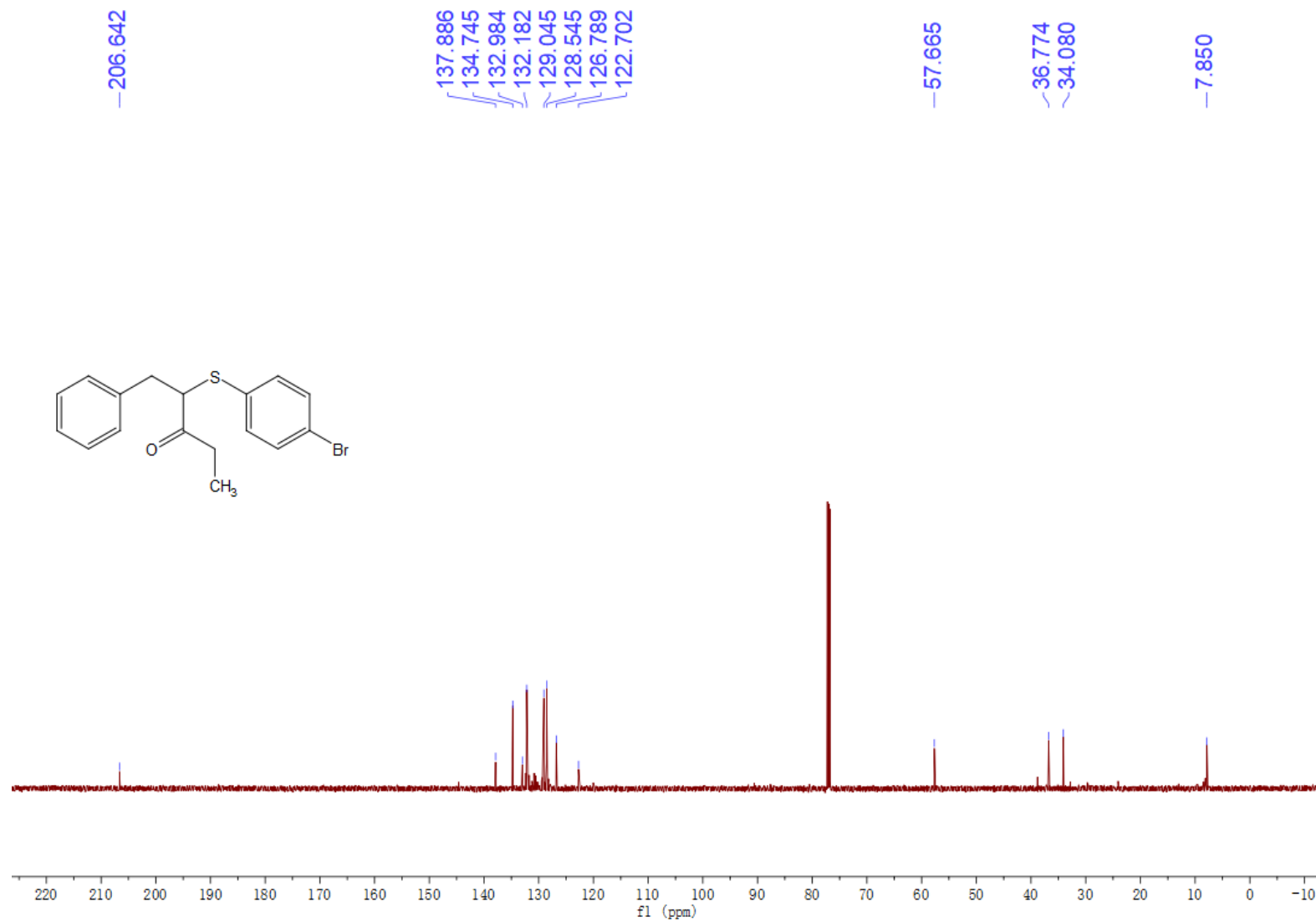


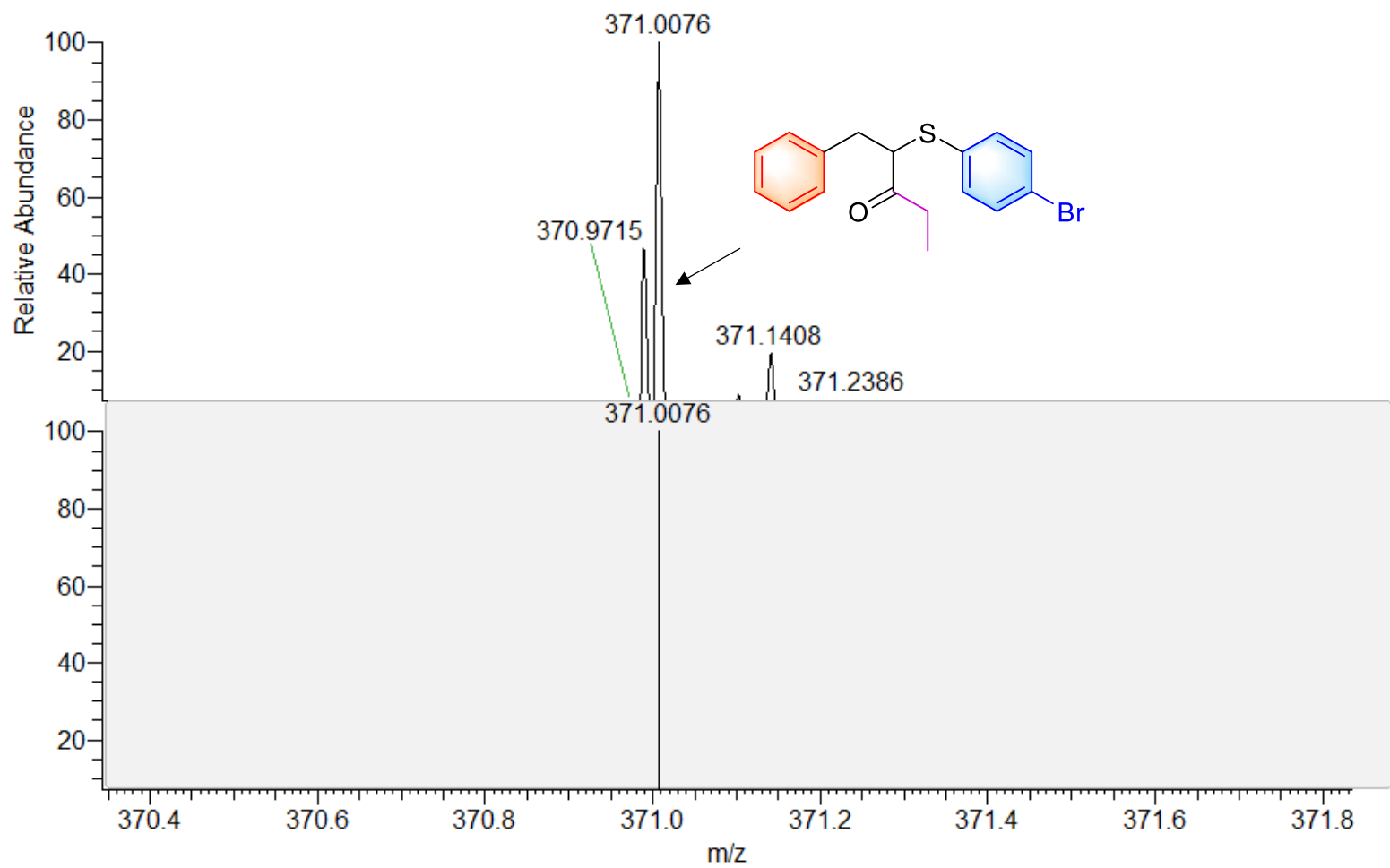
NL:
5.81E6
MOUDAN-M30#1 RT:
0.00 AV: 1 T: FTMS + p
ESI Full lock ms
[66.7000-1000.0000]

NL:
4.03E5
C₁₆ H₁₅ BrOS +Na:
C₁₆ H₁₅ Br₁ O₁ S₁ Na₁
pa Chrg 1

2-((4-bromophenyl)thio)-1-phenylpentan-3-one (3dd)



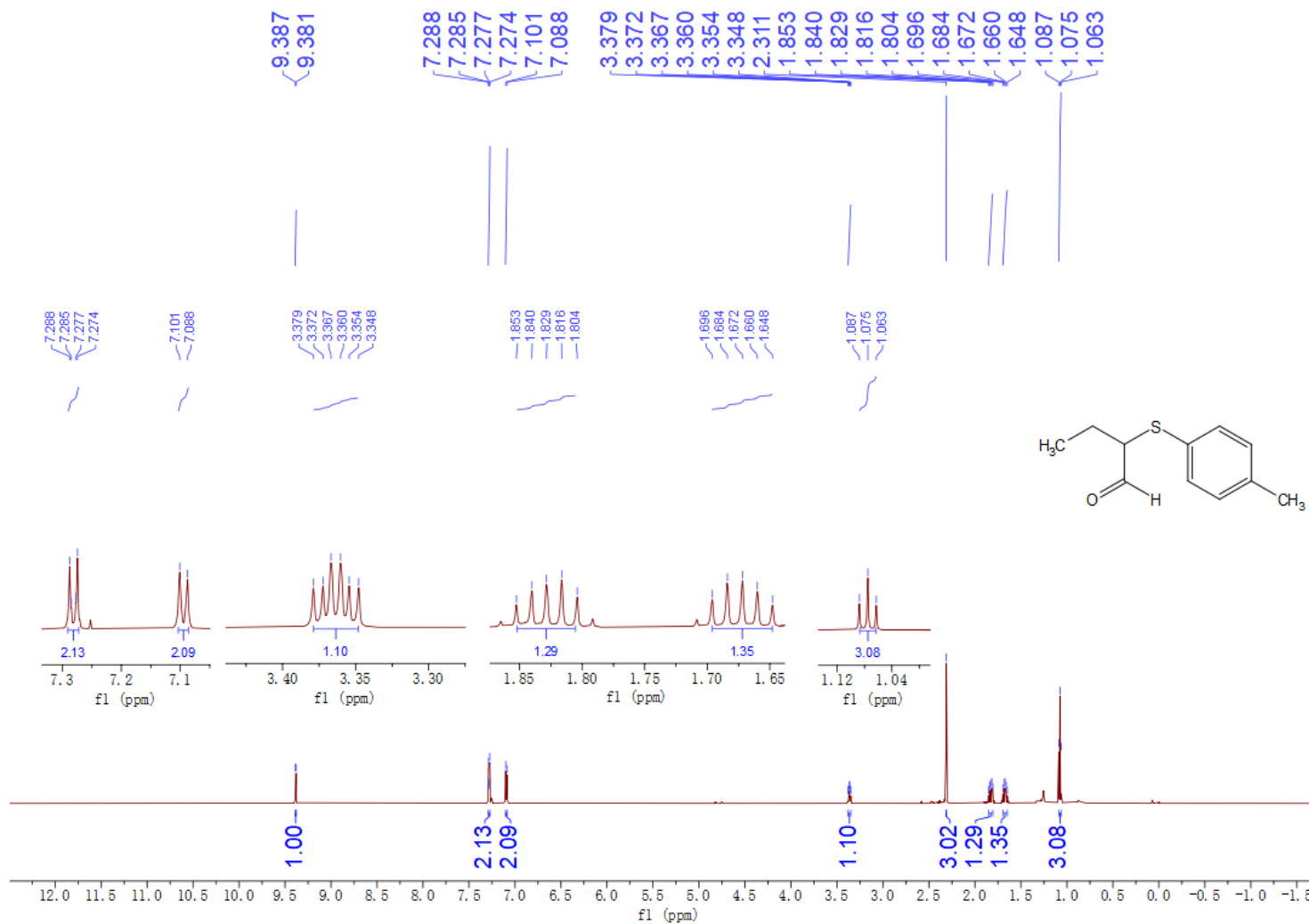


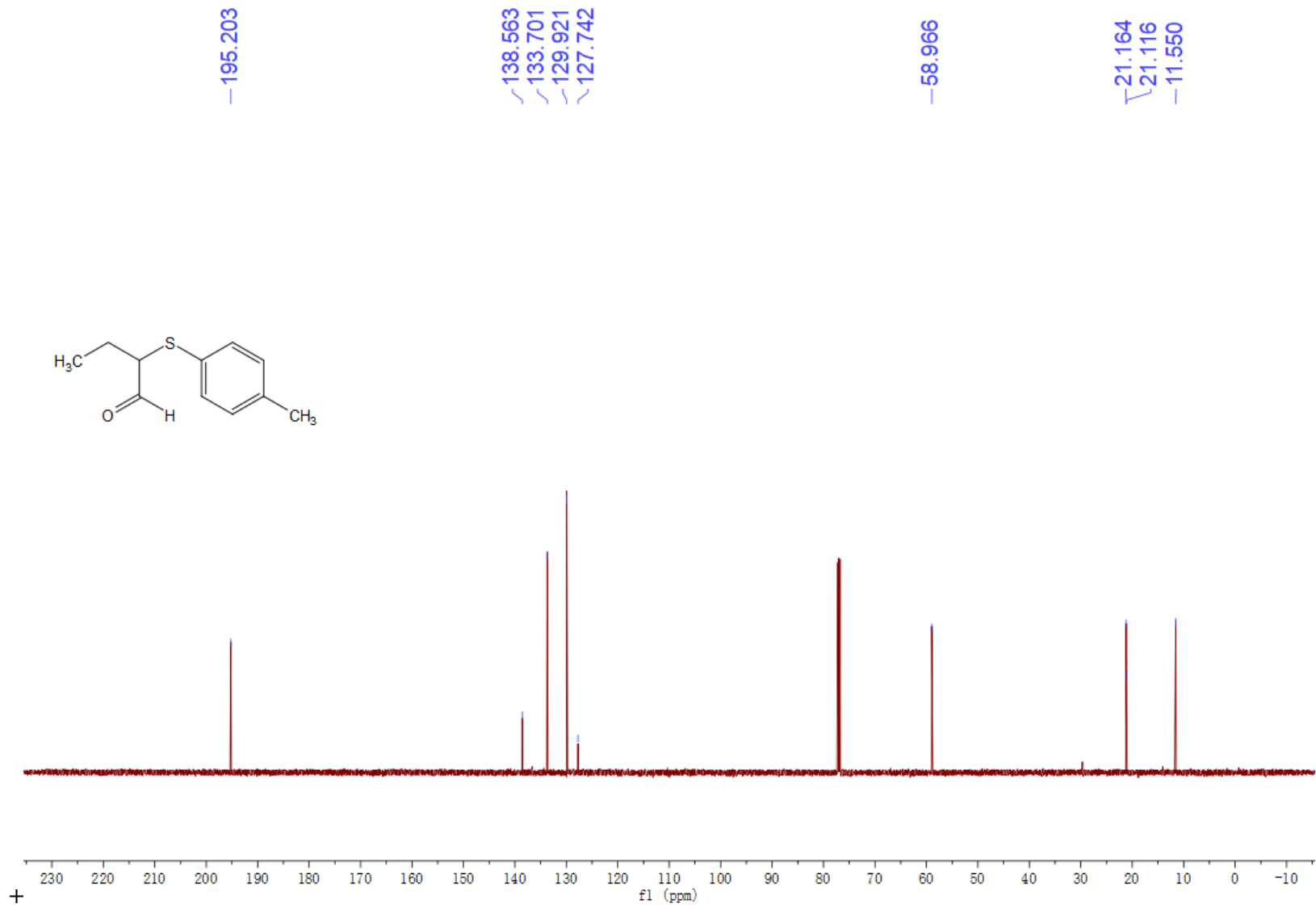


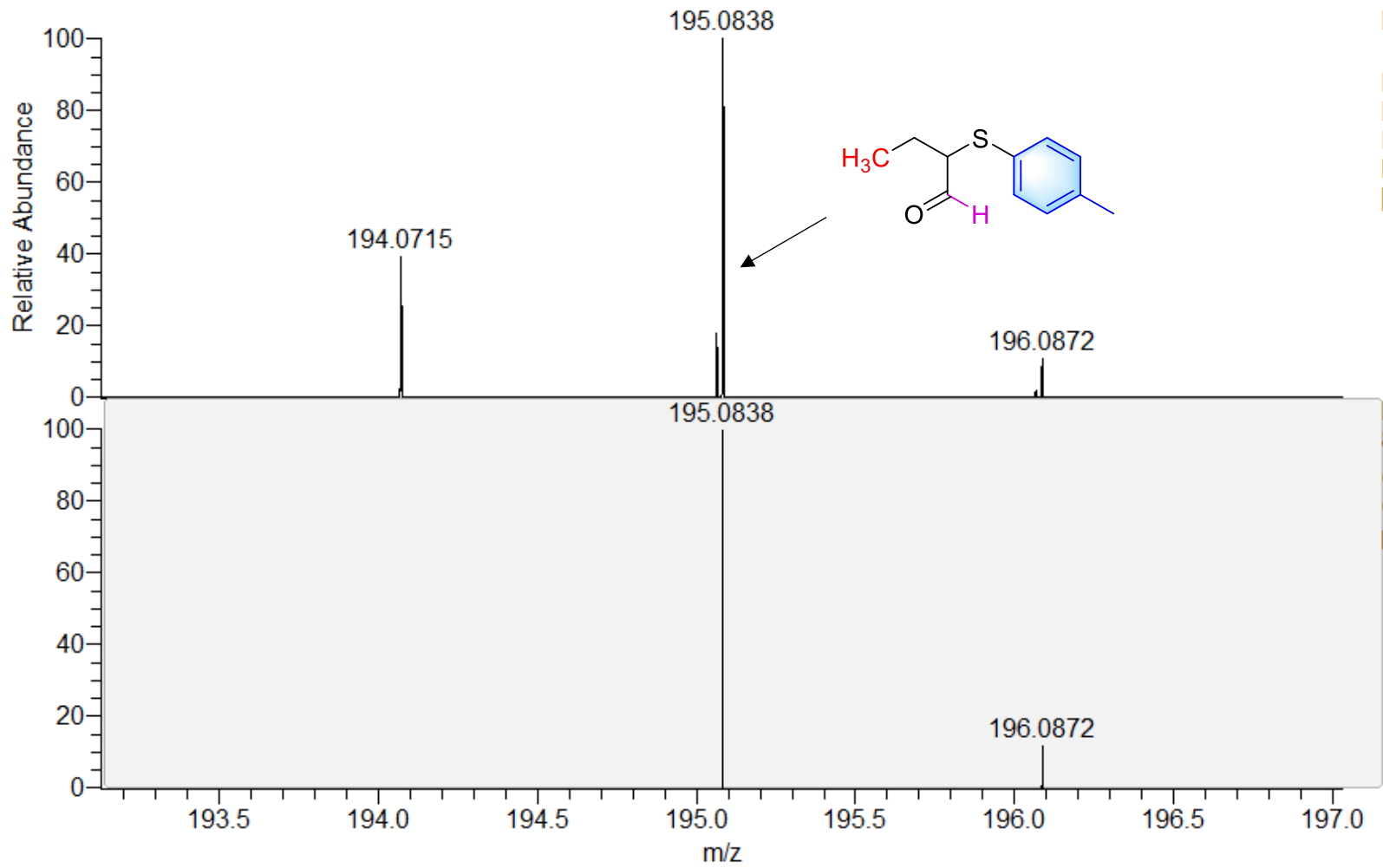
NL:
5.07E6
MOUDAN-M31#1 RT:
0.00 AV: 1 T: FTMS + p
ESI Full lock ms
[66.7000-1000.0000]

NL:
3.99E5
C₁₇ H₁₇ BrOS +Na:
C₁₇ H₁₇ Br₁ O₁ S₁ Na₁
pa Chrg 1

2-(*p*-tolylthio)butanal (3de)



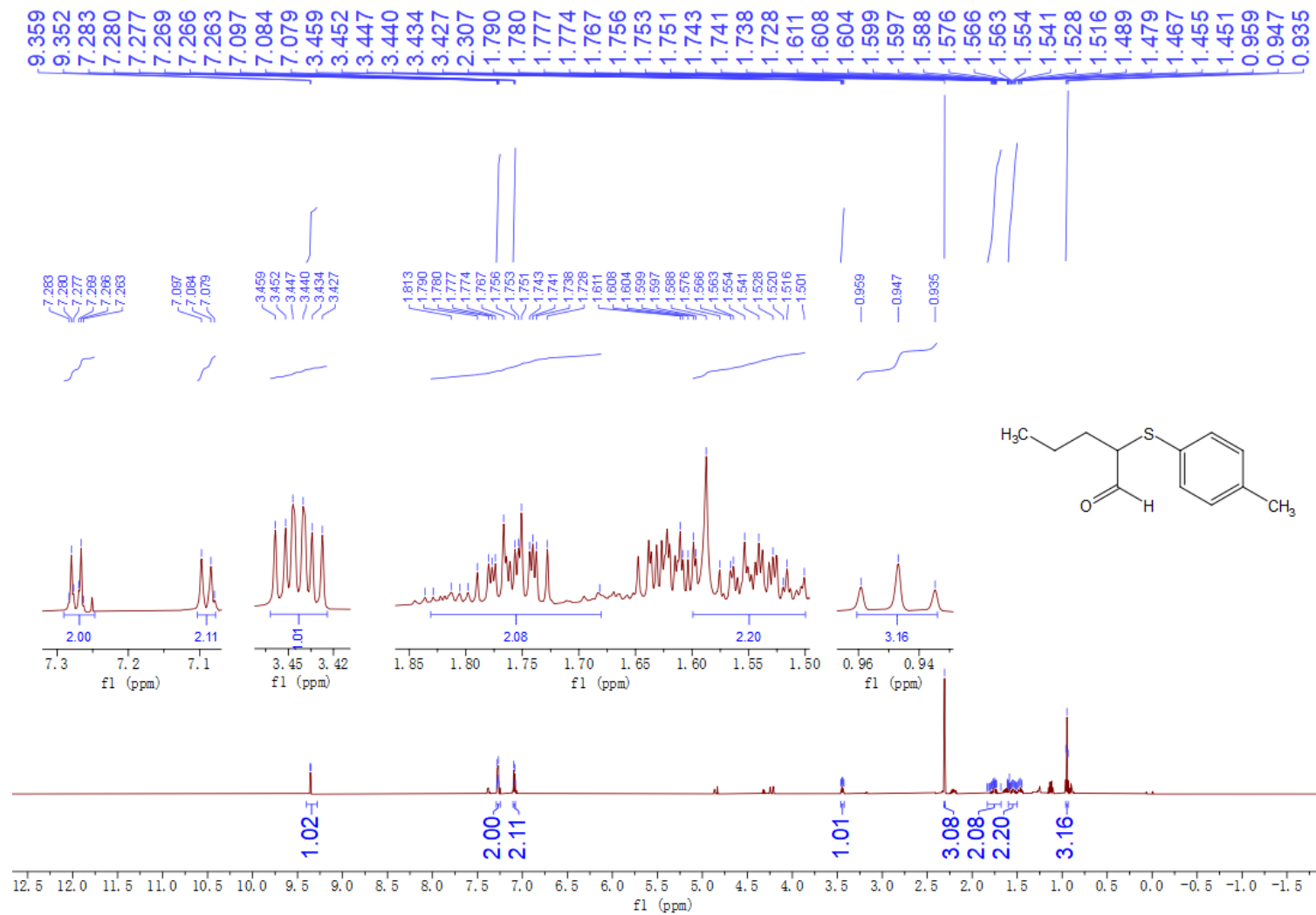


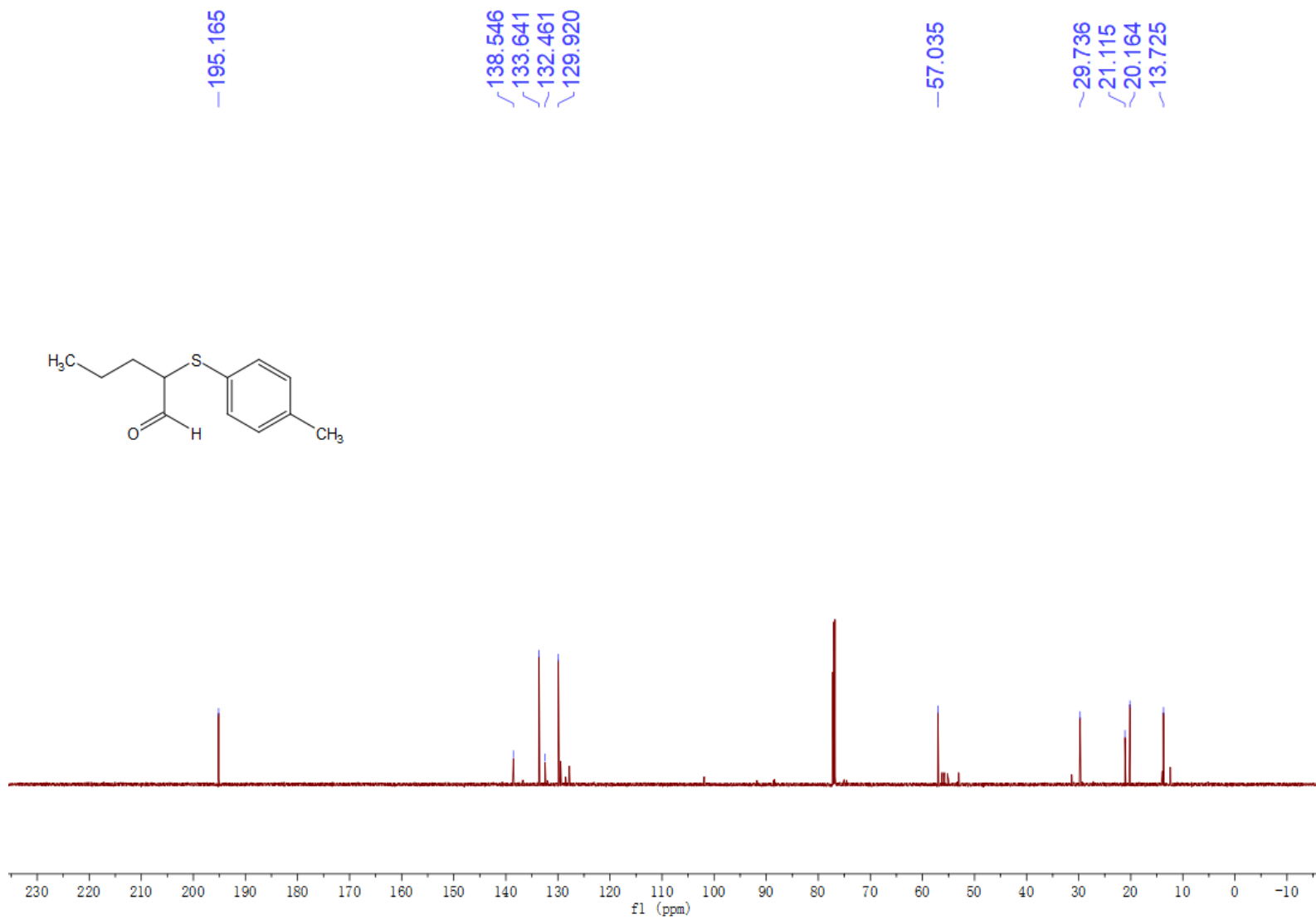


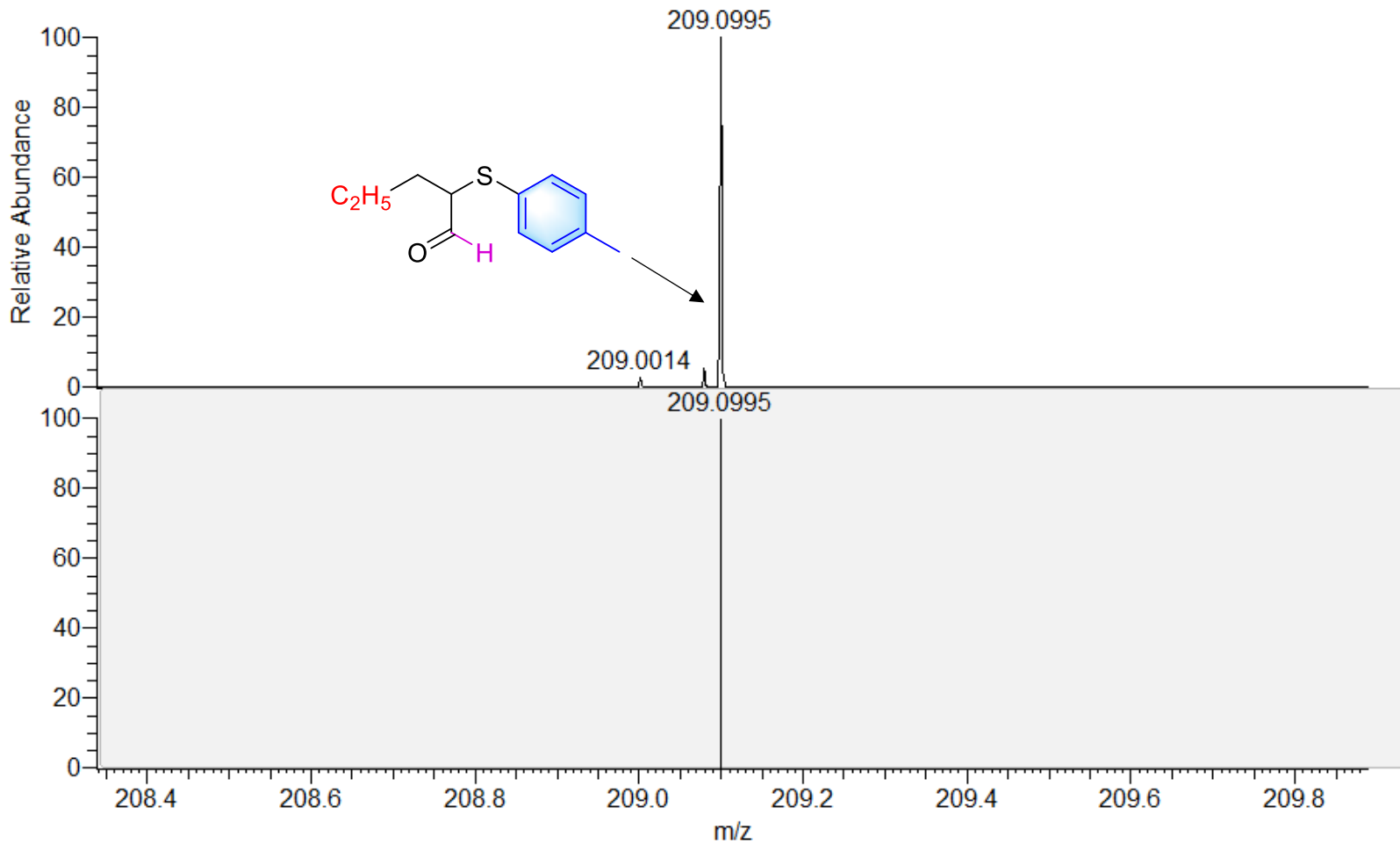
NL:
1.91E7
MOUDAN-M56#5
RT: 0.02 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
8.40E5
C₁₁H₁₄OS +H:
C₁₁H₁₅O₁S₁
pa Chrg 1

2-(*p*-tolylthio)pentanal (3df)

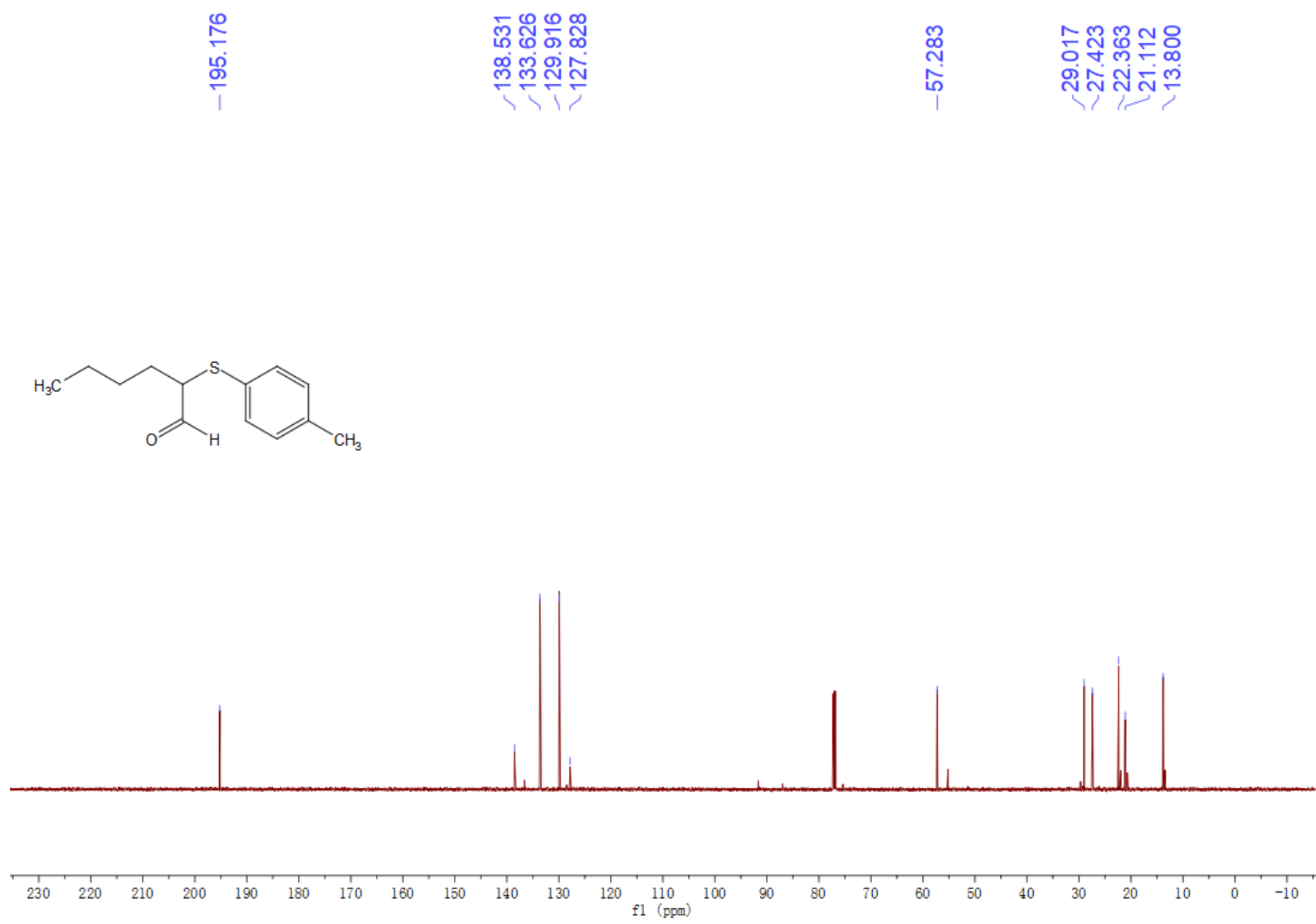


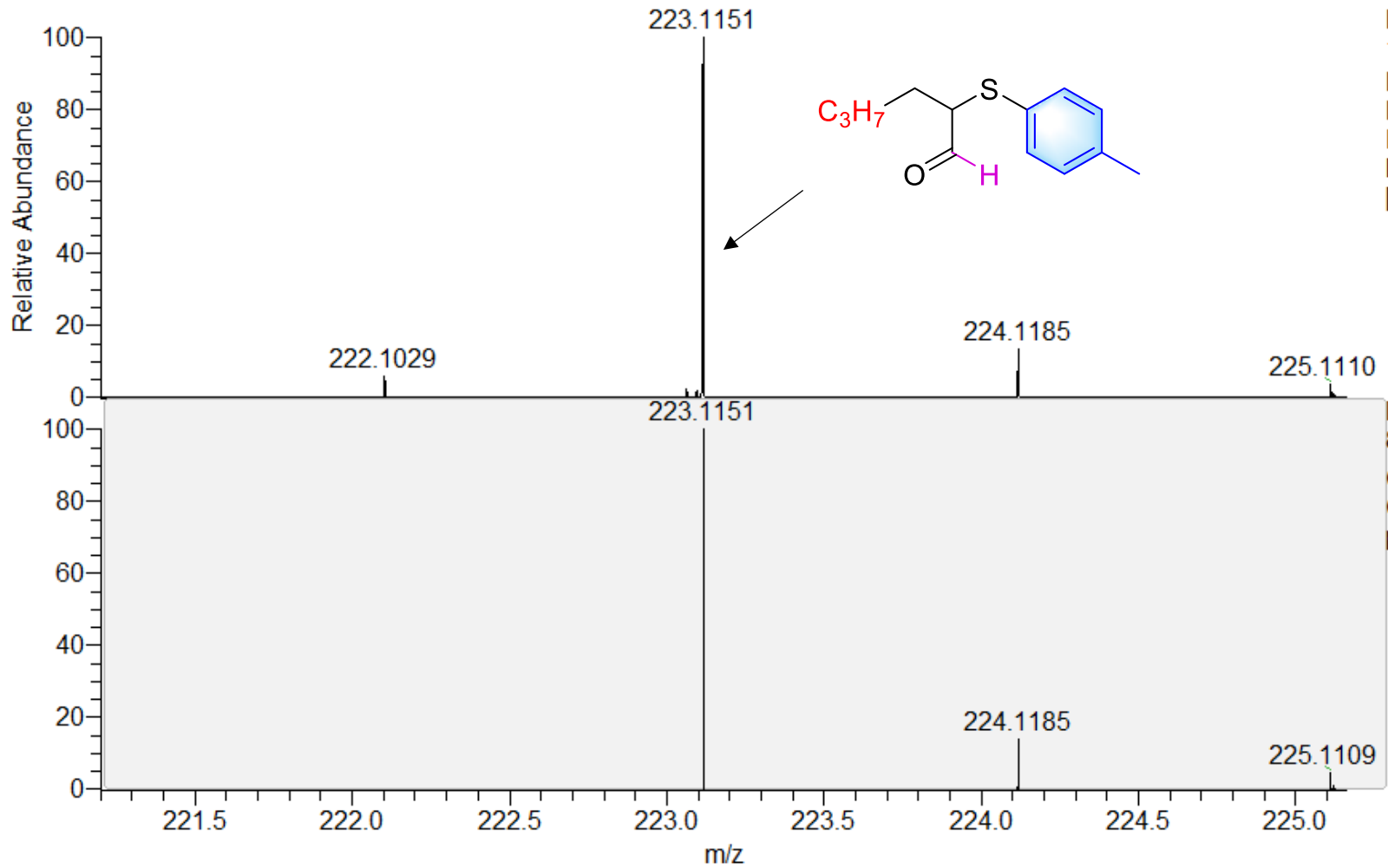




NL:
8.84E6
MOUDAN-M21#6
RT: 0.03 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
8.31E5
C₁₂ H₁₆ OS +H:
C₁₂ H₁₇ O₁ S₁
pa Chrg 1

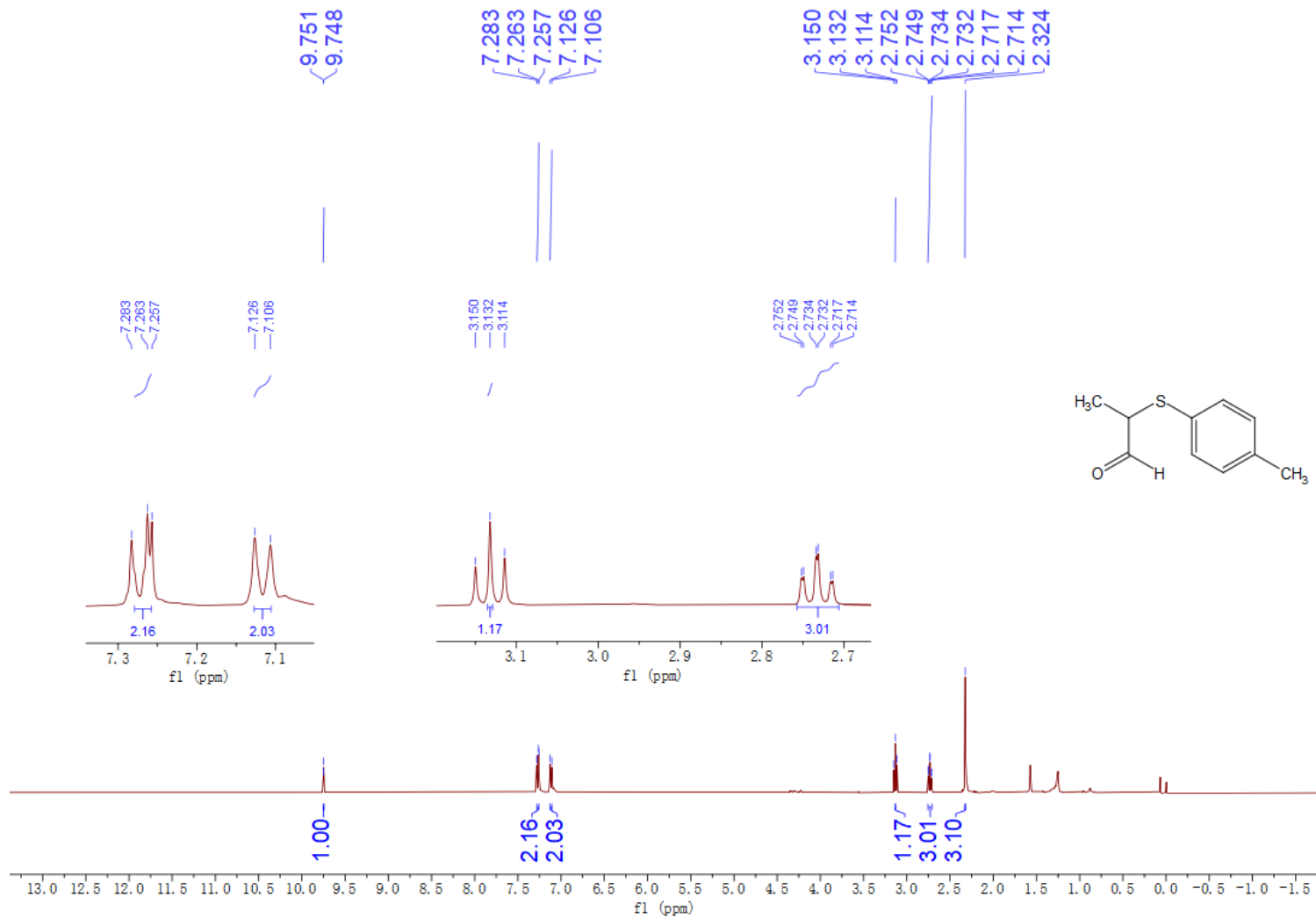


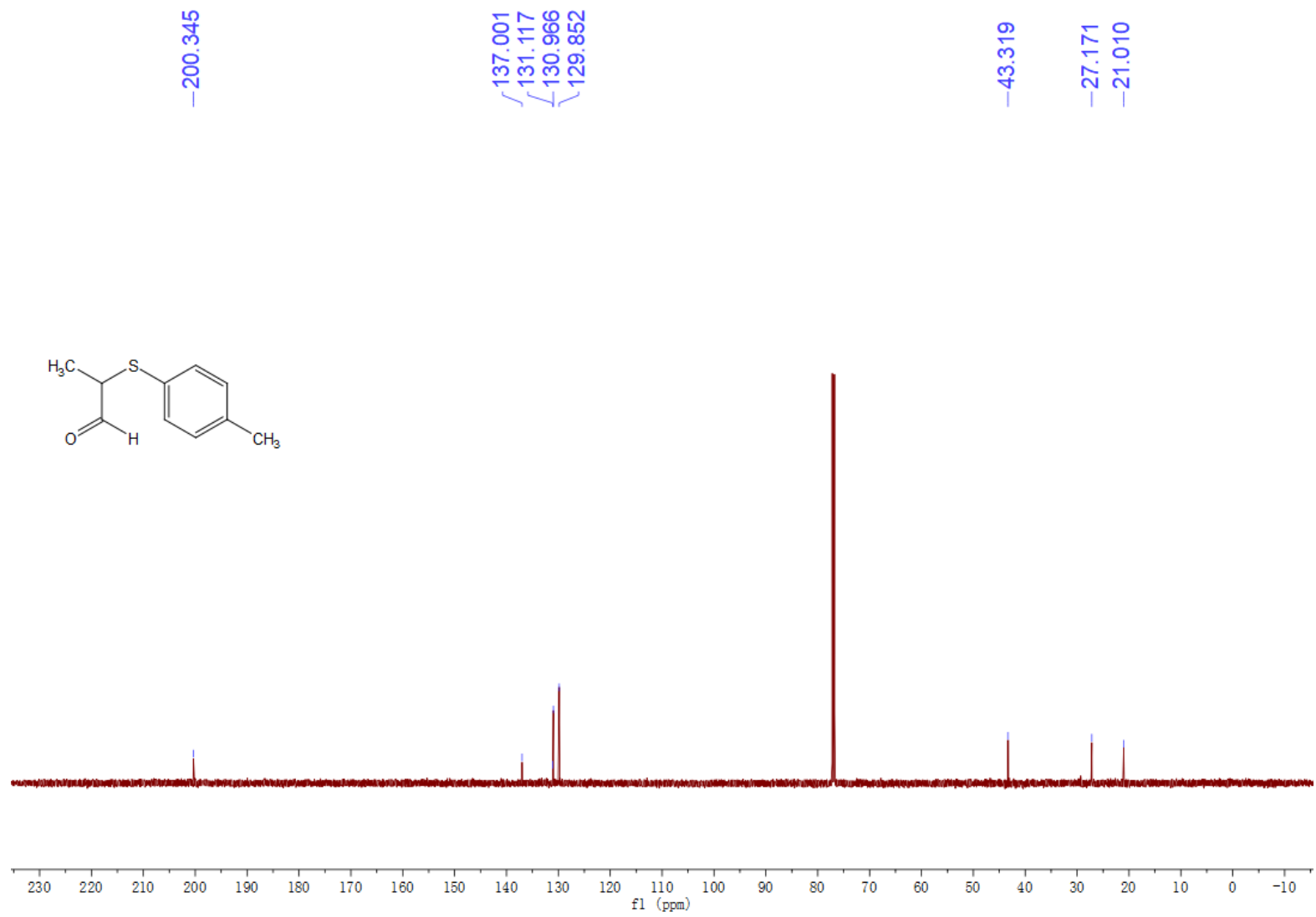


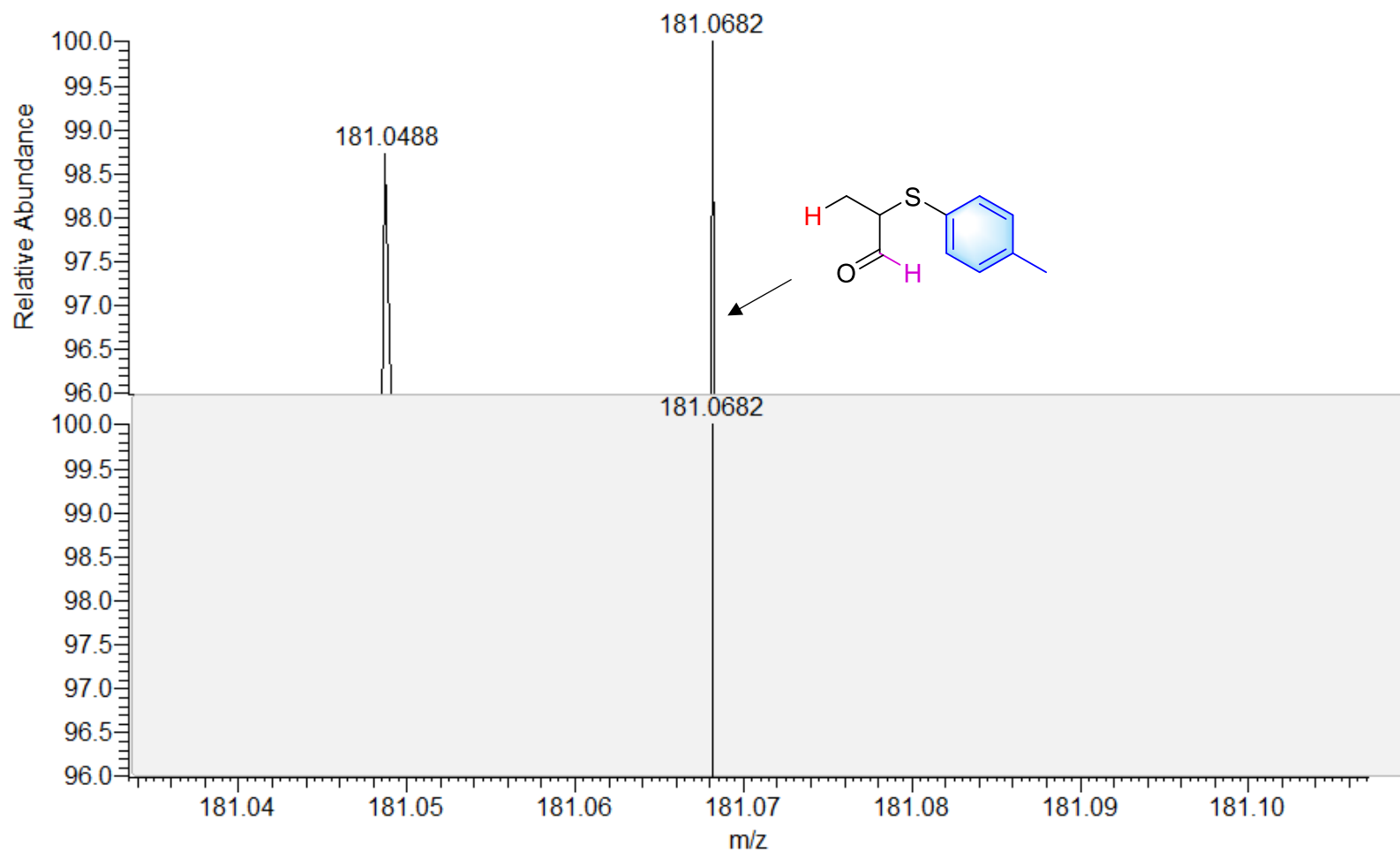
NL:
1.18E8
MOUDAN-M57#1
RT: 0.00 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
8.22E5
C₁₃ H₁₈ OS +H:
C₁₃ H₁₉ O₁ S₁
pa Chrg 1

2-(*p*-tolylthio)propanal (3dh)



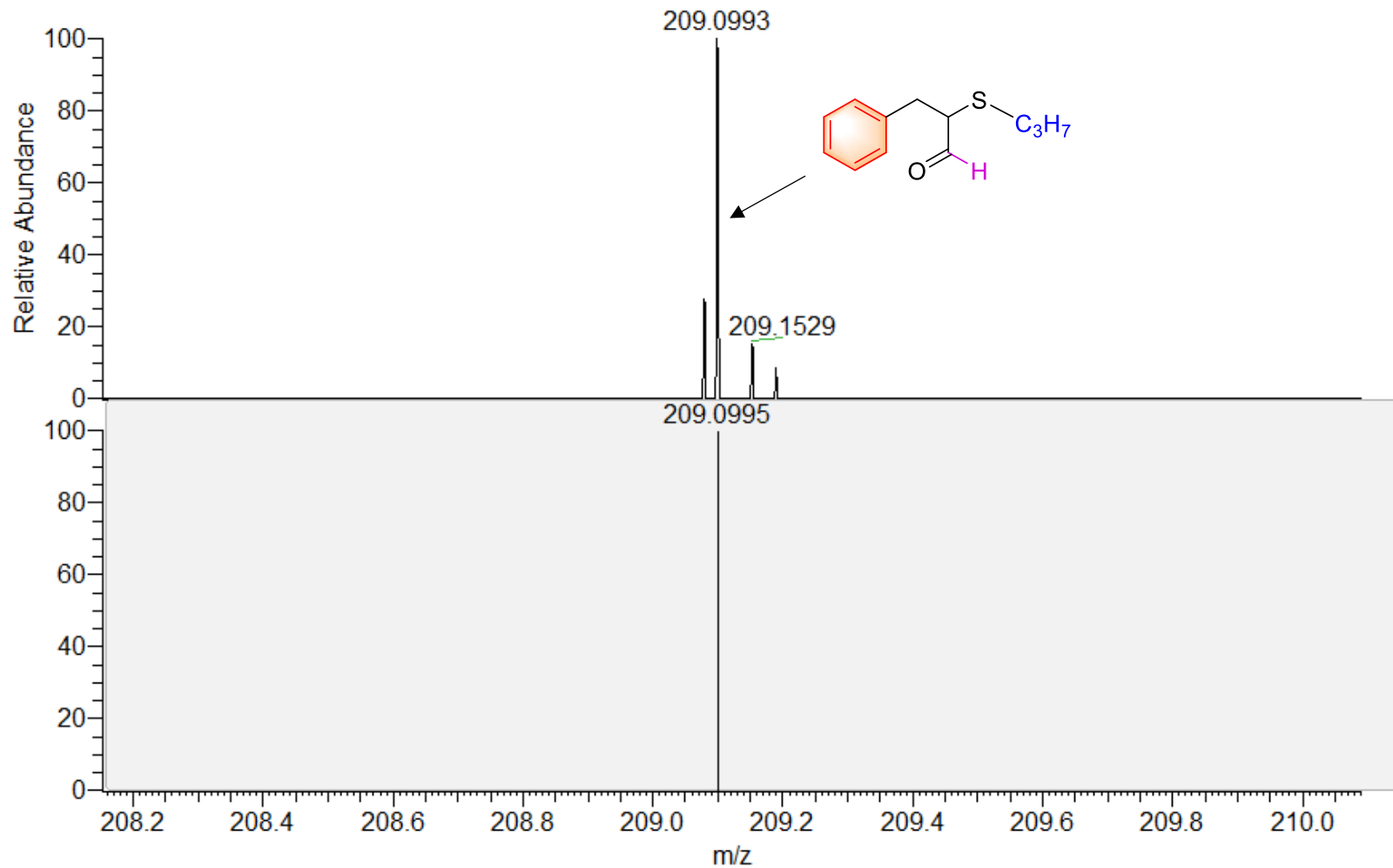




NL:
 2.26E5
 MOUDAN-M20#87
 RT: 0.39 AV: 1 T:
 FTMS + p ESI Full
 lock ms
 [60.0000-900.0000]

NL:
 8.49E5
 C₁₀ H₁₂ OS +H:
 C₁₀ H₁₃ O₁ S₁
 pa Chrg 1

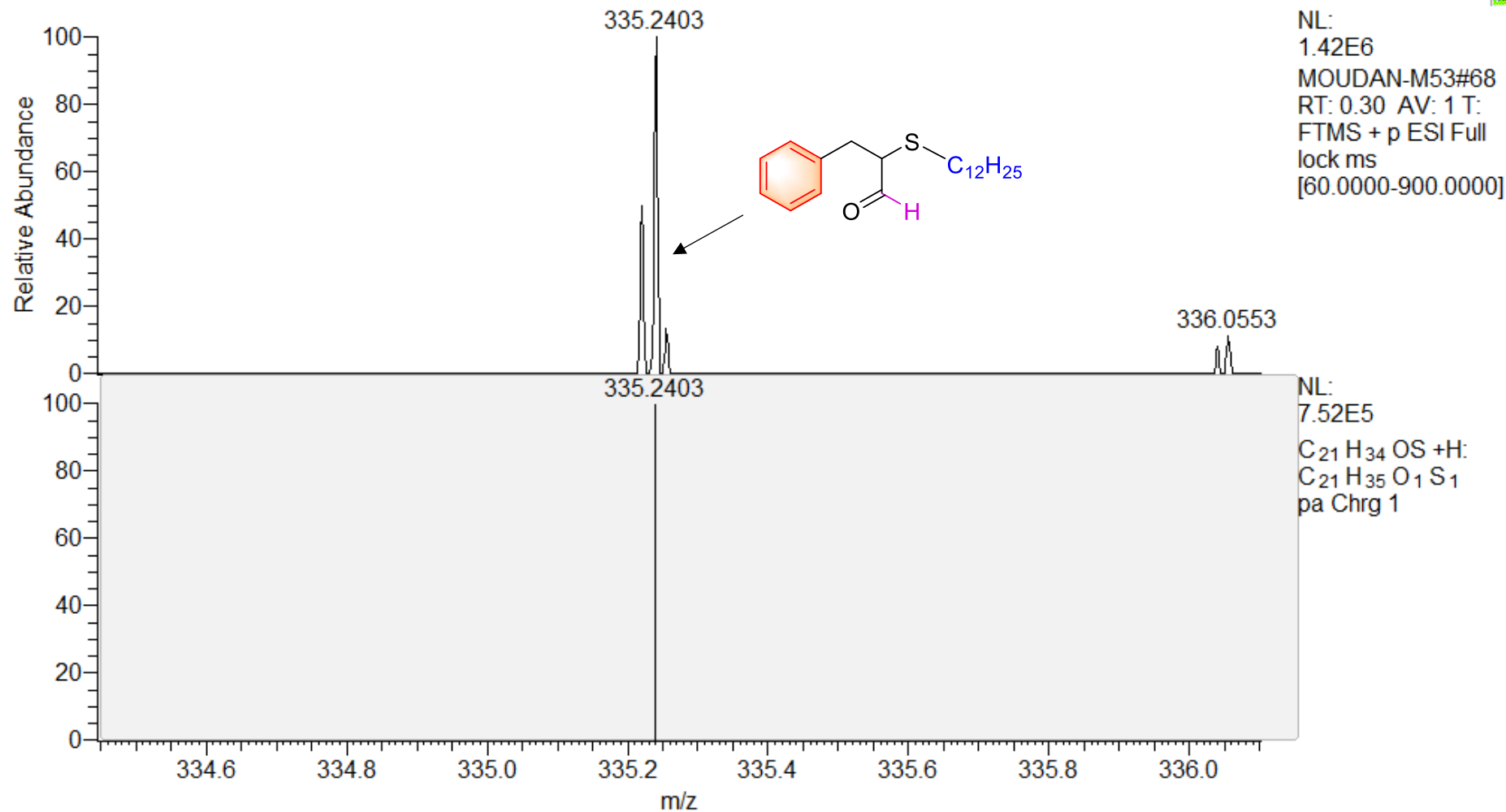
3-phenyl-2-(propylthio)propanal (3di)



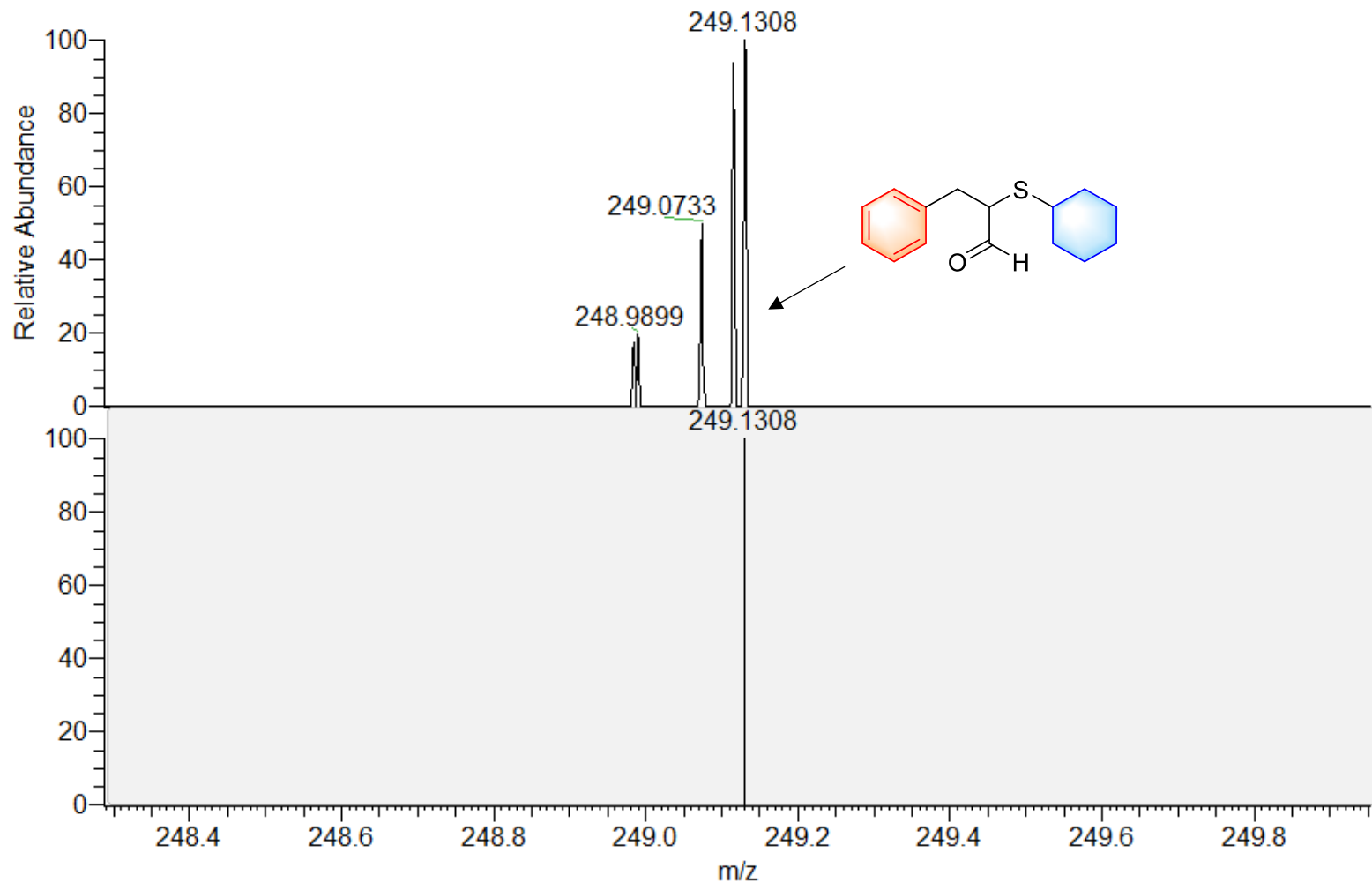
NL:
8.40E5
MOUDAN-M55#53
RT: 0.24 AV: 1 T:
FTMS + p ESI Full
ms
[60.0000-
900.0000]

NL:
8.31E5
C₁₂ H₁₆ OS +H:
C₁₂ H₁₇ O₁ S₁
pa Chrg 1

2-(dodecylthio)-3-phenylpropanal (3dj)



2-(cyclohexylthio)-3-phenylpropanal (3dk)



NL:
5.67E5
MOUDAN-M54#9
RT: 0.04 AV: 1 T:
FTMS + p ESI Full
lock ms
[60.0000-900.0000]

NL:
8.04E5
C₁₅ H₂₀ OS +H:
C₁₅ H₂₁ O₁ S₁
pa Chrg 1