

**Anticancer Effects of New Ceramides Isolated from the Red Sea Red Algae *Hypnea musciformis* In a Model of Ehrlich Ascites Carcinoma: LC-HRMS Analysis Profile and Molecular Modeling**

**Additional Experimental Detail**

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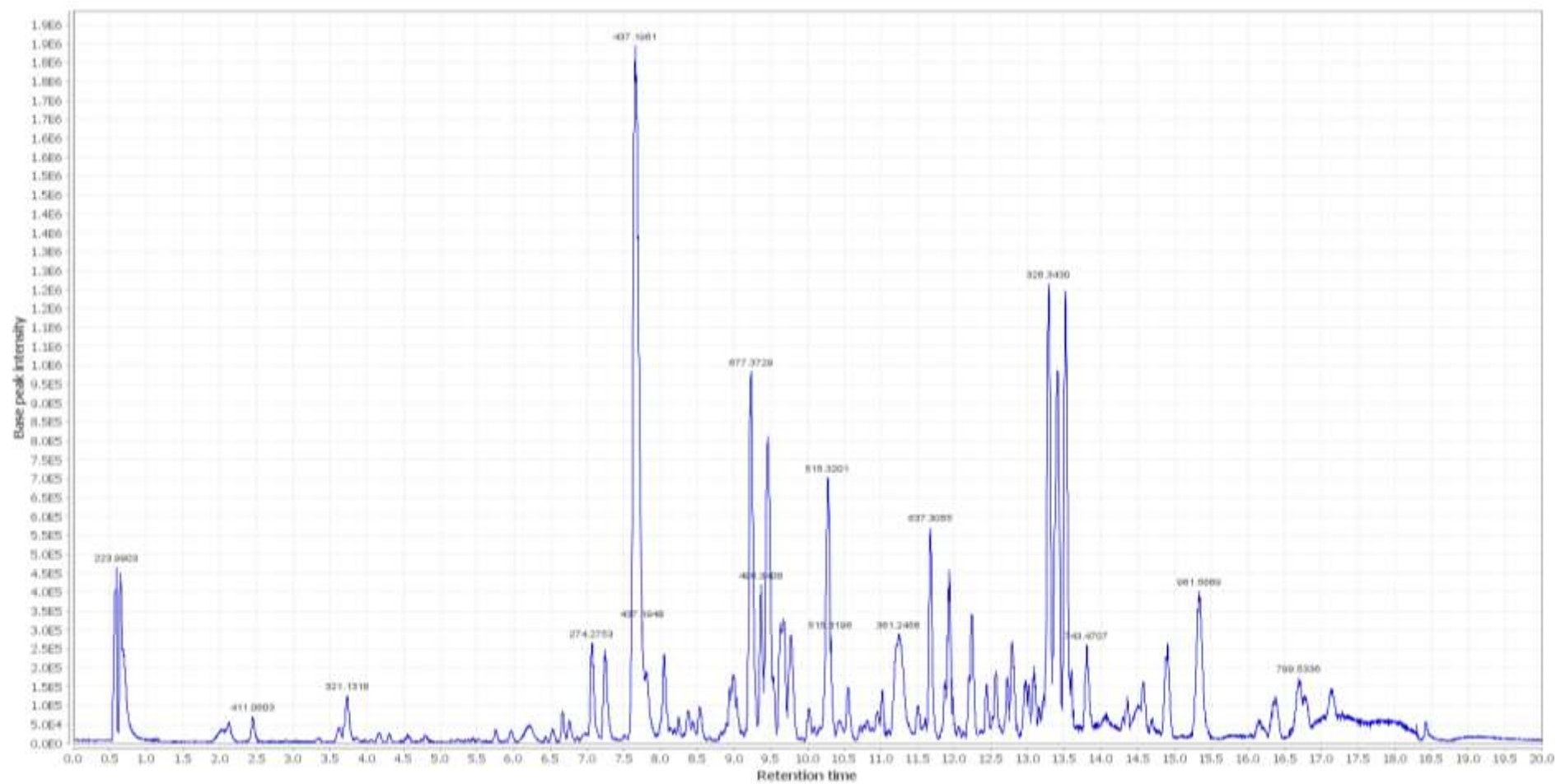


Figure S1. LC-ESI-HRMS chromatogram of crude extract of *Hypnea musciformis* (positive mode).

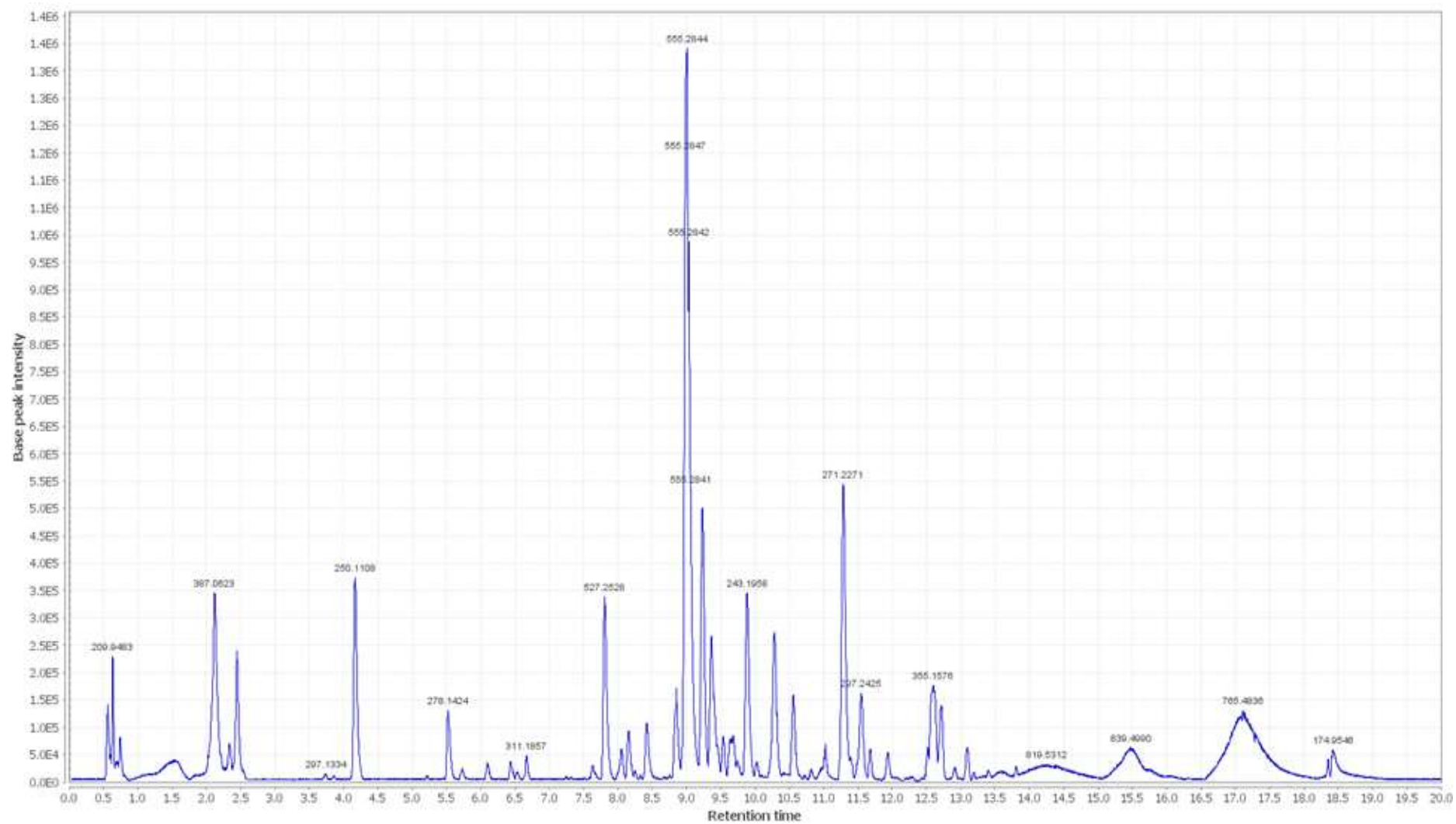


Figure S2. LC-ESI-HRMS chromatogram of crude extract of *Hypnea musciformis* (negative mode).

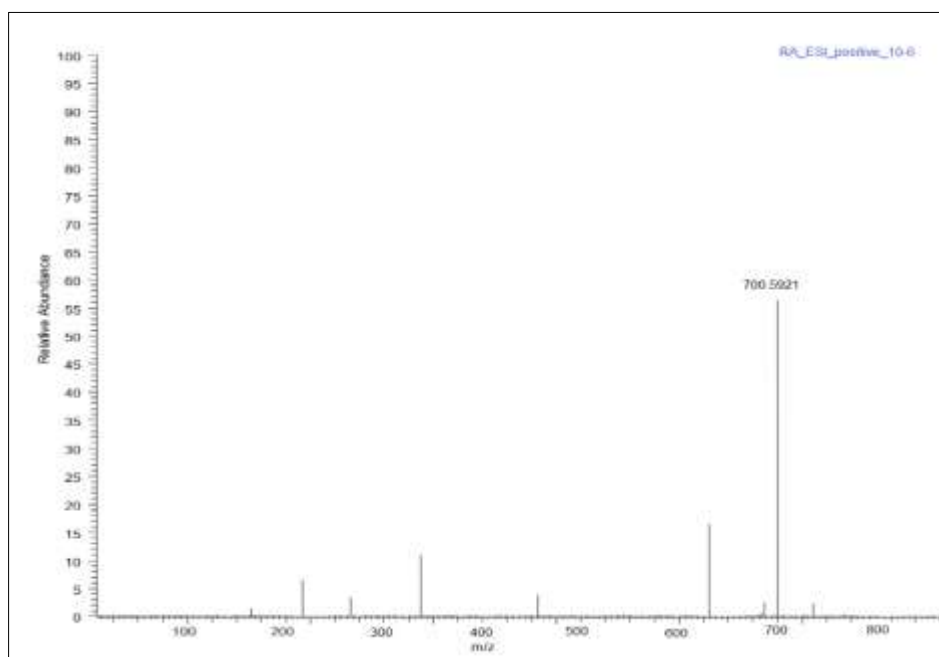


Figure S3. ESI-HRMS chromatogram of ceramide **A** (**1**)

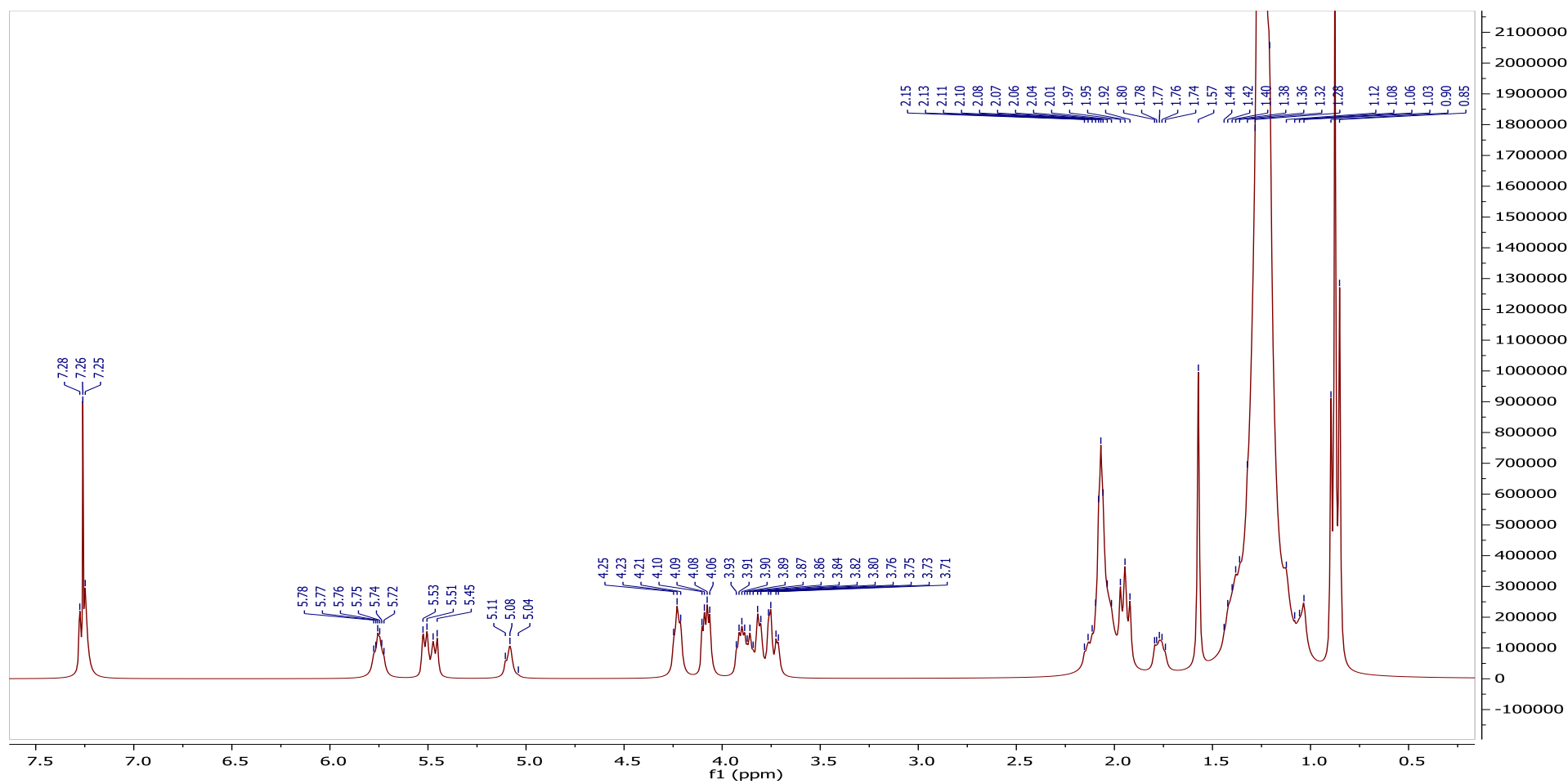


Figure S4.  $^1\text{H}$  NMR spectra of ceramide A (1)

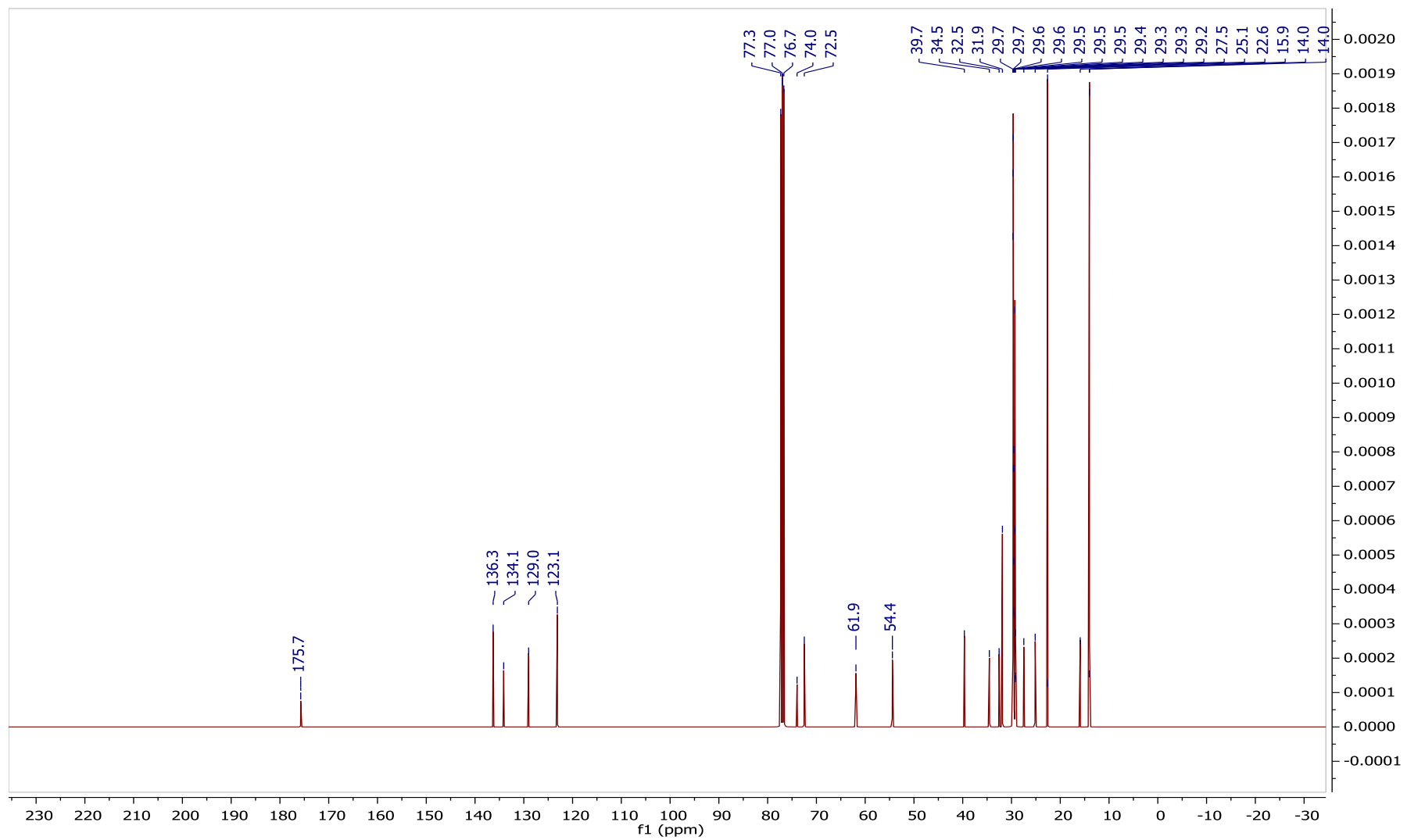


Figure S5.  $^{13}\text{C}$  NMR spectra of ceramide A (1)

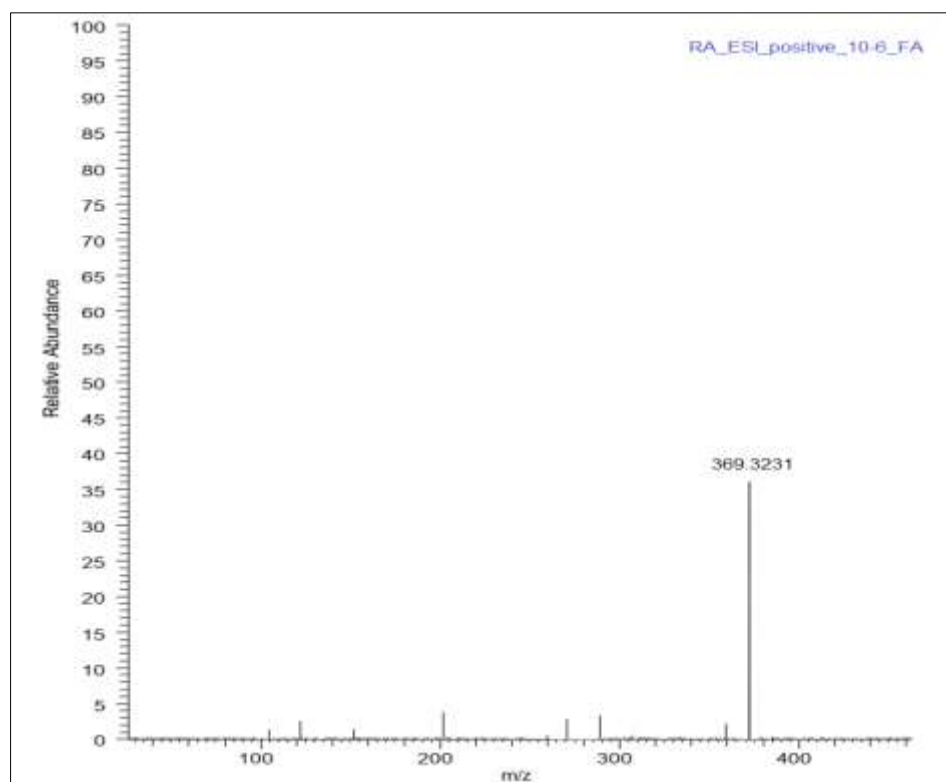


Figure S6. ESI-HRMS chromatogram of fatty acid methyl ester of ceramide **A** (**1**)

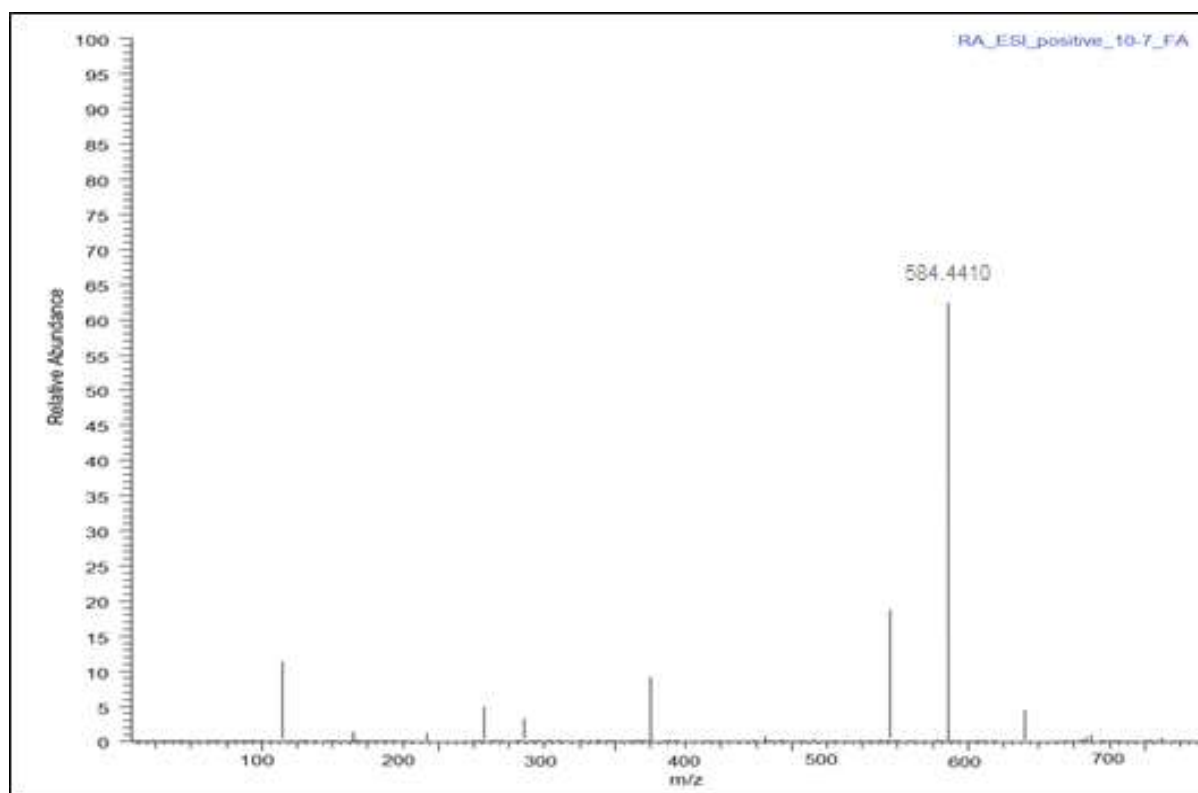


Figure S7. ESI-HRMS chromatogram of ceramide **B** (**2**)



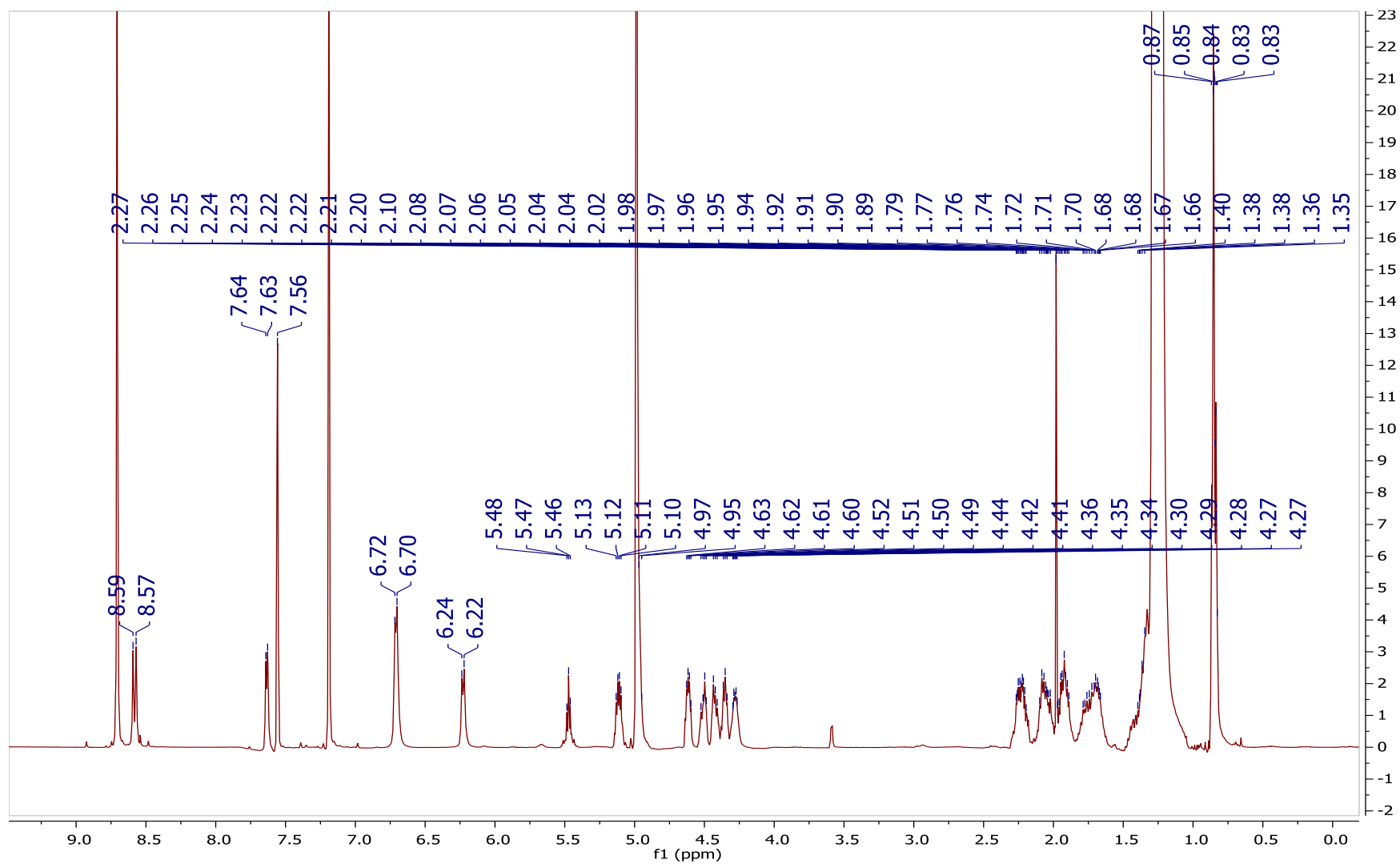


Figure S8.  $^1\text{H}$  NMR spectra of ceramide **B** (2)

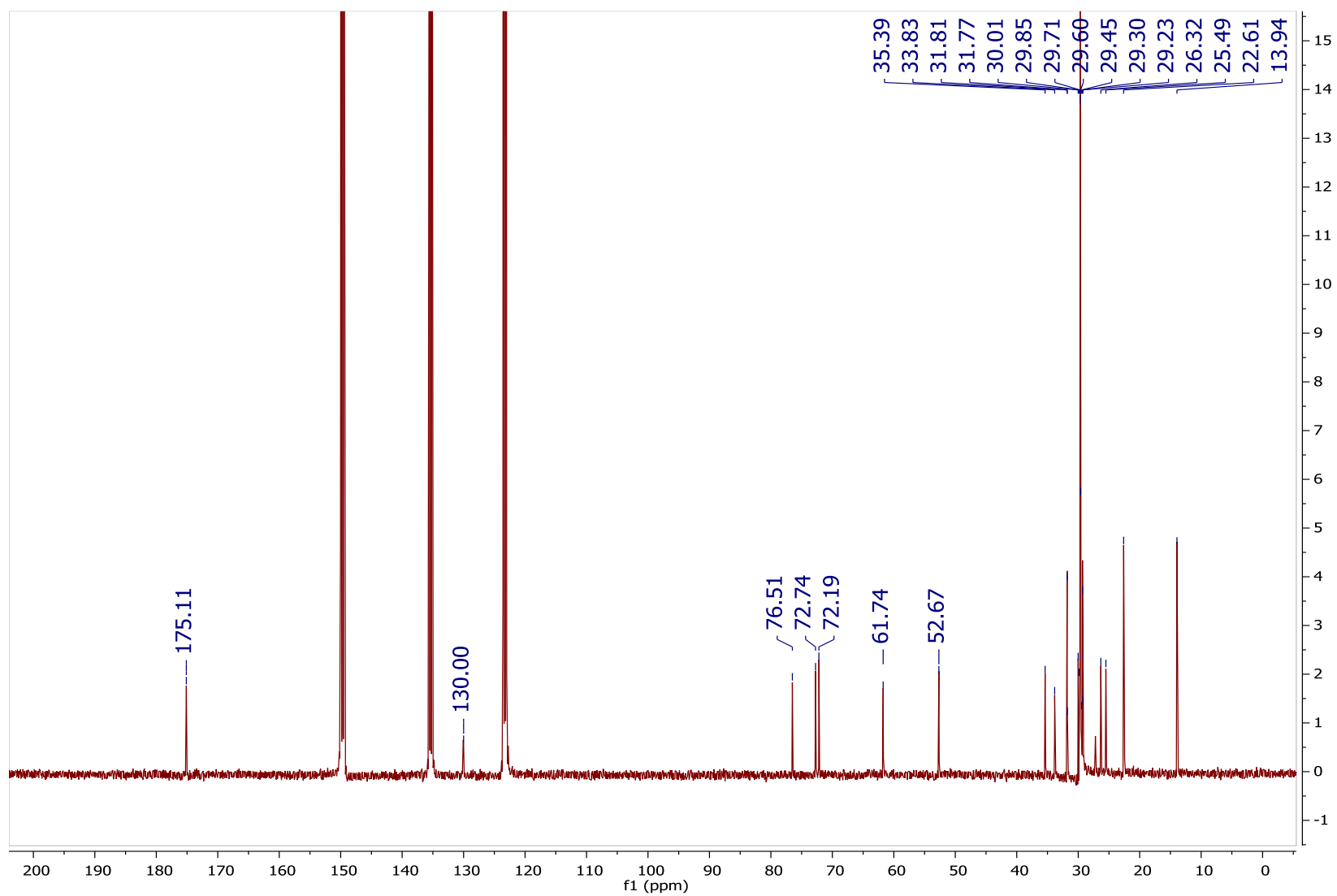


Figure S9. <sup>13</sup>C NMR spectra of ceramide **B** (2)

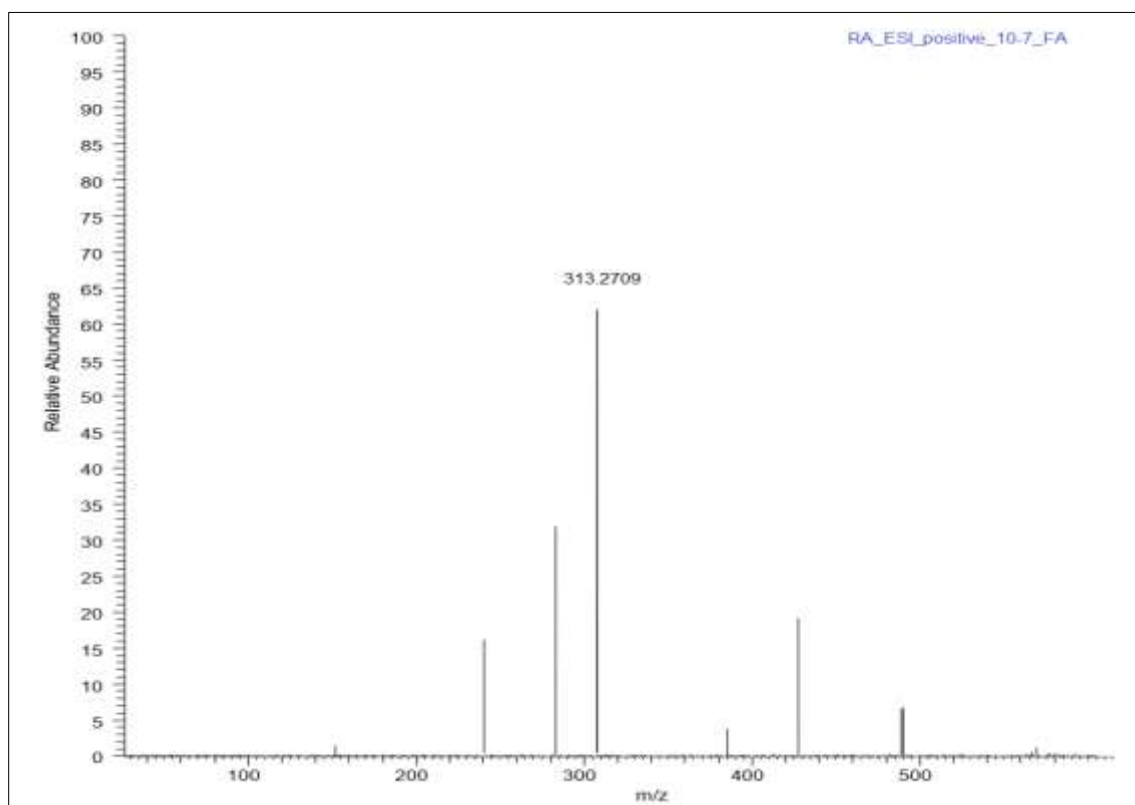


Figure S10. ESI-HRMS chromatogram of fatty acid methyl ester of ceramide **B** (**2**)

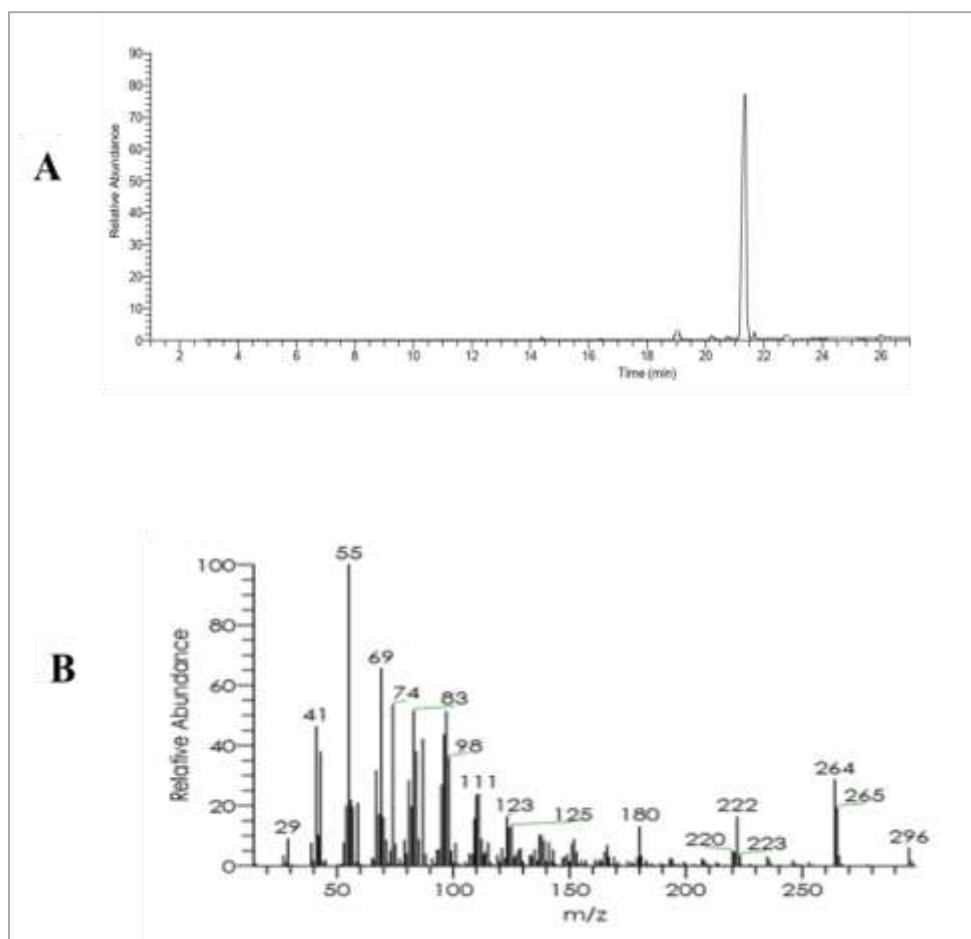


Figure S11. GC-MS analysis, GC-MS chromatogram (**A**) and fragmentation pattern (**B**), of fatty acid methyl ester of ceramide **B** (**2**)

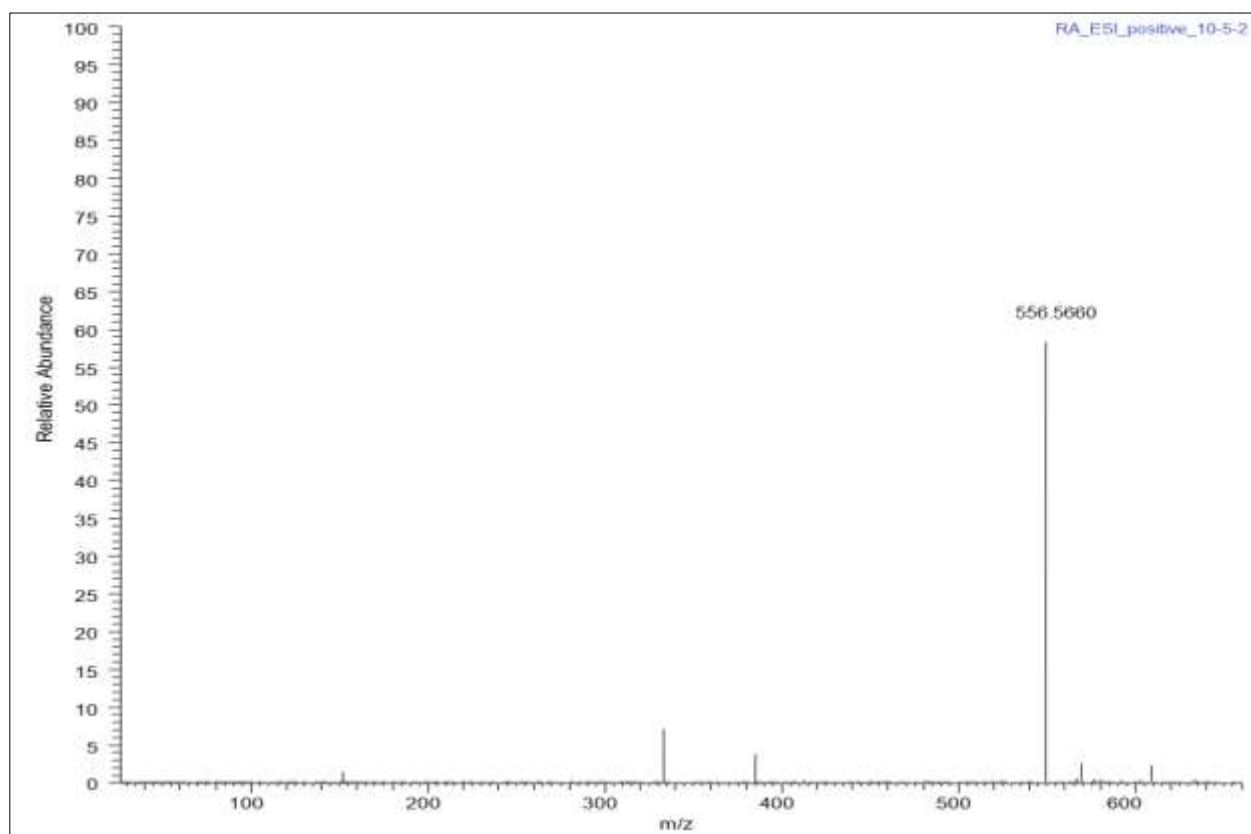


Figure S12. ESI-HRMS chromatogram of ceramide **C (3)**

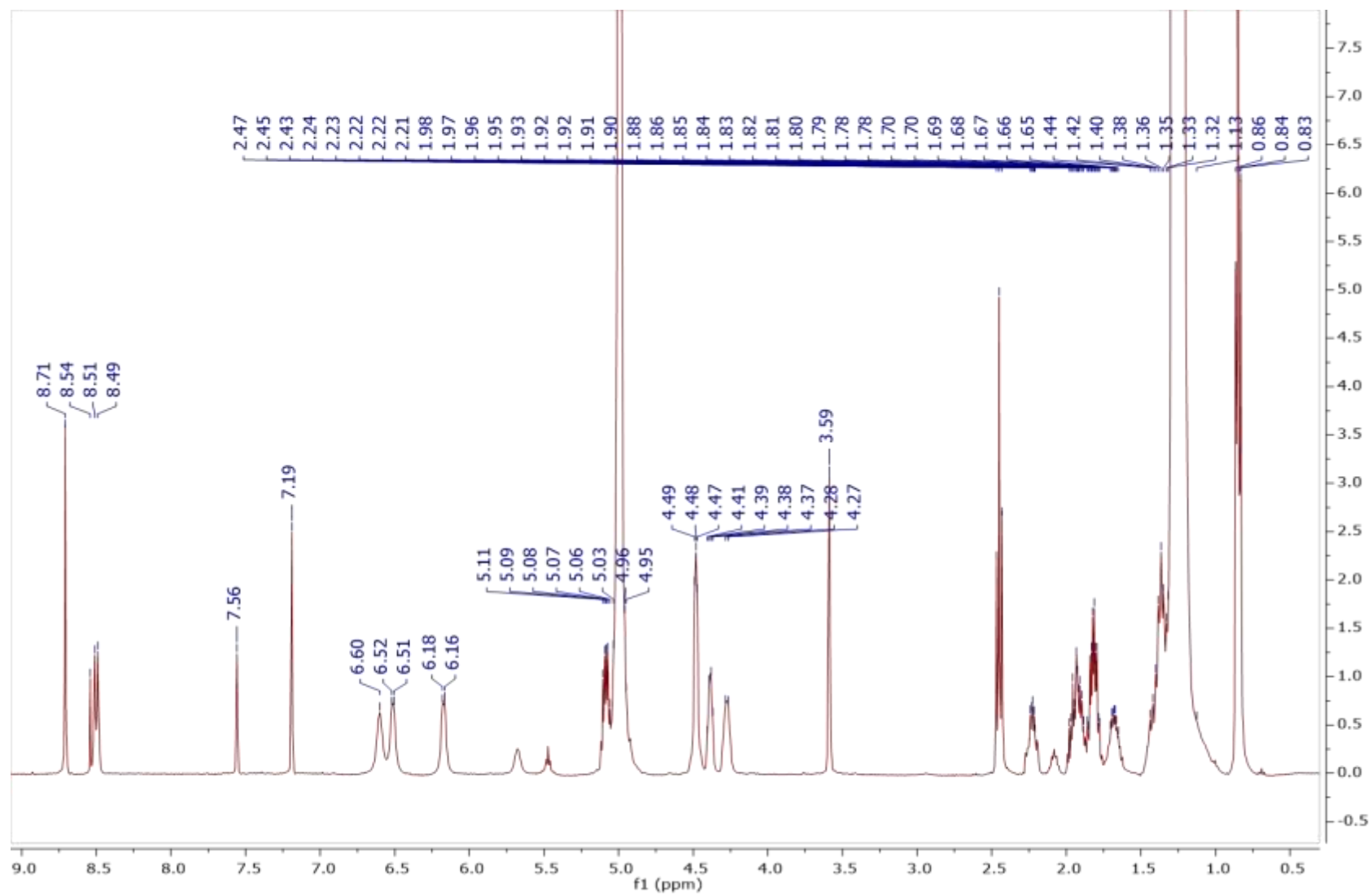


Figure S13.  $^1\text{H}$  NMR spectra of ceramide **C** (**3**)

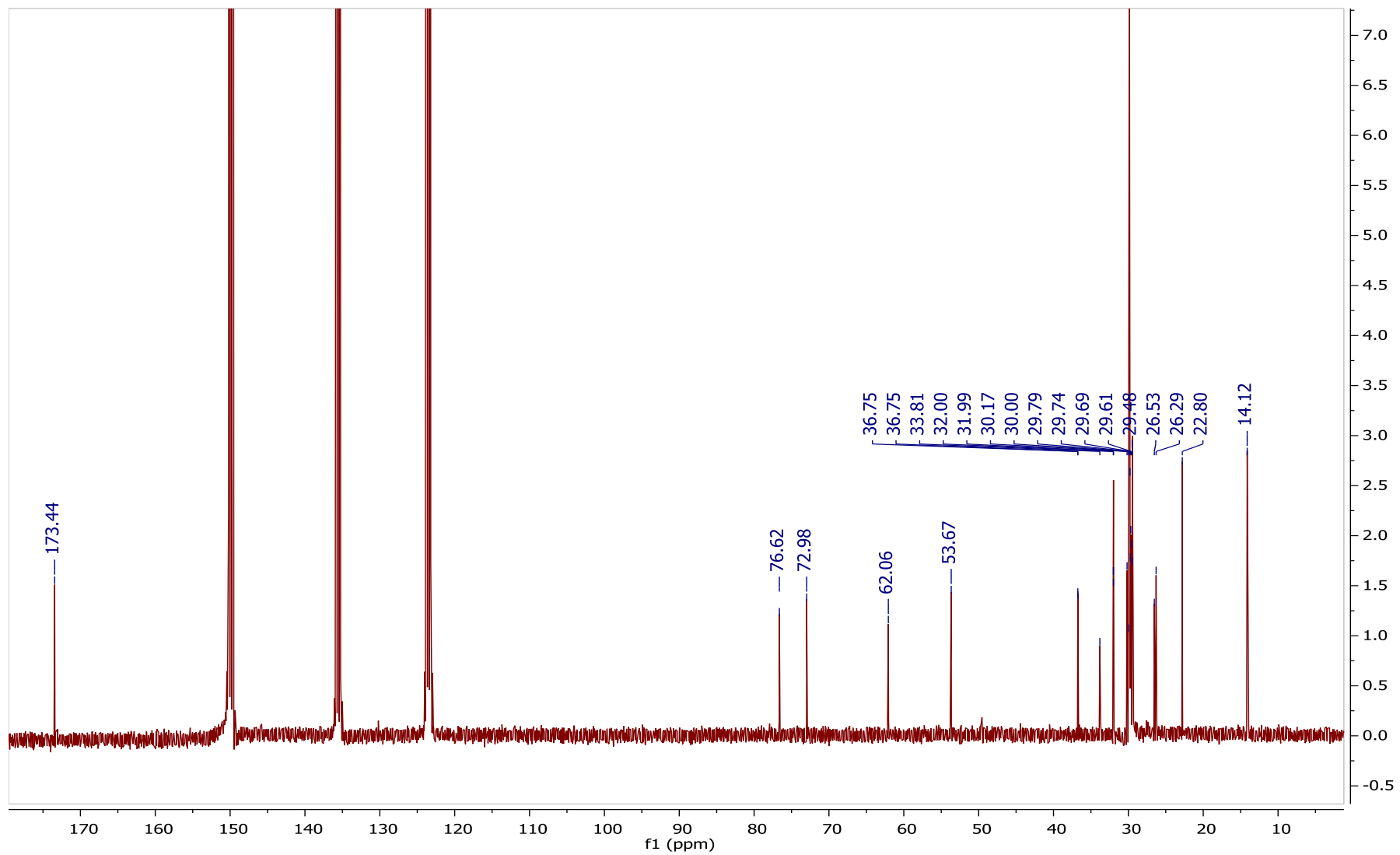


Figure S14.  $^{13}\text{C}$  NMR spectra of ceramide C (3)

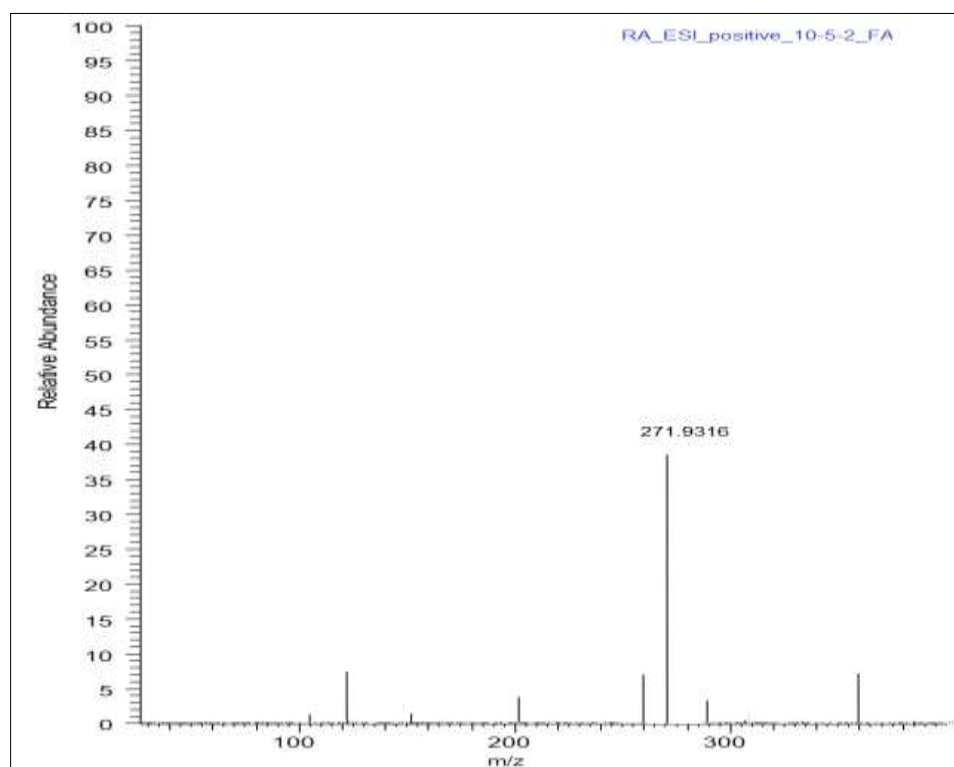


Figure S15. ESI-HRMS chromatogram of fatty acid methyl ester of ceramide **C** (**3**)



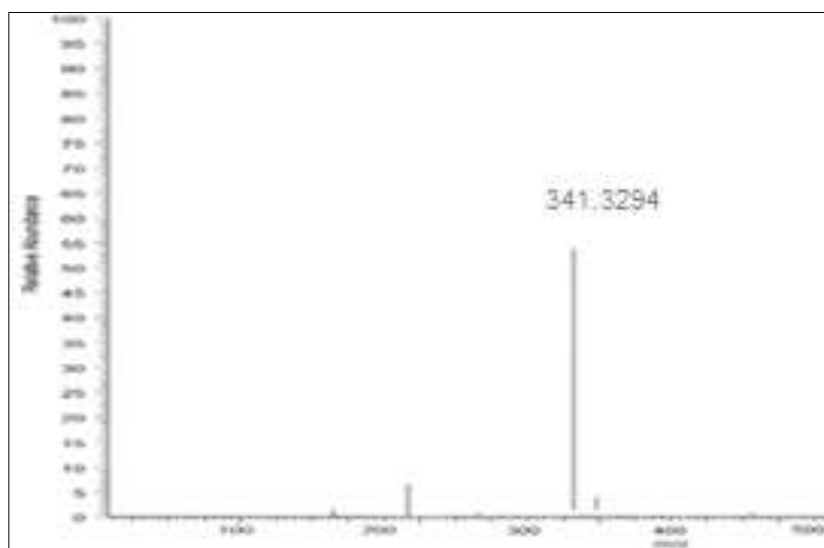


Figure S16. ESI-HRMS chromatogram of compound **4**.

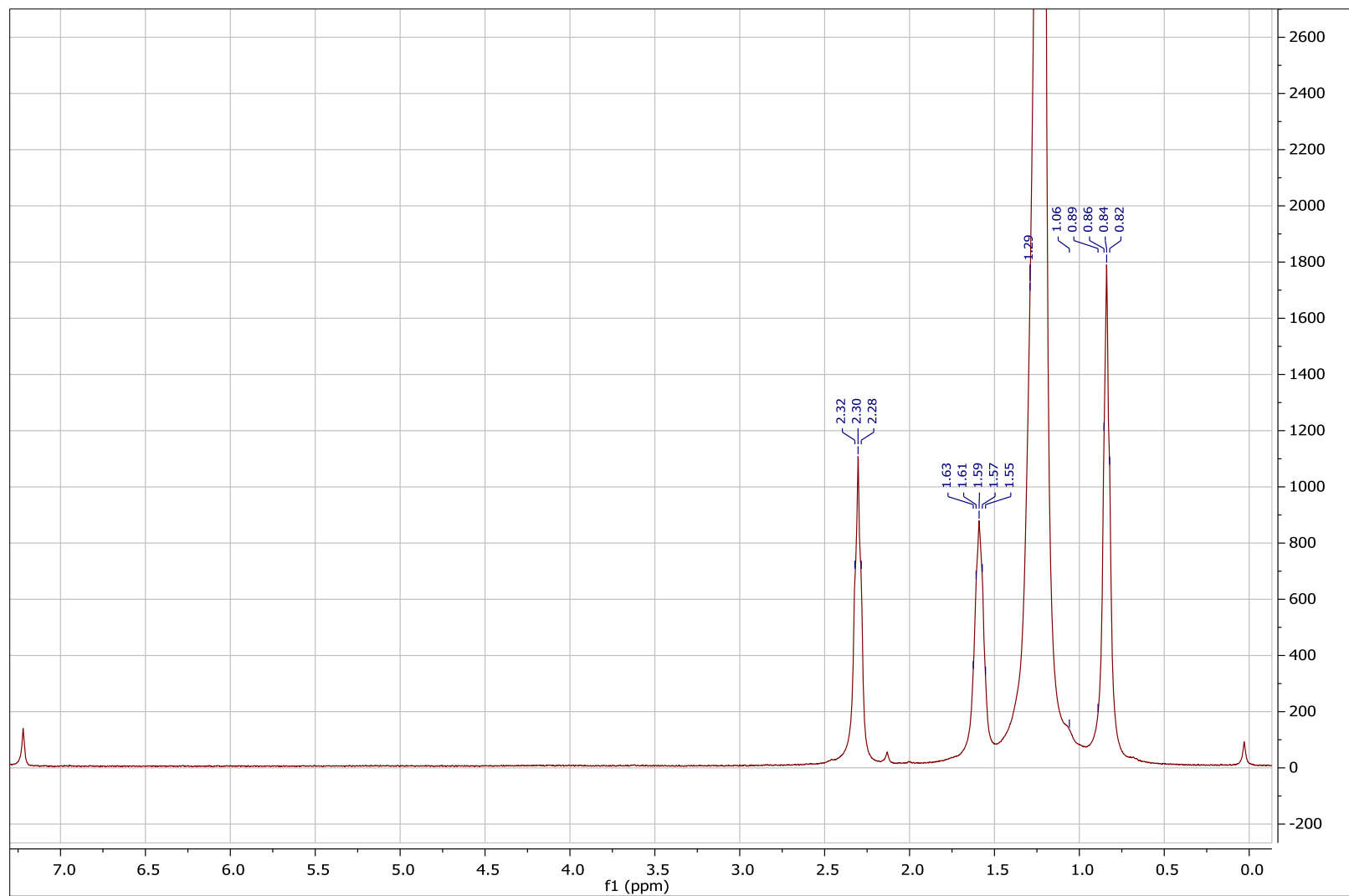


Figure S17. <sup>1</sup>H NMR spectra of compound **4**.

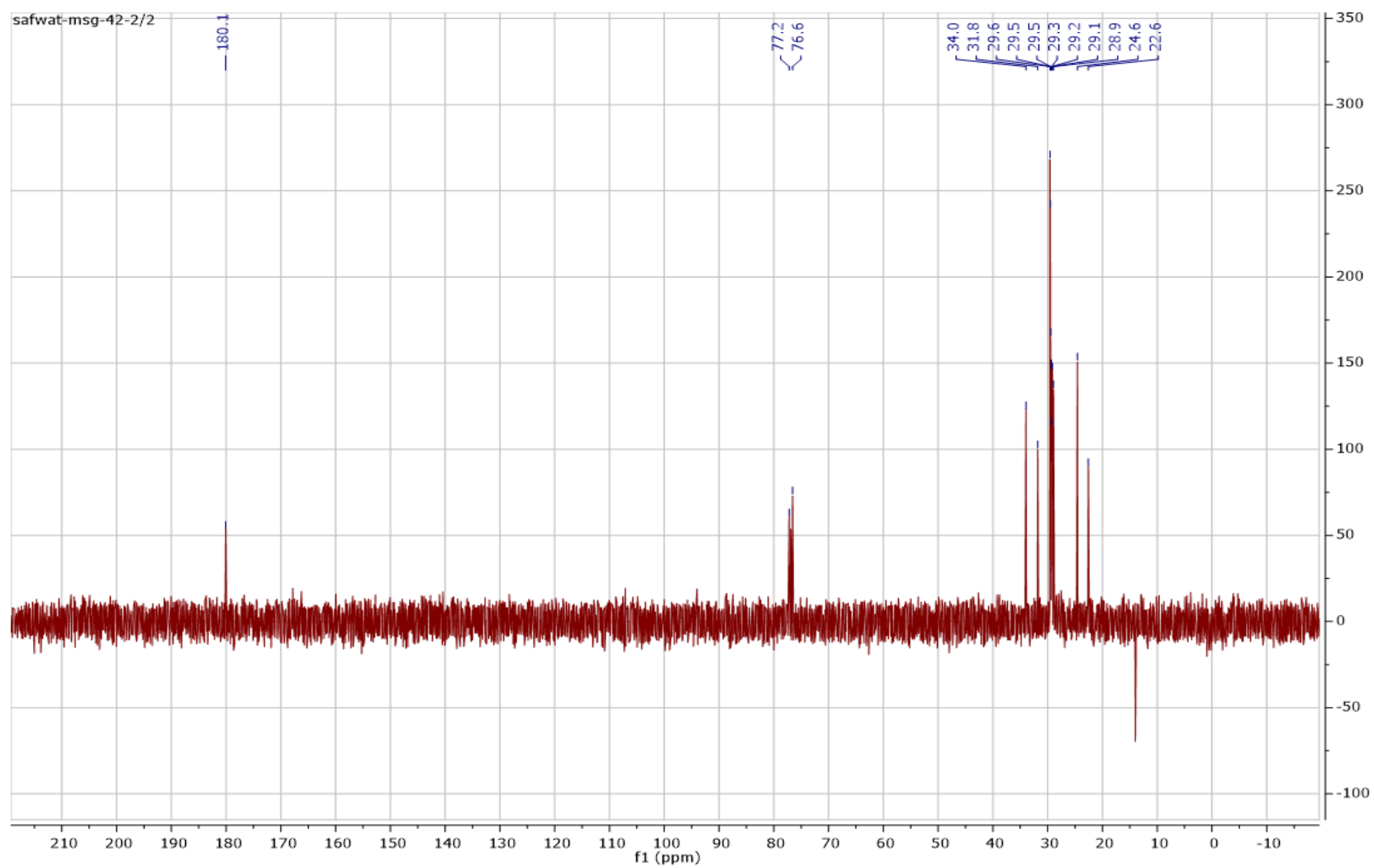


Figure S18.  $^{13}\text{C}$  APT NMR spectra of compound **4**.

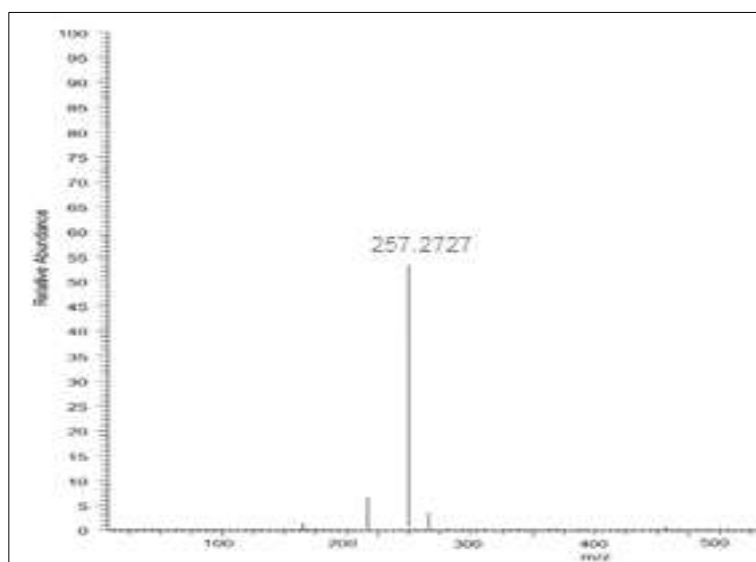


Figure S19. ESI-HRMS chromatogram of compound **5**.

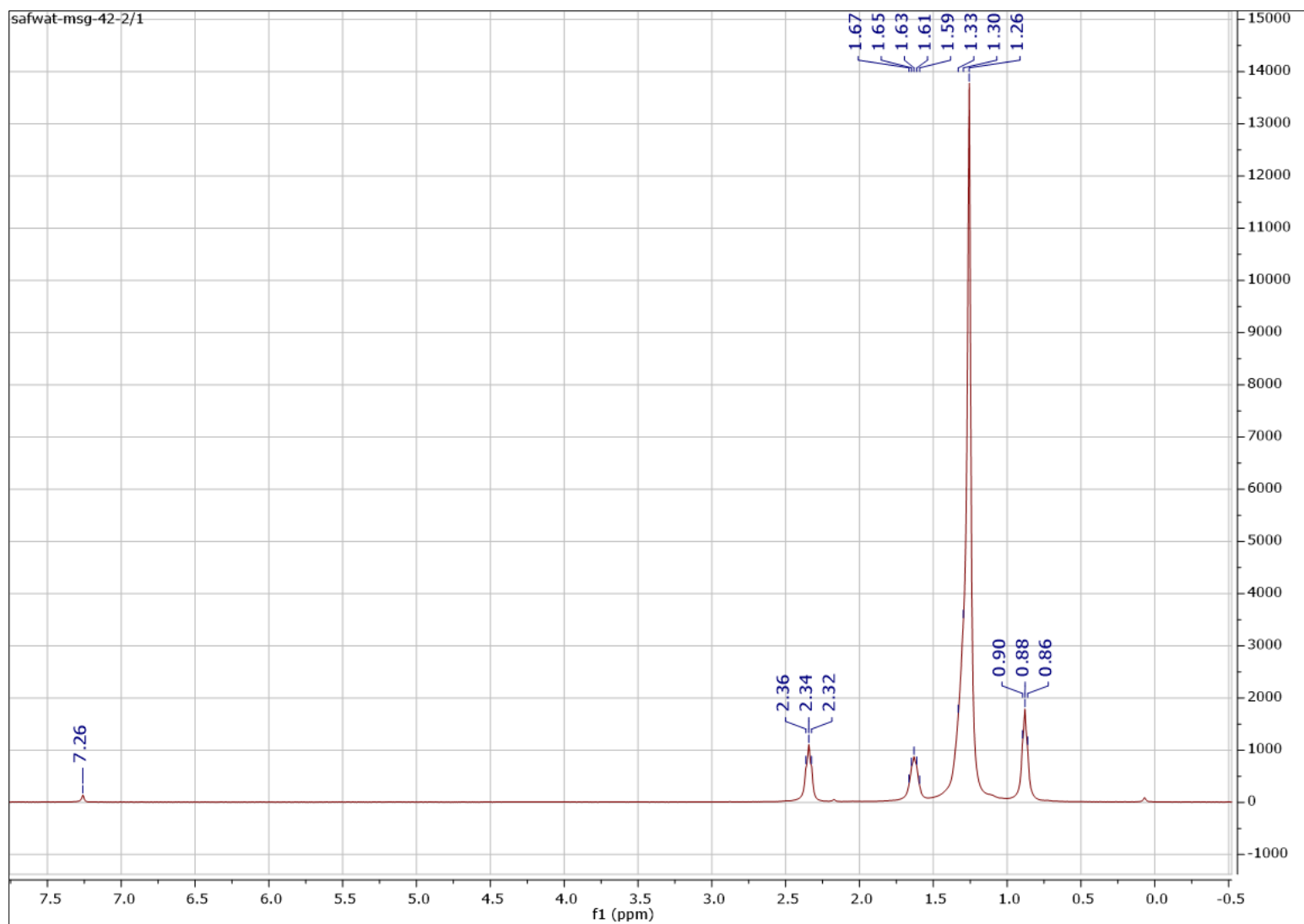


Figure S20.  $^1\text{H}$  NMR spectra of compound **5**.

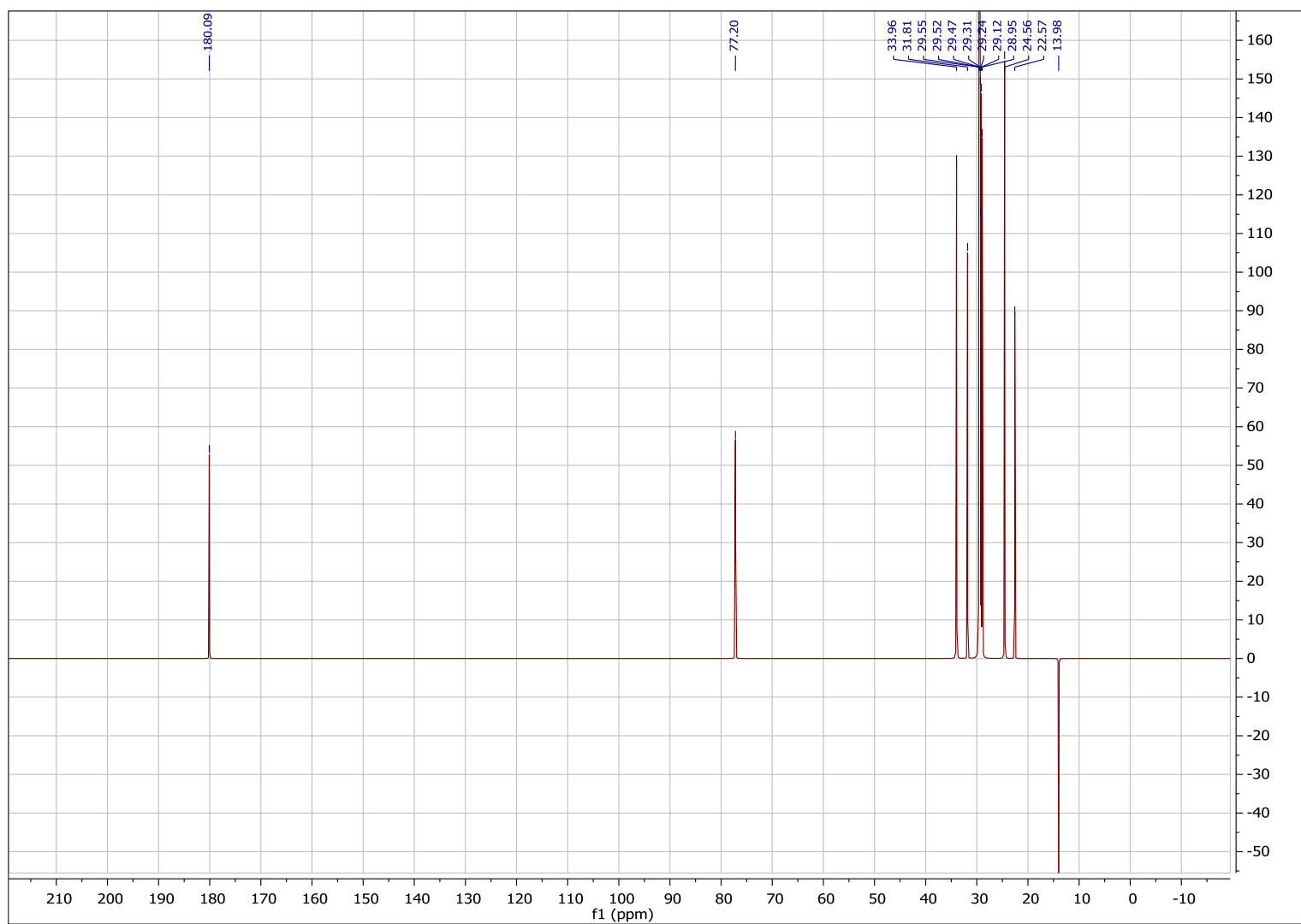


Figure S21.  $^{13}\text{C}$  APT NMR spectra of compound **5**.

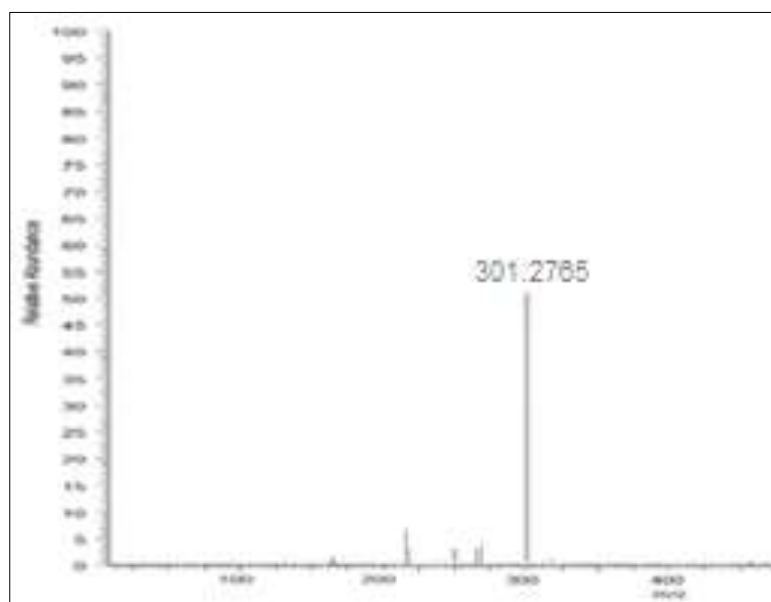


Figure S22. ESI-HRMS chromatogram of compound **6**.

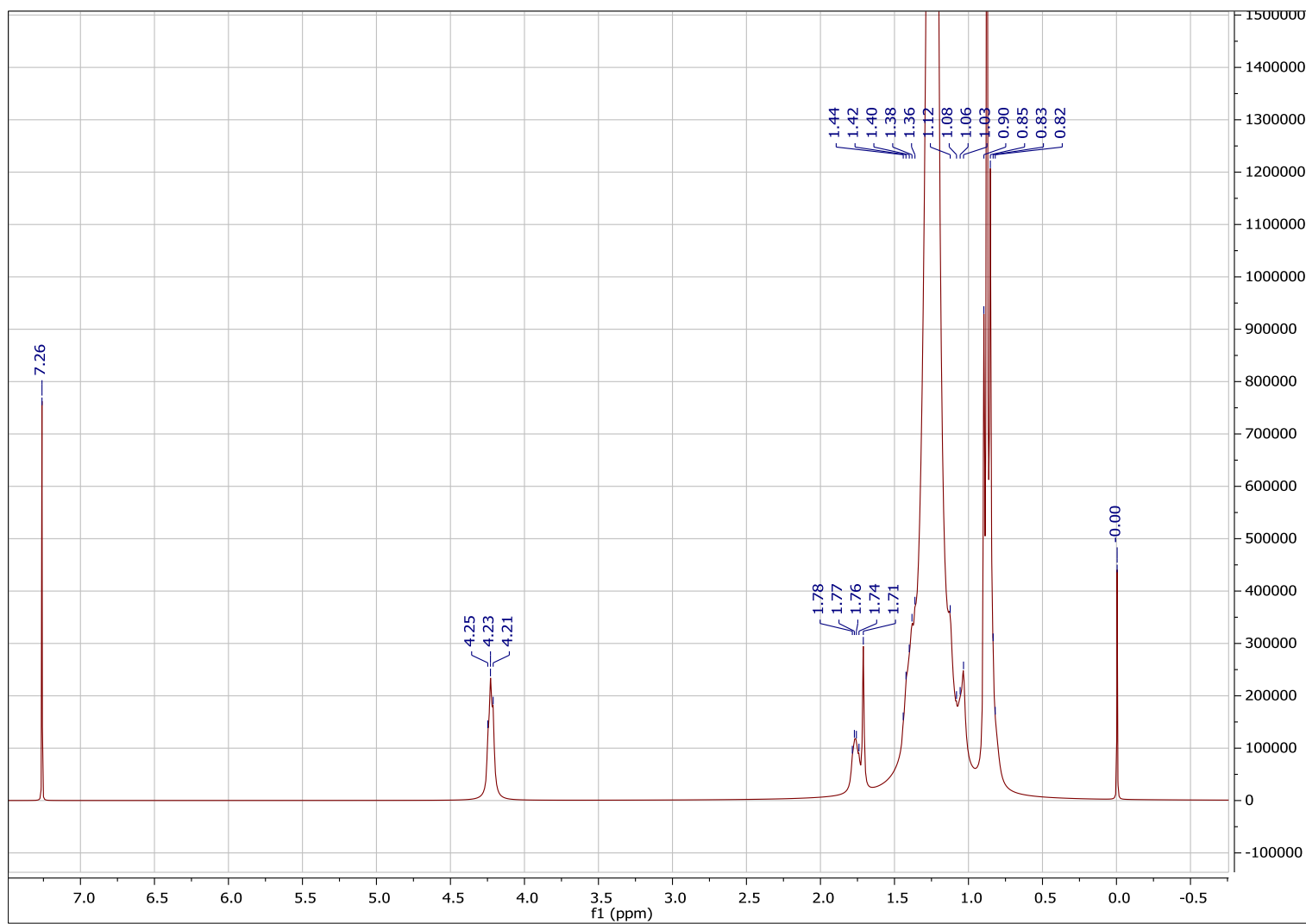


Figure S23.  $^1\text{H}$  NMR spectra of compound **6**.



Table S1. Liver enzymes and kidney markers in the study groups.

	ALT (IU/L)	AST (IU/L)	Urea (mg/dL)	Creatinine (mg/dL)
Normal	44.60 ± 4.29	53.78 ± 6.31	18.52 ± 3.22	0.90 ± 0.15
Control	53.59 ± 6.11	63.61 ± 6.90	25.33 ± 5.60	1.30 ± 0.25
Ceramide 1 (1 mg/kg)	51.23 ± 4.10	62.31 ± 5.40	25.32 ± 6.66	1.25 ± 0.24
Ceramide 1 (2 mg/kg)	50.31 ± 5.91	60.40 ± 5.70	24.76 ± 6.87	1.22 ± 0.27
Ceramide 2 (1 mg/kg)	52.51 ± 5.10	61.33 ± 5.89	24.83 ± 6.50	1.24 ± 0.27
Ceramide 2 (2 mg/kg)	49.32 ± 6.90	60.32 ± 7.10	23.60 ± 6.98	1.21 ± 0.26

Values are expressed as mean ± SD. Data were analyzed using ANOVA followed by Bonferroni post hoc test.