

## Supplementary Materials

# Nutritional, antioxidant, antimicrobial, and anticholinesterase properties of *Phyllanthus emblica*: A study supported by spectroscopic and computational investigations

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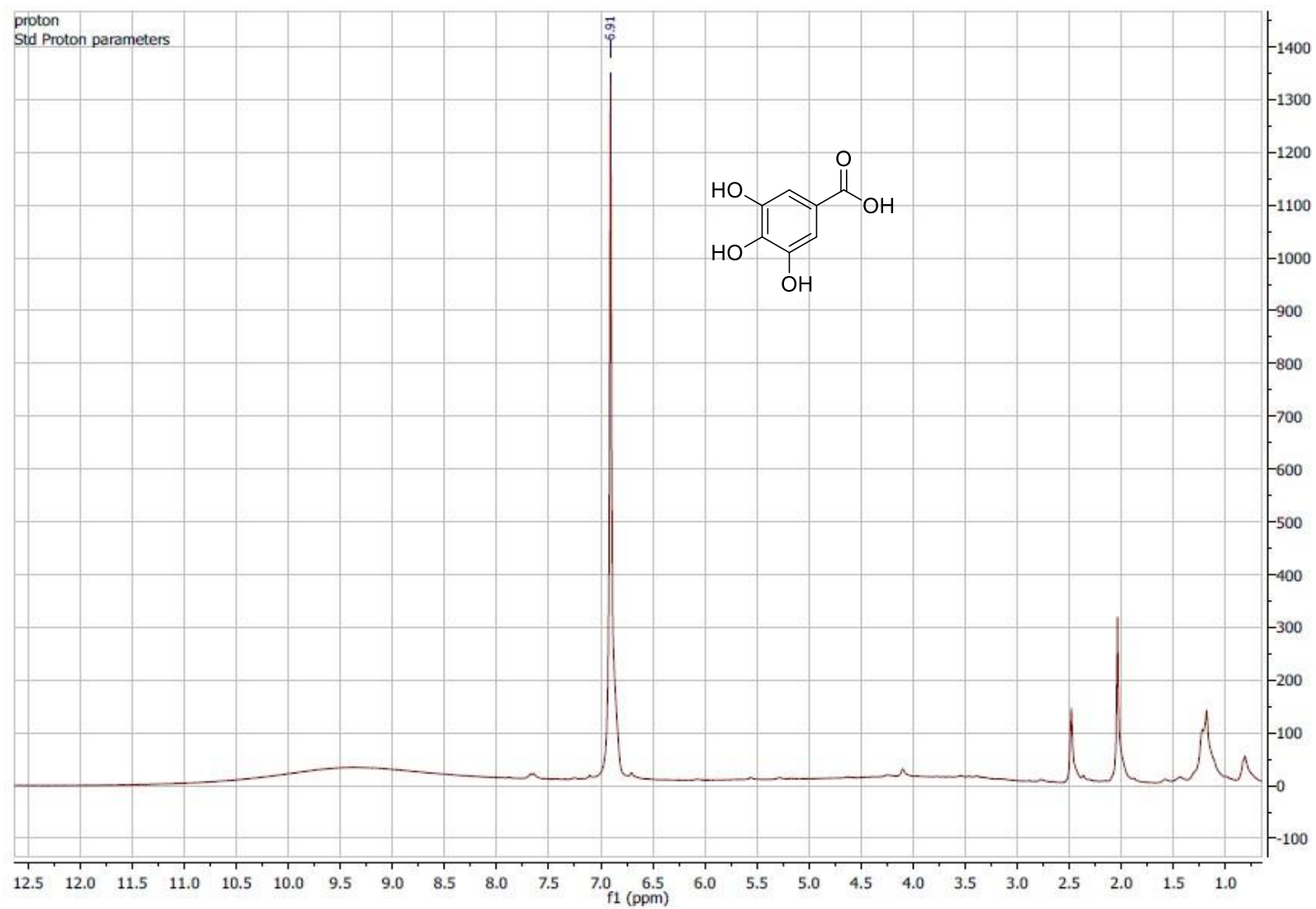
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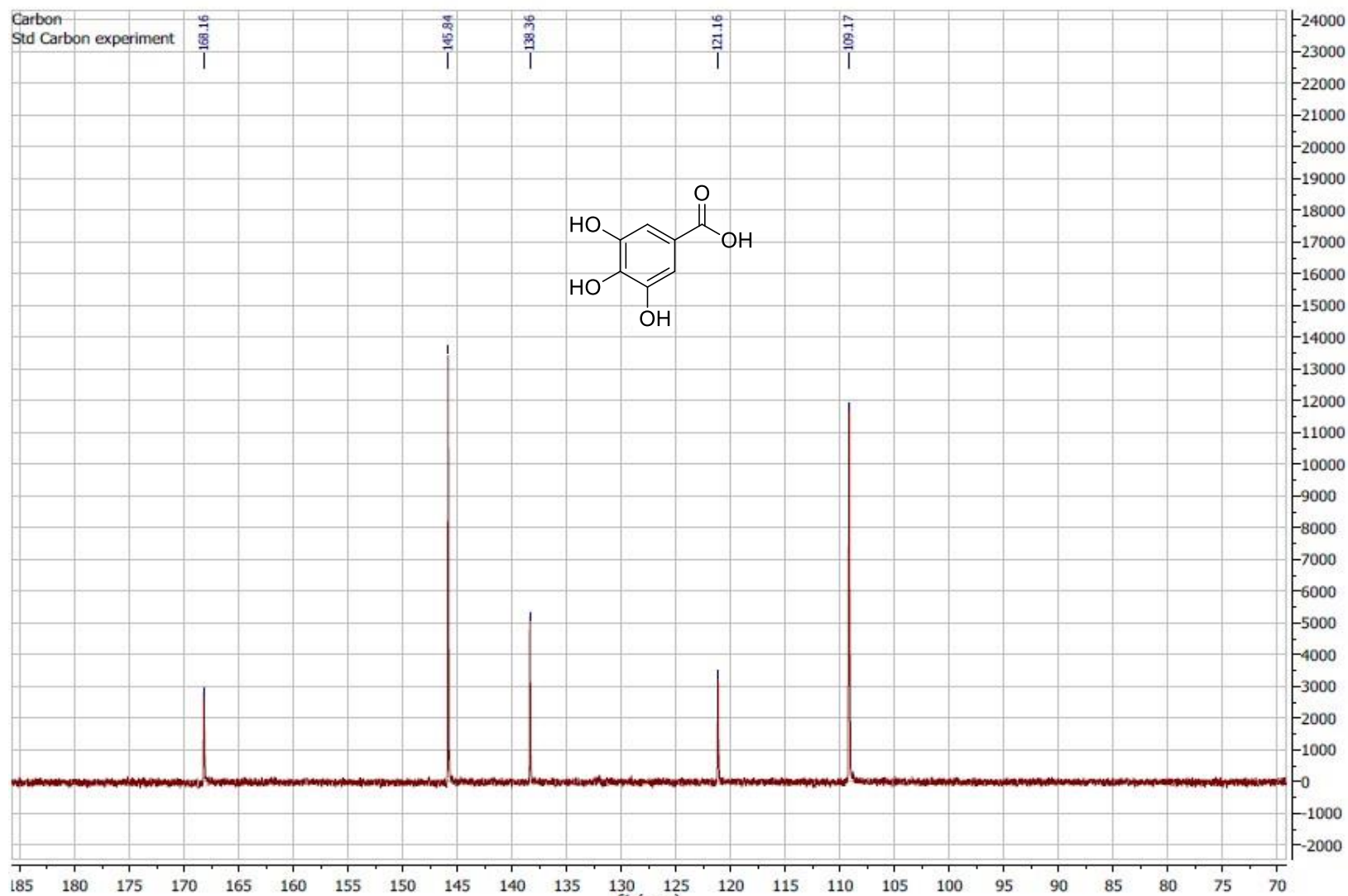
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**Figure S1.**  $^1\text{H}$  NMR spectrum of compound **1** ( $\text{DMSO}-d_6$ , 400 MHz)



**Figure S2.**  $^{13}\text{C}$  NMR spectrum of compound 1 ( $\text{DMSO-}d_6$ , 100 MHz)

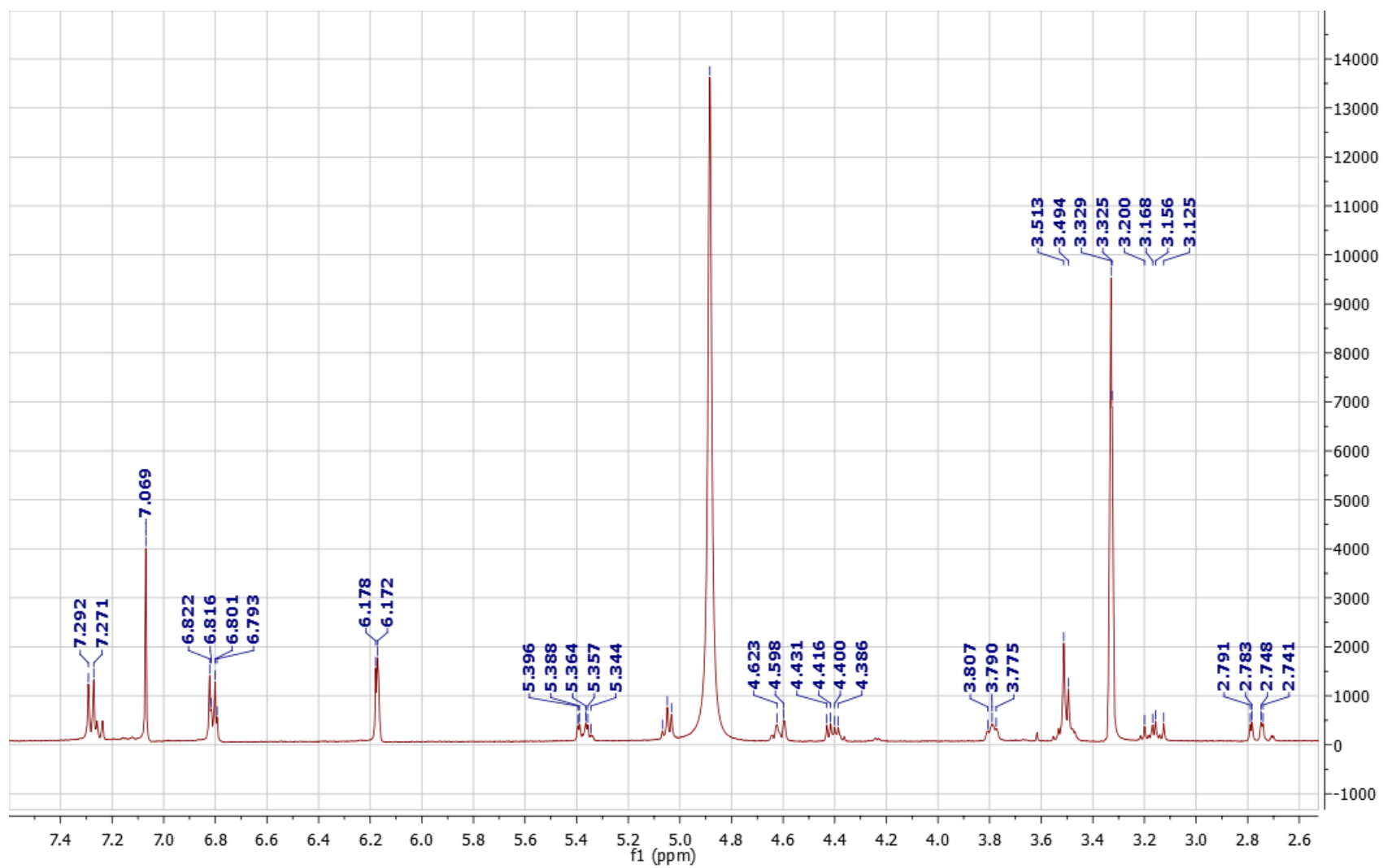


Figure S3. <sup>1</sup>H NMR spectrum of compound 2 (CD<sub>3</sub>OD, 400MHz)

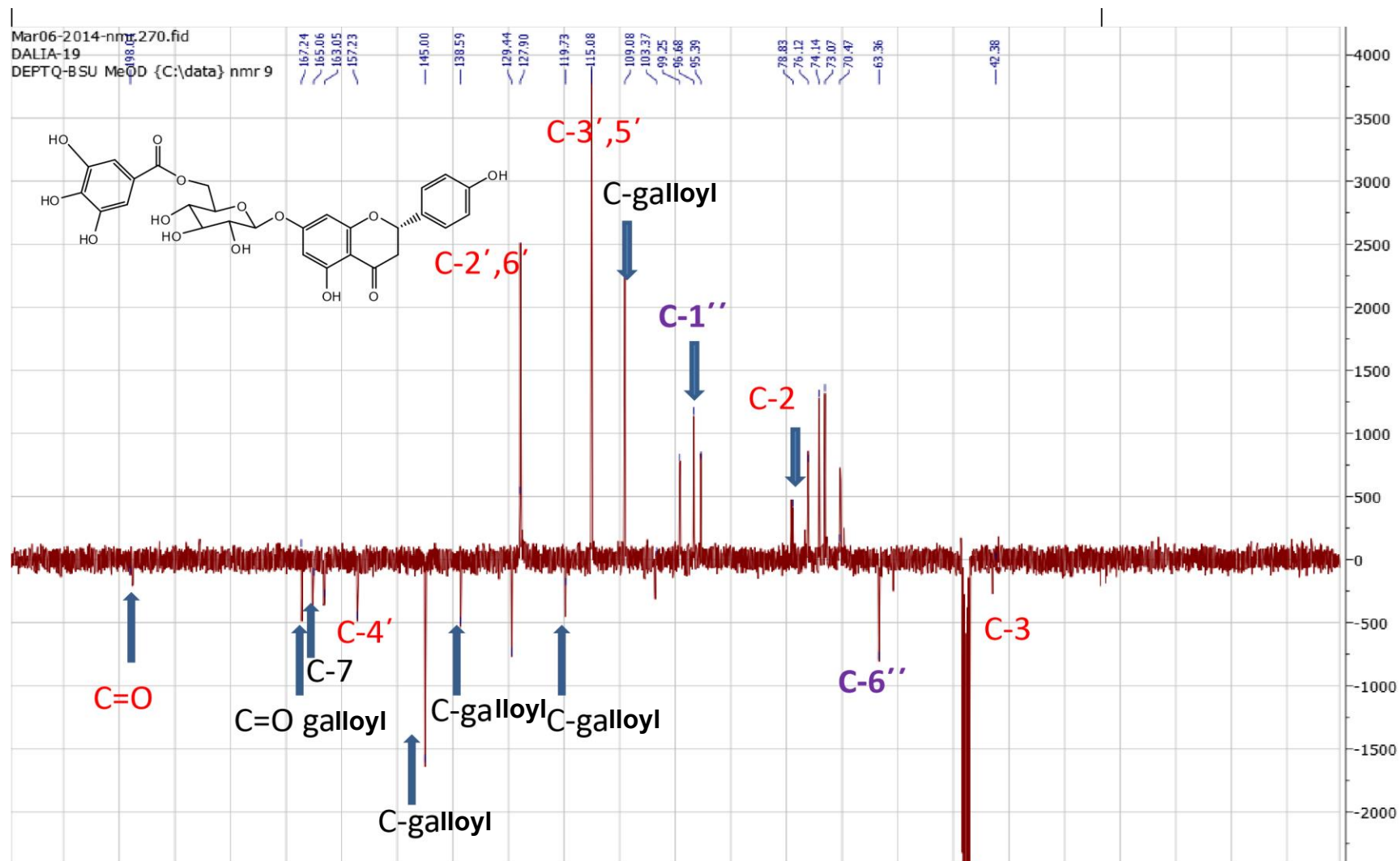
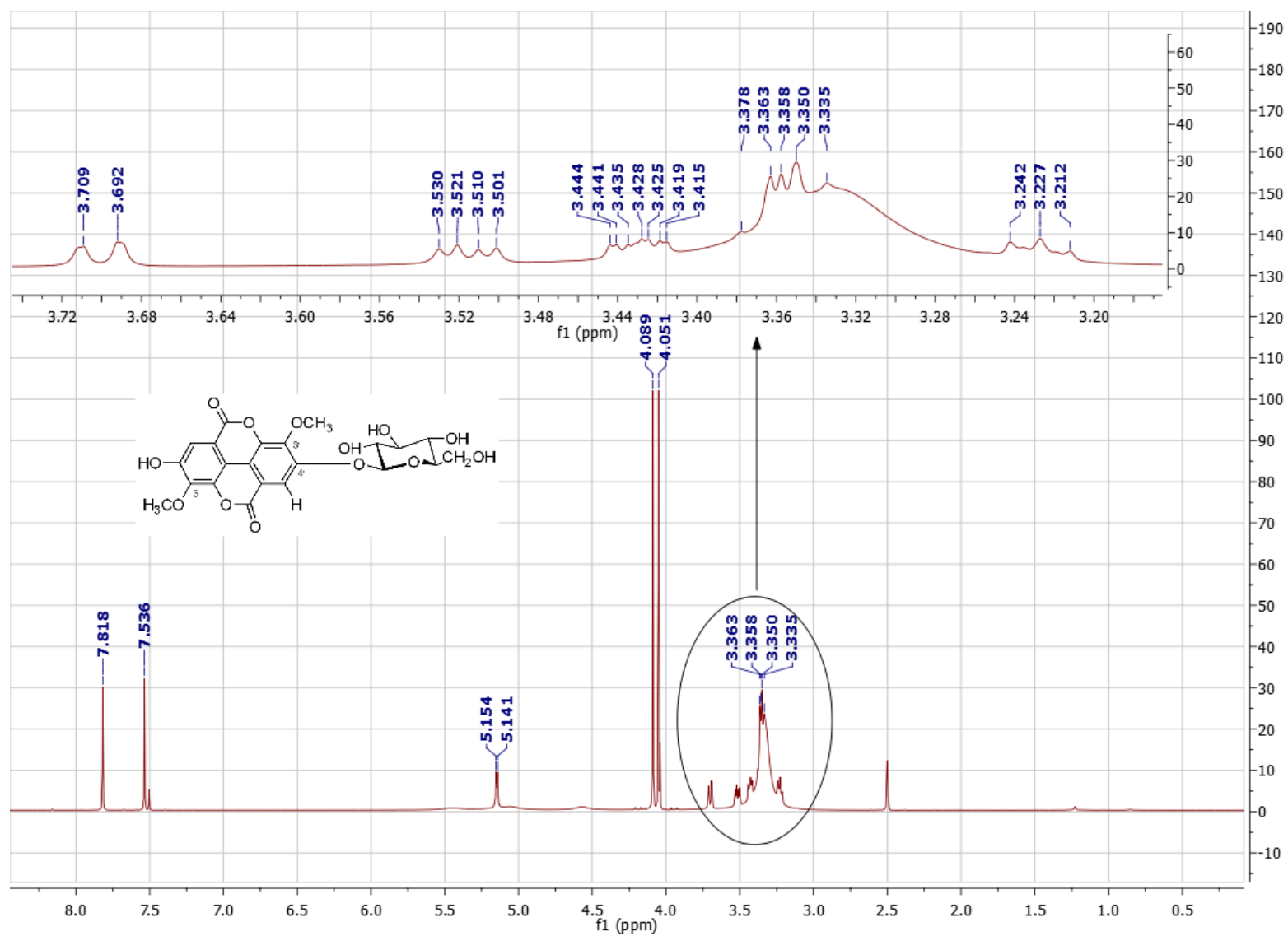
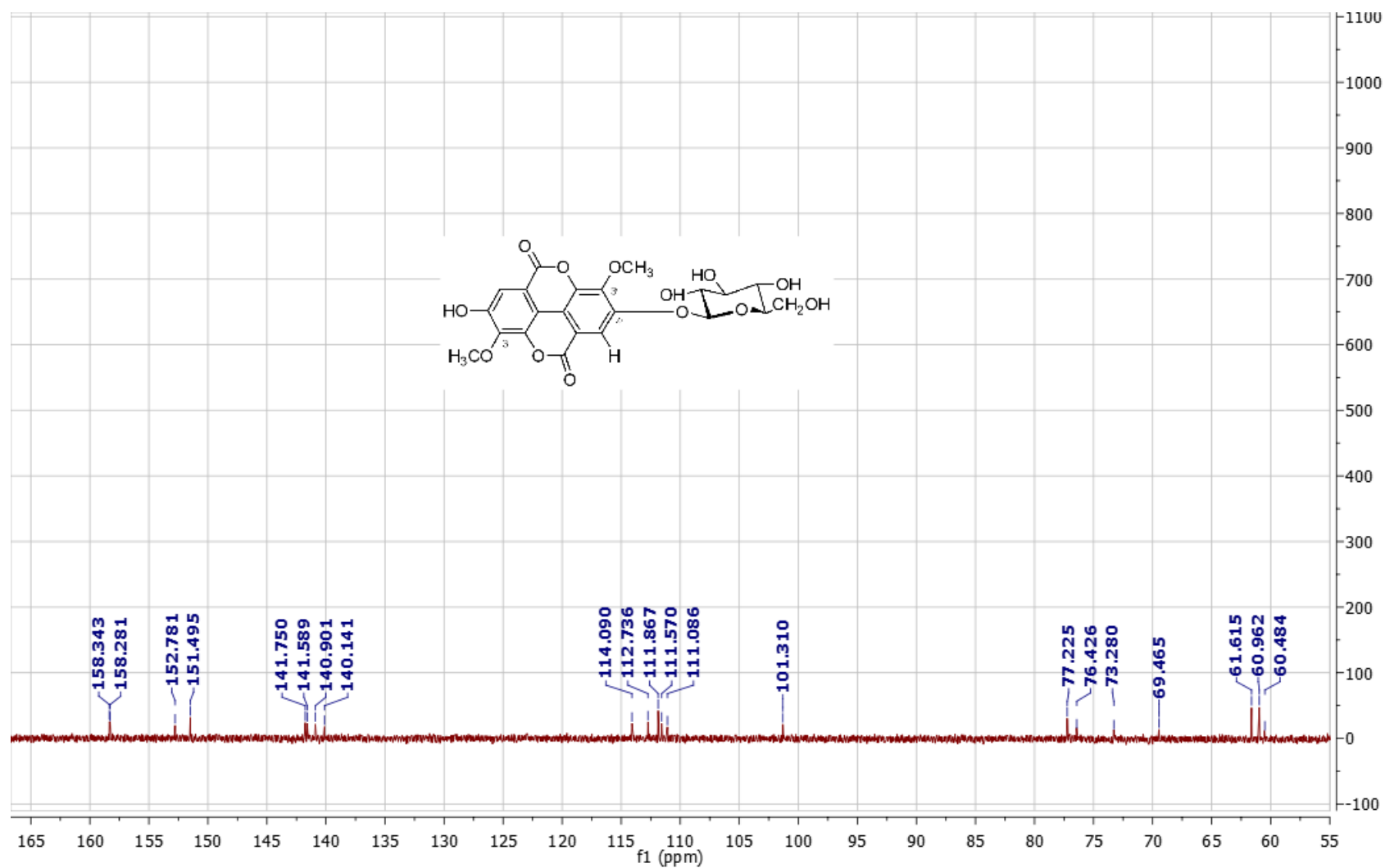


Figure S4. DPTQ NMR spectrum of compound 2 (CD<sub>3</sub>OD, 100 MHz)

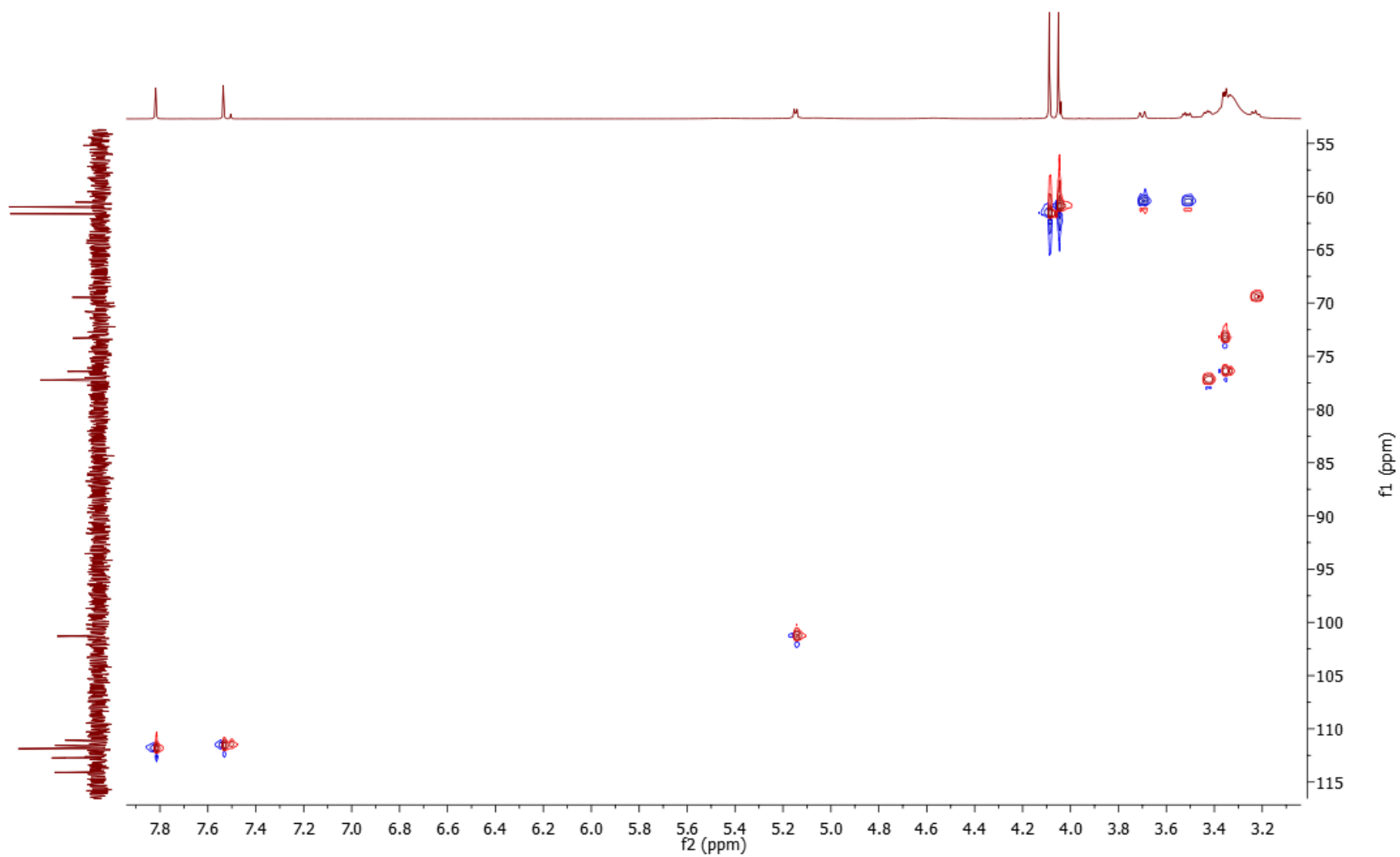


**Figure S5.**  $^1\text{H}$  NMR spectrum of compound **3** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]

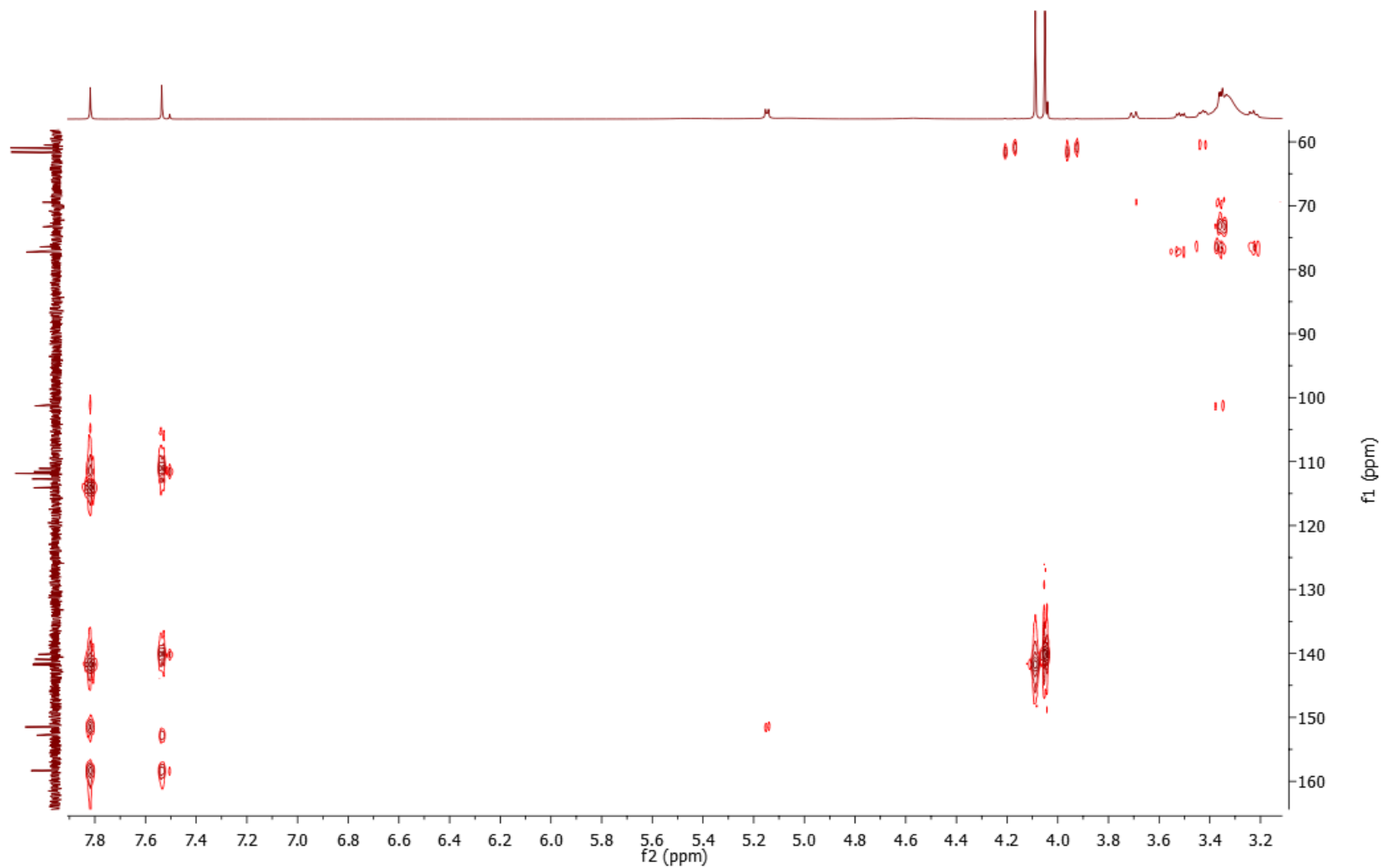




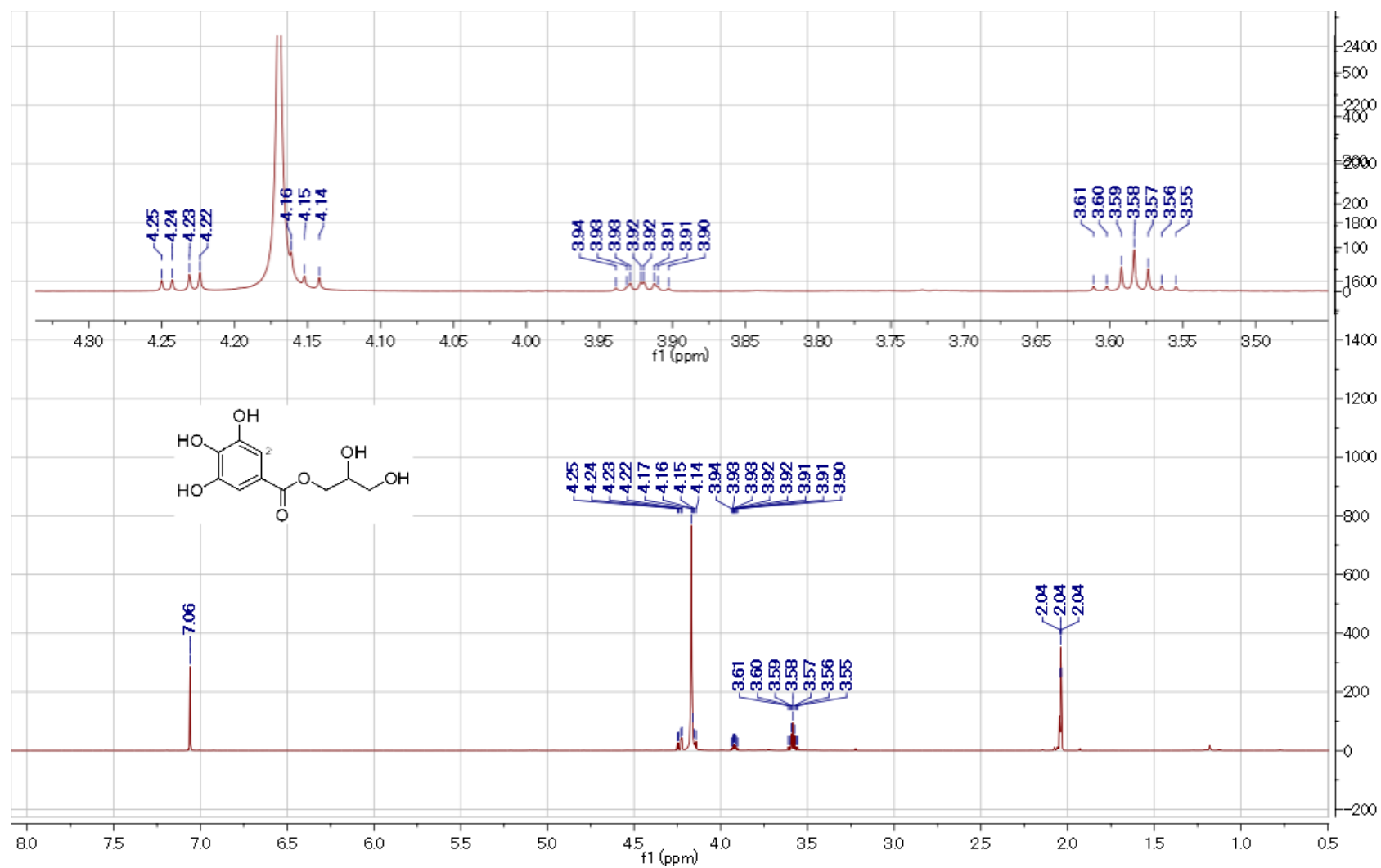
**Figure S6.** <sup>13</sup>C NMR spectrum of compound **3** [acetone-*d*<sub>6</sub>/D<sub>2</sub>O, 9/1, v/v, 151 MHz]



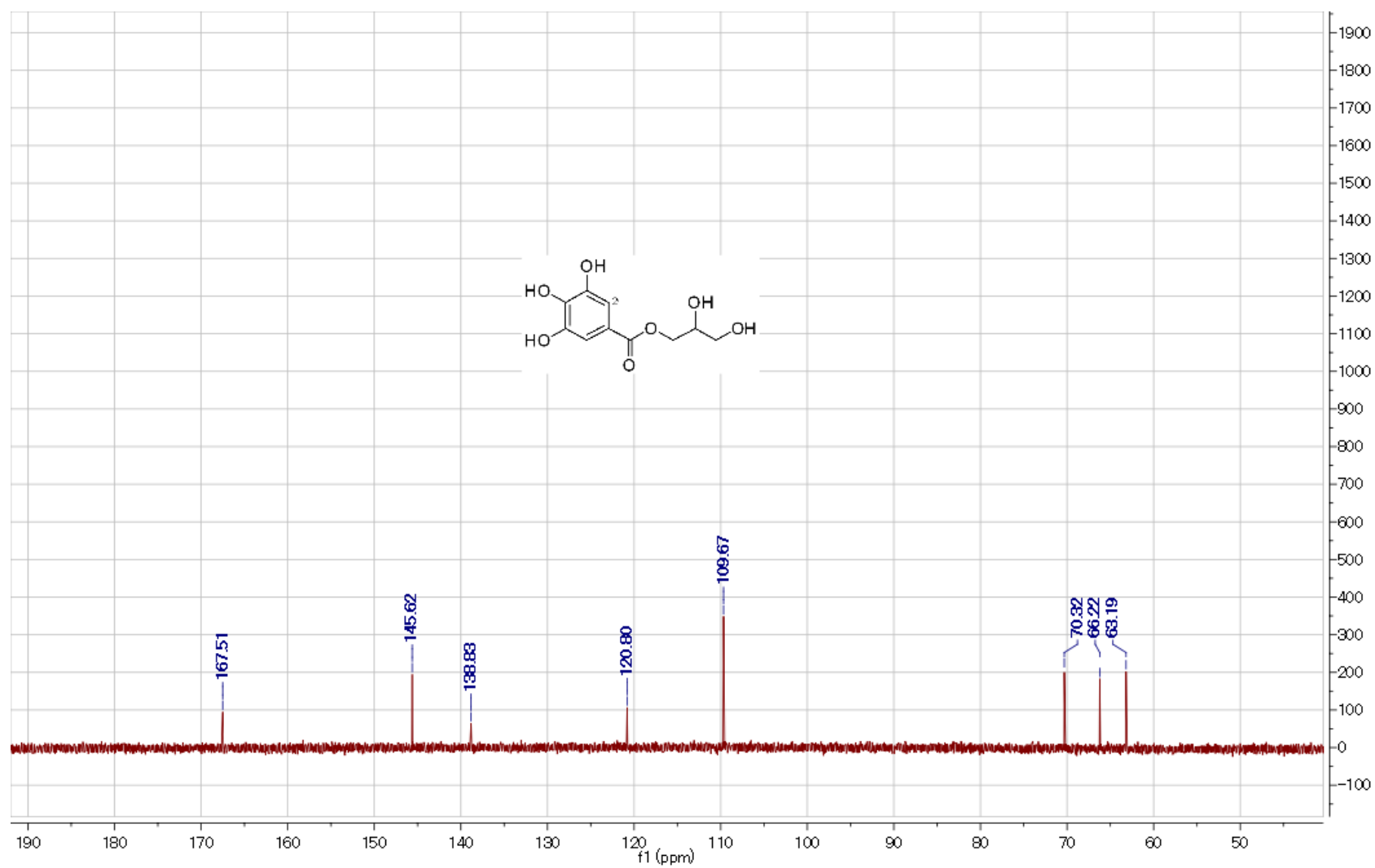
**Figure S7.** HSQC spectrum of compound **3** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



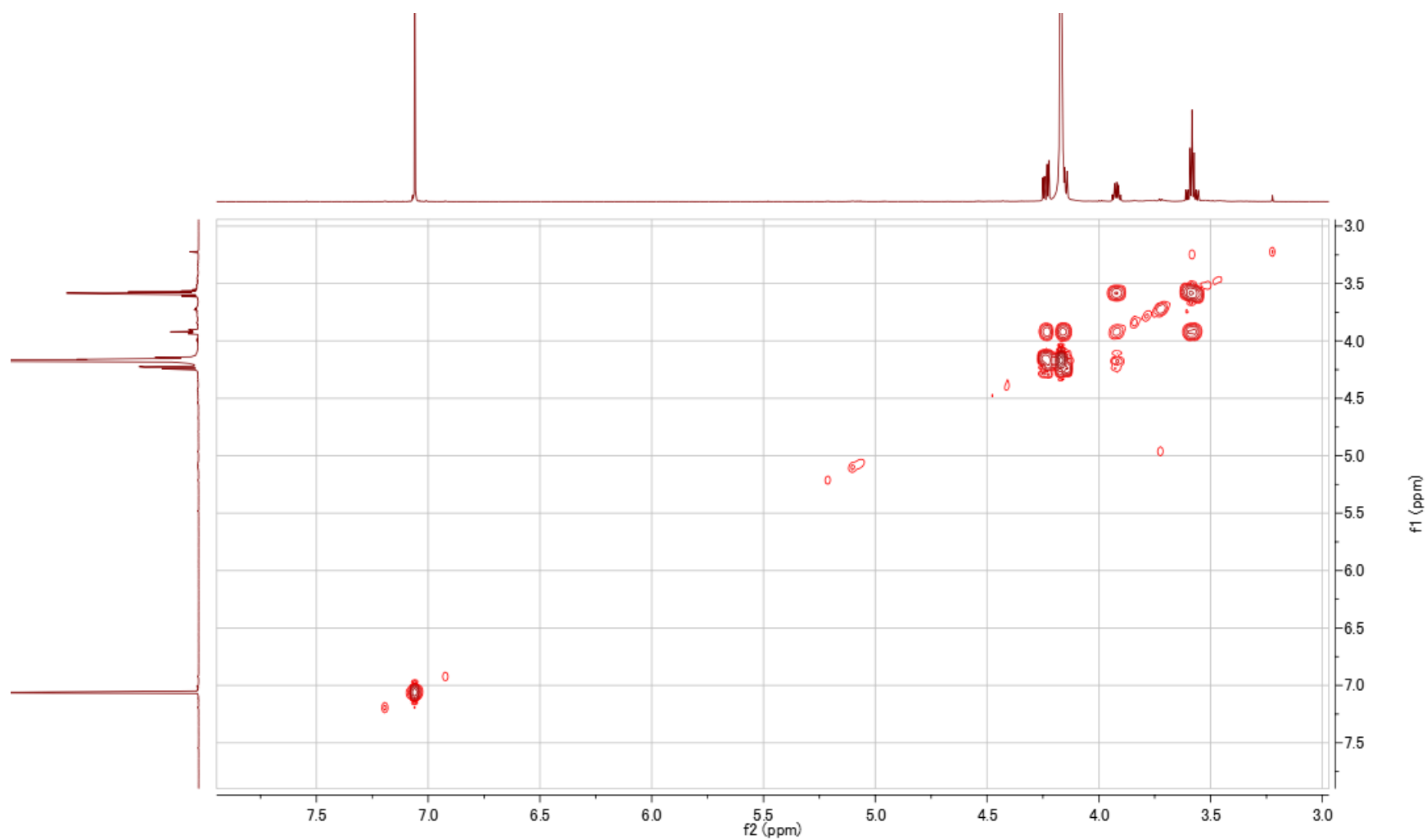
**Figure S8.** HMBC spectrum of compound **3** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



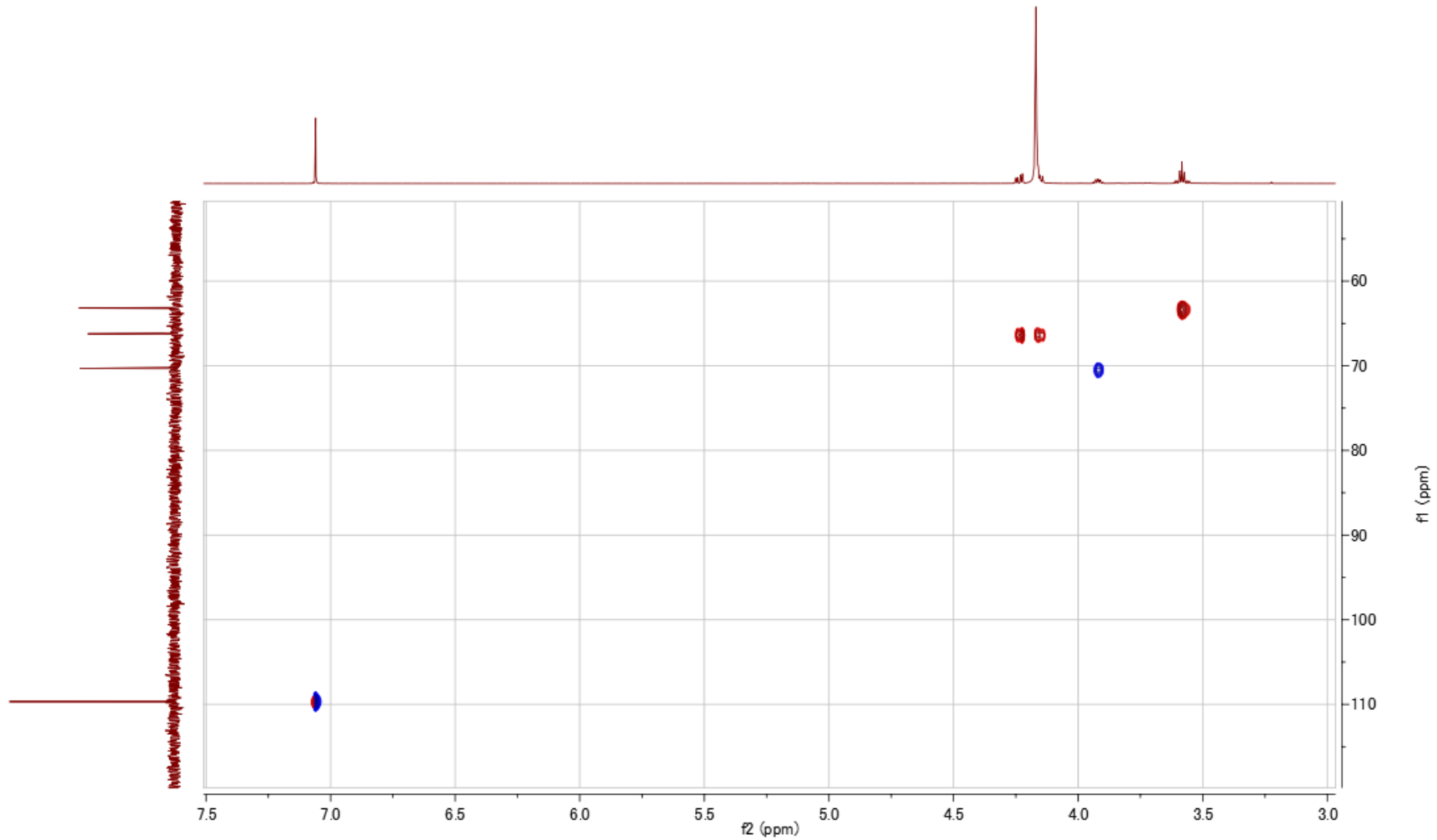
**Figure S9.**  $^1\text{H}$  NMR spectrum of compound **4** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



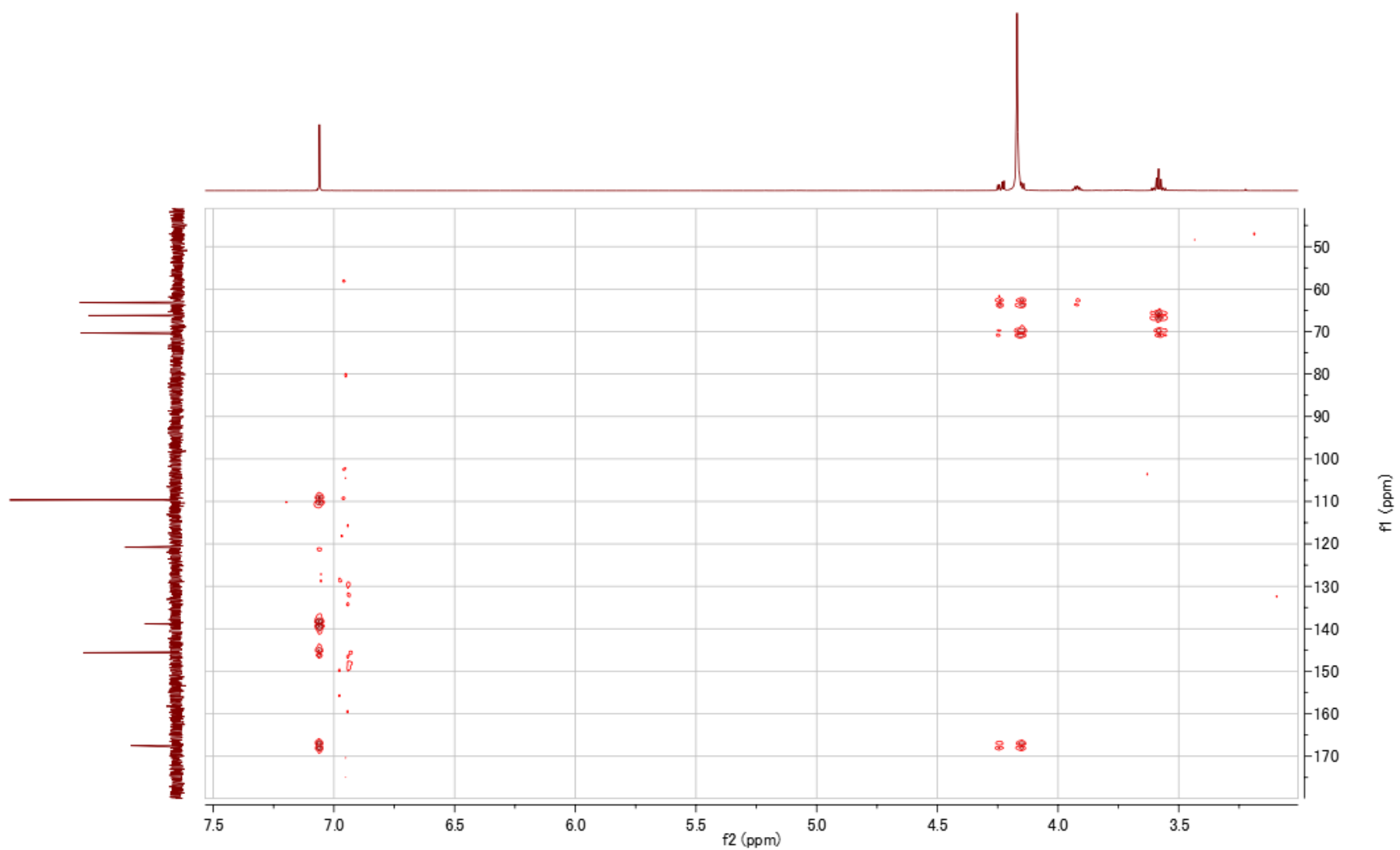
**Figure S10.**  $^{13}\text{C}$  NMR spectrum of compound **4** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 151 MHz]



**Figure S11.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of compound **4** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]

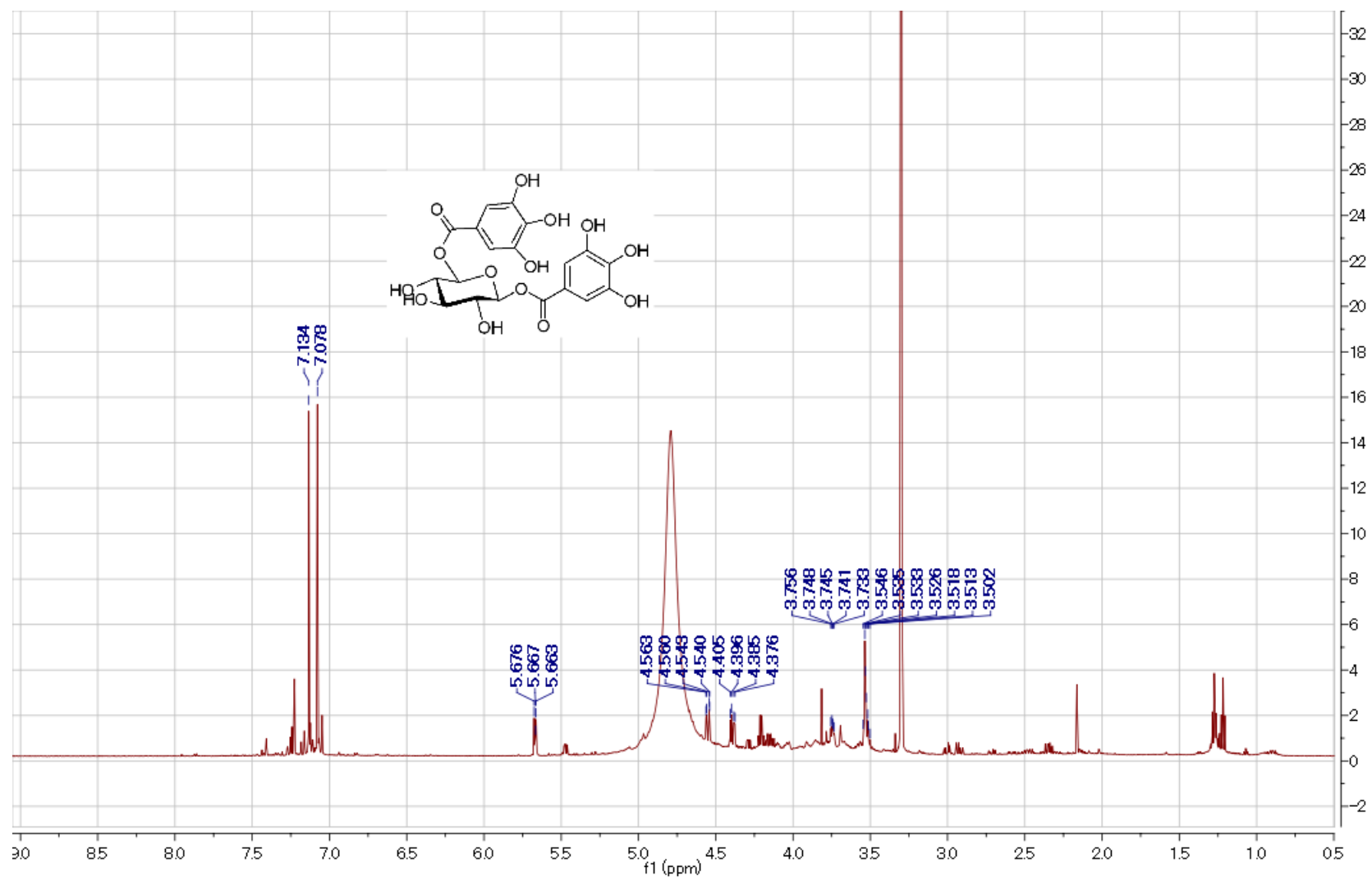


**Figure S12.** HSQC spectrum of compound **4** [acetone- $d_6$ /D $_2$ O, 9/1,  $v/v$ , 600 MHz]

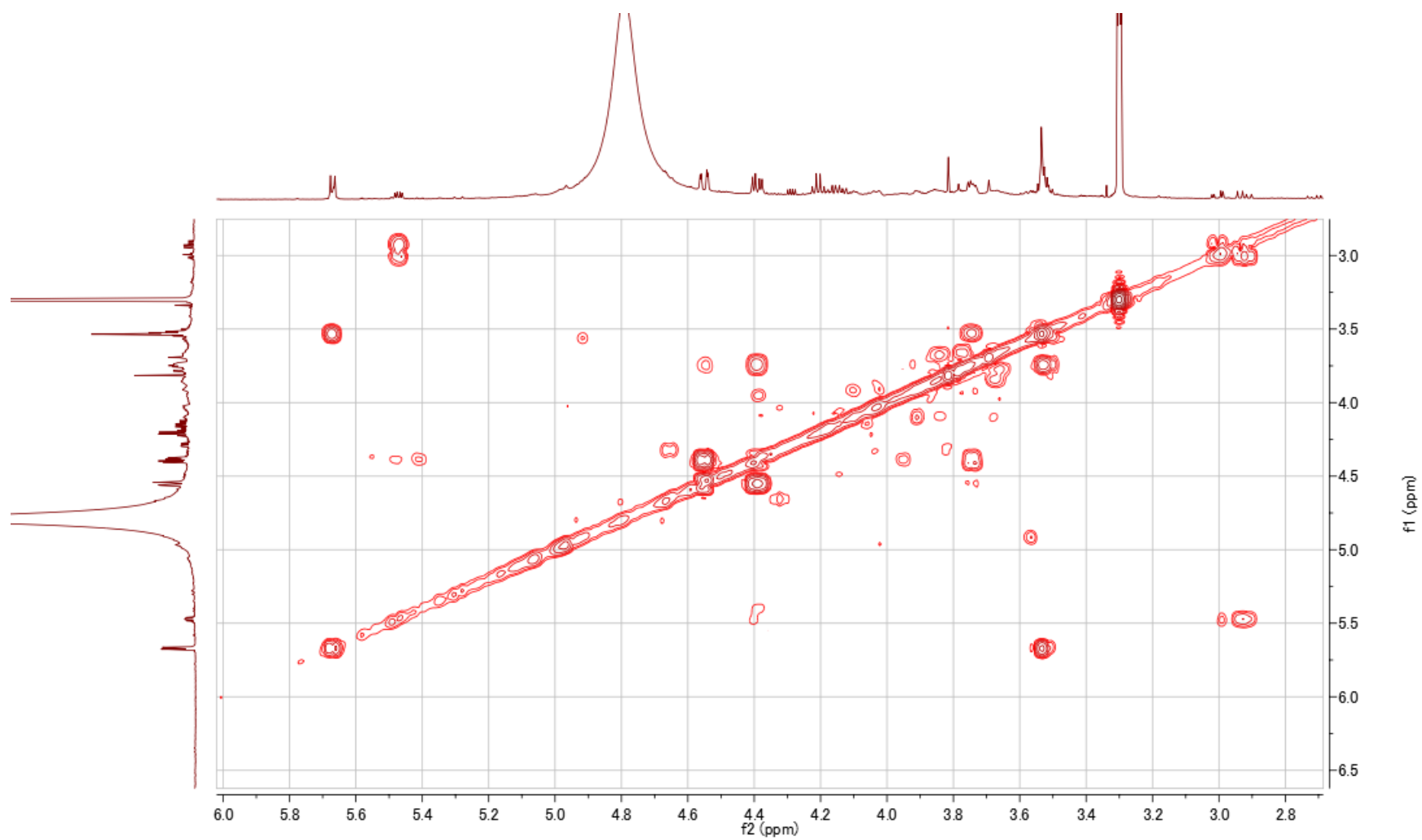


**Figure S13.** HMBC spectrum of compound **4** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]

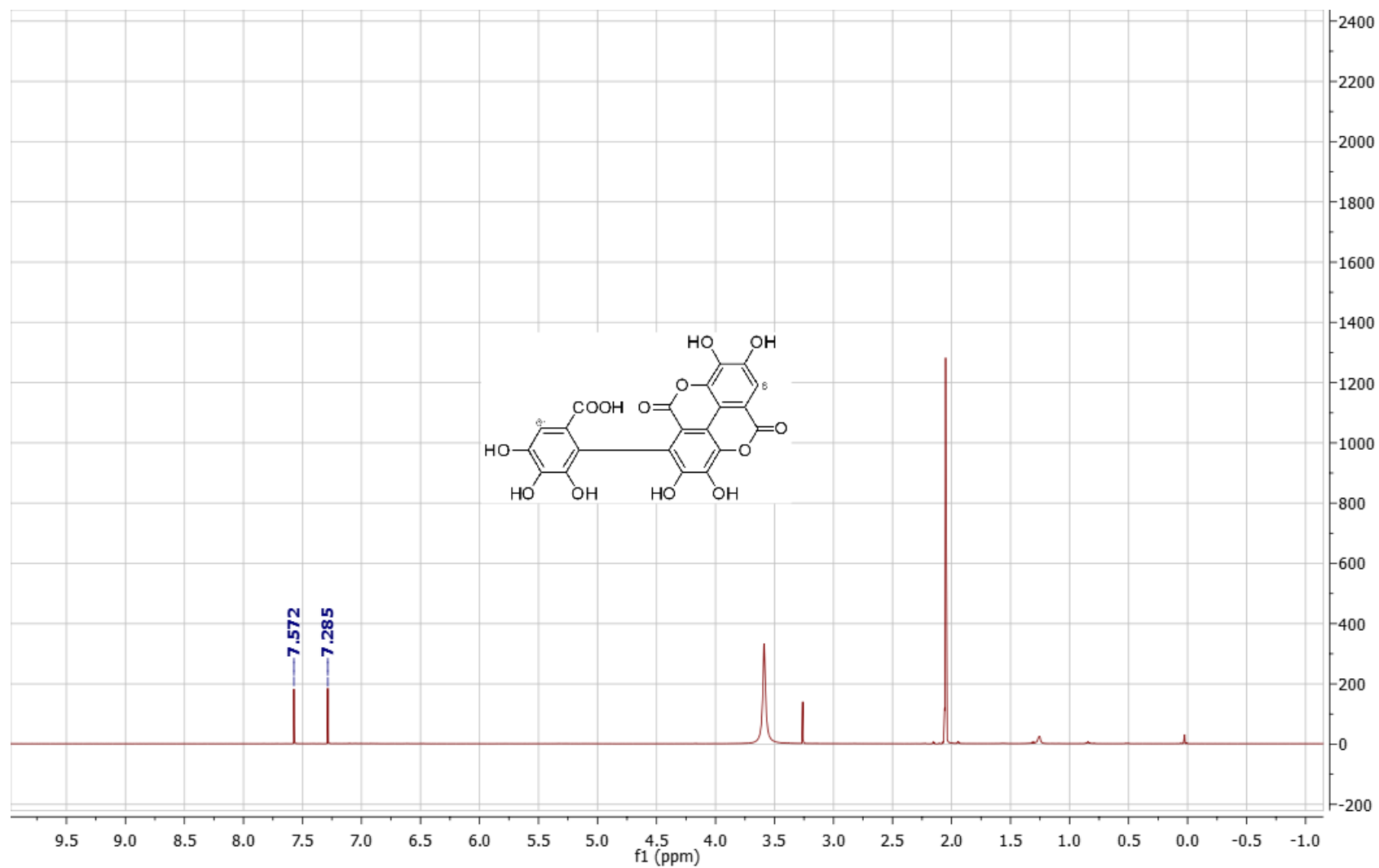




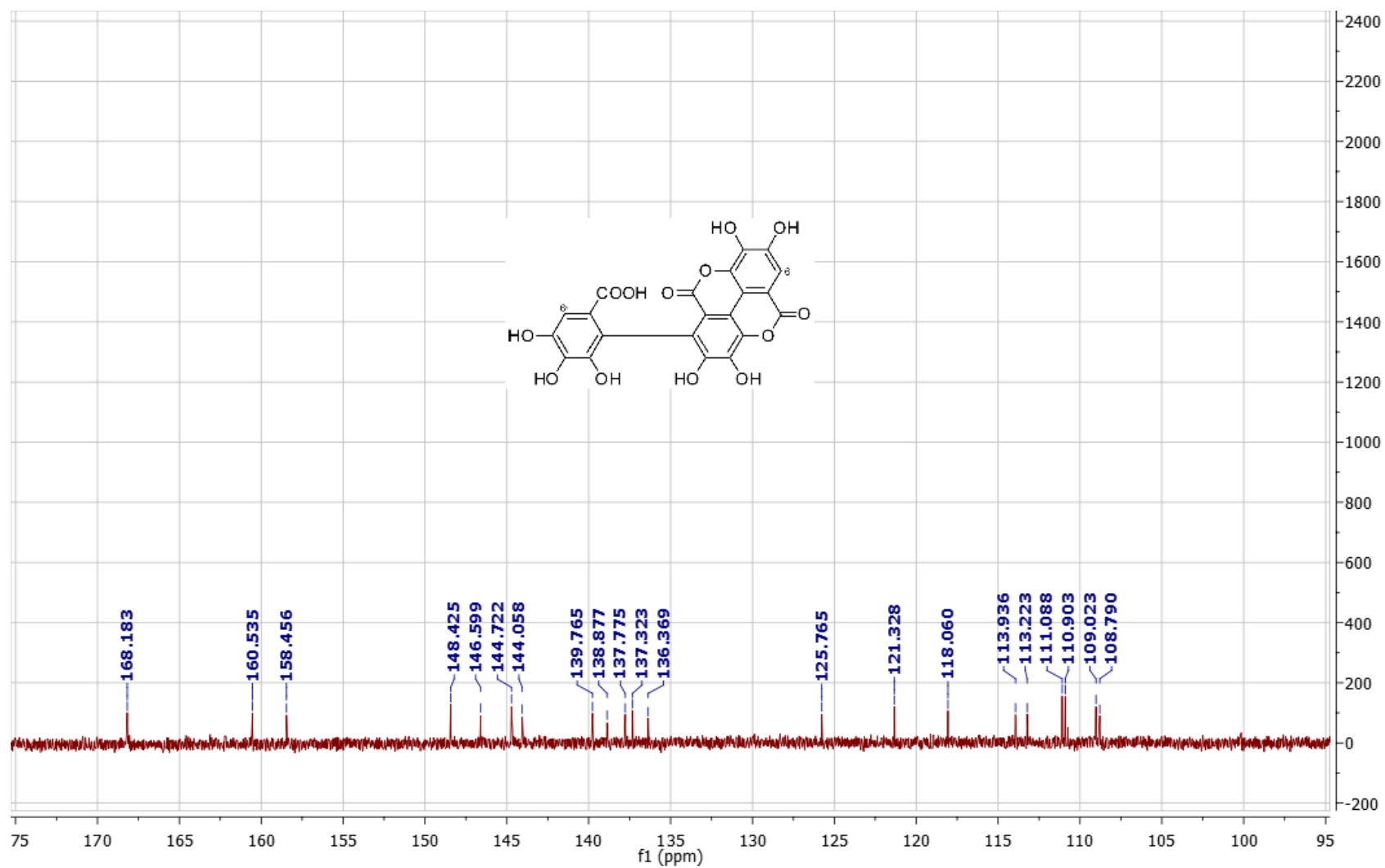
**Figure S14.**  $^1\text{H}$  NMR spectrum of compound **5** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



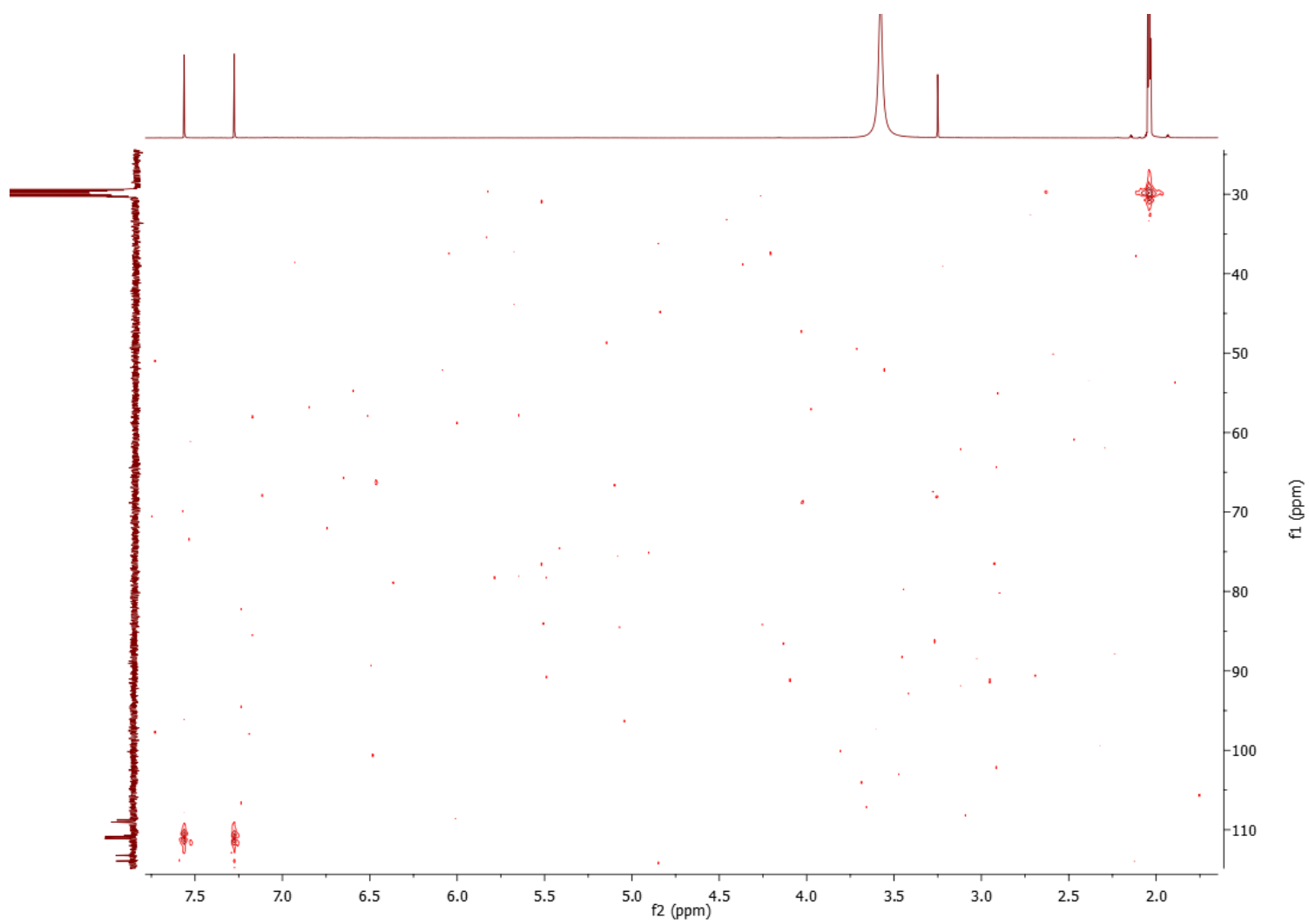
**Figure S15.**  $^1\text{H}$ – $^1\text{H}$  COSY spectrum of compound **5** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



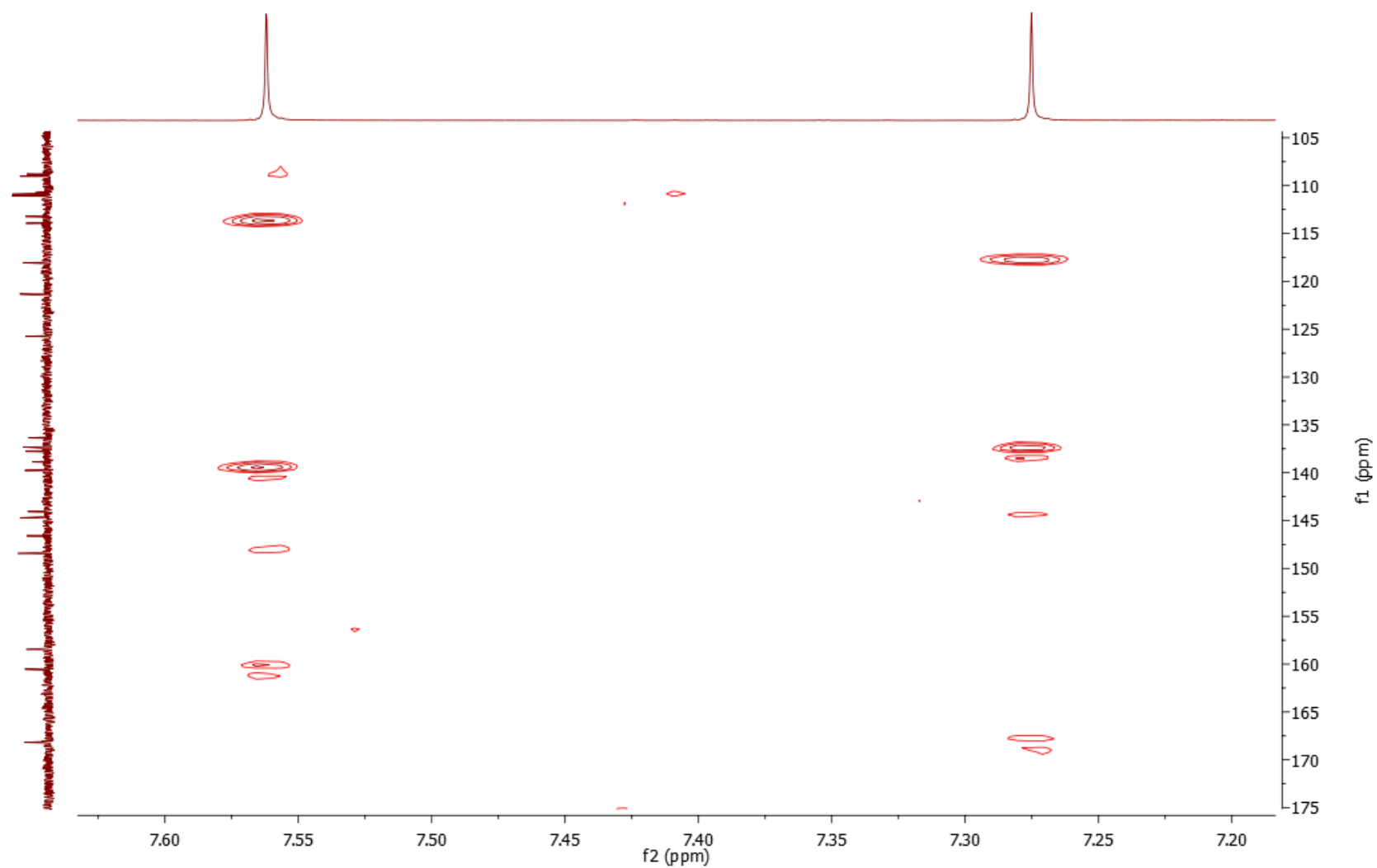
**Figure S16.**  $^1\text{H}$  NMR spectrum of compound **6** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



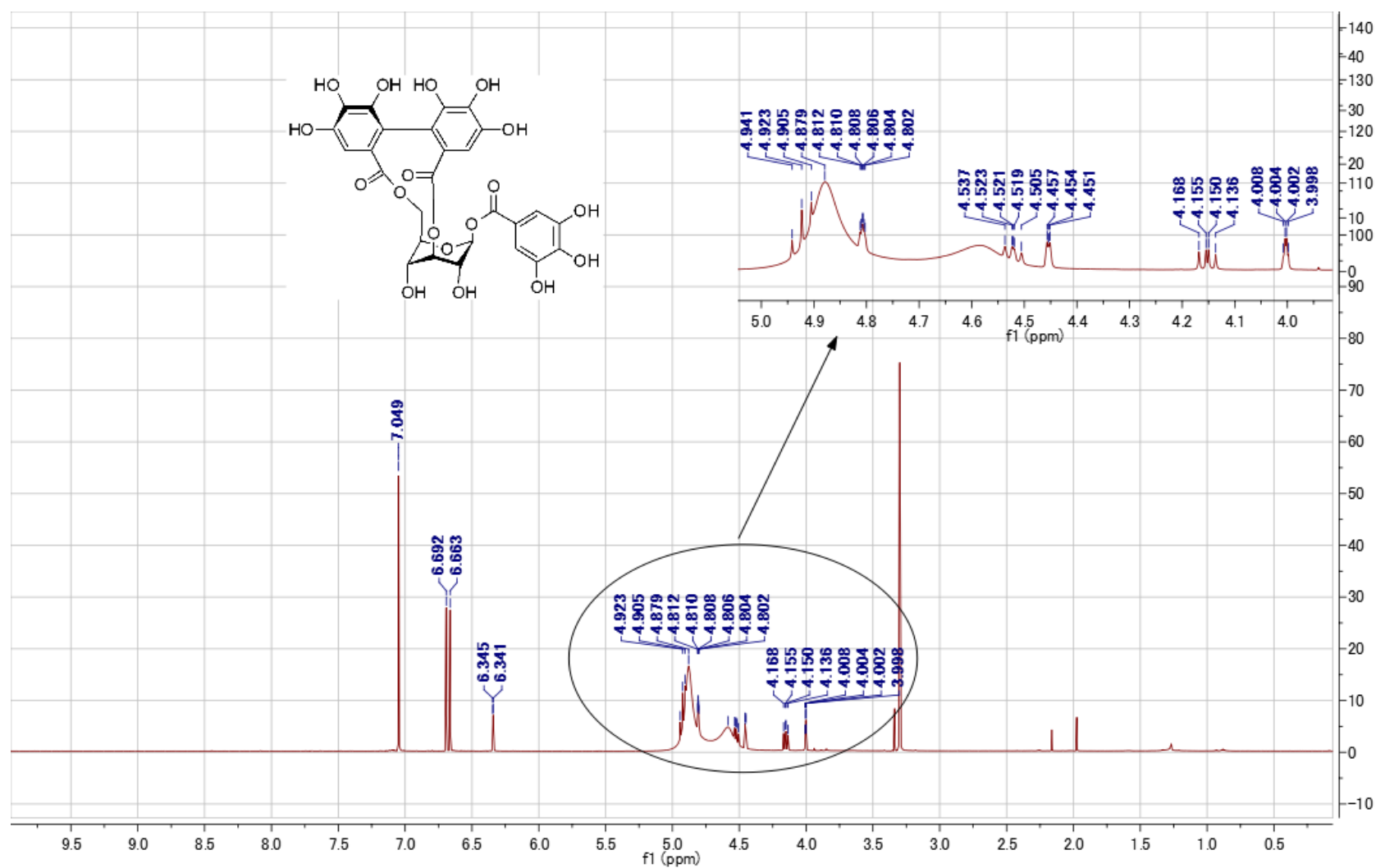
**Figure S17.**  $^{13}\text{C}$  NMR spectrum of compound **6** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 151 MHz]



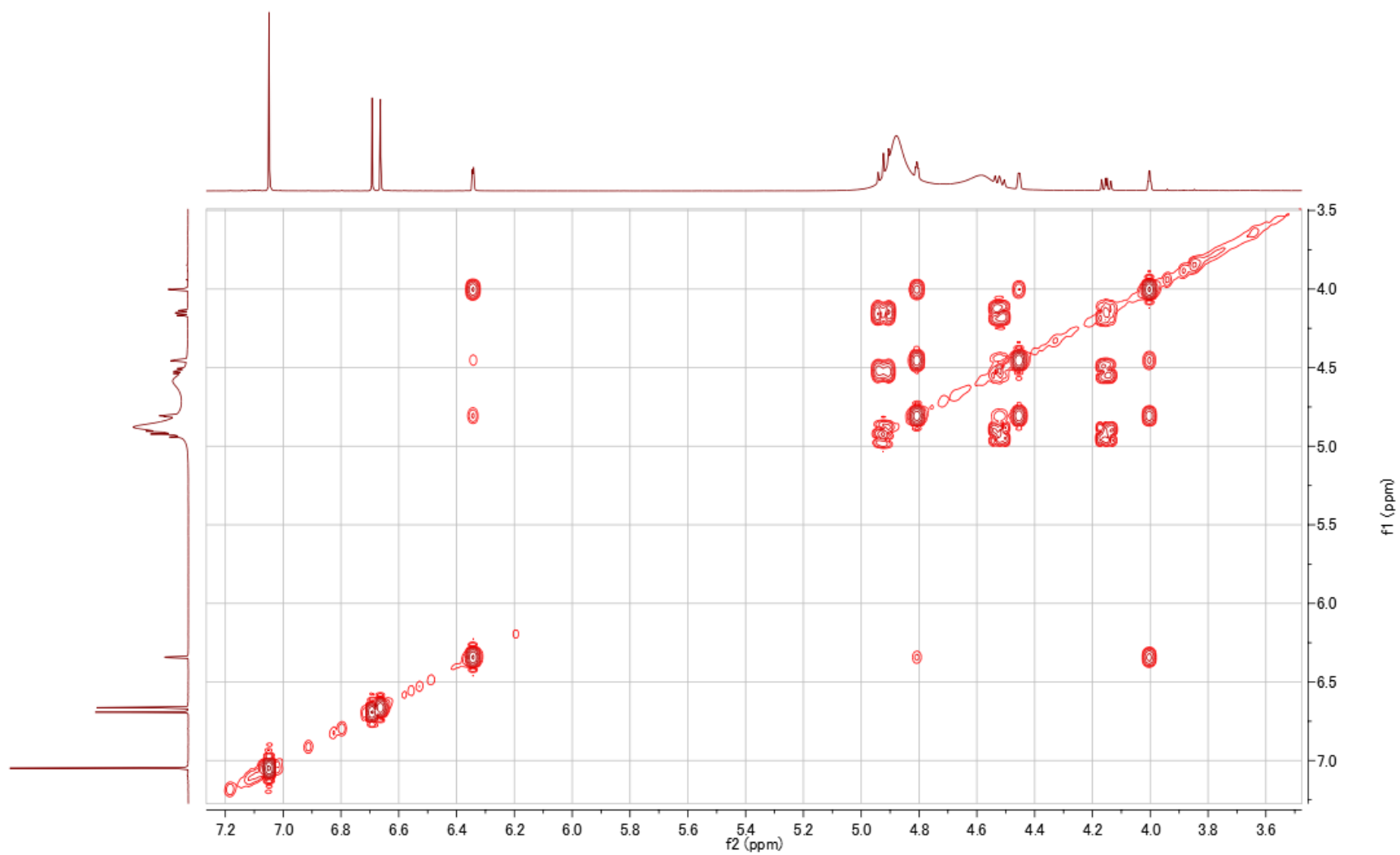
**Figure S18.** HSQC spectrum of compound **6** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



**Figure S19.** HMBC spectrum of compound **6** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]

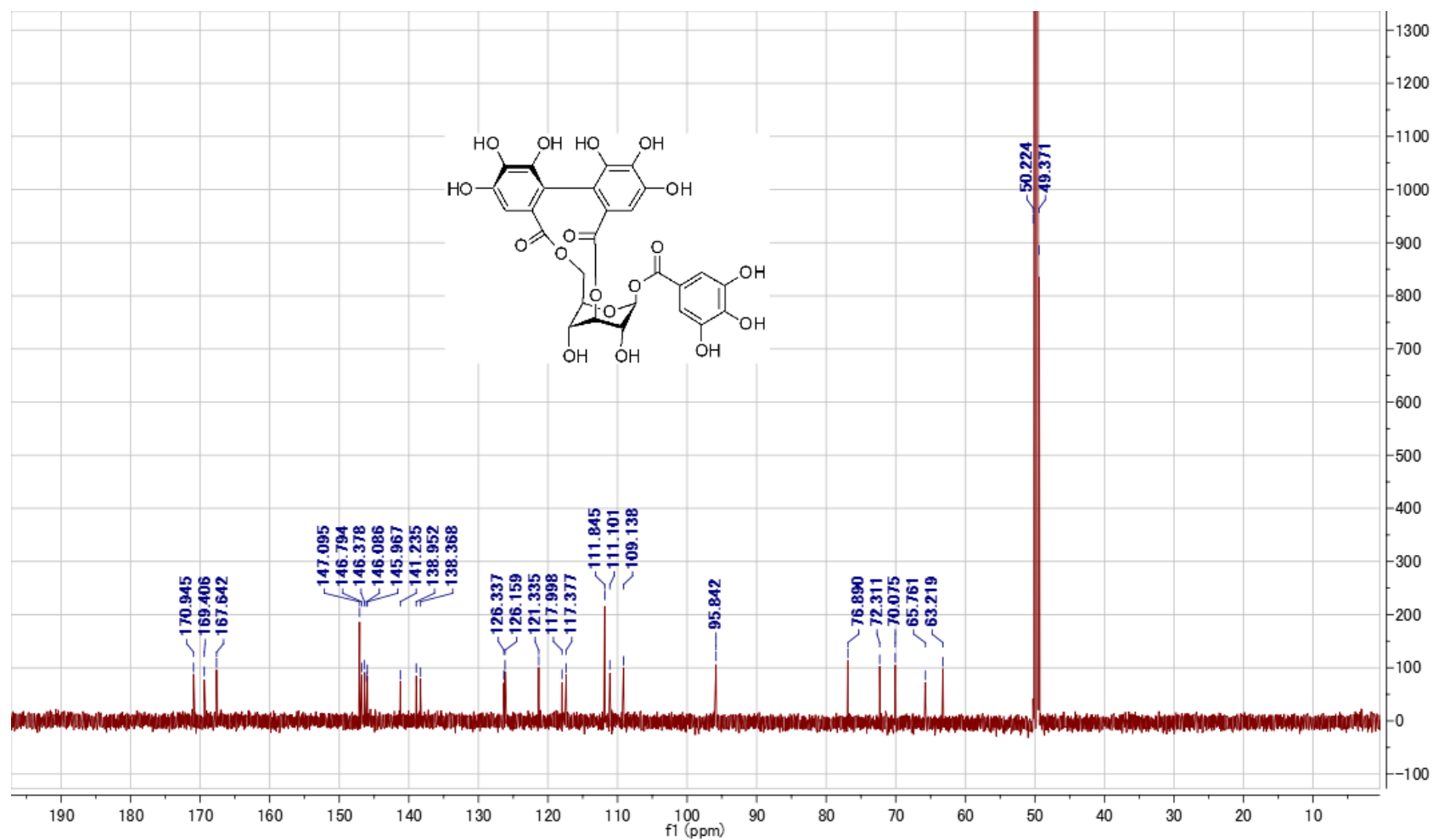


**Figure S20.** <sup>1</sup>H NMR spectrum of compound 7 [acetone-d<sub>6</sub>/D<sub>2</sub>O, 9/1, v/v, 600 MHz]

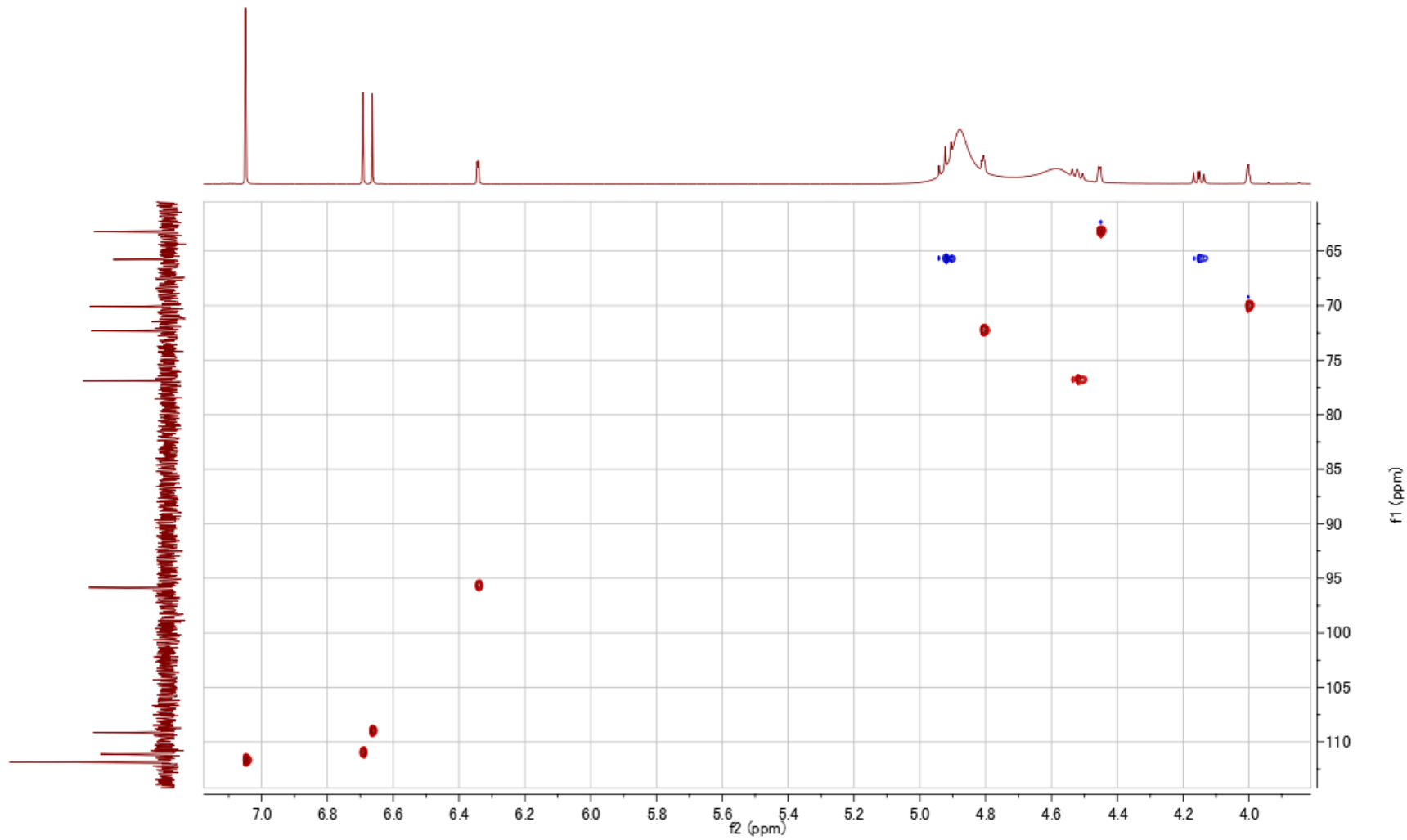


**Figure S21.**  ${}^1\text{H}$ - ${}^1\text{H}$  COSY spectrum of compound 7 [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]

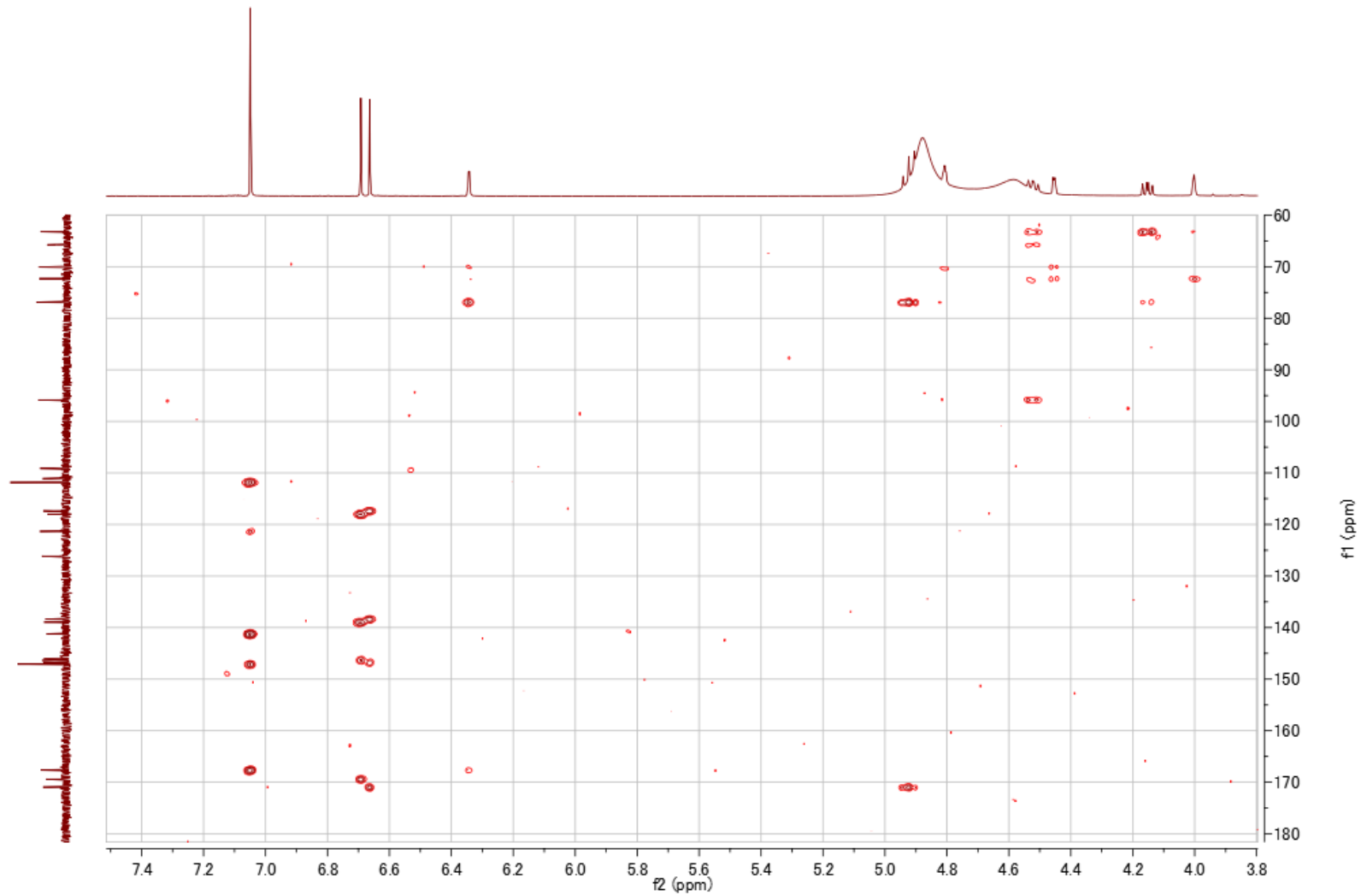




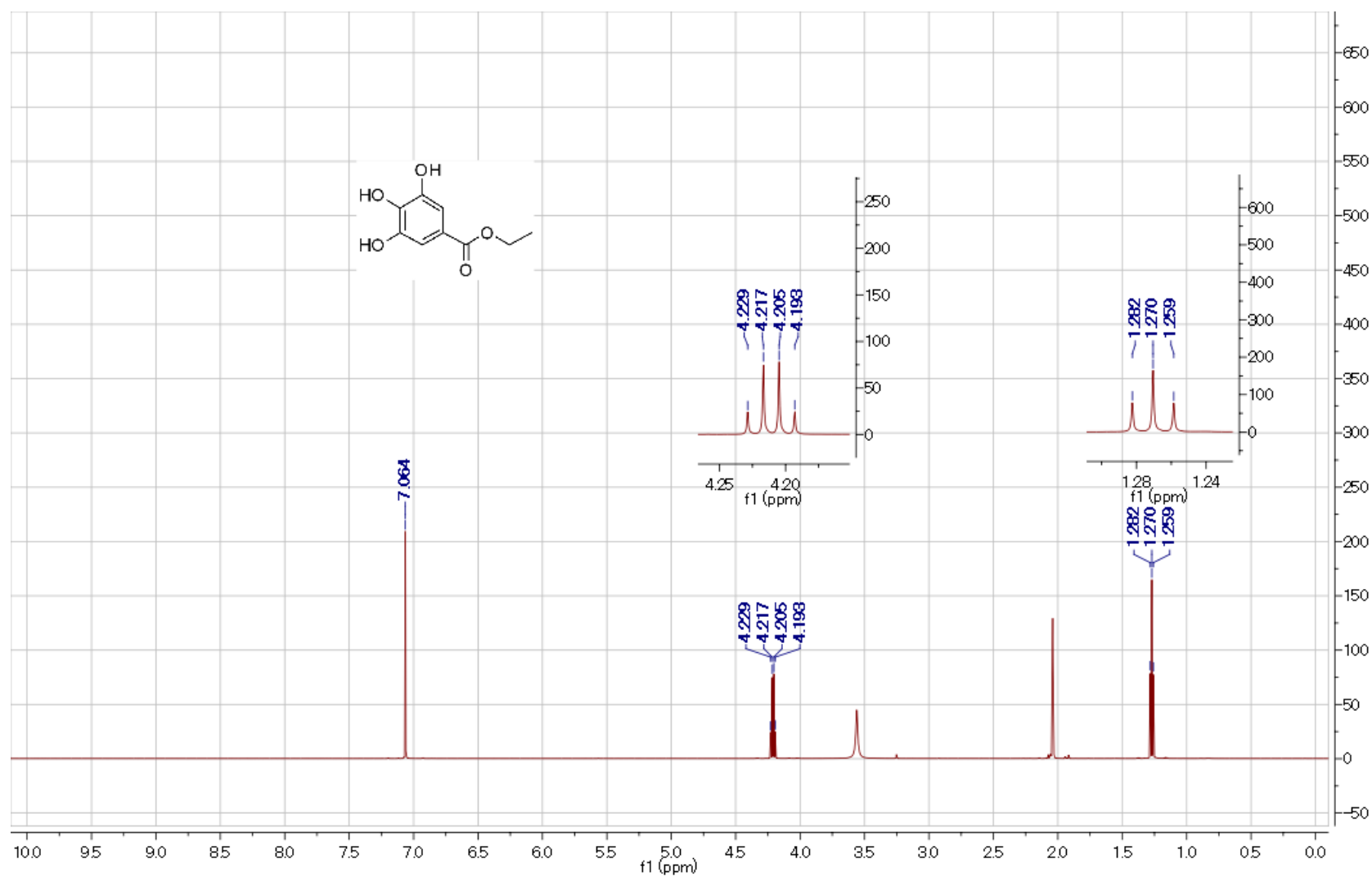
**Figure S22.**  $^{13}\text{C}$  NMR spectrum of compound 7 [acetone- $d_6/\text{D}_2\text{O}$ , 9/1, v/v, 151 MHz]



**Figure S23.** HSQC spectrum of compound 7 [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



**Figure S24.** HMBC spectrum of compound **7** [acetone- $d_6$ /D<sub>2</sub>O, 9/1, v/v, 600 MHz]



**Figure S25.** <sup>1</sup>H NMR spectrum of compound **8** [acetone-*d*<sub>6</sub>/D<sub>2</sub>O, 9/1, v/v, 600 MHz]

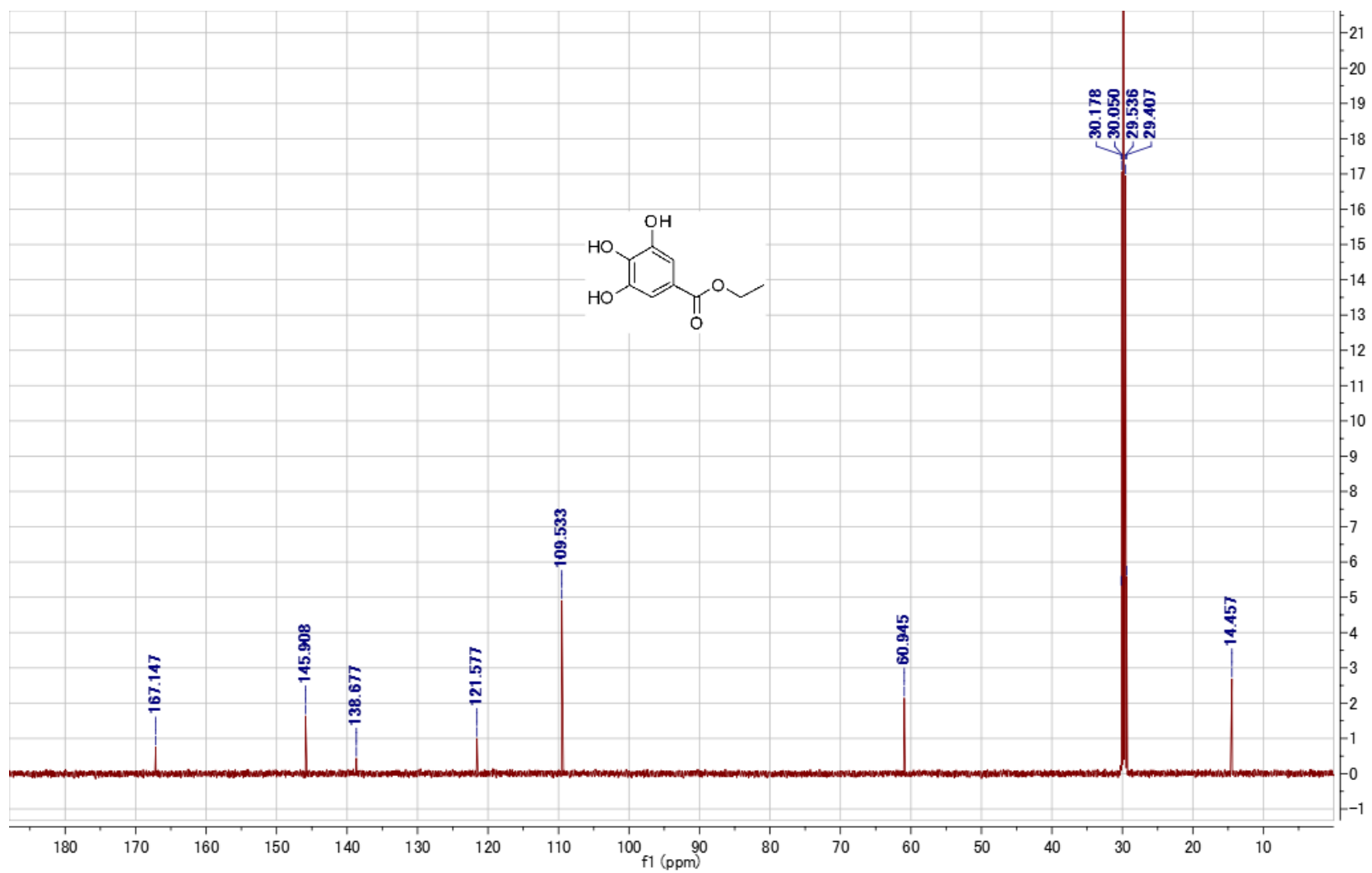
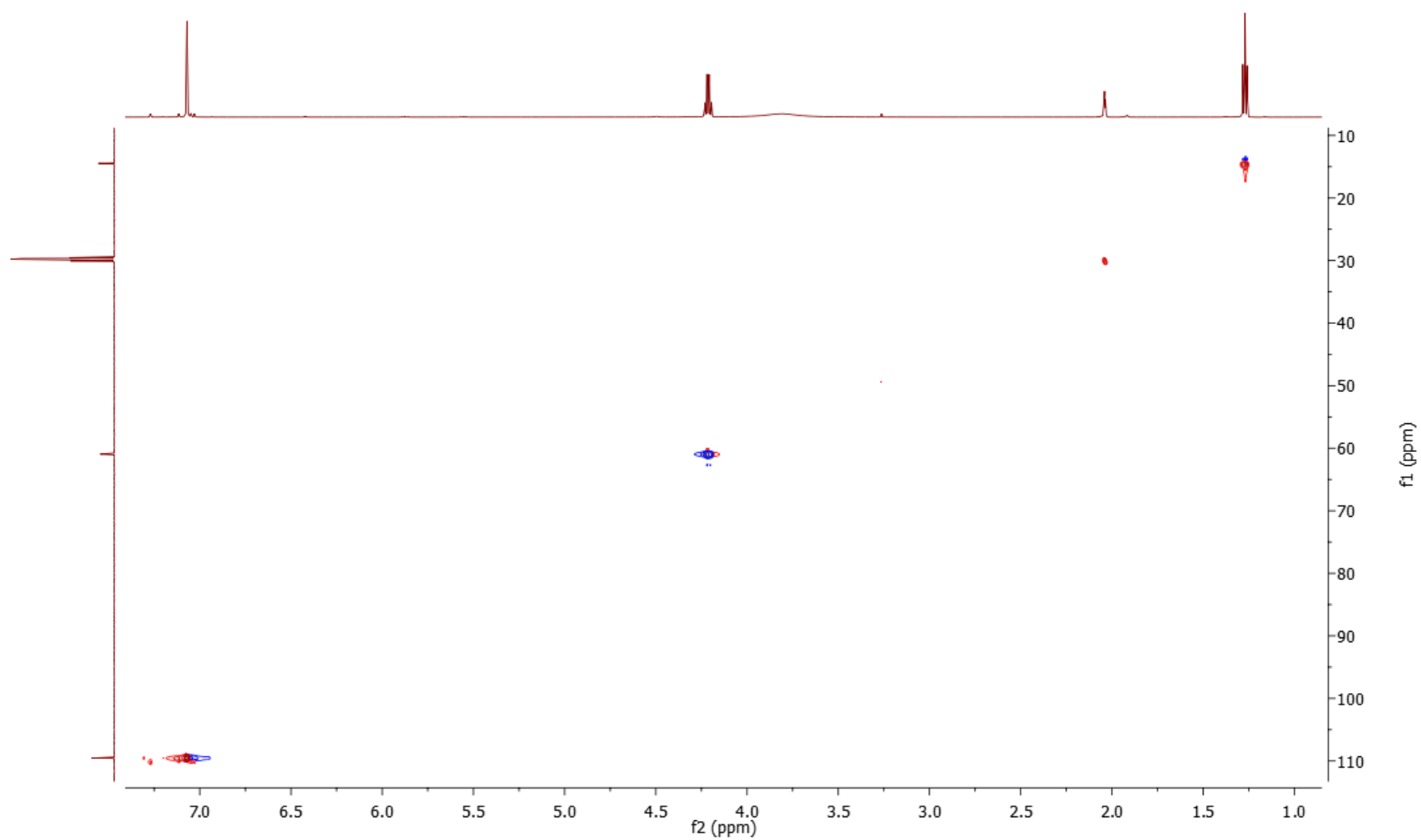
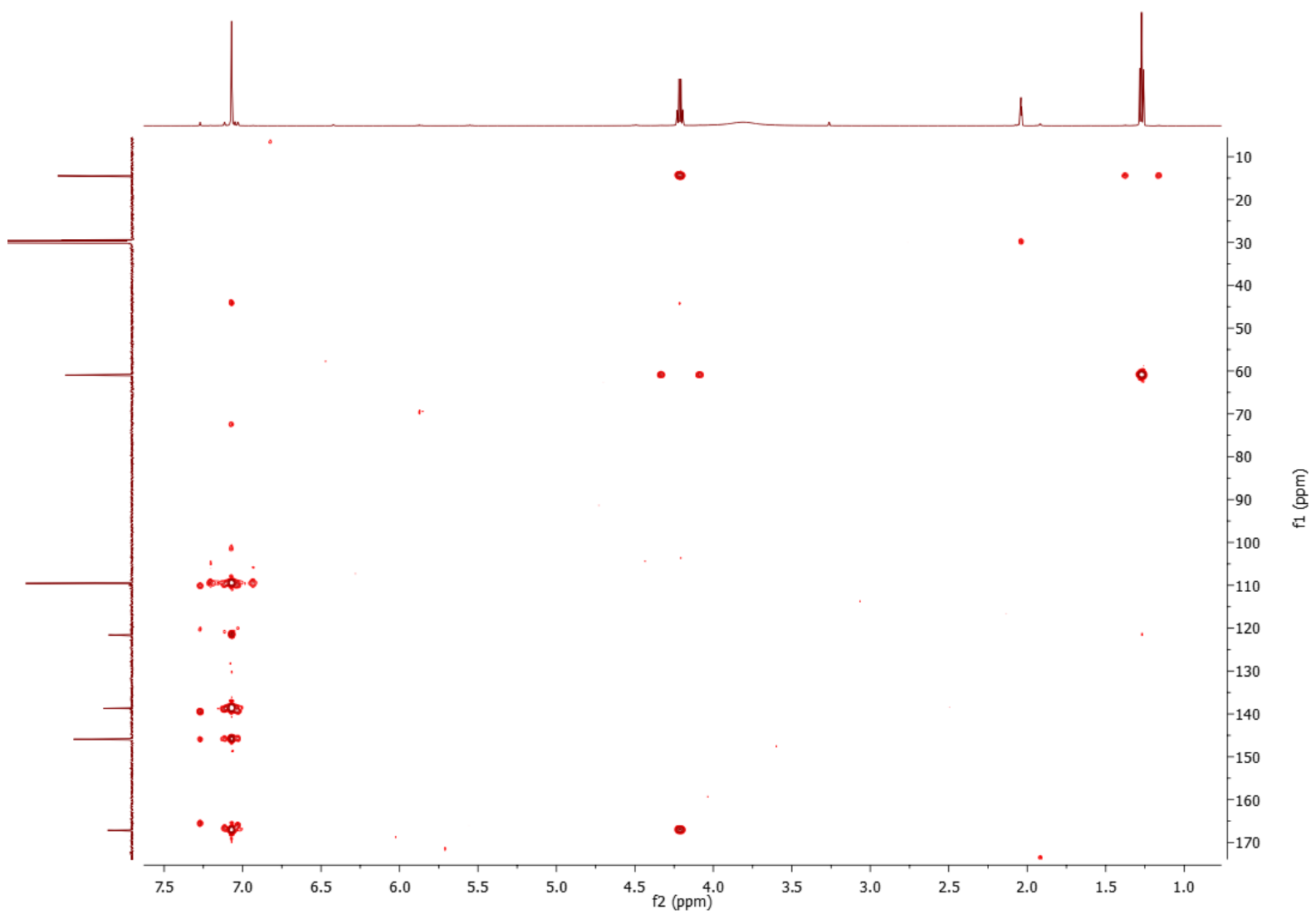


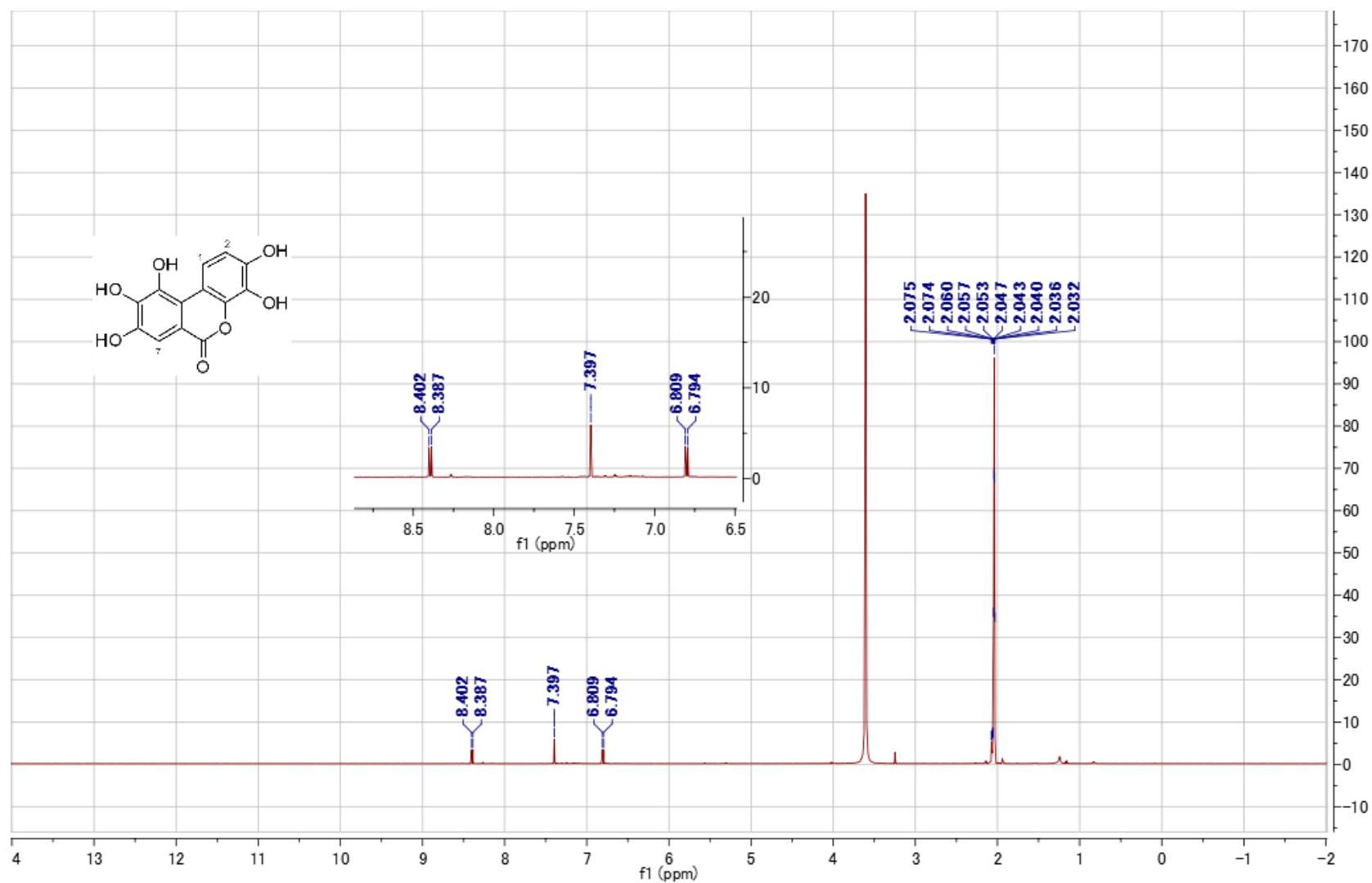
Figure S26. <sup>13</sup>C NMR spectrum of compound **8** [acetone-*d*<sub>6</sub>/D<sub>2</sub>O, 9/1, v/v, 151 MHz]



**Figure S27.** HSQC spectrum of compound **8** [acetone- $d_6$ /D<sub>2</sub>O, 9/1, v/v, 600 MHz]

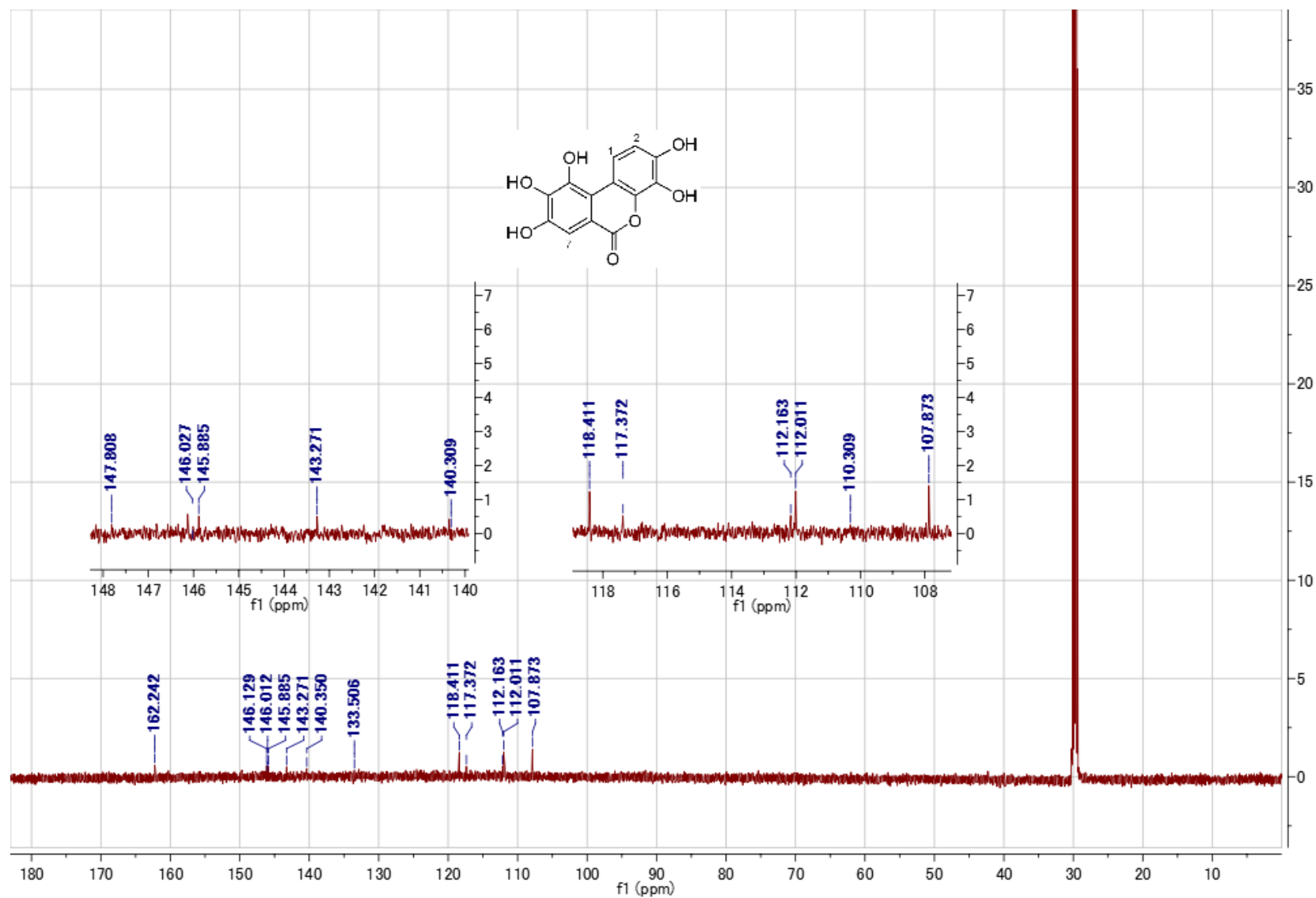


**Figure S28.** HMBC spectrum of compound **8** [acetone-*d*<sub>6</sub>/D<sub>2</sub>O, 9/1, *v/v*, 600 MHz]

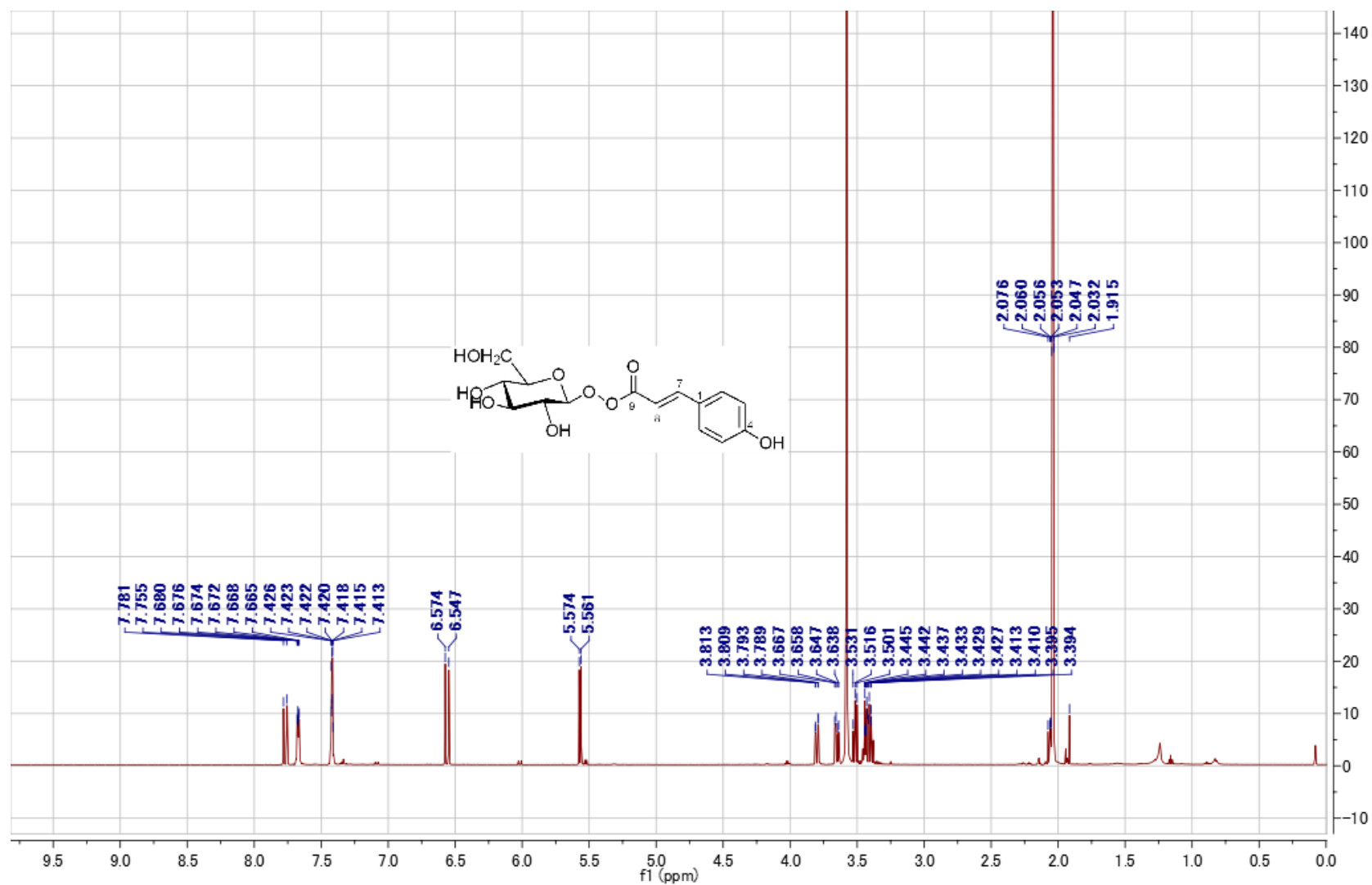


**Figure S29.**  $^1\text{H}$  NMR spectrum of compound **9** [ $\text{acetone-}d_6/\text{D}_2\text{O}$ , 9/1, v/v, 600 MHz]

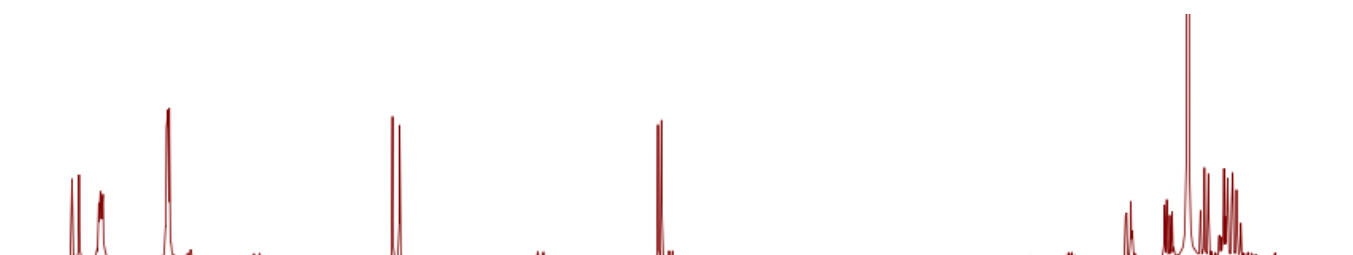




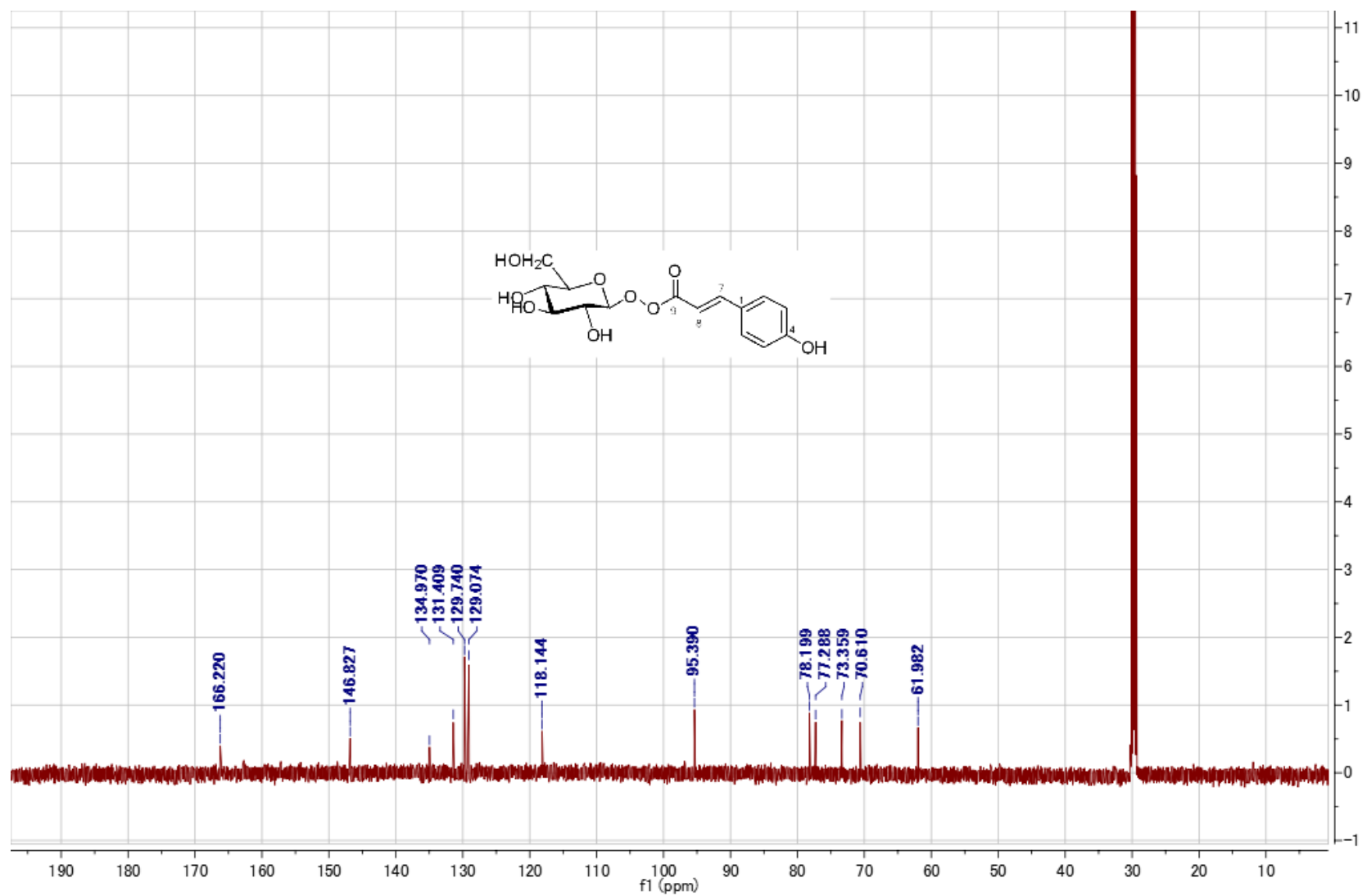
**Figure S30.**  $^{13}\text{C}$  NMR spectrum of compound 9 [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 151 MHz]



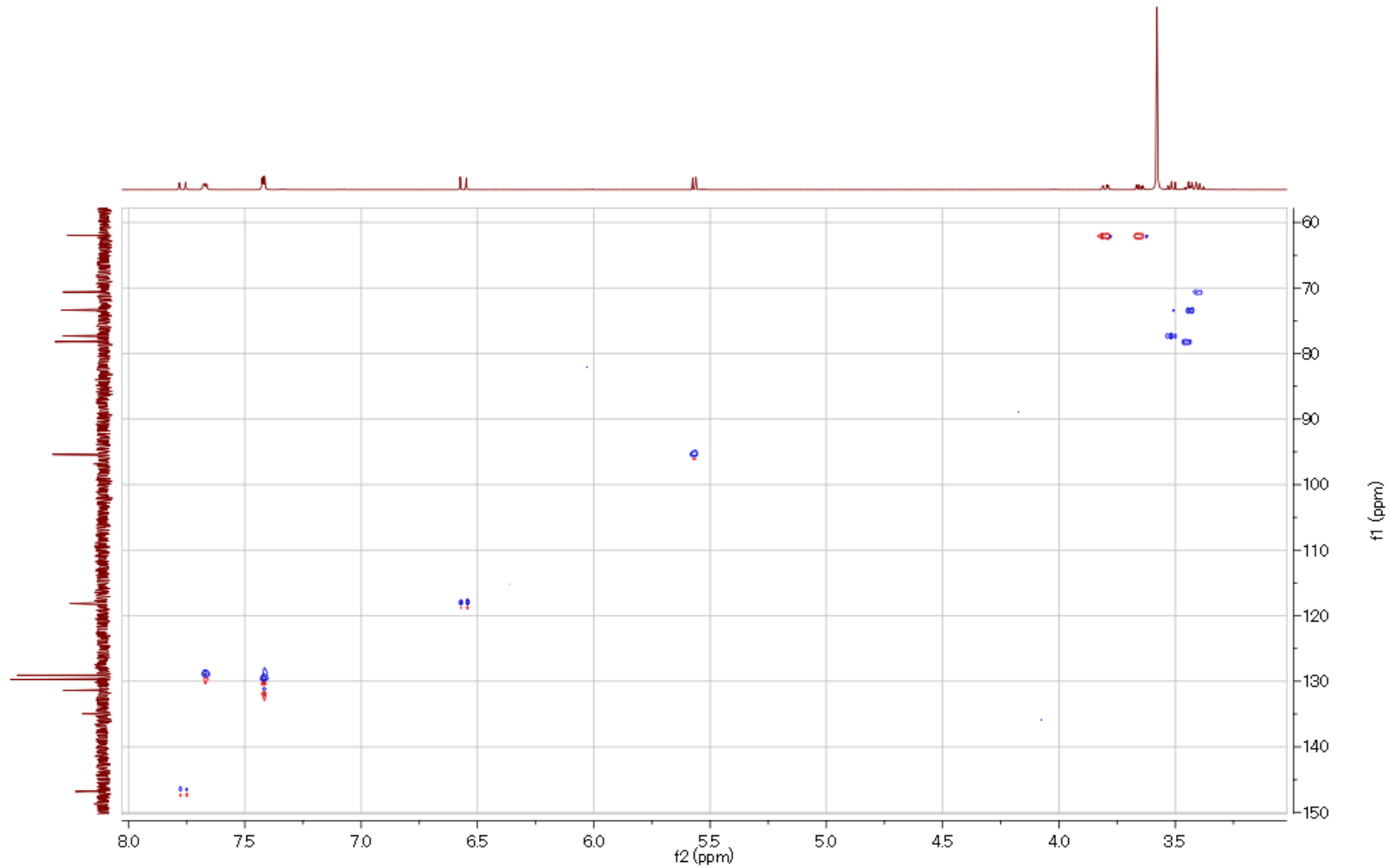
**Figure S31.** <sup>1</sup>H NMR spectrum of compound **10** [acetone-*d*<sub>6</sub>/D<sub>2</sub>O, 9/1, v/v, 600 MHz]



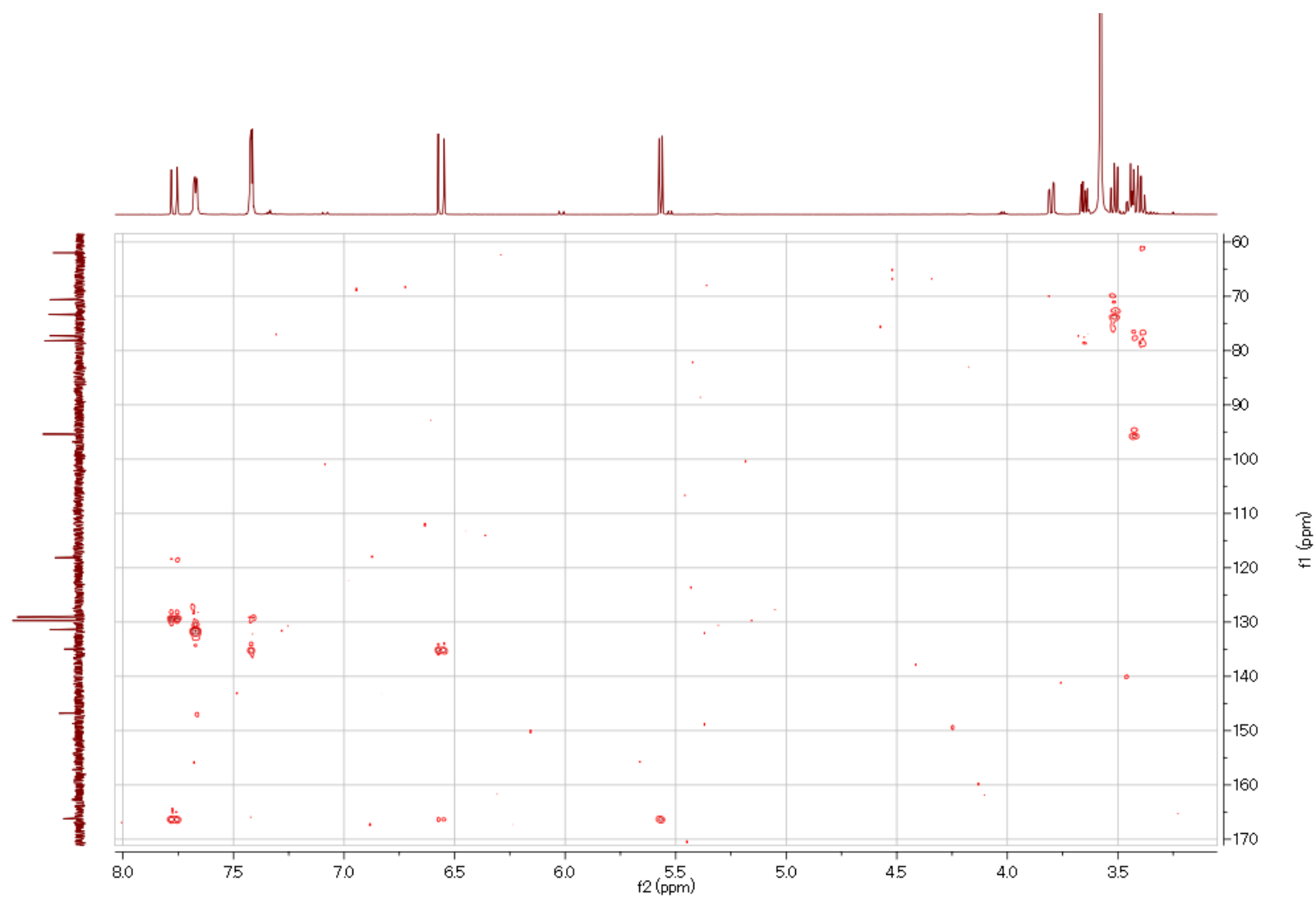
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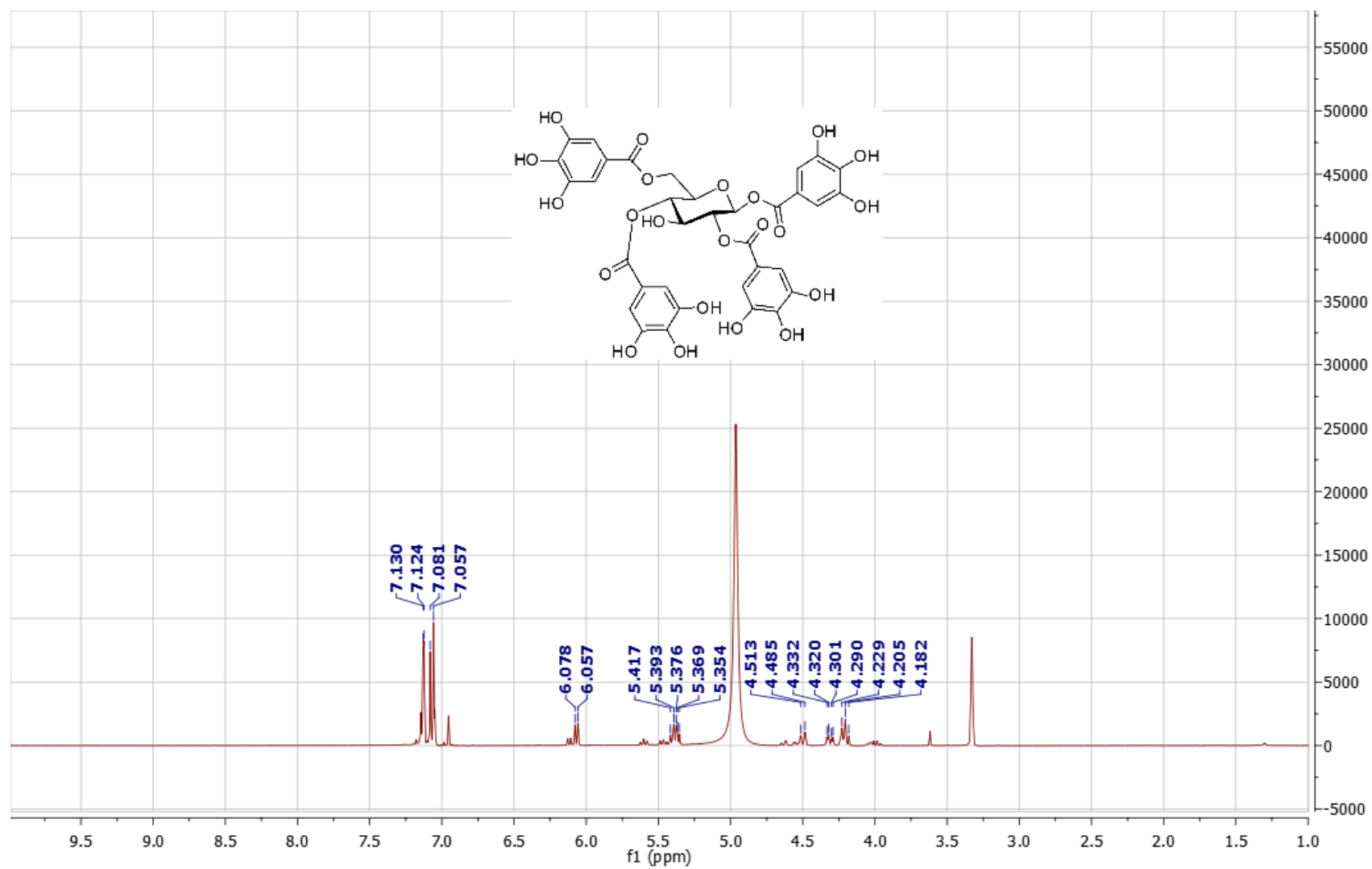
**Figure S33.** <sup>13</sup>C NMR spectrum of compound **10** [acetone-*d*<sub>6</sub>/D<sub>2</sub>O, 9/1, v/v, 151 MHz]



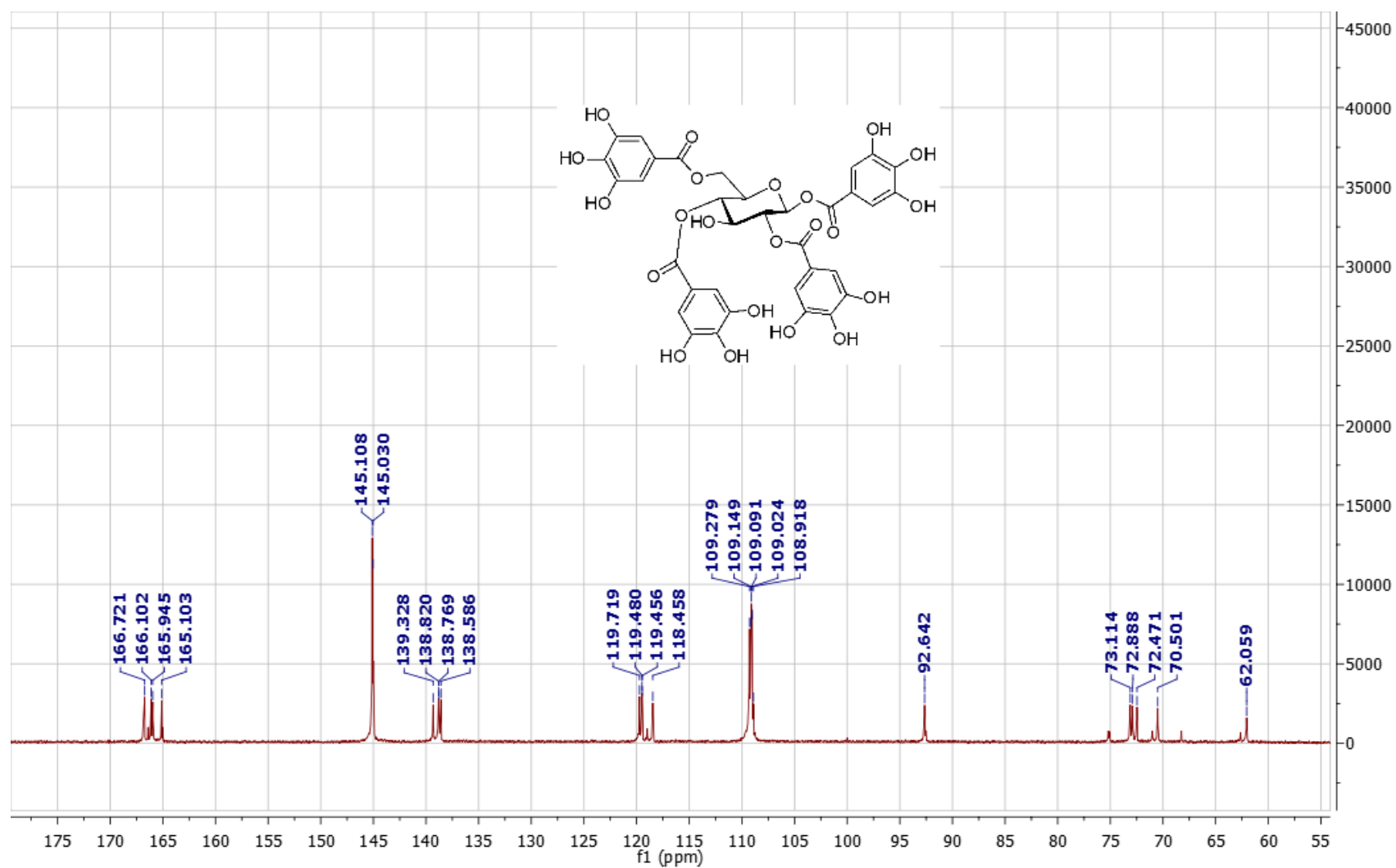
**Figure S34.** HSQC spectrum of compound **10** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



**Figure S35.** HMBC spectrum of compound **10** [acetone- $d_6$ /D $_2$ O, 9/1, v/v, 600 MHz]



**Figure S36.**  $^1\text{H}$  NMR spectrum of compound **11** (CD<sub>3</sub>OD, 100 MHz)



**Figure S37.** <sup>13</sup>C NMR spectrum of compound **11** (CD<sub>3</sub>OD, 100 MHz)