# Supplementary Information

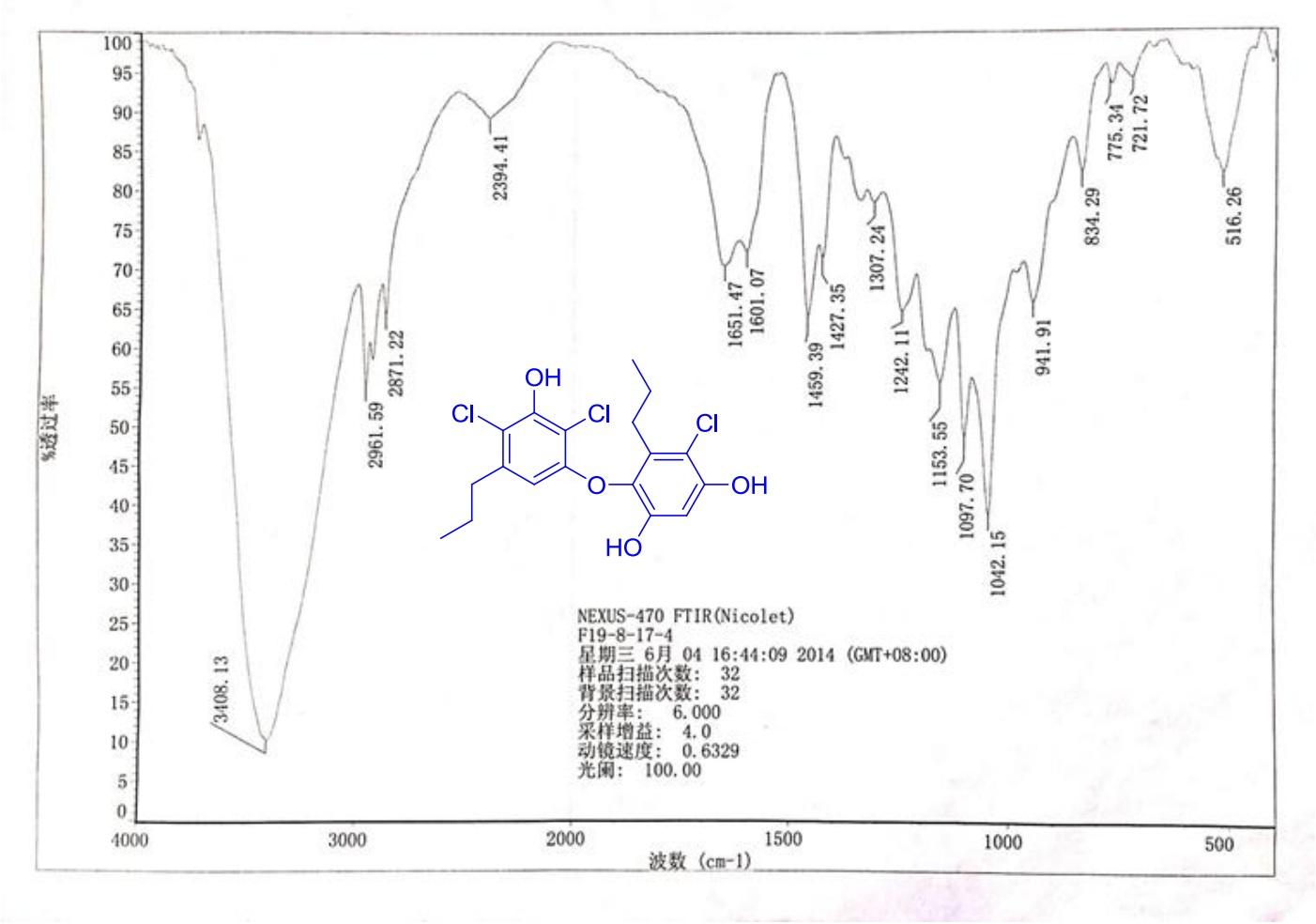


**Figure S1.** IR spectrum of compound **1**.

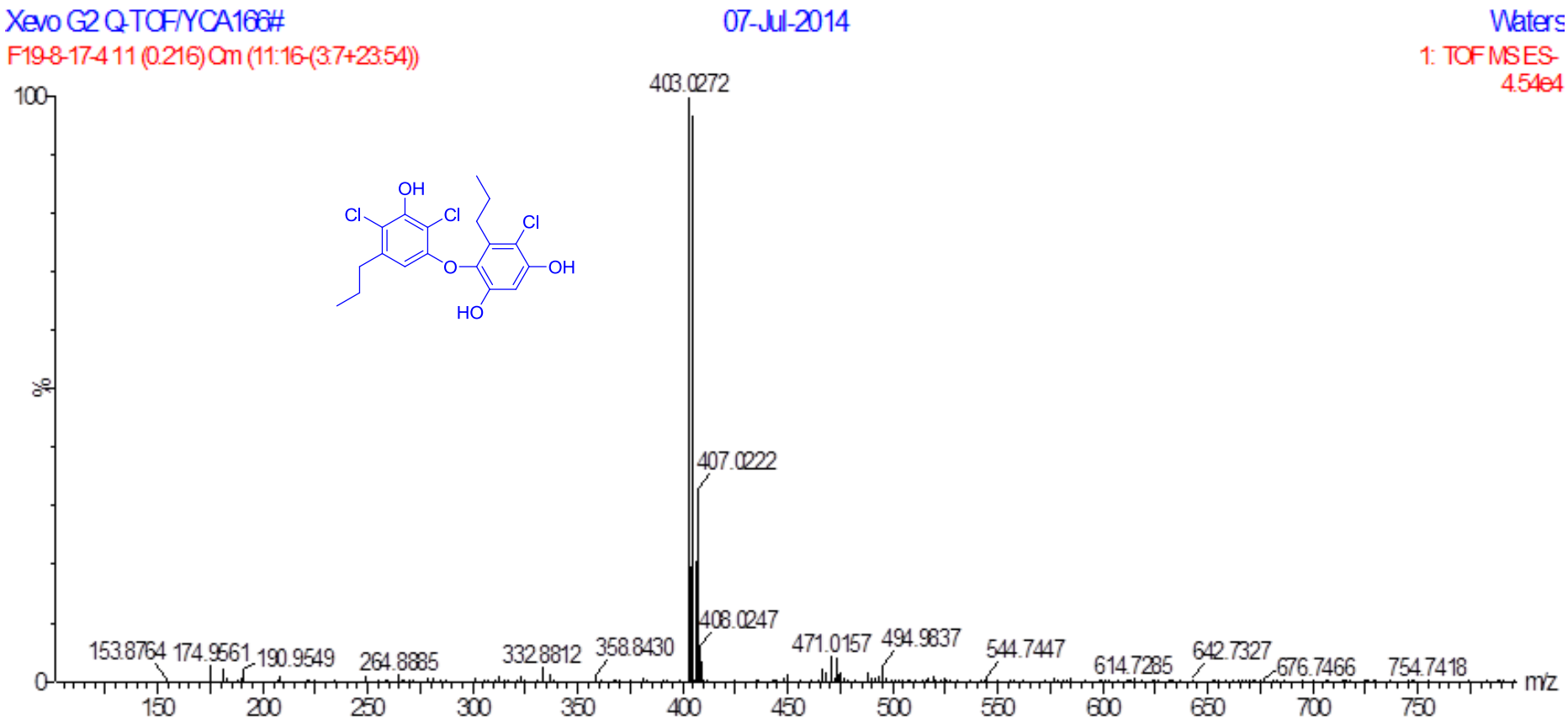


**Figure S2.** Negative mode HRESIMS data of compound **1**.

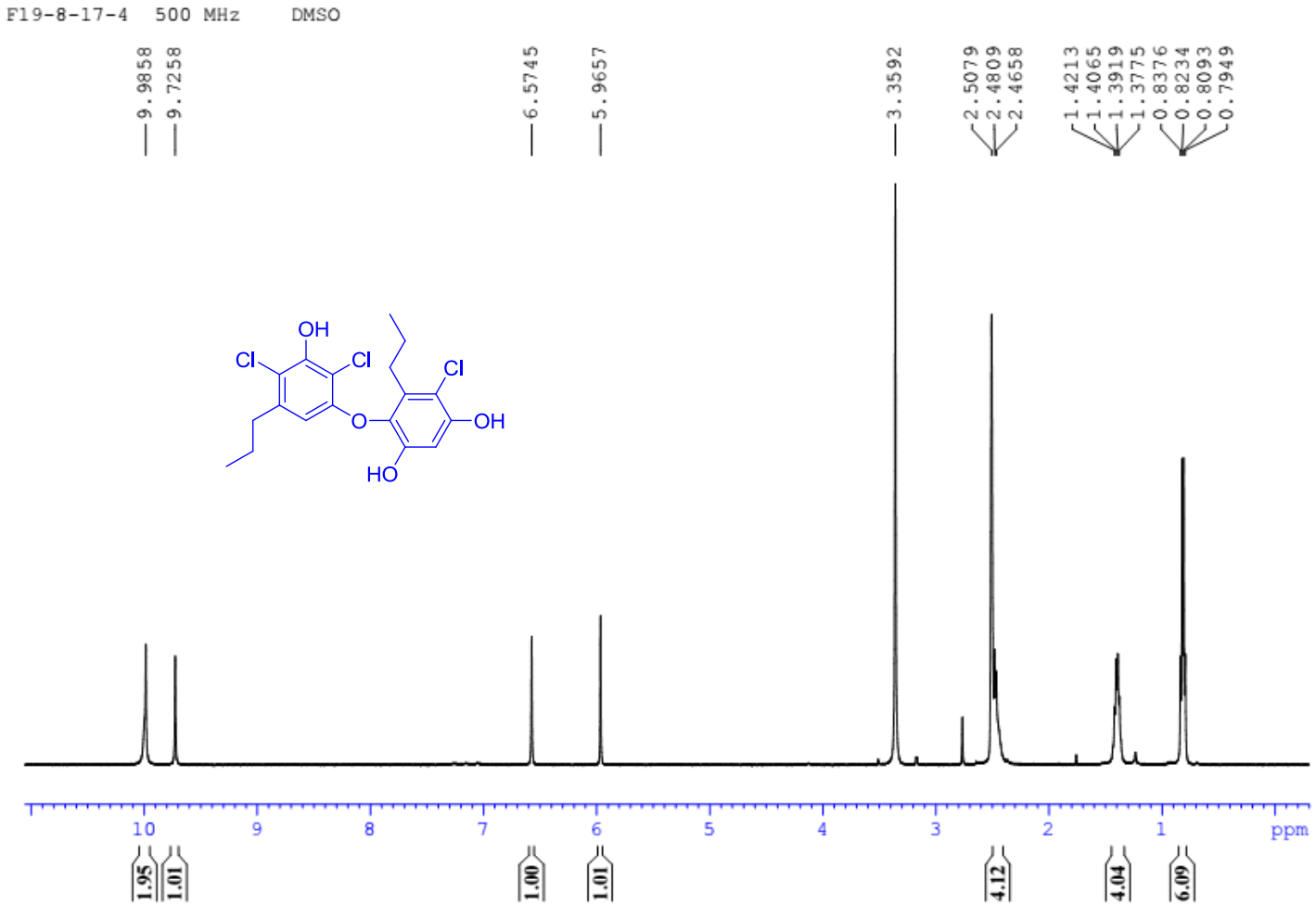


**Figure S3.** [1]H NMR spectrum of compound **1** in DMSO-d6 (500 MHz).

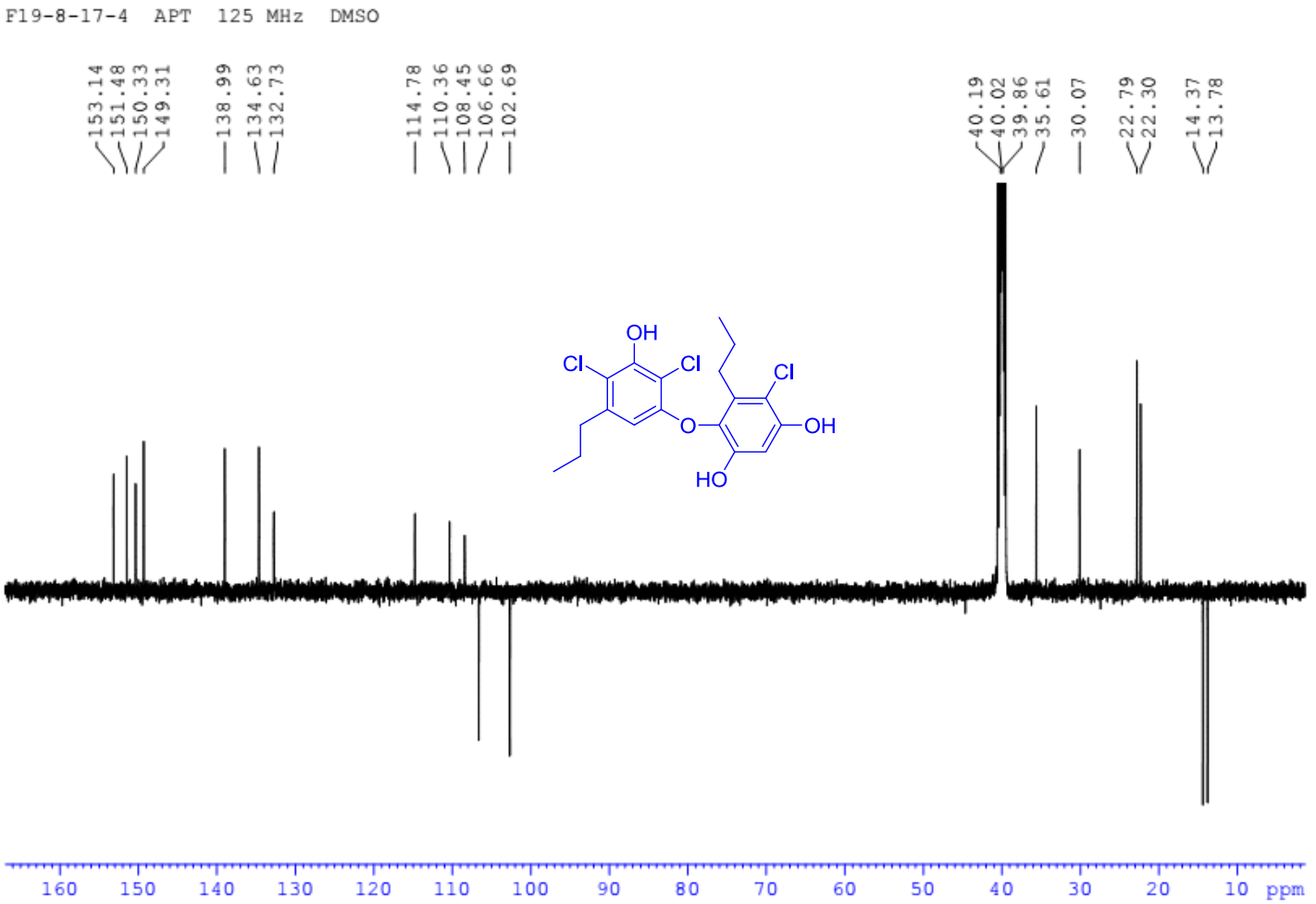


**Figure S4.** $^{13}$C NMR spectrum of compound **1** in DMSO-d6 (125 MHz).

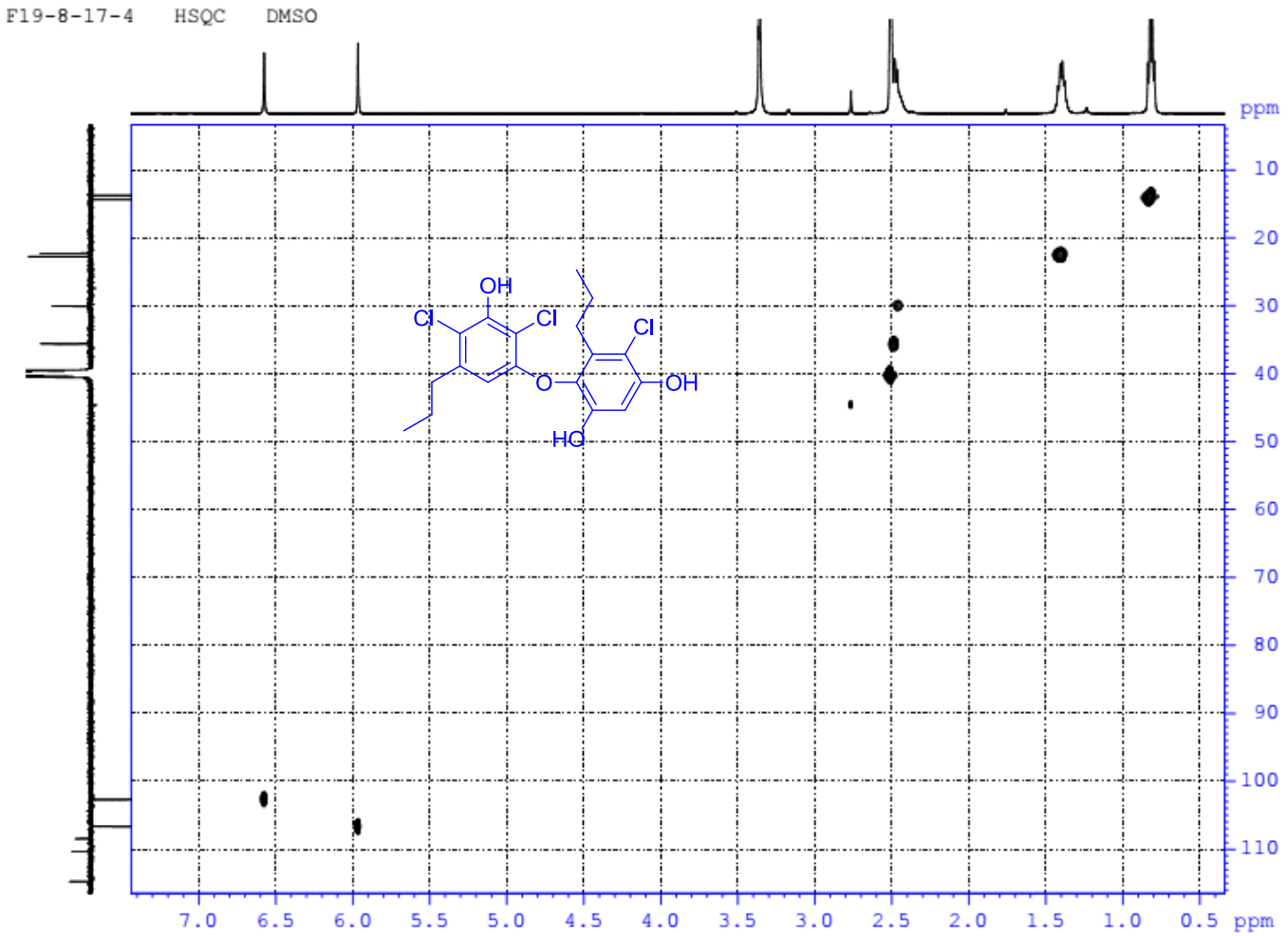


**Figure S5.** HSQC spectrum of compound **1** in DMSO-d6.

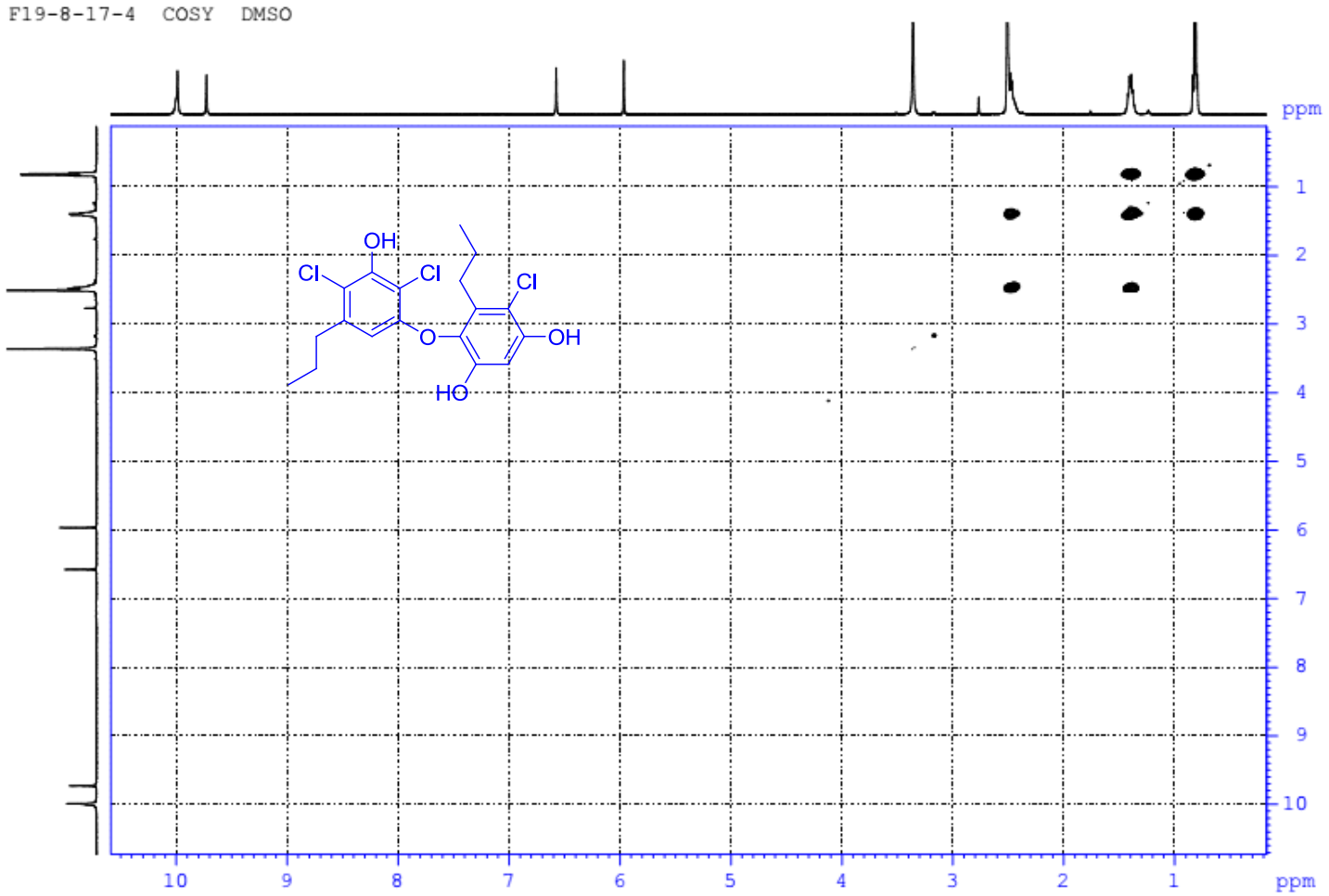


**Figure S6.** $^{1}$H-$^{1}$H COSY spectrum of compound **1** in DMSO-d6.

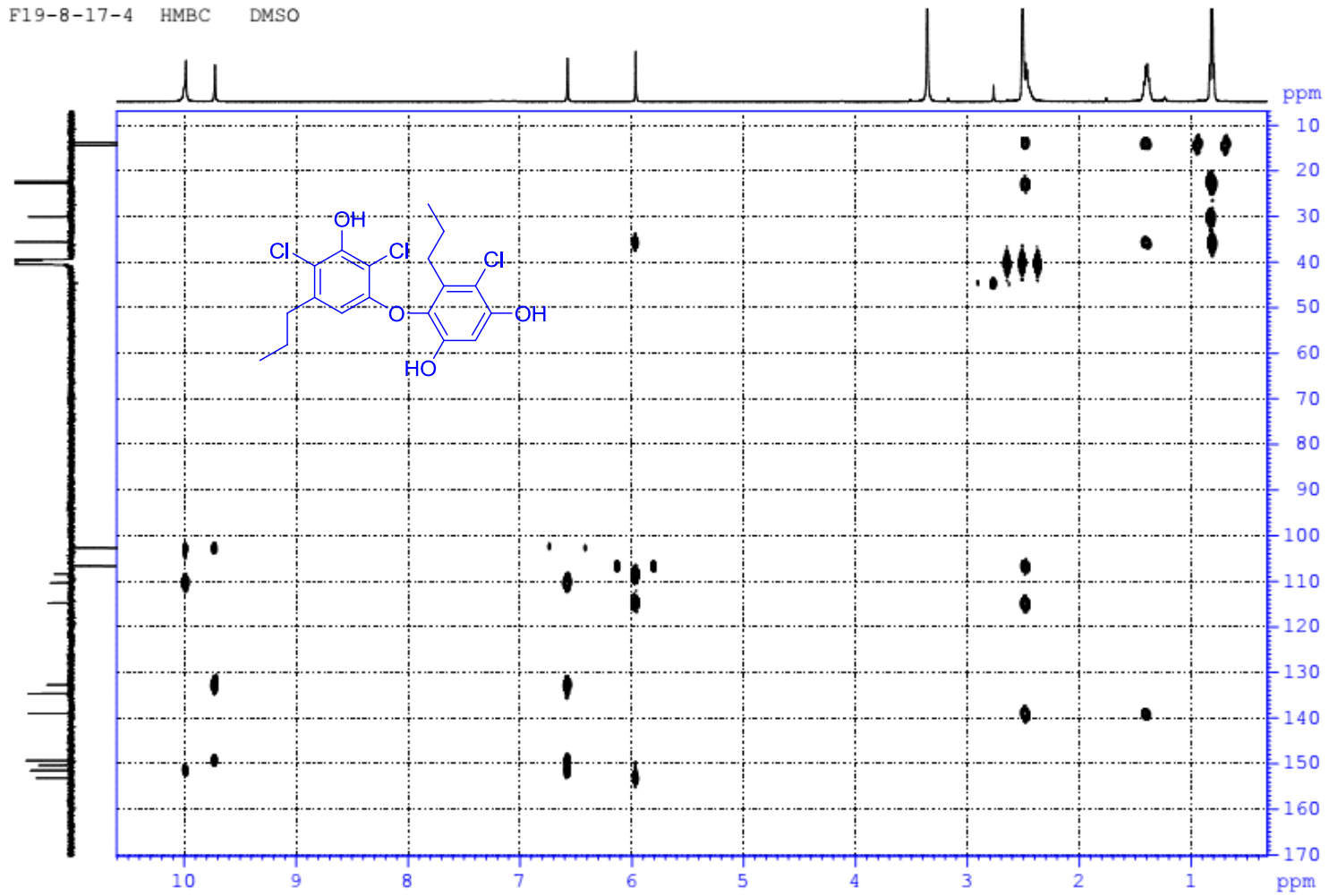


**Figure S7.** HMBC spectrum of compound **1** in DMSO-d6.

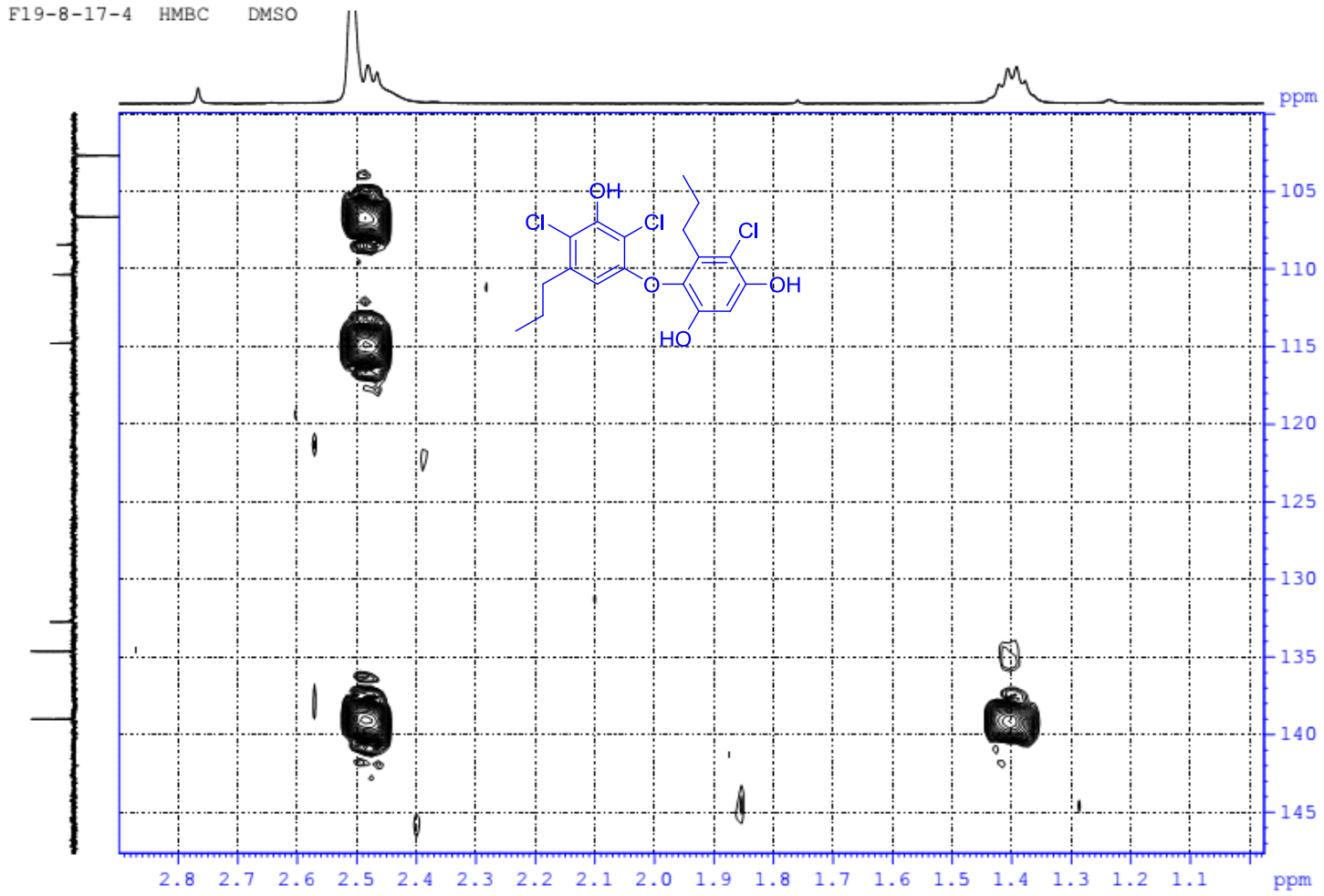


**Figure S7-1.** HMBC spectrum of compound **1** in DMSO-d6 (part amplification).

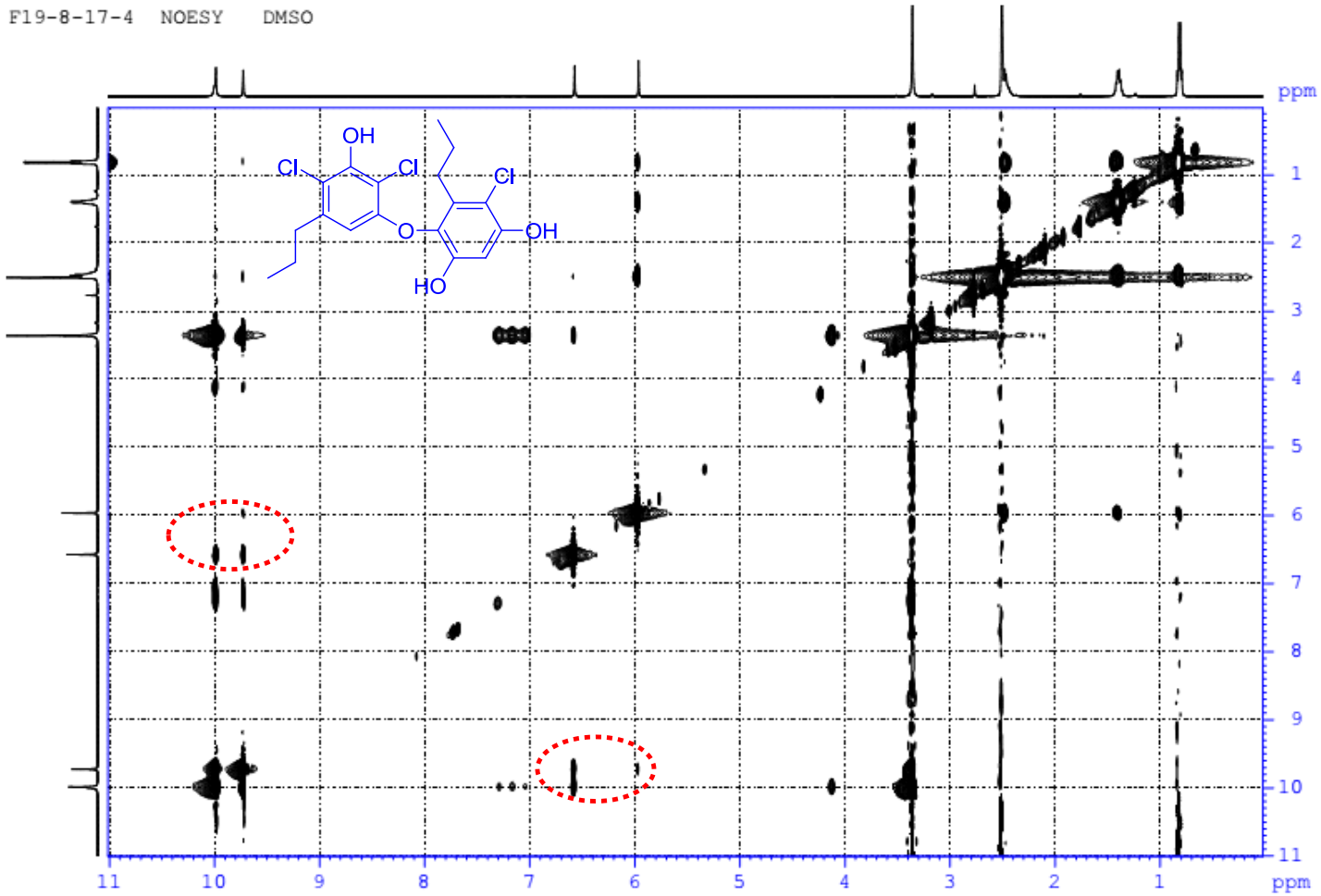


**Figure S8.** NOESY spectrum of compound **1** in DMSO-d6.

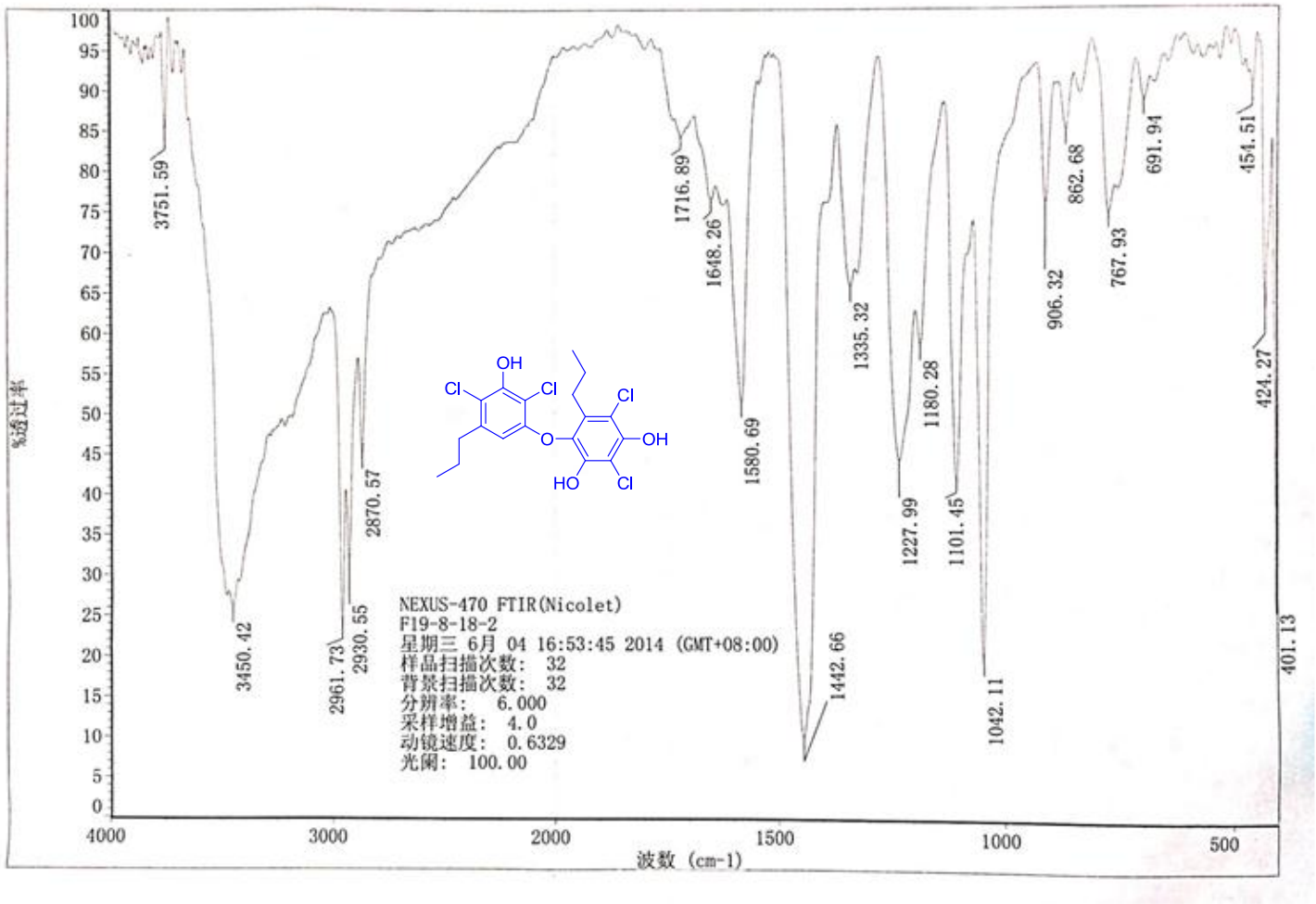


**Figure S9.** IR spectrum of compound **2**.

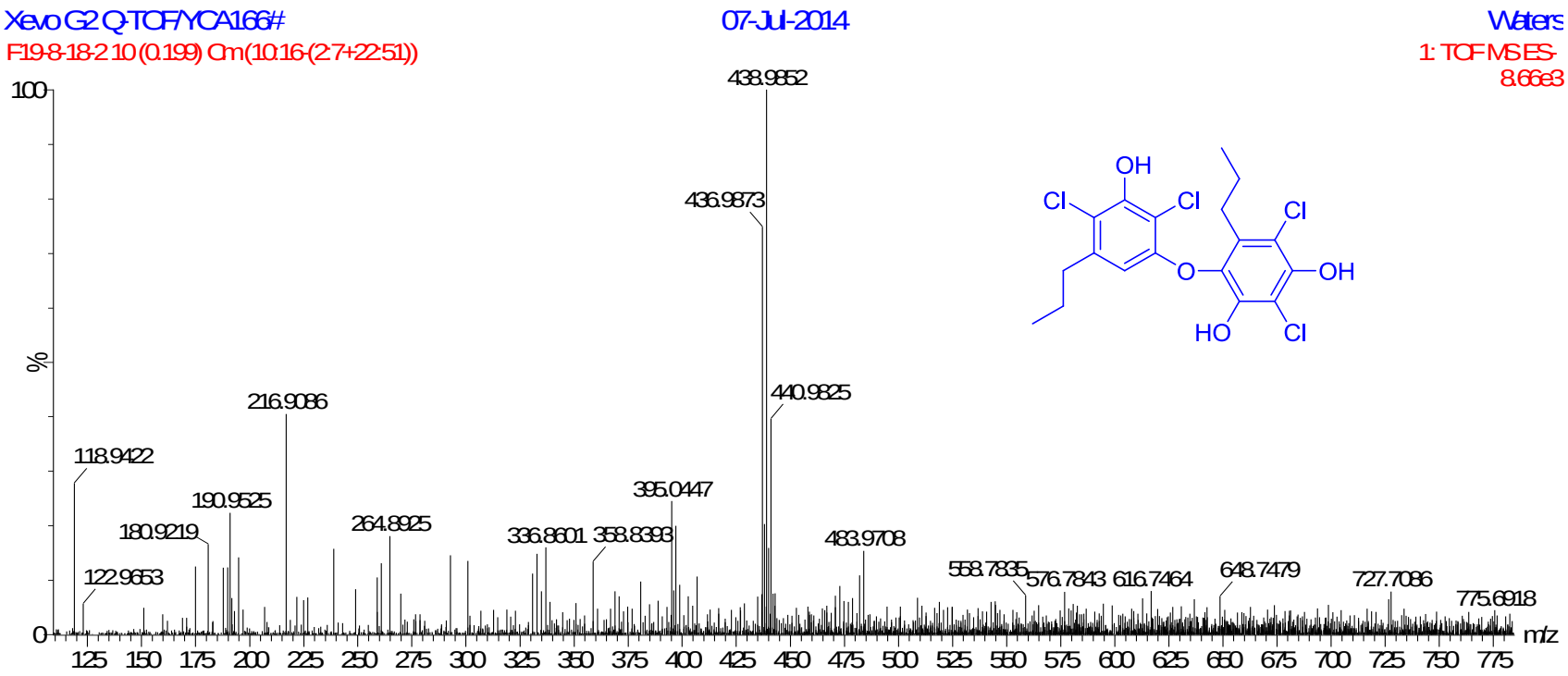


**Figure S10.** Negative mode HRESIMS data of compound **2**.

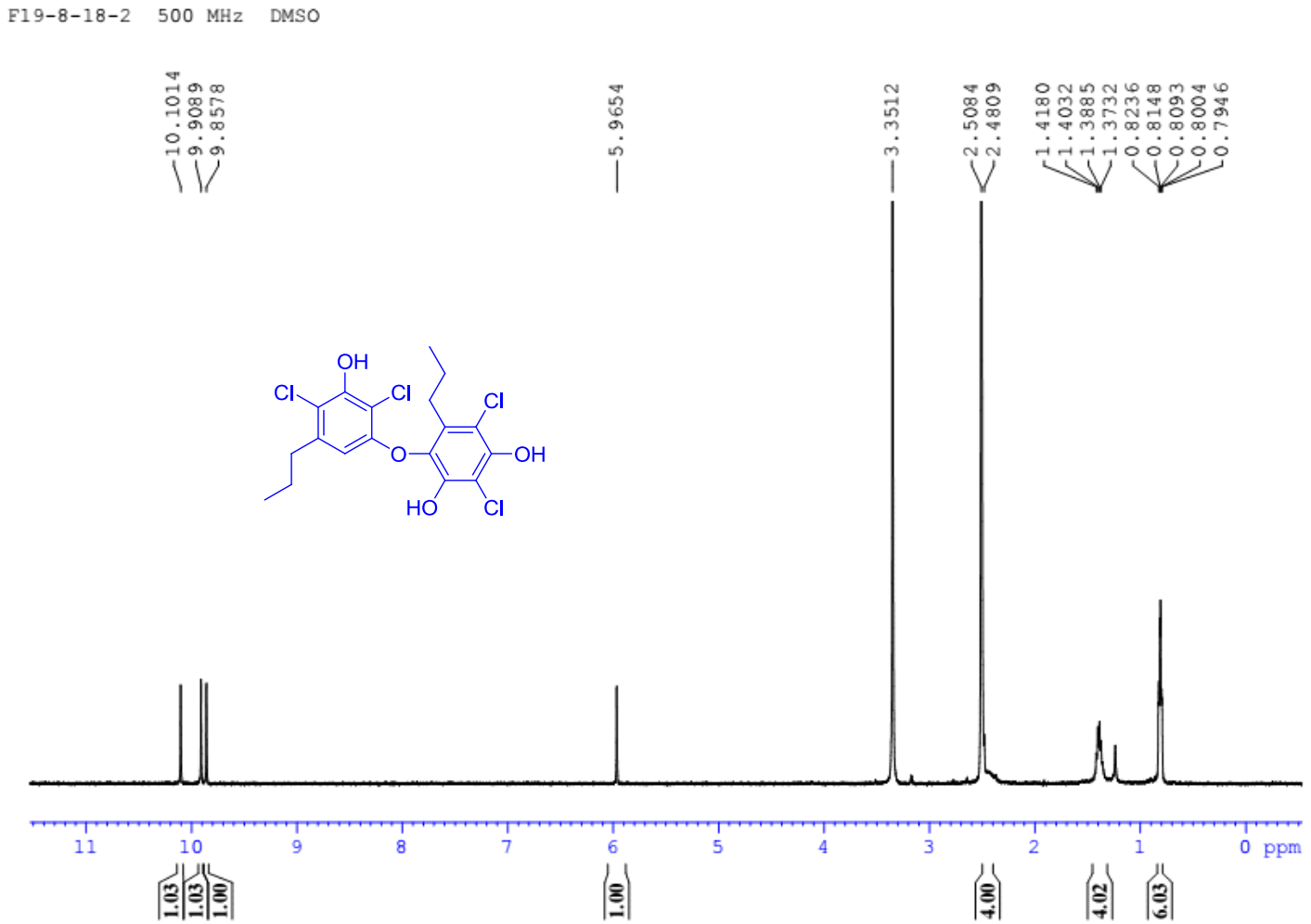


**Figure S11.** $^{1}$H NMR spectrum of compound **2** in DMSO-d6 (500 MHz).

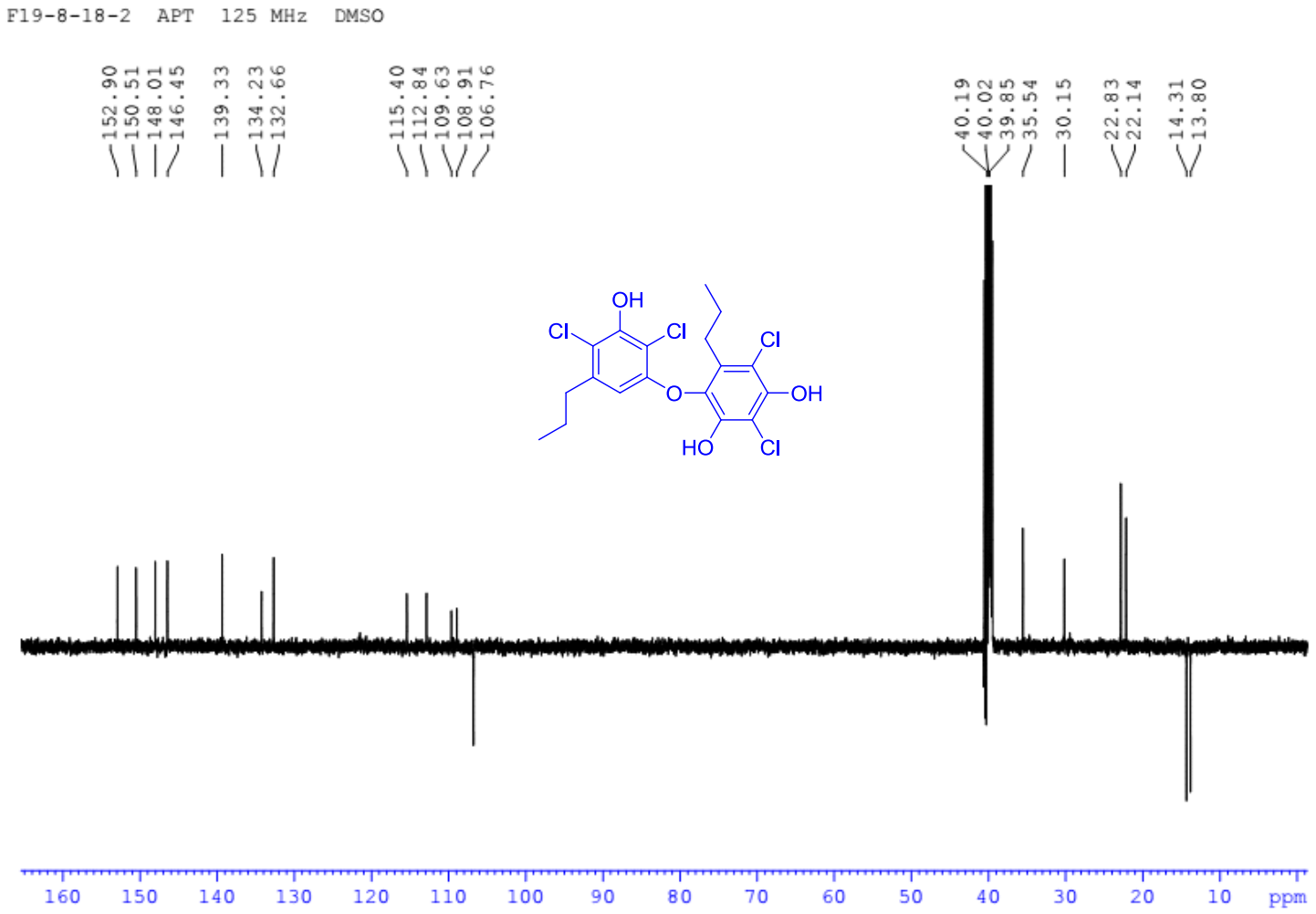


**Figure S12.** $^{13}$C NMR spectrum of compound **2** in DMSO-d6 (125 MHz).

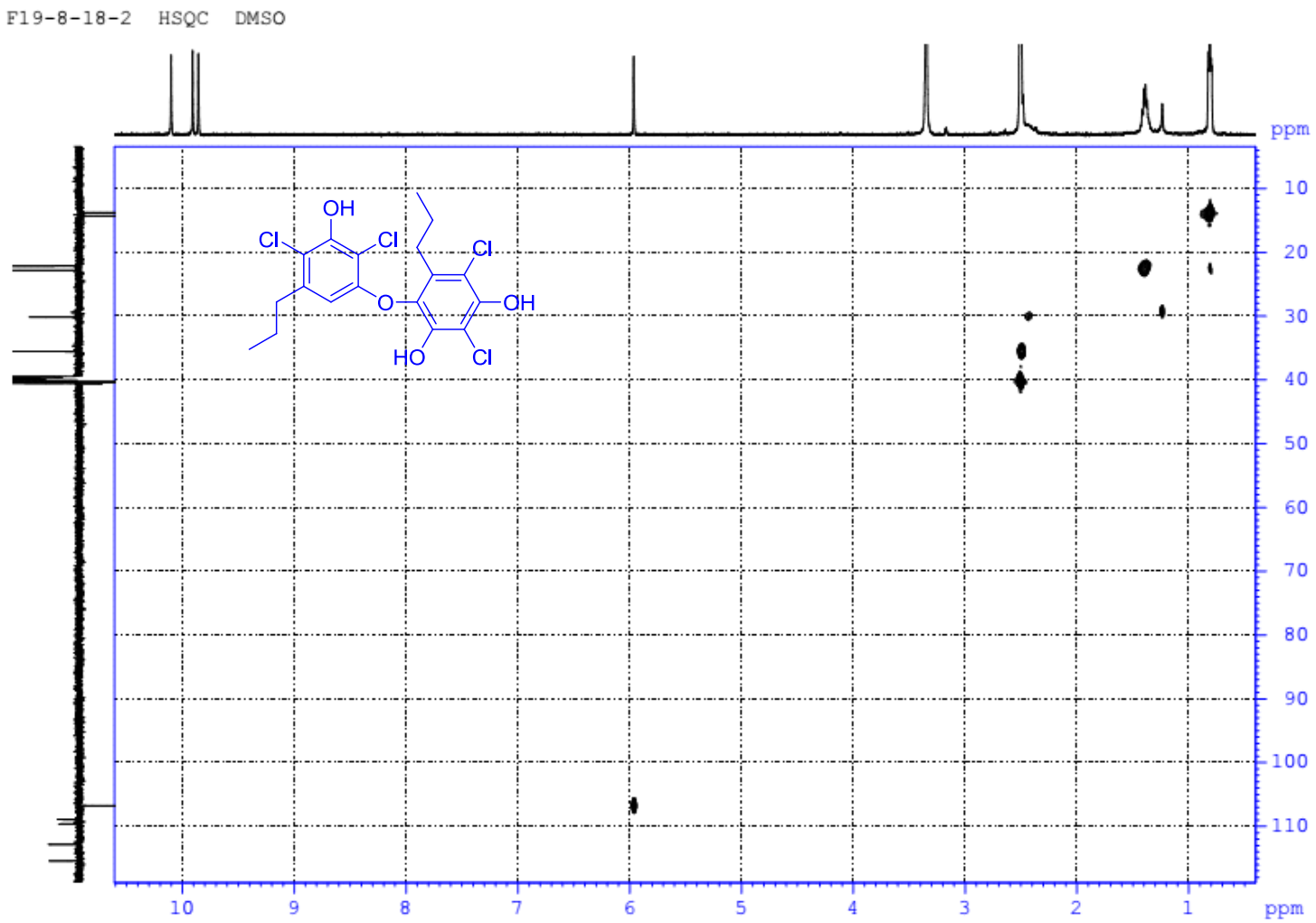


**Figure S13.** HSQC spectrum of compound **2** in DMSO-d6.

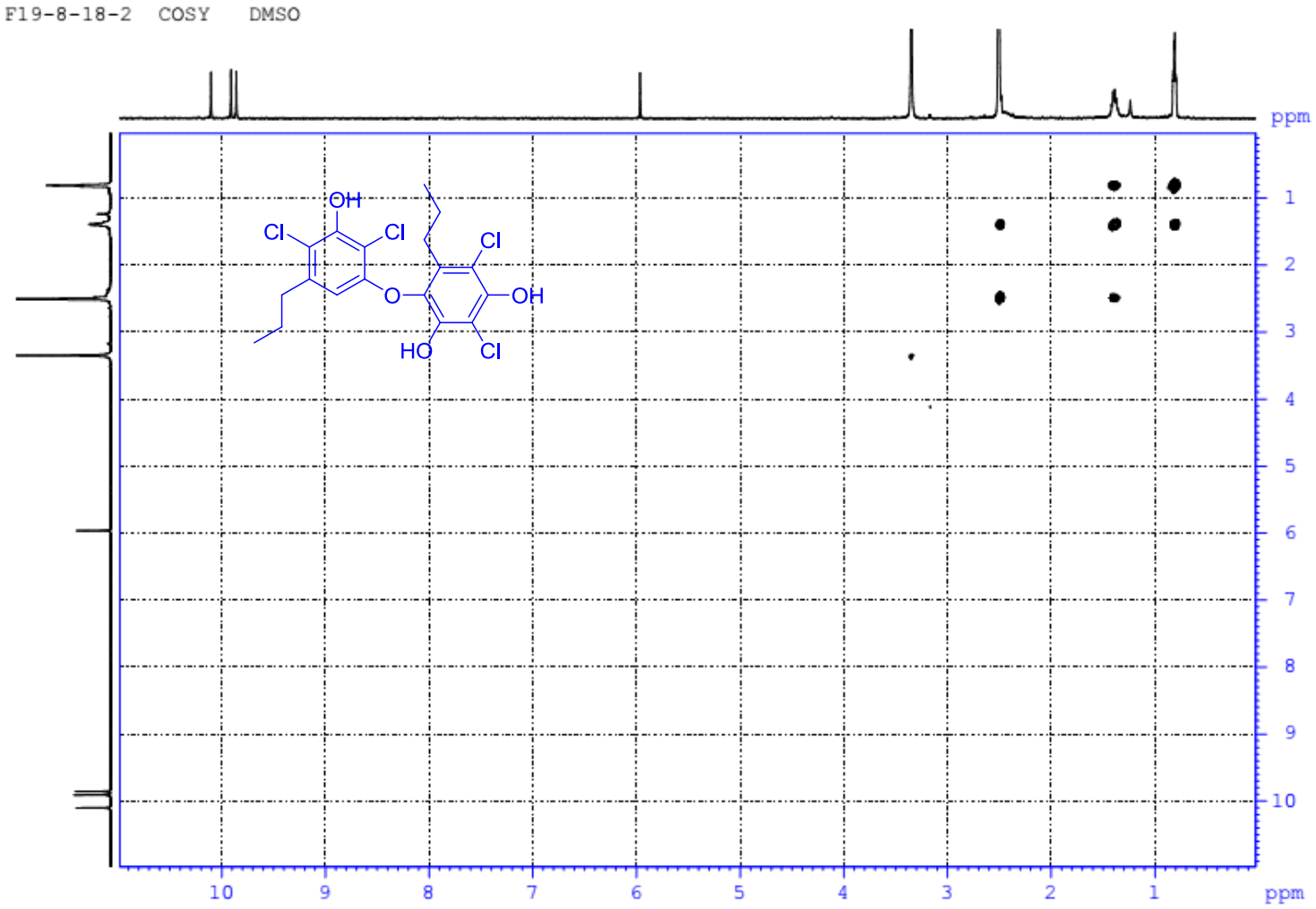


**Figure S14.** $^{1}$H-$^{1}$H COSY spectrum of compound **2** in DMSO-d6.

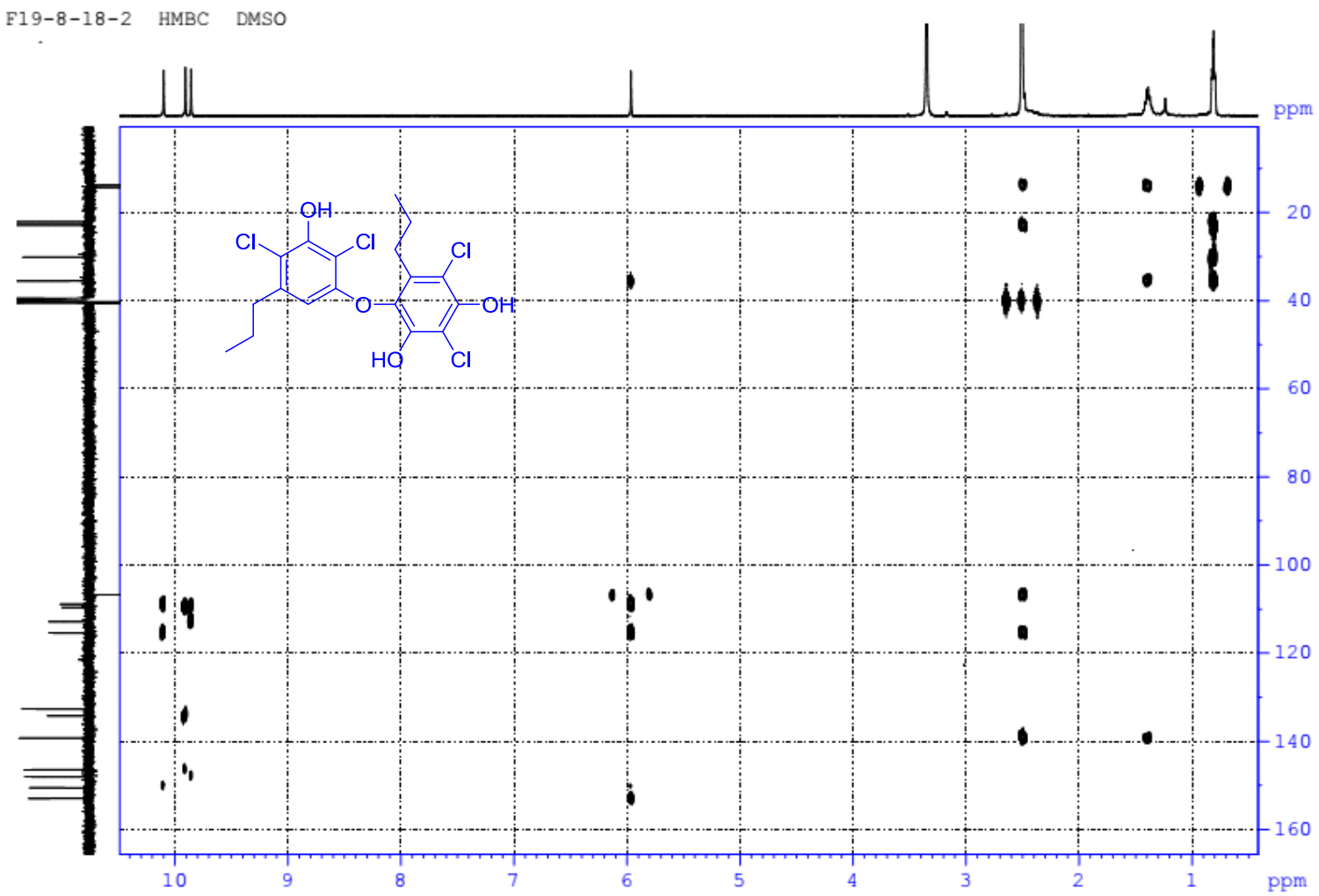


**Figure S15.** HMBC spectrum of compound **2** in DMSO-d6.

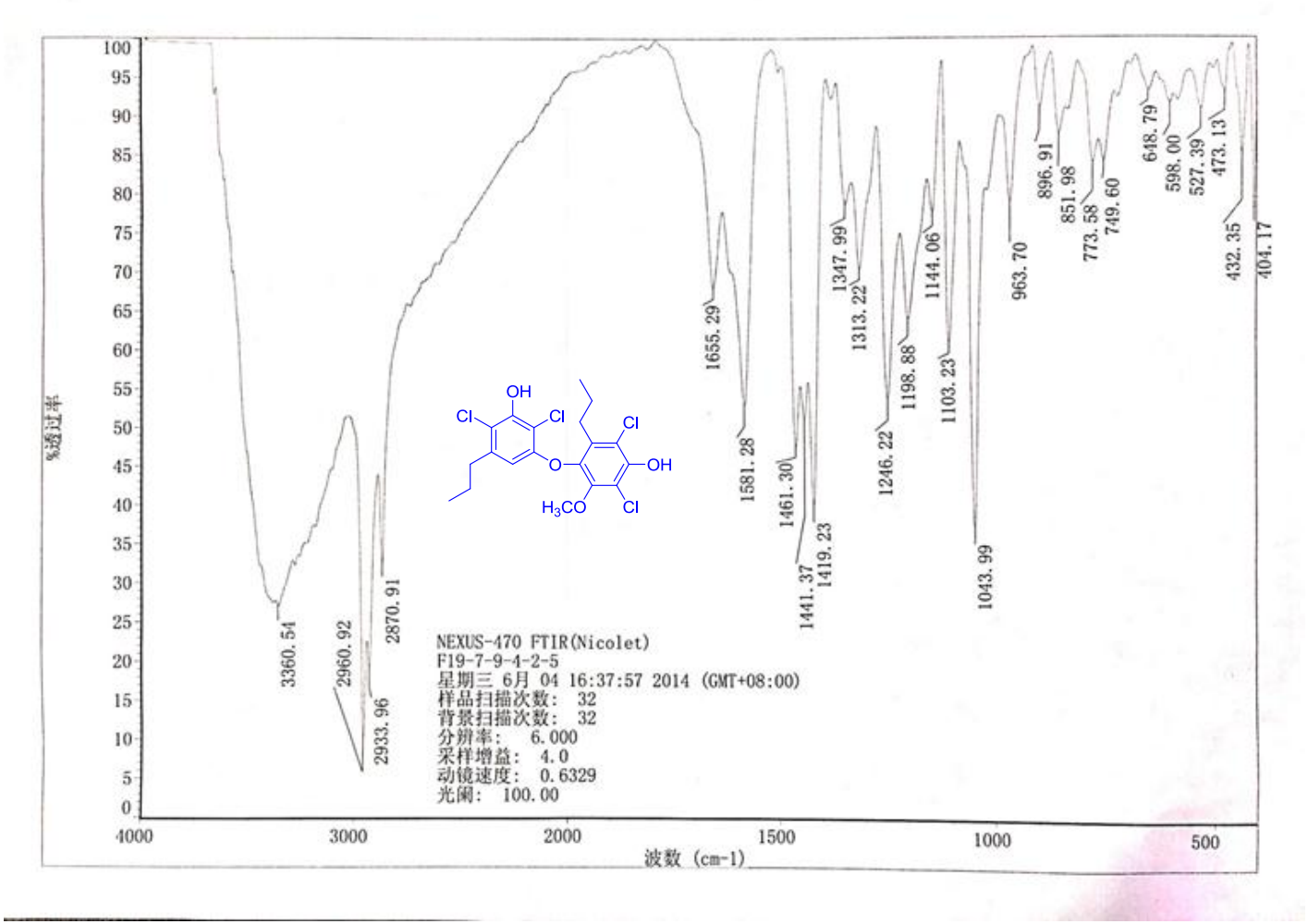


**Figure S16.** IR spectrum of compound **3**.

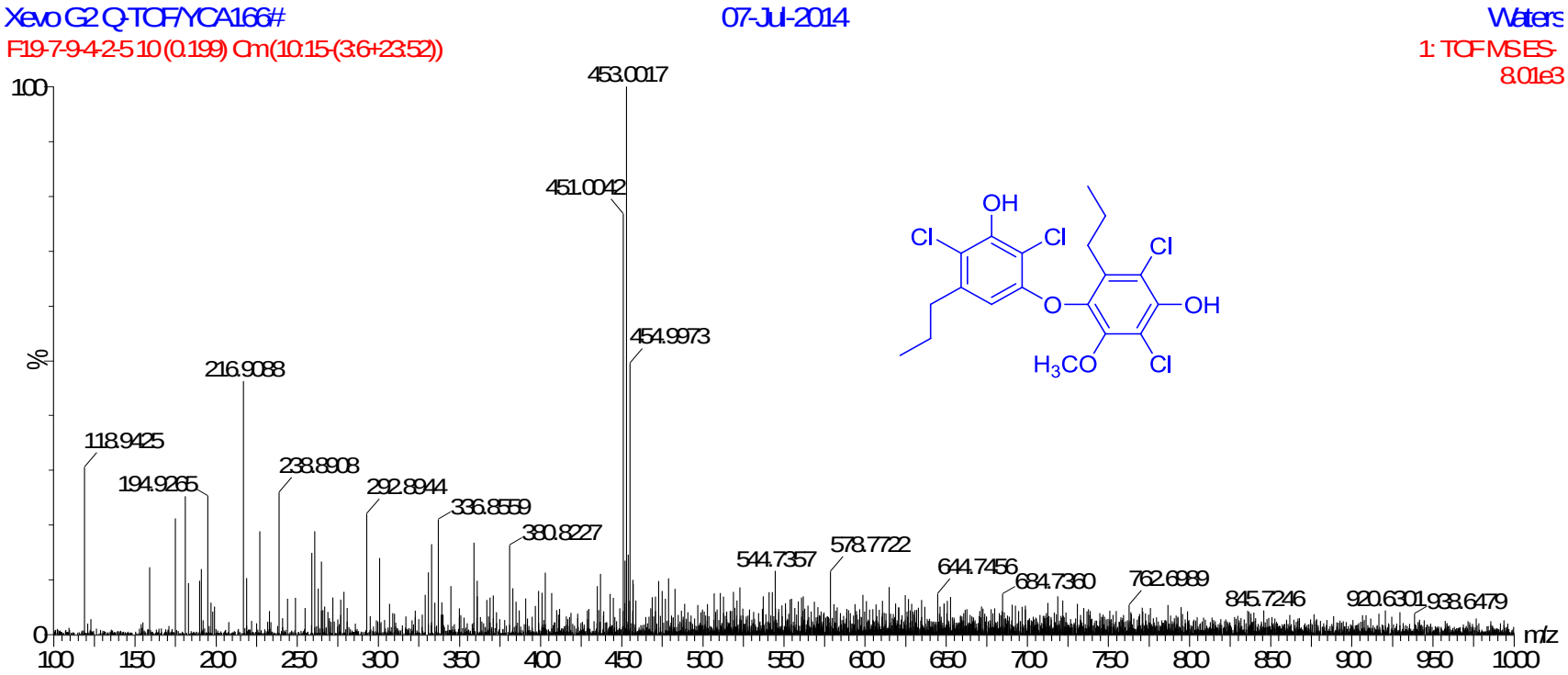


**Figure S17.** Negative mode HRESIMS data of compound **3**.

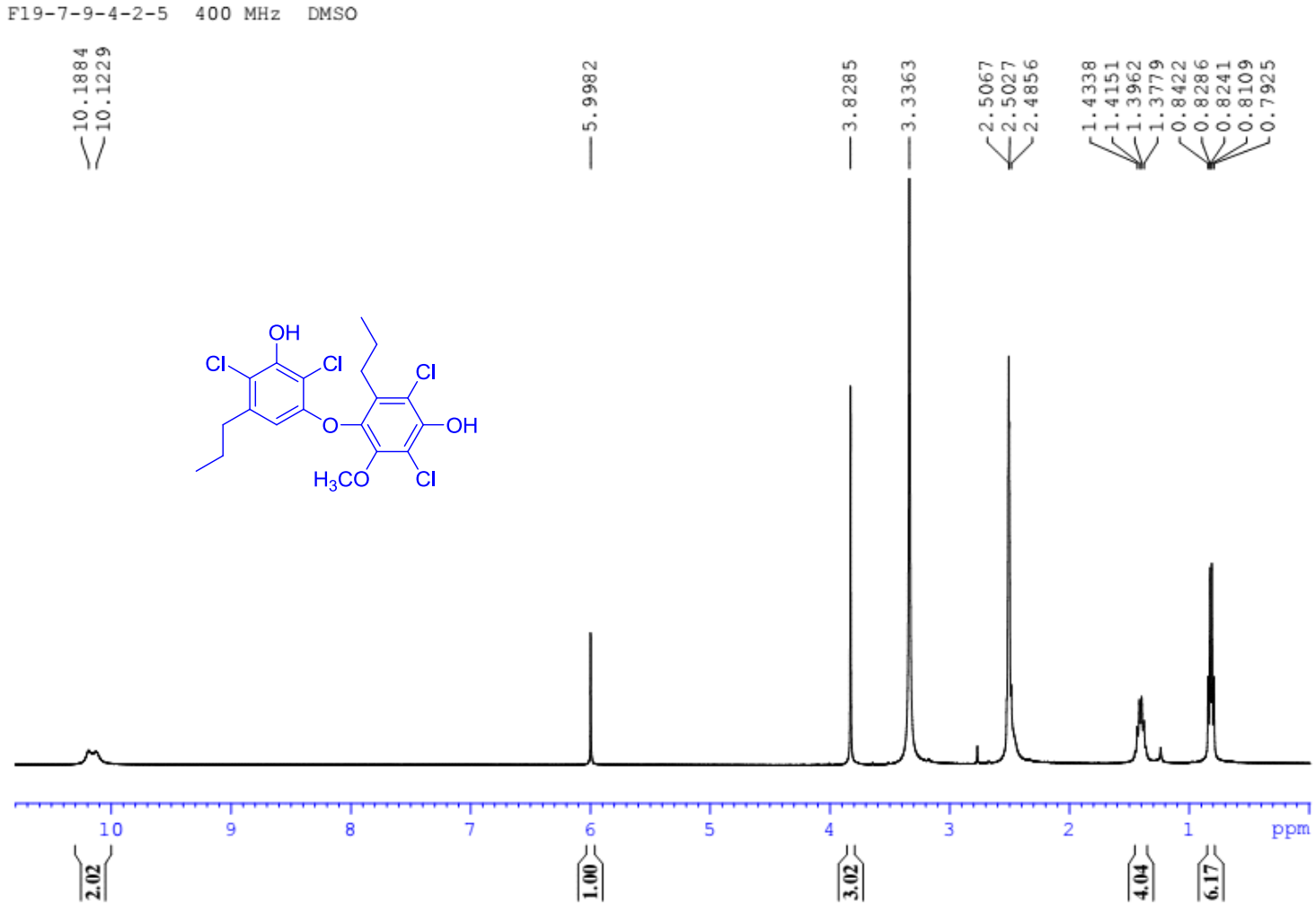


**Figure S18.** $^{1}$H NMR spectrum of compound **3** in DMSO-d6 (400 MHz).

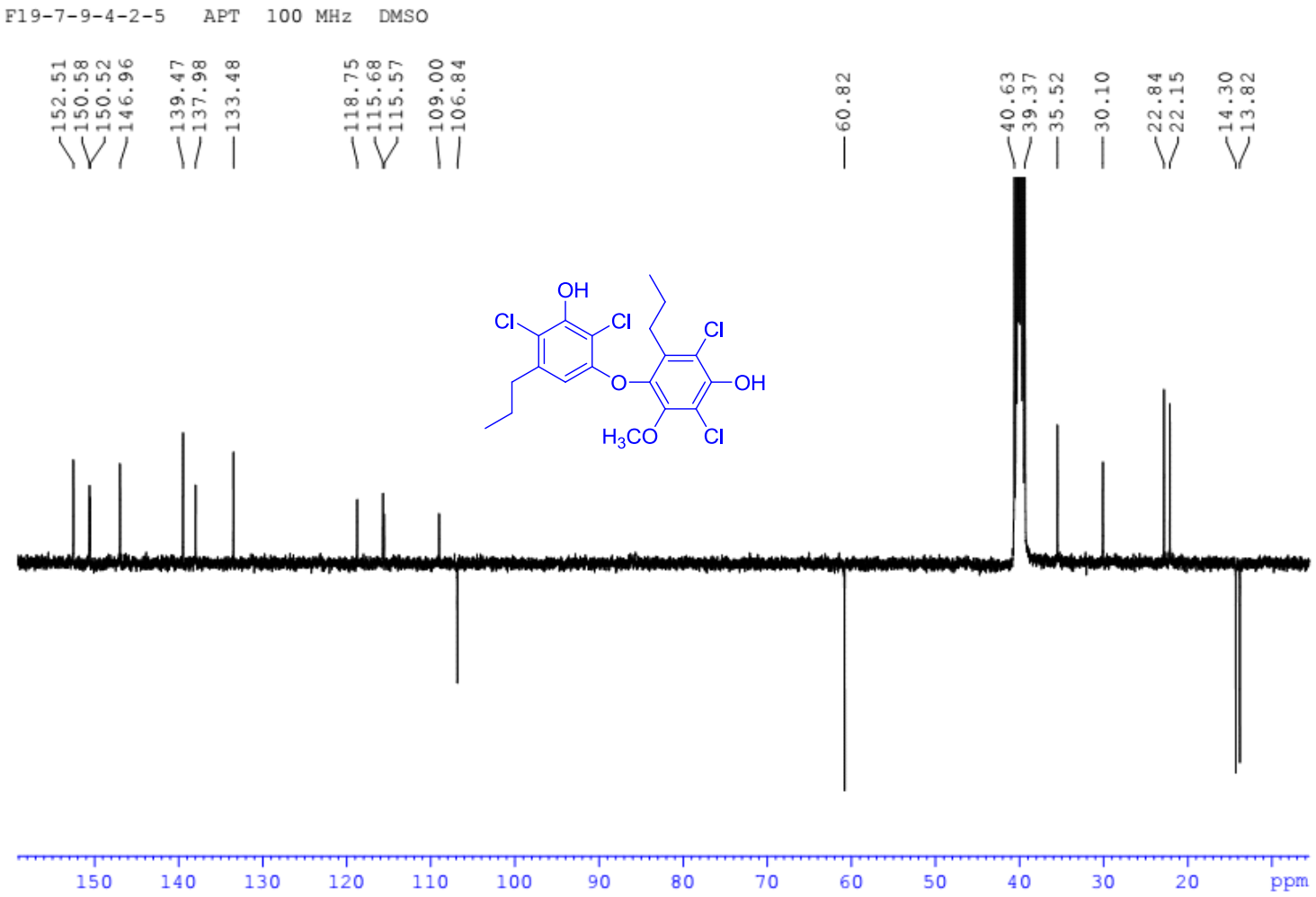


**Figure S19.** $^{13}$C NMR spectrum of compound **3** in DMSO-d6 (100 MHz).

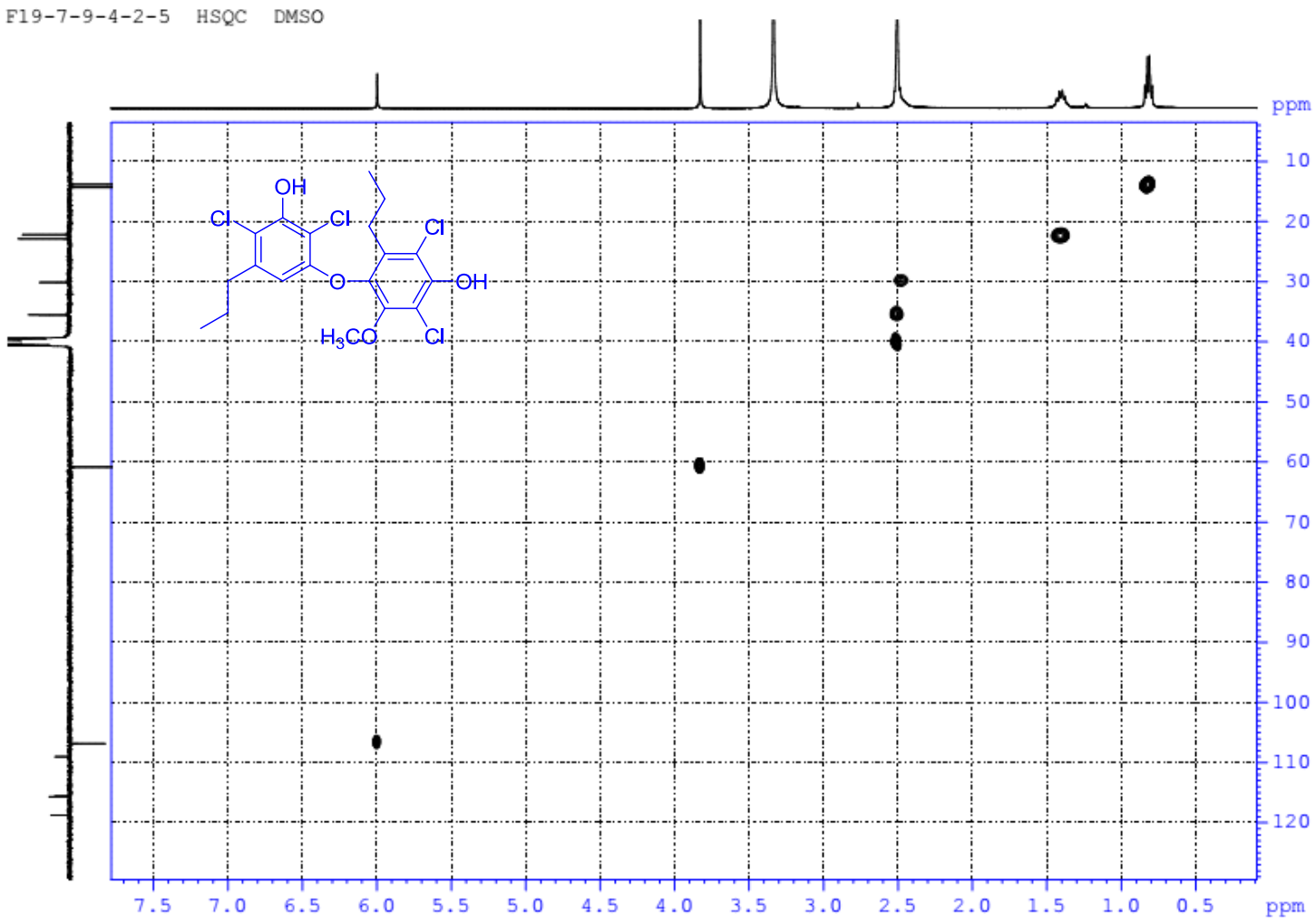


**Figure S20.** HSQC spectrum of compound **3** in DMSO-d6.

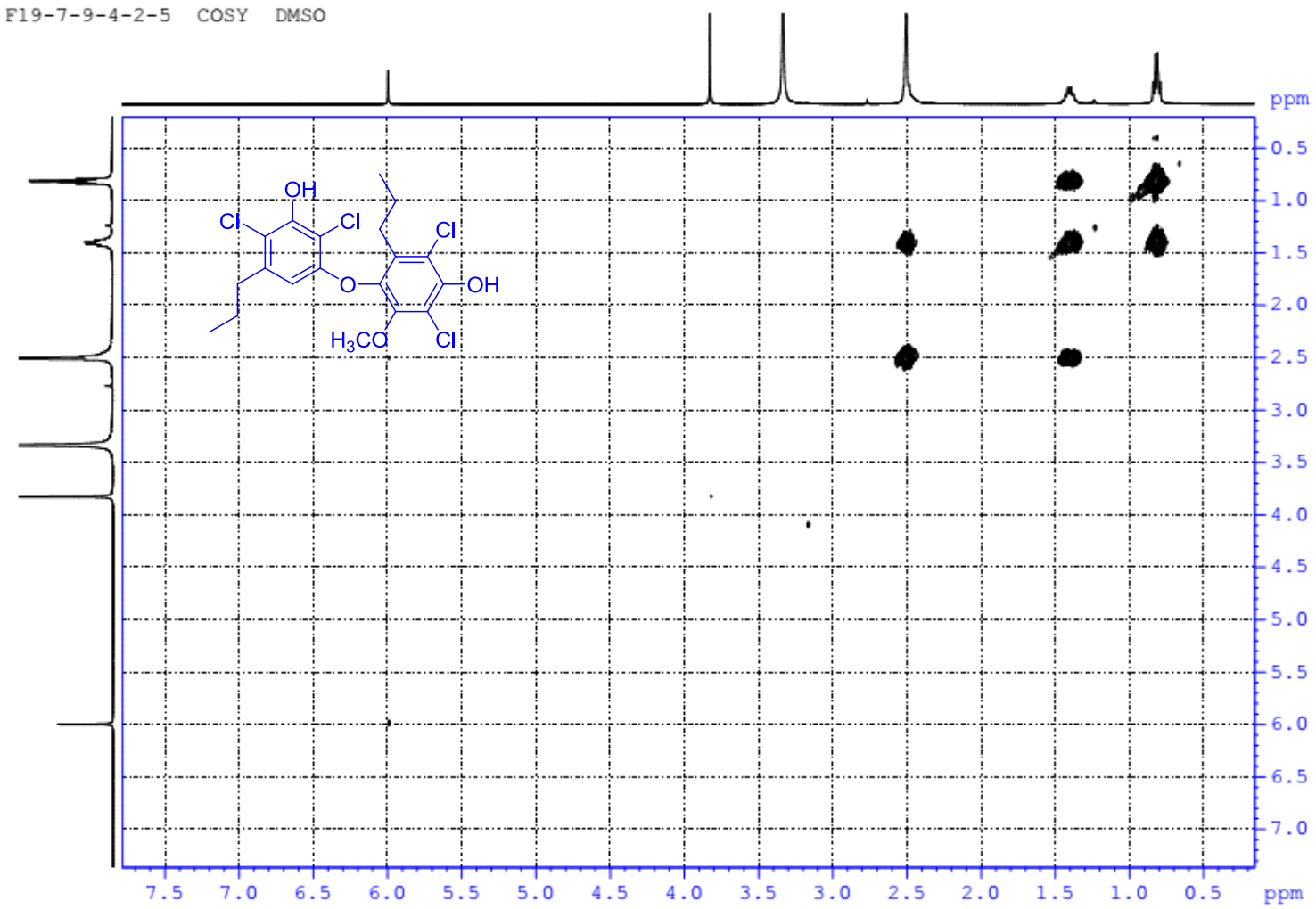


**Figure S21.** $^{1}$H-$^{1}$H COSY spectrum of compound **3** in DMSO-d6.

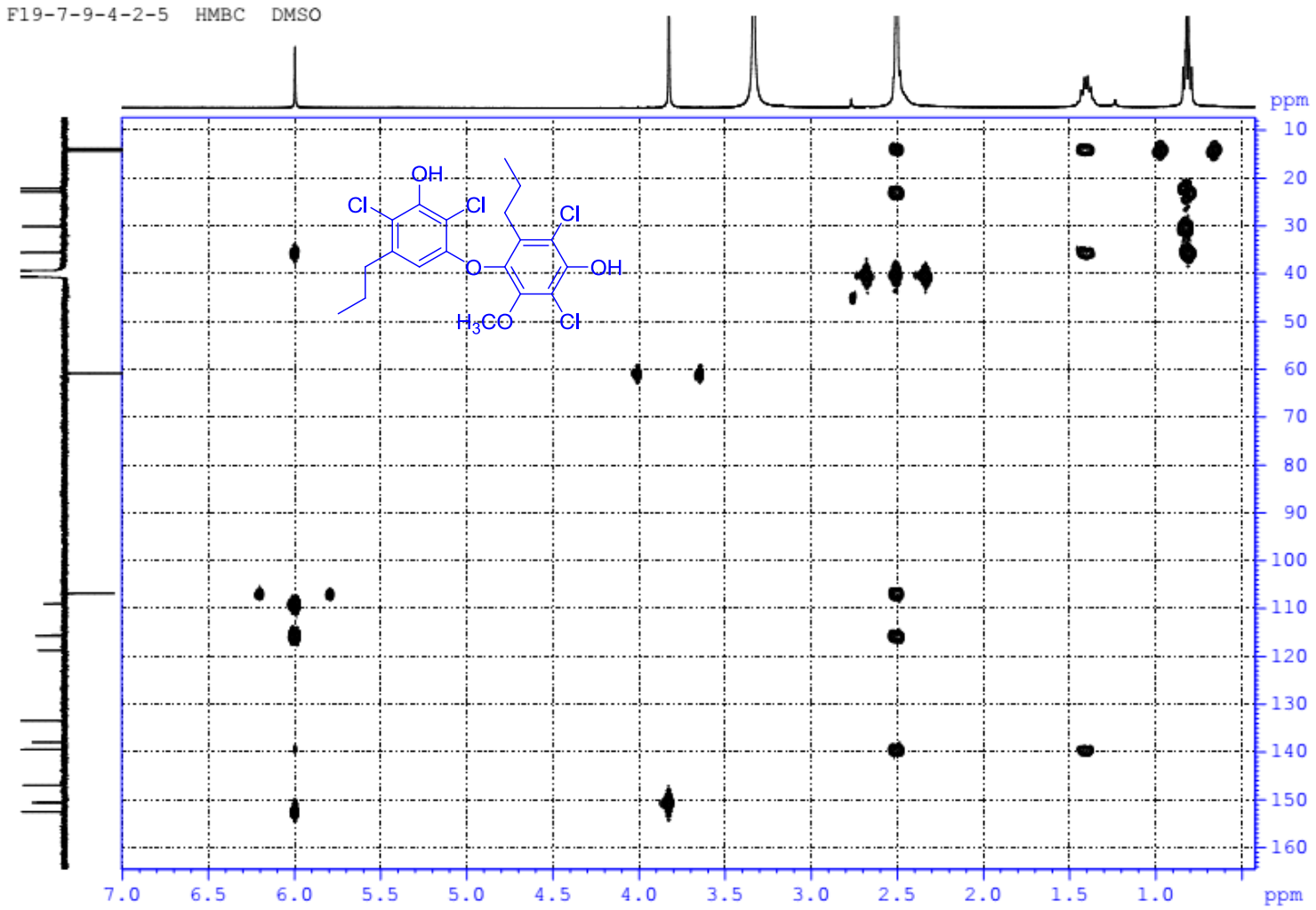


**Figure S22.** HMBC spectrum of compound **3** in DMSO-d6.

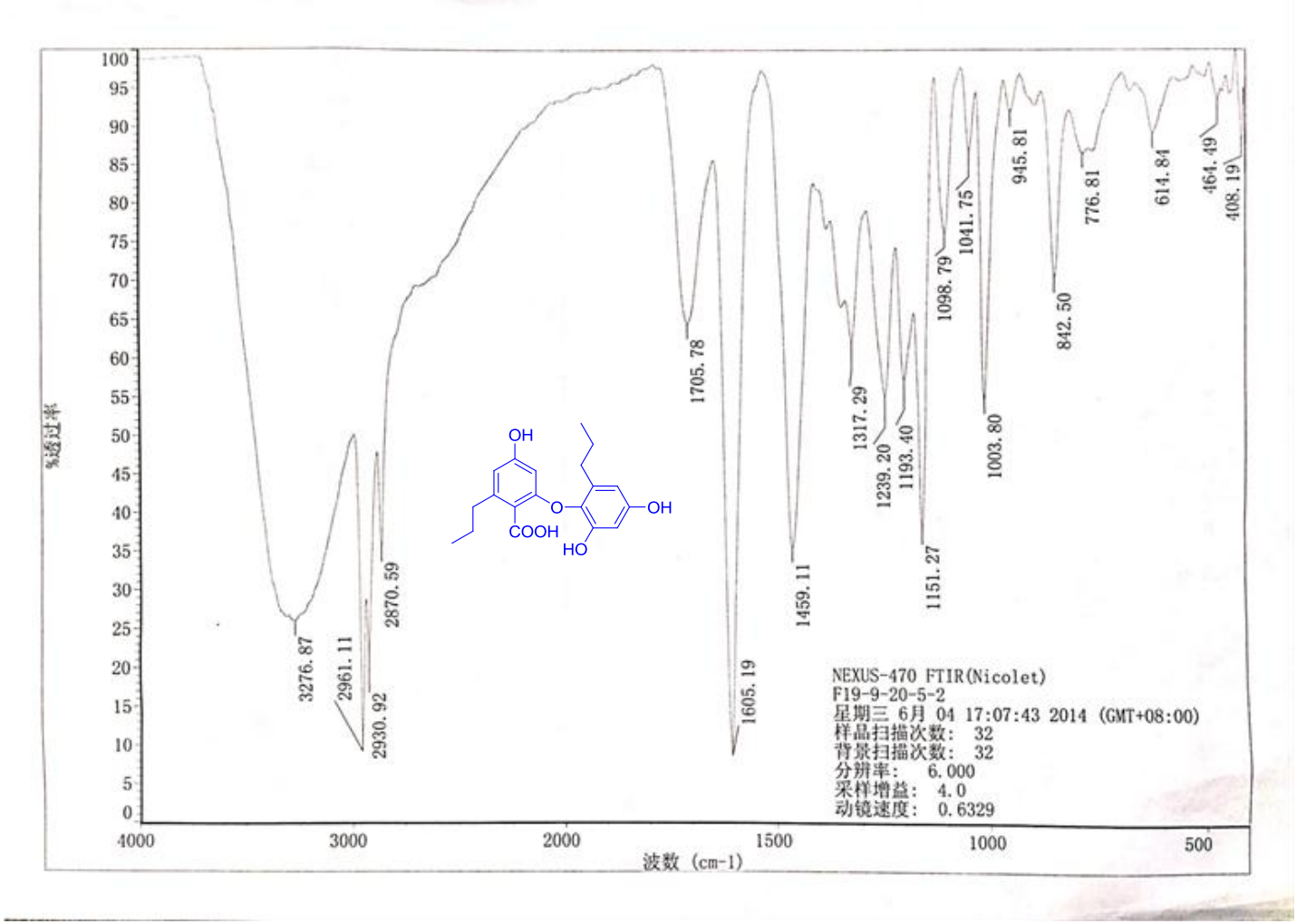


**Figure S23.** IR spectrum of compound **4**.

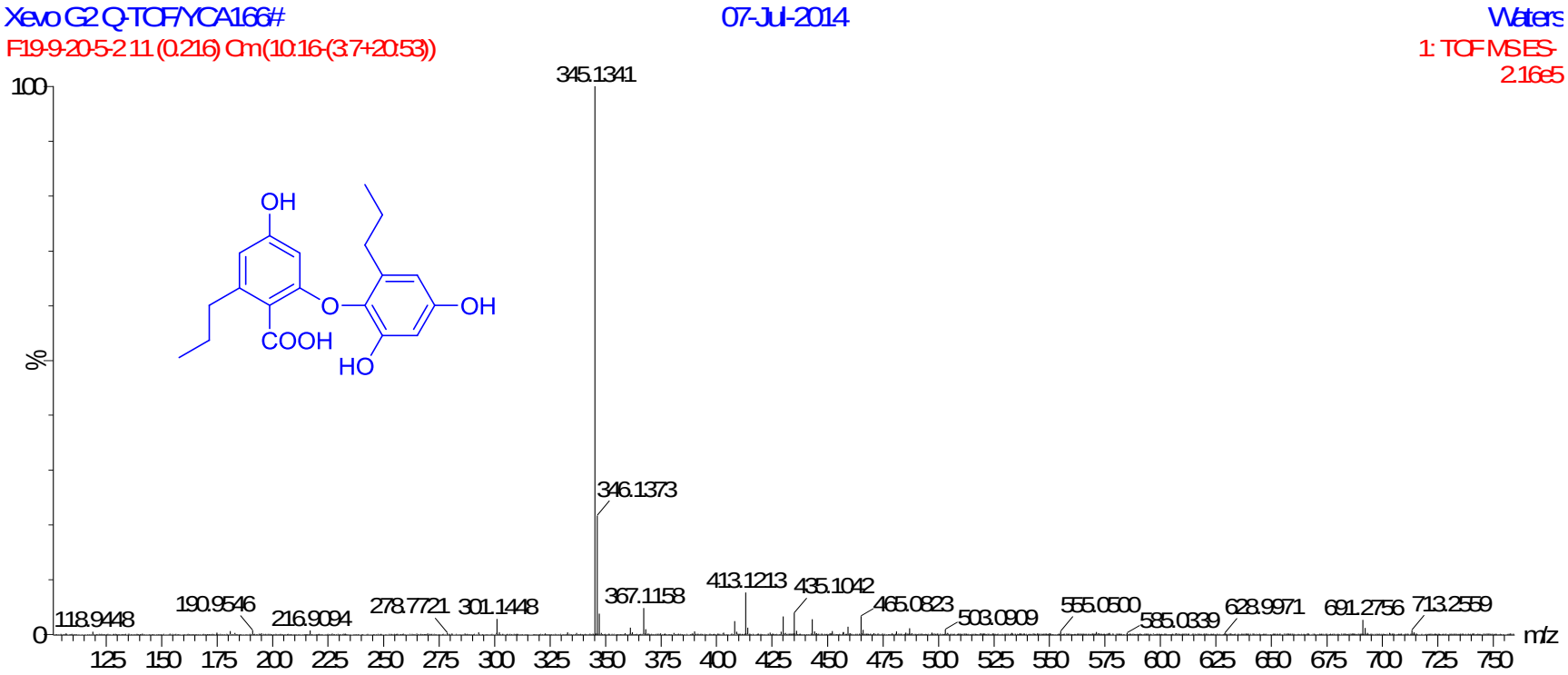


**Figure S24.** Negative mode HRESIMS data of compound **4**.

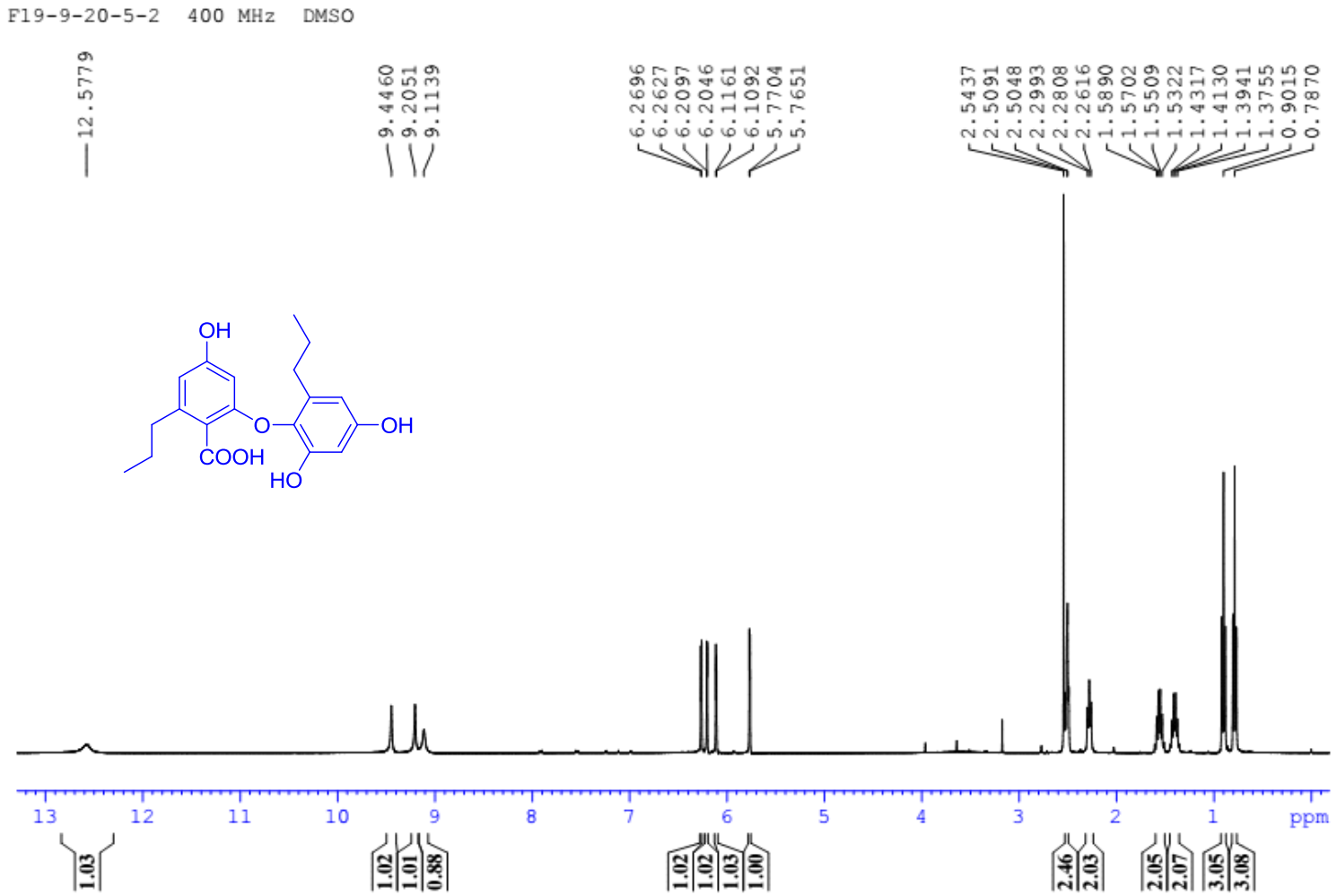


**Figure S25.** $^{1}$H NMR spectrum of compound **4** in DMSO-d6 (400 MHz).

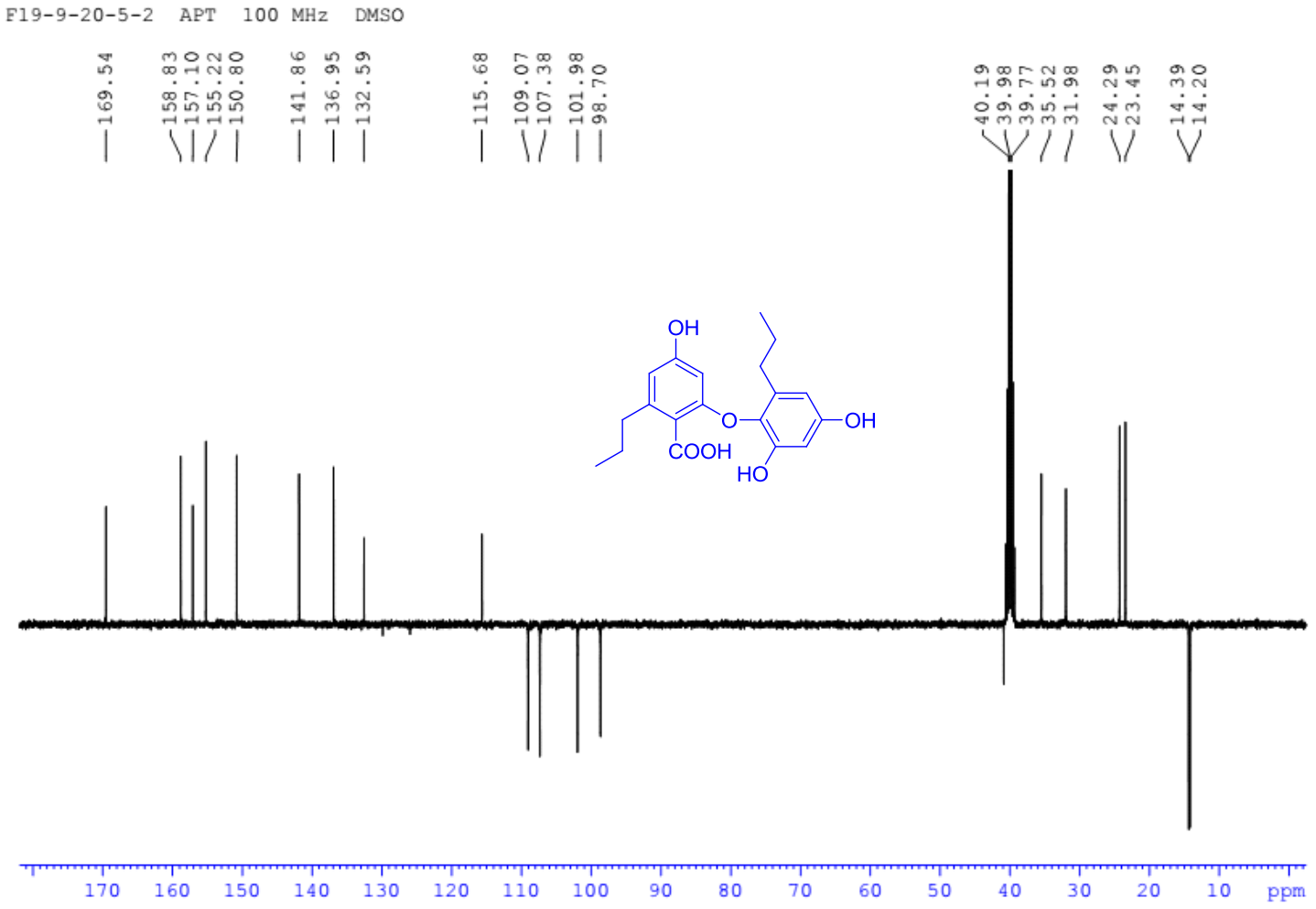


**Figure S26.** $^{13}$C NMR spectrum of compound **4** in DMSO-d6 (100 MHz).

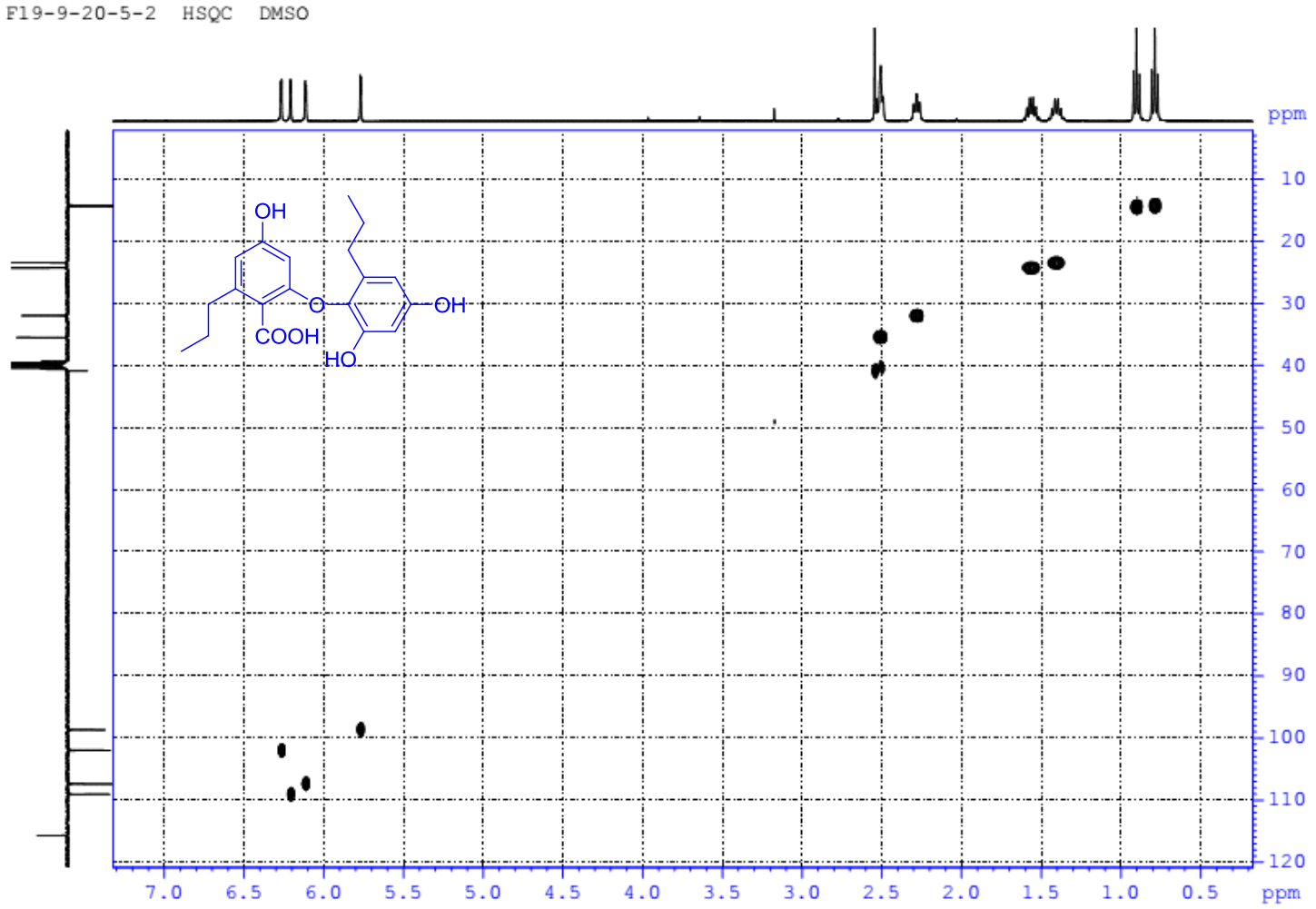


**Figure S27.** HSQC spectrum of compound **4** in DMSO-d6.

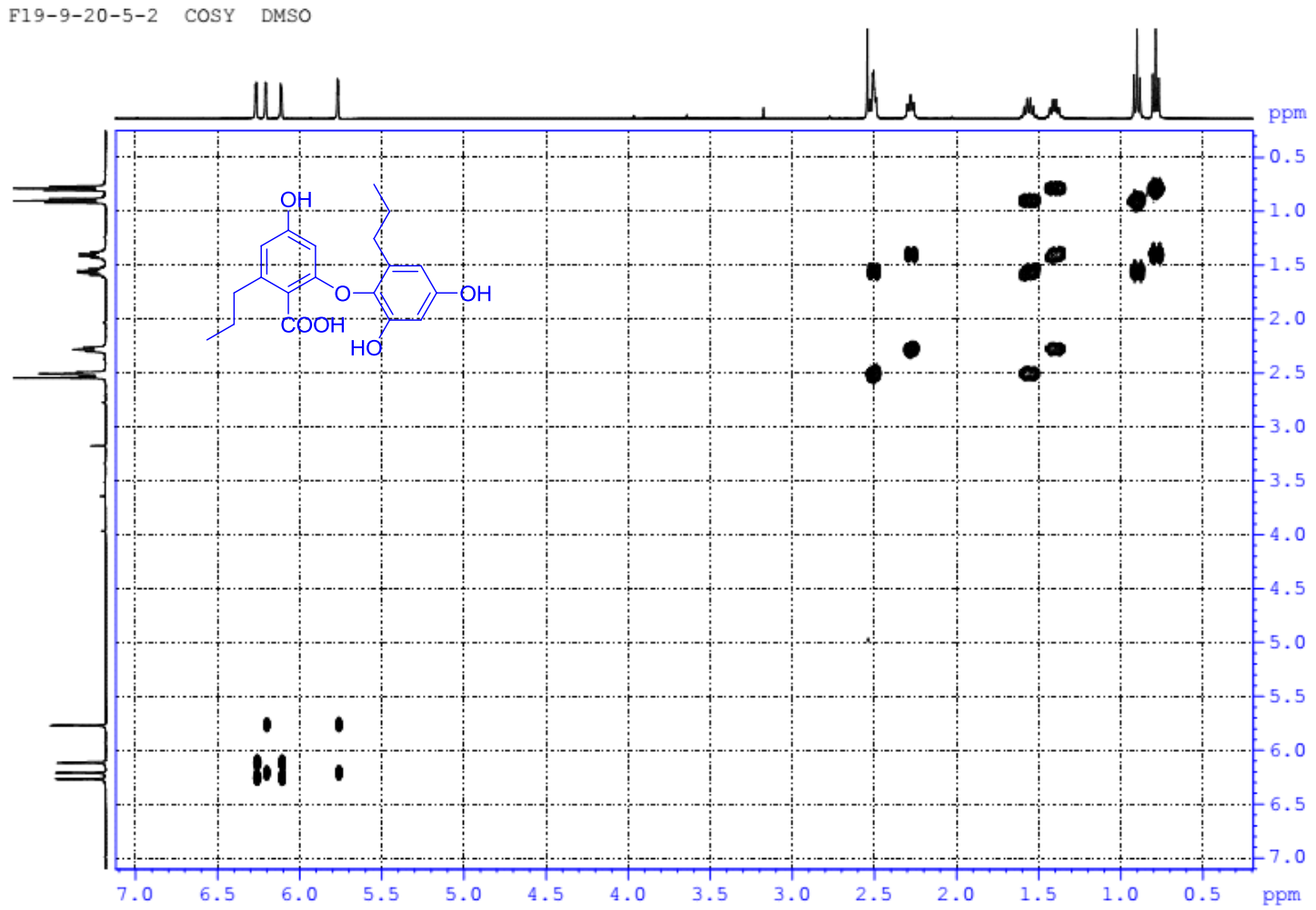


**Figure S28.** $^{1}$H-$^{1}$H COSY spectrum of compound **4** in DMSO-d6.

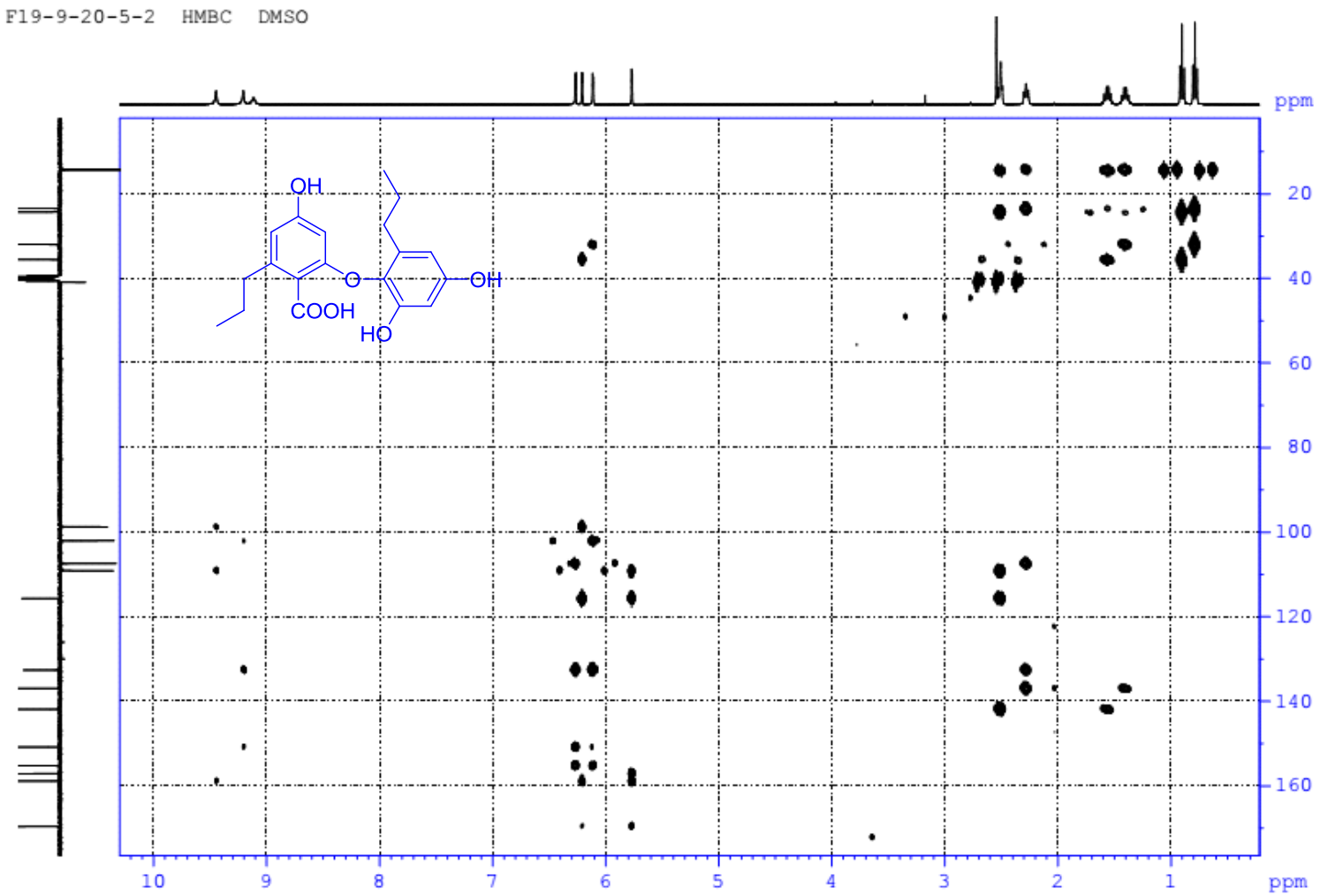


**Figure S29.** HMBC spectrum of compound **4** in DMSO-d6.

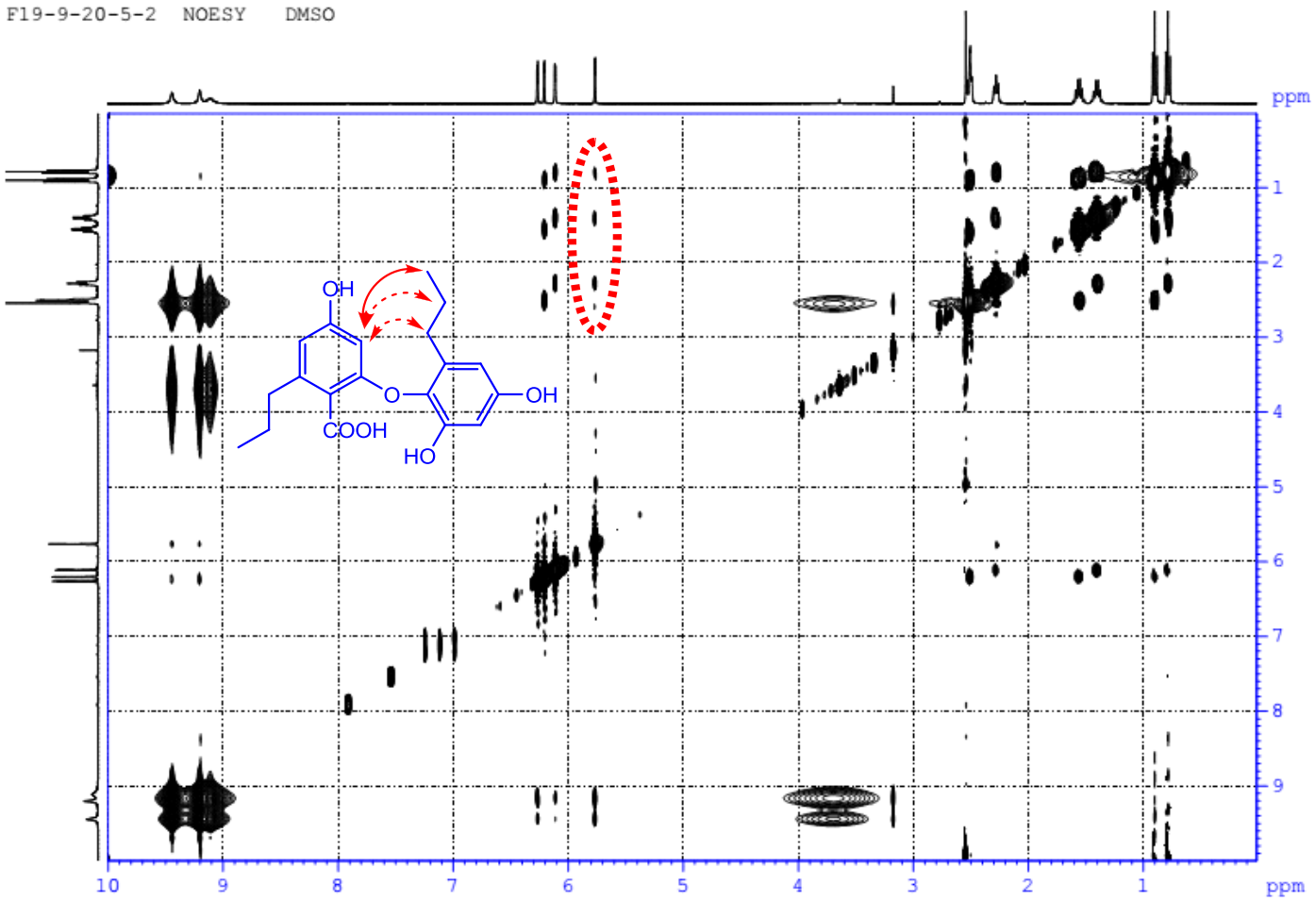


**Figure S30.** NOESY spectrum of compound **4** in DMSO-d6.

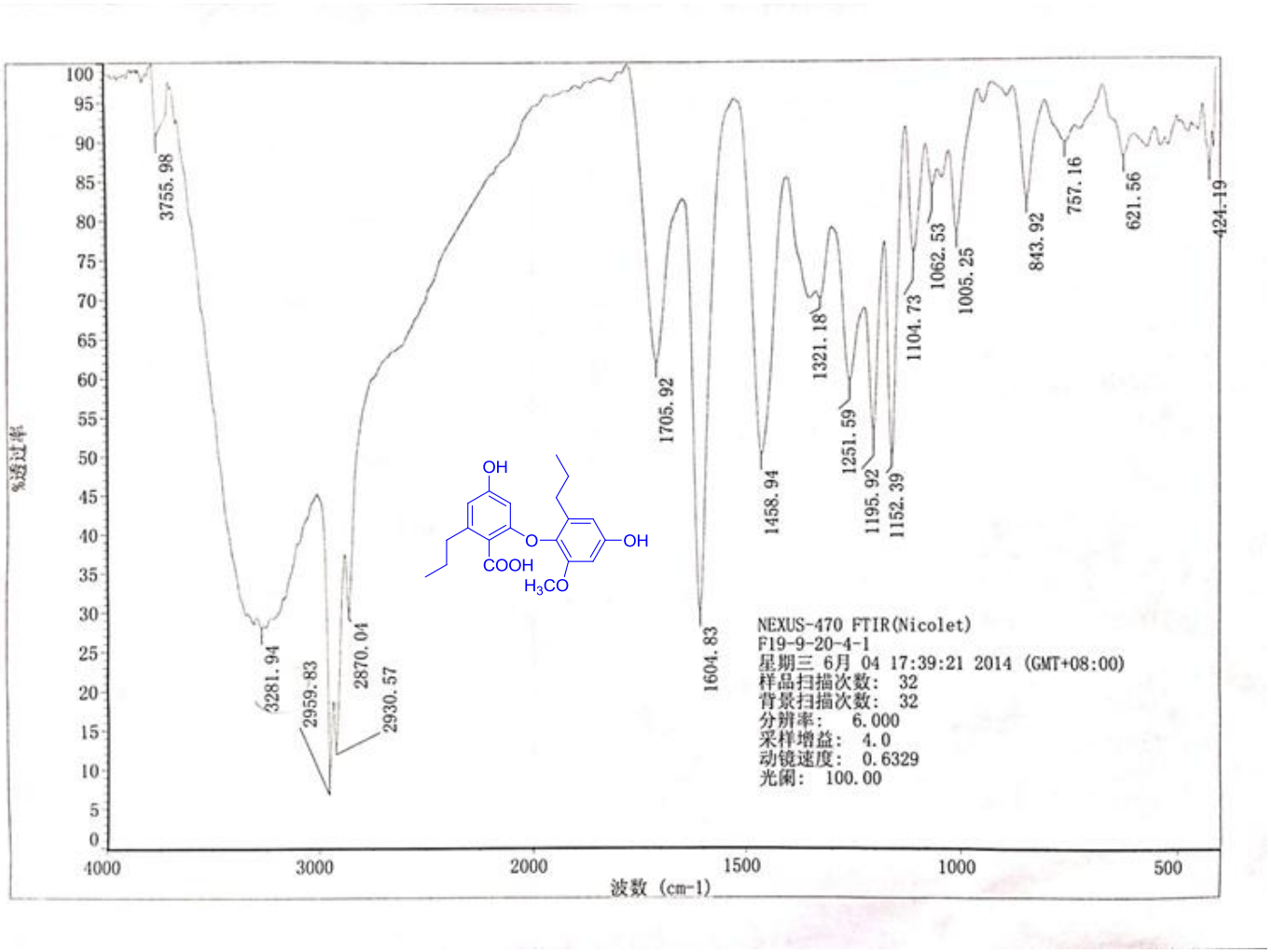


**Figure S31.** IR spectrum of compound **5**.

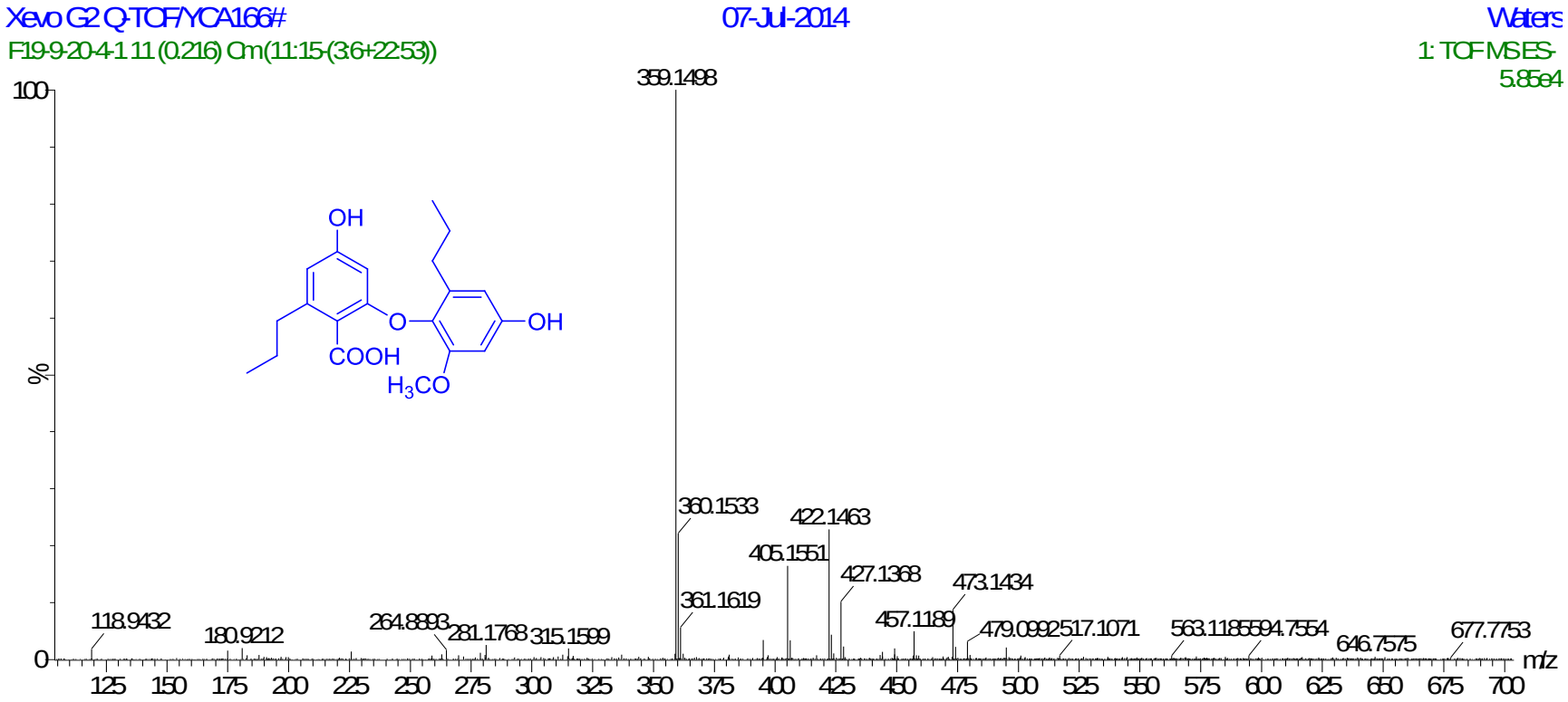


**Figure S32.** Negative mode HRESIMS data of compound **5**.

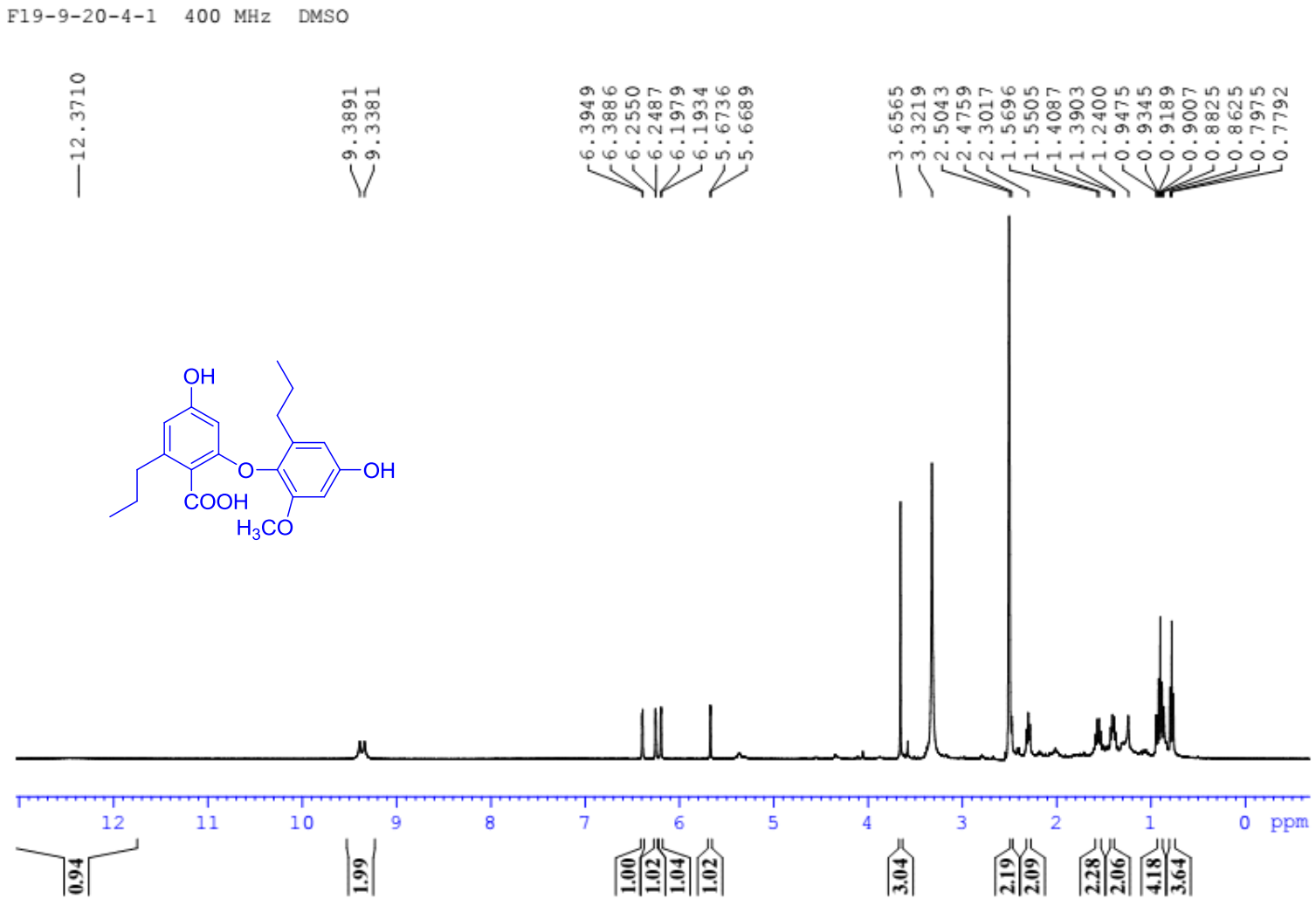


**Figure S33.** $^{1}$H NMR spectrum of compound **5** in DMSO-d6 (400 MHz).

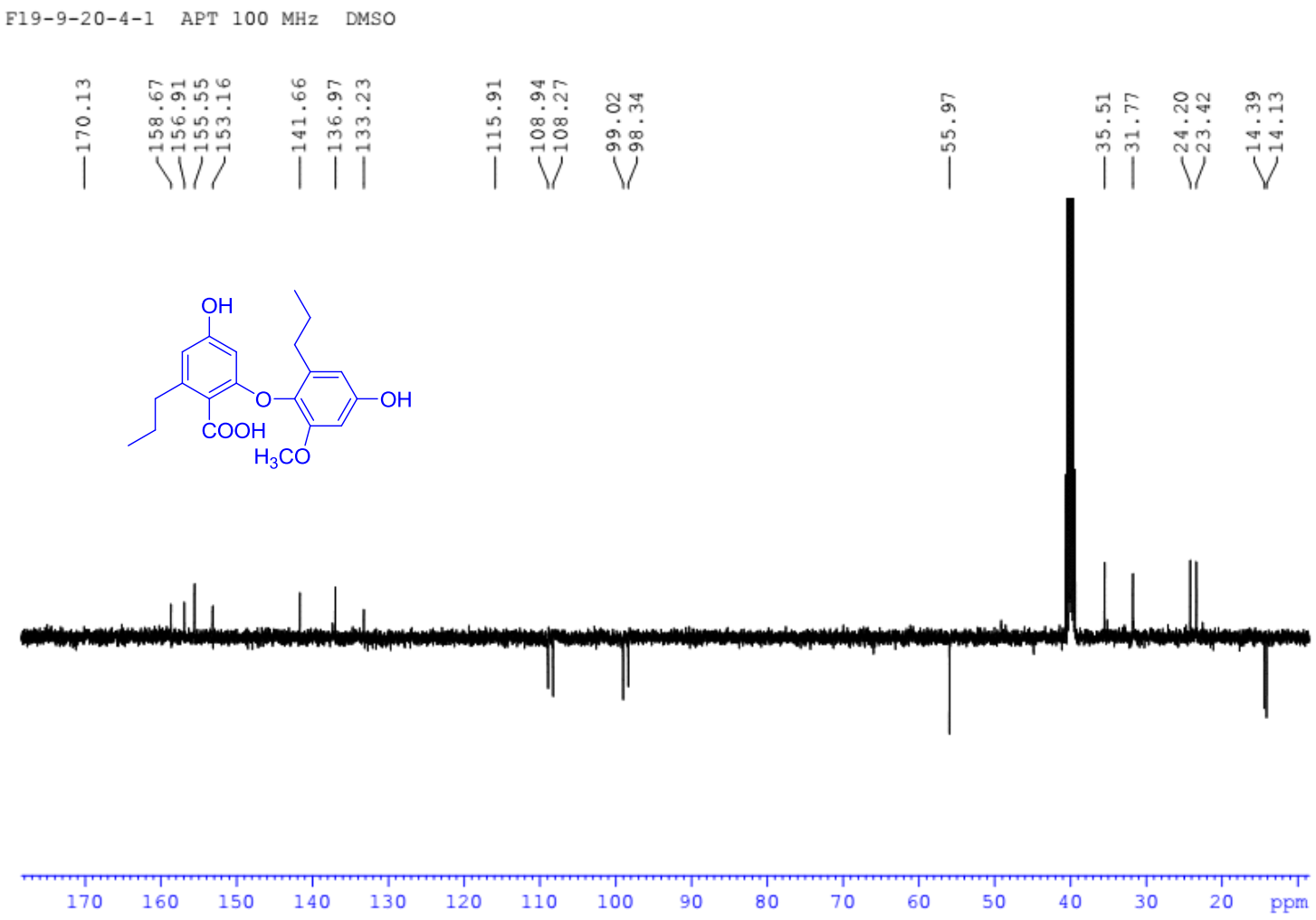


**Figure S34.** $^{13}$C NMR spectrum of compound **5** in DMSO-d6 (100 MHz).

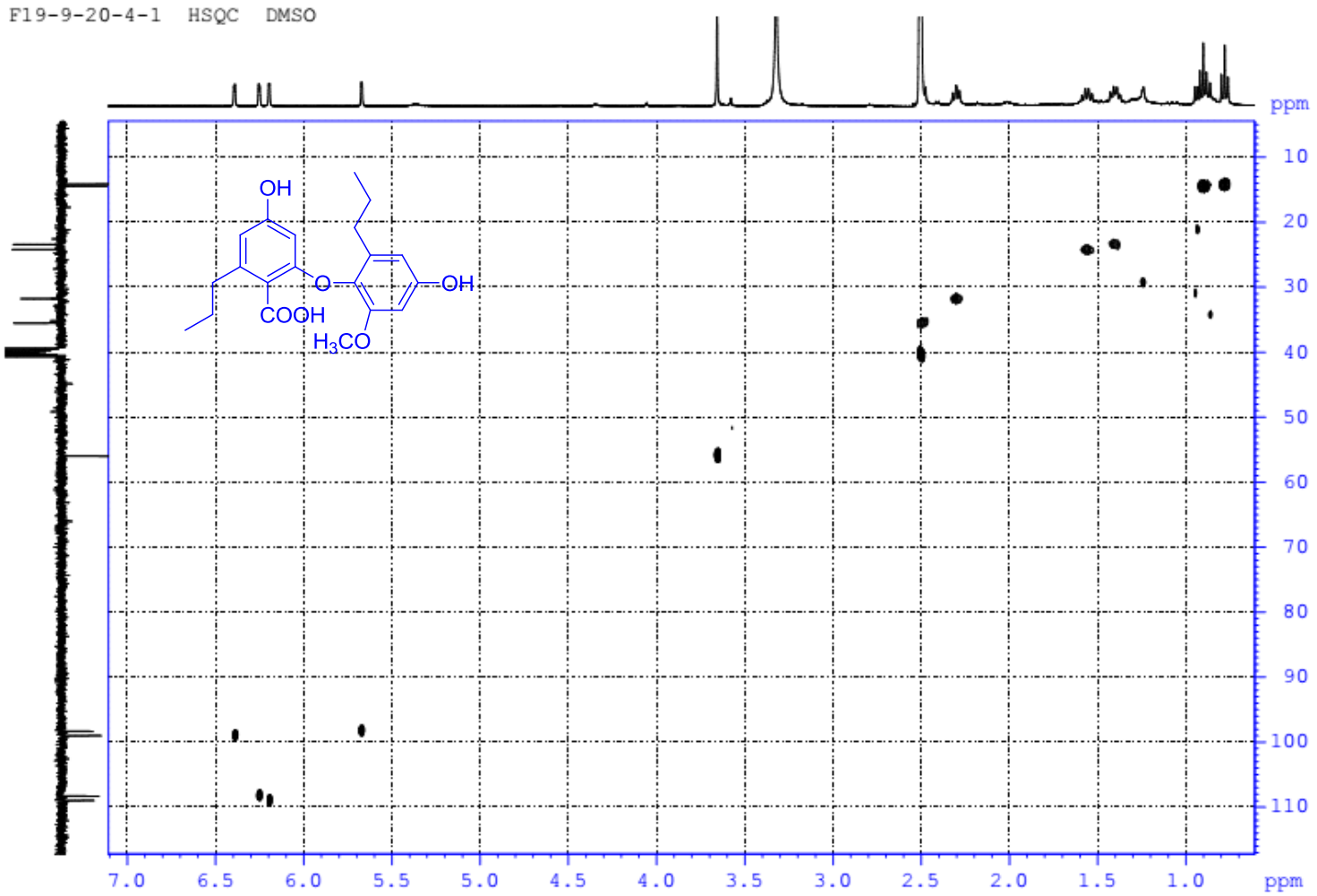


**Figure S35.** HSQC spectrum of compound **5** in DMSO-d6.

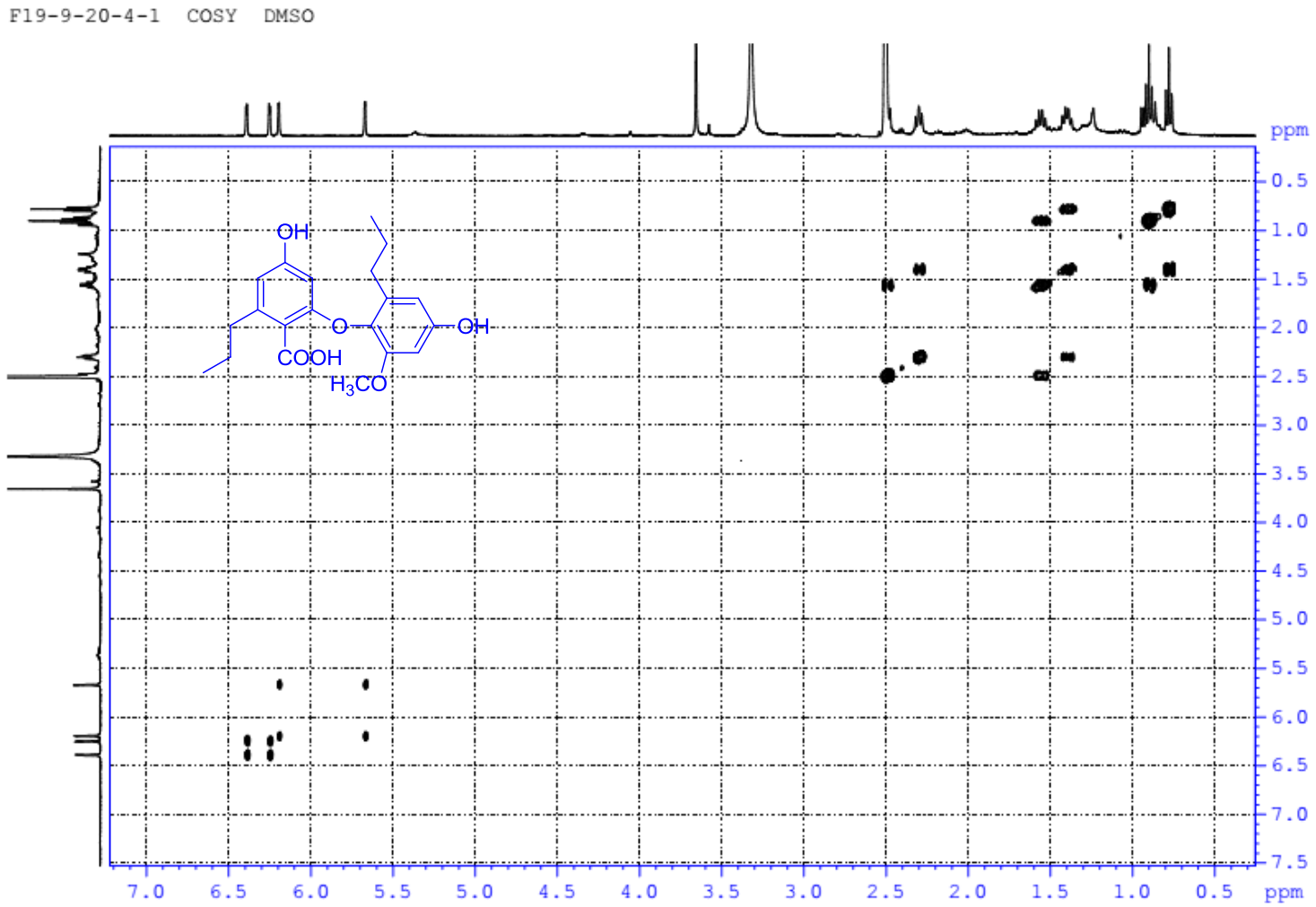


**Figure S36.** $^{1}$H-$^{1}$H COSY spectrum of compound **5** in DMSO-d6.

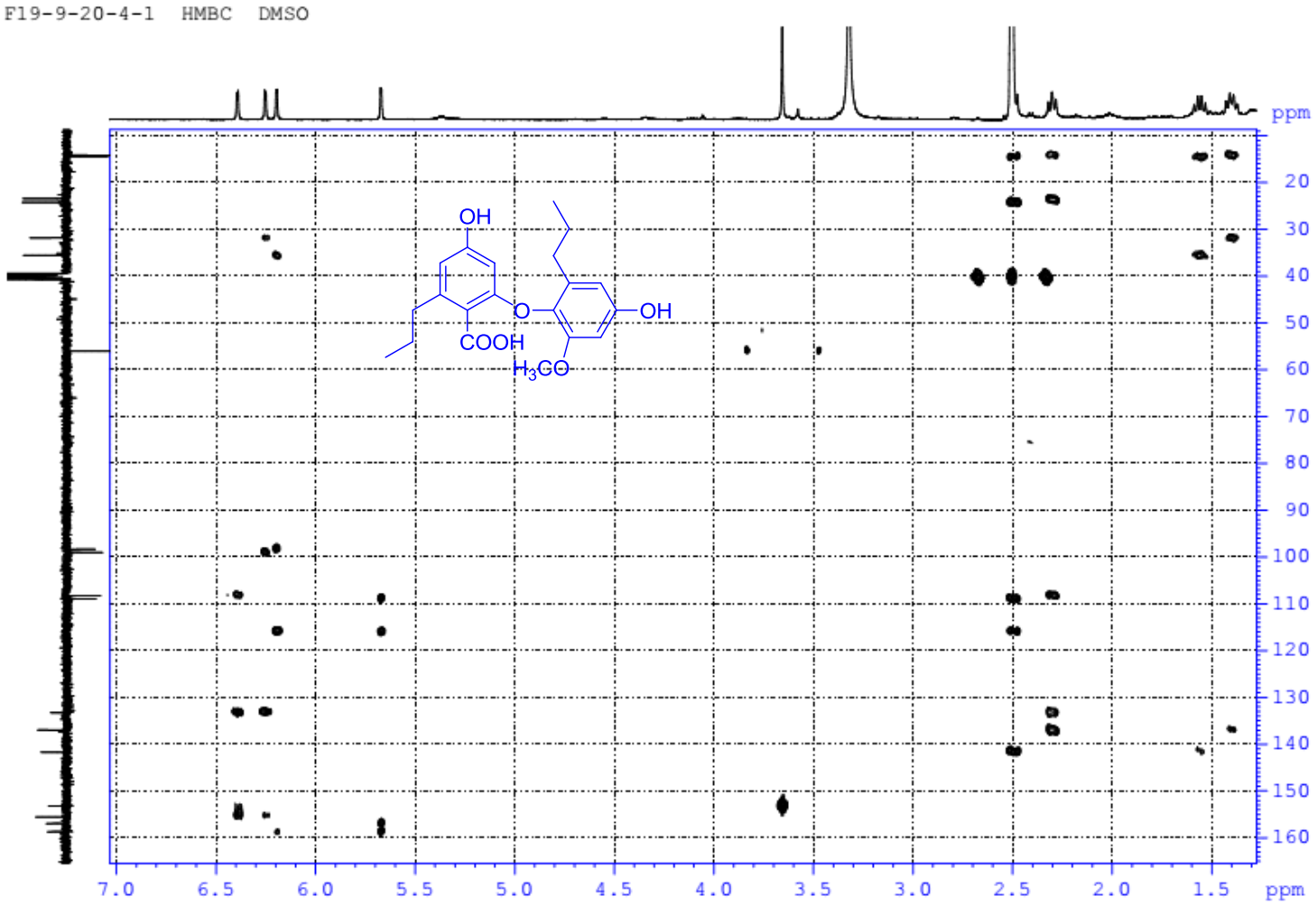


**Figure S37.** HMBC spectrum of compound **5** in DMSO-d6.

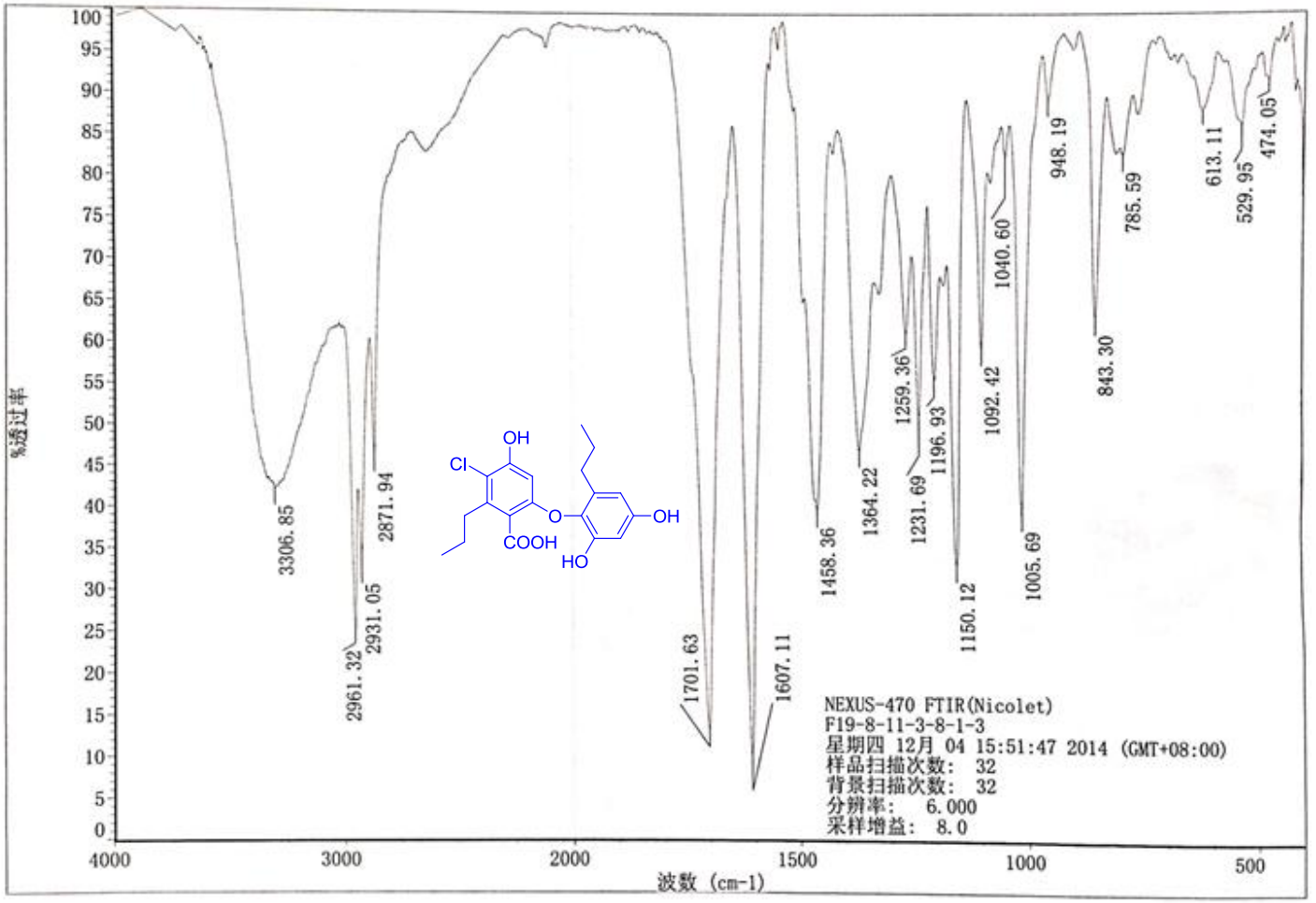


**Figure S38.** IR spectrum of compound **6**.

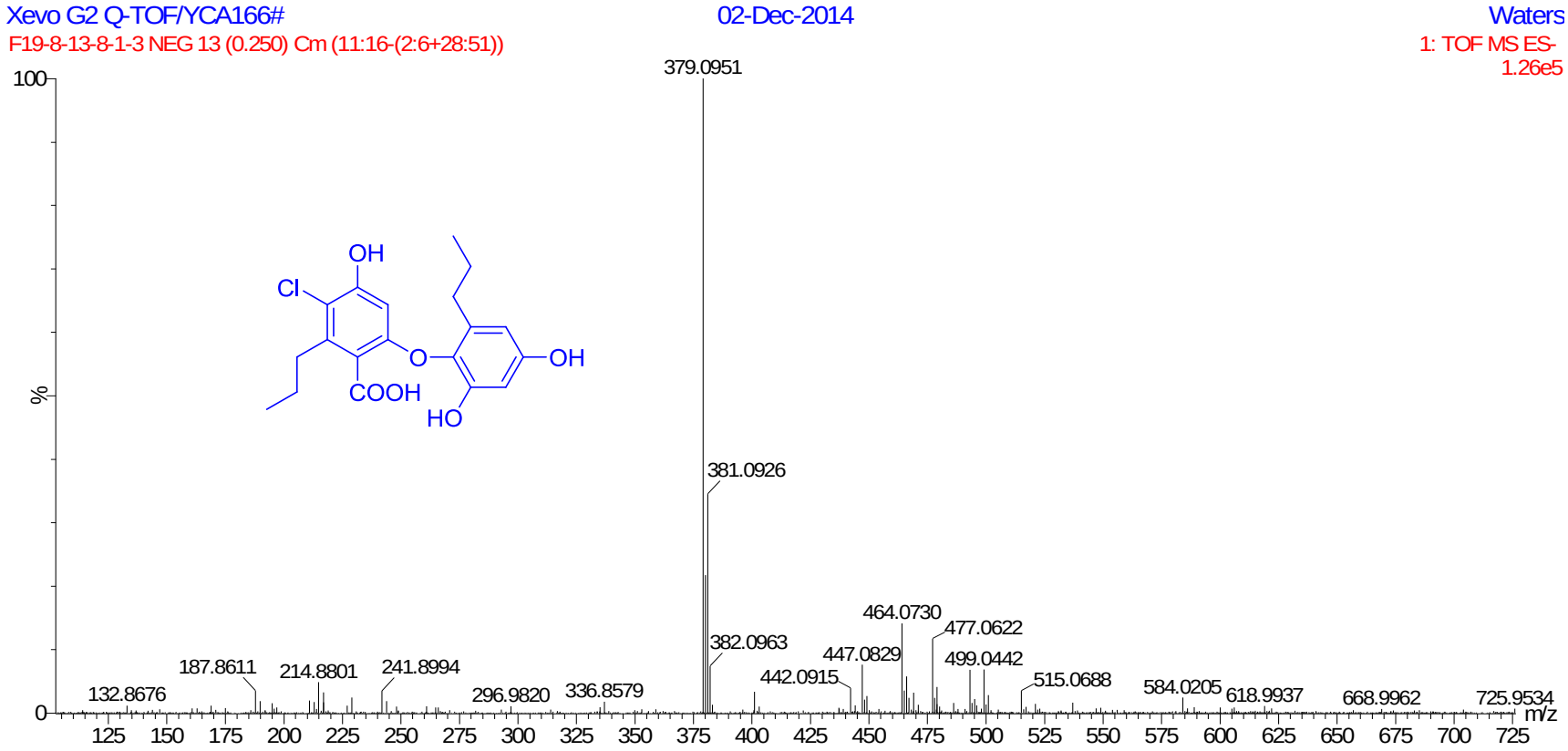


**Figure S39.** Negative mode HRESIMS data of compound **6**.

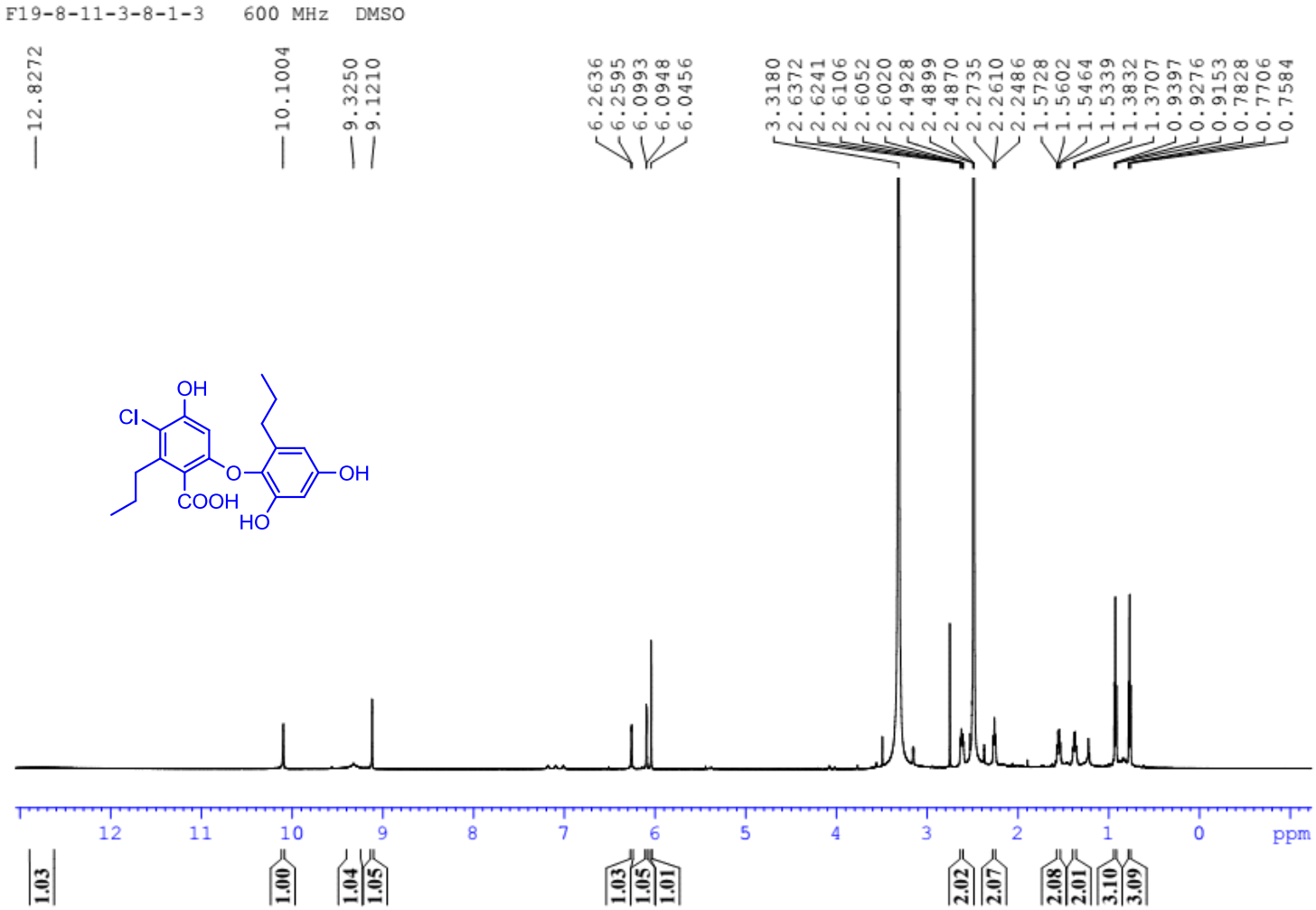


**Figure S40.** $^{1}$H NMR spectrum of compound **6** in DMSO-d6 (600 MHz).

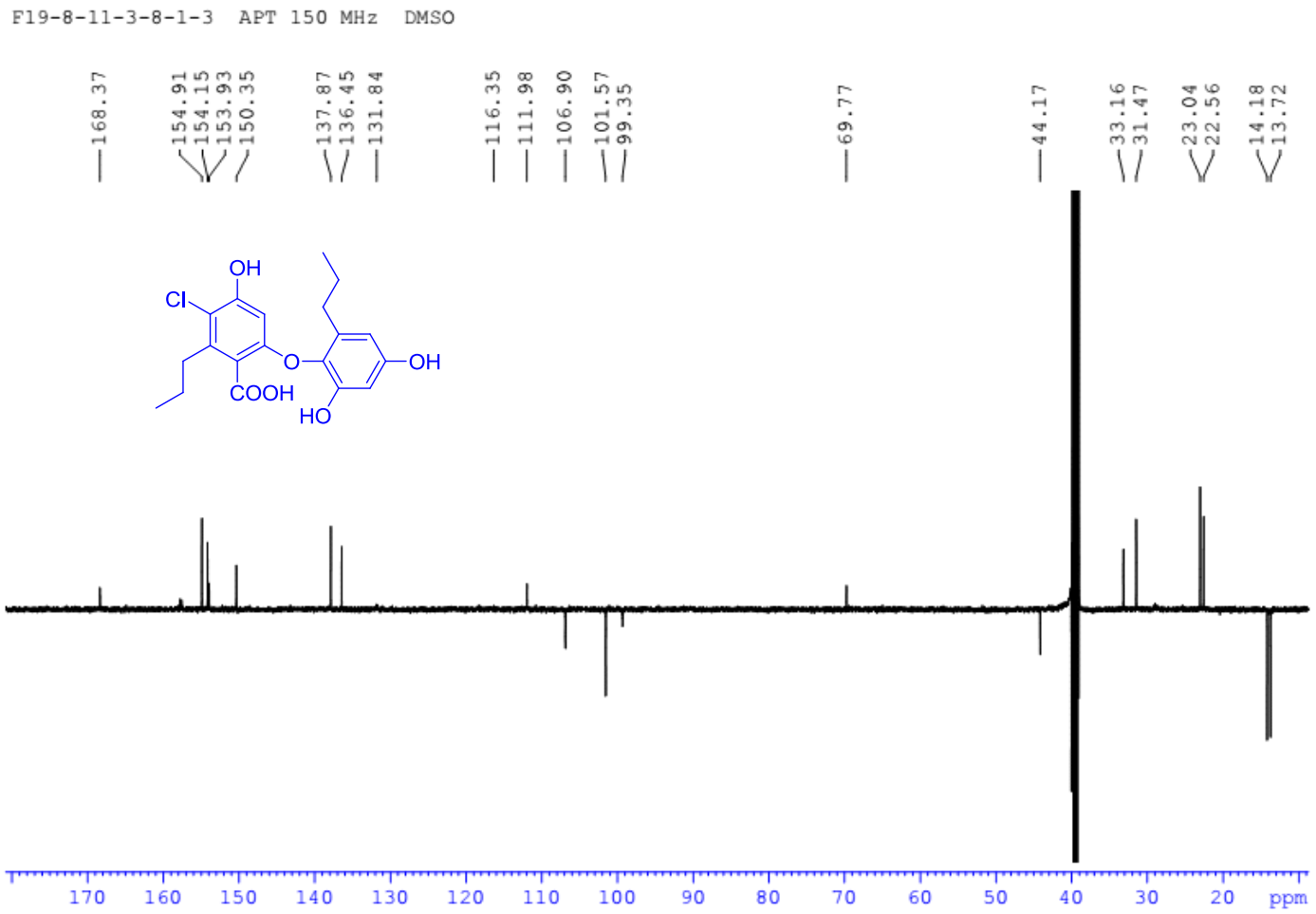


**Figure S41.** $^{13}$C NMR spectrum of compound **6** in DMSO-d6 (150 MHz).

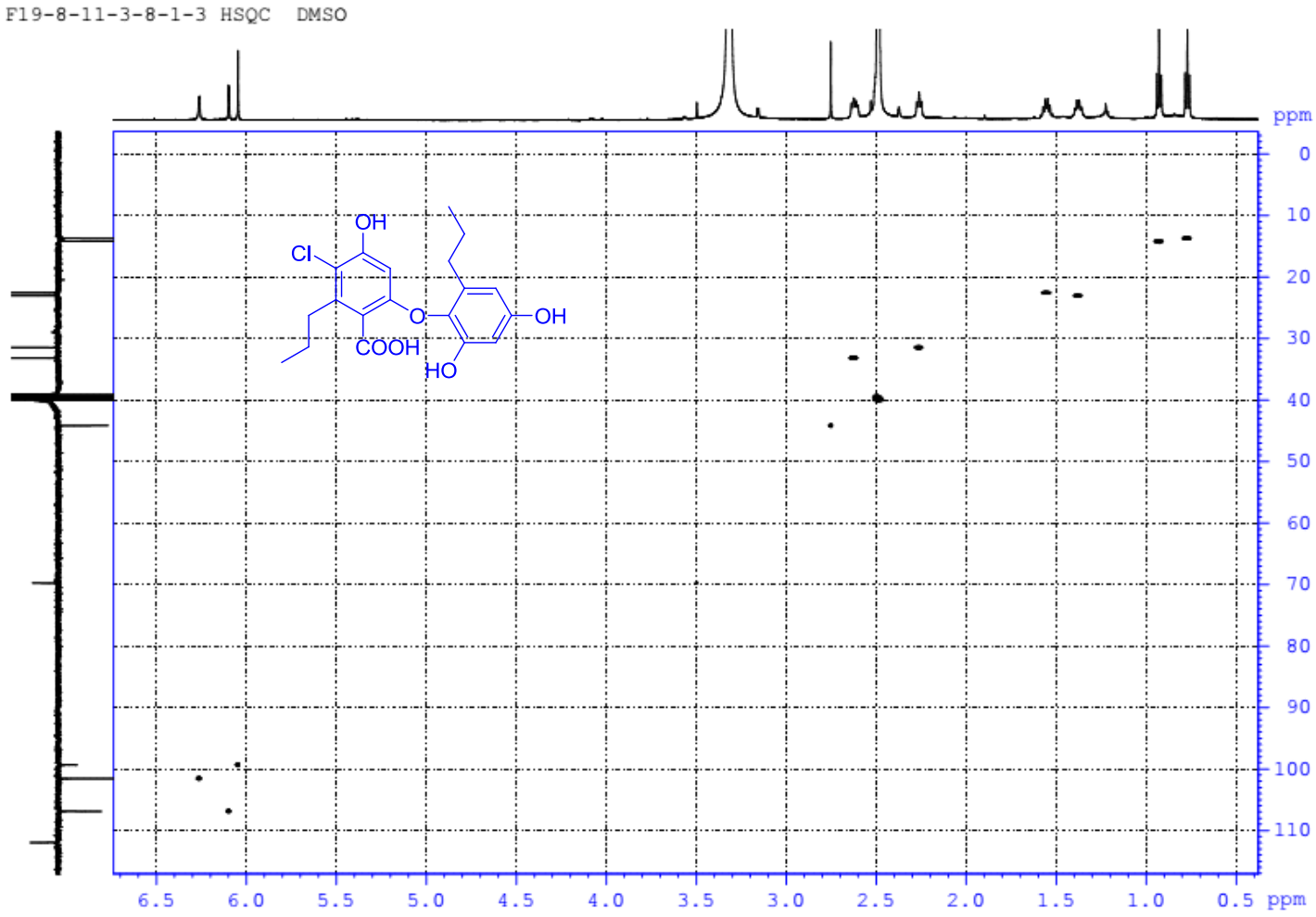


**Figure S42.** HSQC spectrum of compound **6** in DMSO-d6.

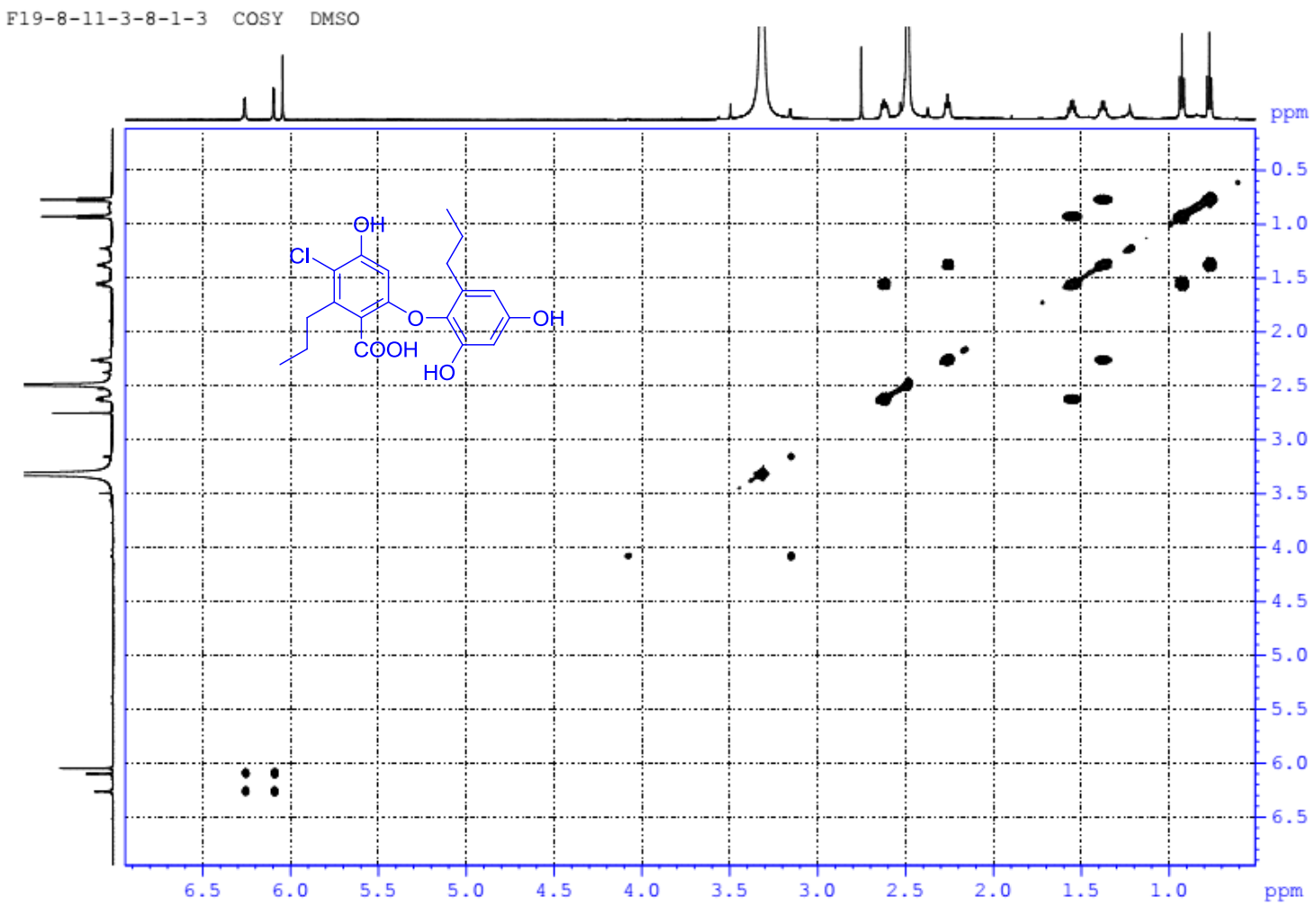


**Figure S43.** $^{1}$H-$^{1}$H COSY spectrum of compound **6** in DMSO-d6.

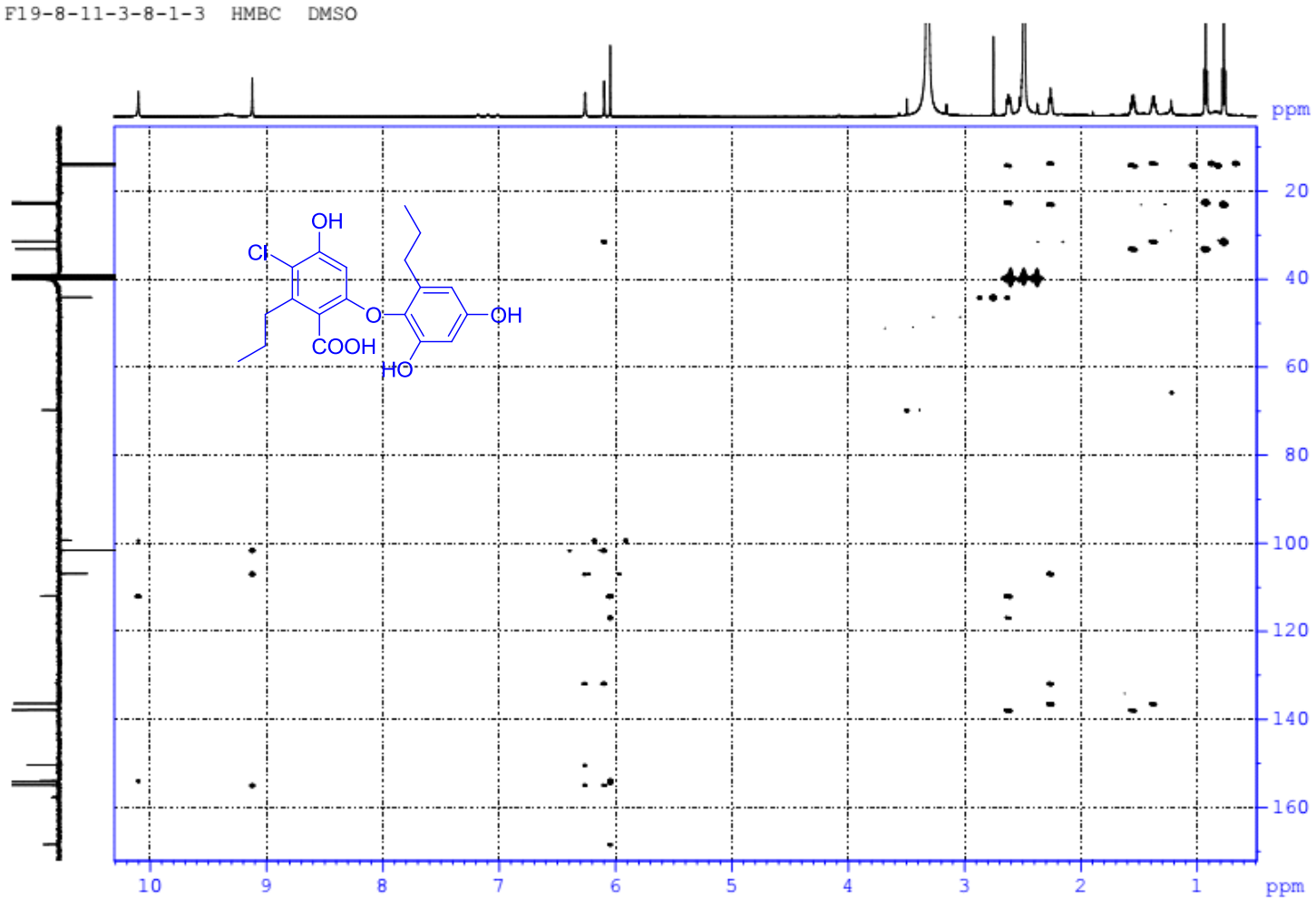


**Figure S44.** HMBC spectrum of compound **6** in DMSO-d6.

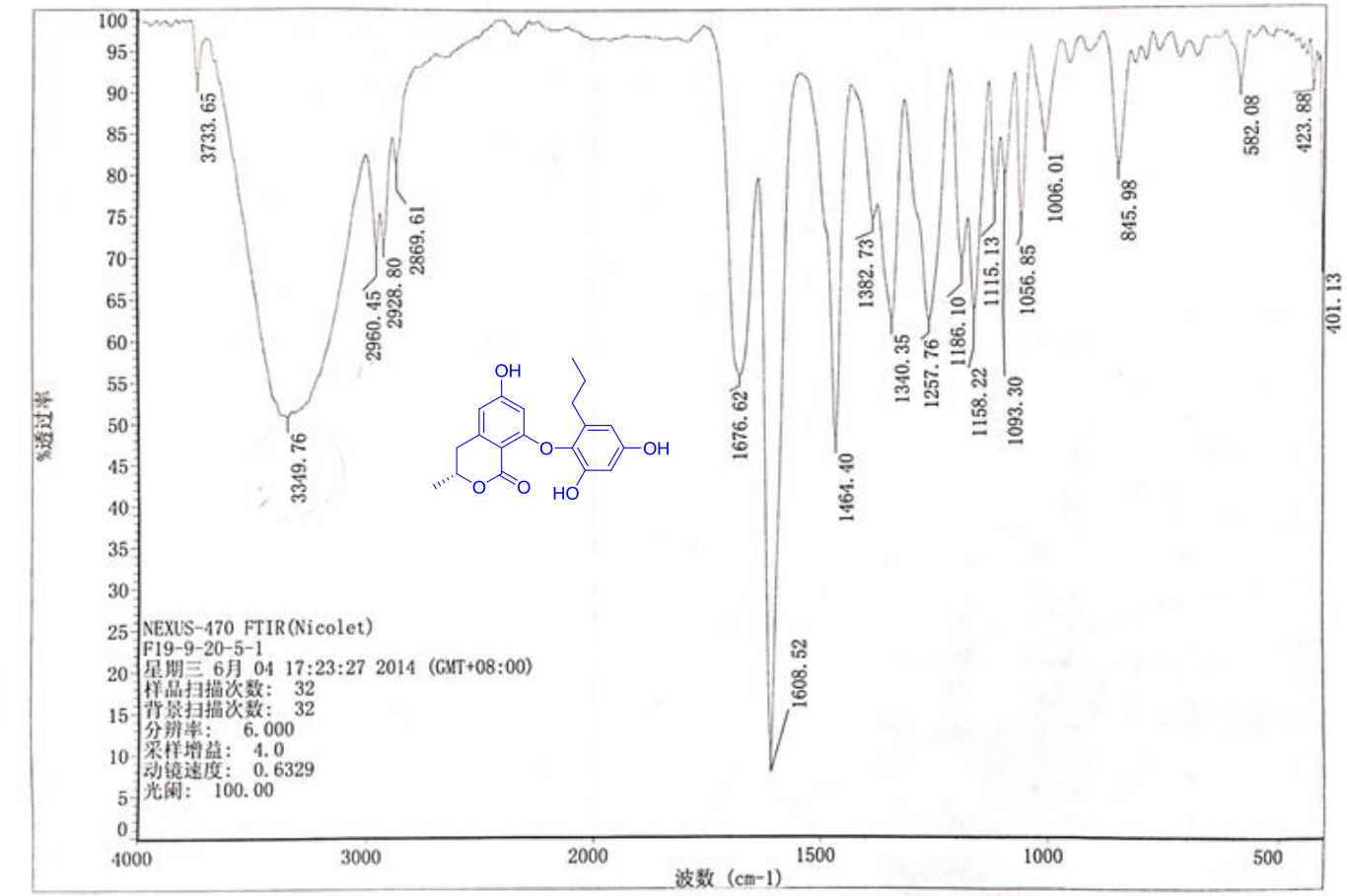


**Figure S45.** IR spectrum of compound **7**.

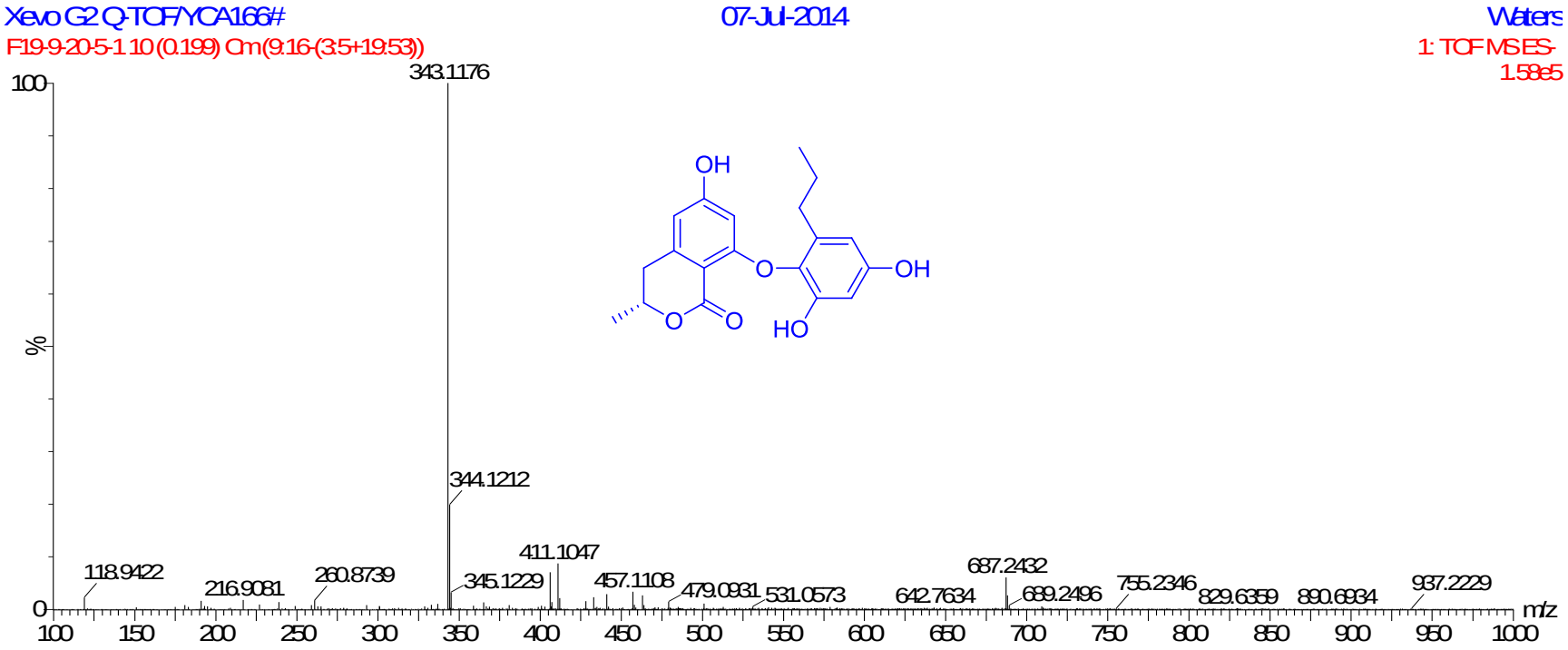


**Figure S46.** Negative mode HRESIMS data of compound **7**.

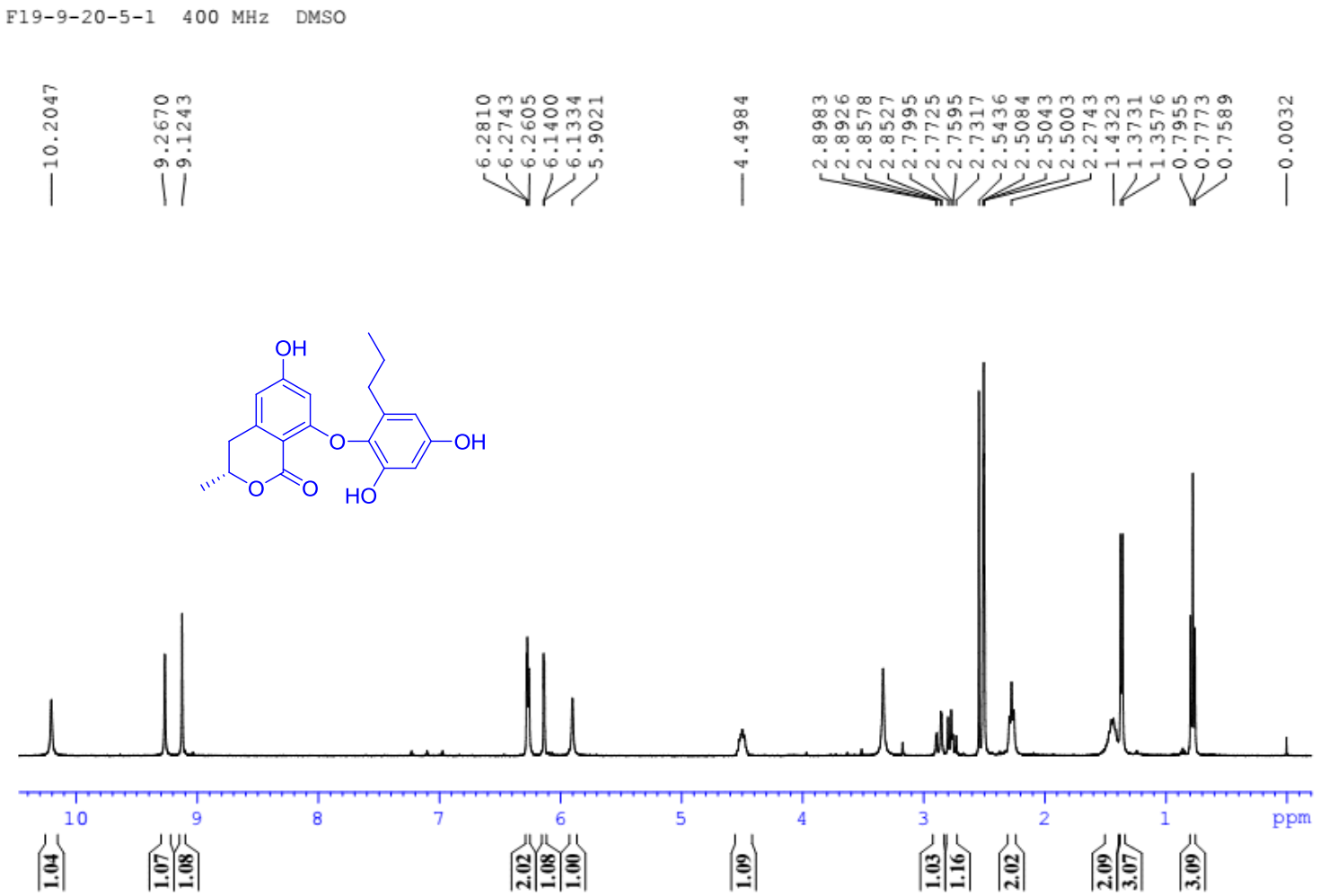


**Figure S47.** $^{1}$H NMR spectrum of compound **7** in DMSO-d6 (400 MHz).

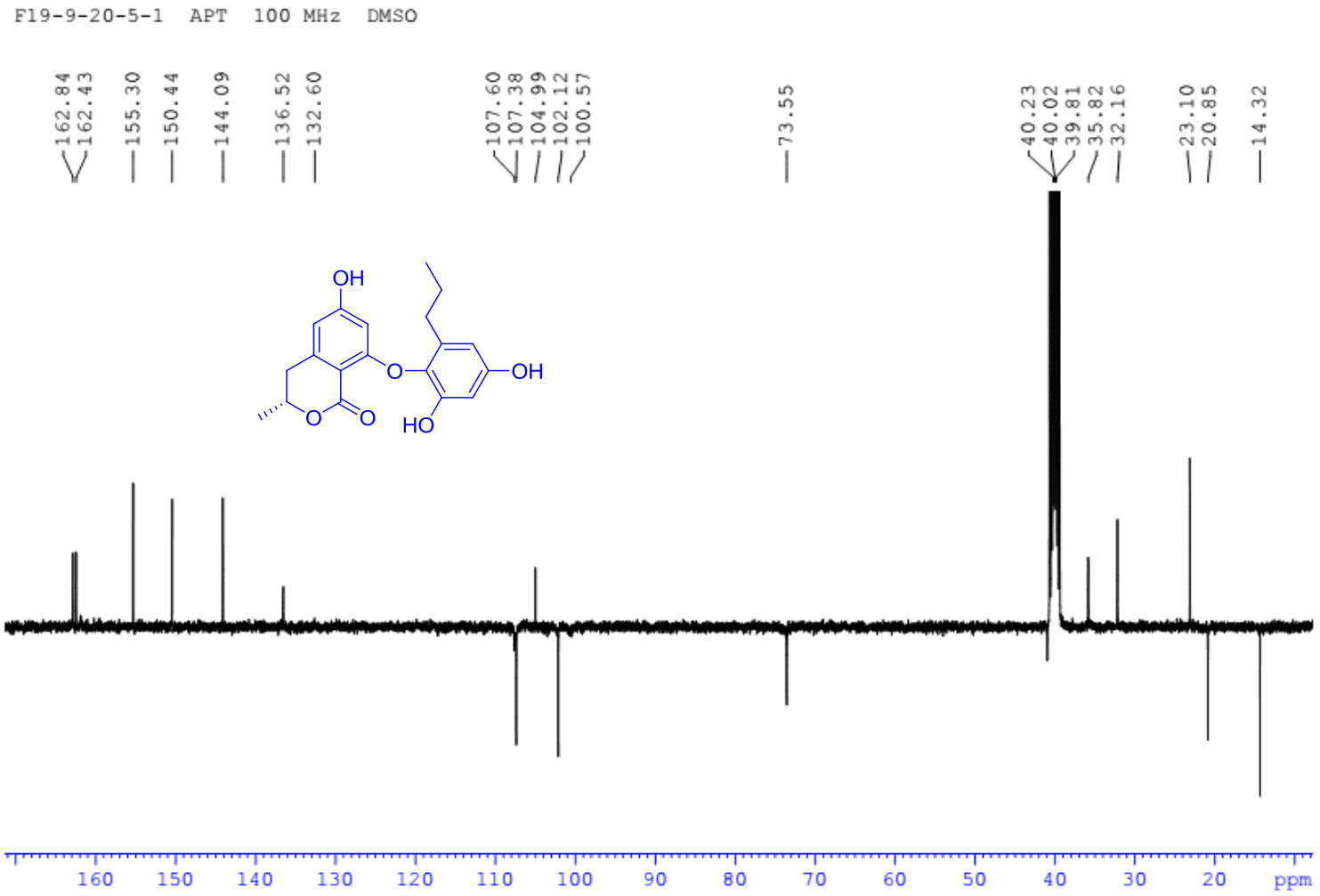


**Figure S48.** $^{13}$C NMR spectrum of compound **7** in DMSO-d6 (100 MHz).

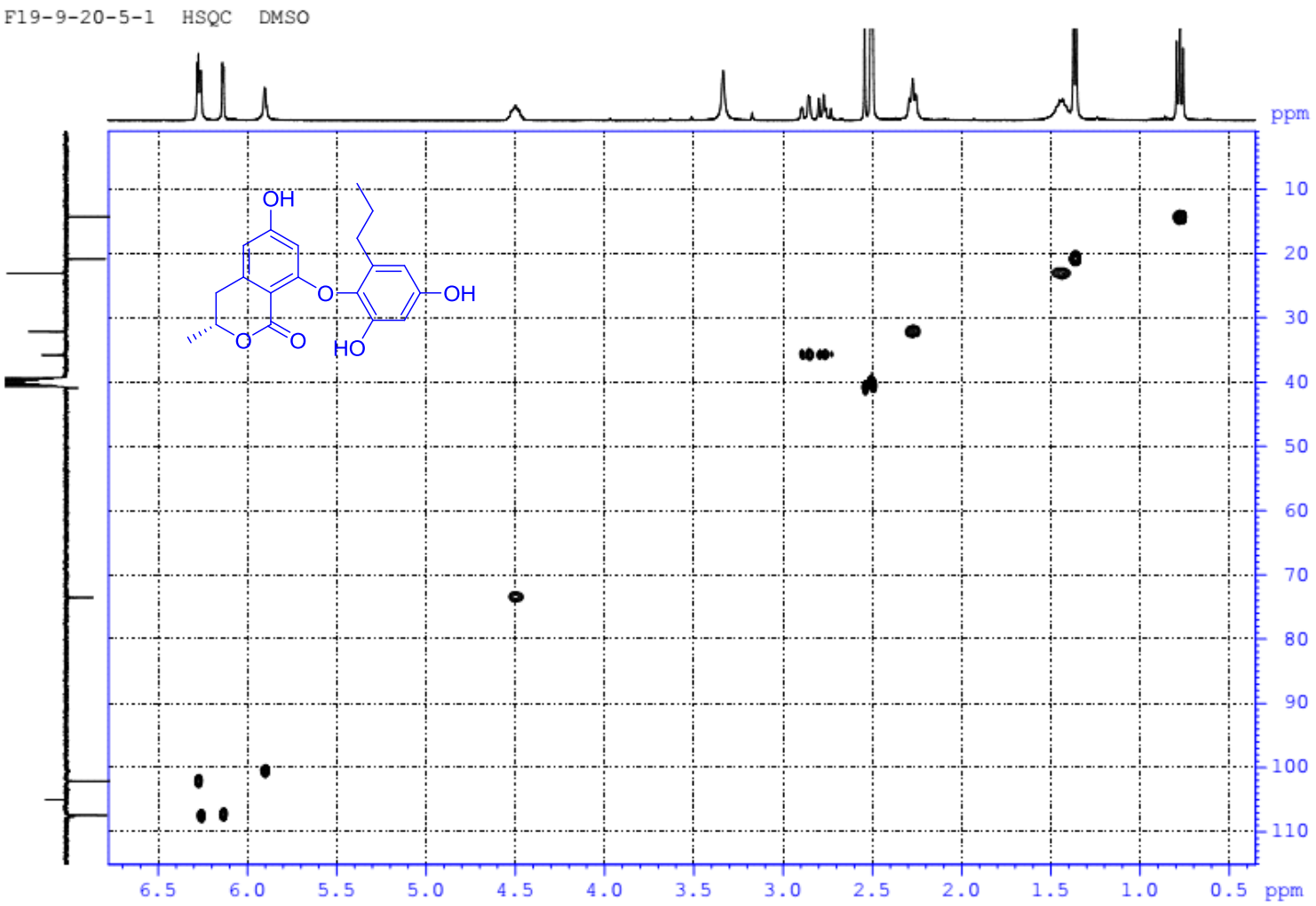


**Figure S49.** HSQC spectrum of compound **7** in DMSO-d6.

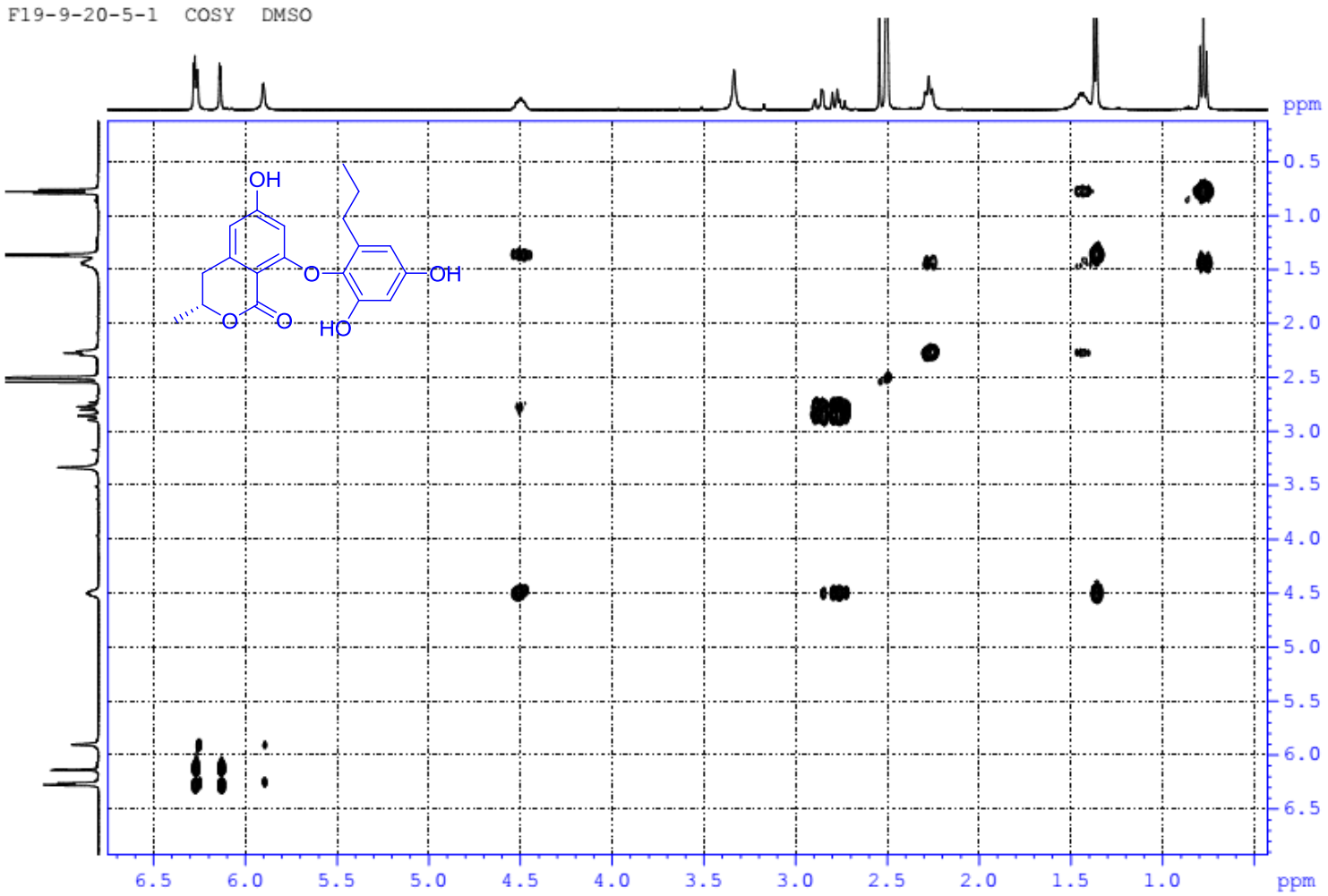


**Figure S50.** $^{1}$H-$^{1}$H COSY spectrum of compound **7** in DMSO-d6.

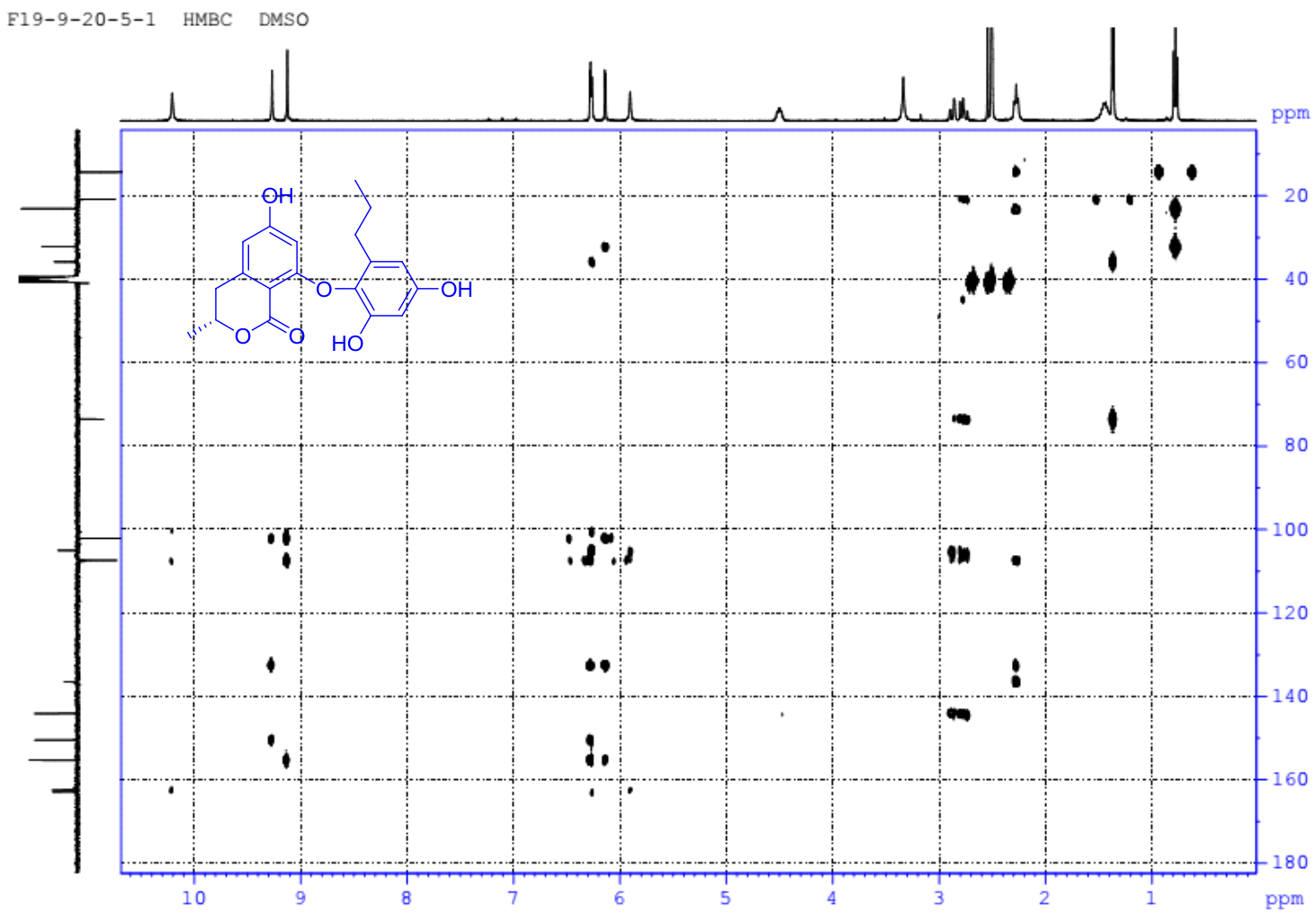


**Figure S51.** HMBC spectrum of compound **7** in DMSO-d6.

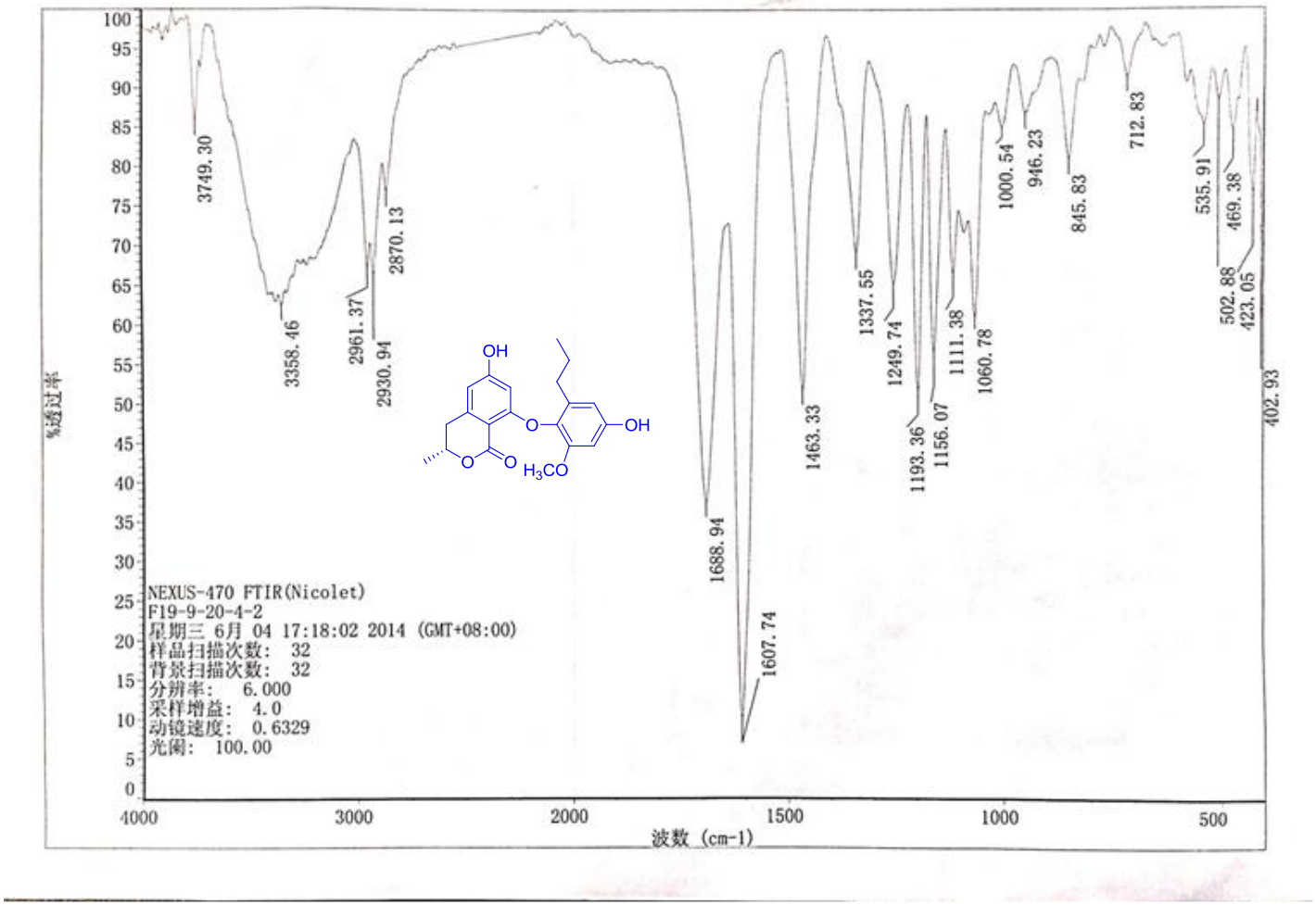


**Figure S52.** IR spectrum of compound **8**.

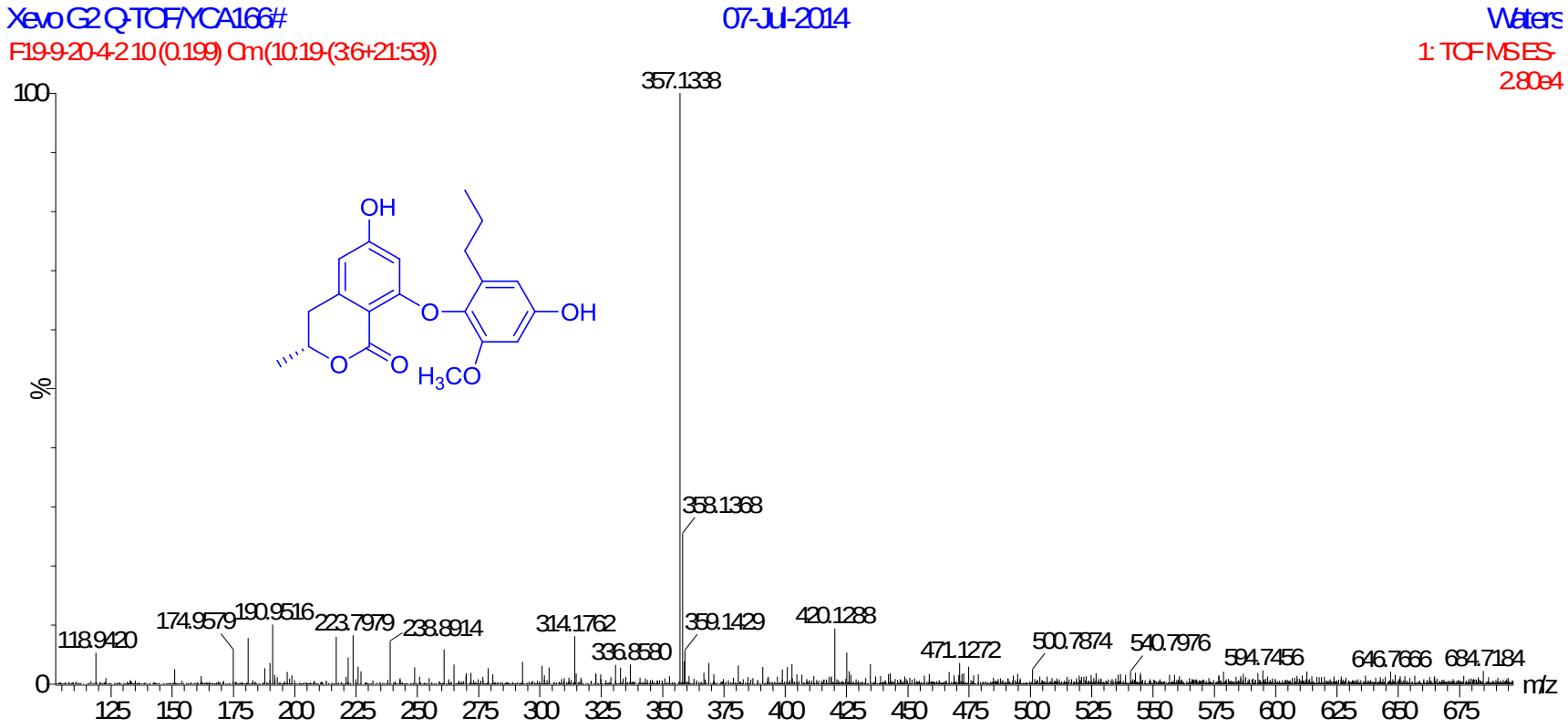


**Figure S53.** Negative mode HRESIMS data of compound **8**.

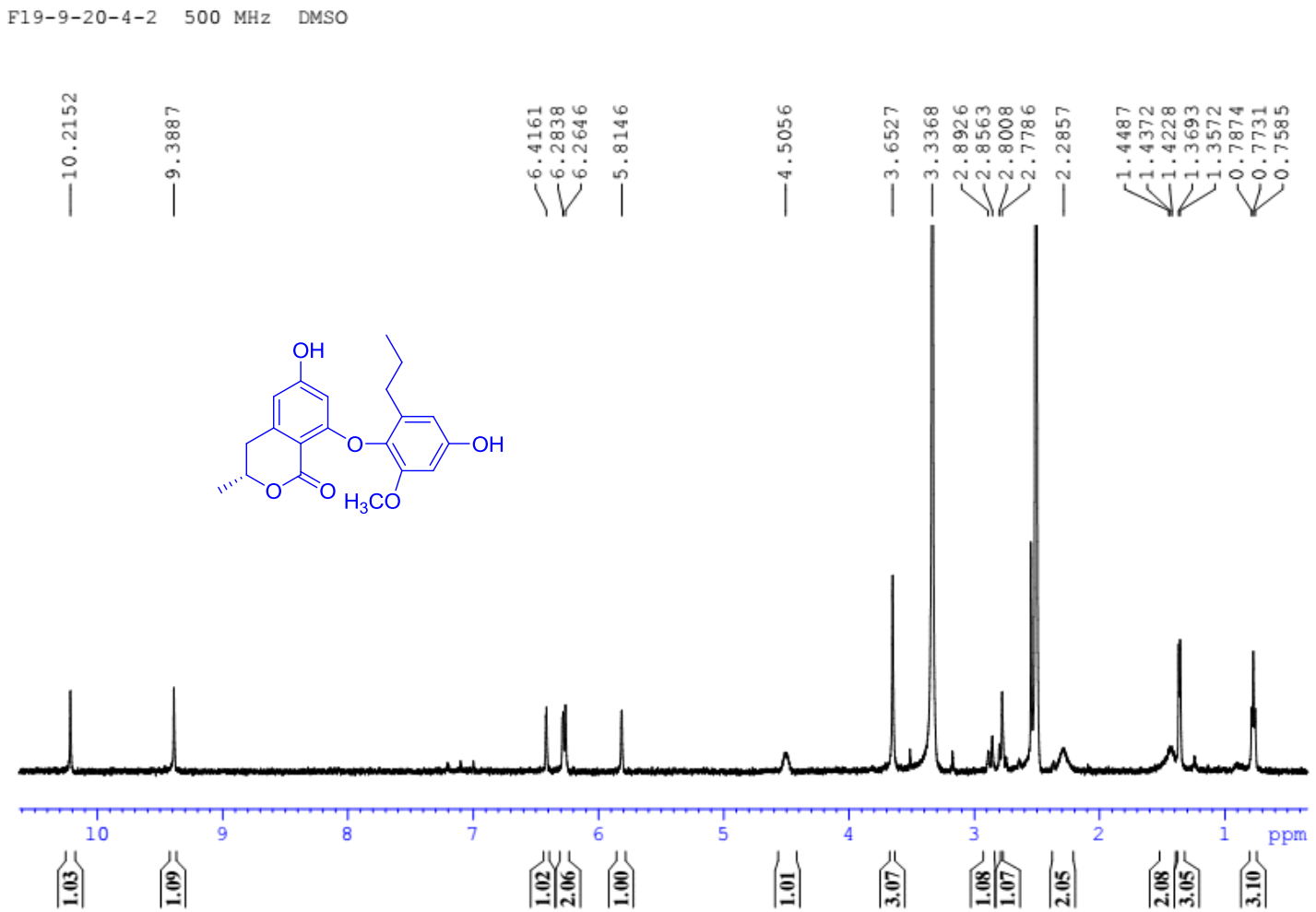


**Figure S54.** $^{1}$H NMR spectrum of compound **8** in DMSO-d6 (500 MHz).

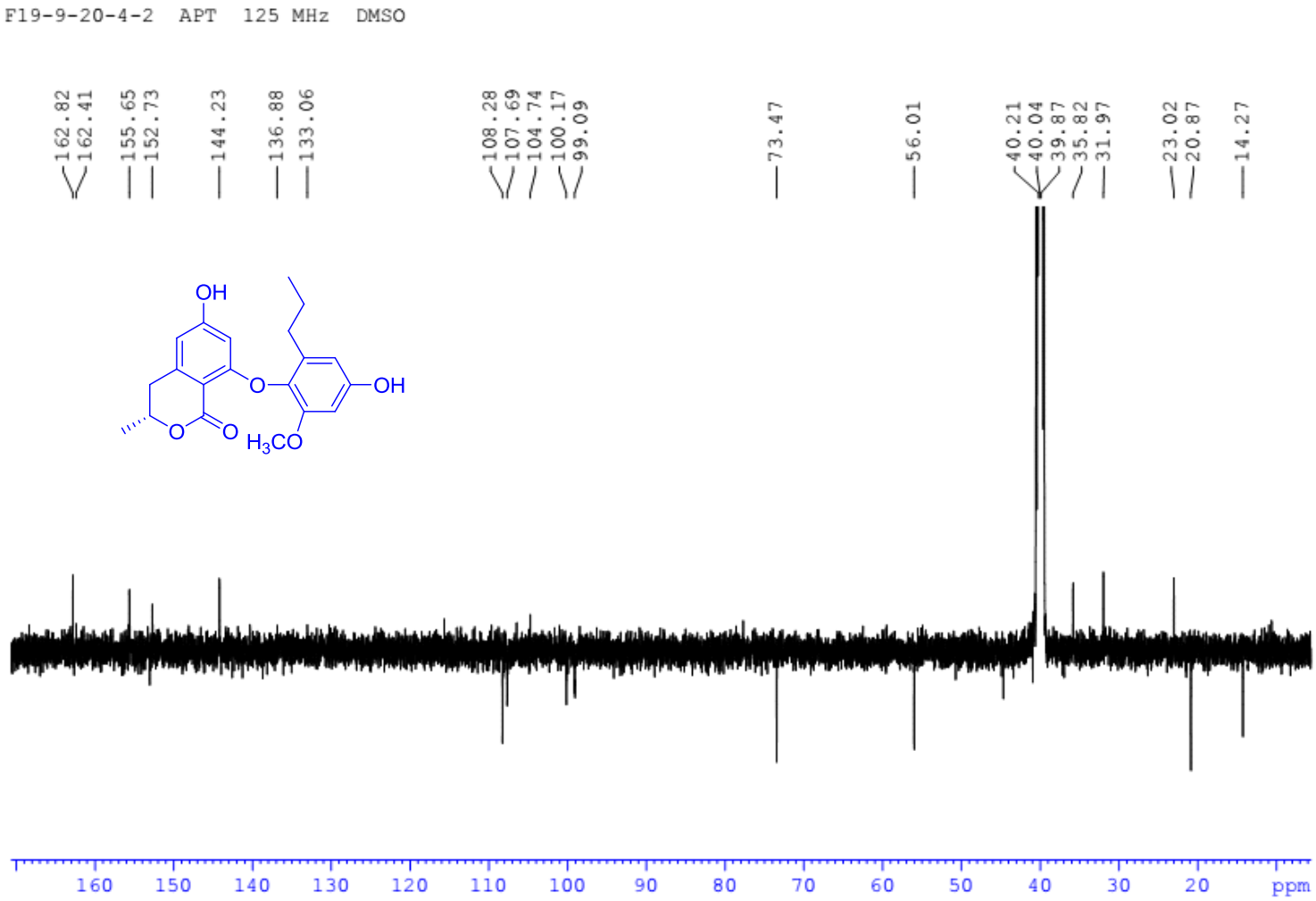


**Figure S55.** $^{13}$C NMR spectrum of compound **8** in DMSO-d6 (125 MHz).

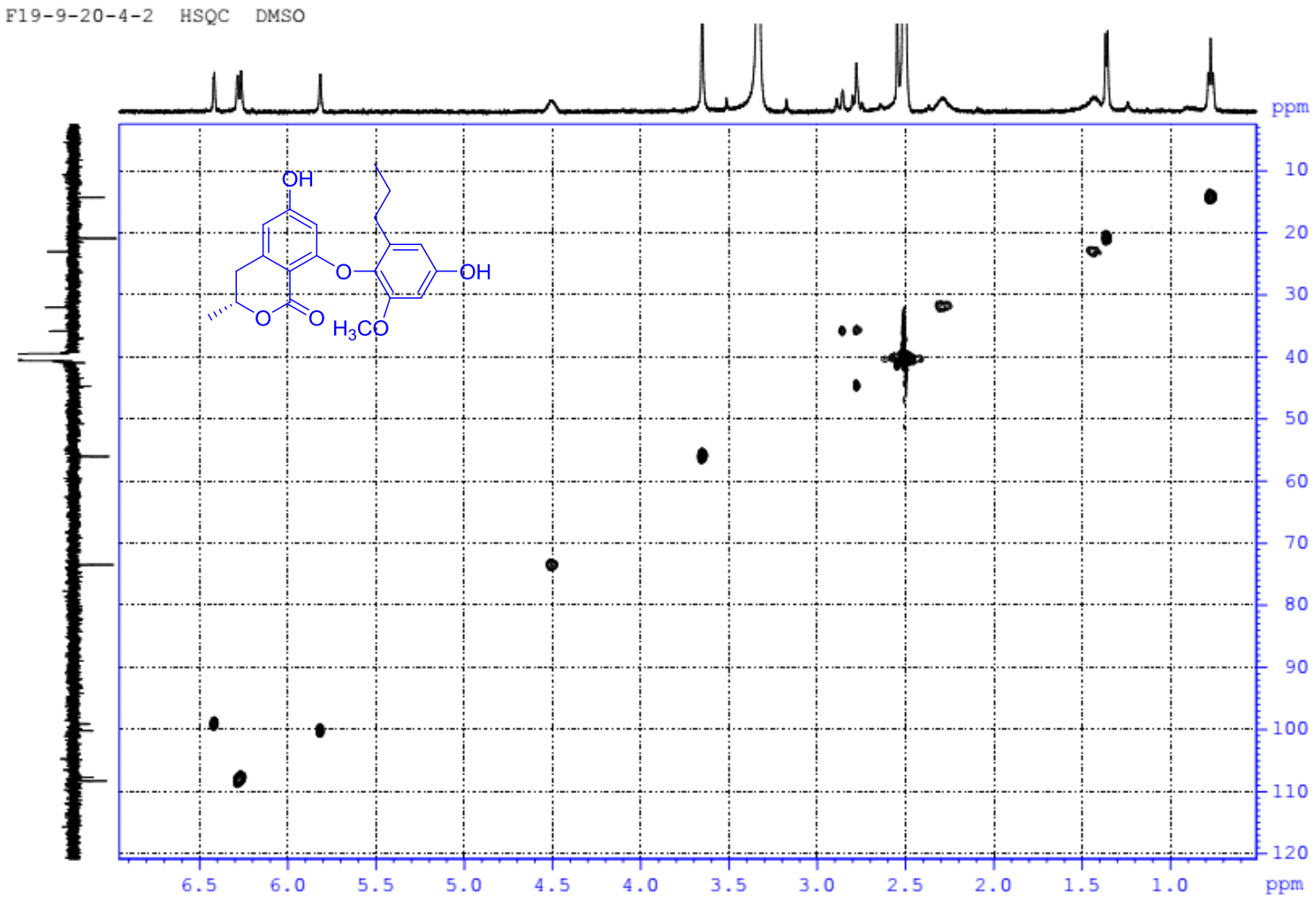


**Figure S56.** HSQC spectrum of compound **8** in DMSO-d6.

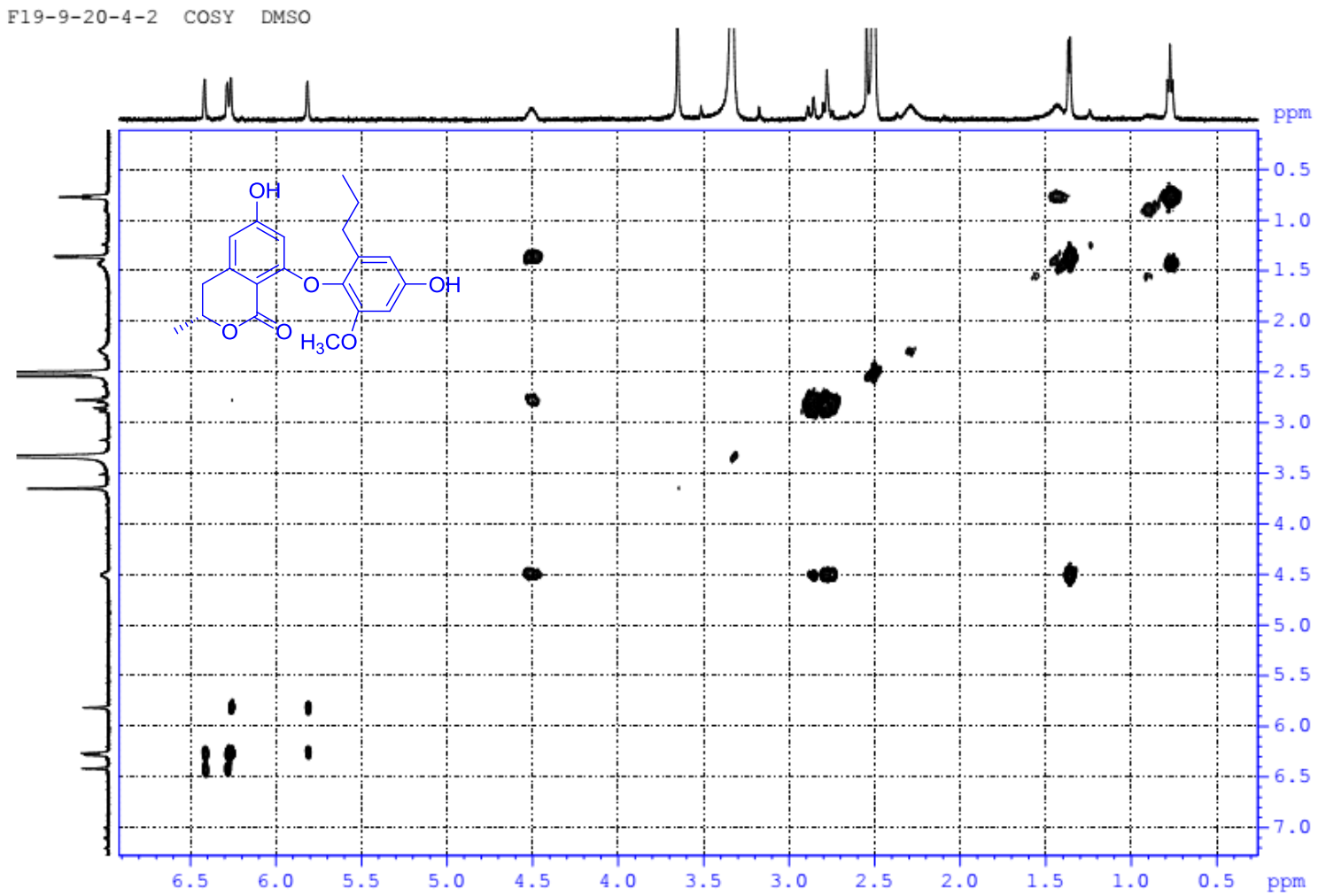


**Figure S57.** $^{1}$H-$^{1}$H COSY spectrum of compound **8** in DMSO-d6.

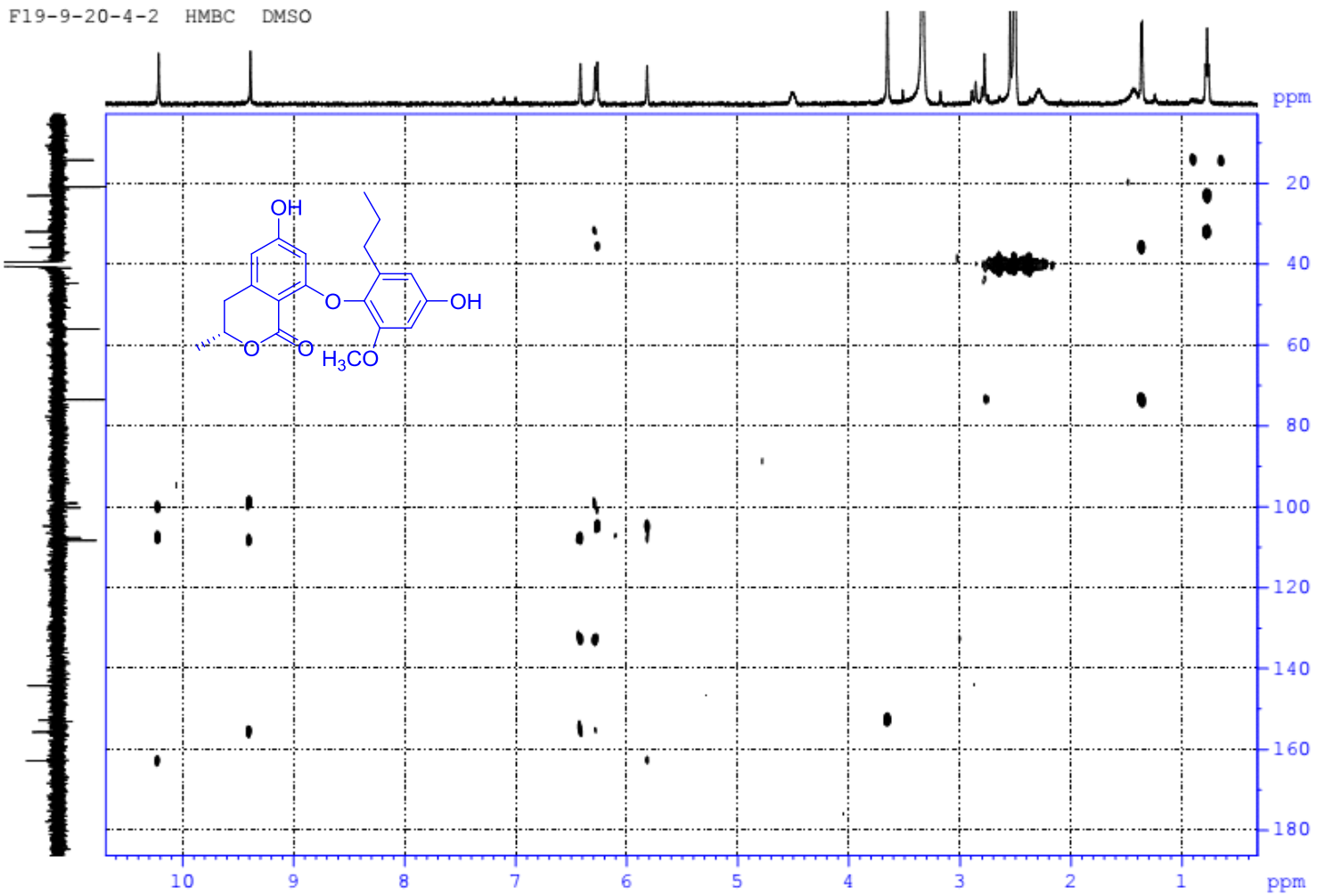


**Figure S58.** HMBC spectrum of compound **8** in DMSO-d6.

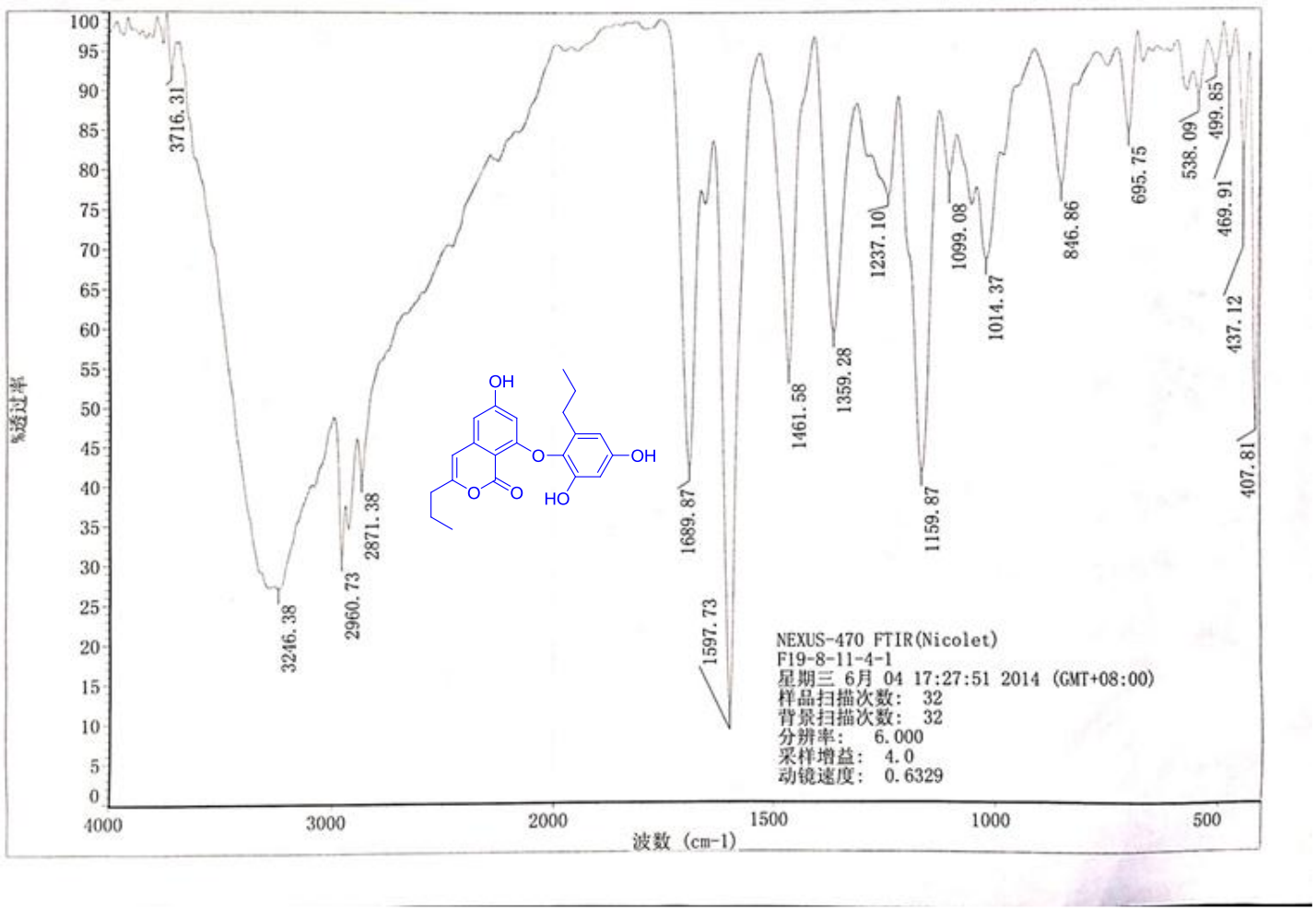


**Figure S59.** IR spectrum of compound **9**.

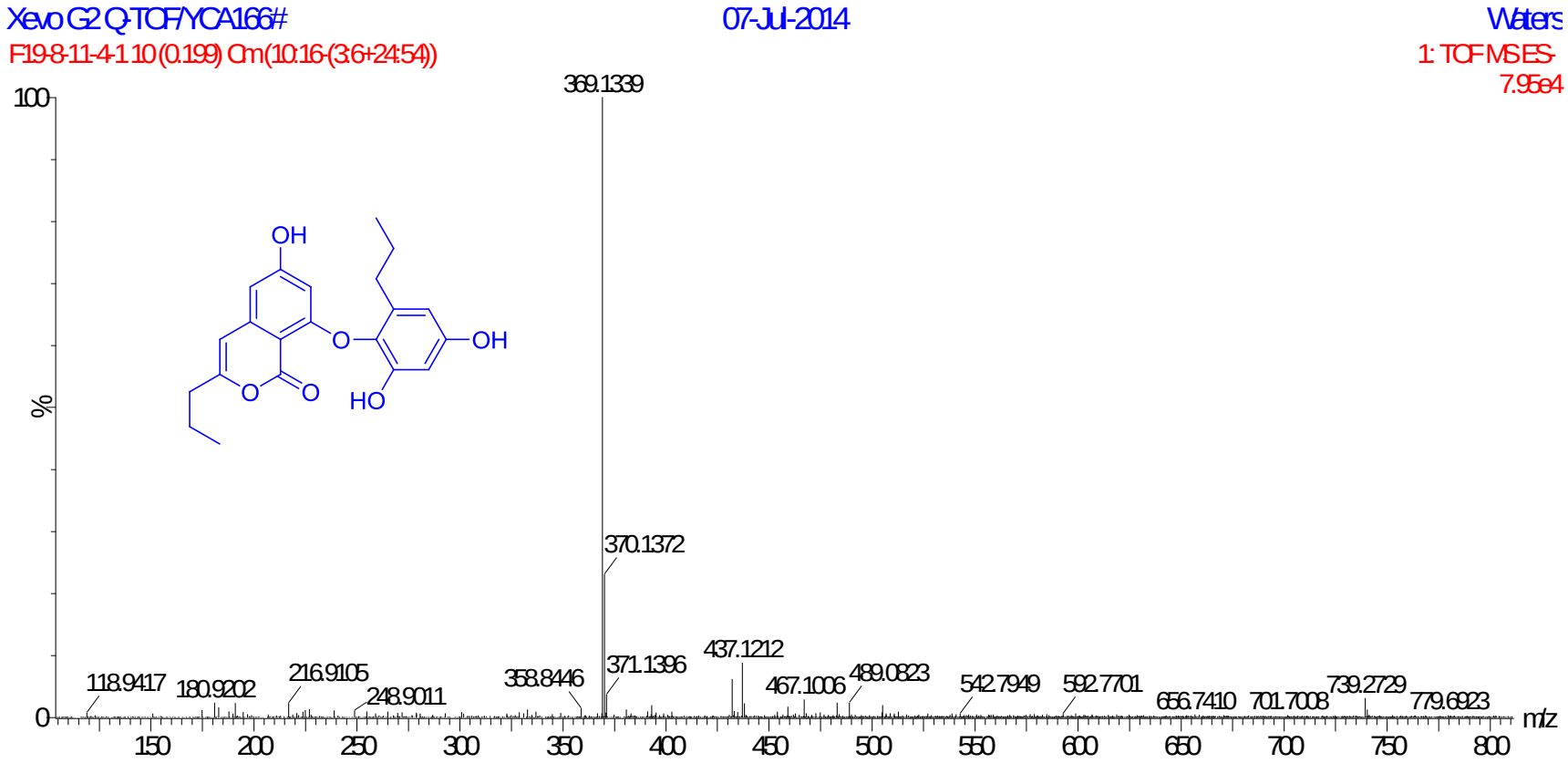


**Figure S60.** Negative mode HRESIMS data of compound **9**.

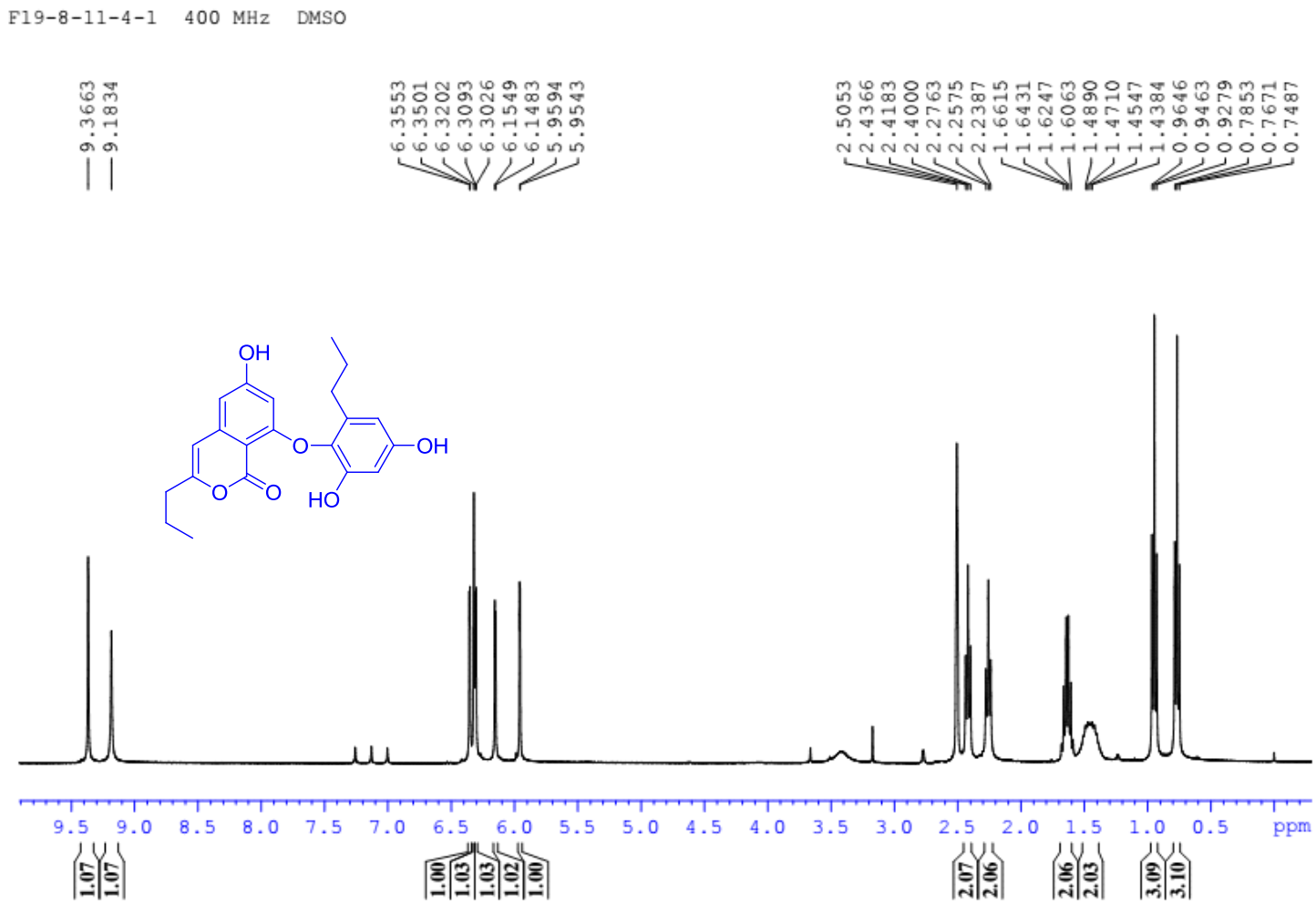


**Figure S61.** $^{1}$H NMR spectrum of compound **9** in DMSO-d6 (400 MHz).

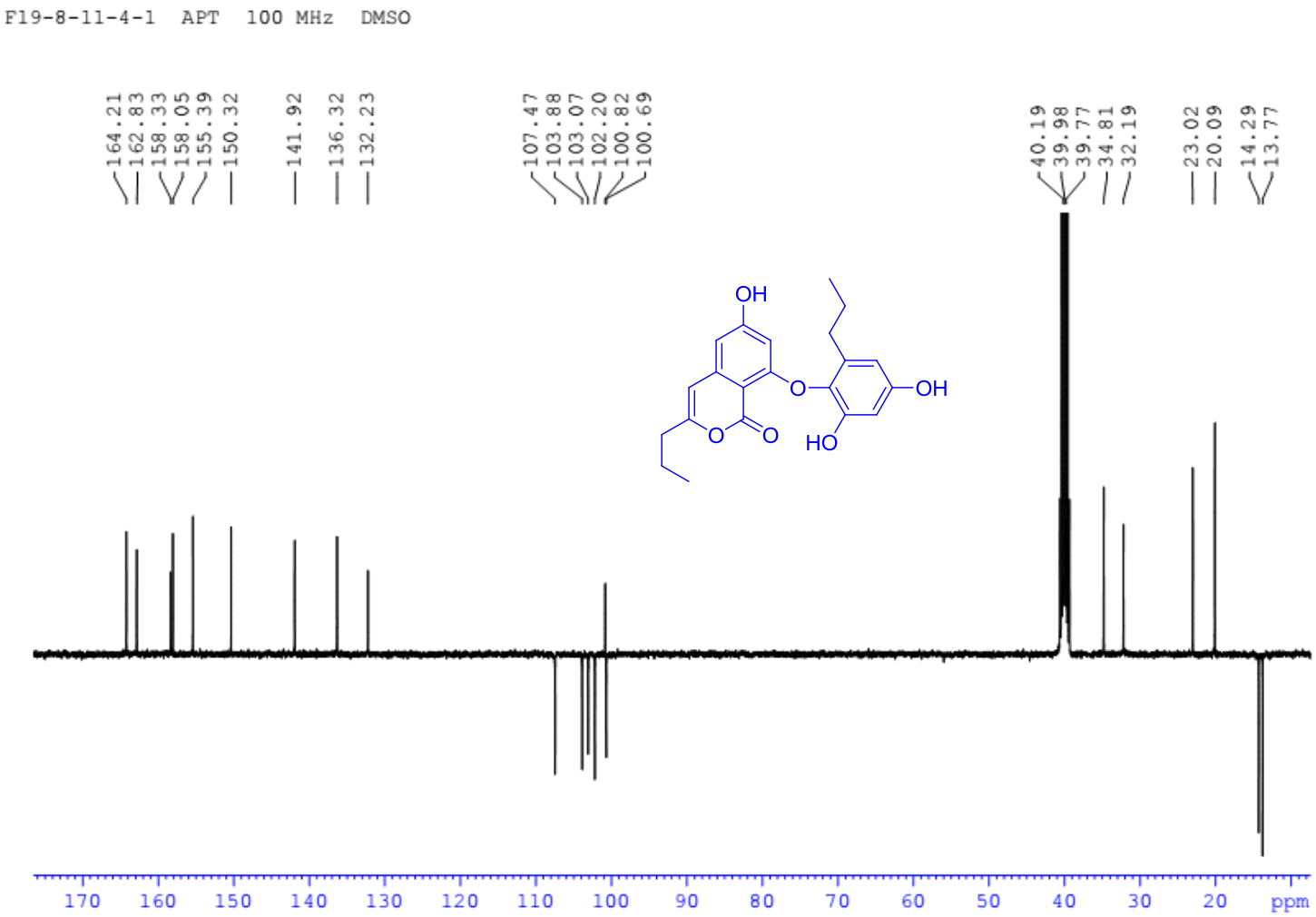


**Figure S62.** $^{13}$C NMR spectrum of compound **9** in DMSO-d6 (100 MHz).

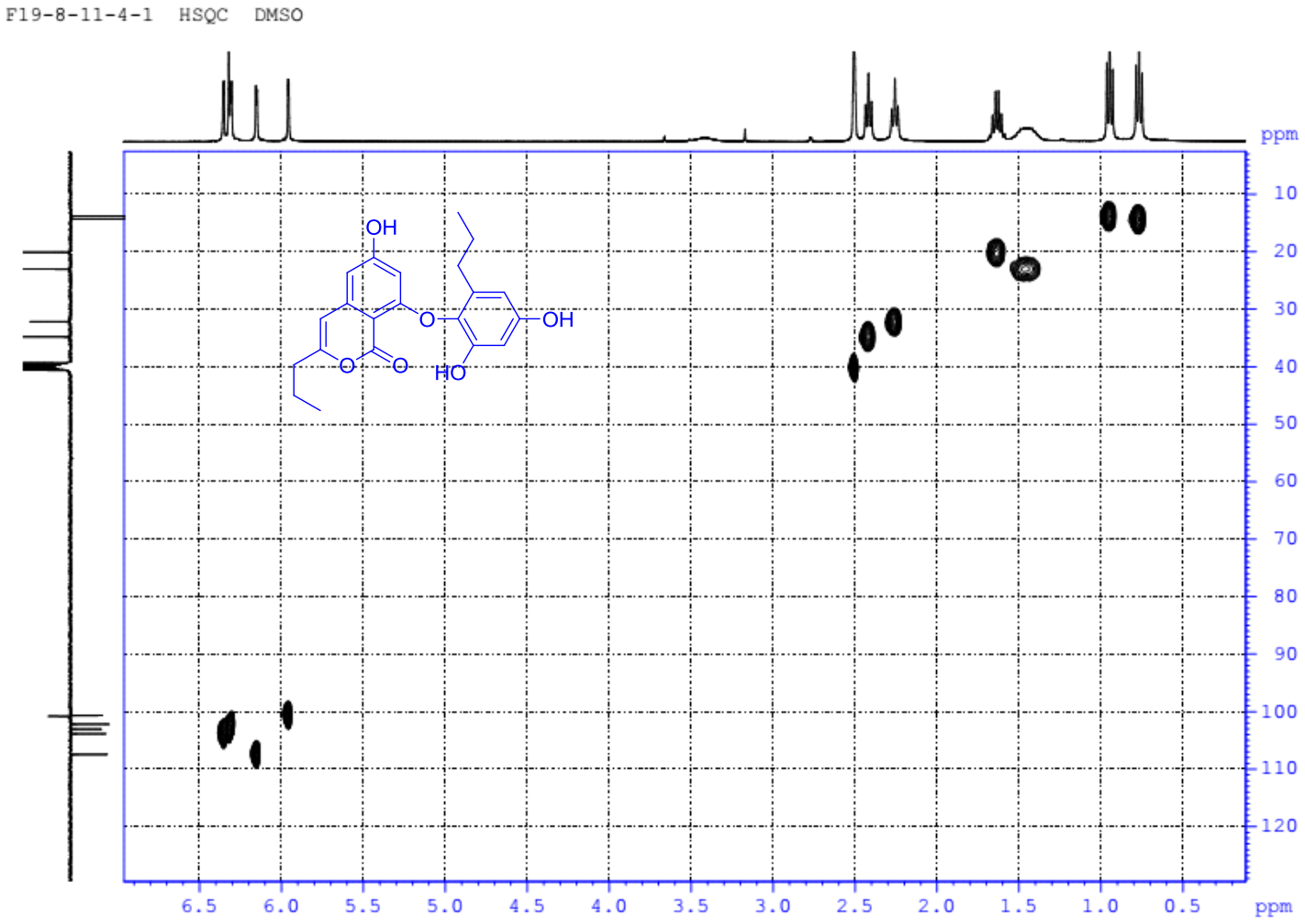


**Figure S63.** HSQC spectrum of compound **9** in DMSO-d6.

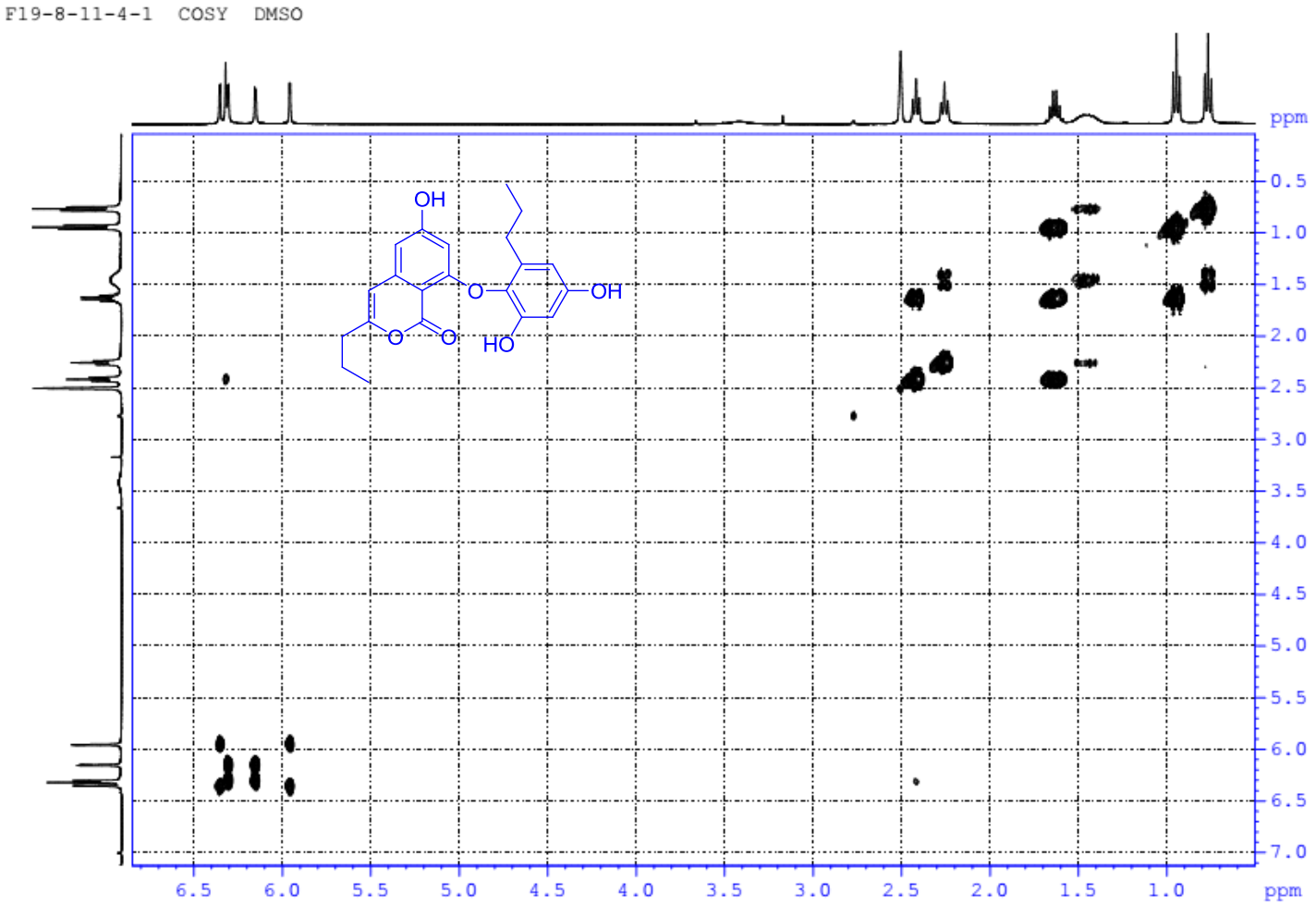


**Figure S64.** $^{1}$H-$^{1}$H COSY spectrum of compound **9** in DMSO-d6.

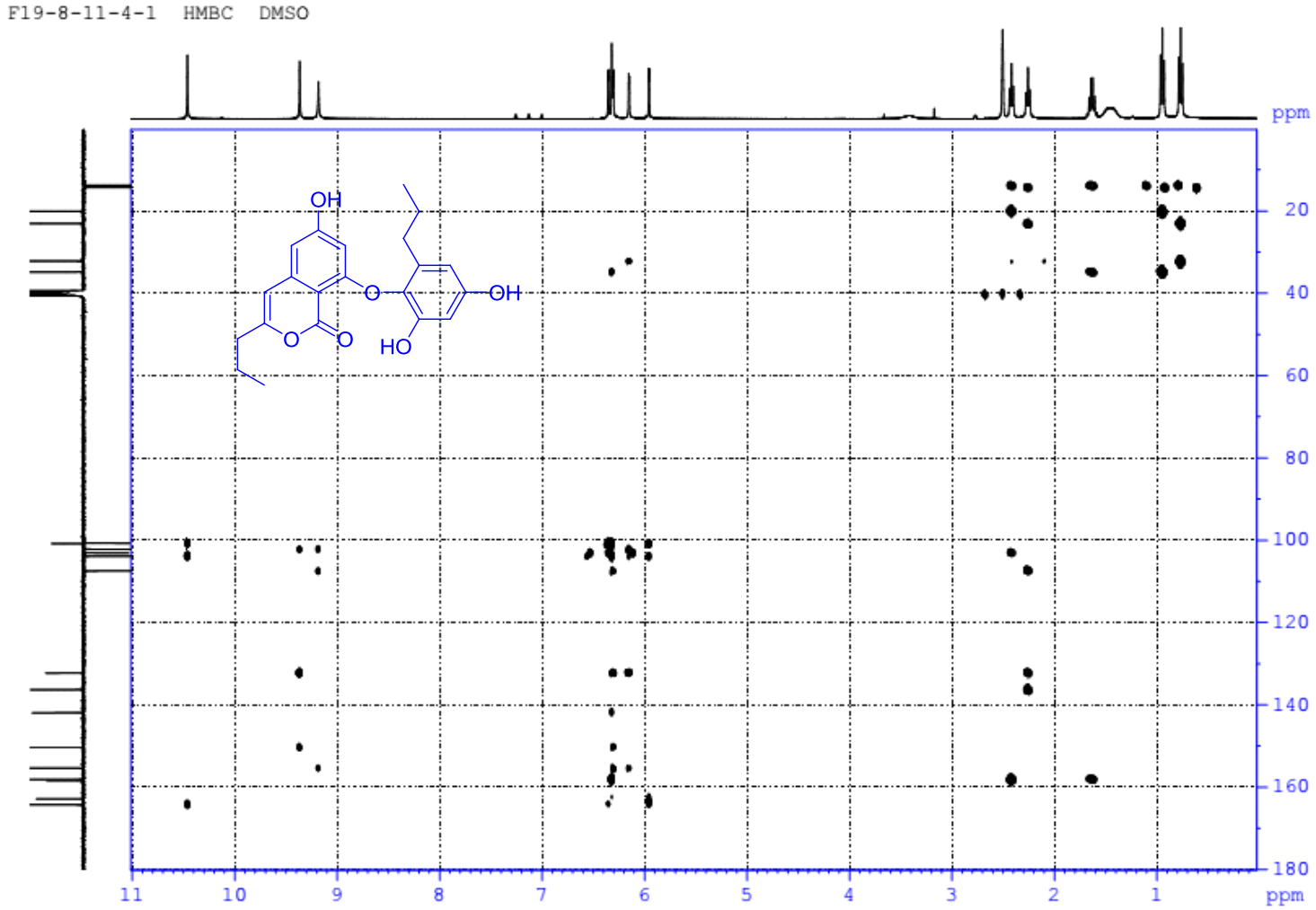


**Figure S65.** HMBC spectrum of compound **9** in DMSO-d6.

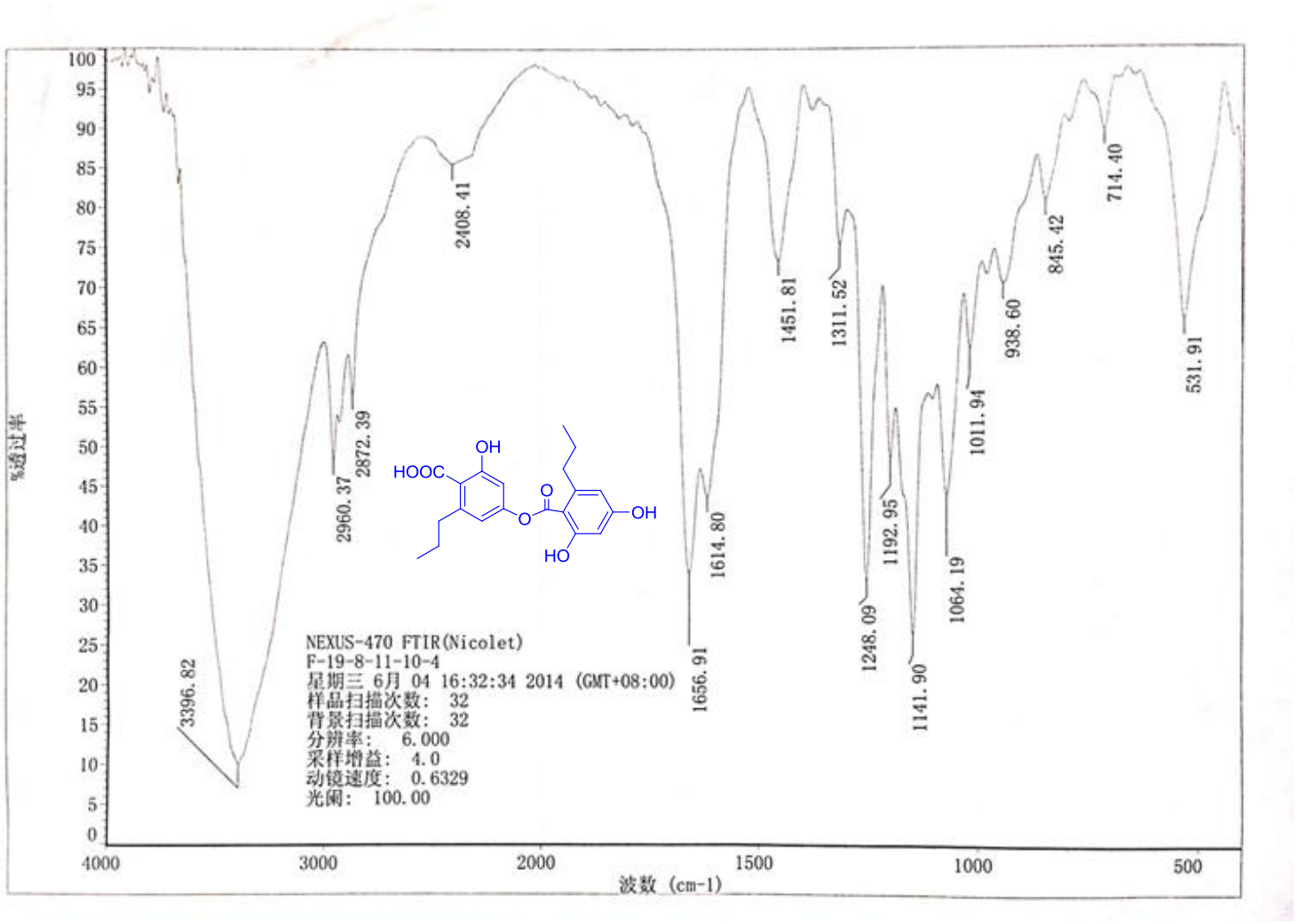


**Figure S66.** IR spectrum of compound **10**.

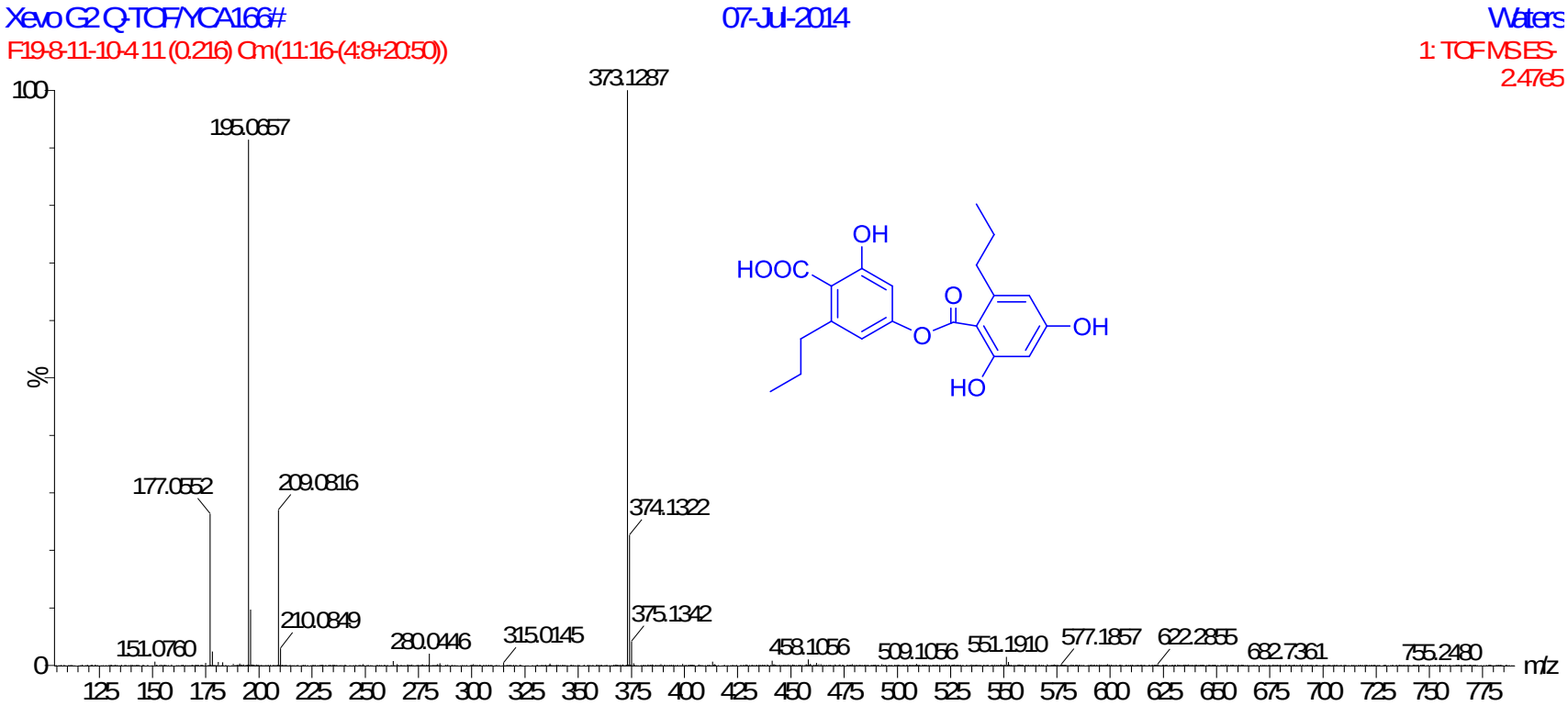


**Figure S67.** Negative mode HRESIMS data of compound **10**.

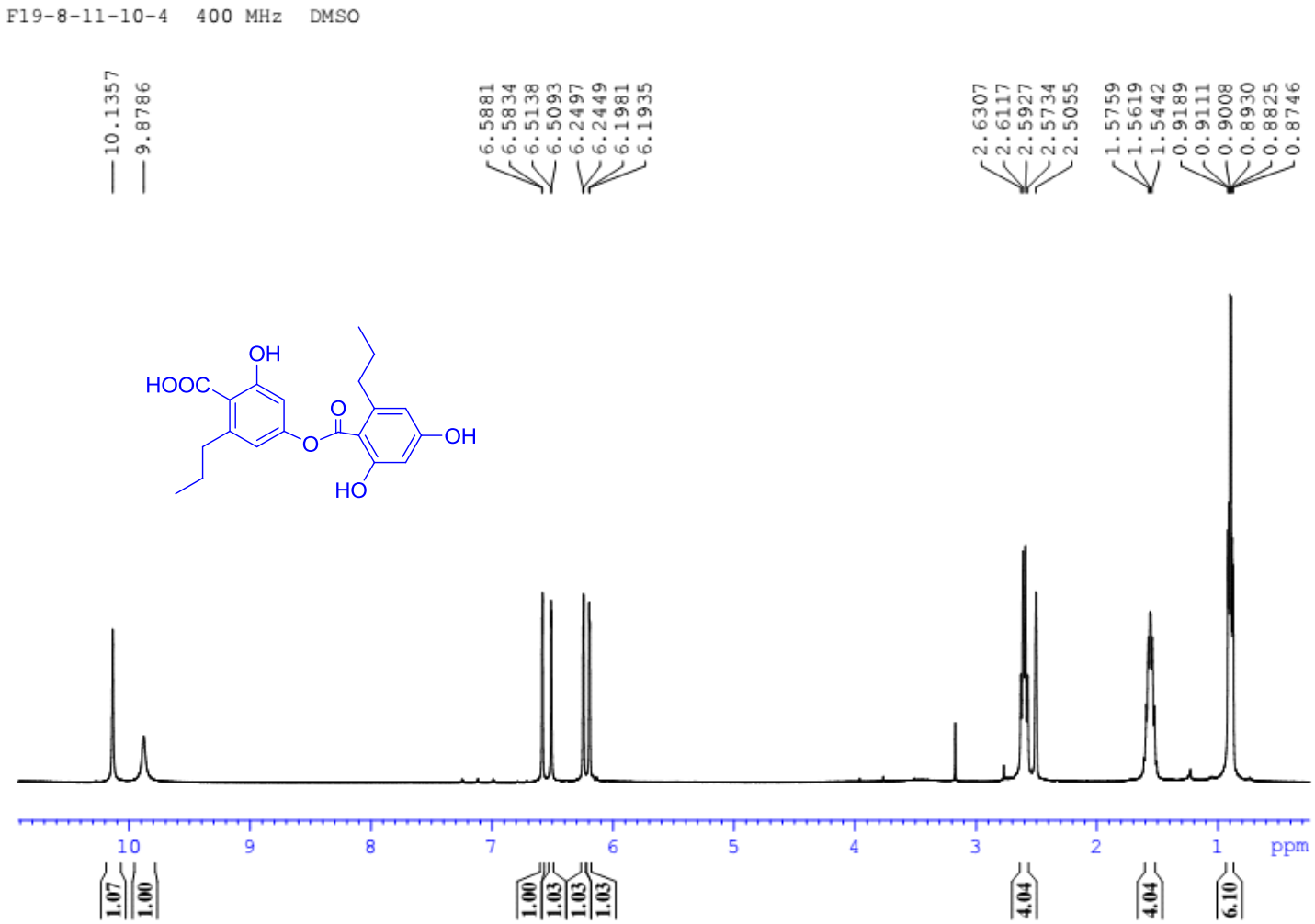


**Figure S68.** $^{1}$H NMR spectrum of compound **10** in DMSO-d6 (400 MHz).

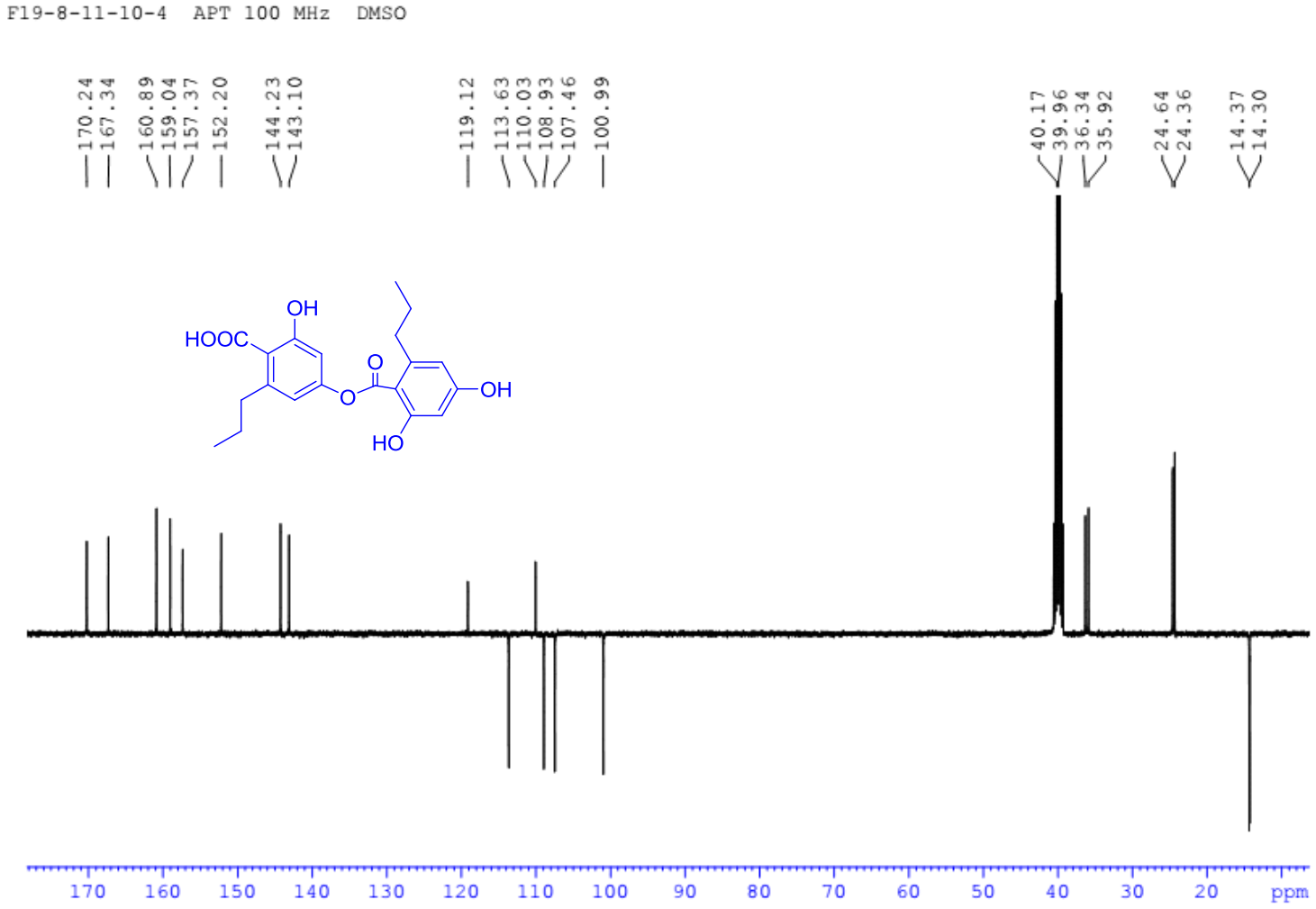


**Figure S69.** $^{13}$C NMR spectrum of compound **10** in DMSO-d6 (100 MHz).

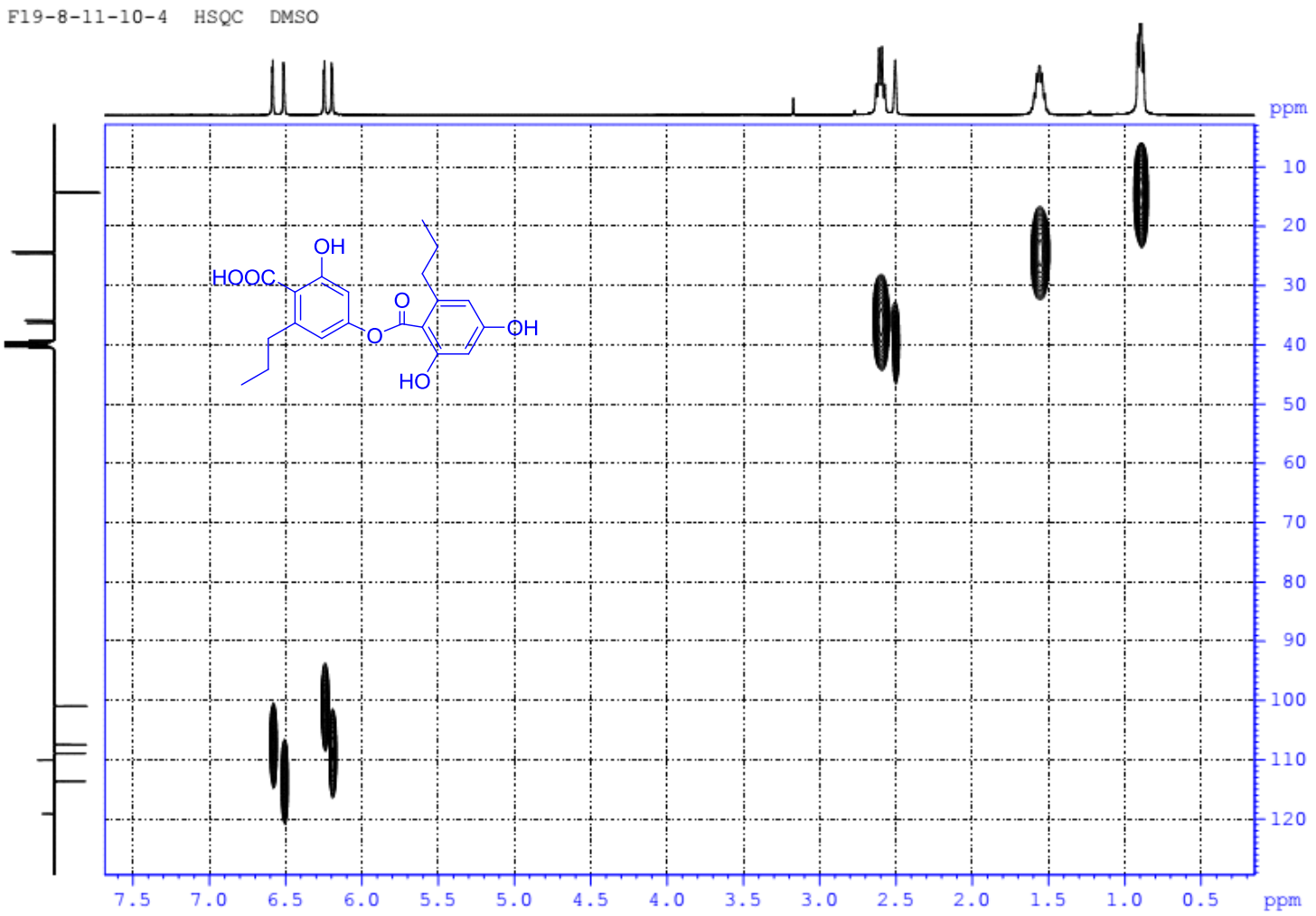


**Figure S70.** HSQC spectrum of compound **10** in DMSO-d6.

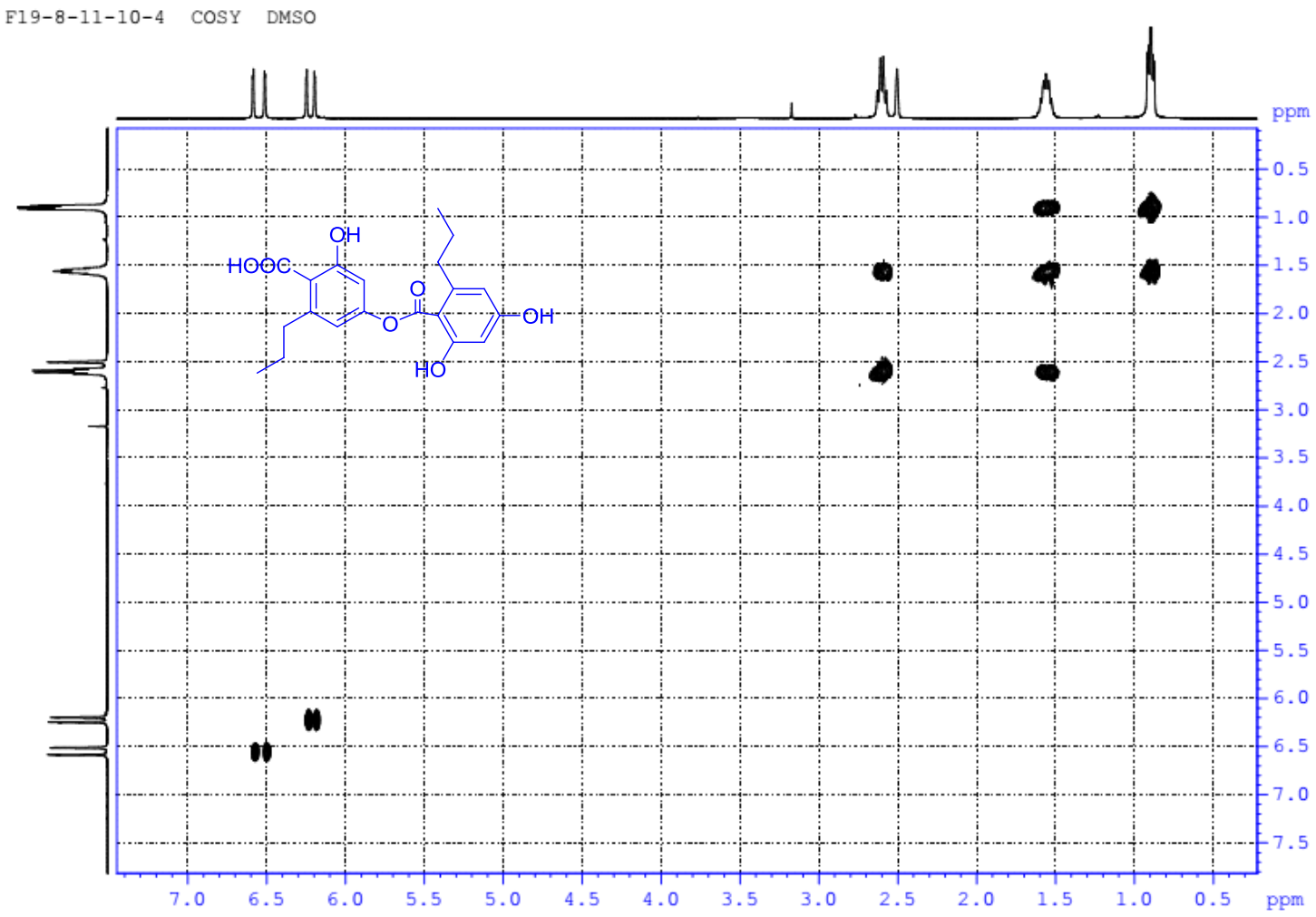


**Figure S71.** $^{1}$H-$^{1}$H COSY spectrum of compound **10** in DMSO-d6.

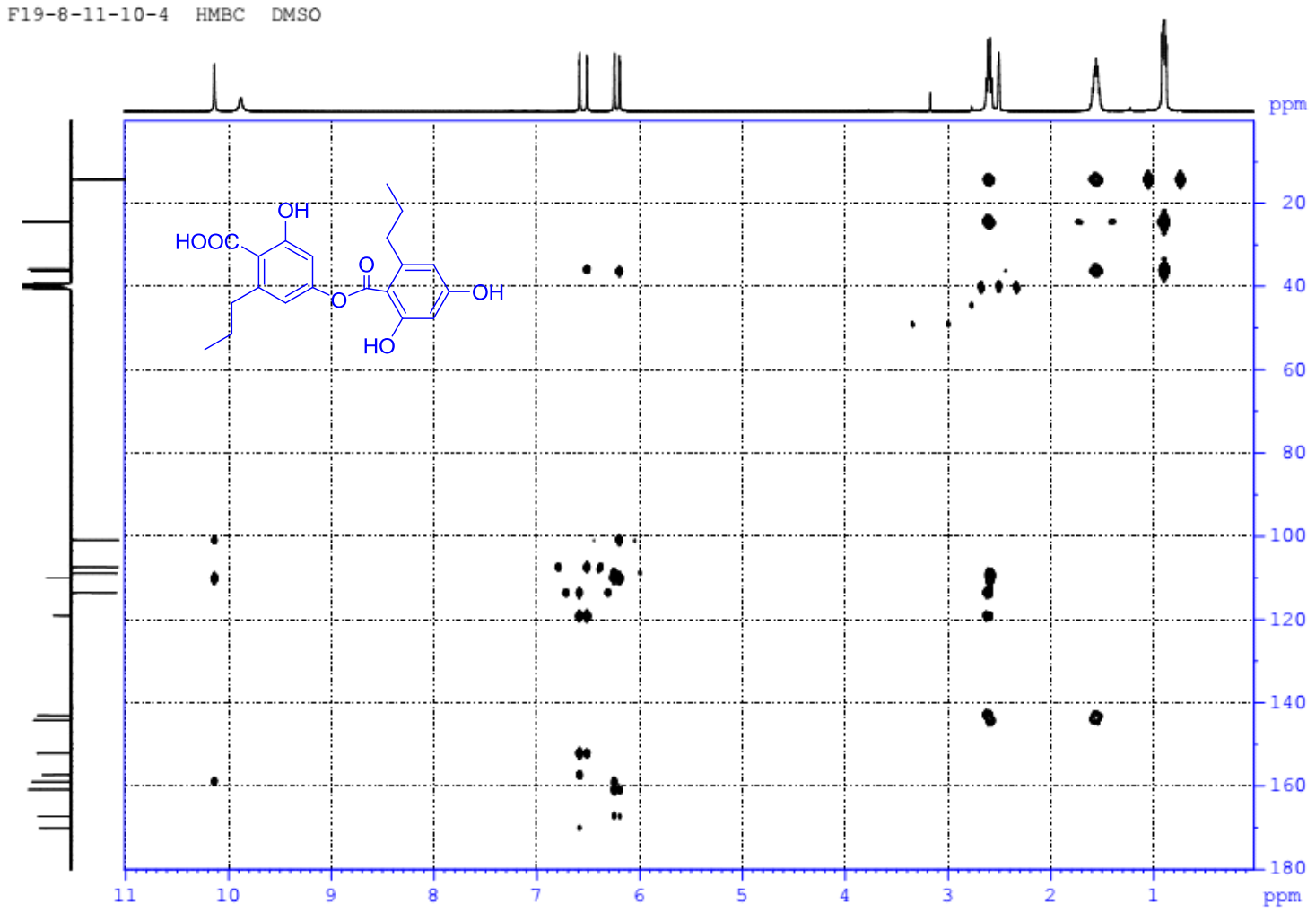


**Figure S72.** HMBC spectrum of compound **10** in DMSO-d6.

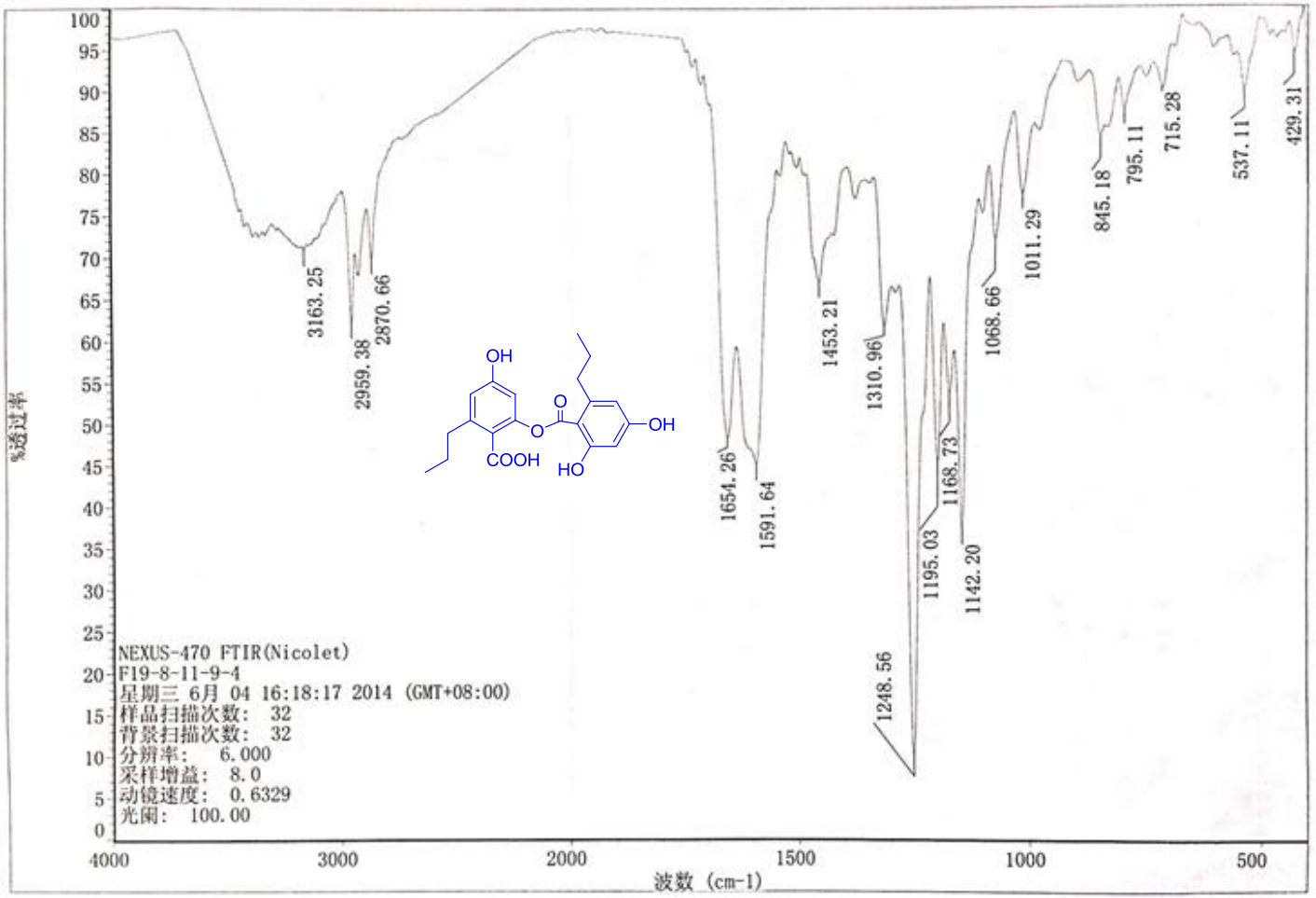


**Figure S73.** IR spectrum of compound **11**.

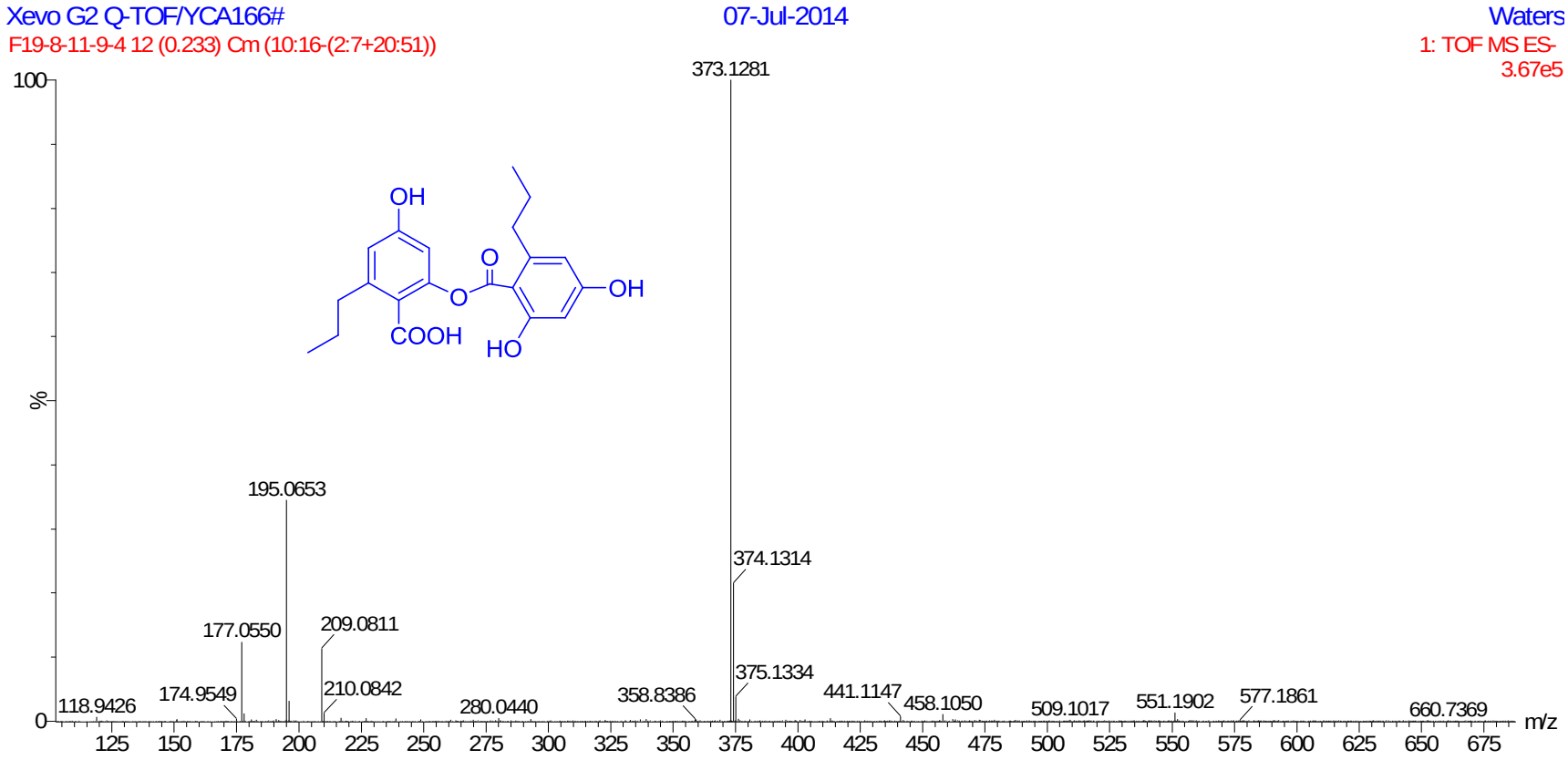


**Figure S74.** Negative mode HRESIMS data of compound **11**.

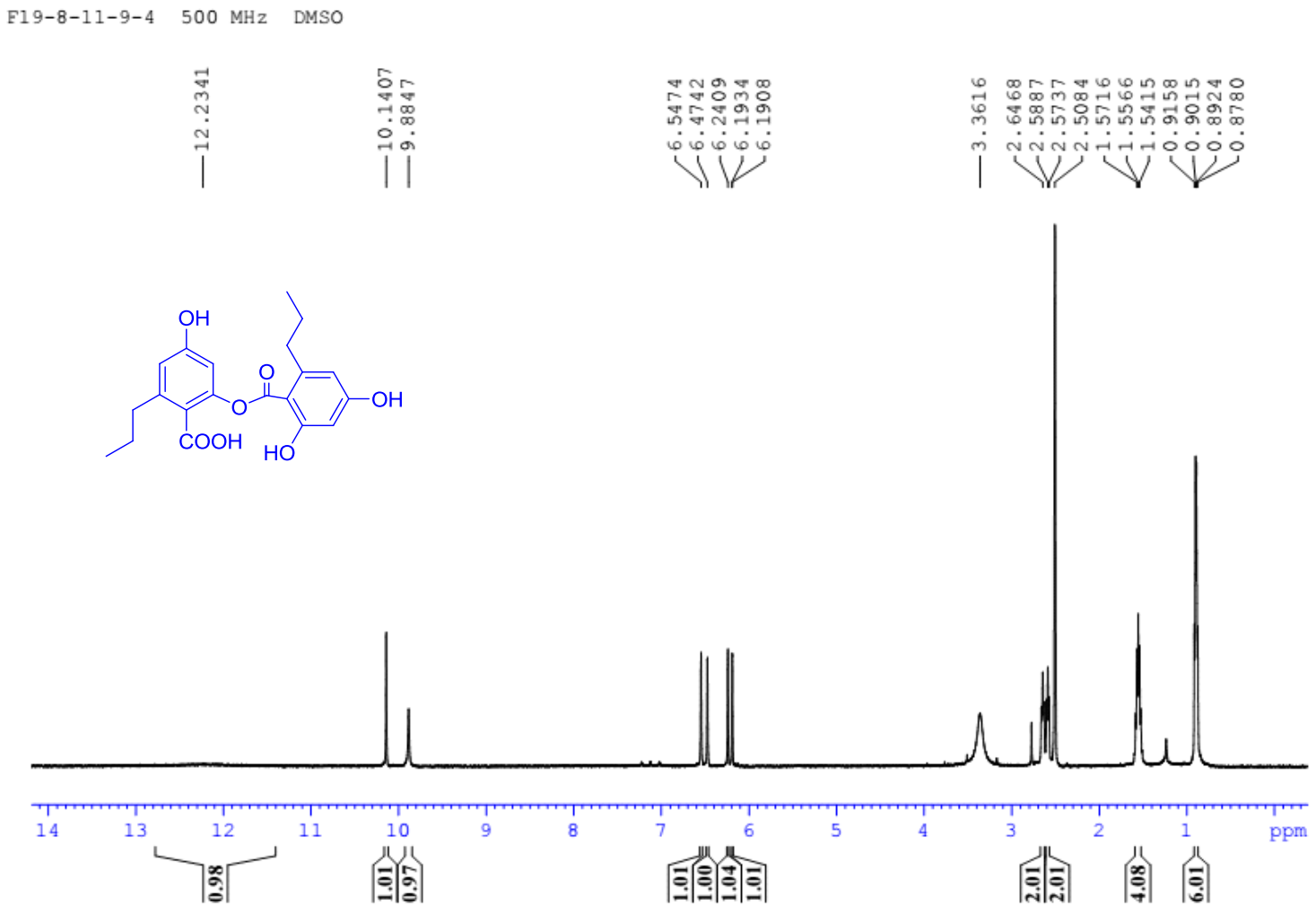


**Figure S75.** $^{1}$H NMR spectrum of compound **11** in DMSO-d6 (500 MHz).

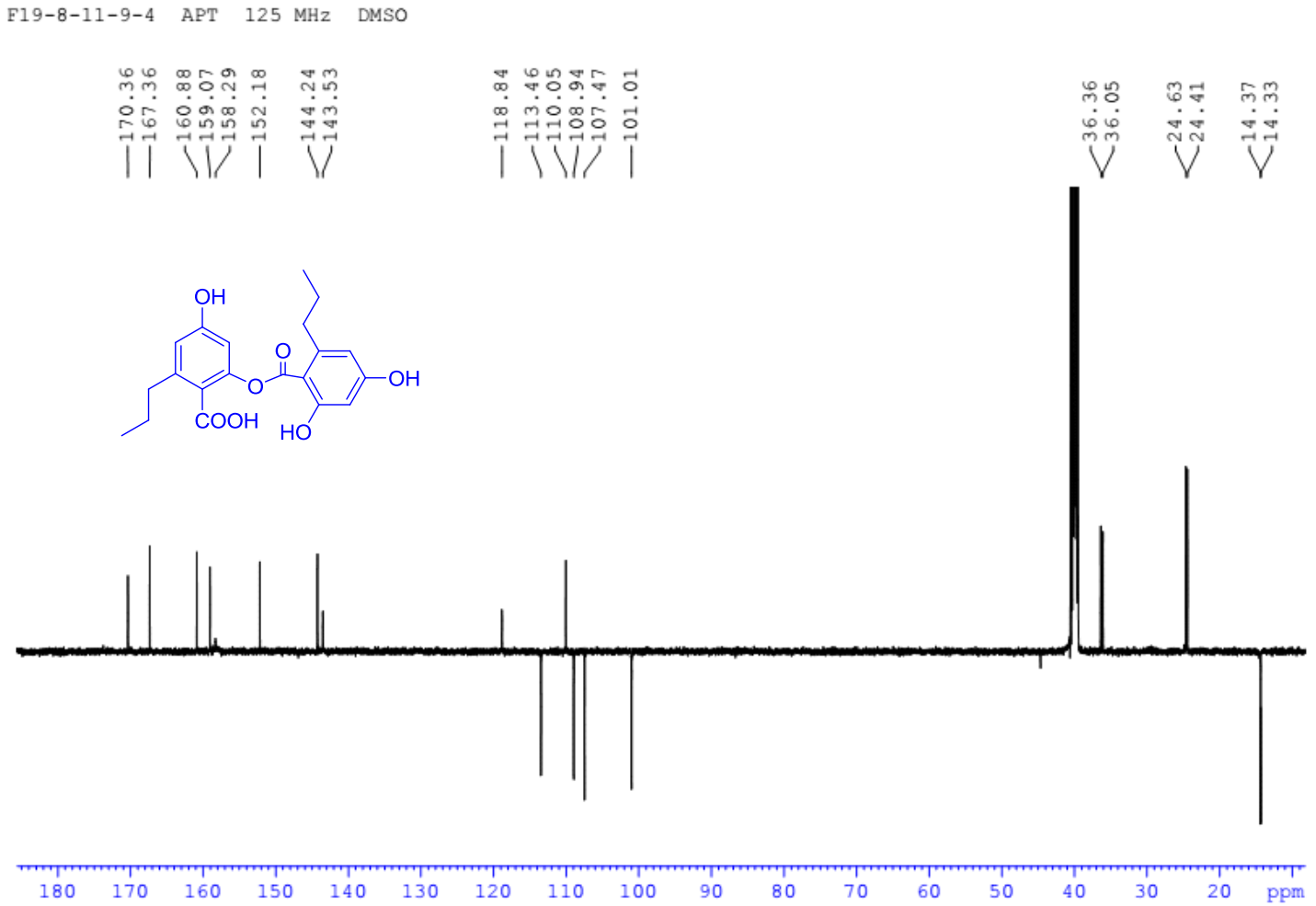


**Figure S76.** $^{13}$C NMR spectrum of compound **11** in DMSO-d6 (100MHz).

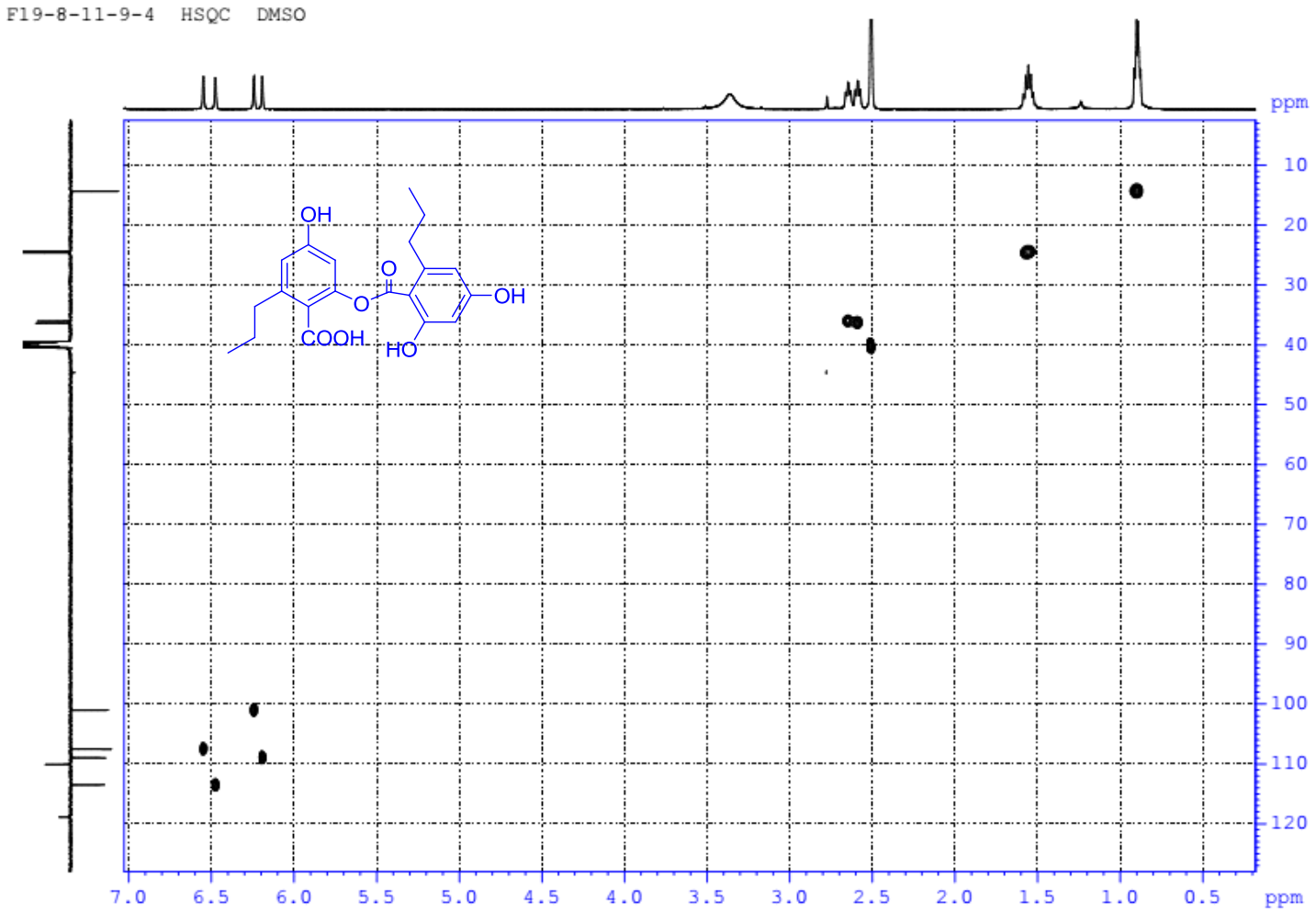


**Figure S77.** HSQC spectrum of compound **11** in DMSO-d6.

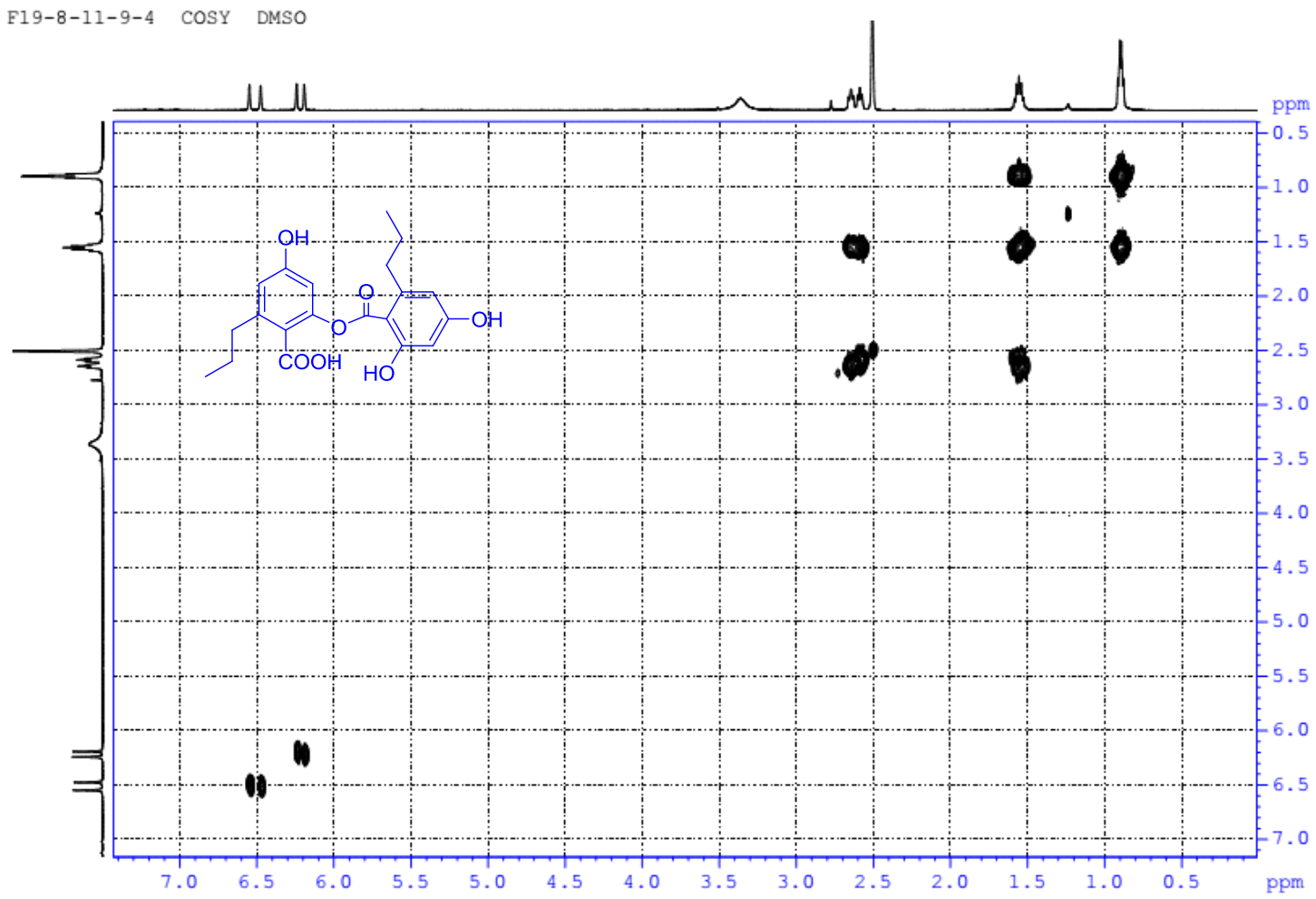


**Figure S78.** $^{1}$H-$^{1}$H COSY spectrum of compound **11** in DMSO-d6.

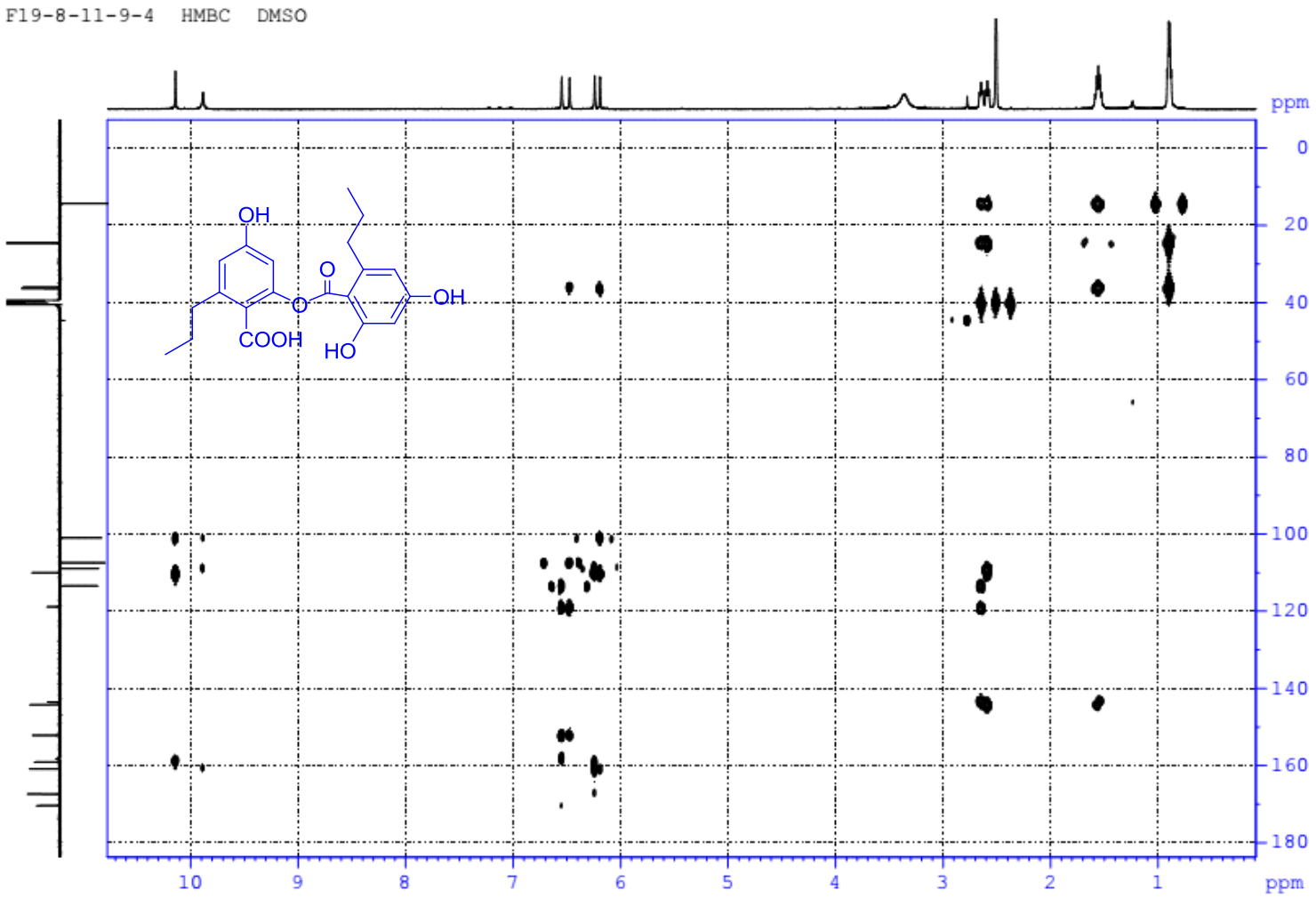


**Figure S79.** HMBC spectrum of compound **11** in DMSO-d6.

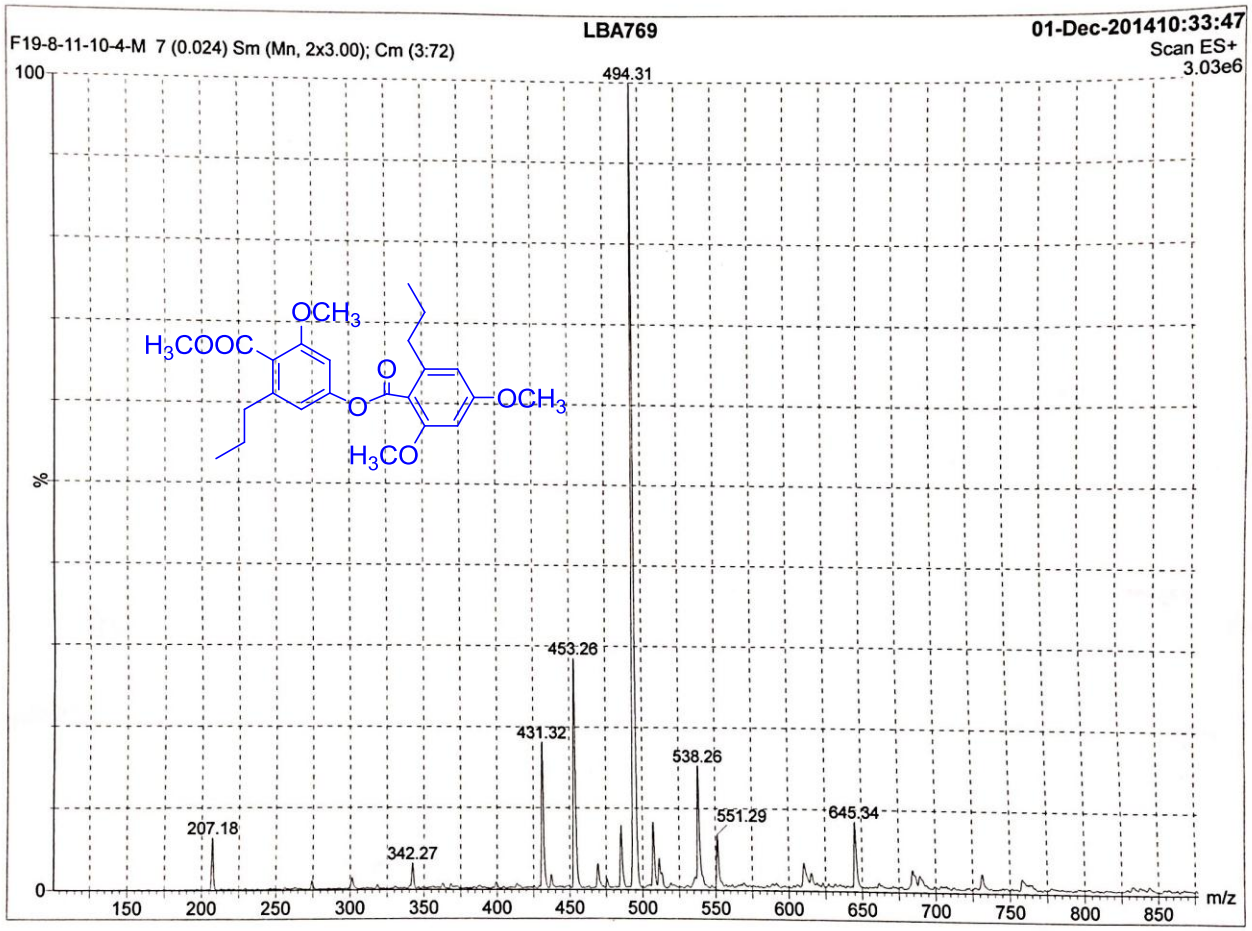


**Figure S80.** Negative mode ESIMS data of compound **10a**.

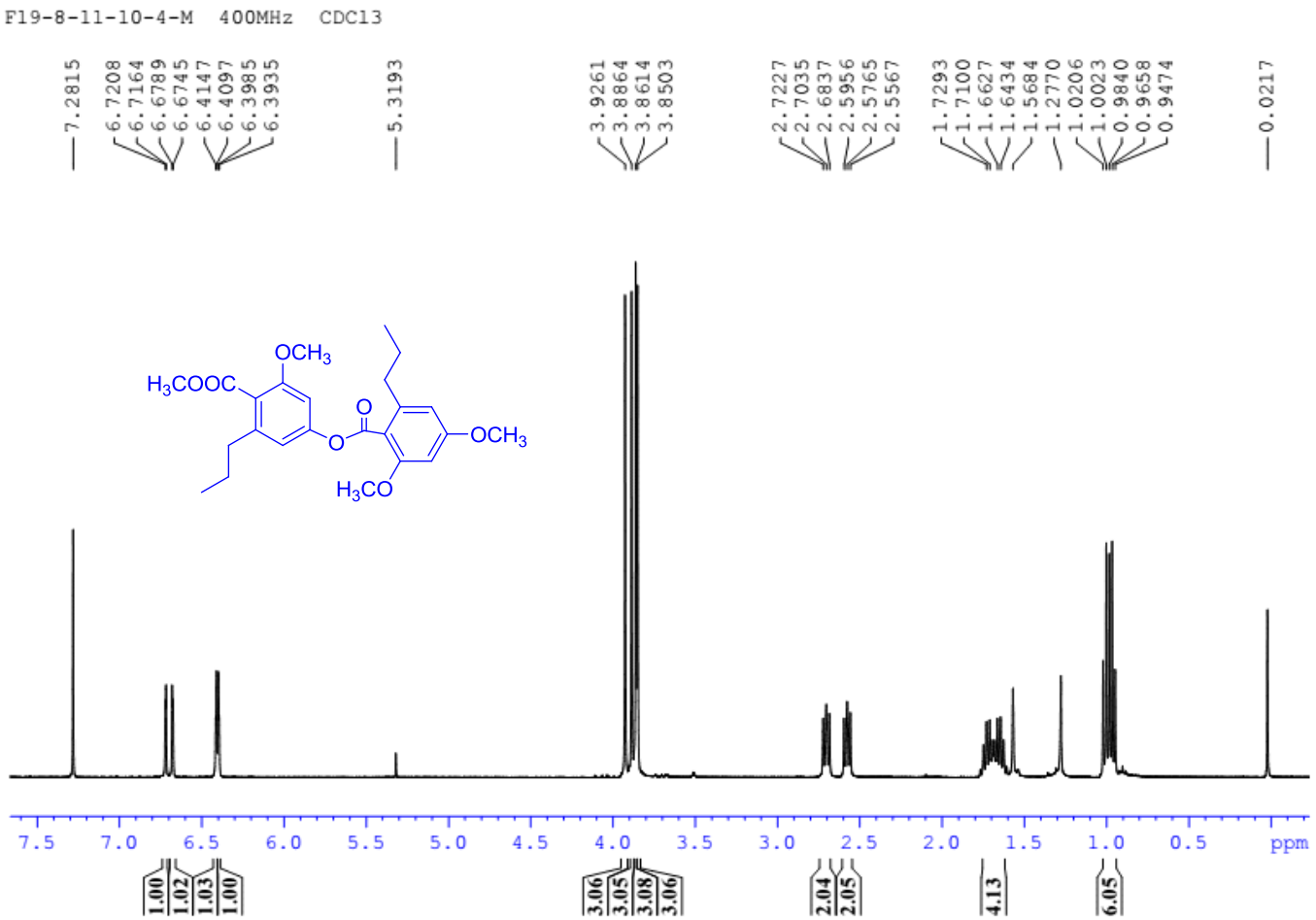


**Figure S81.** $^{1}$H NMR spectrum of compound **10a** in $CDCl_3$ (400 MHz).

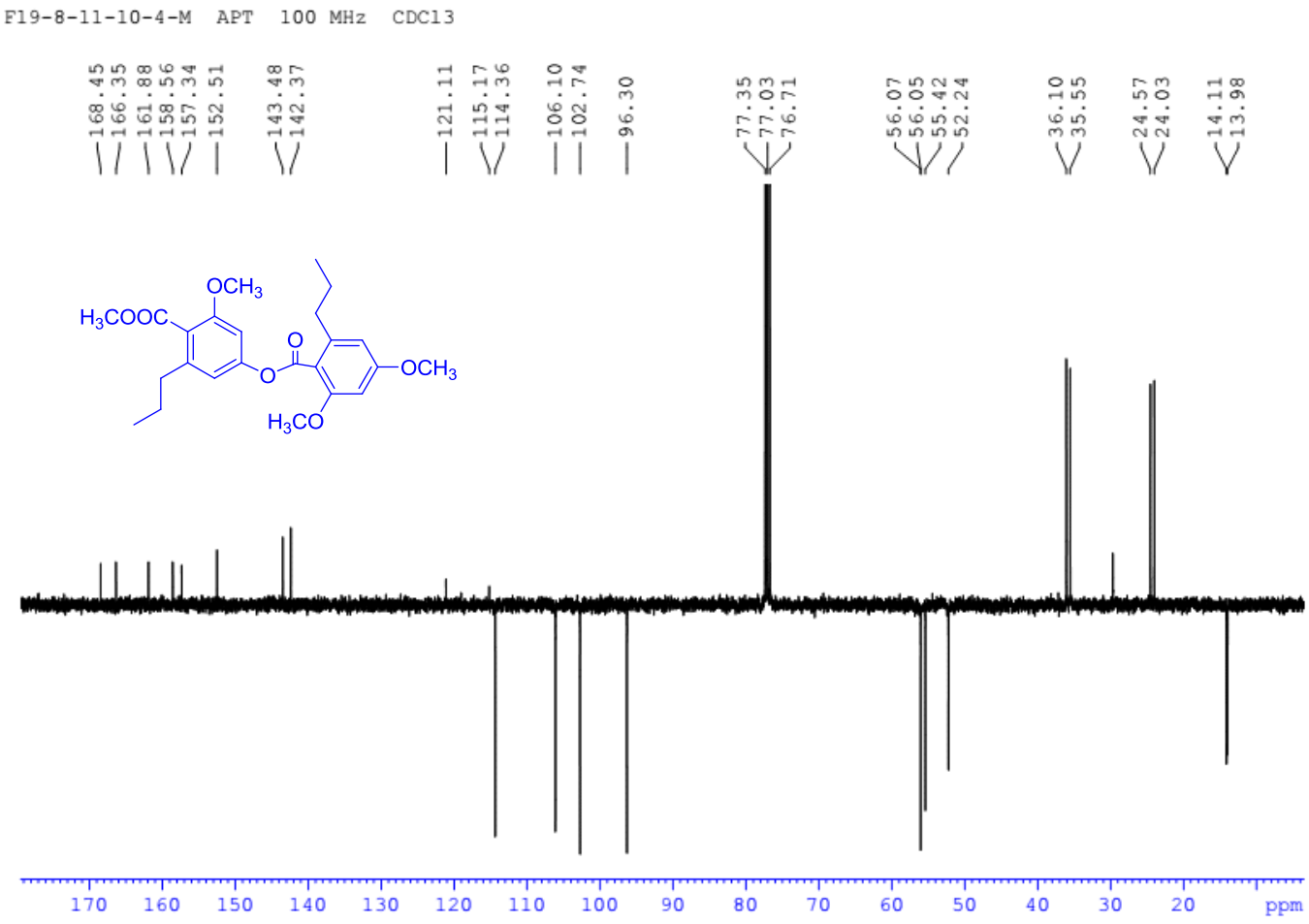


**Figure S82.** $^{13}C$ NMR spectrum of compound **10a** in $CDCl_3$ (100 MHz).

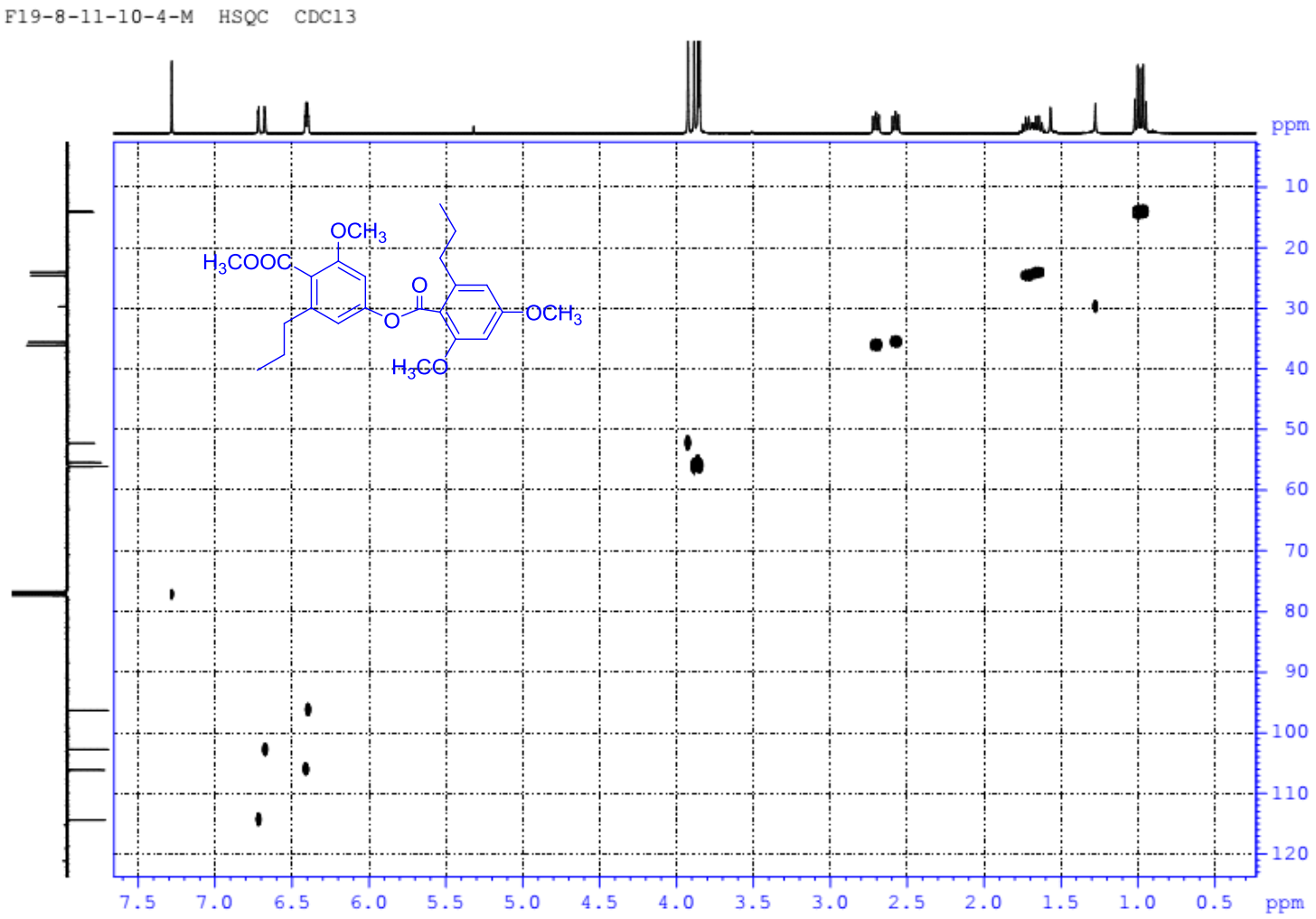


**Figure S83.** HSQC spectrum of compound **10a** in $CDCl_3$.

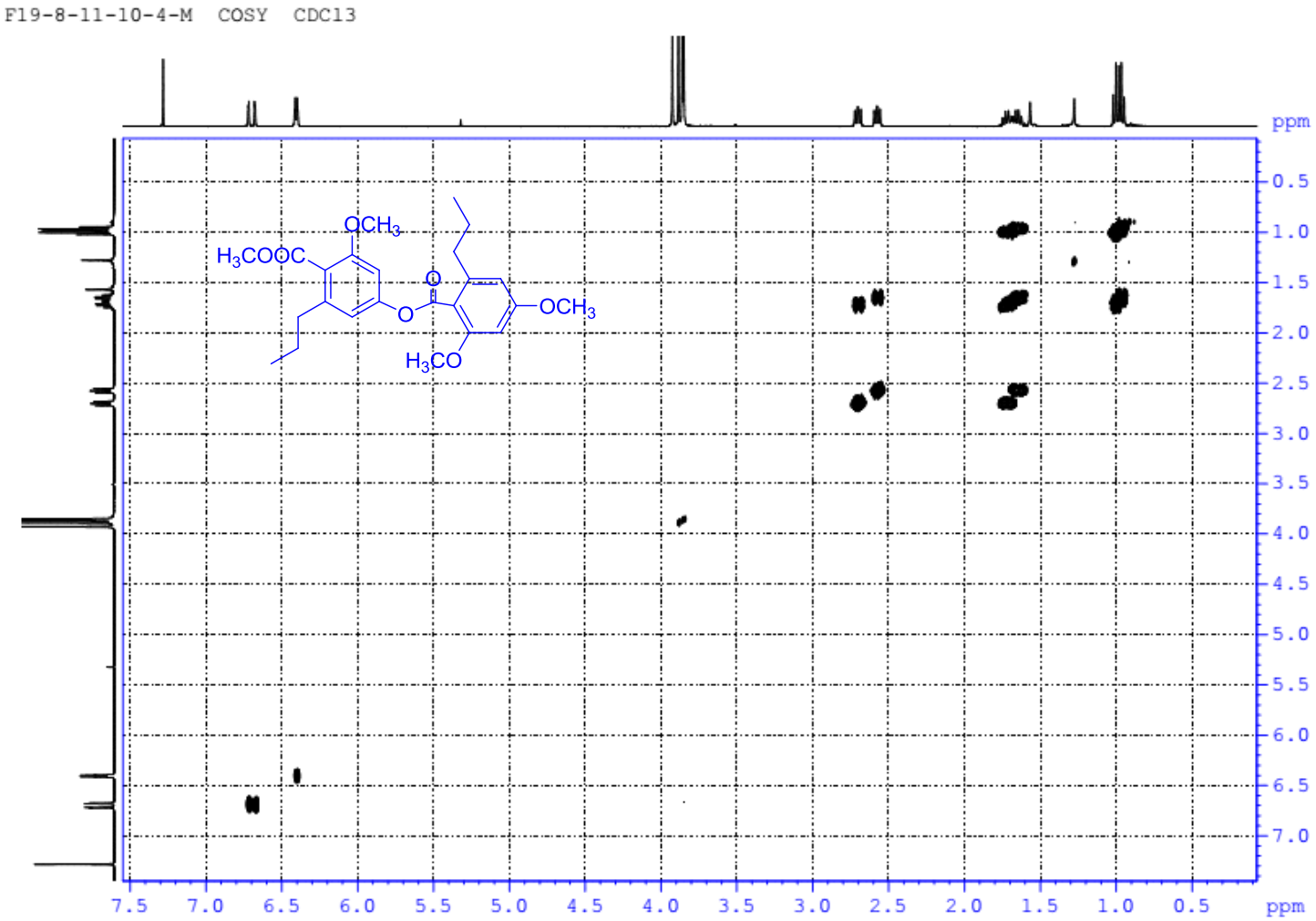


**Figure S84.** $^{1}$H-$^{1}$H COSY spectrum of compound **10a** in $CDCl_3$.

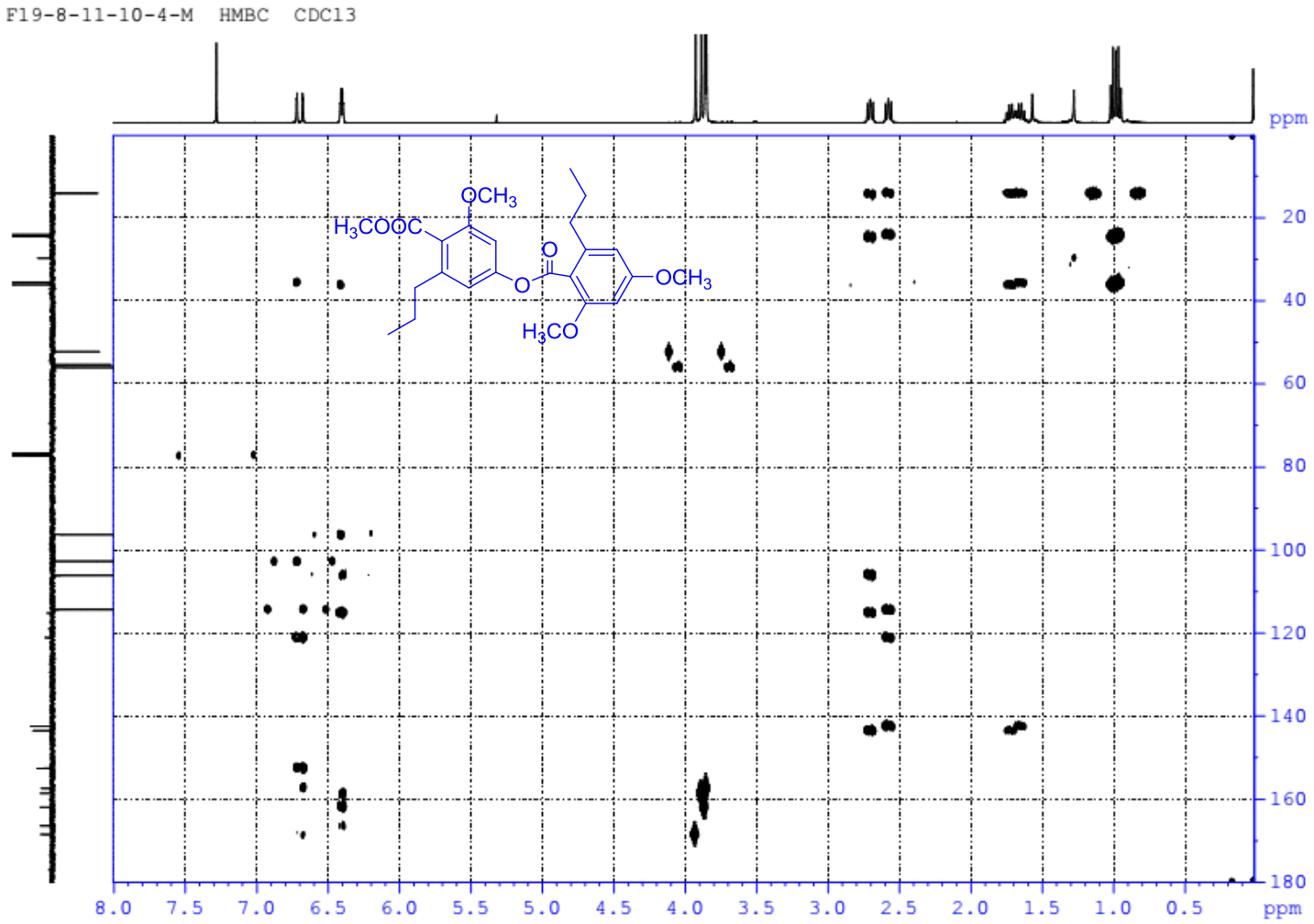


**Figure S85.** HMBC spectrum of compound **10a** in $CDCl_3$.