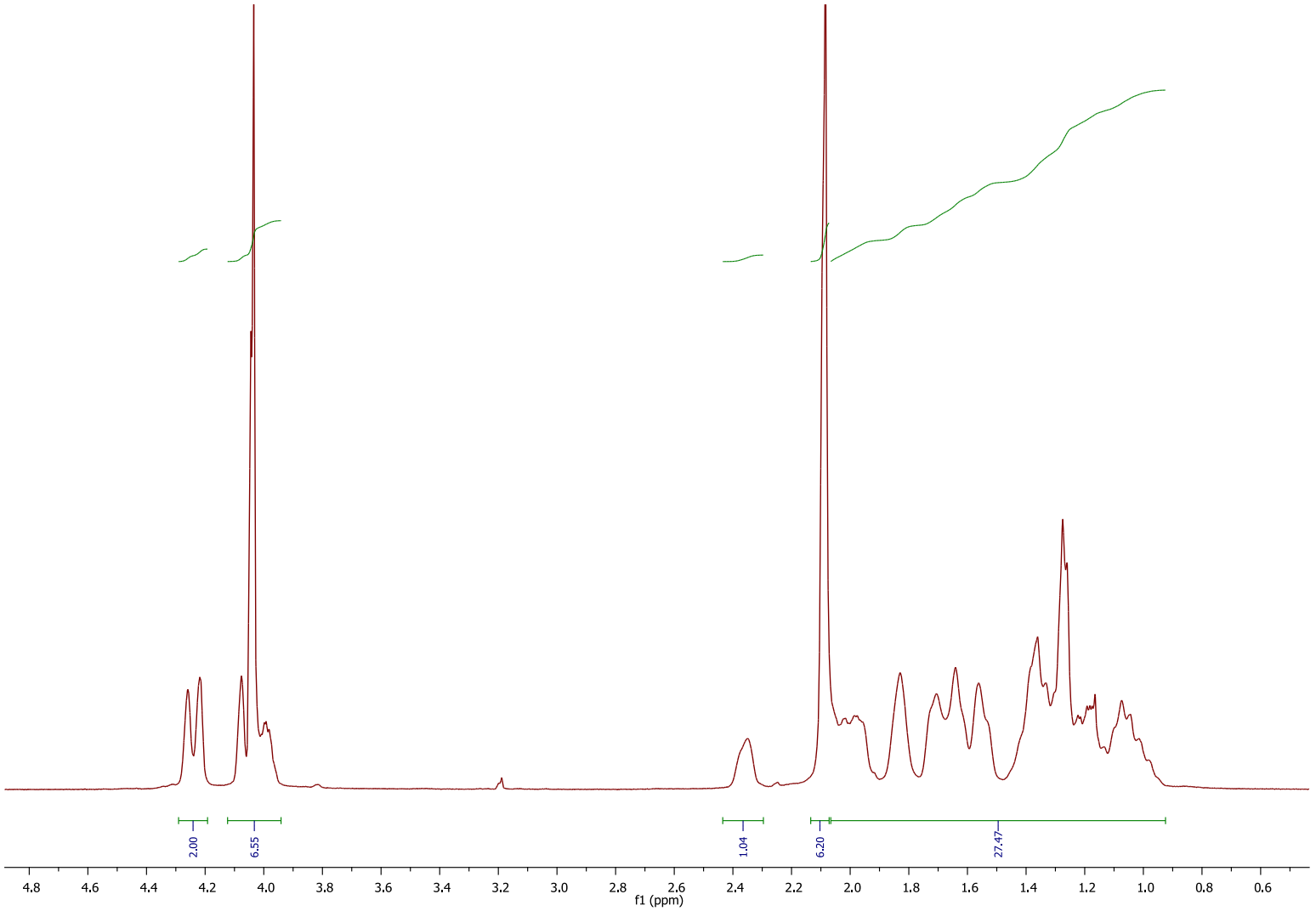
Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

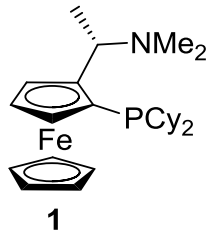
Supporting information

Synthesis of new derivatives of copper complexes of Josiphos family ligands for applications in asymmetric catalysis

R. Oost[a], J. Rong[a], A.J. Minnaard*[a], S.R. Harutyunyan*[a]

^{1}H-NMR spectrum of **1** in $CDCl_3$





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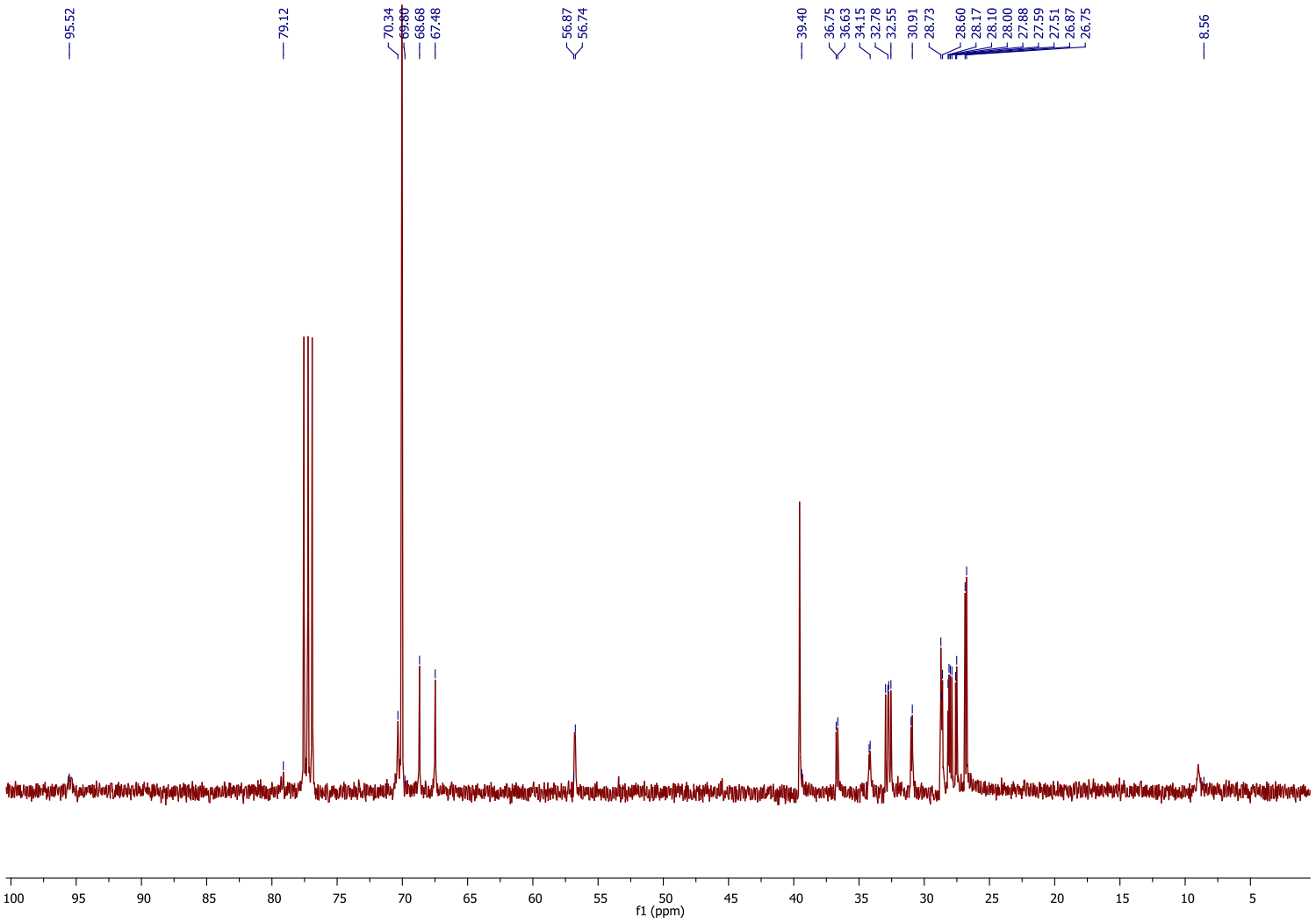
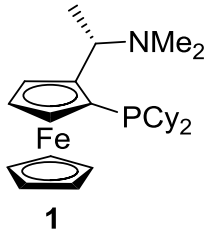
^{13}C-NMR spectrum of **1** in $CDCl_3$





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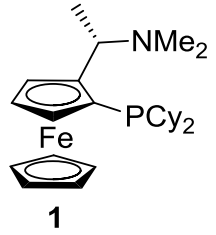
^{31}P-NMR spectrum of **1** in $CDCl_3$



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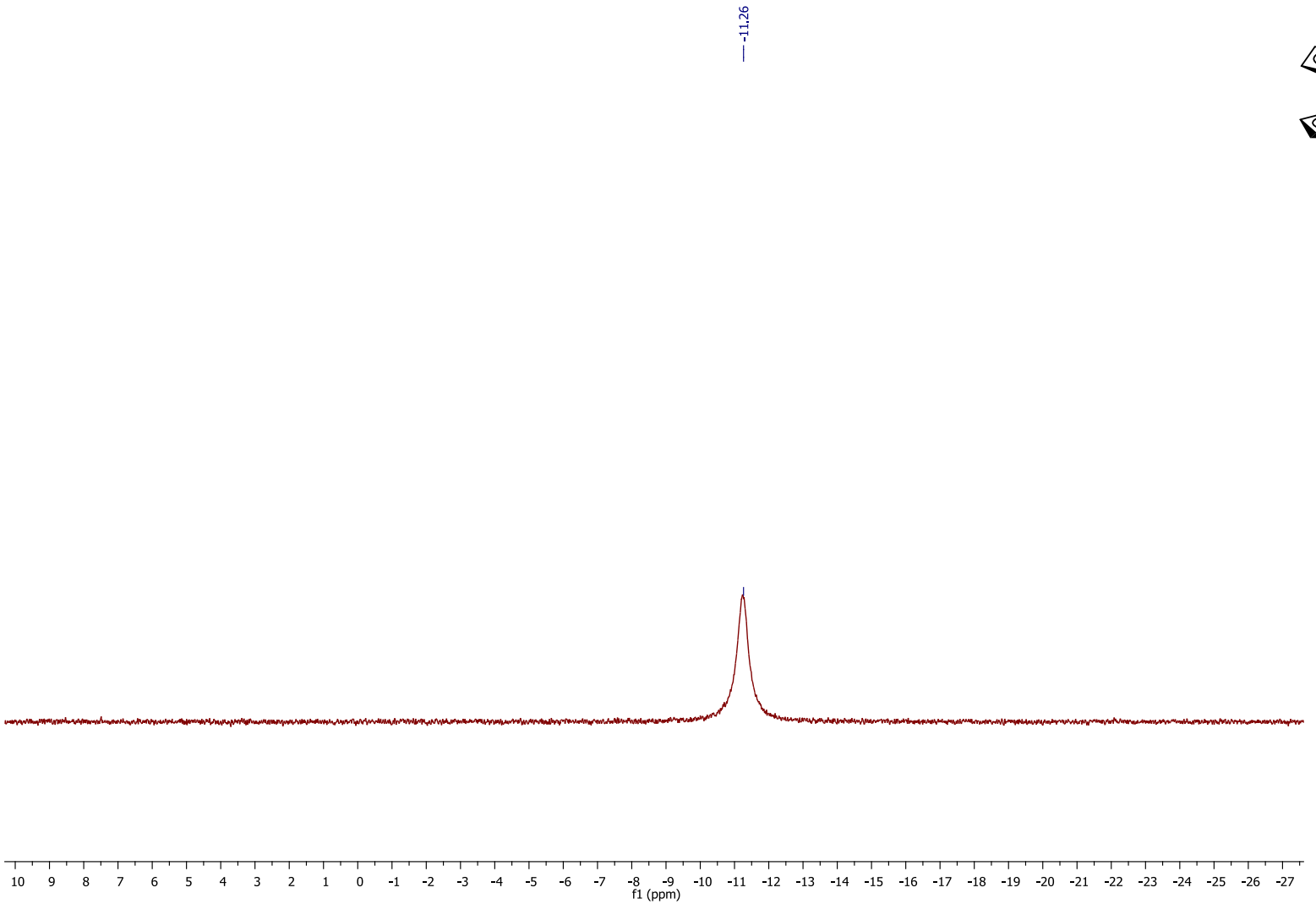

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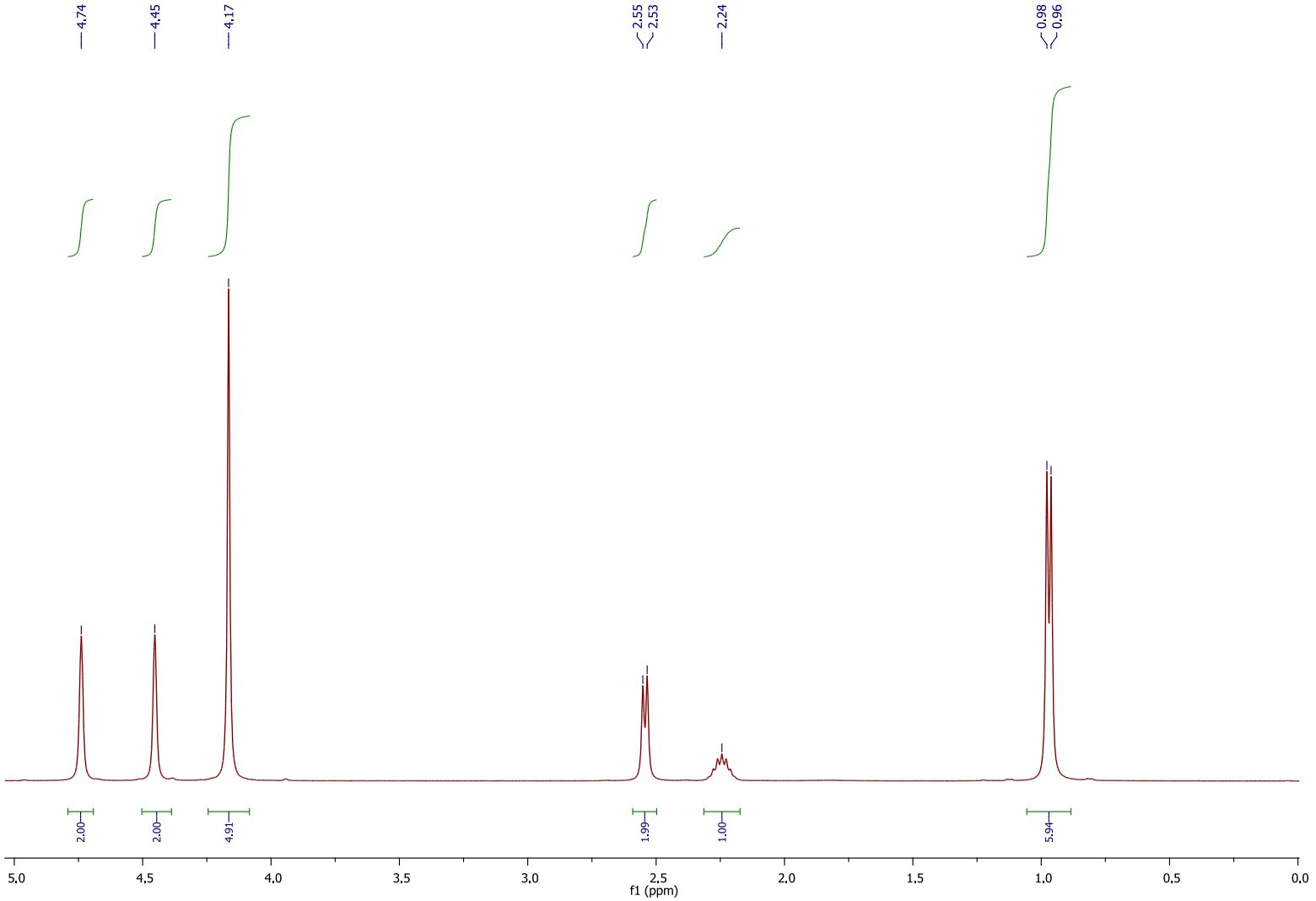

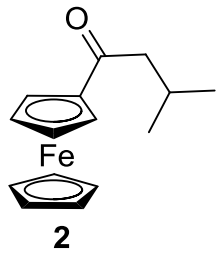

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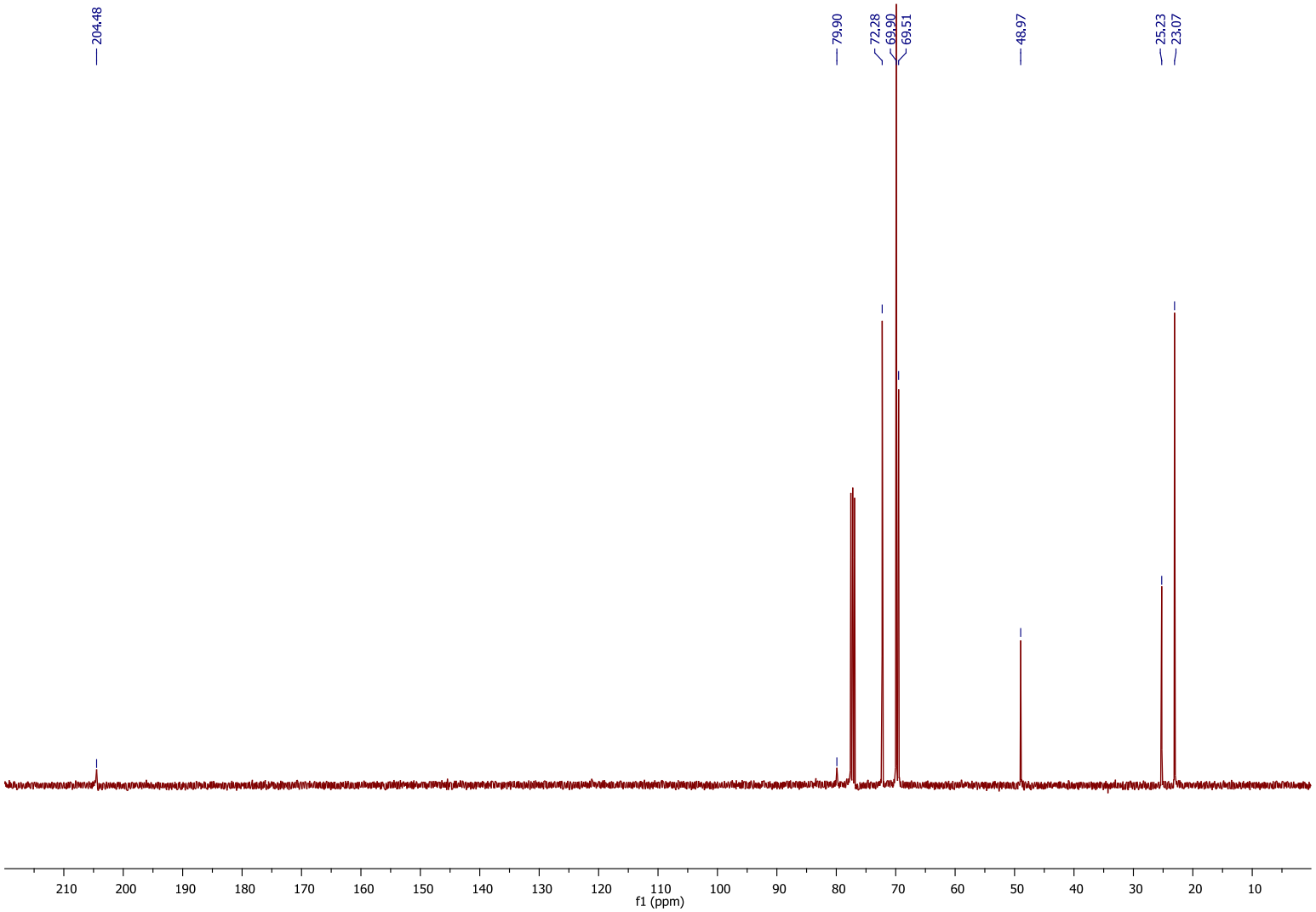
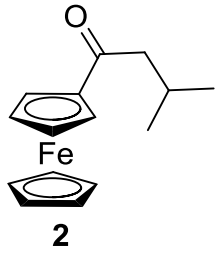
^{13}C-NMR spectrum of **2** in $CDCl_3$





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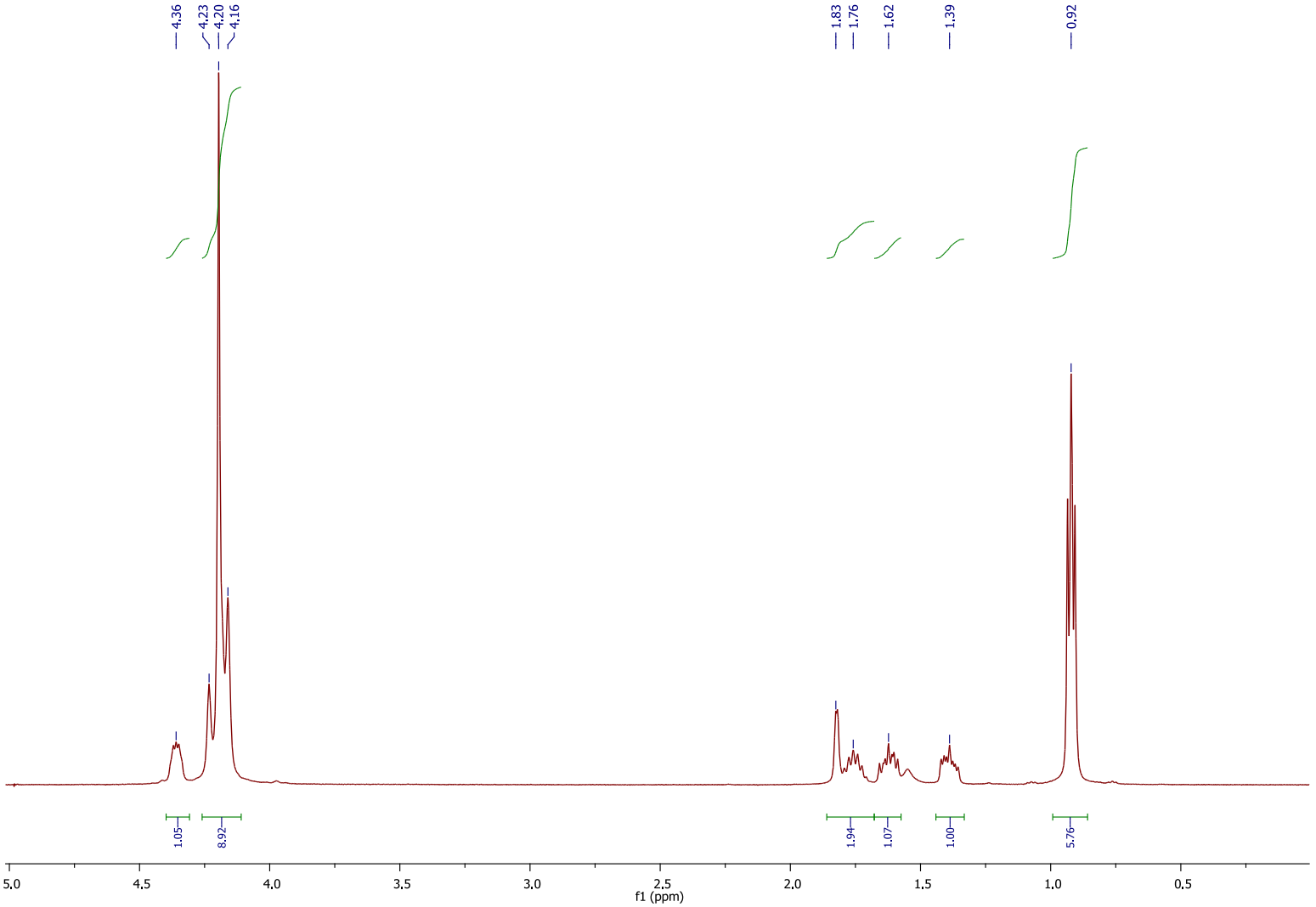

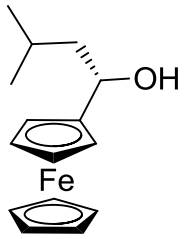

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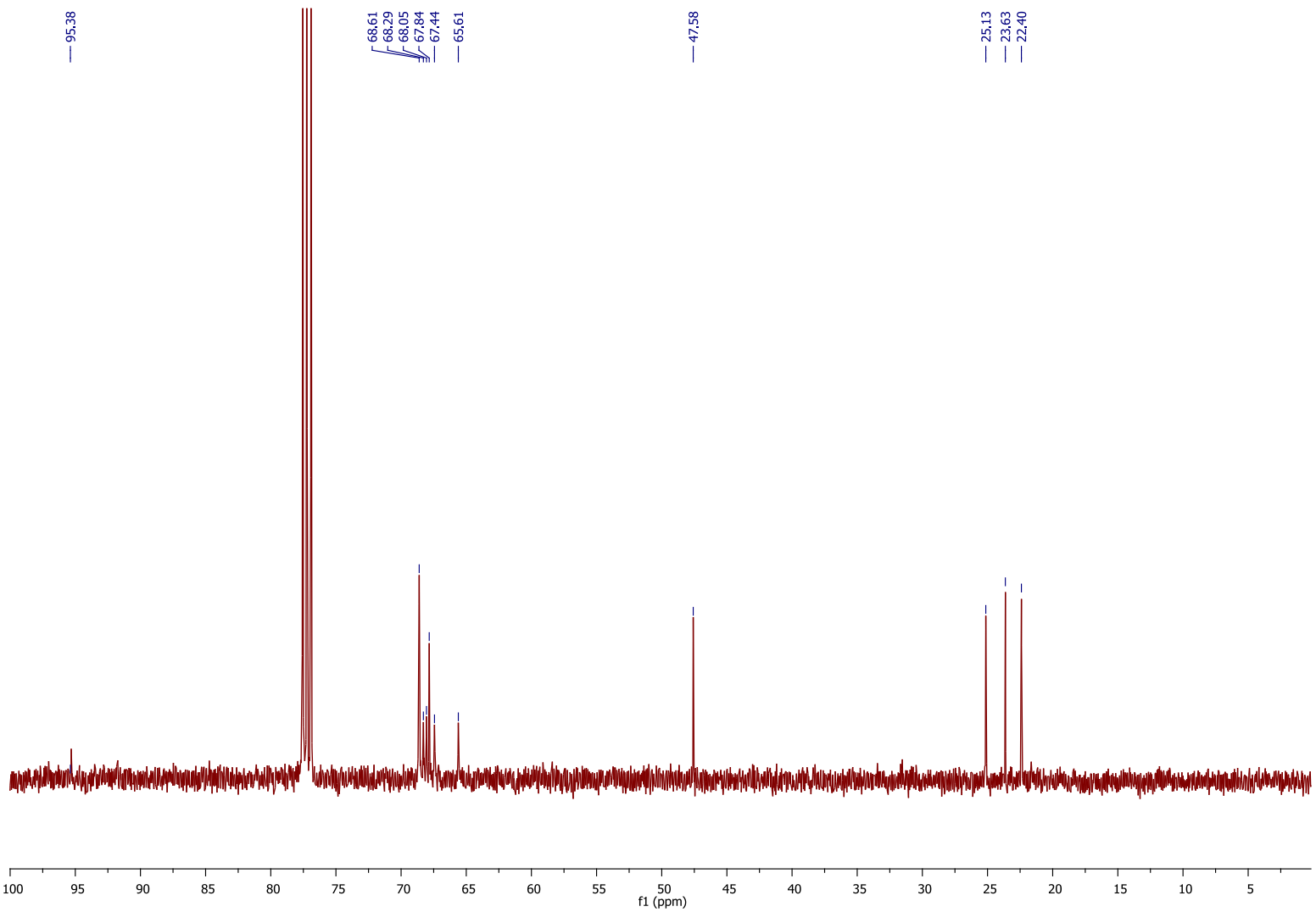
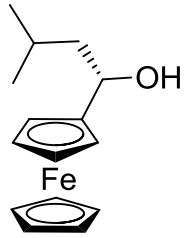
^{13}C-NMR spectrum of **3** in $CDCl_3$





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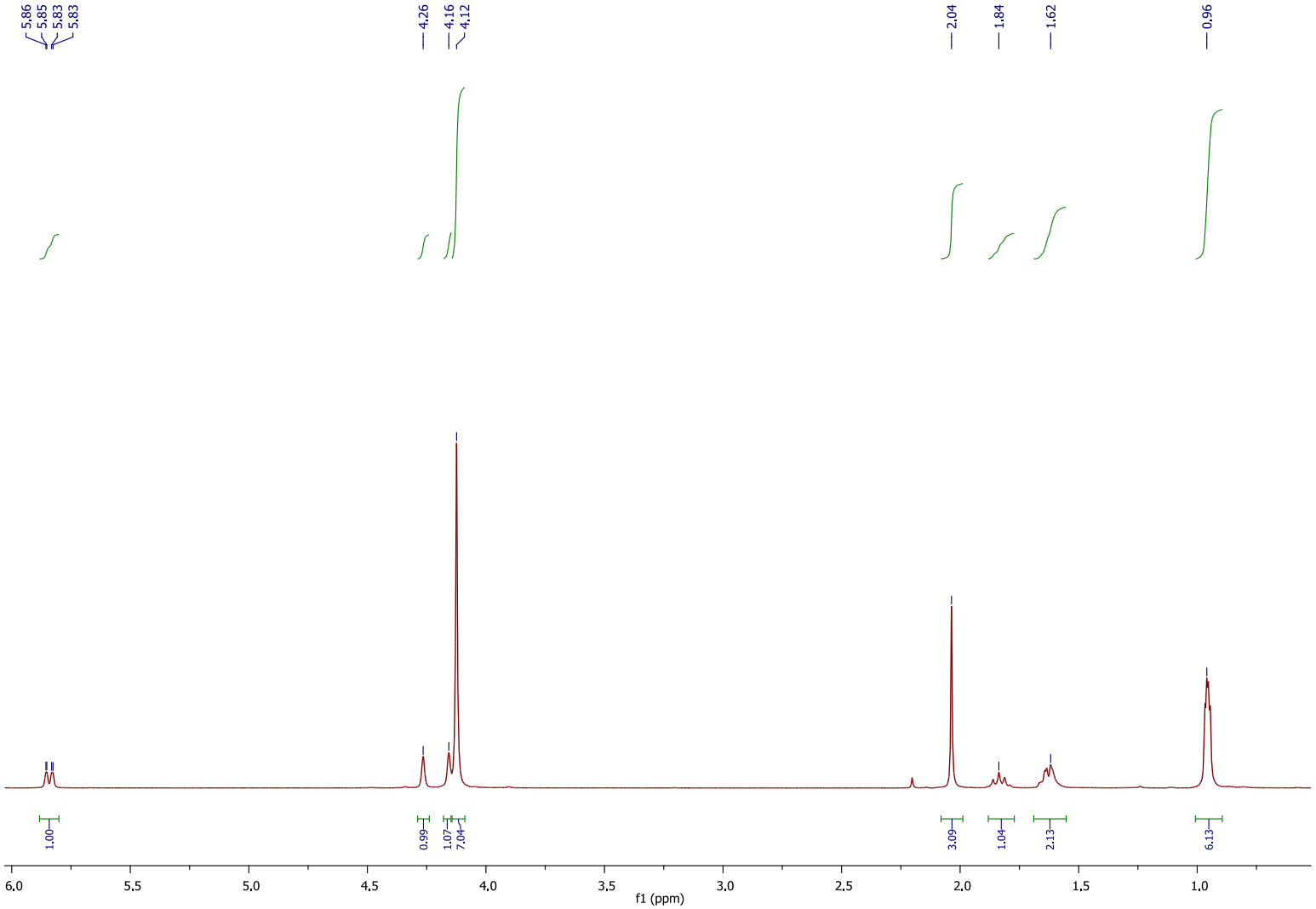
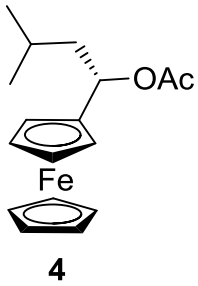
^{1}H-NMR spectrum of **4** in $CDCl_3$





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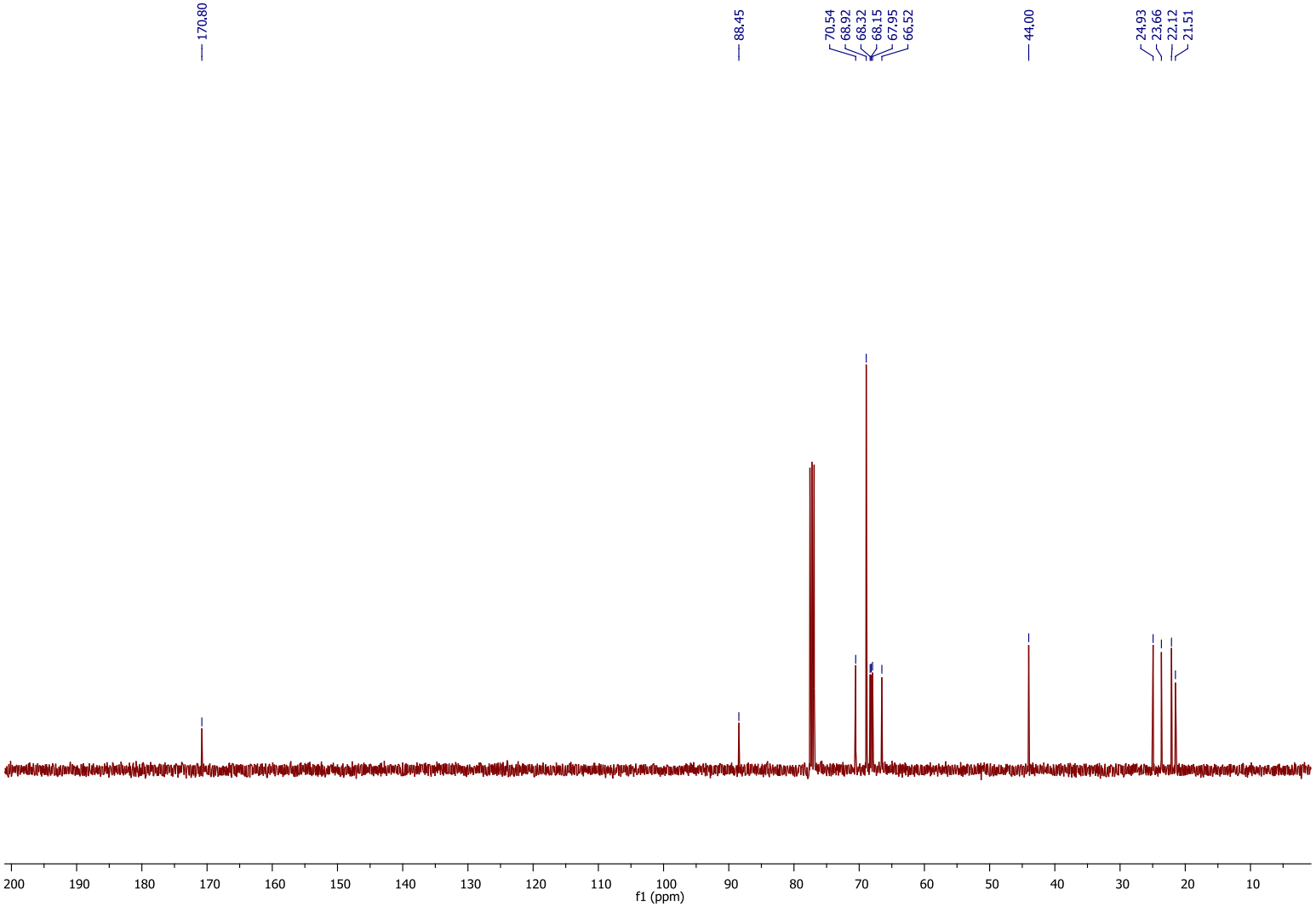
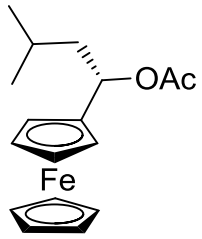
^{13}C-NMR spectrum of **4** in $CDCl_3$





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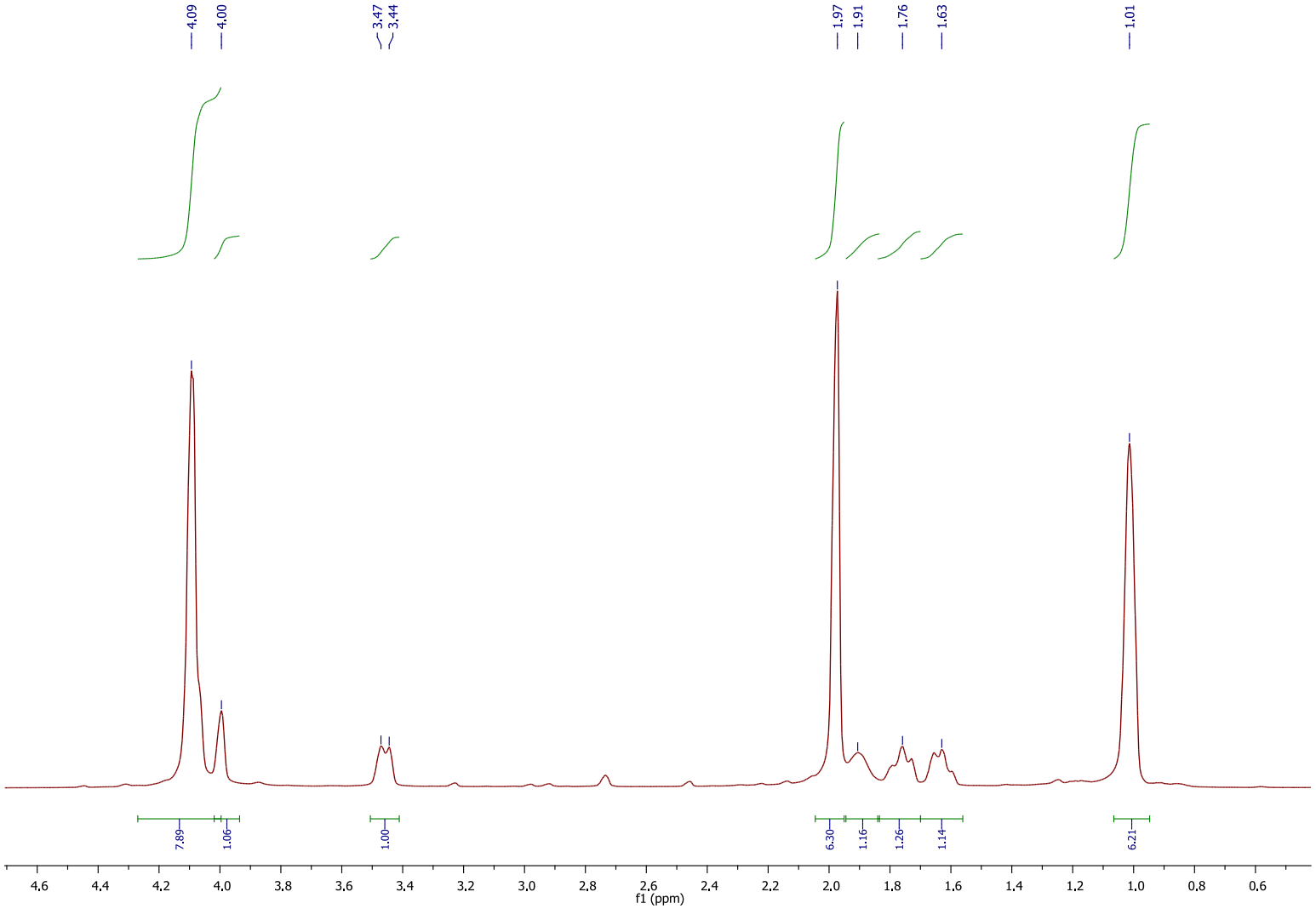
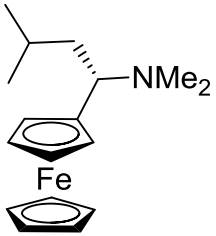
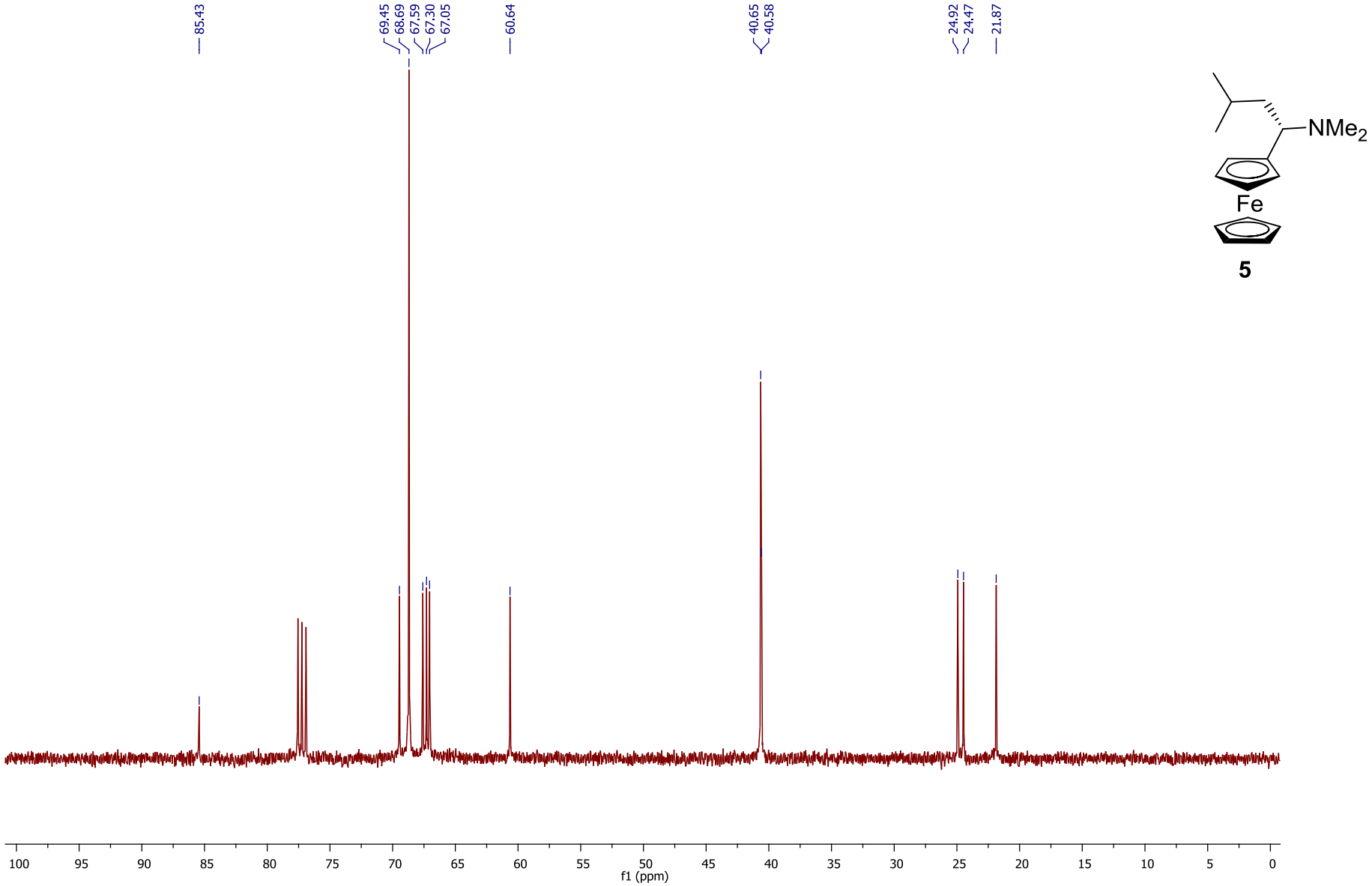




5

^{13}C-NMR spectrum of **5** in $CDCl_3$



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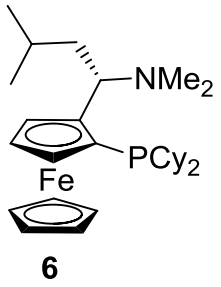
^{1}H-NMR spectrum of **6** in $CDCl_3$



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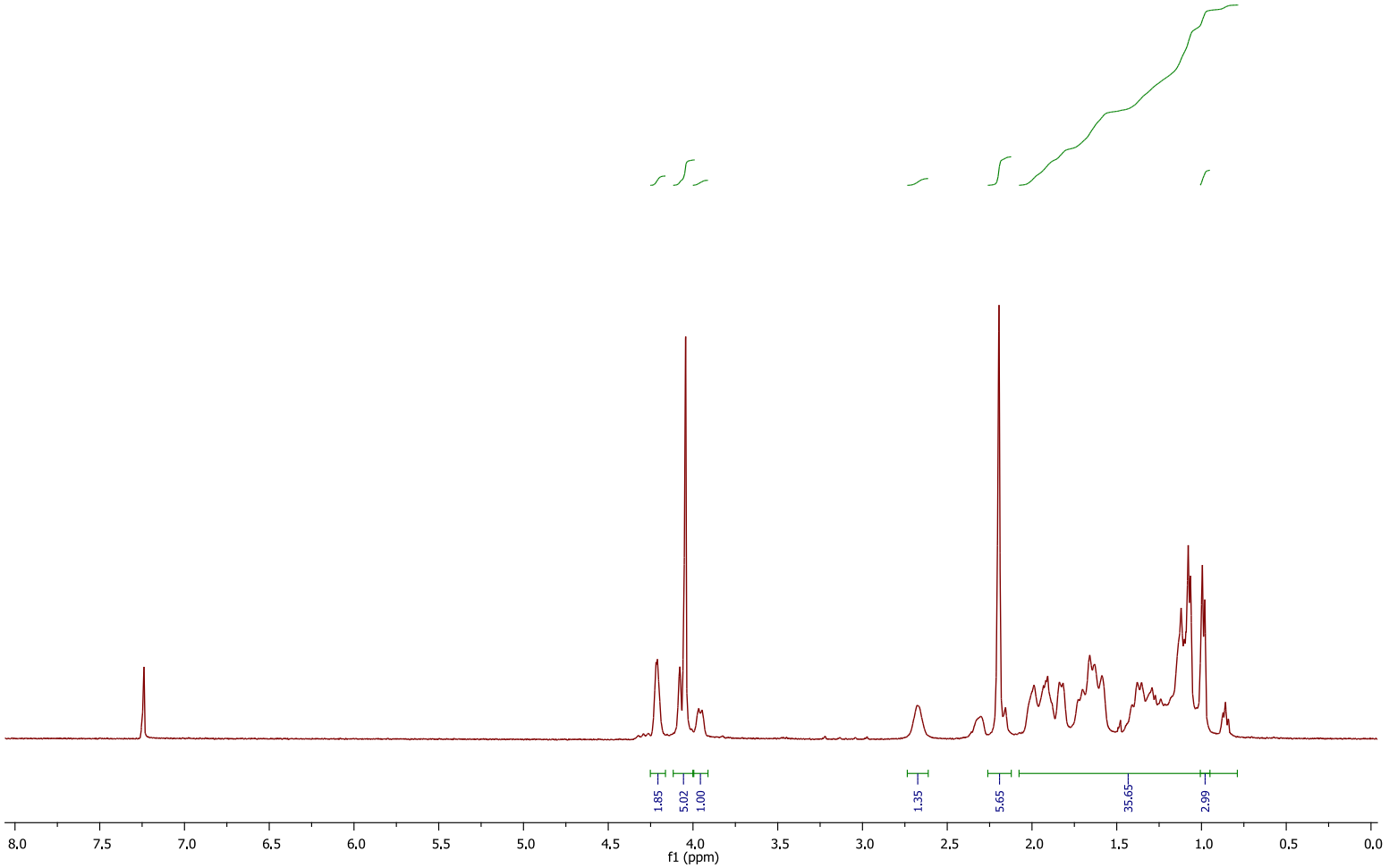
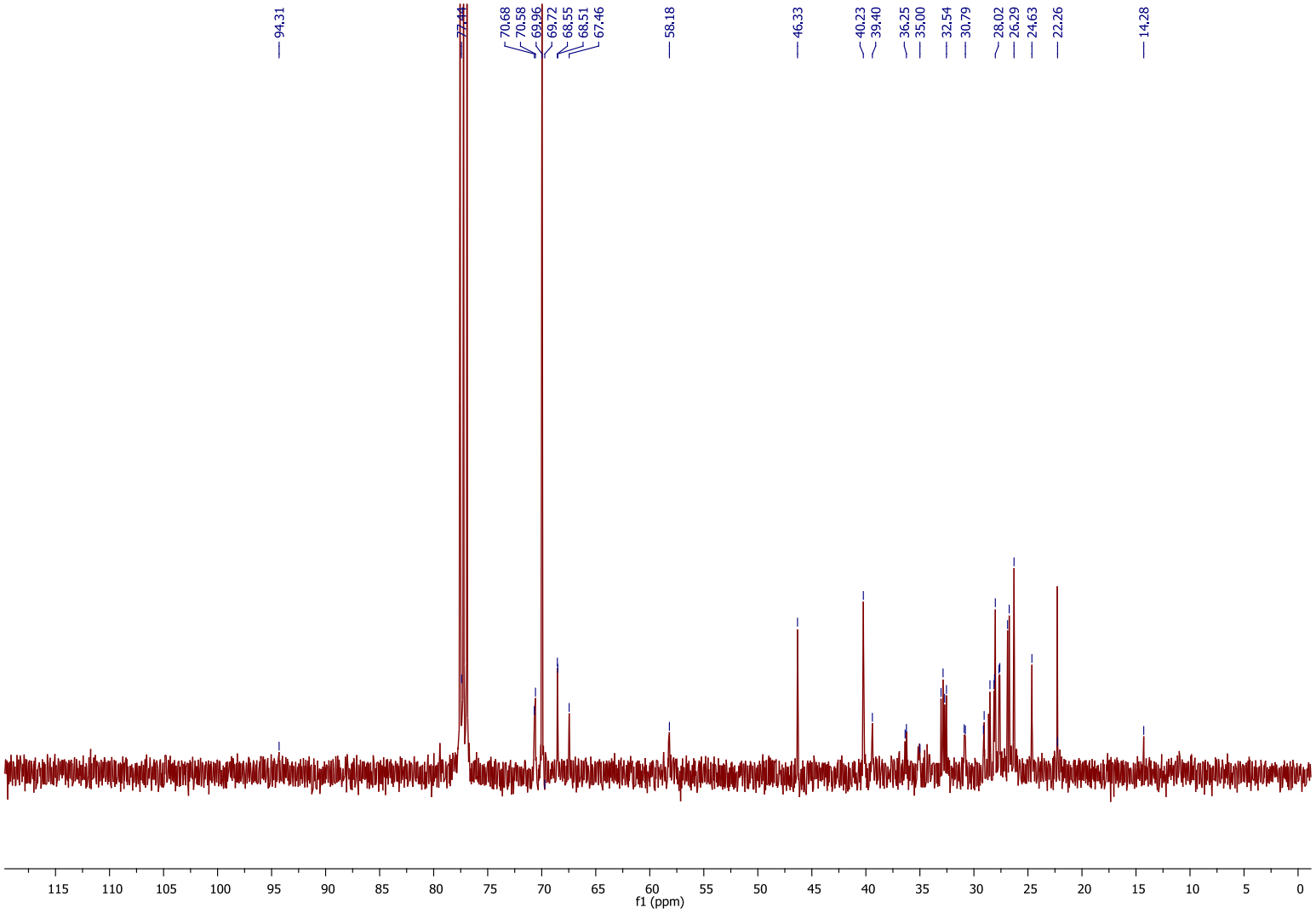
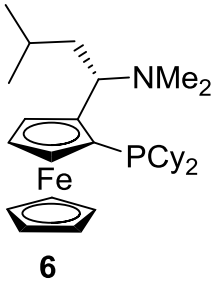


^{13}C-NMR spectrum of **6** in $CDCl_3$





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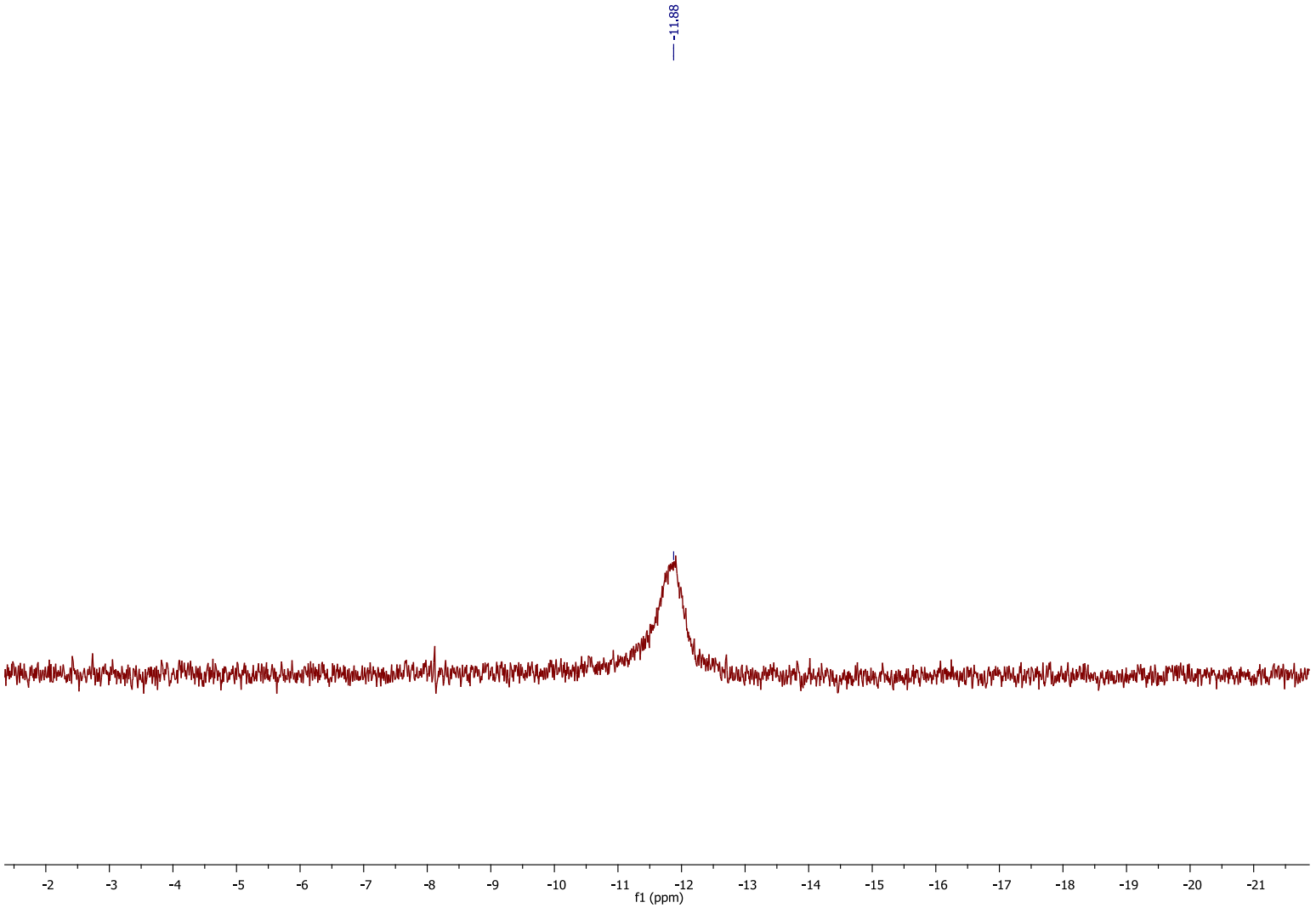
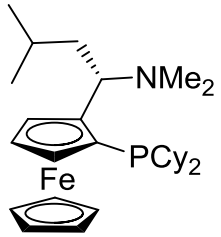
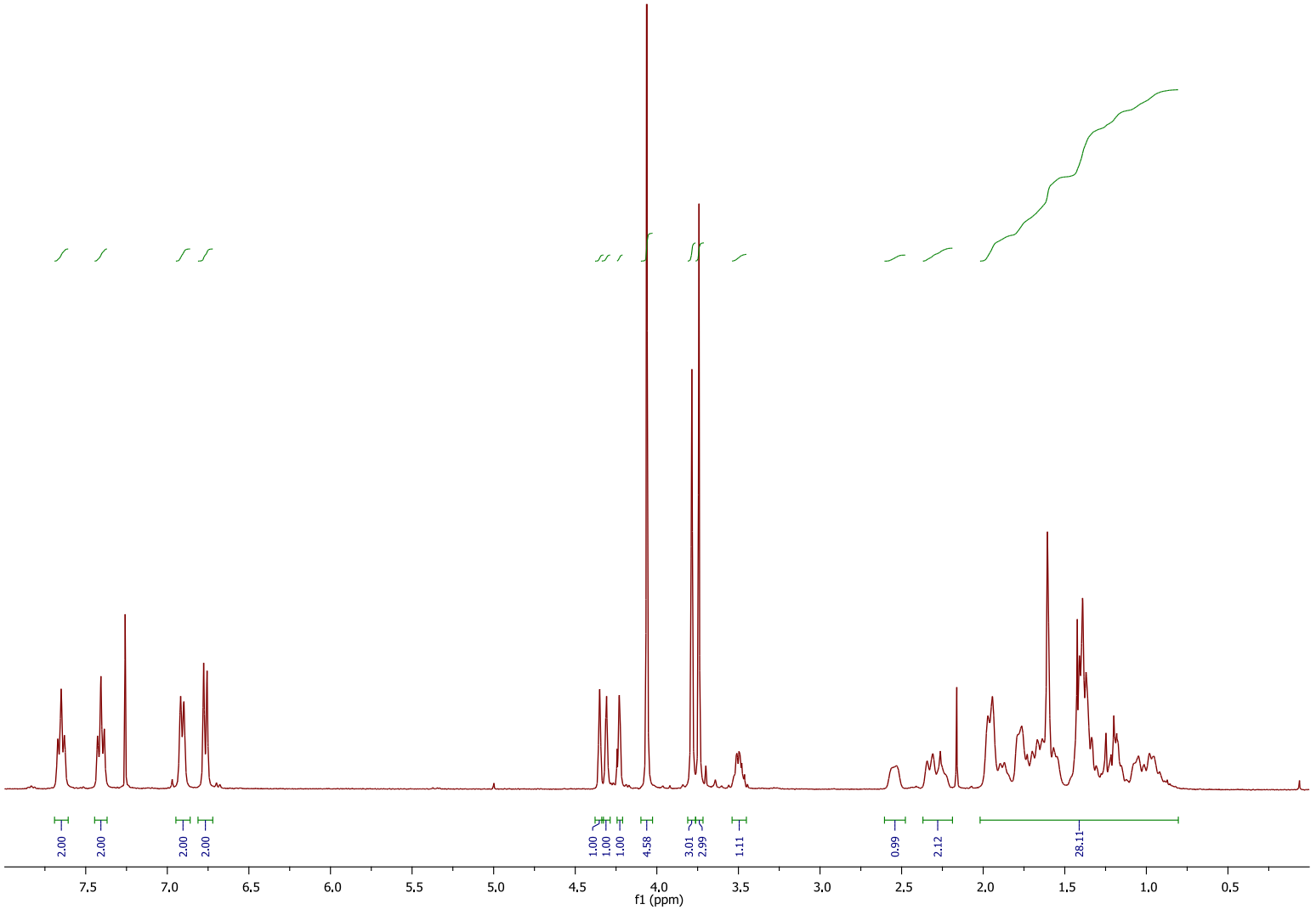
^{31}P-NMR spectrum of **6** in $CDCl_3$

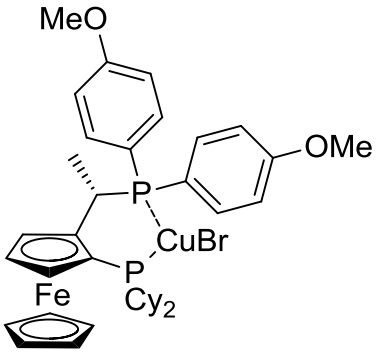




6

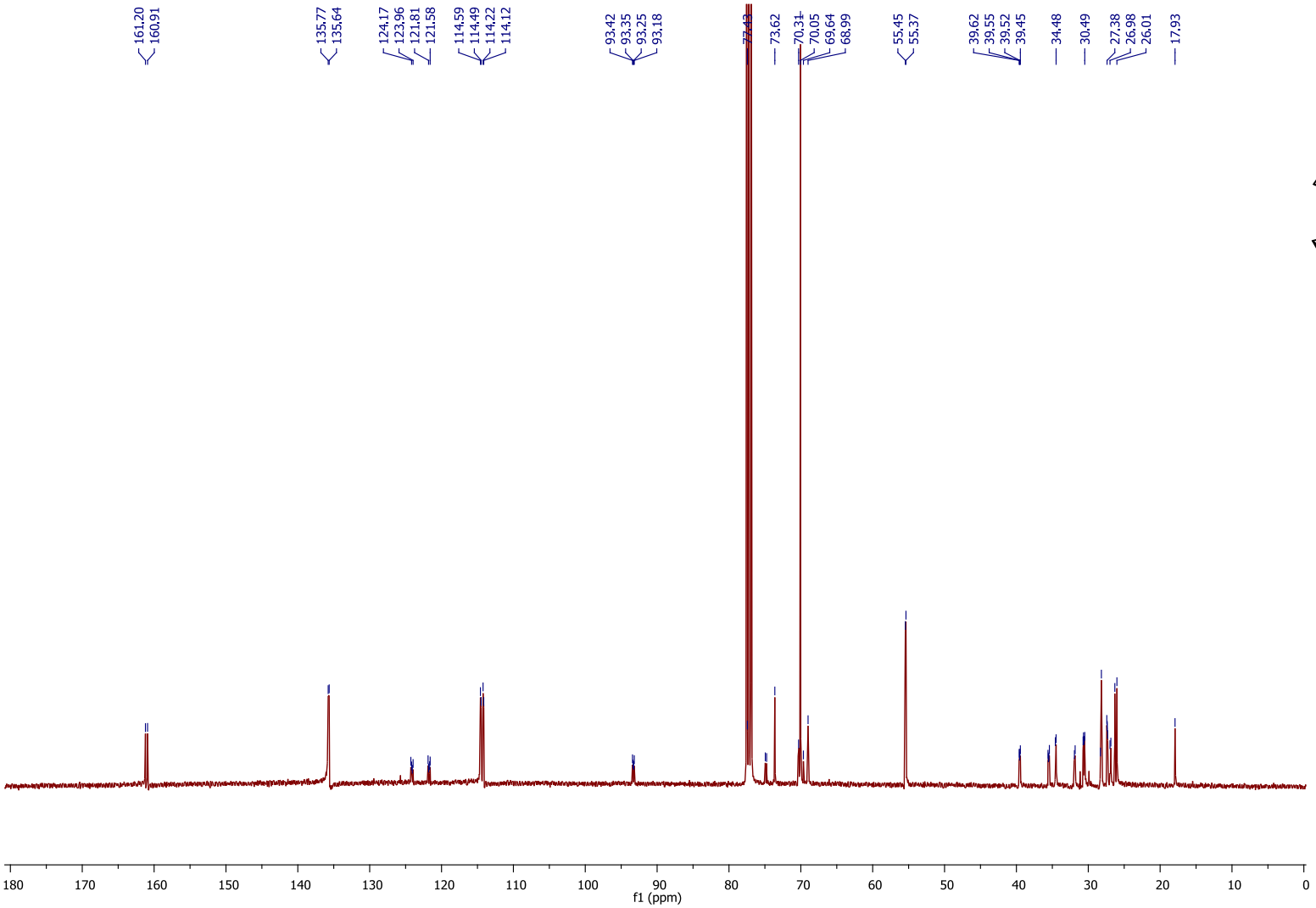
^{1}H-NMR spectrum of Cu-**L1** in $CDCl_3$

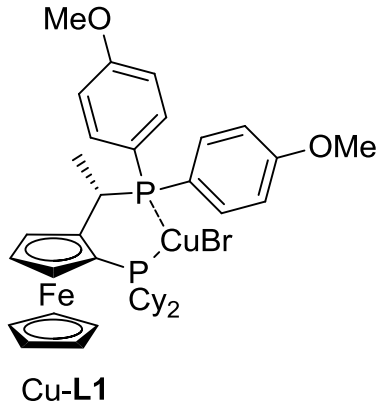




Cu-**L1**

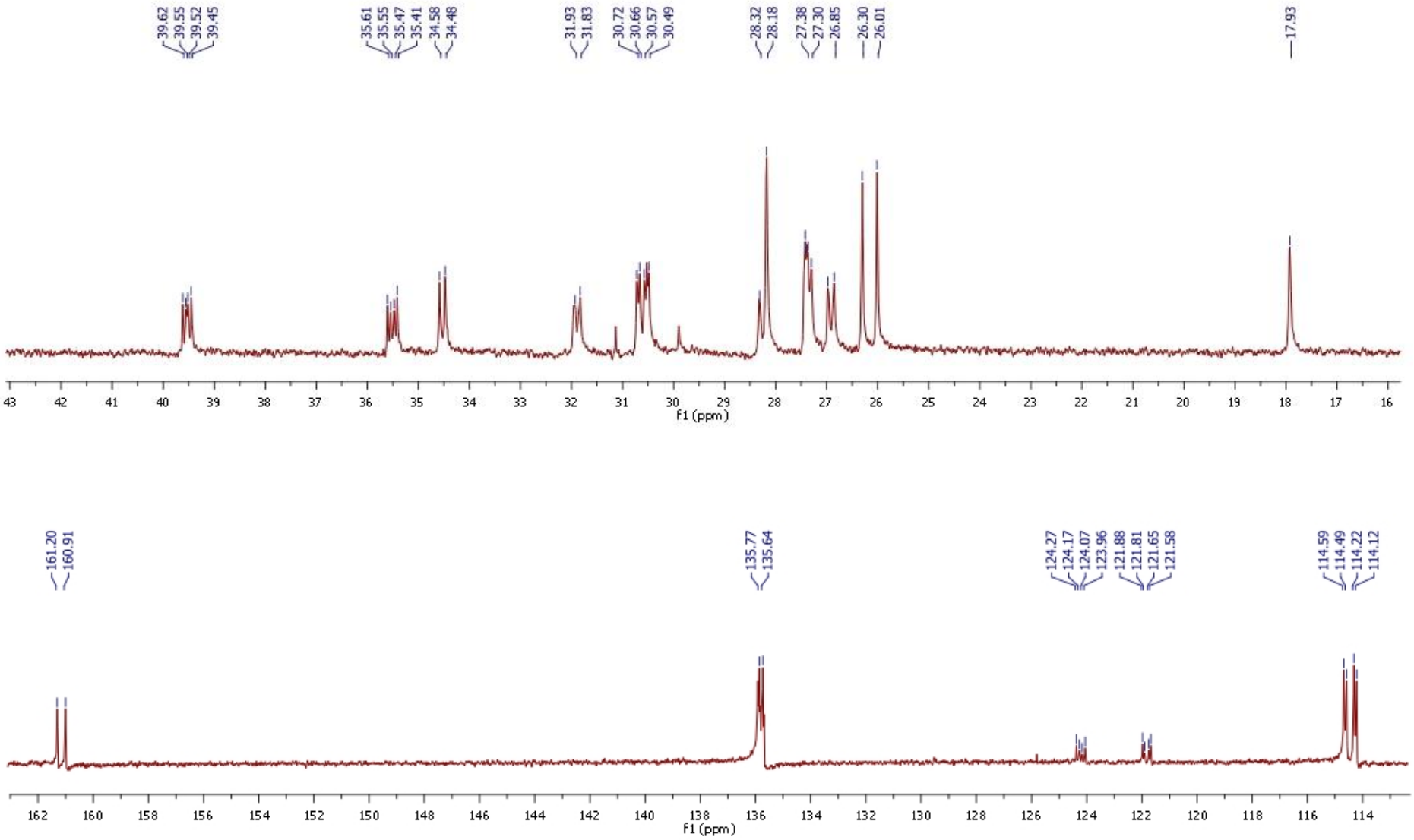
^{13}C-NMR spectrum of Cu-**L1** in $CDCl_3$



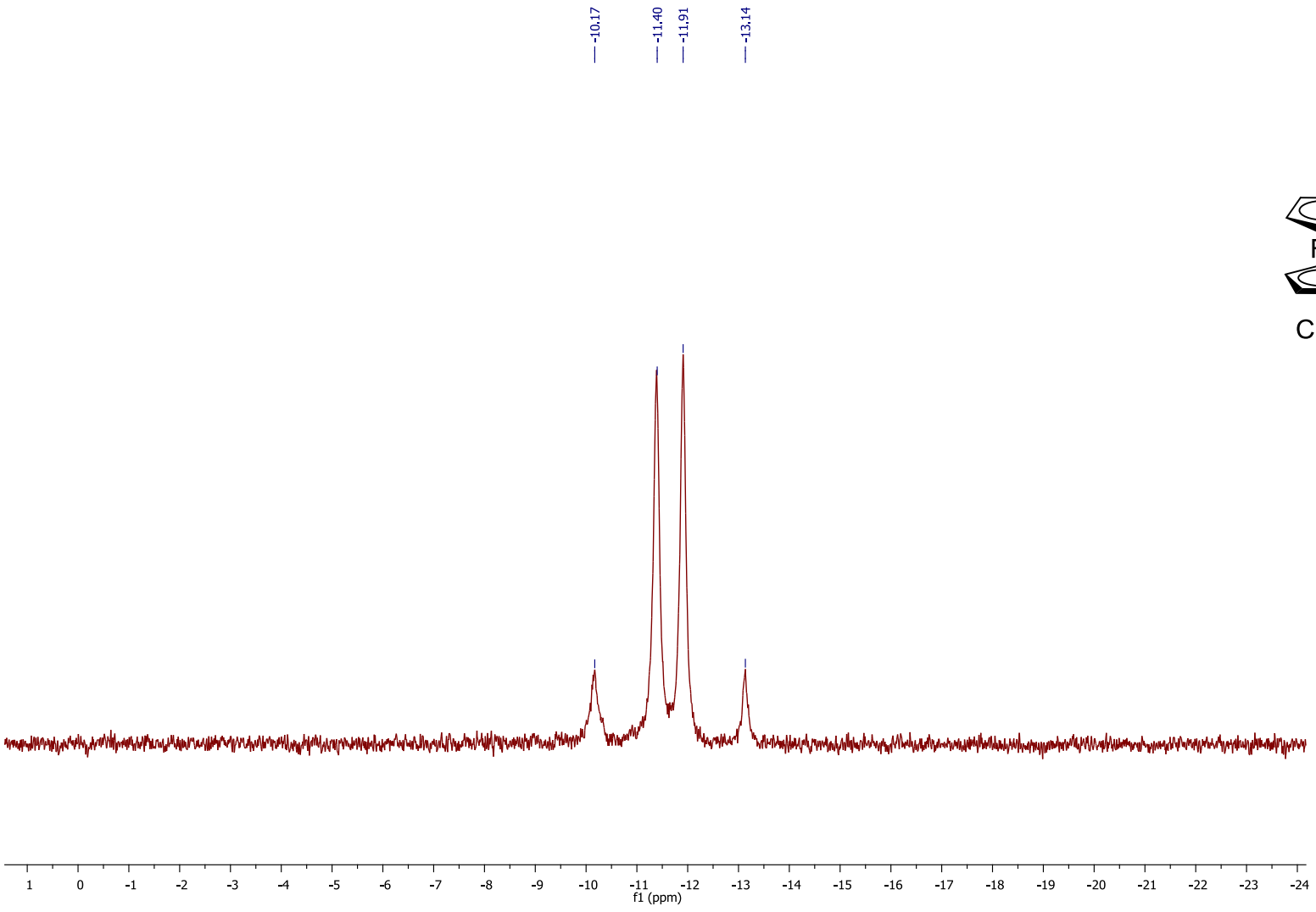


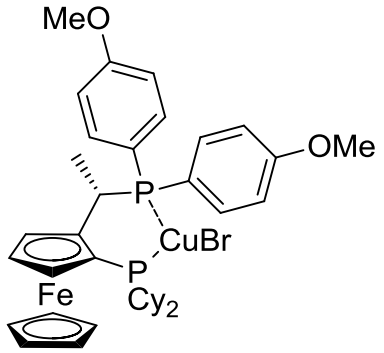
Cu-**L1**

^{13}C-NMR spectrum of Cu-**L1** in $CDCl_3$



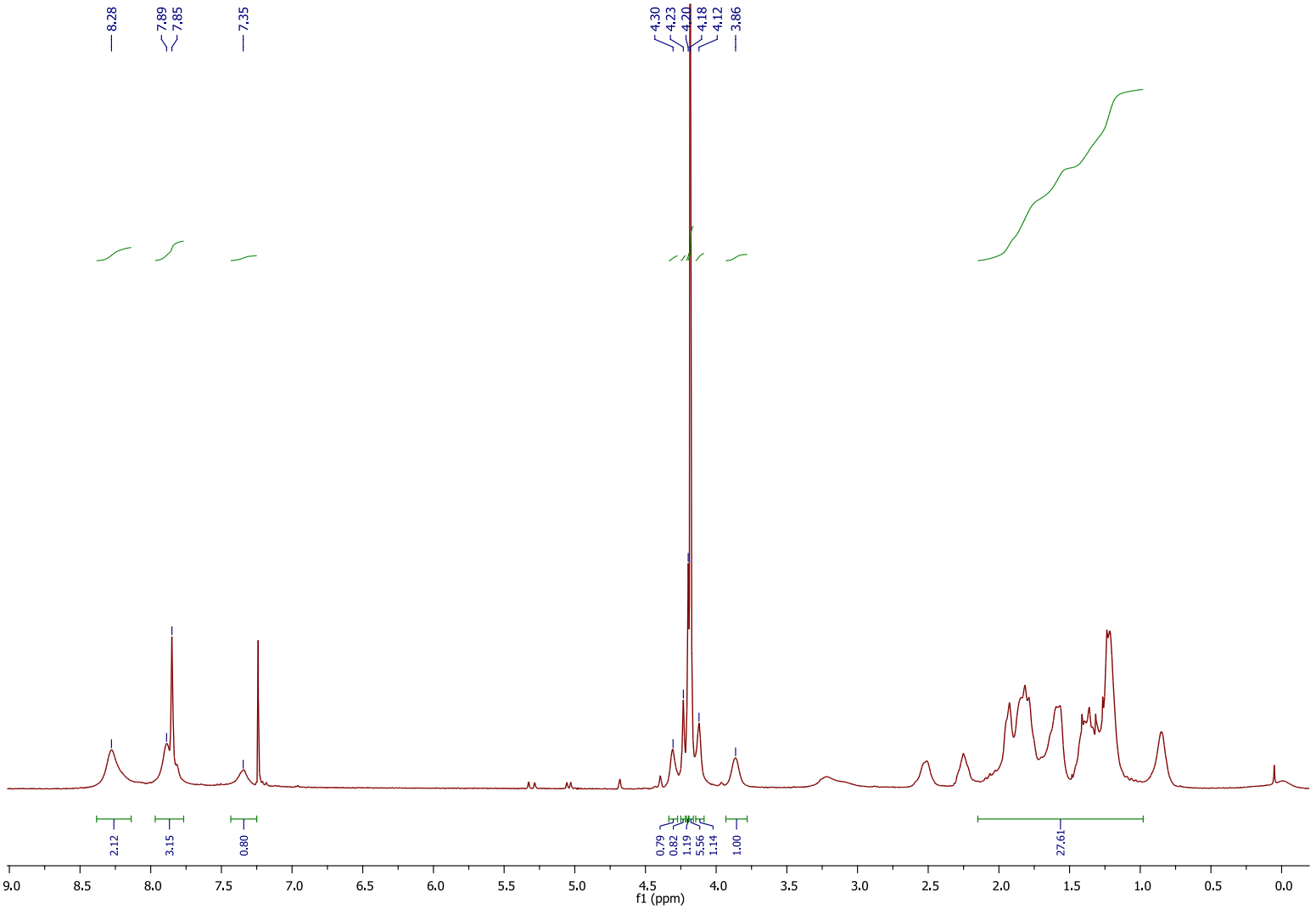
^{31}P-NMR spectrum of Cu-**L1** in $CDCl_3$

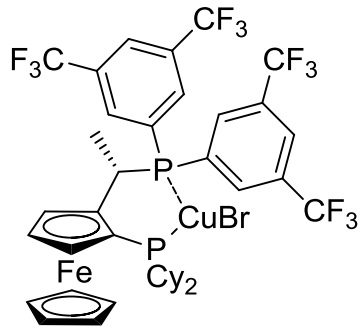




Cu-**L1**

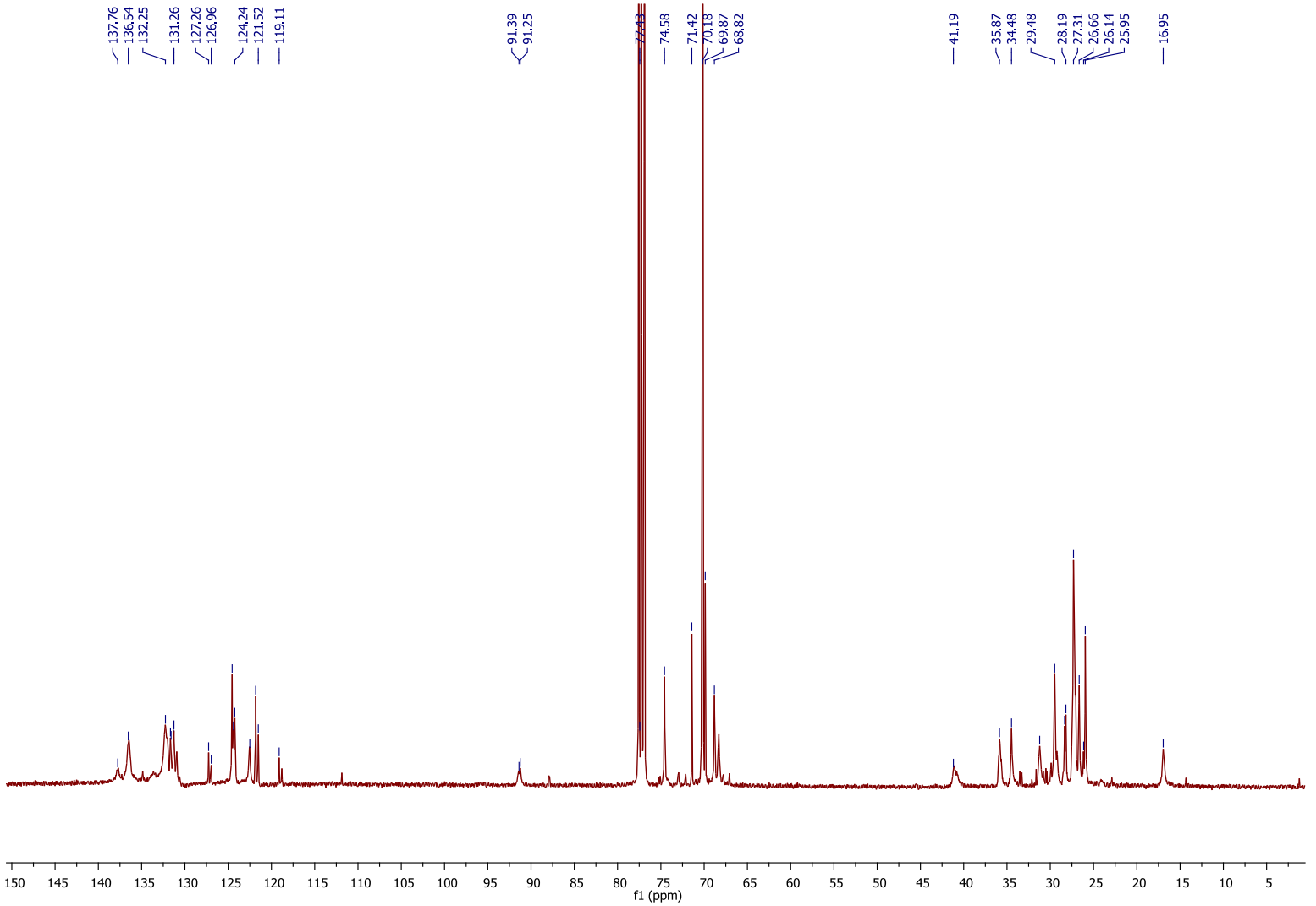
^{1}H-NMR spectrum of Cu-**L2** in $CDCl_3$

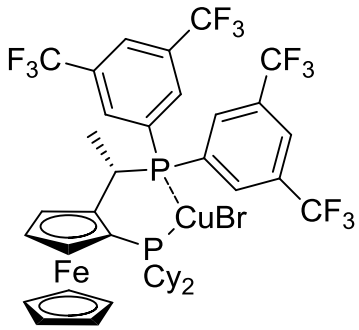




Cu-**L2**

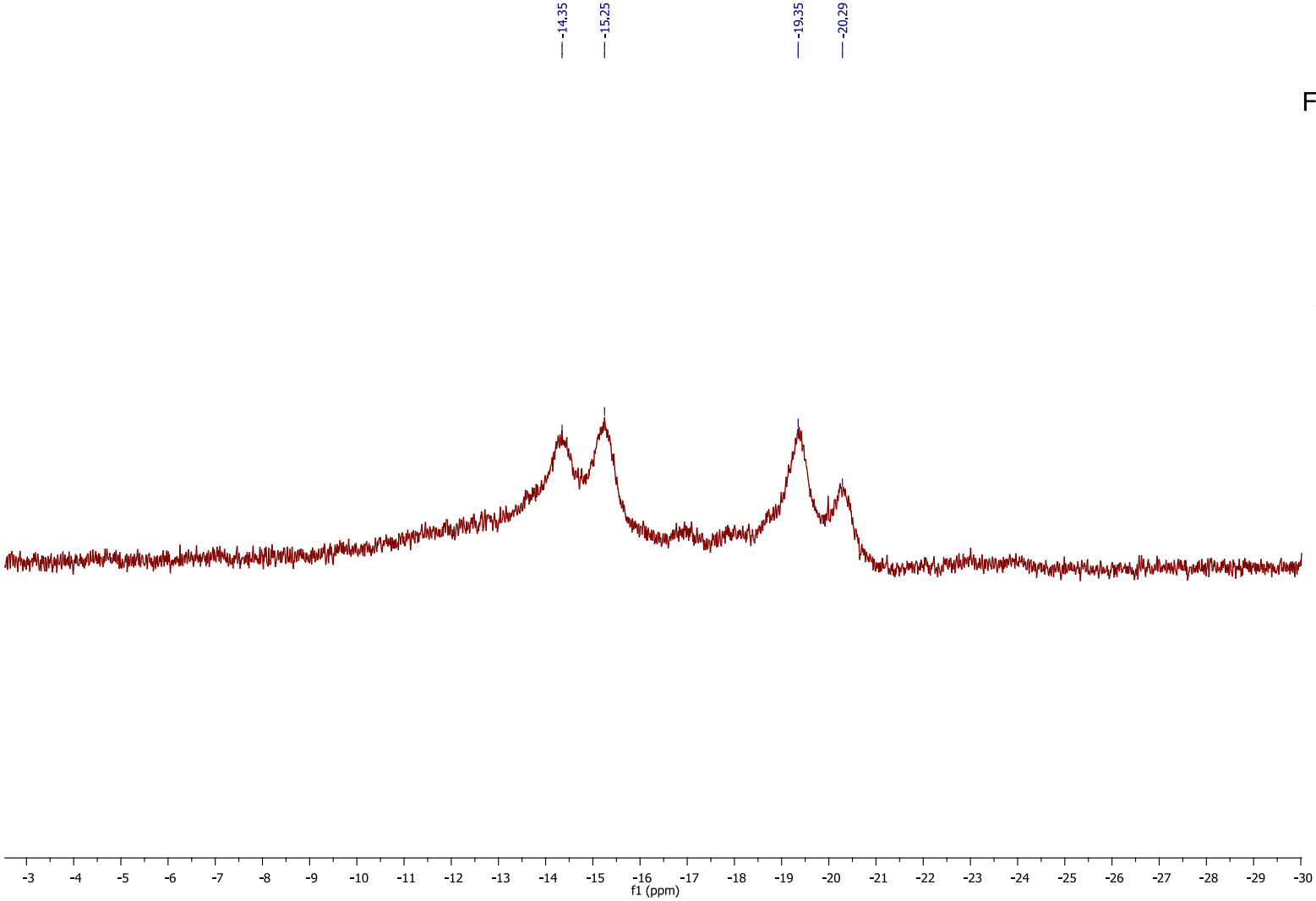
^{13}C-NMR spectrum of Cu-**L2** in $CDCl_3$

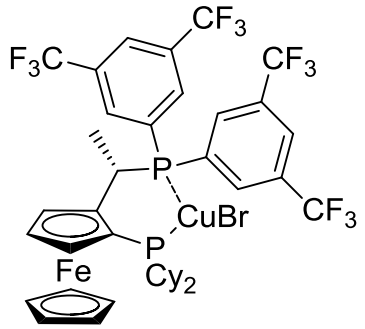




Cu-**L2**

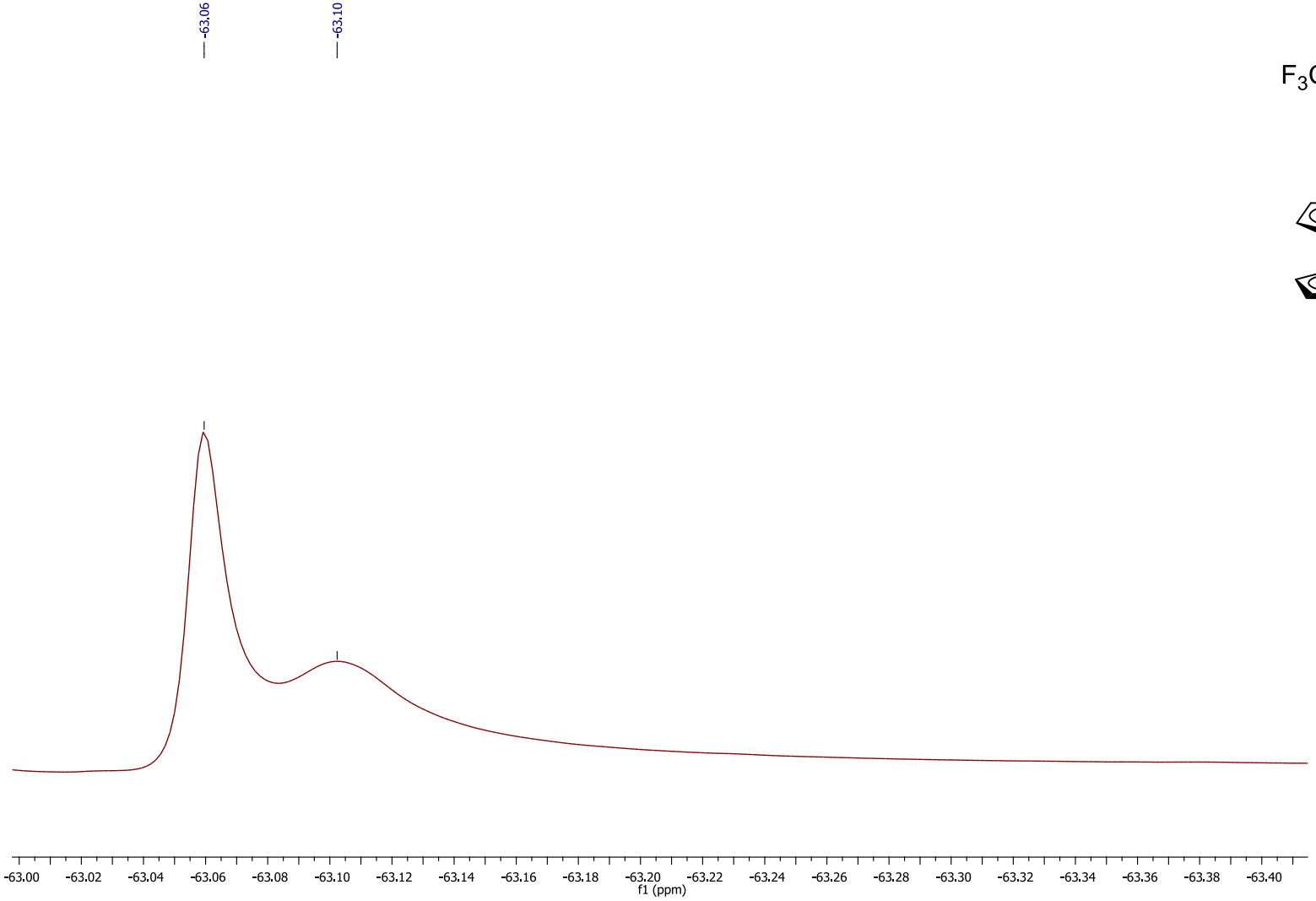
^{31}P-NMR spectrum of Cu-**L2** in $CDCl_3$

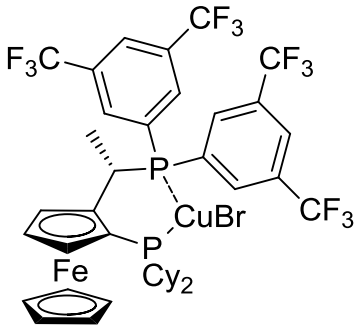




Cu-**L2**

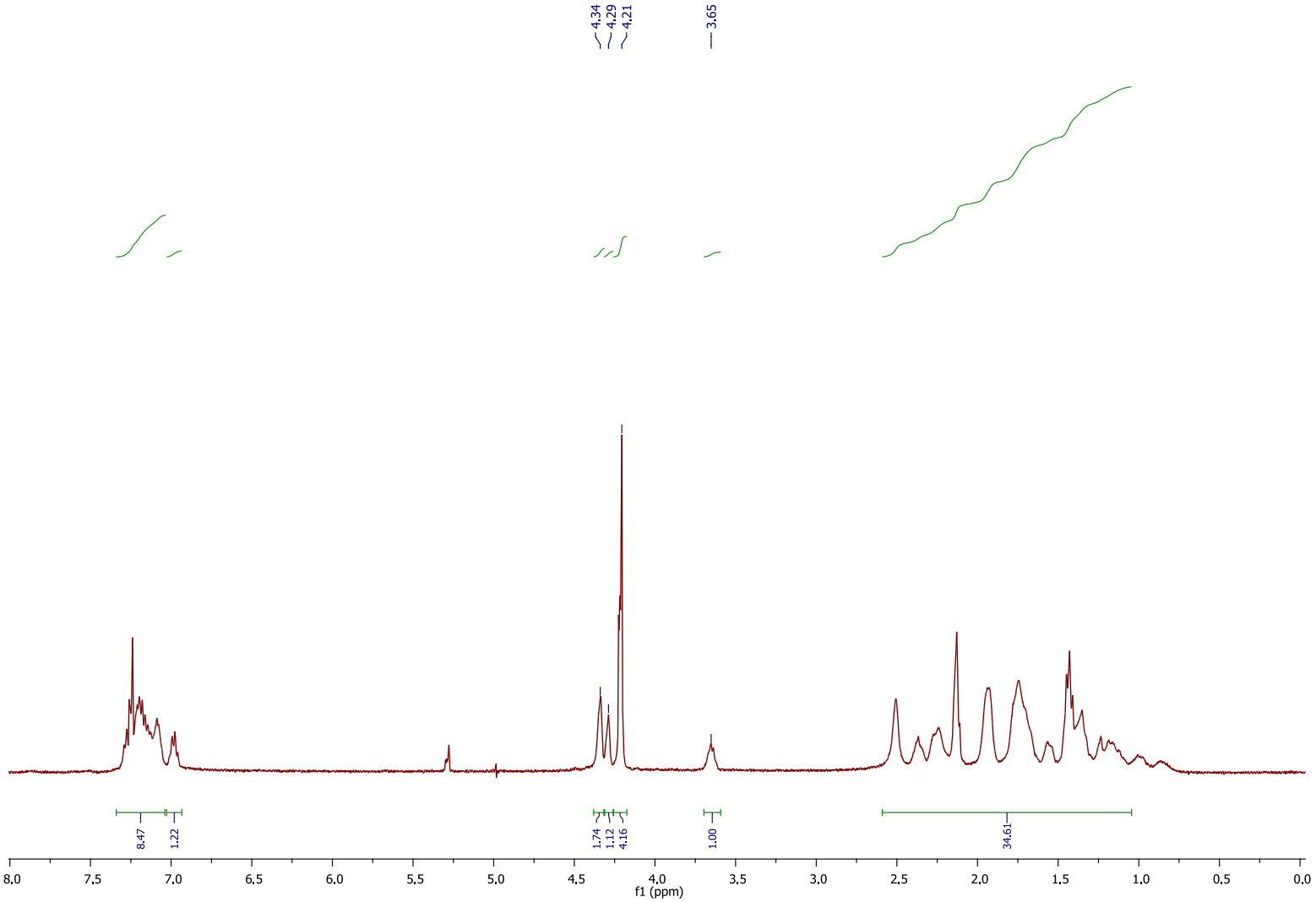
^{19}F-NMR spectrum of Cu-**L2** in $CDCl_3$

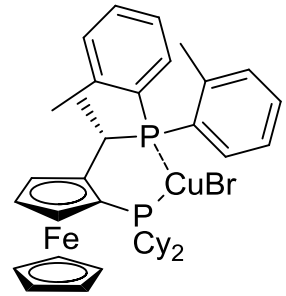




Cu-**L2**

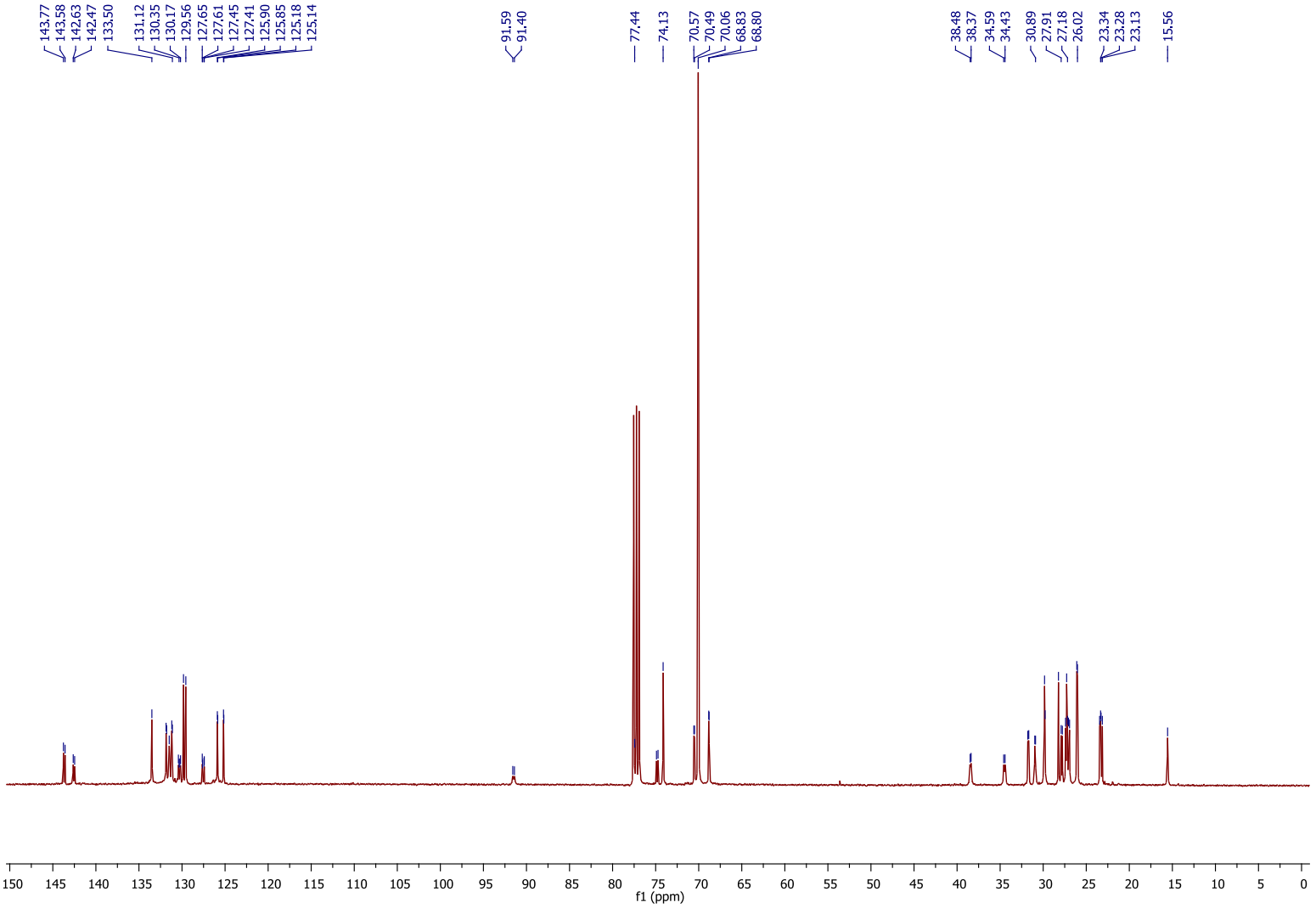
^{1}H-NMR spectrum of Cu-**L3** in $CDCl_3$

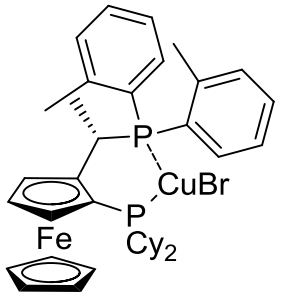




Cu-**L3**

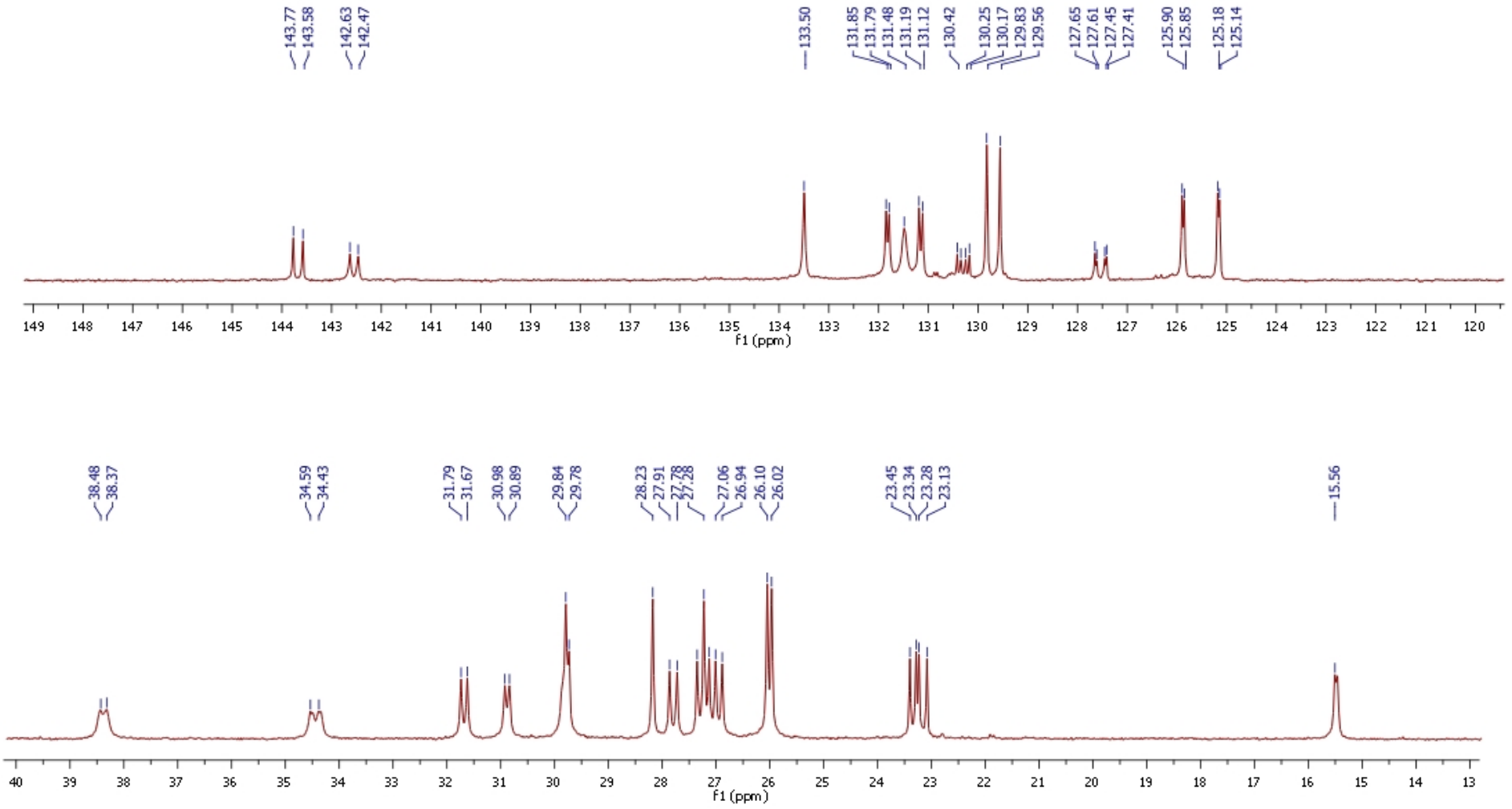
^{13}C-NMR spectrum of Cu-**L3** in $CDCl_3$



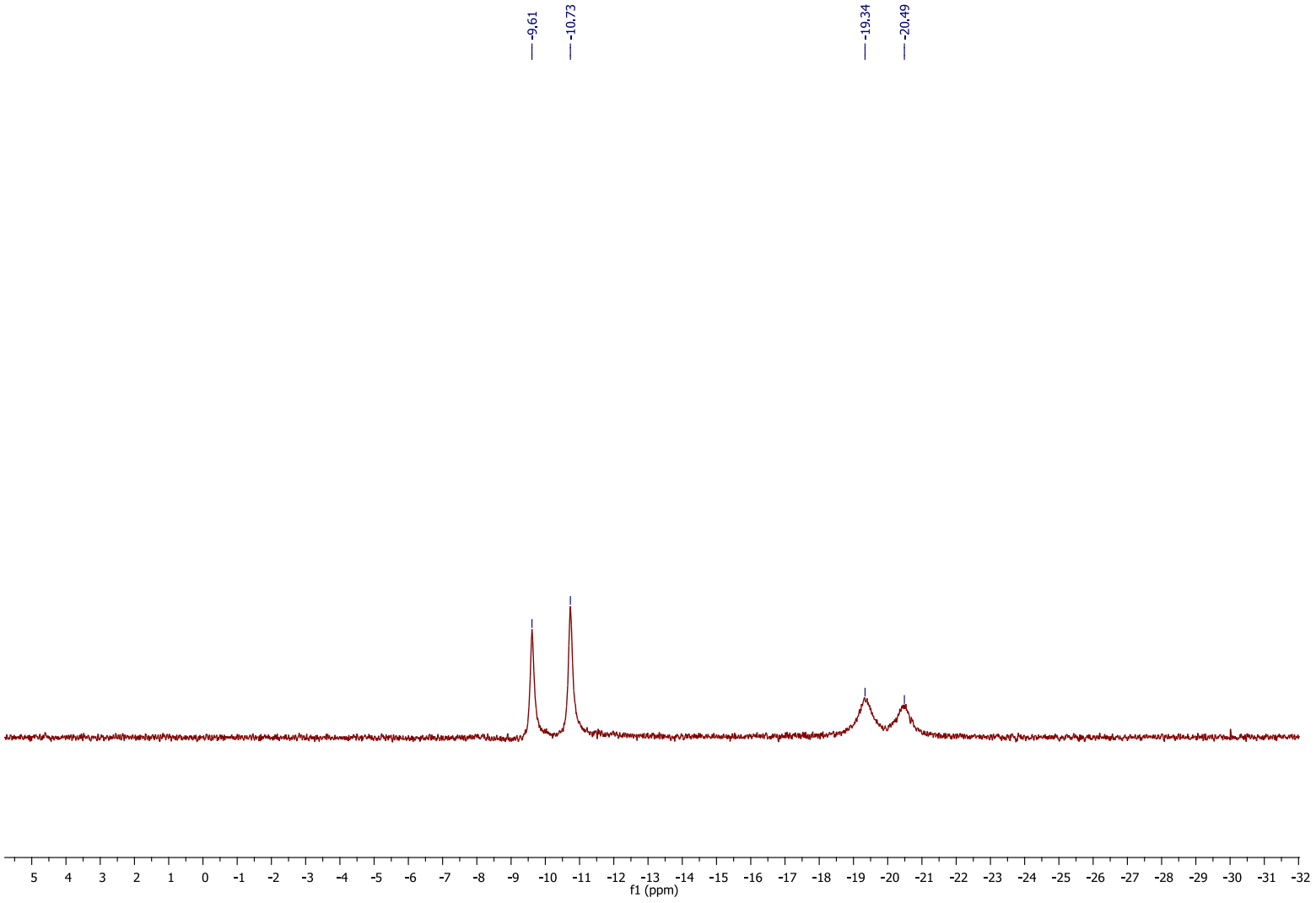


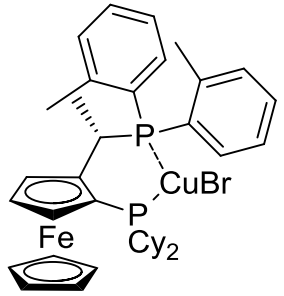
Cu-**L3**

^{13}C-NMR spectrum of Cu-**L3** in $CDCl_3$



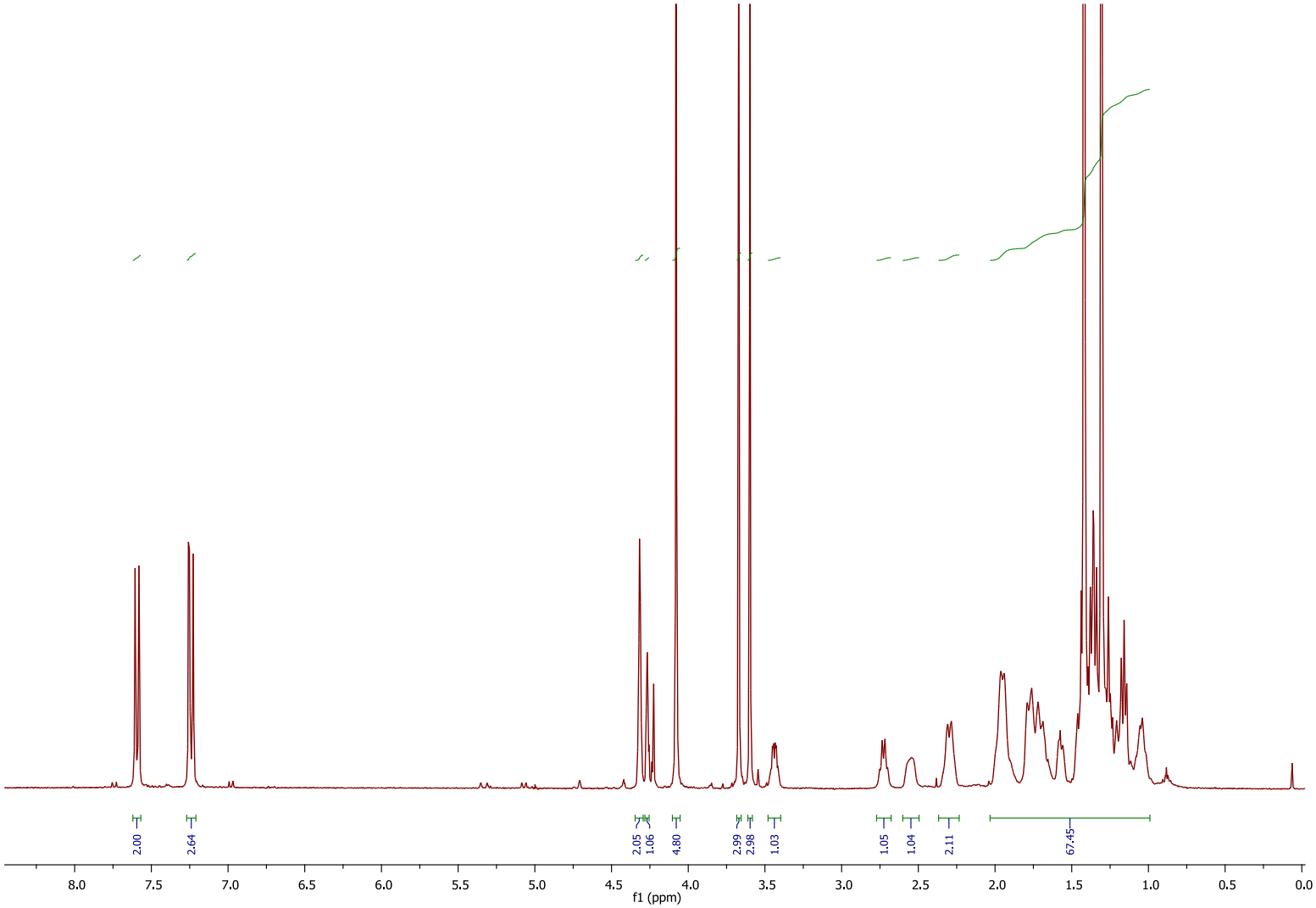
^{31}P-NMR spectrum of Cu-**L3** in $CDCl_3$

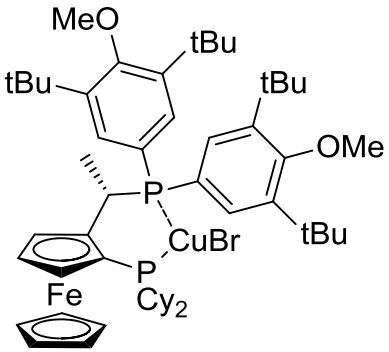




Cu-**L3**

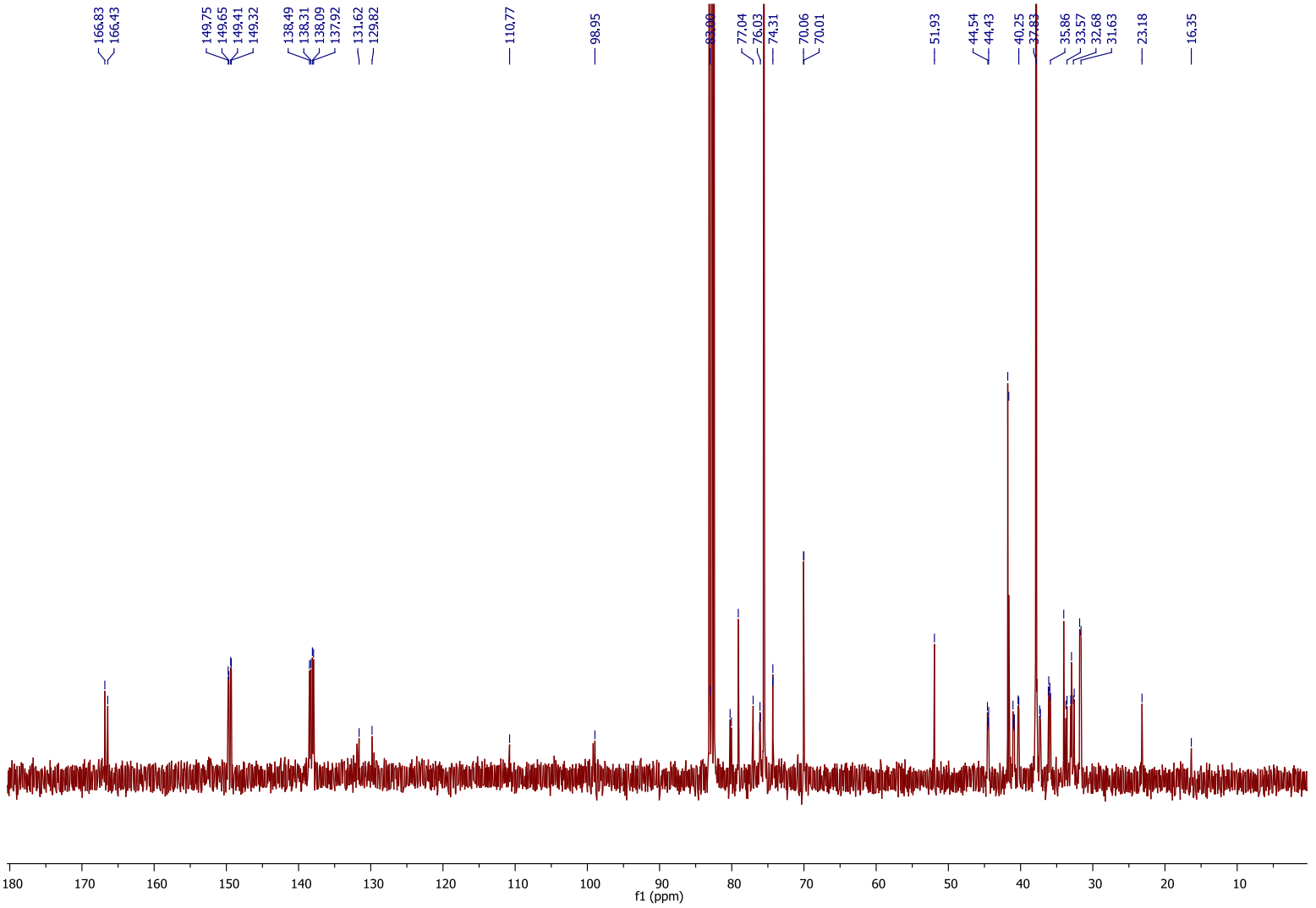
^{1}H-NMR spectrum of Cu-**L4** in $CDCl_3$

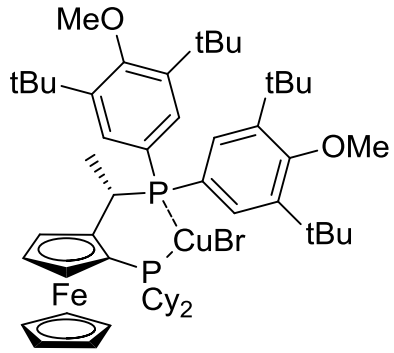




Cu-**L4**

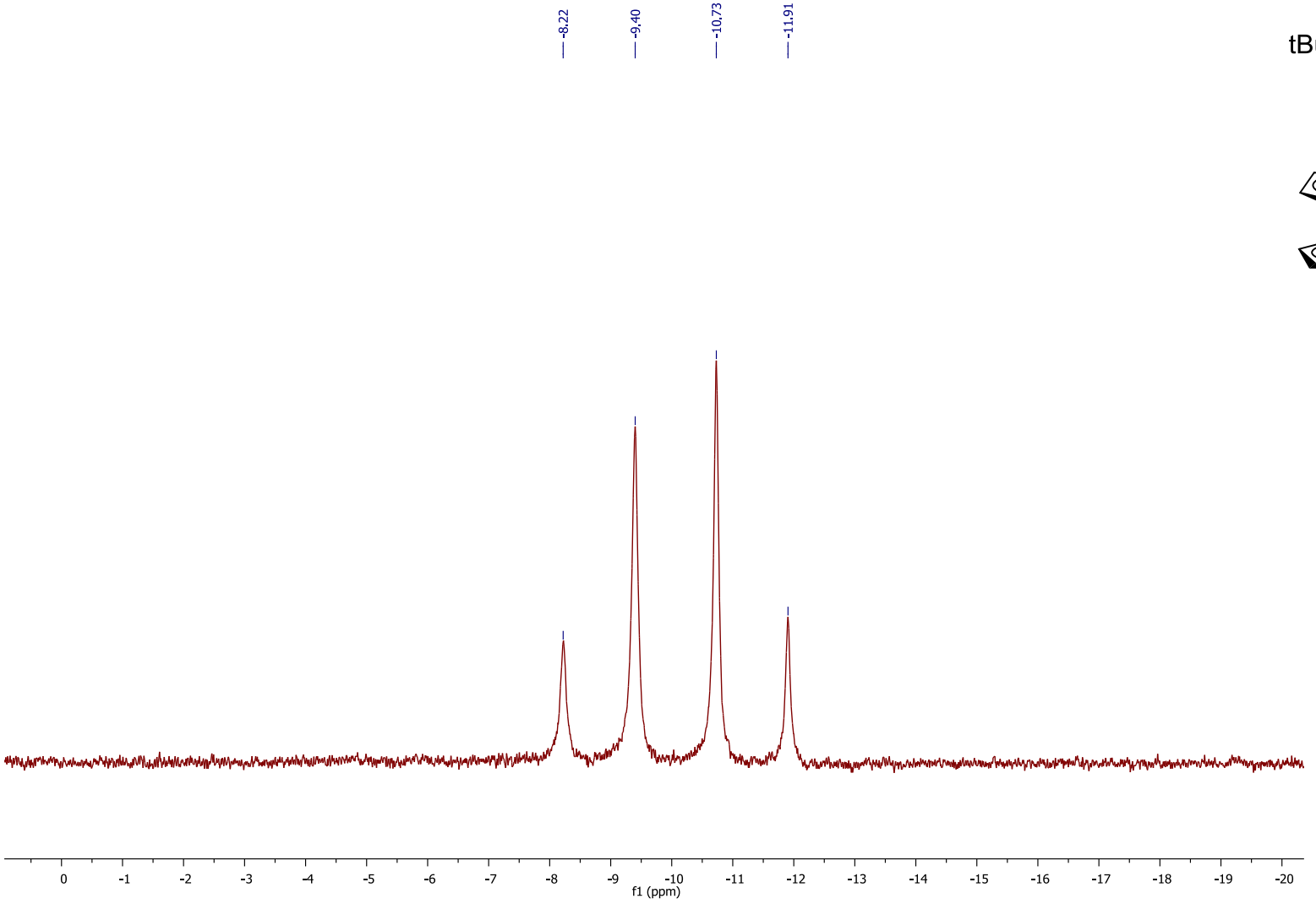
^{13}C-NMR spectrum of Cu-**L4** in $CDCl_3$

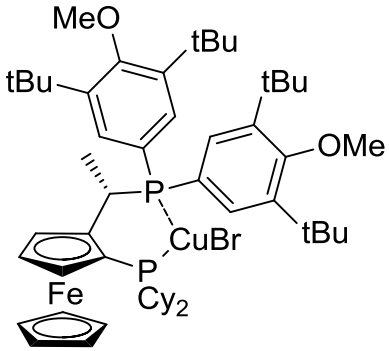




Cu-**L4**

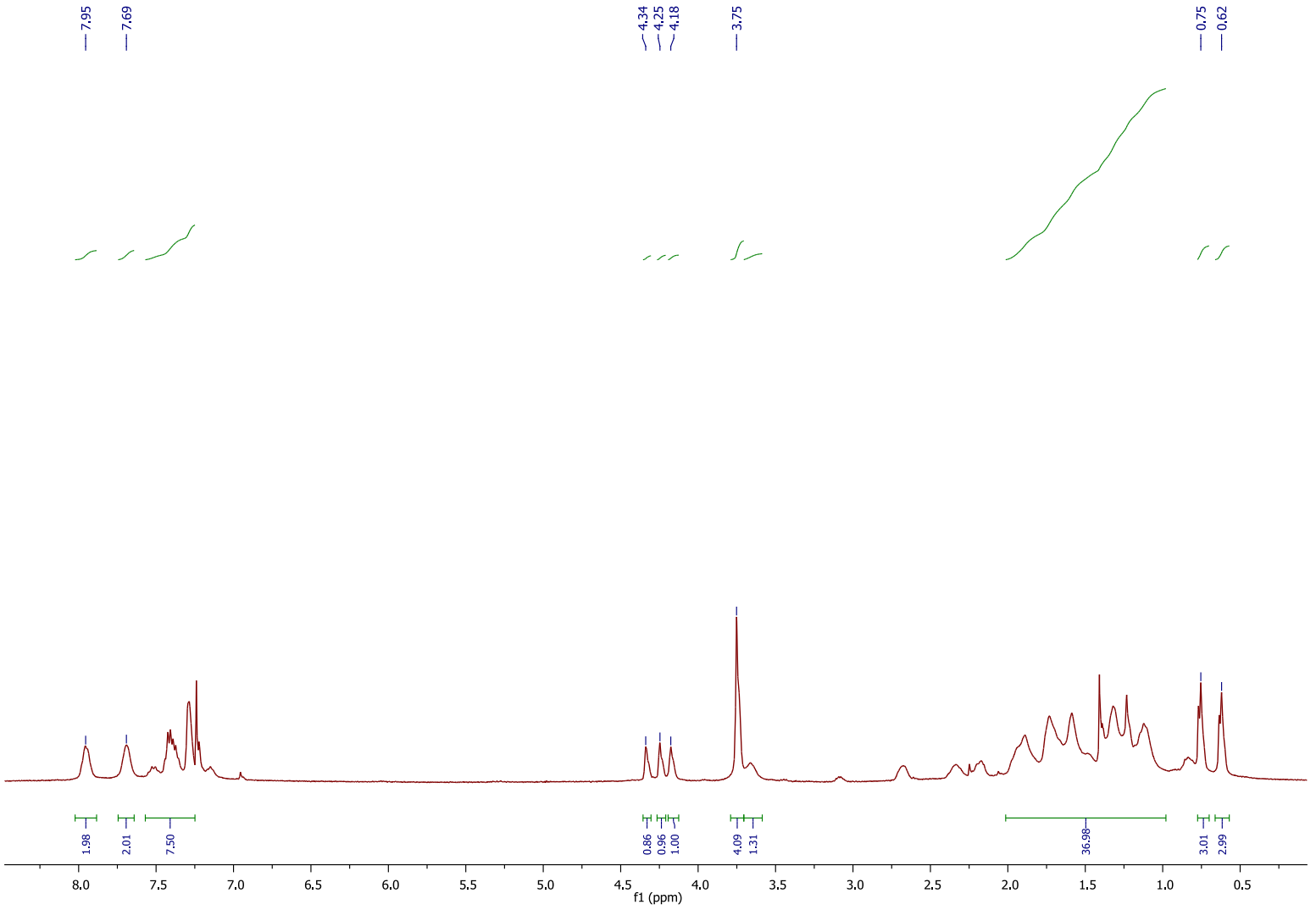
^{31}P-NMR spectrum of Cu-**L4** in $CDCl_3$

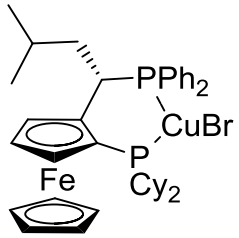




Cu-**L4**

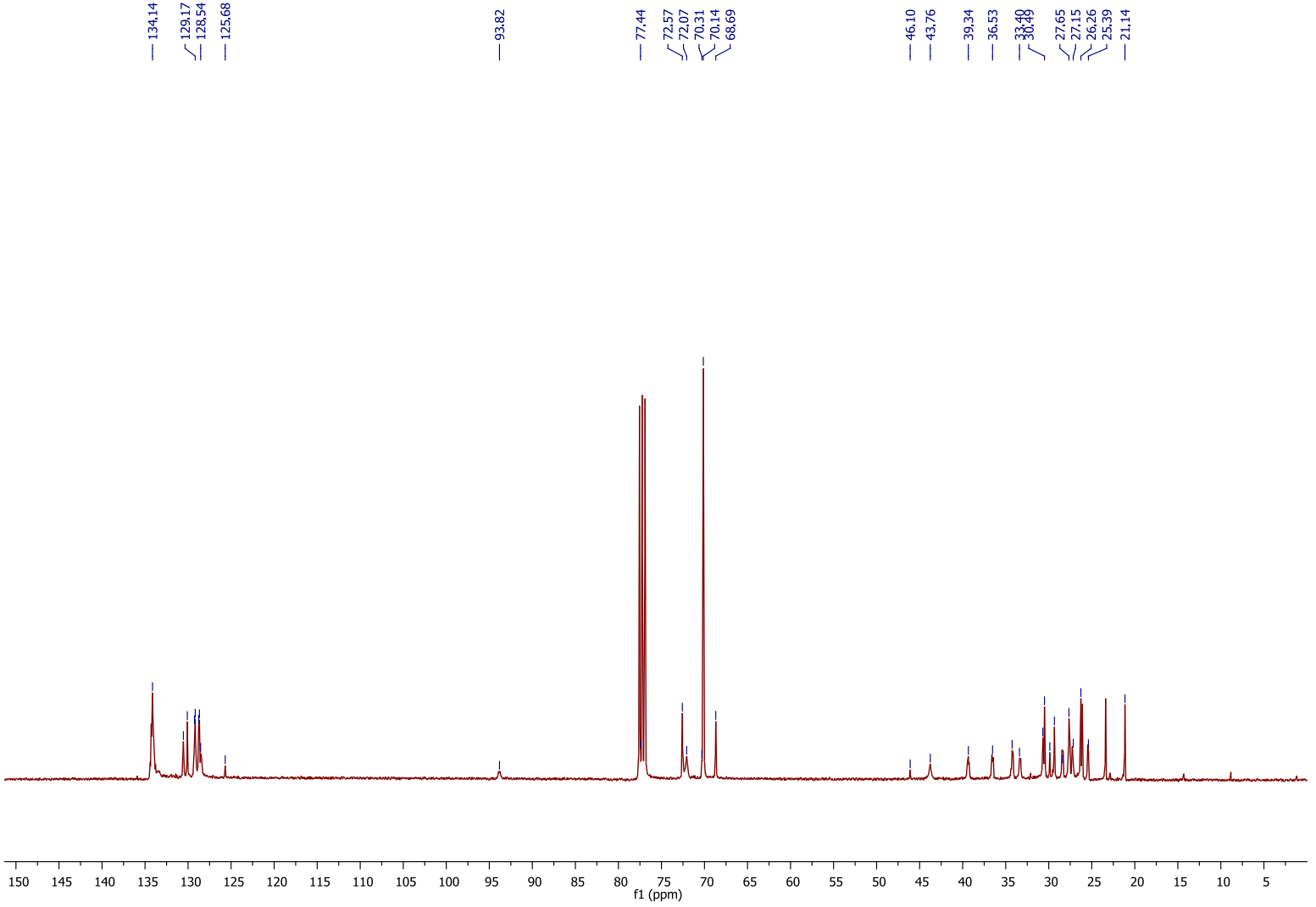
^{1}H-NMR spectrum of Cu-**L5** in $CDCl_3$

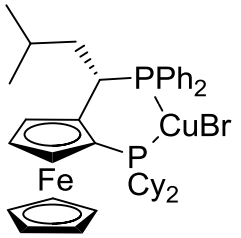




Cu-**L5**

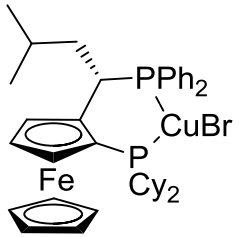
^{13}C-NMR spectrum of Cu-**L5** in $CDCl_3$



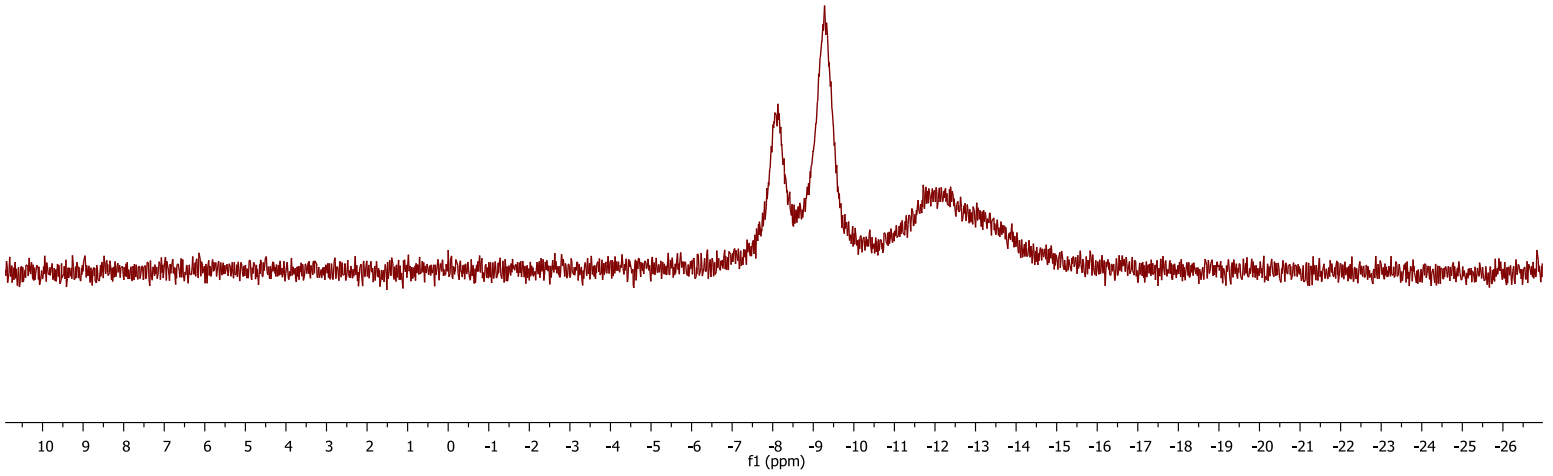


Cu-**L5**

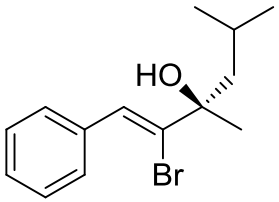
^{31}P-NMR spectrum of Cu-**L5** in $CDCl_3$



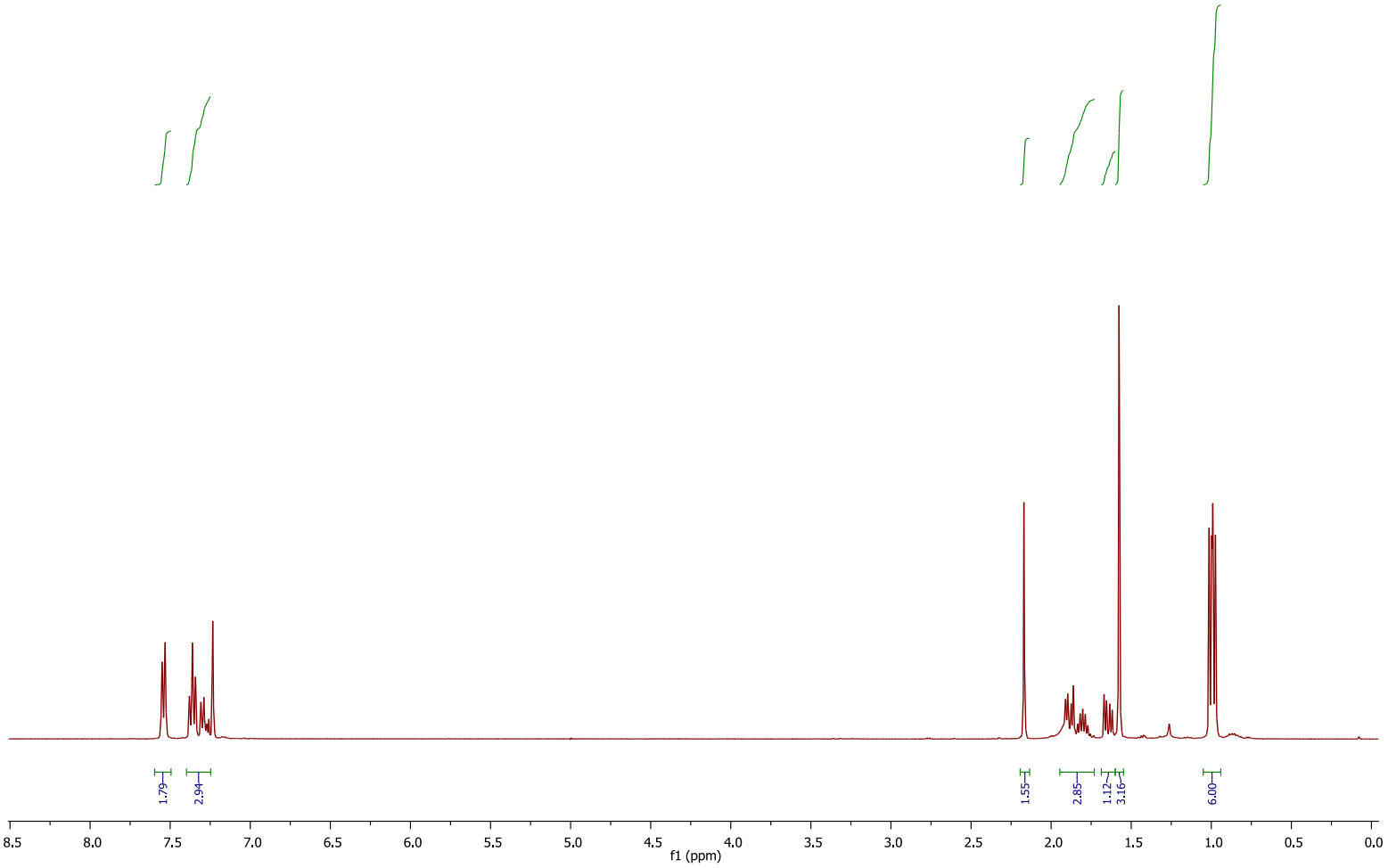
Cu-**L5**



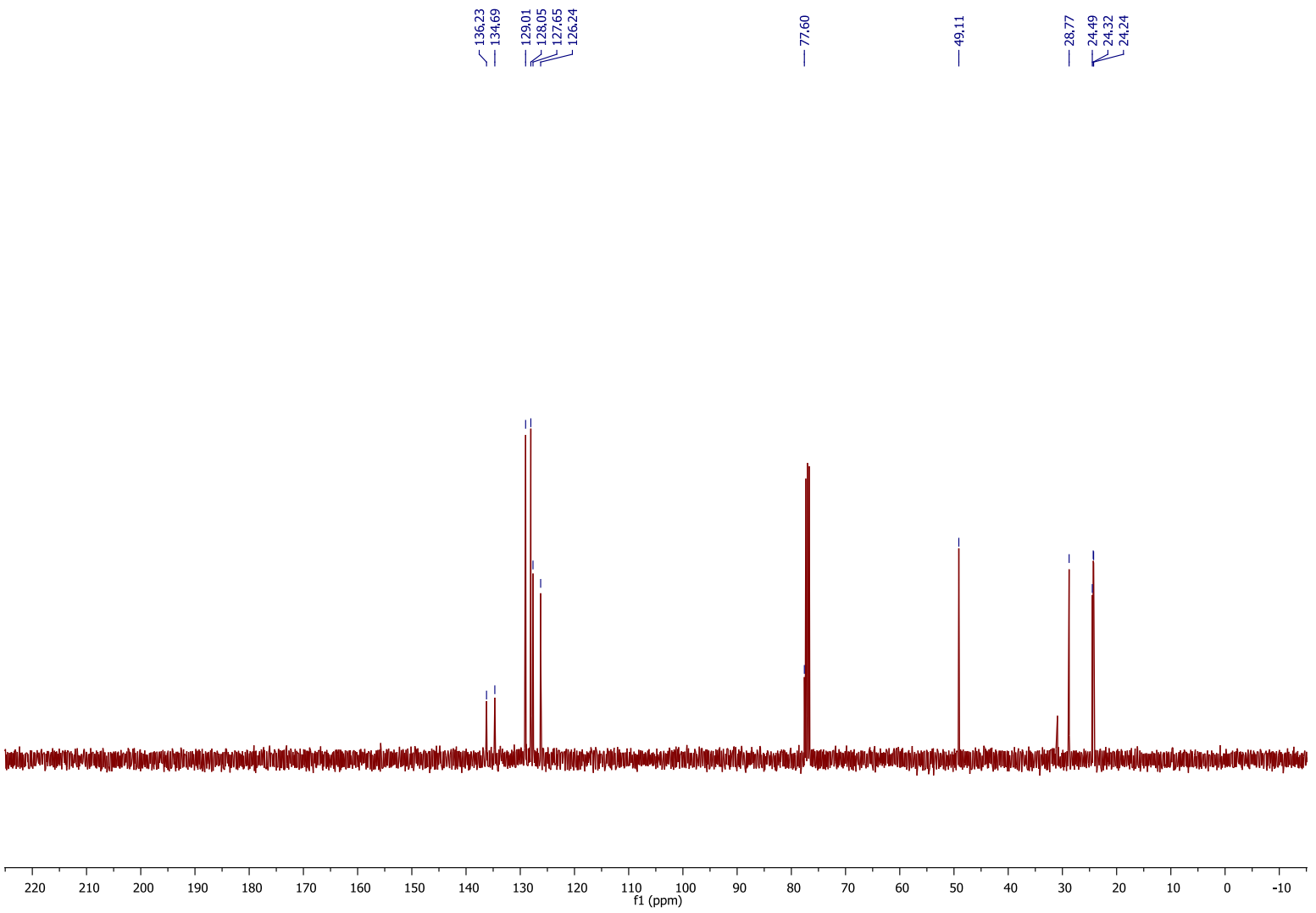
^{1}H-NMR spectrum of **8a** in $CDCl_3$

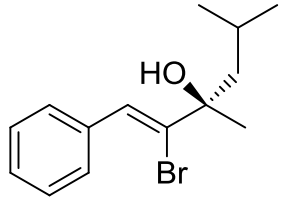


8a



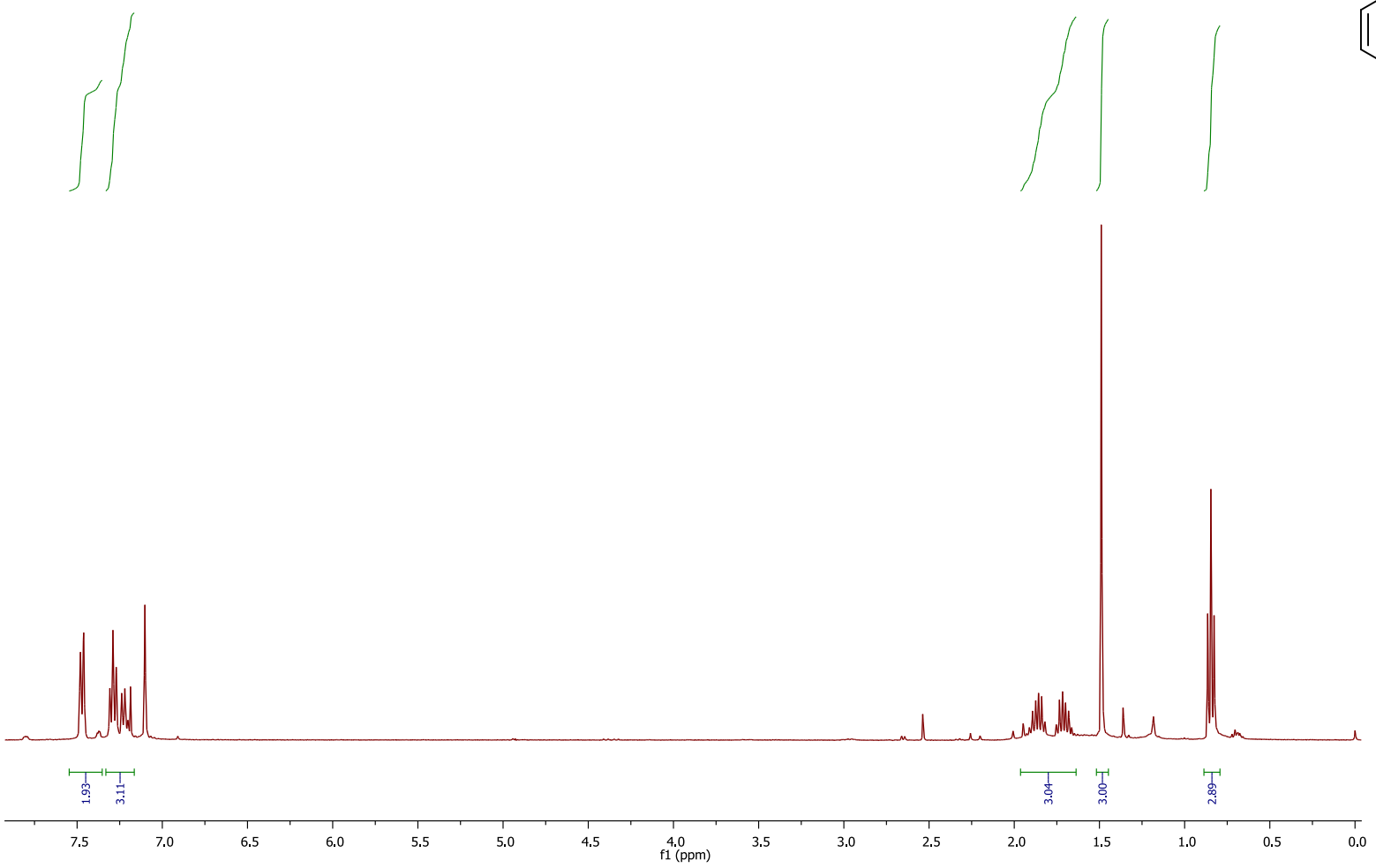
^{13}C-NMR spectrum of **8a** in $CDCl_3$

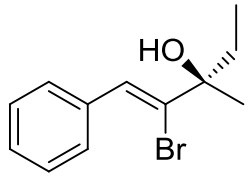




8a

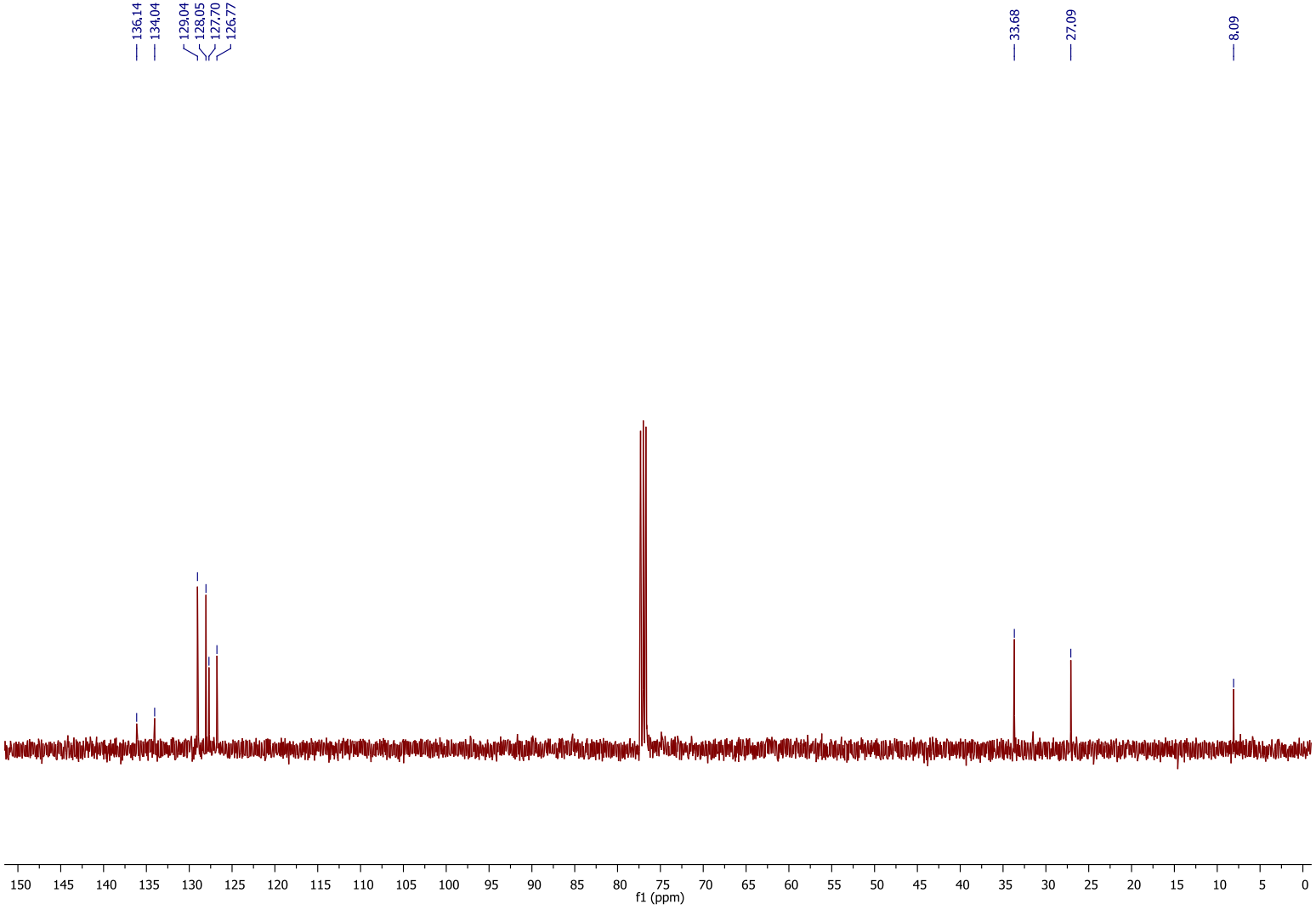
^{1}H-NMR spectrum of **8B** in $CDCl_3$

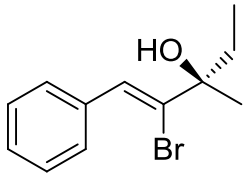




8b

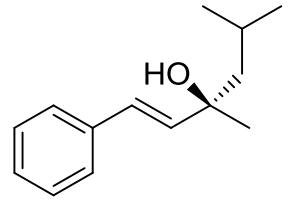
^{13}C-NMR spectrum of **8b** in $CDCl_3$



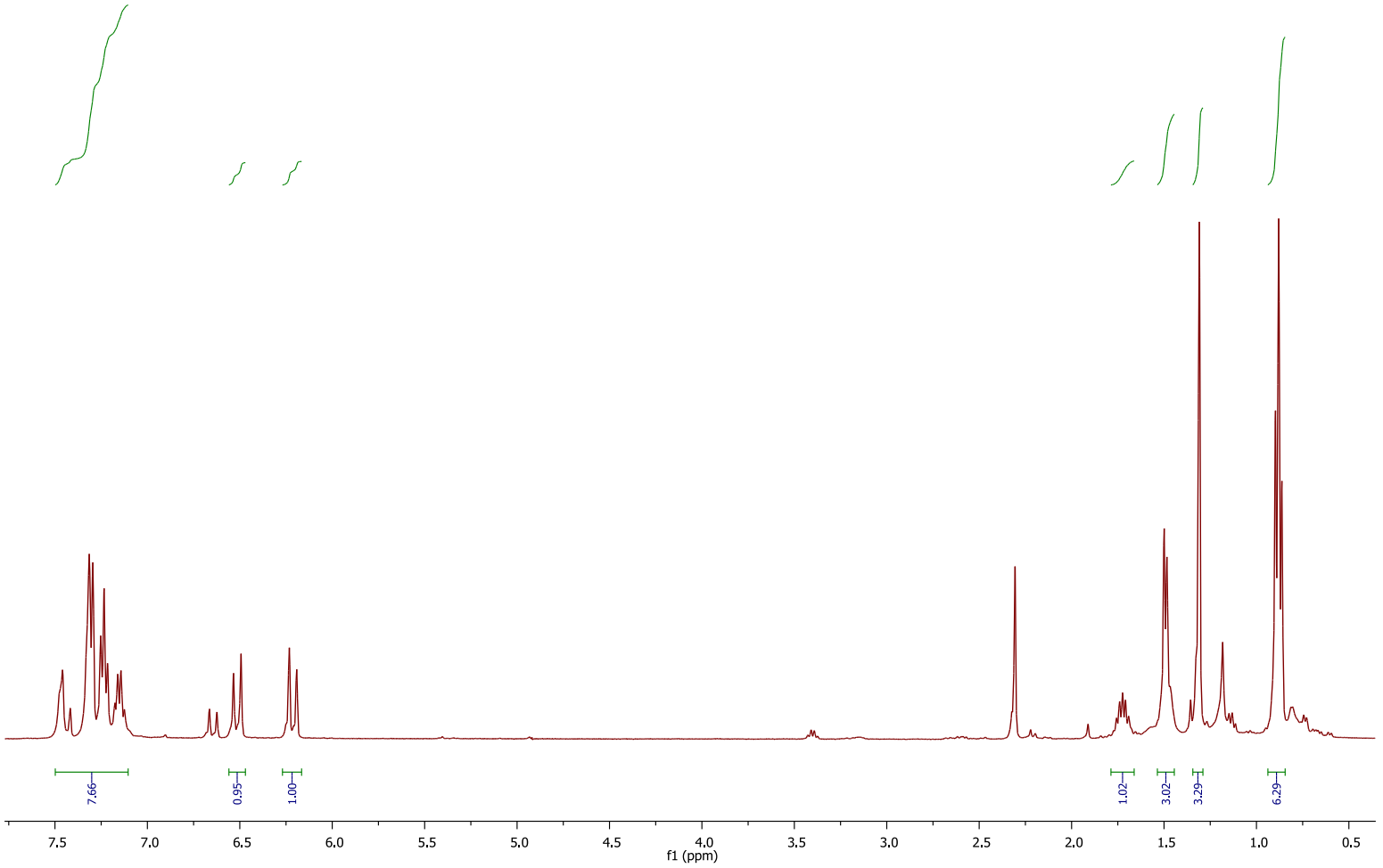


8b

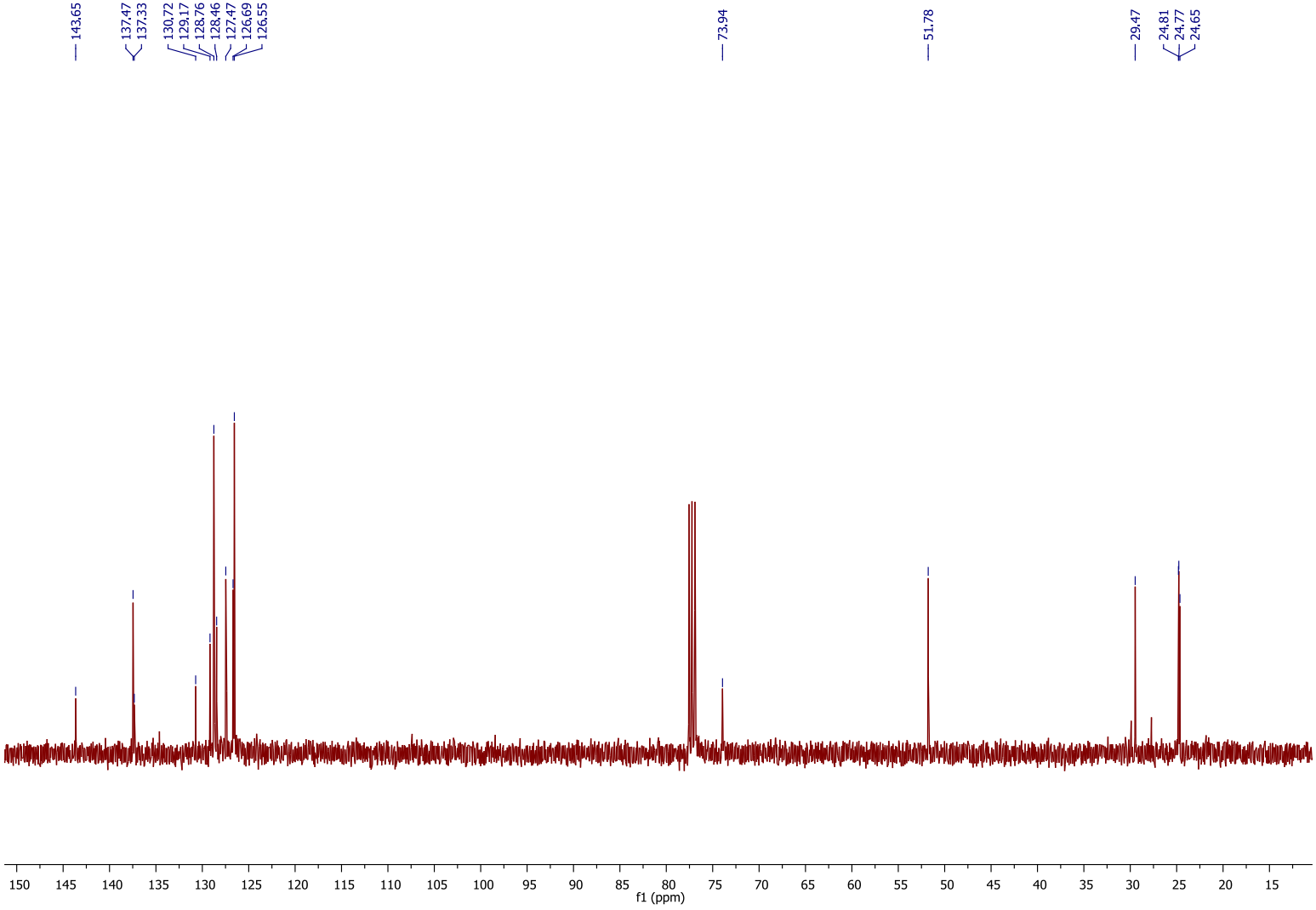
^{1}H-NMR spectrum of **12** in $CDCl_3$

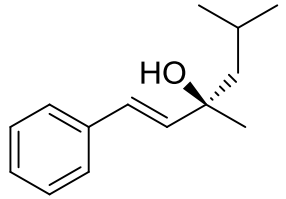


12



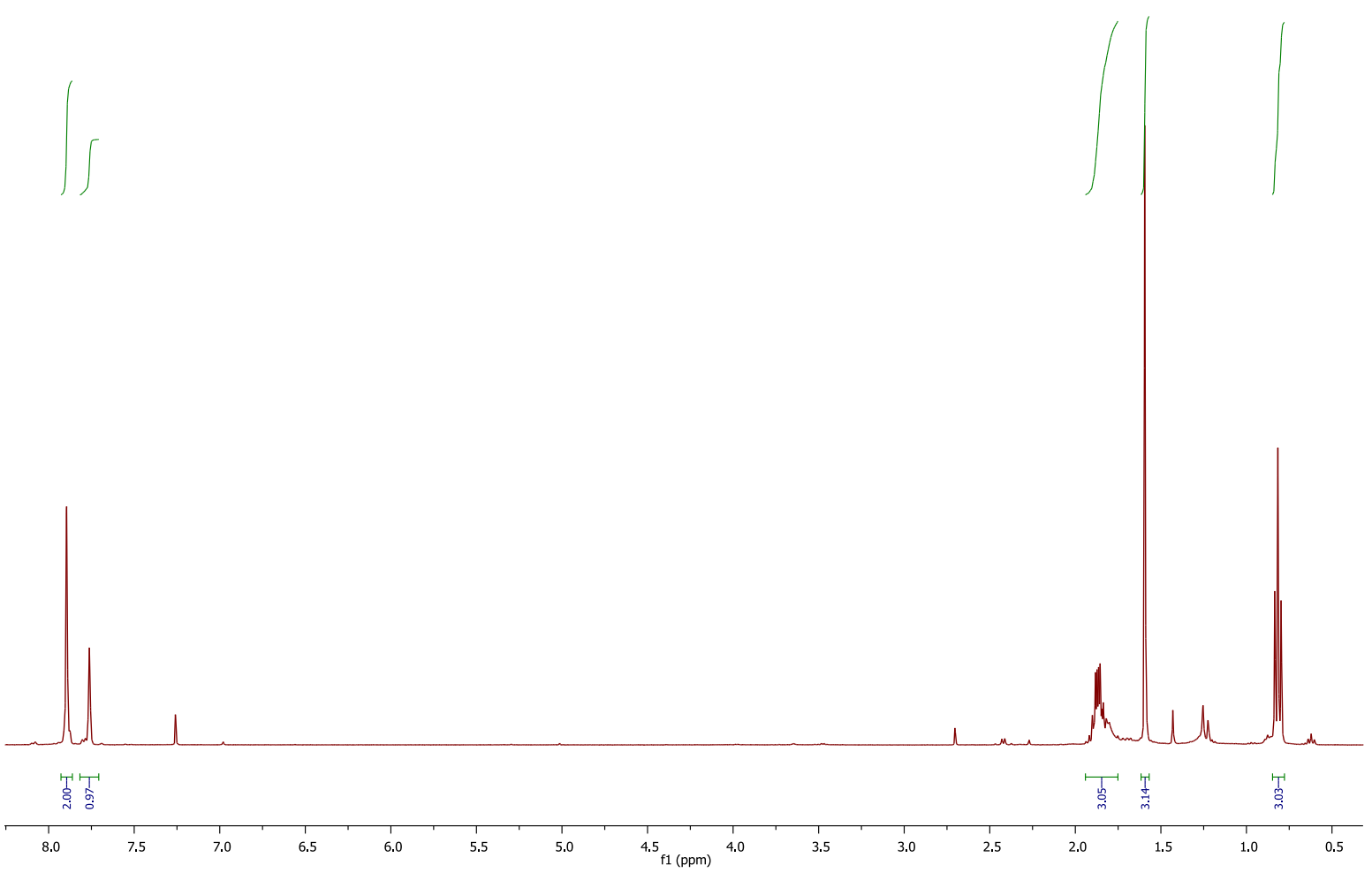
^{13}C-NMR spectrum of **12** in $CDCl_3$

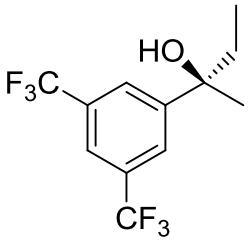




12

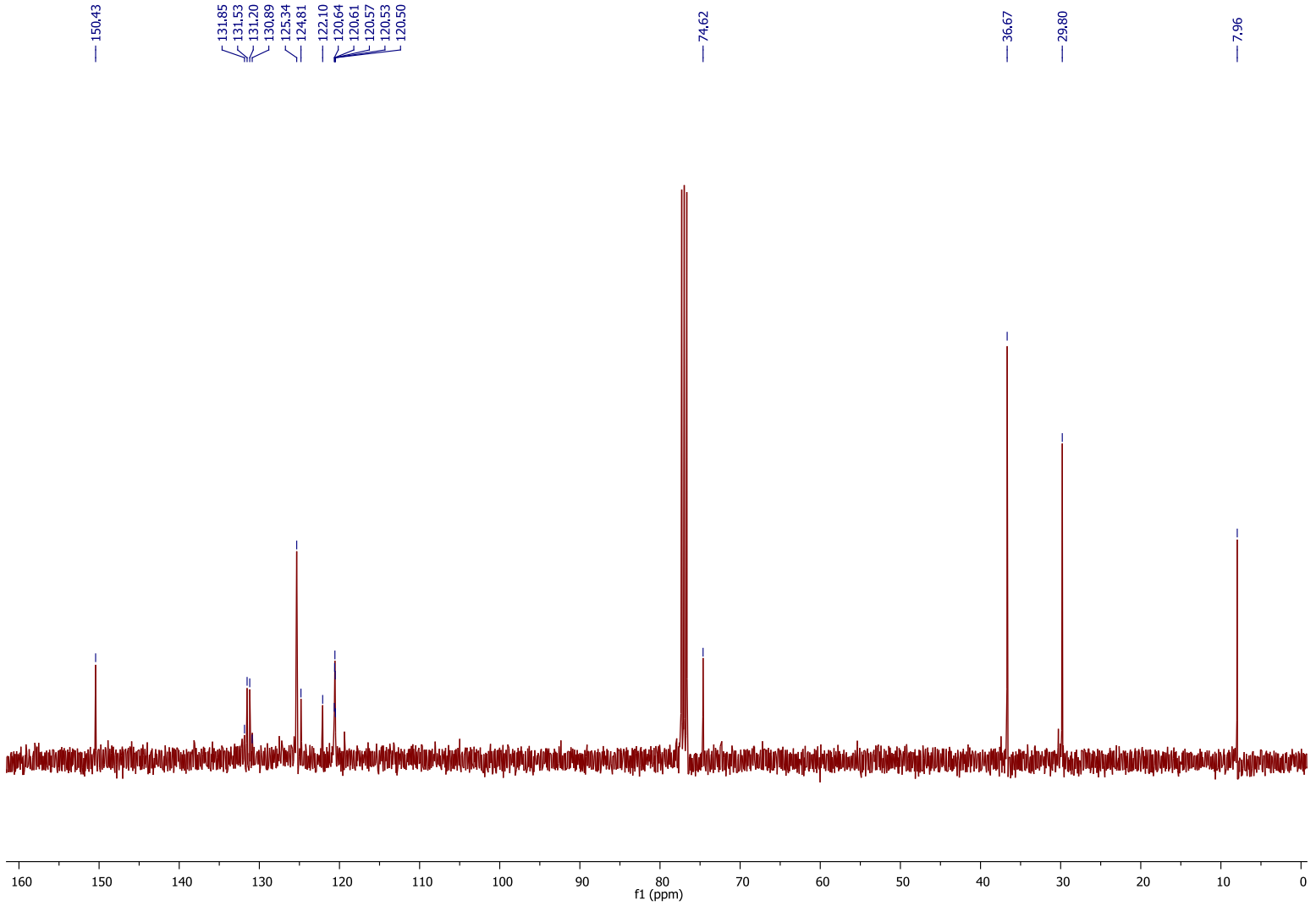
^{1}H-NMR spectrum of **16** in $CDCl_3$

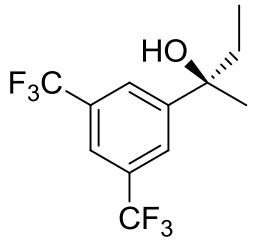




16

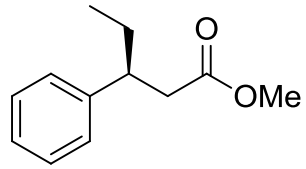
^{13}C-NMR spectrum of **16** in $CDCl_3$



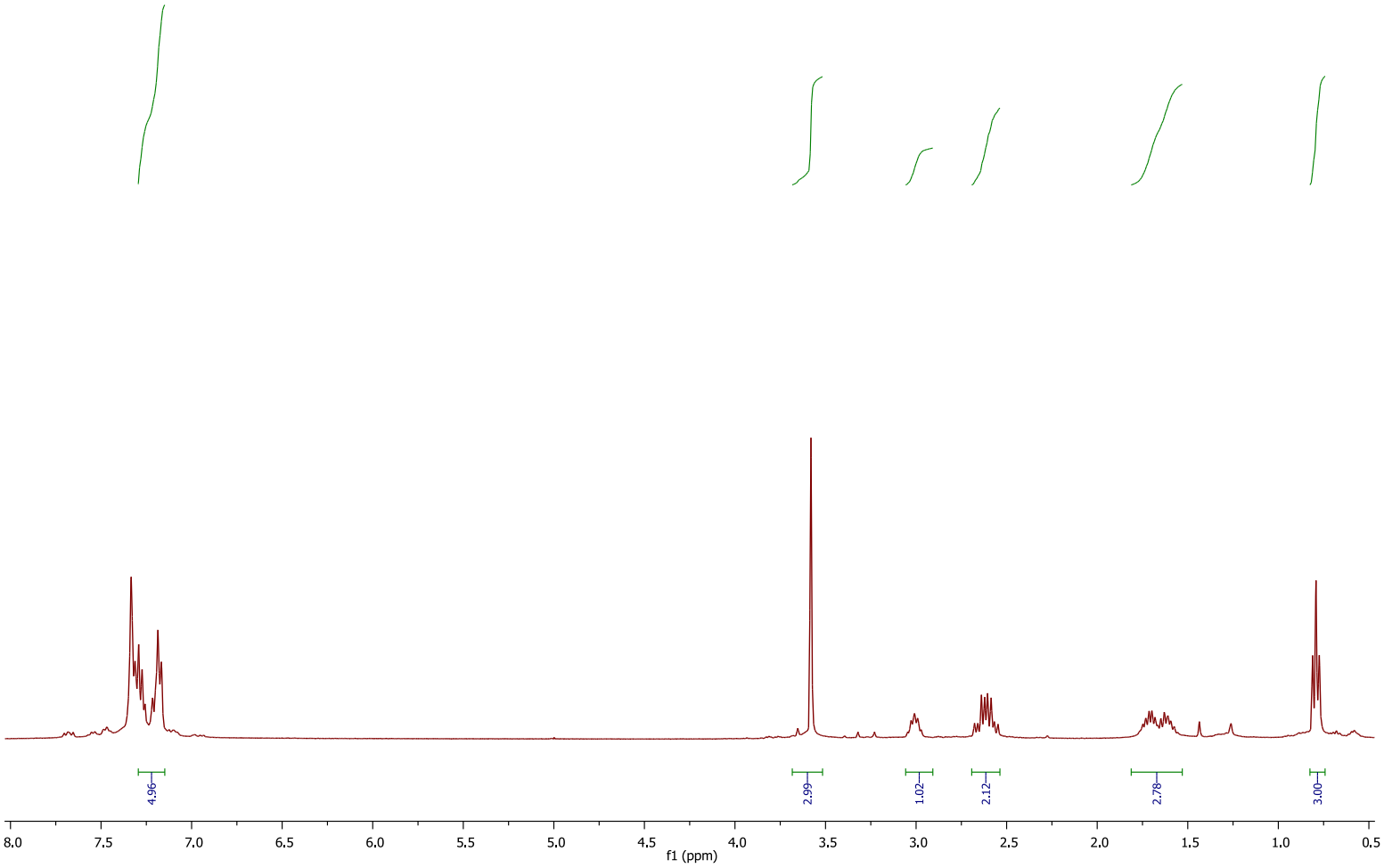


16

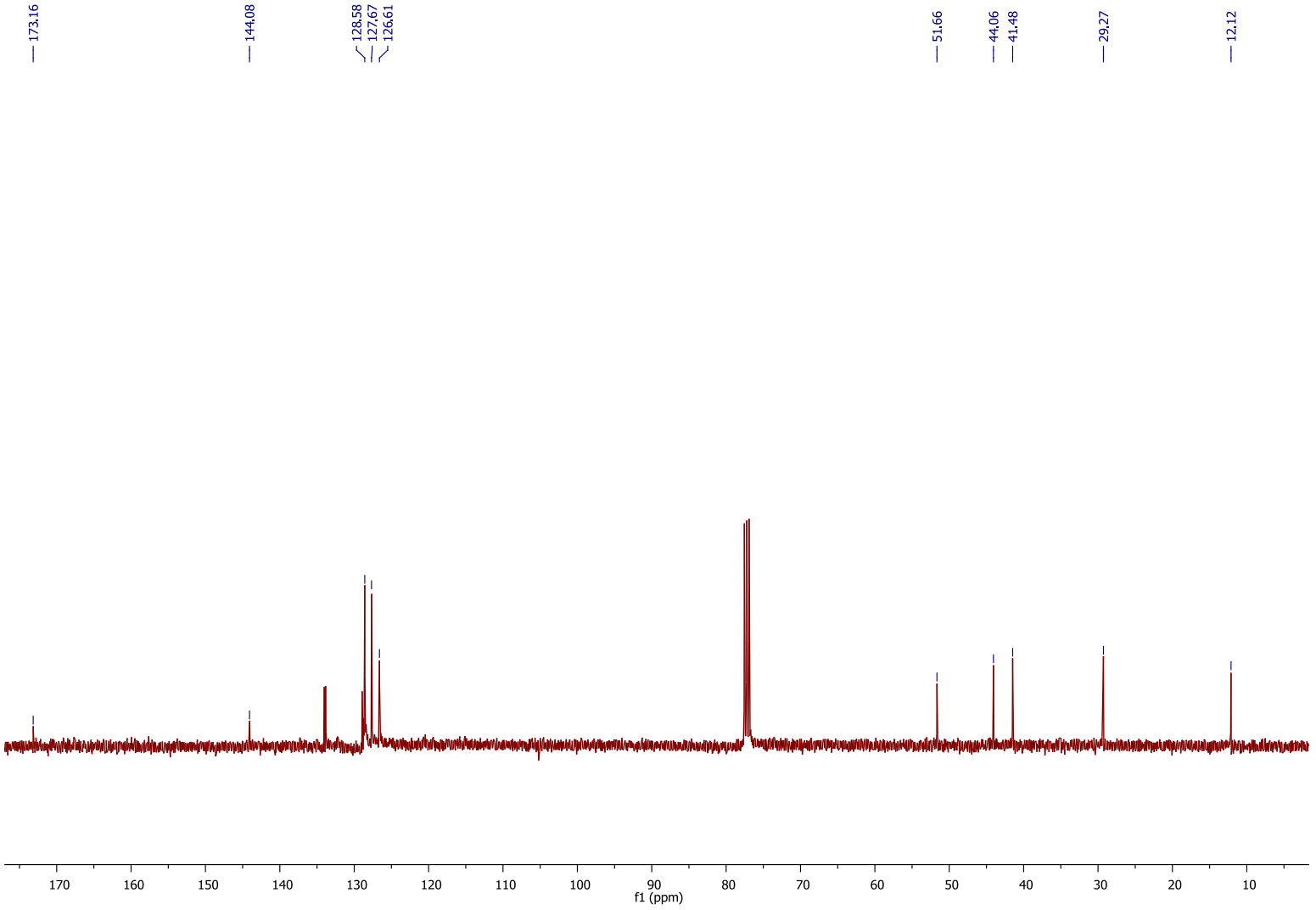
^{1}H-NMR spectrum of **19** in $CDCl_3$

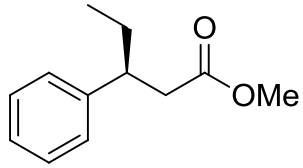


19



^{13}C-NMR spectrum of **19** in $CDCl_3$





19