

# Supplementary Materials

## Design, synthesis, and biological evaluation of novel urea-containing carnosic acid derivatives with anticancer activity

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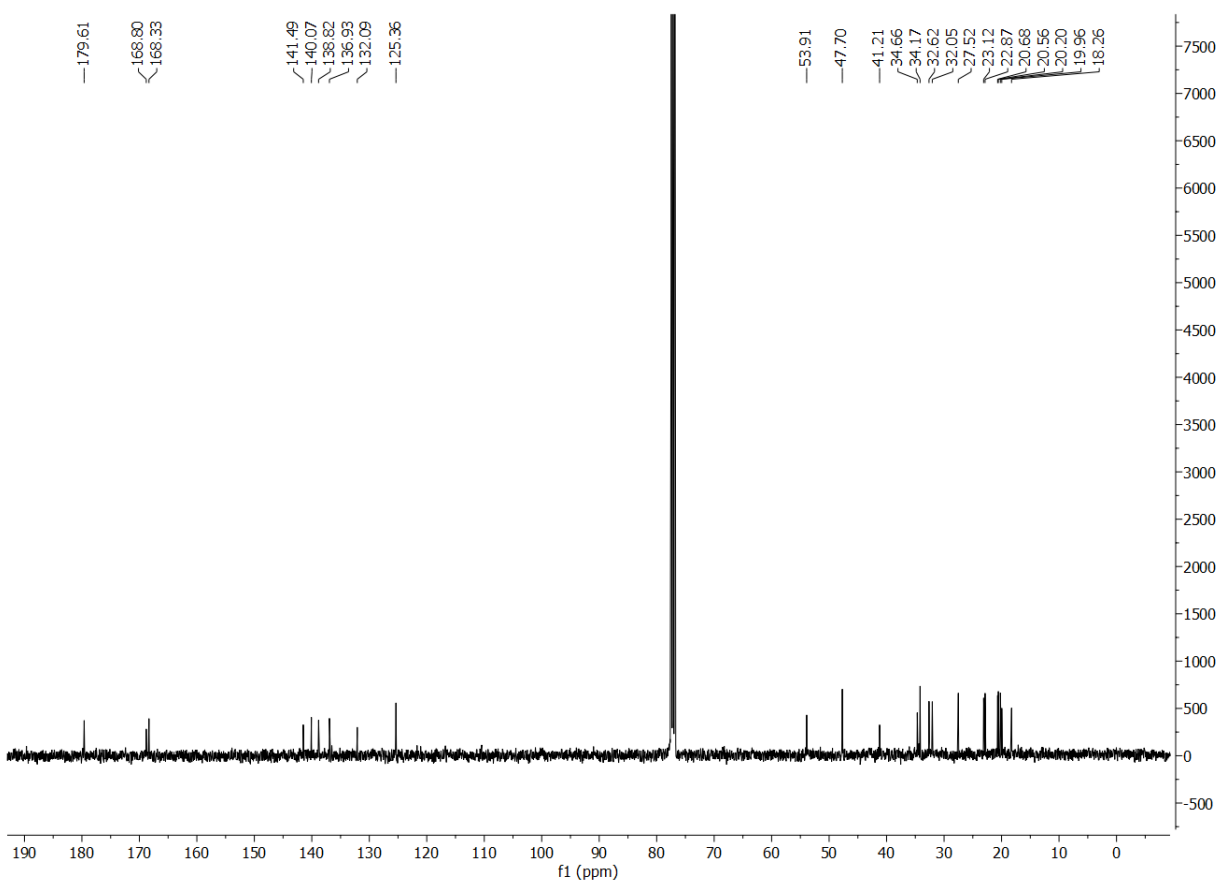
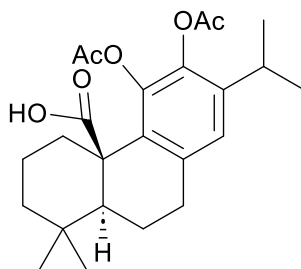
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## 1. NMR data for compound 2

### 1.1. $^1\text{H}$ spectrum for compound 2 recorded in $\text{CDCl}_3$



1.2.  $^{13}\text{C}$  spectrum for compound **2** recorded in  $\text{CDCl}_3$

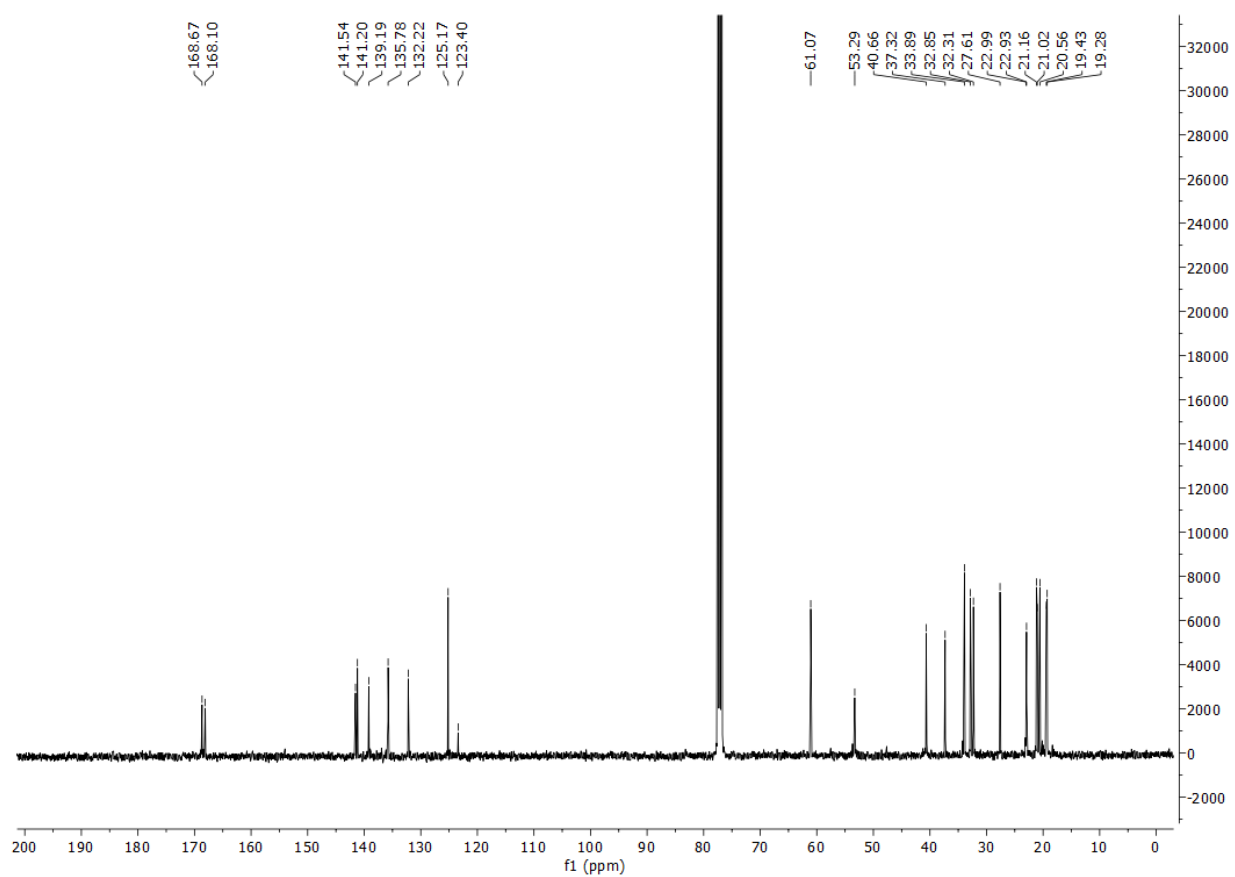
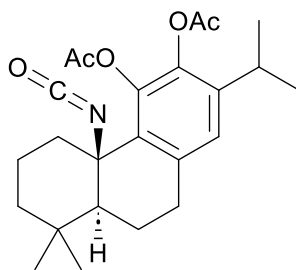


## 2. NMR data for compound 5

### 2.1. $^1\text{H}$ spectrum for compound 5 recorded in $\text{CDCl}_3$



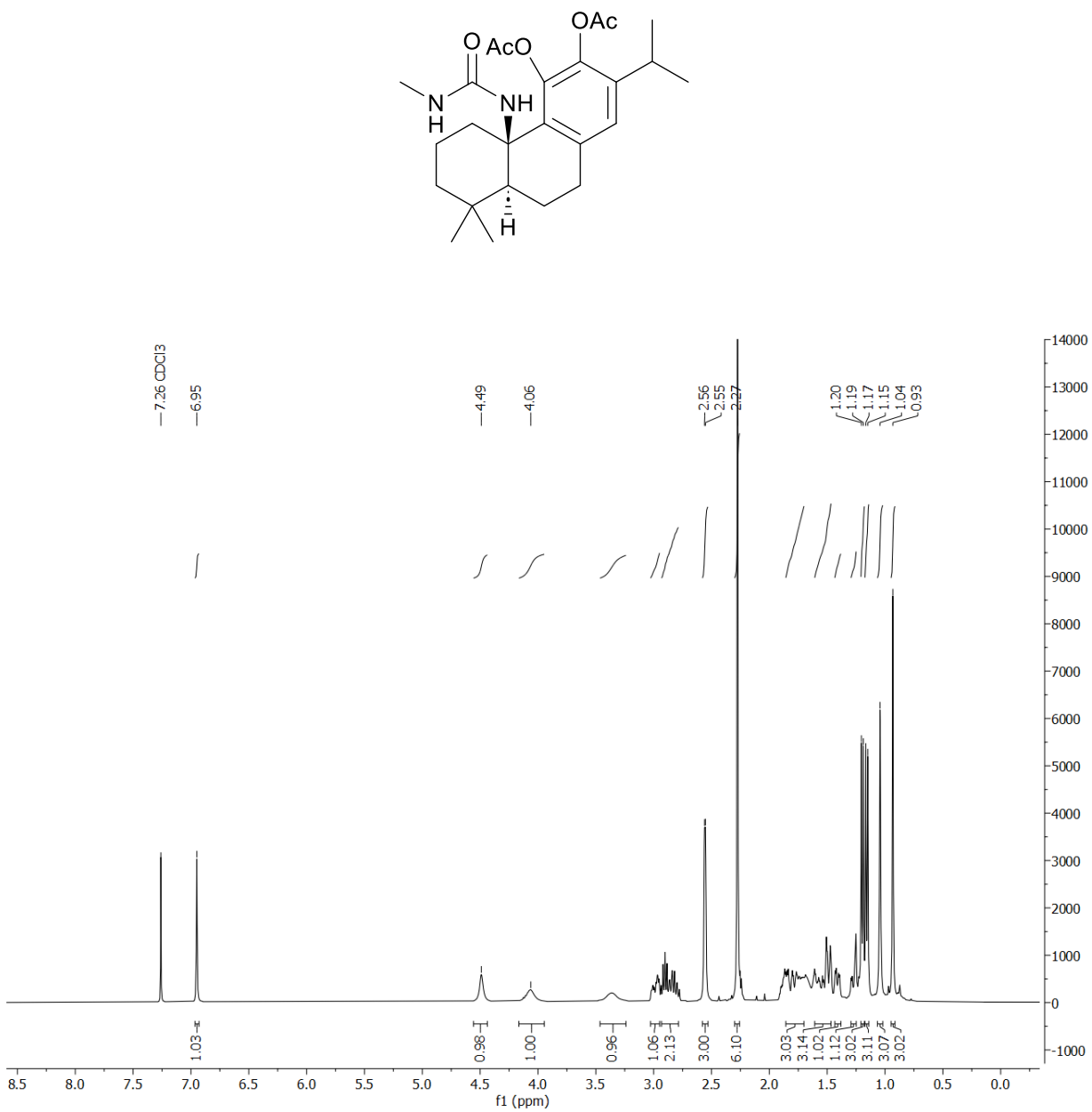
2.2.  $^{13}\text{C}$  spectrum for compound **5** recorded in  $\text{CDCl}_3$



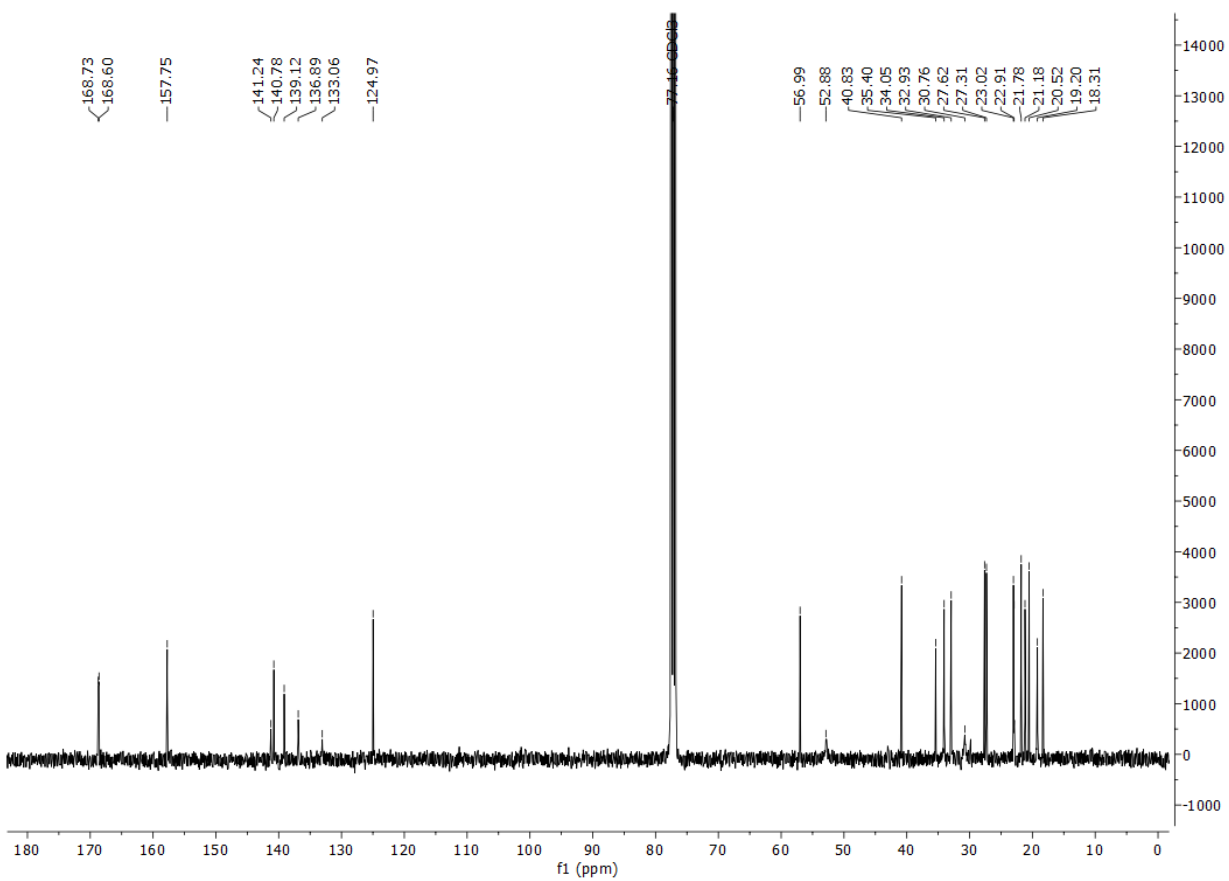
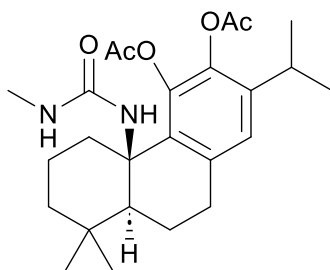


### 3. NMR data for compound **6**

#### 3.1. $^1\text{H}$ spectrum for compound **6** recorded in $\text{CDCl}_3$

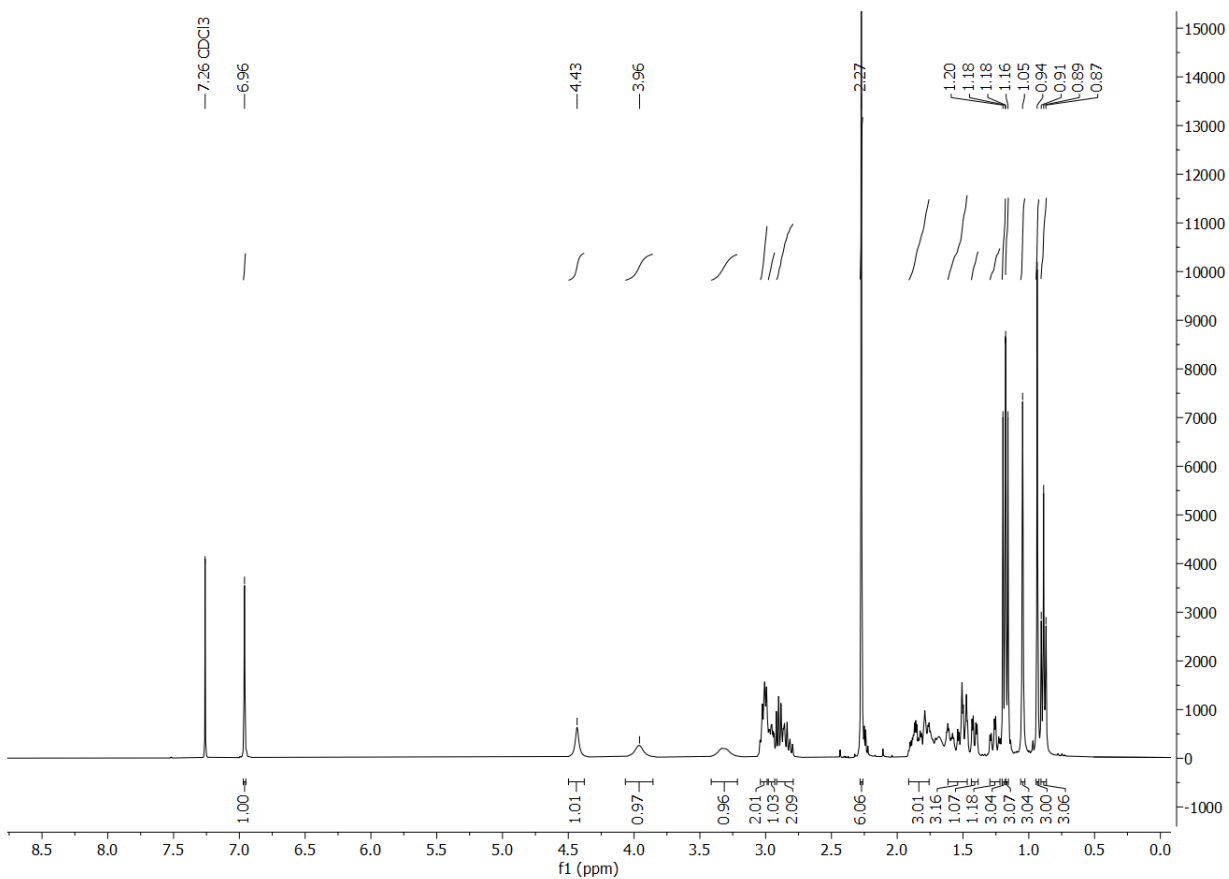
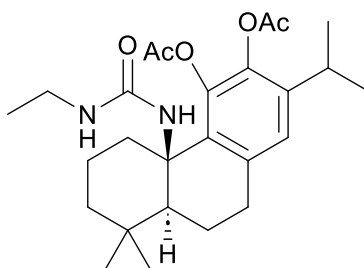


3.2.  $^{13}\text{C}$  spectrum for compound **6** recorded in  $\text{CDCl}_3$

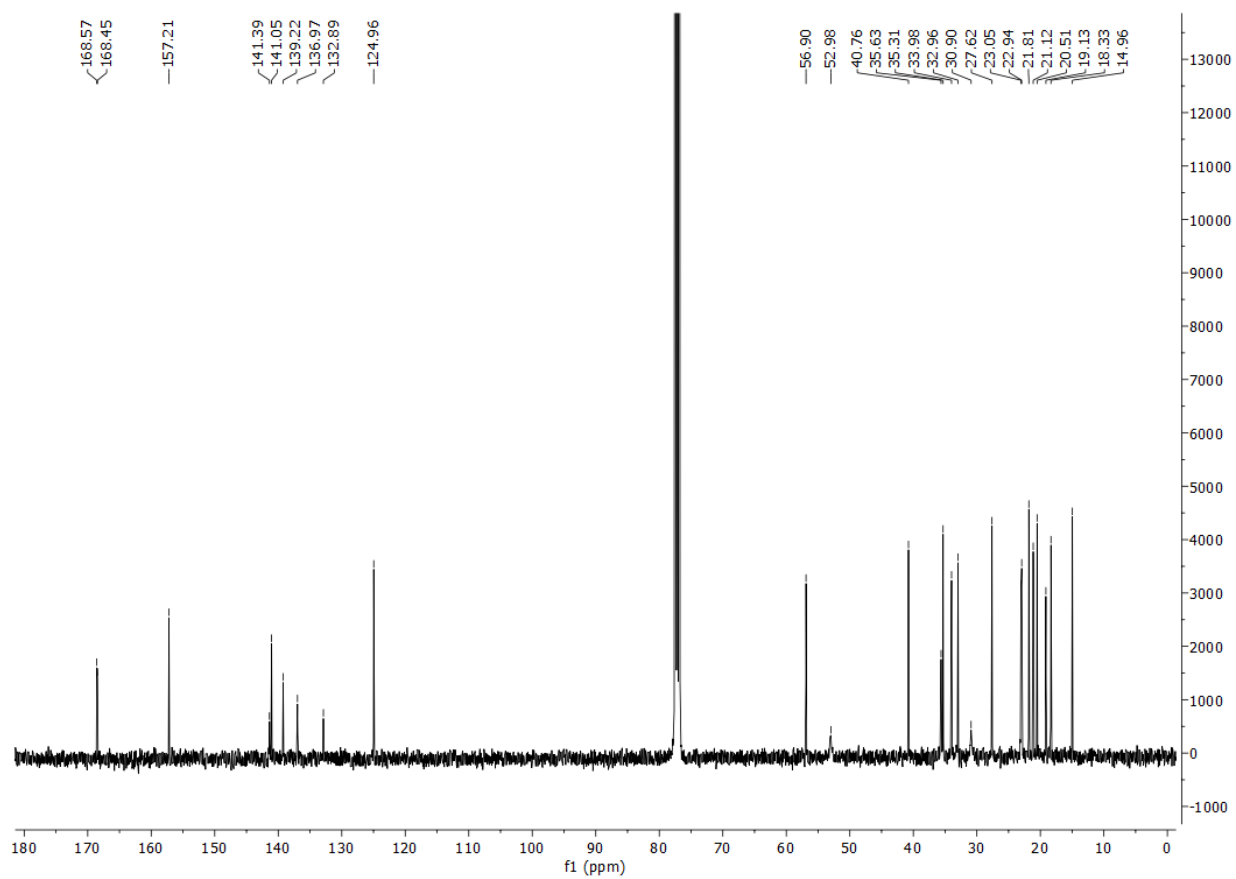
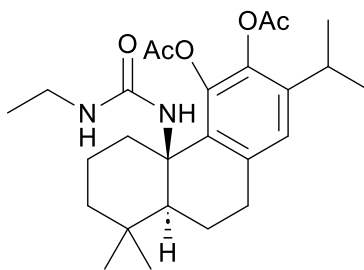


## 4. NMR data for compound 7

### 4.1. $^1\text{H}$ spectrum for compound 7 recorded in $\text{CDCl}_3$

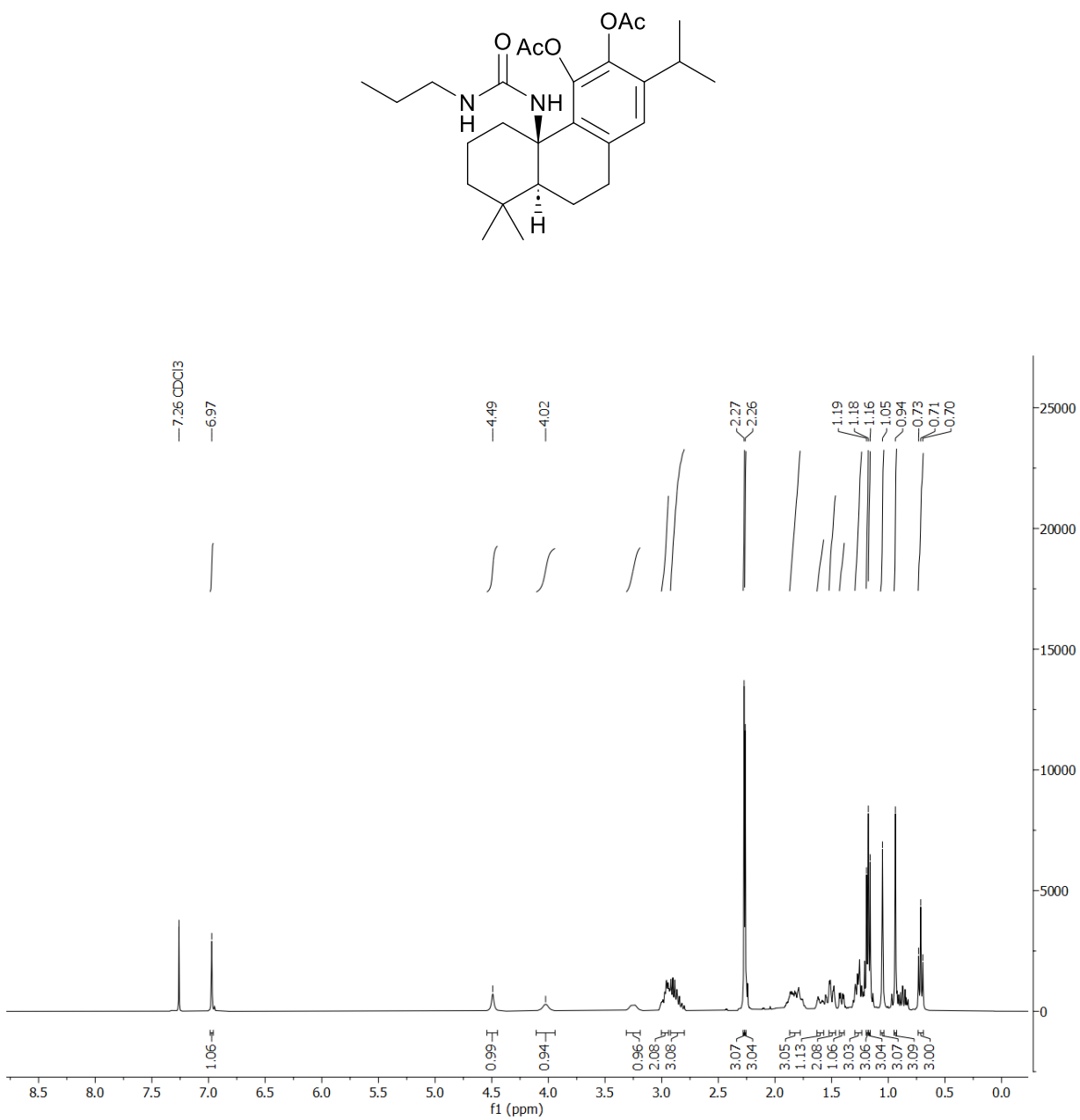


4.2.  $^{13}\text{C}$  spectrum for compound **7** recorded in  $\text{CDCl}_3$

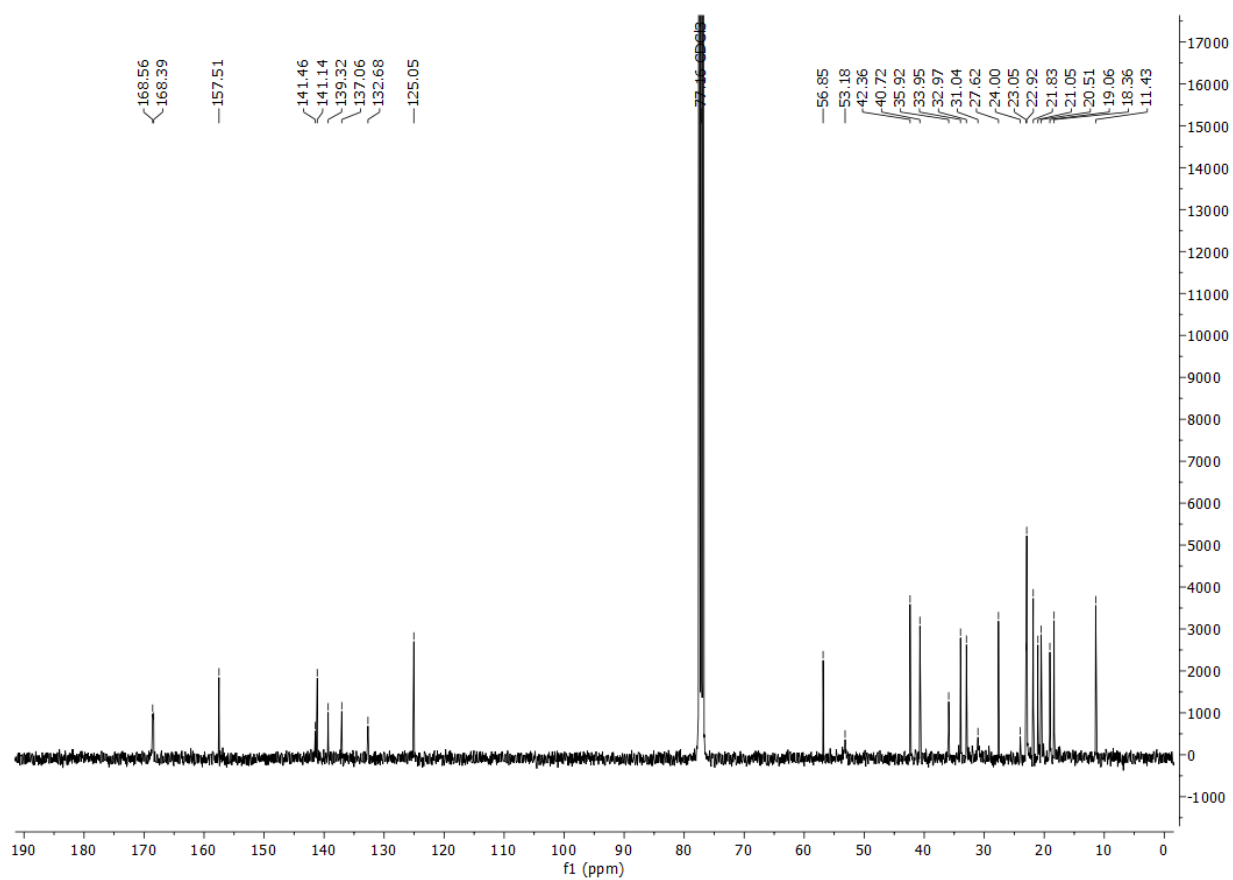
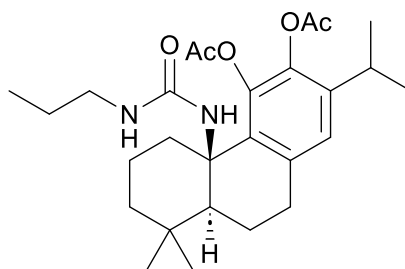


## 5. NMR data for compound **8**

### 5.1. $^1\text{H}$ spectrum for compound **8** recorded in $\text{CDCl}_3$

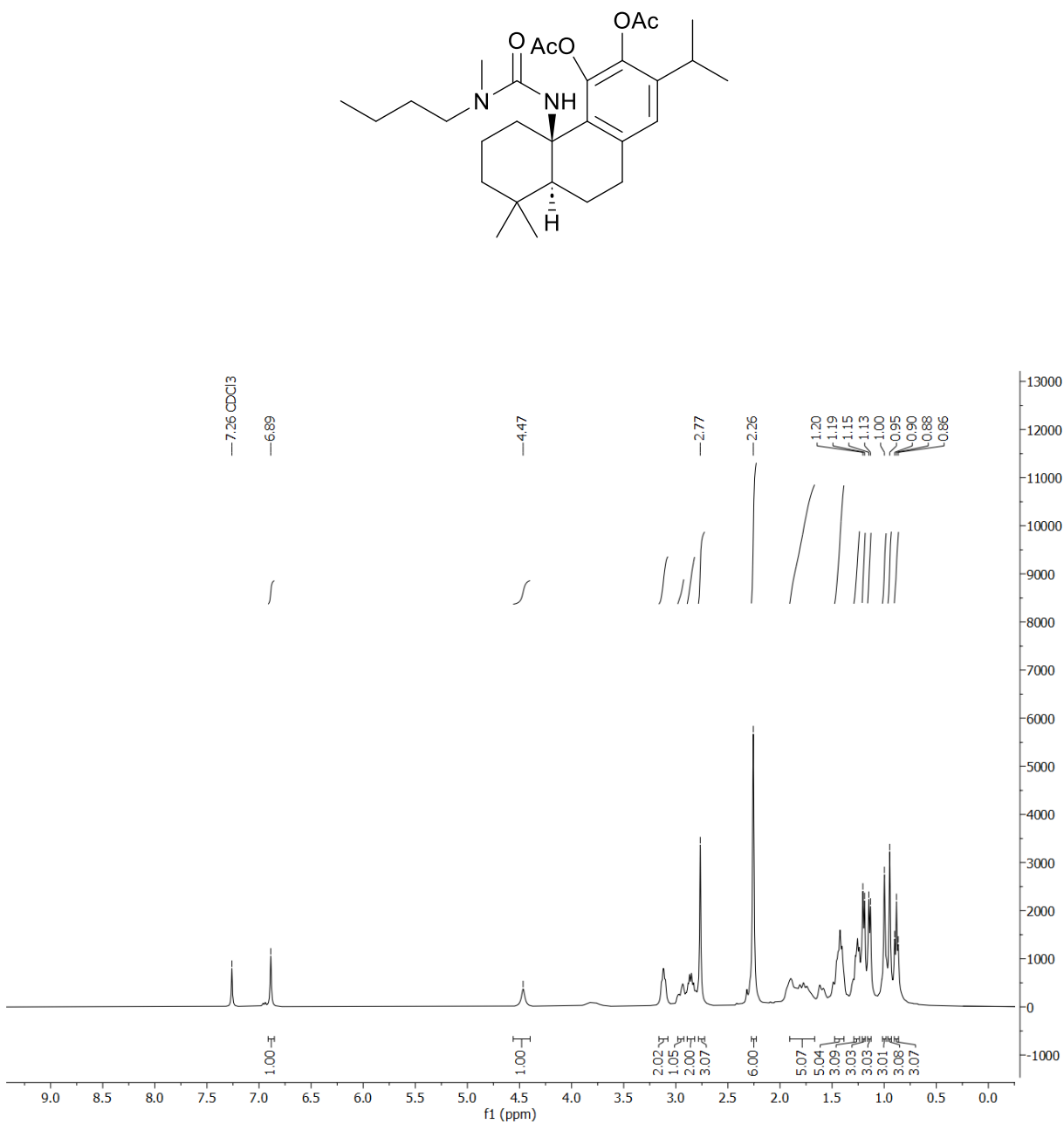


5.2.  $^{13}\text{C}$  spectrum for compound **8** recorded in  $\text{CDCl}_3$

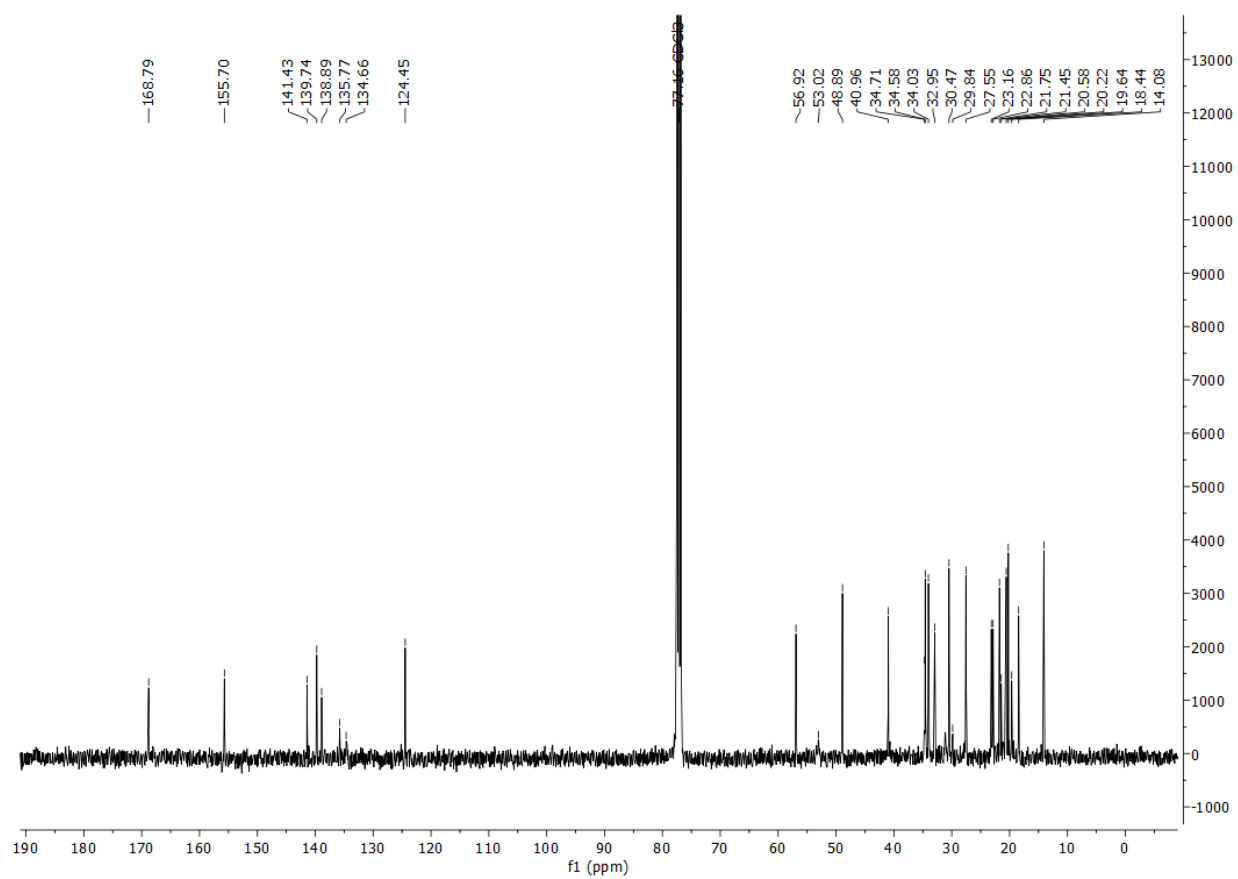
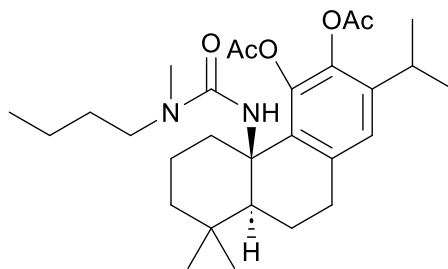


## 6. NMR data for compound **9**

### 6.1. $^1\text{H}$ spectrum for compound **9** recorded in $\text{CDCl}_3$



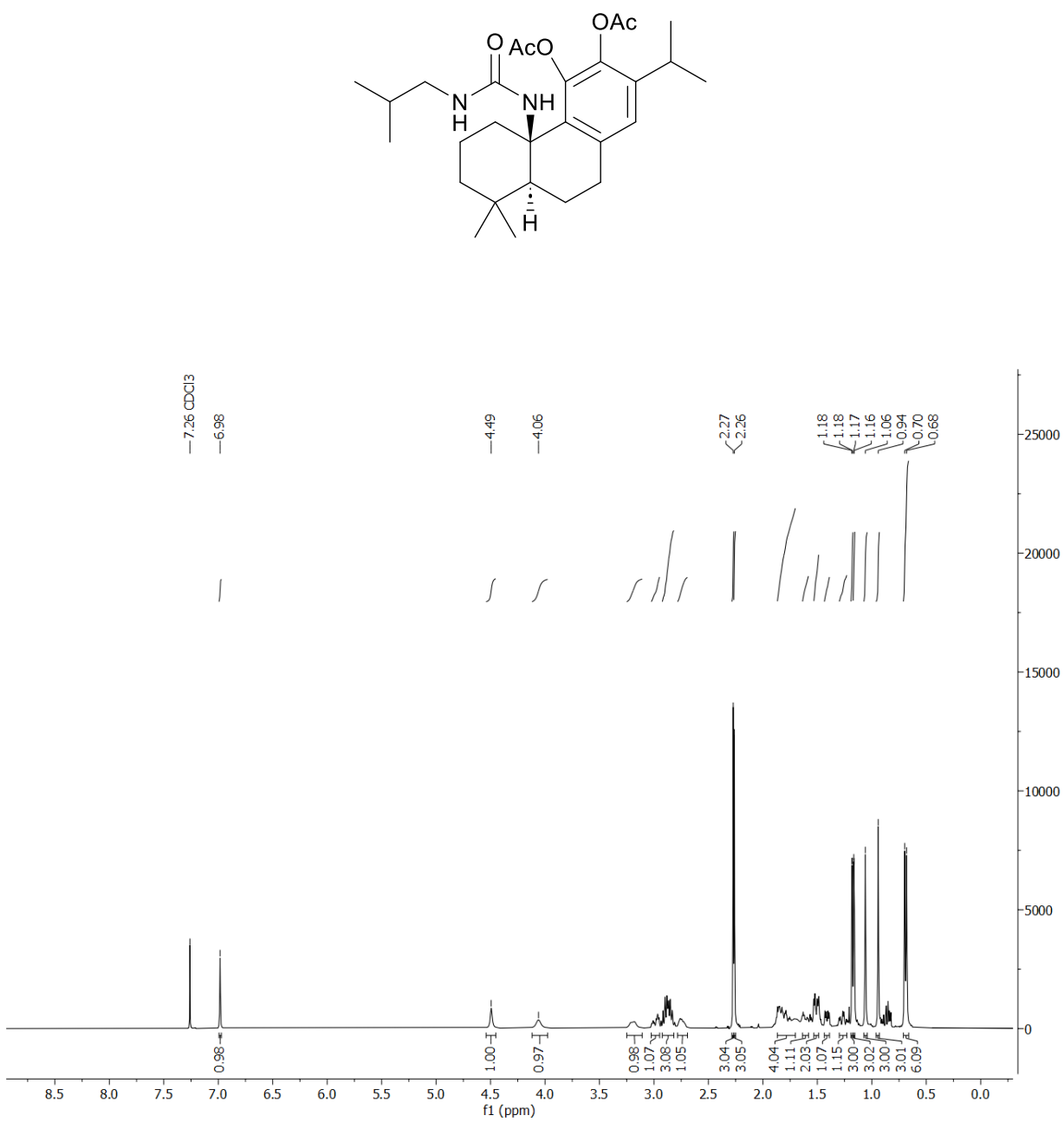
6.2.  $^{13}\text{C}$  spectrum for compound **9** recorded in  $\text{CDCl}_3$



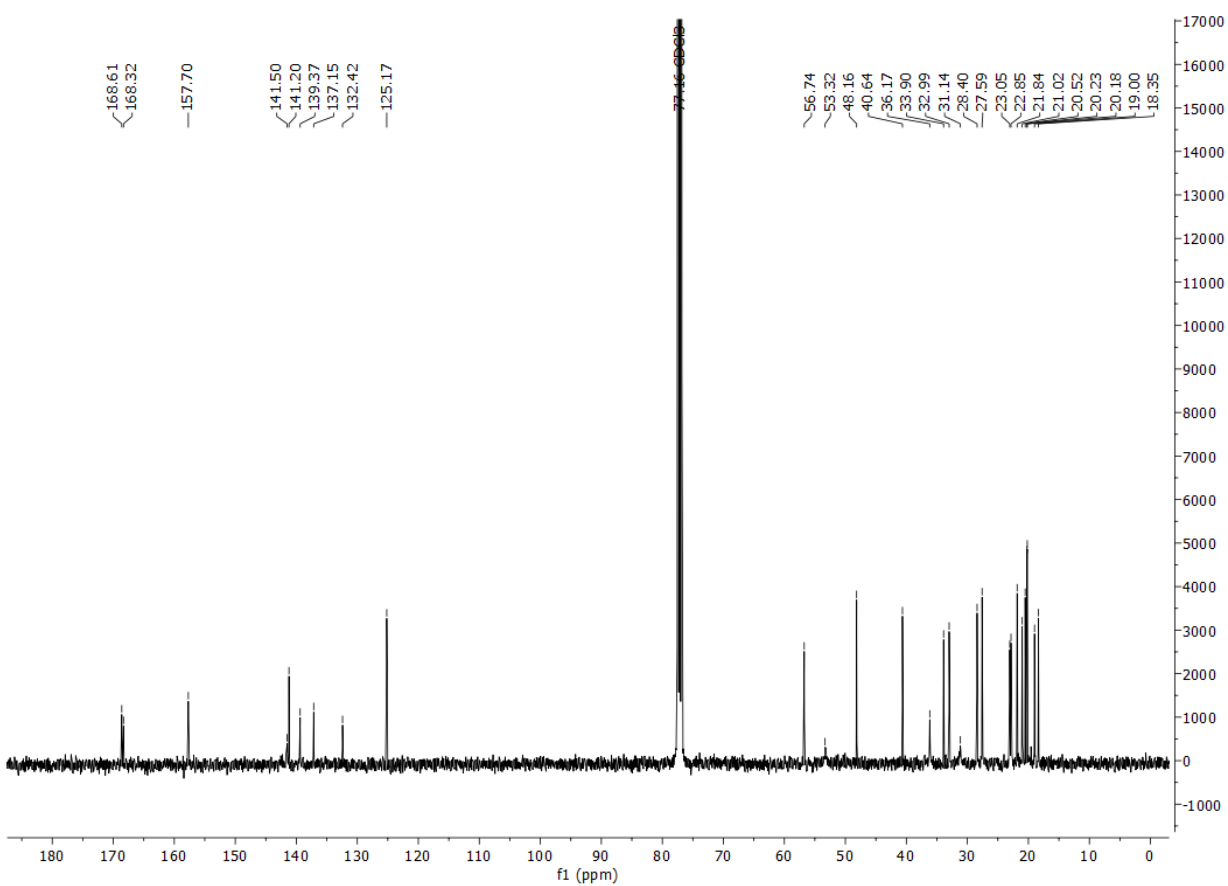
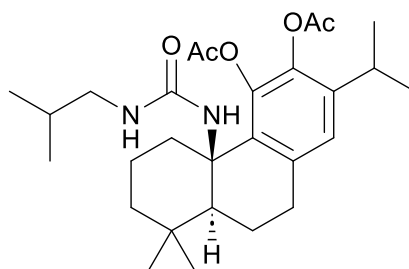


## 7. NMR data for compound **10**

### 7.1. $^1\text{H}$ spectrum for compound **10** recorded in $\text{CDCl}_3$

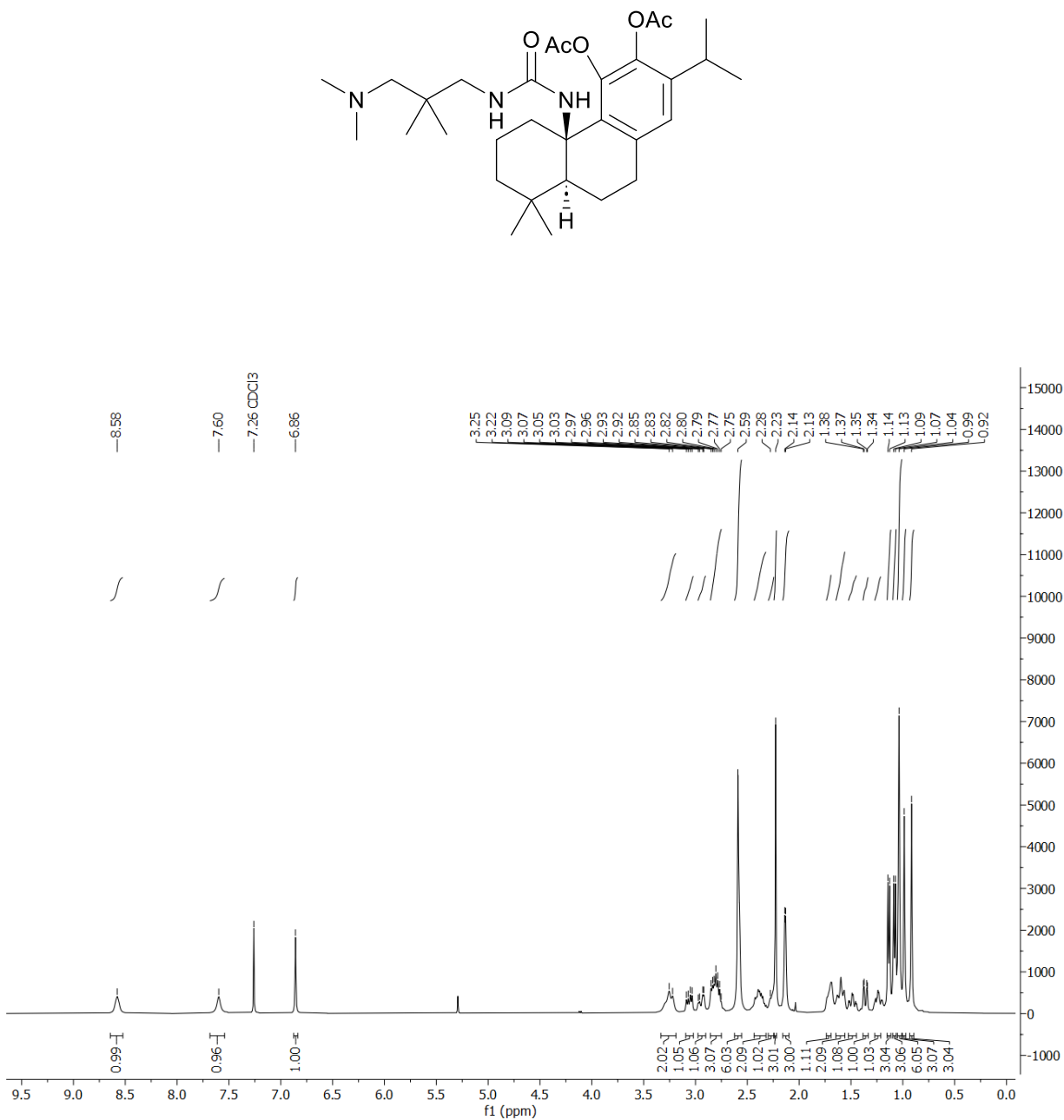


7.2.  $^{13}\text{C}$  spectrum for compound **10** recorded in  $\text{CDCl}_3$

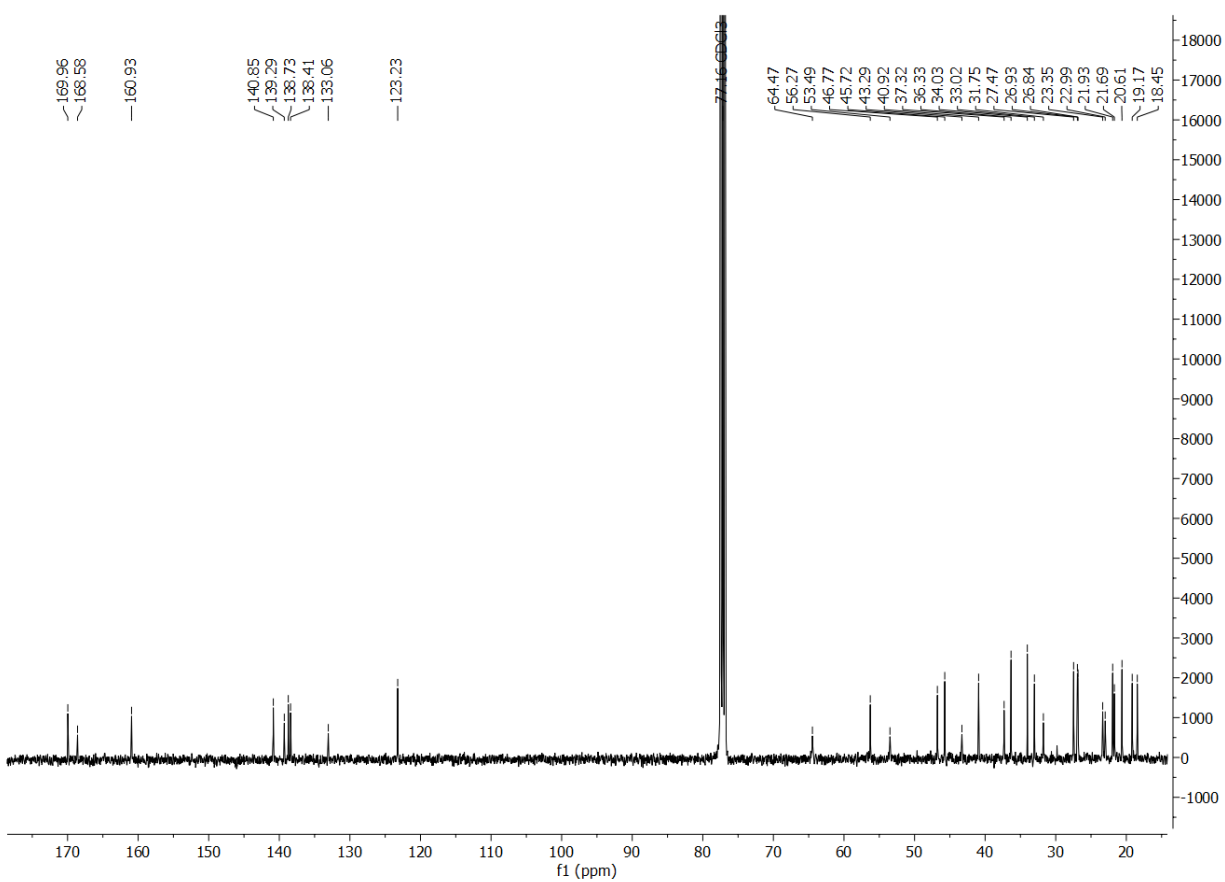
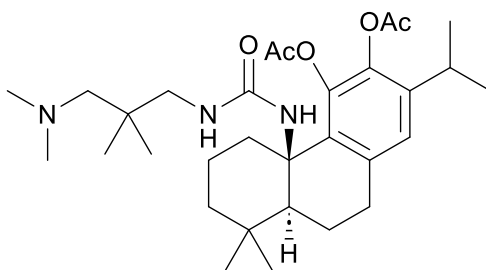


## 8. NMR data for compound 11

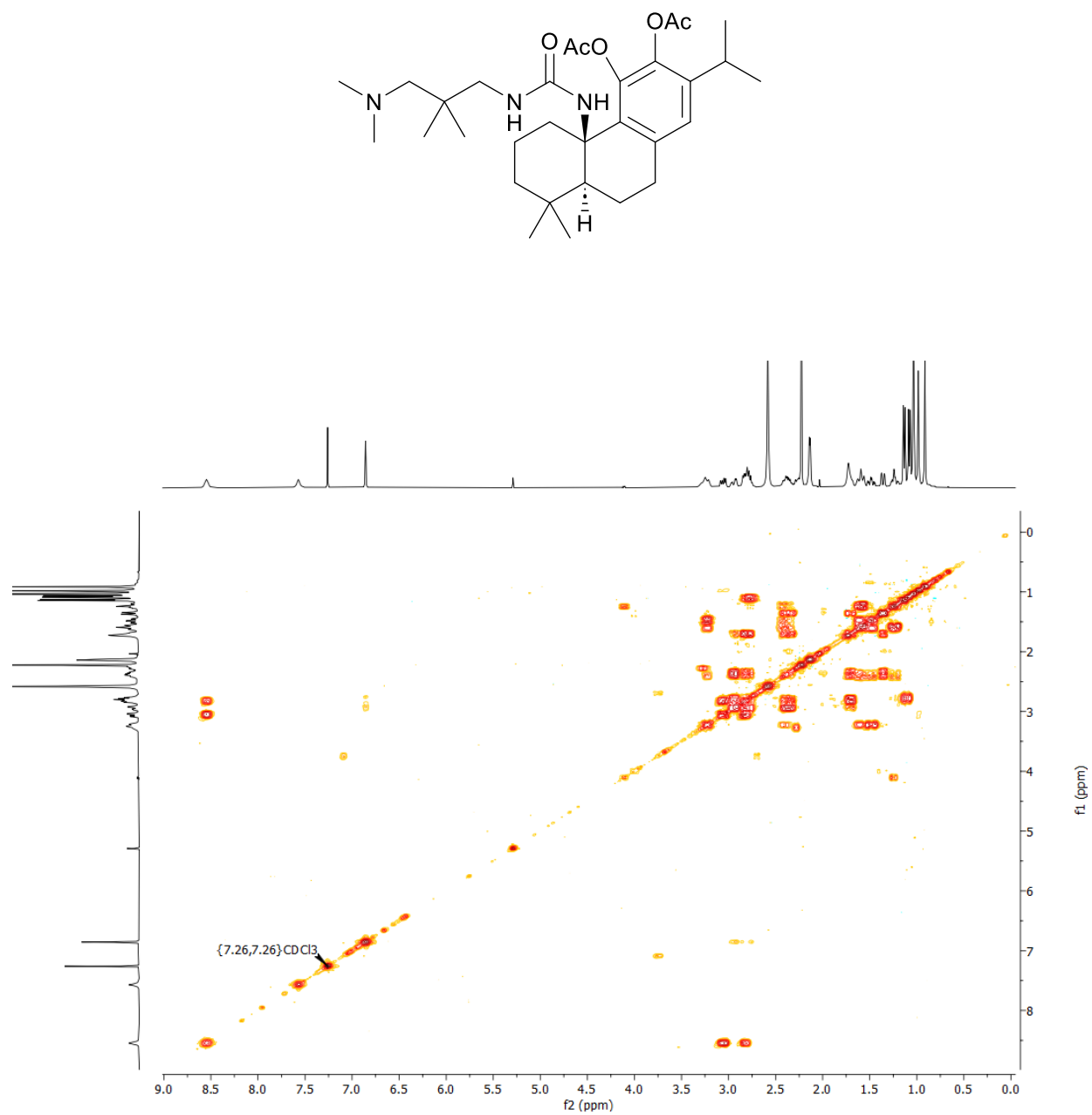
### 8.1. $^1\text{H}$ spectrum for compound 11 recorded in $\text{CDCl}_3$



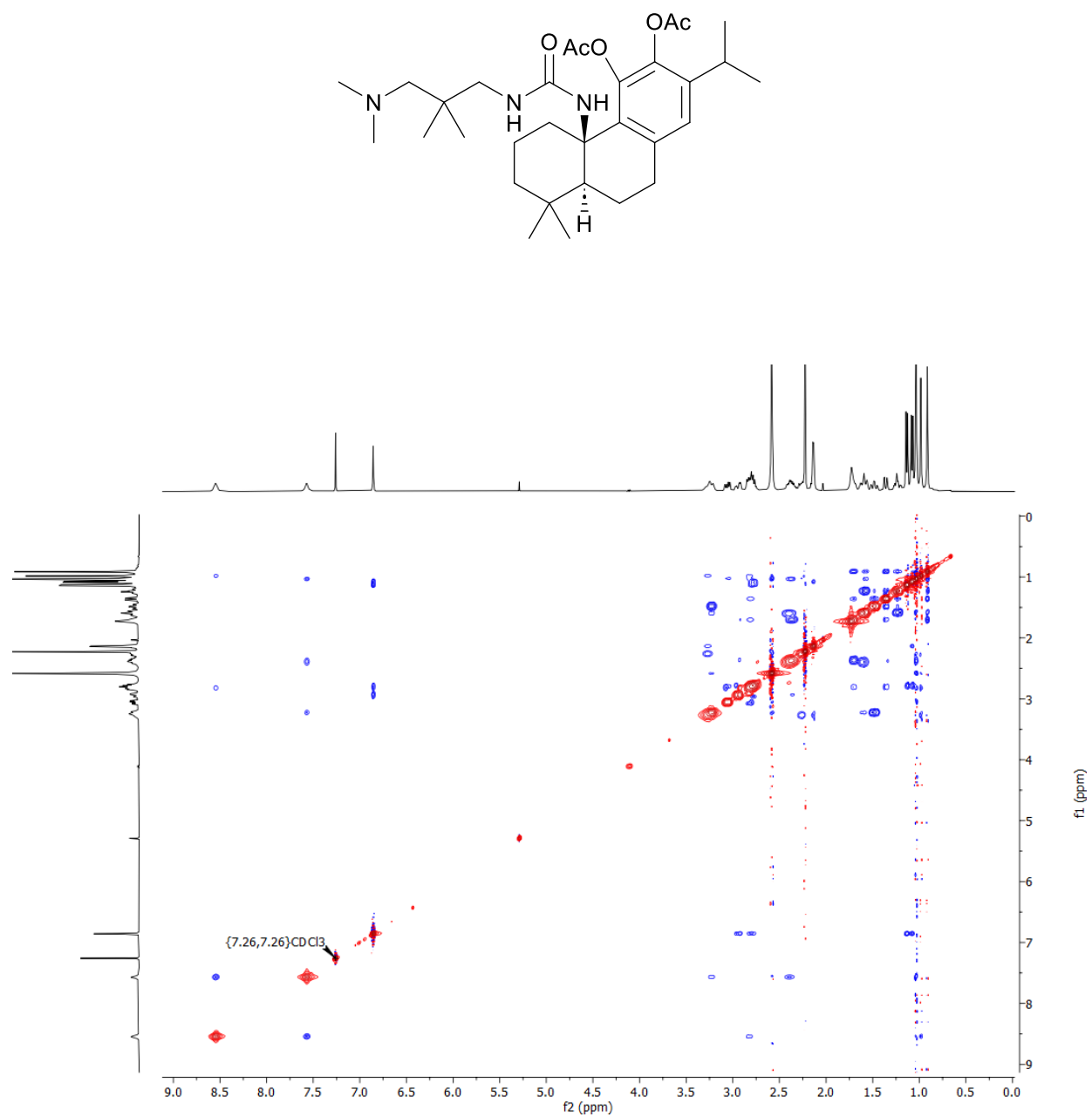
8.2.  $^{13}\text{C}$  spectrum for compound **11** recorded in  $\text{CDCl}_3$



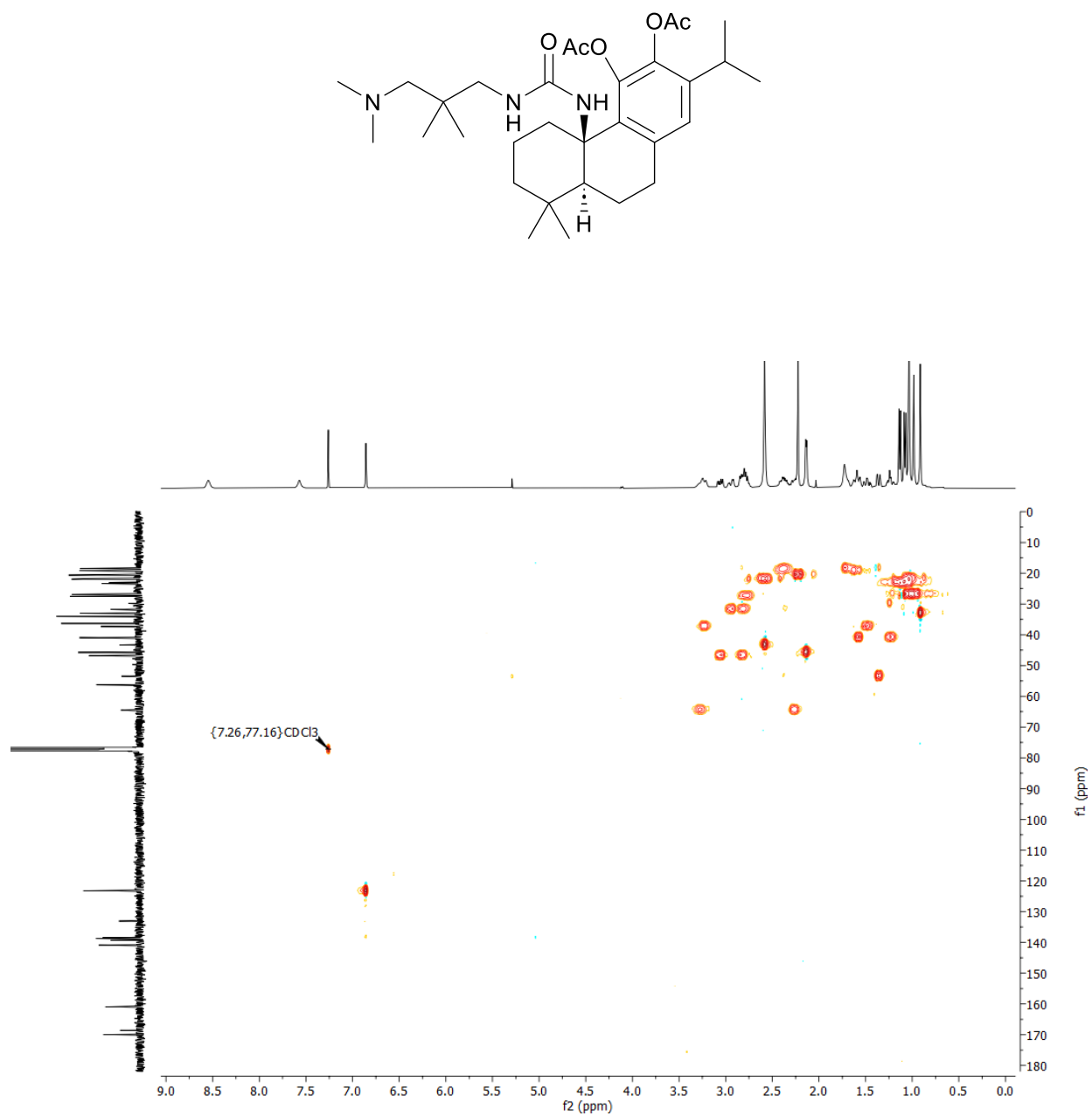
8.3. COSY spectrum for compound **II** recorded in CDCl<sub>3</sub>



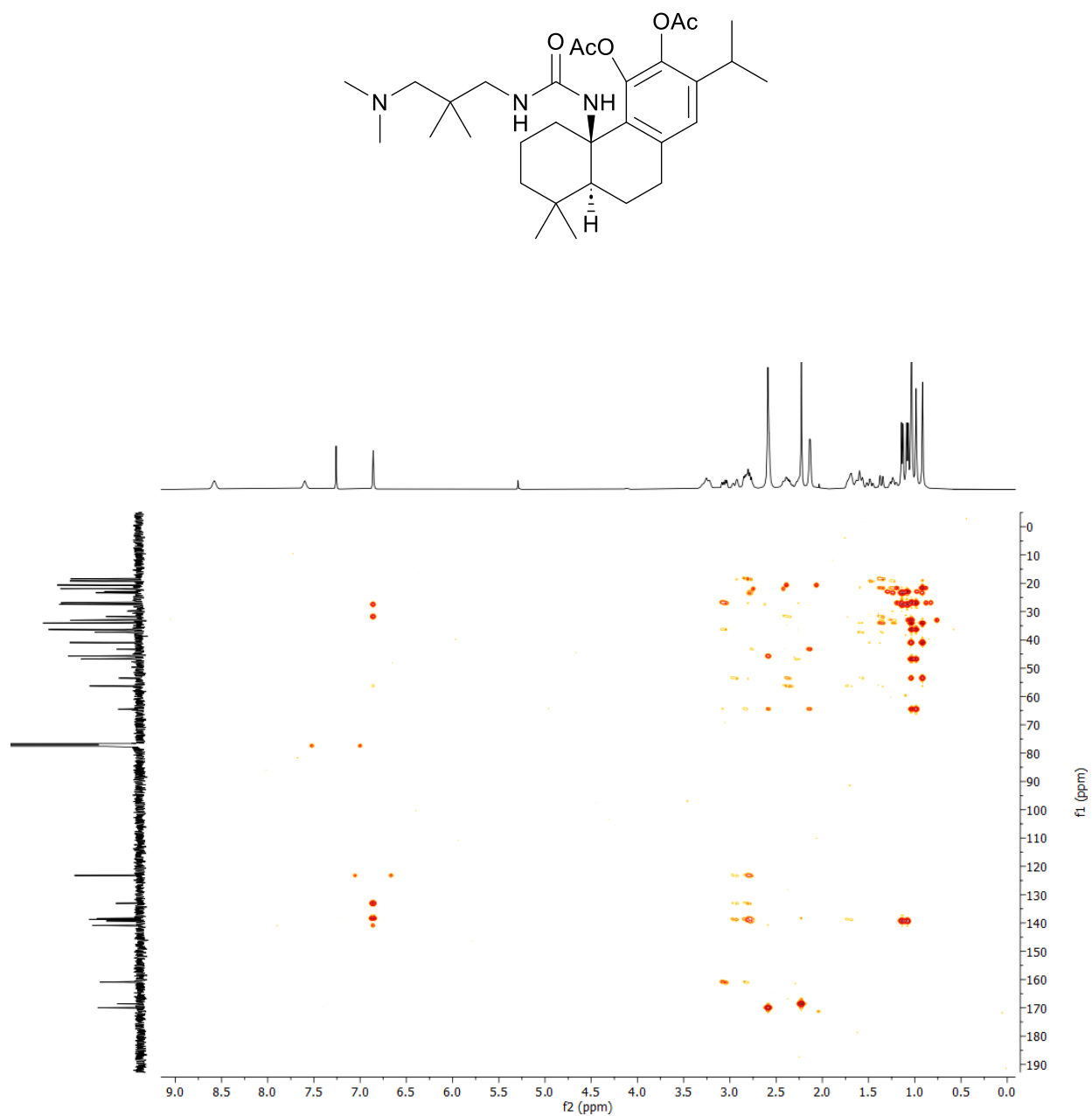
8.4. NOESY spectrum for compound **11** recorded in CDCl<sub>3</sub>



8.5. HSQC spectrum for compound **11** recorded in  $\text{CDCl}_3$



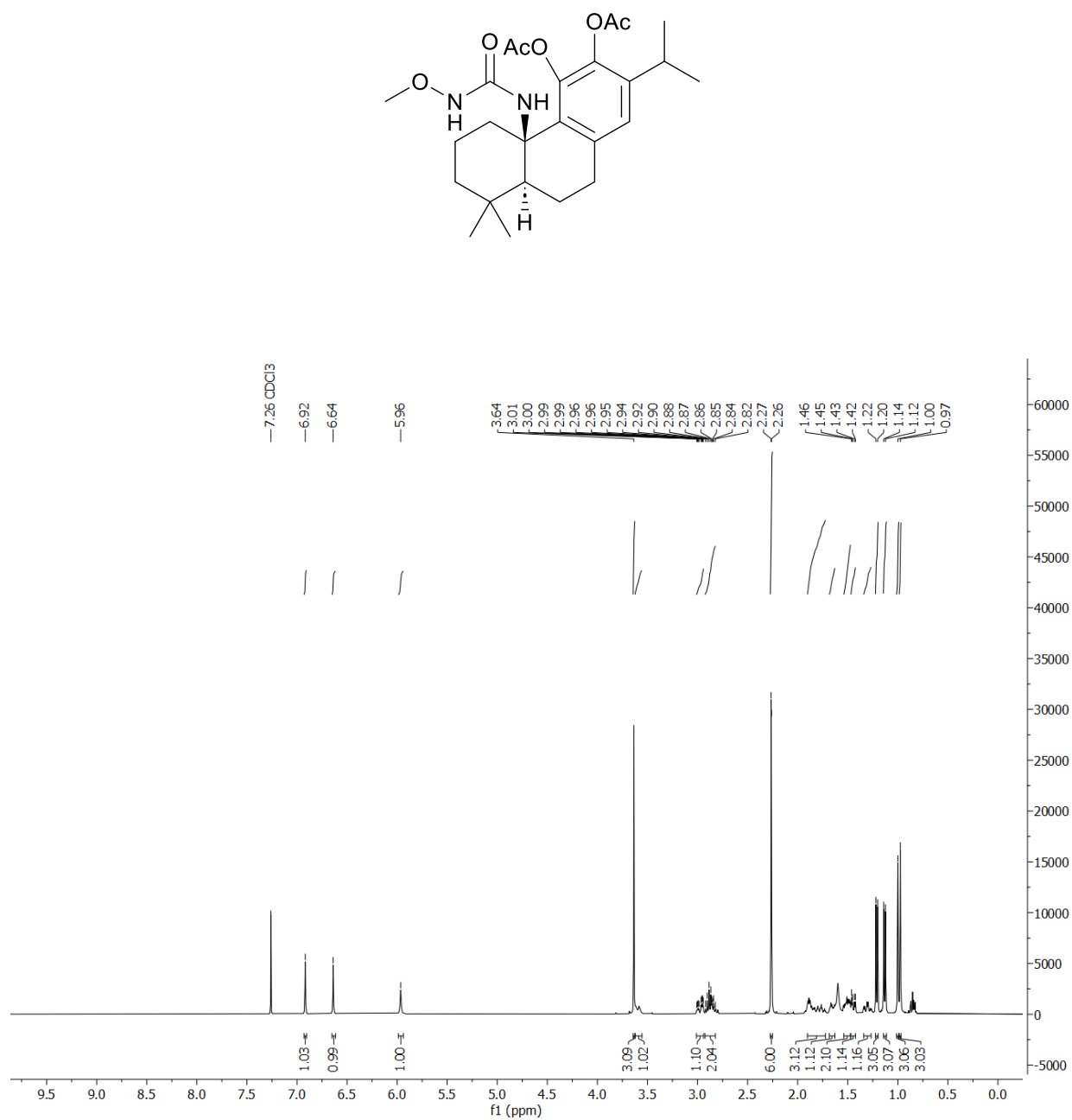
8.6. HMBC spectrum for compound **11** recorded in CDCl<sub>3</sub>



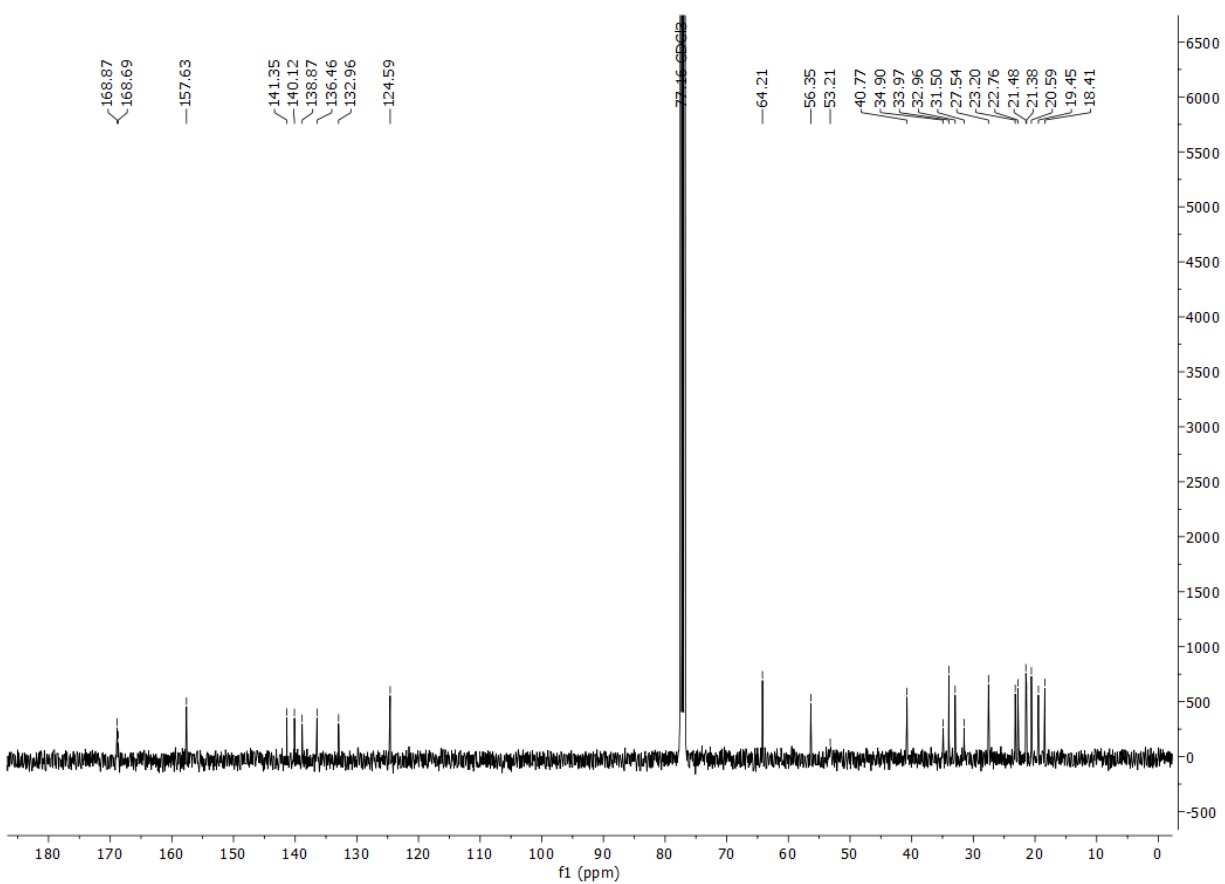
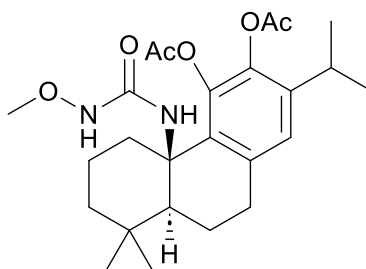


## 9. NMR data for compound **12**

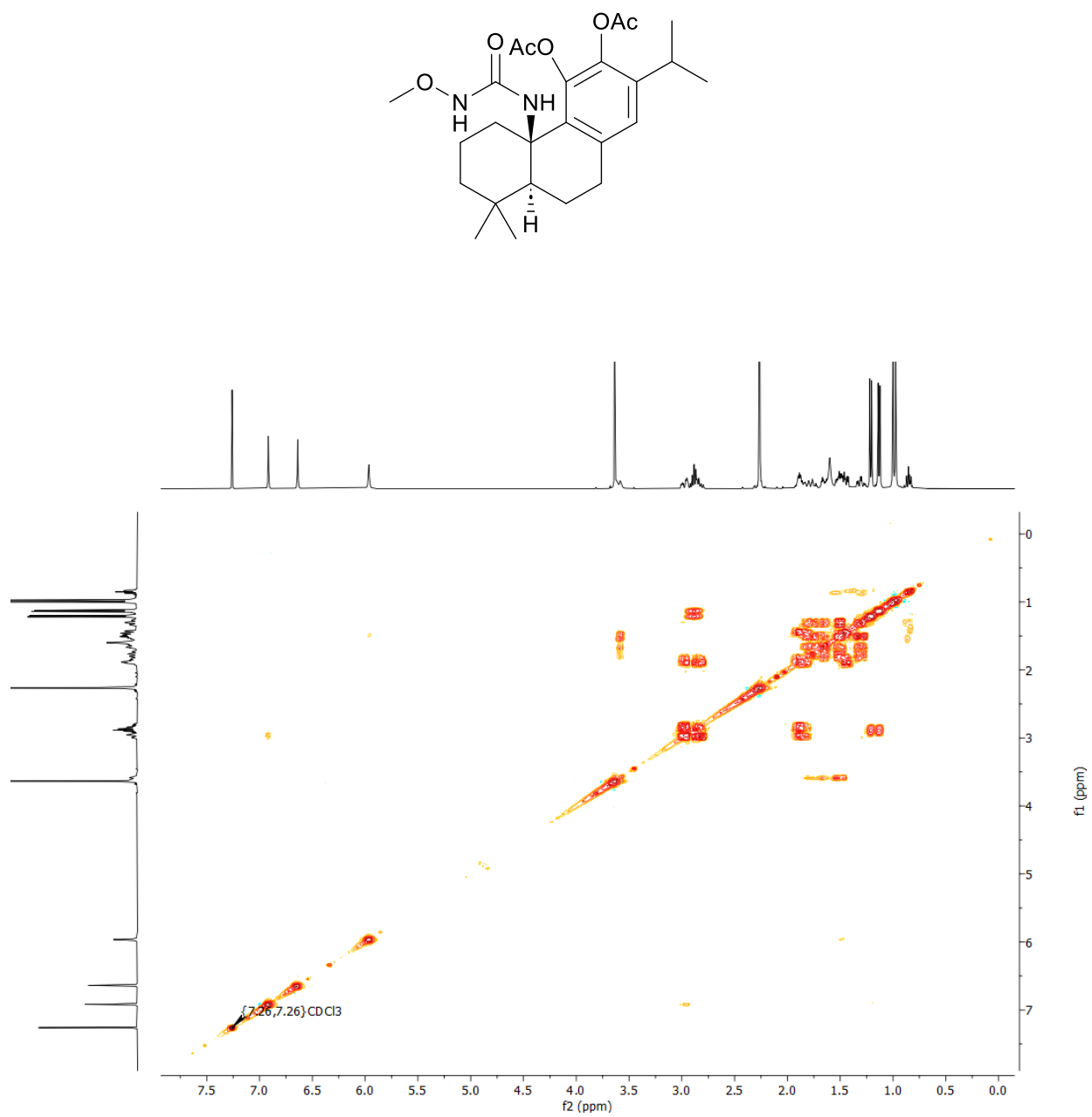
### 9.1. $^1\text{H}$ spectrum for compound **12** recorded in $\text{CDCl}_3$



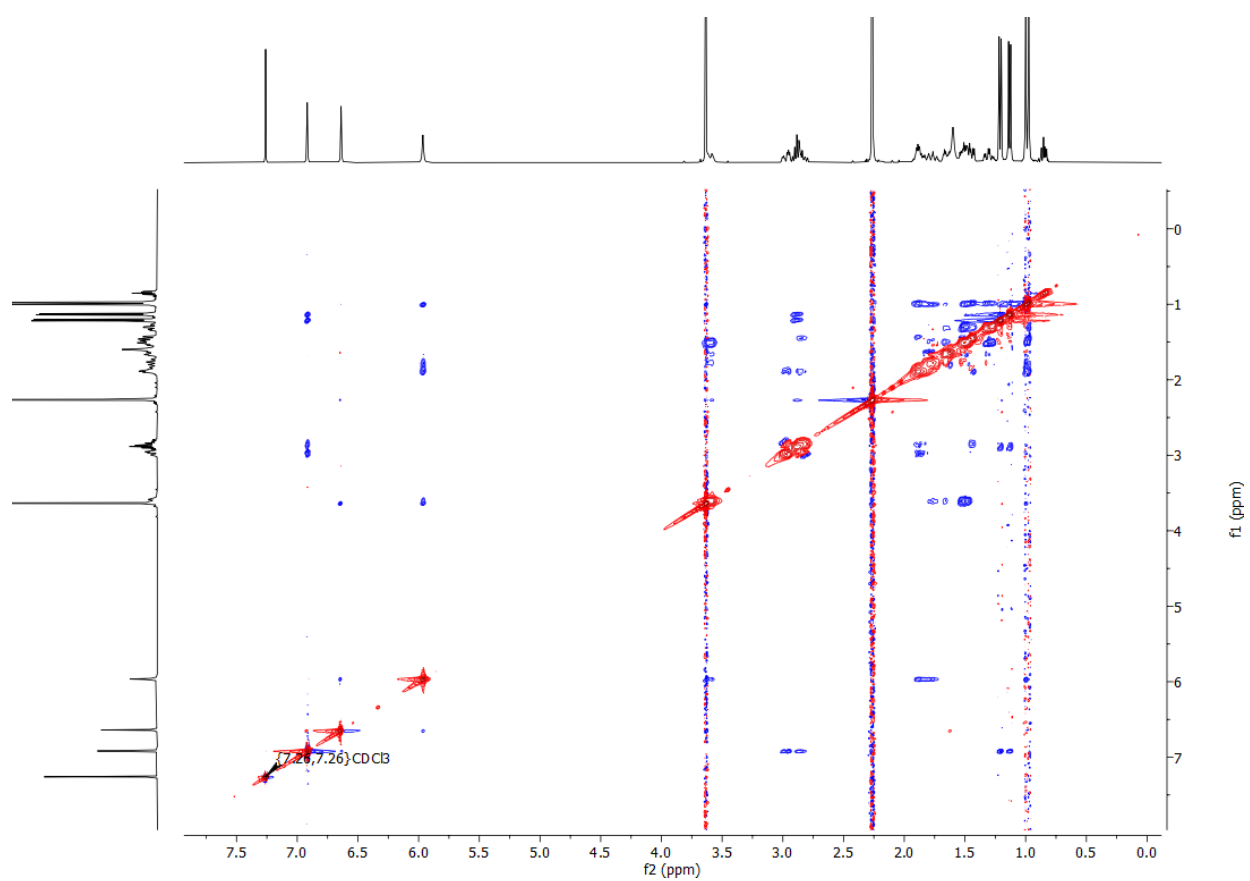
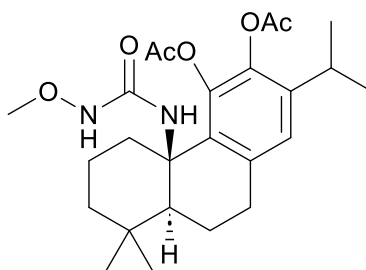
9.2.  $^{13}\text{C}$  spectrum for compound **12** recorded in  $\text{CDCl}_3$



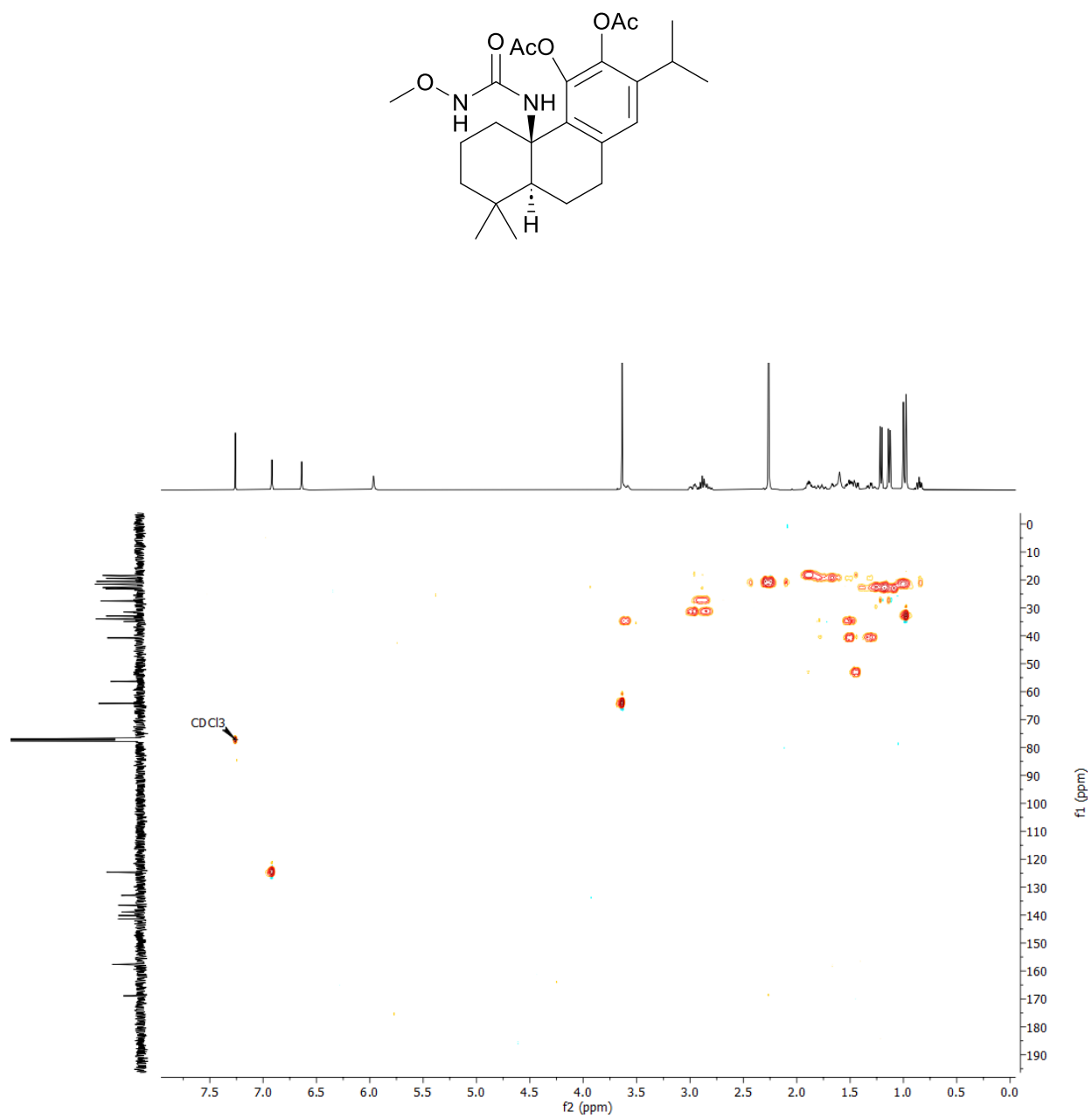
9.3. COSY spectrum for compound **12** recorded in CDCl<sub>3</sub>



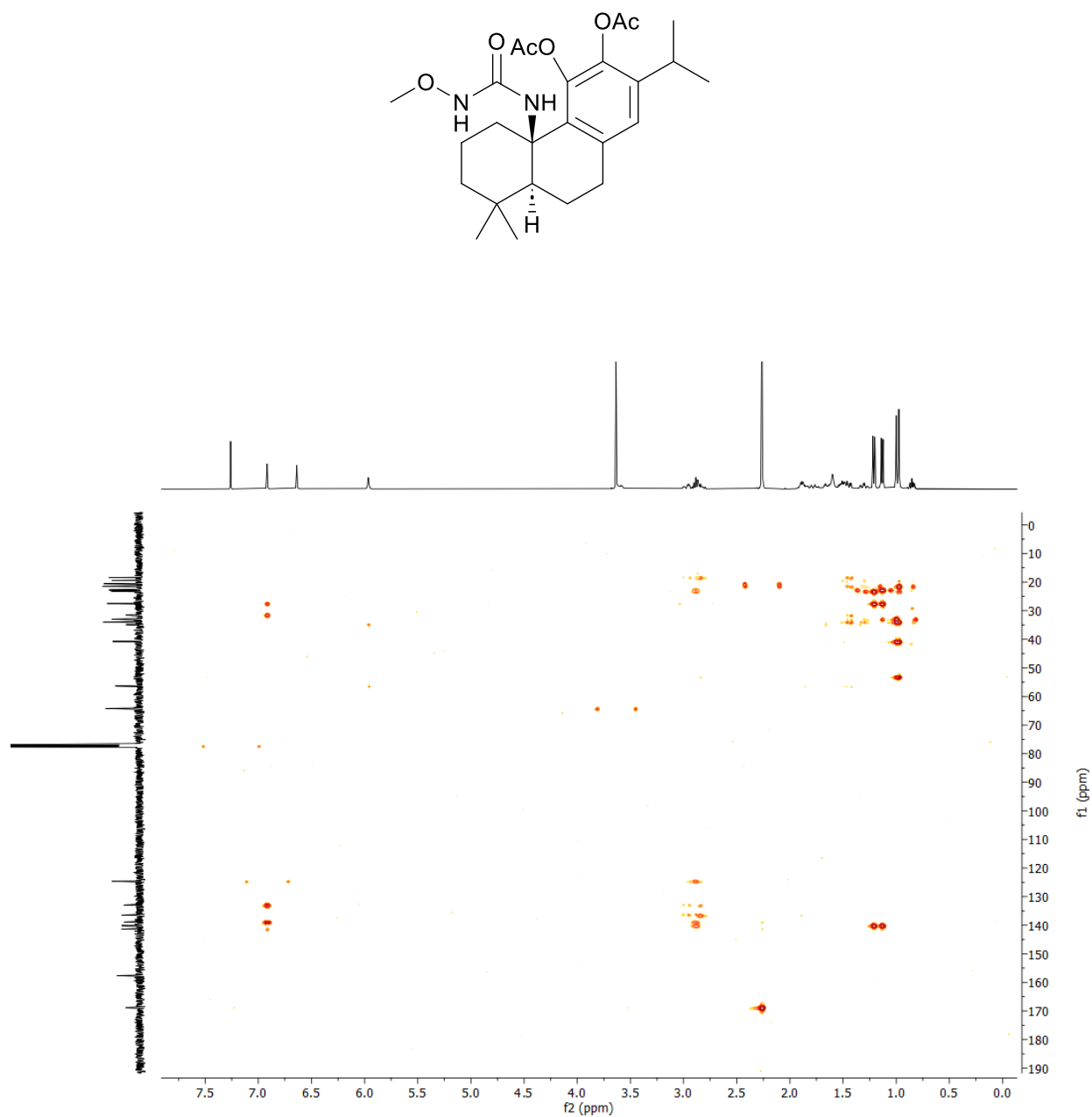
9.4. NOESY spectrum for compound **12** recorded in CDCl<sub>3</sub>



9.5. HSQC spectrum for compound **12** recorded in CDCl<sub>3</sub>

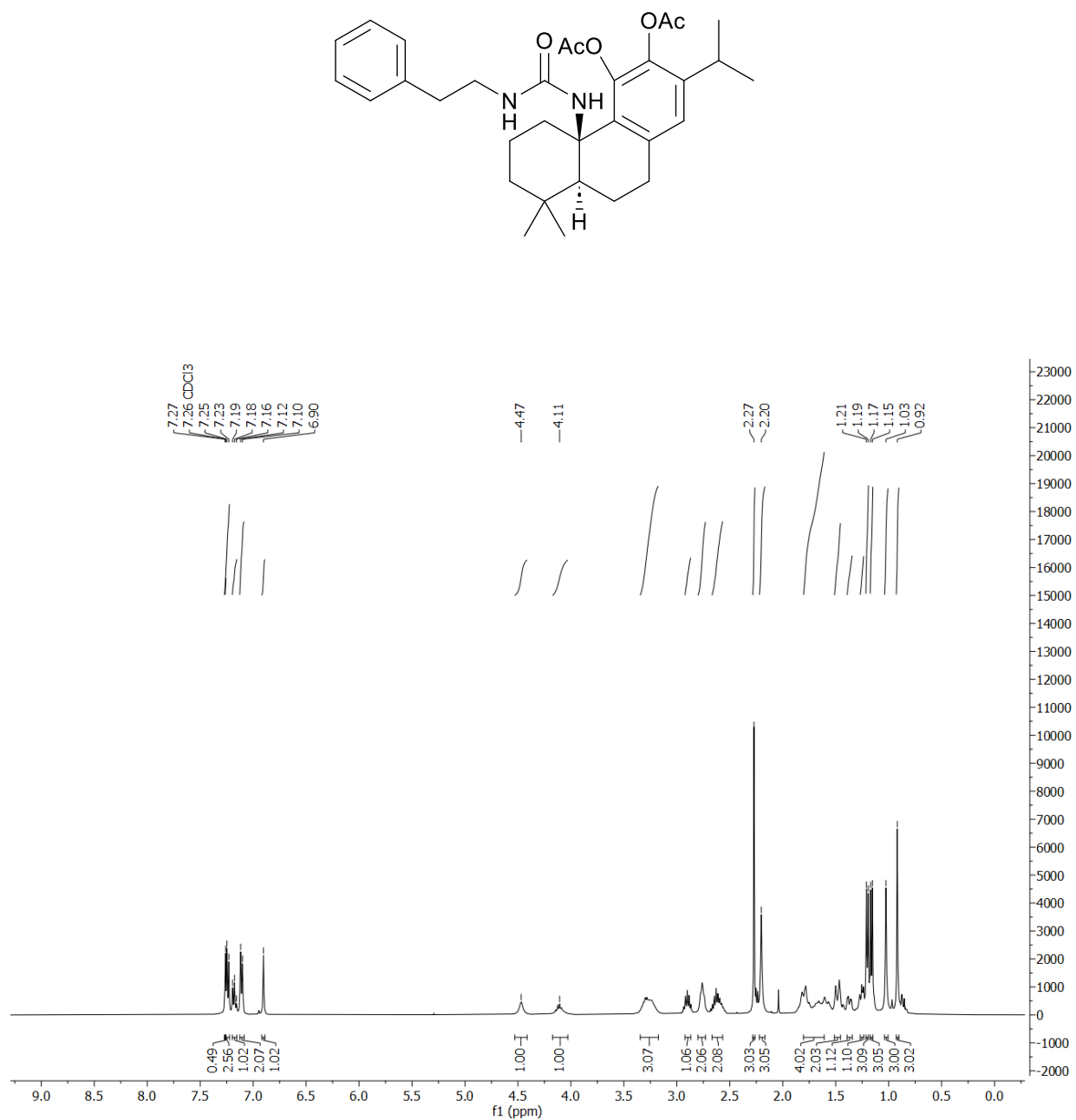


9.6. HMBC spectrum for compound **12** recorded in CDCl<sub>3</sub>

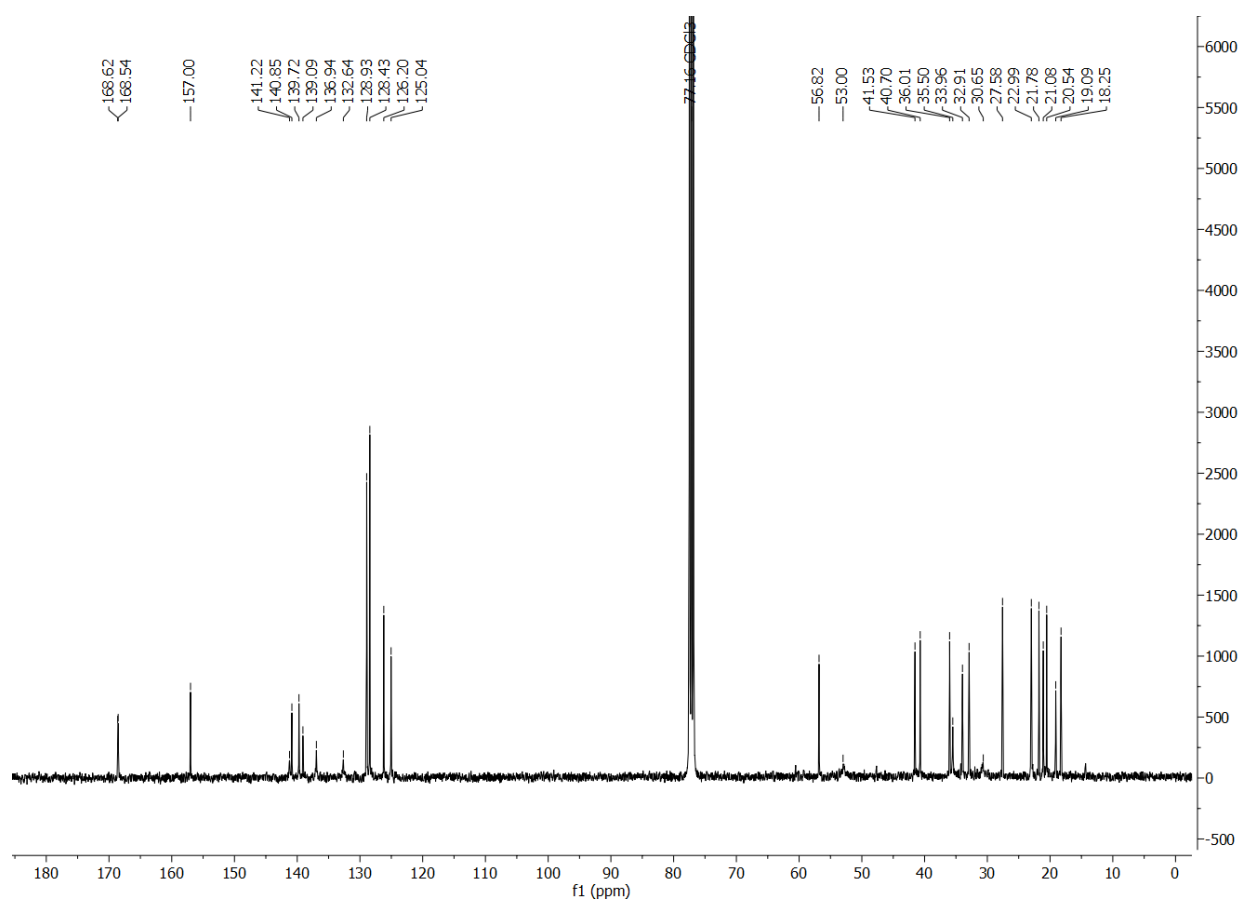
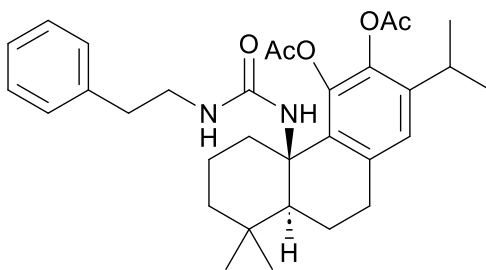


## 10. NMR data for compound **13**

### 10.1. $^1\text{H}$ spectrum for compound **13** recorded in $\text{CDCl}_3$



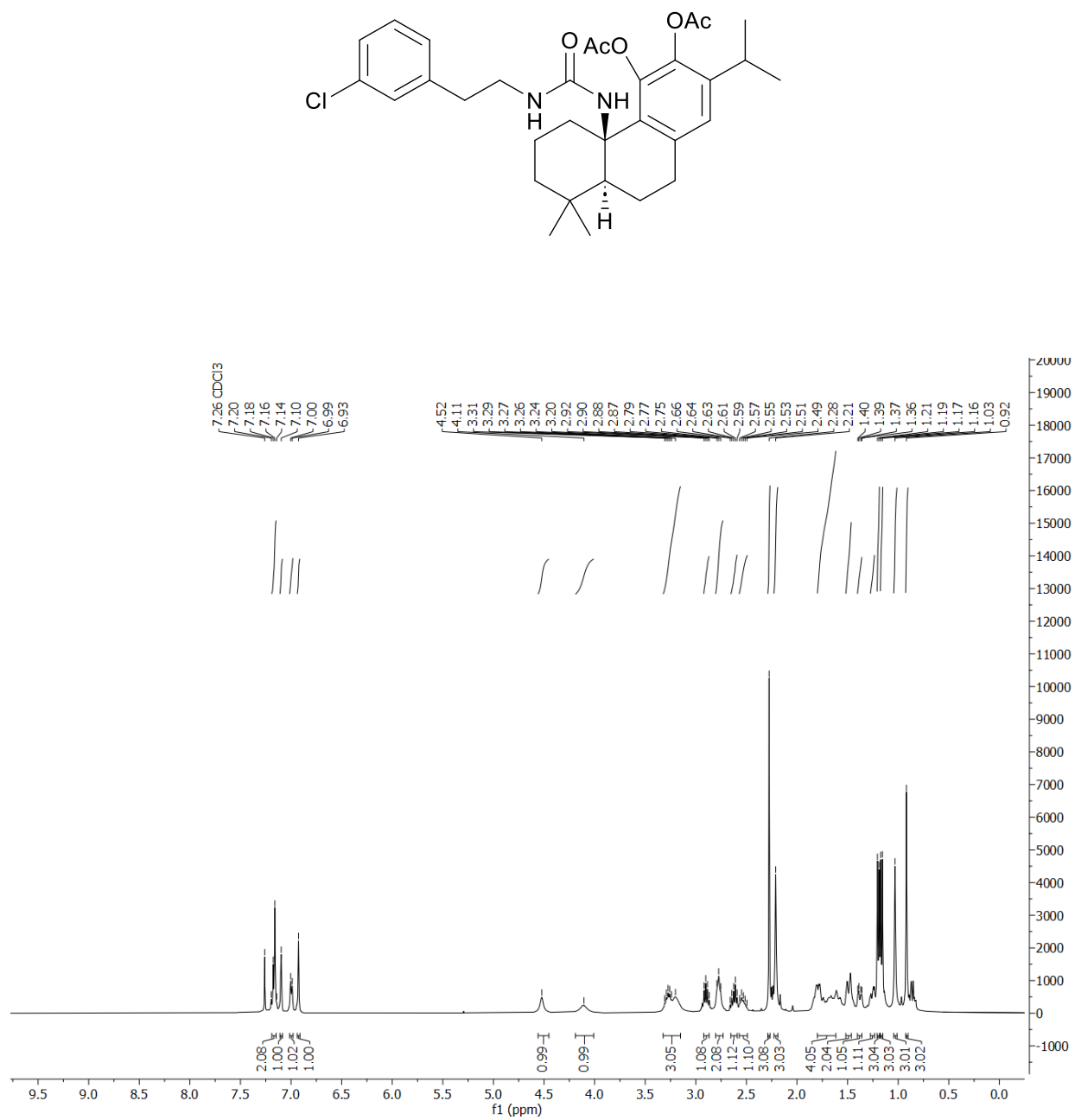
10.2.  $^{13}\text{C}$  spectrum for compound **13** recorded in  $\text{CDCl}_3$



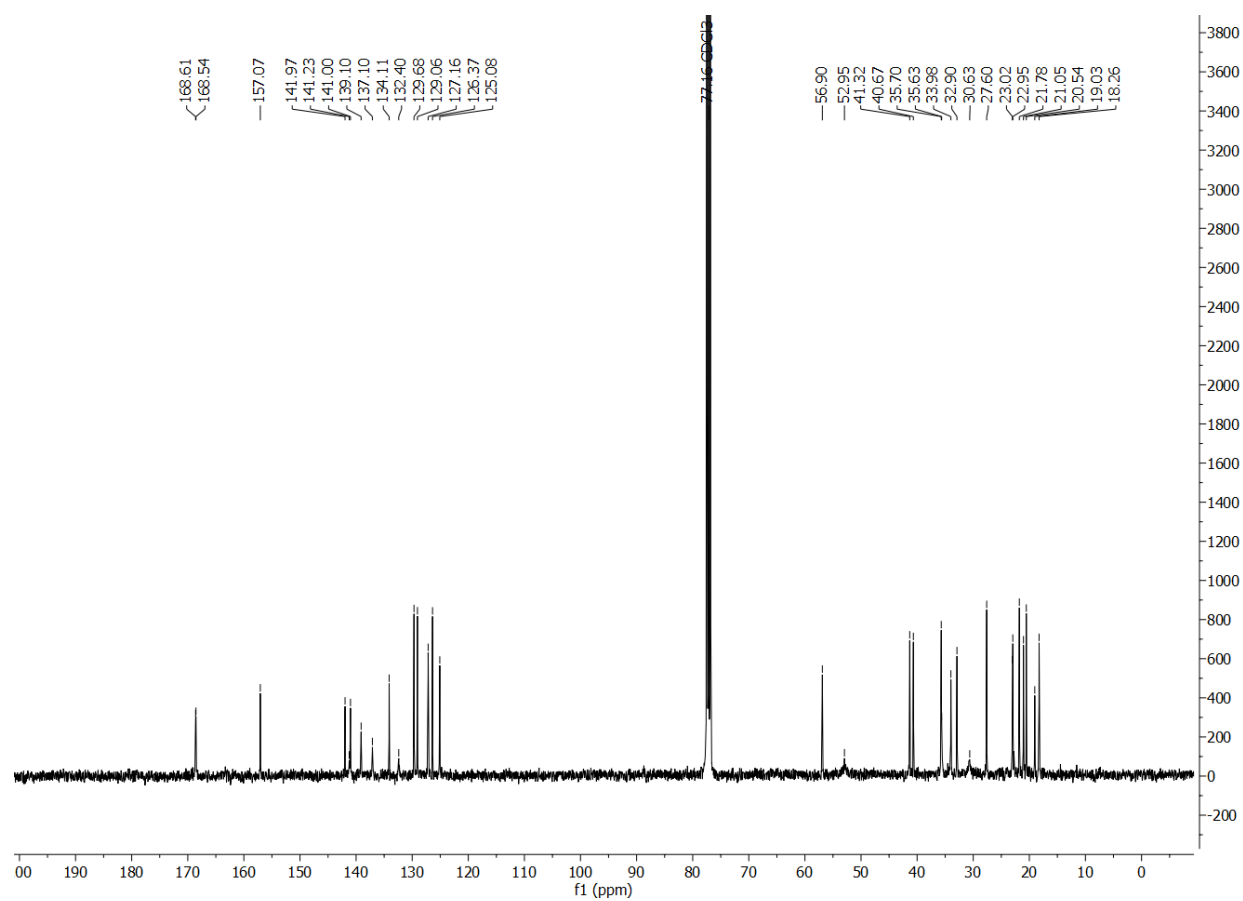
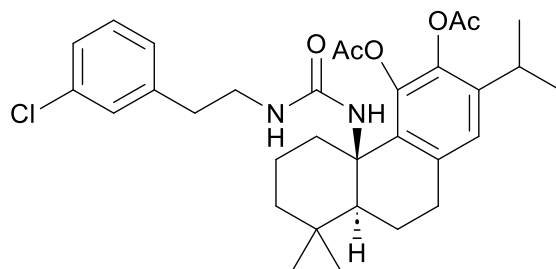


## 11. NMR data for compound **14**

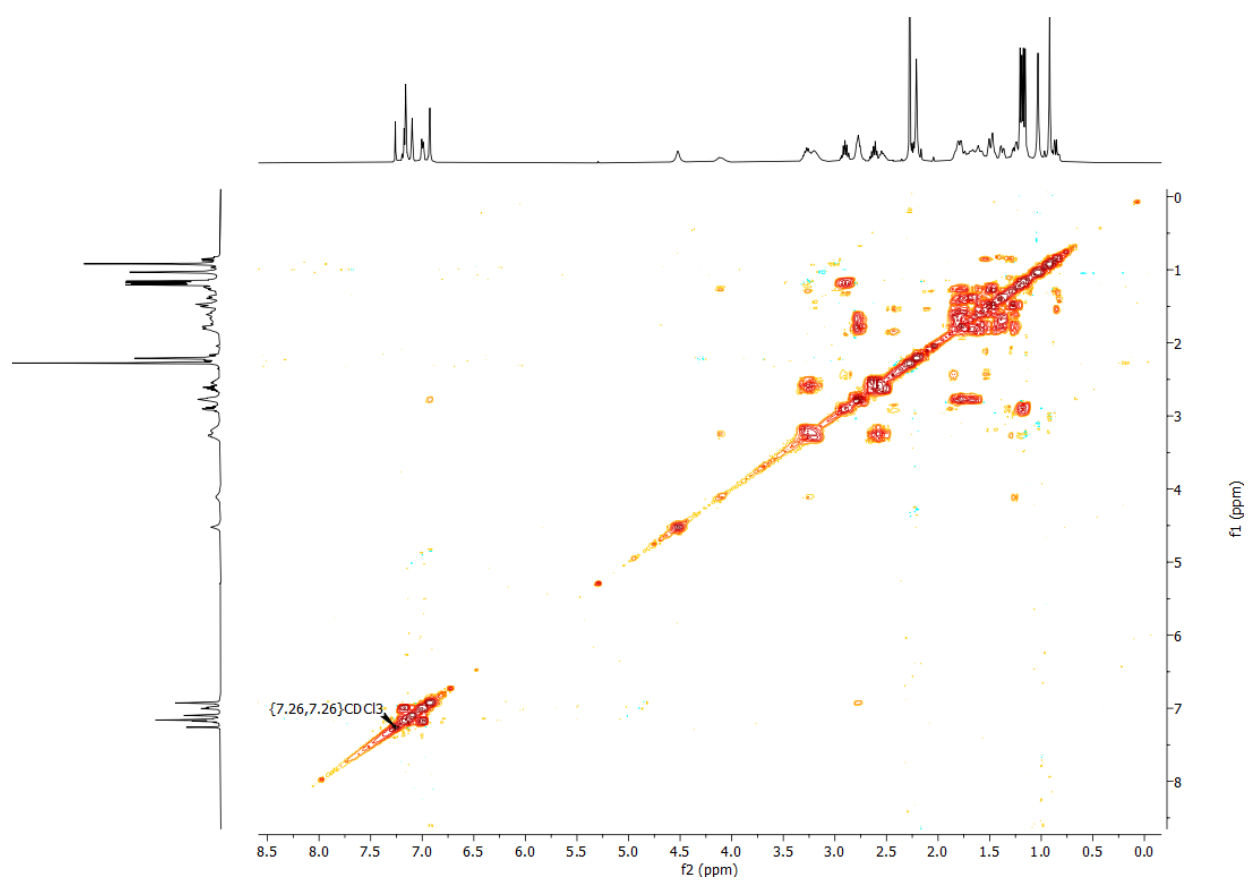
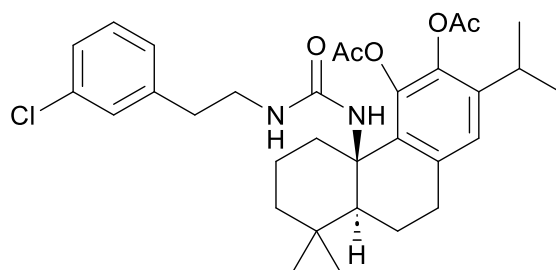
11.1.  $^1\text{H}$  spectrum for compound **14** recorded in  $\text{CDCl}_3$



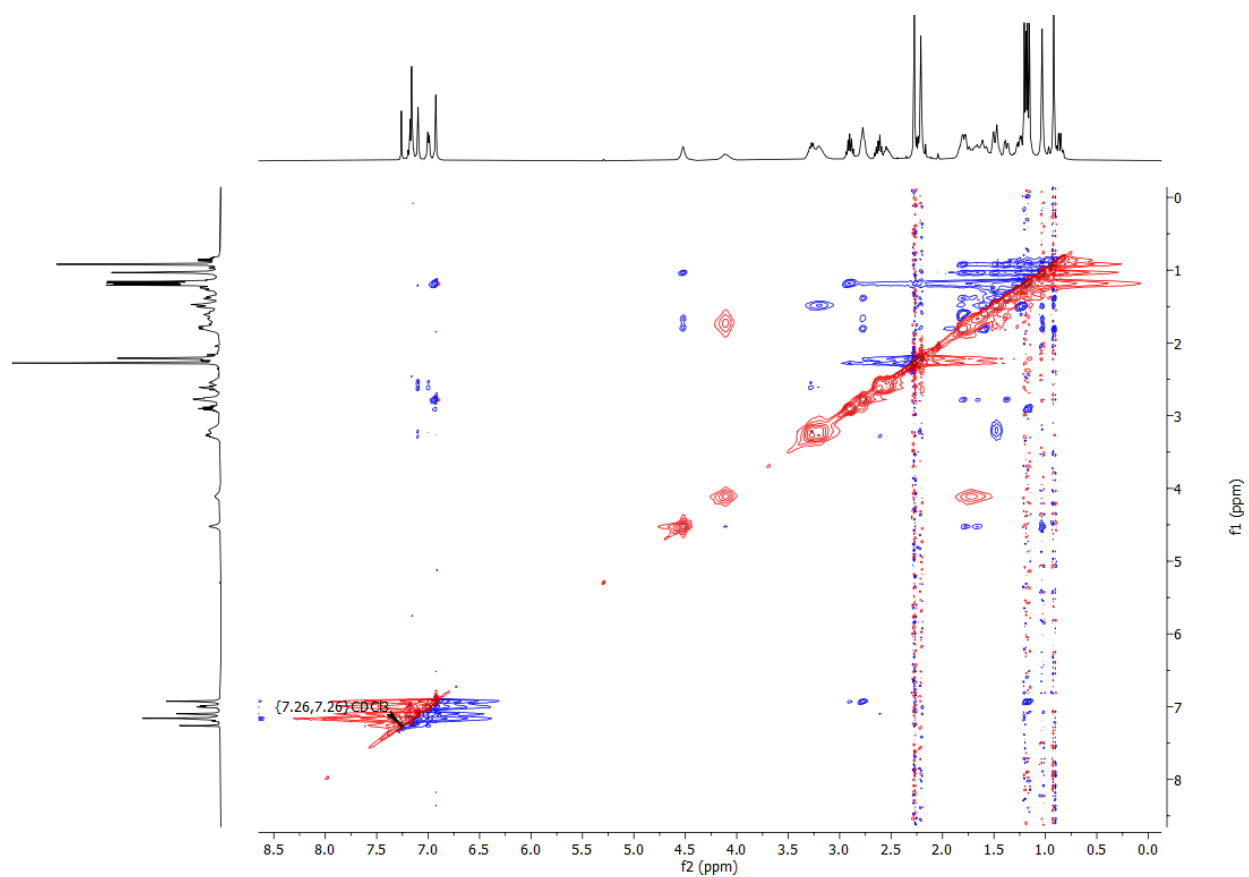
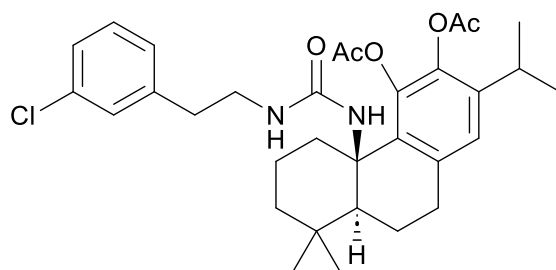
11.2.  $^{13}\text{C}$  spectrum for compound **14** recorded in  $\text{CDCl}_3$



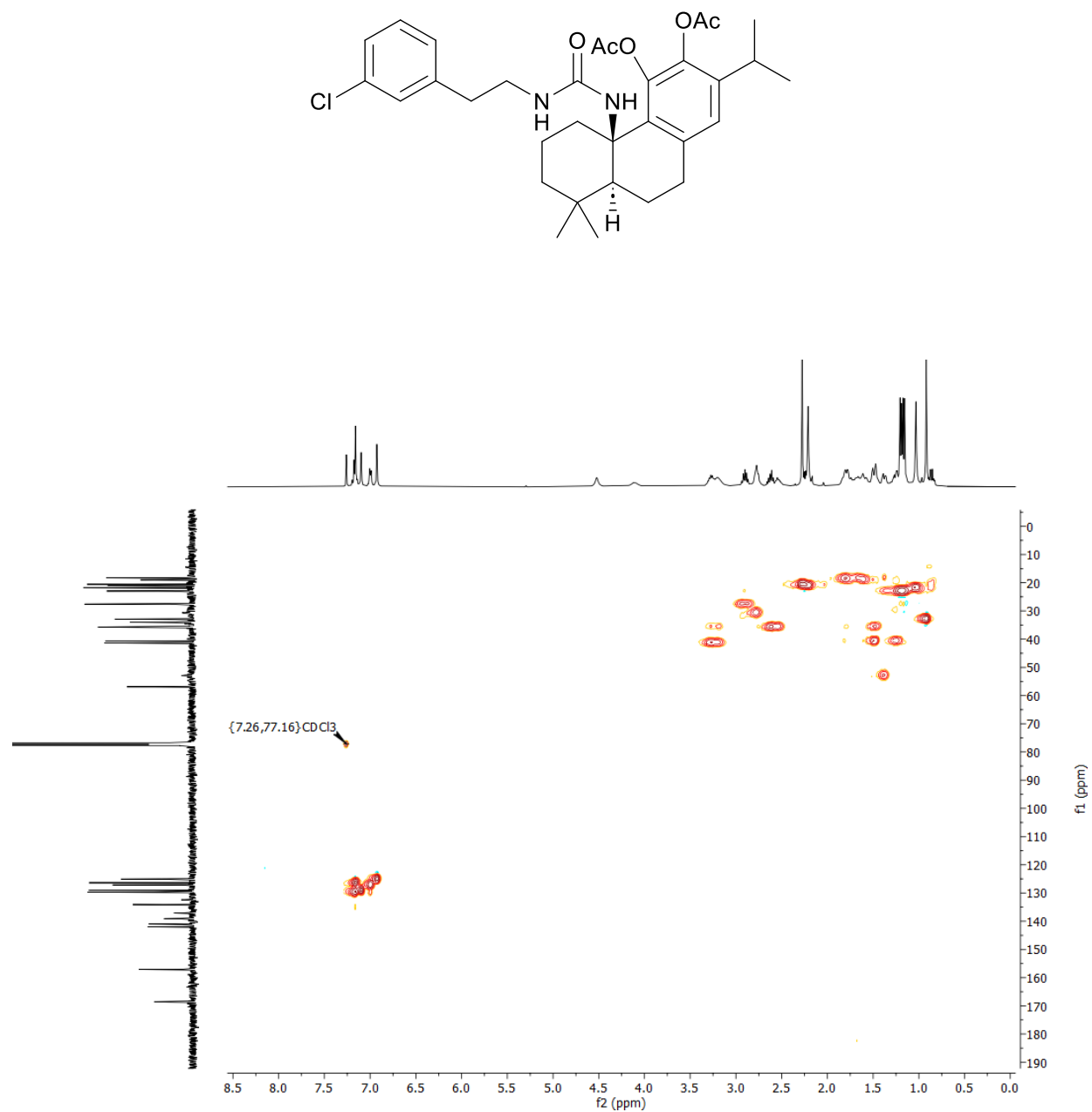
11.3. COSY spectrum for compound **14** recorded in CDCl<sub>3</sub>



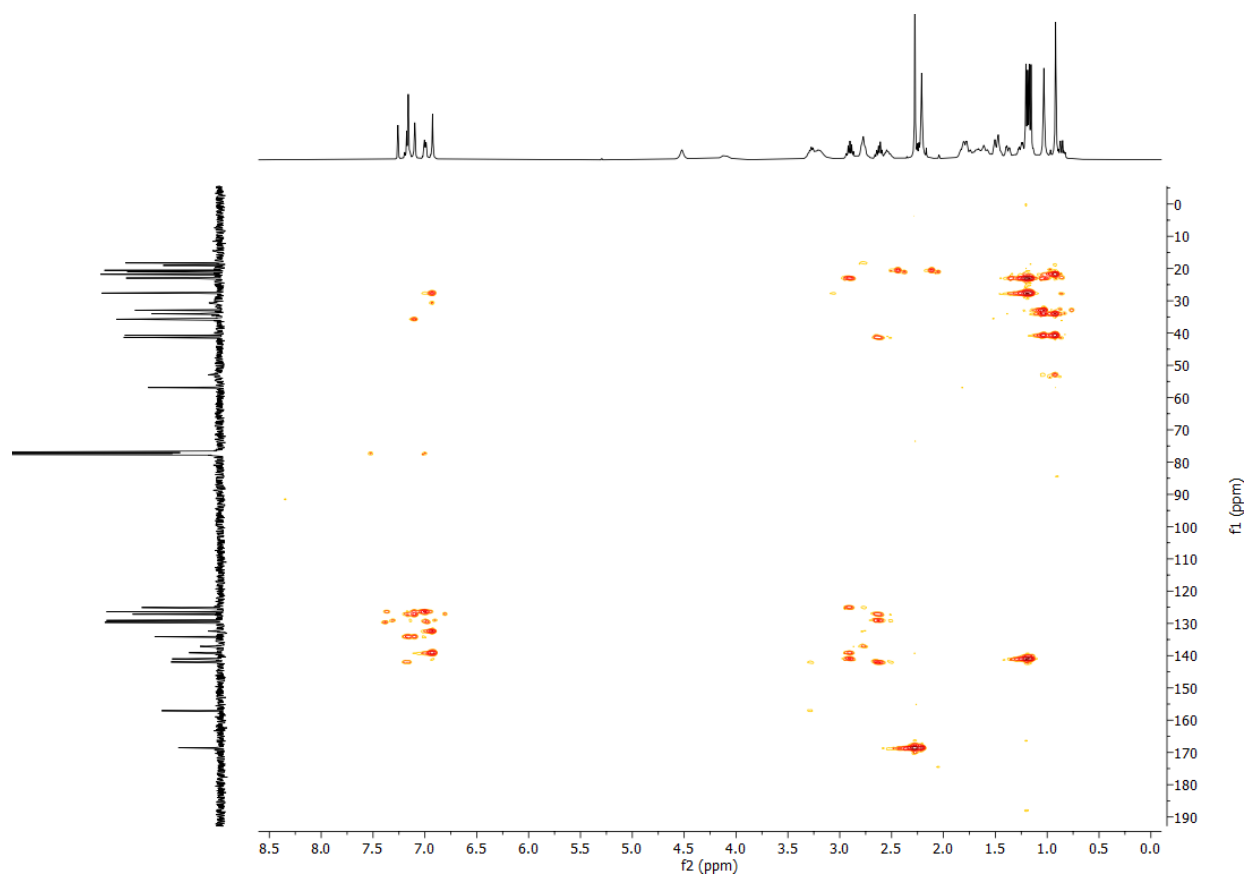
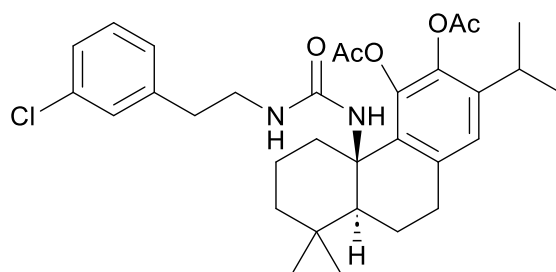
11.4. NOESY spectrum for compound **14** recorded in CDCl<sub>3</sub>



11.5. HSQC spectrum for compound **14** recorded in  $CDCl_3$

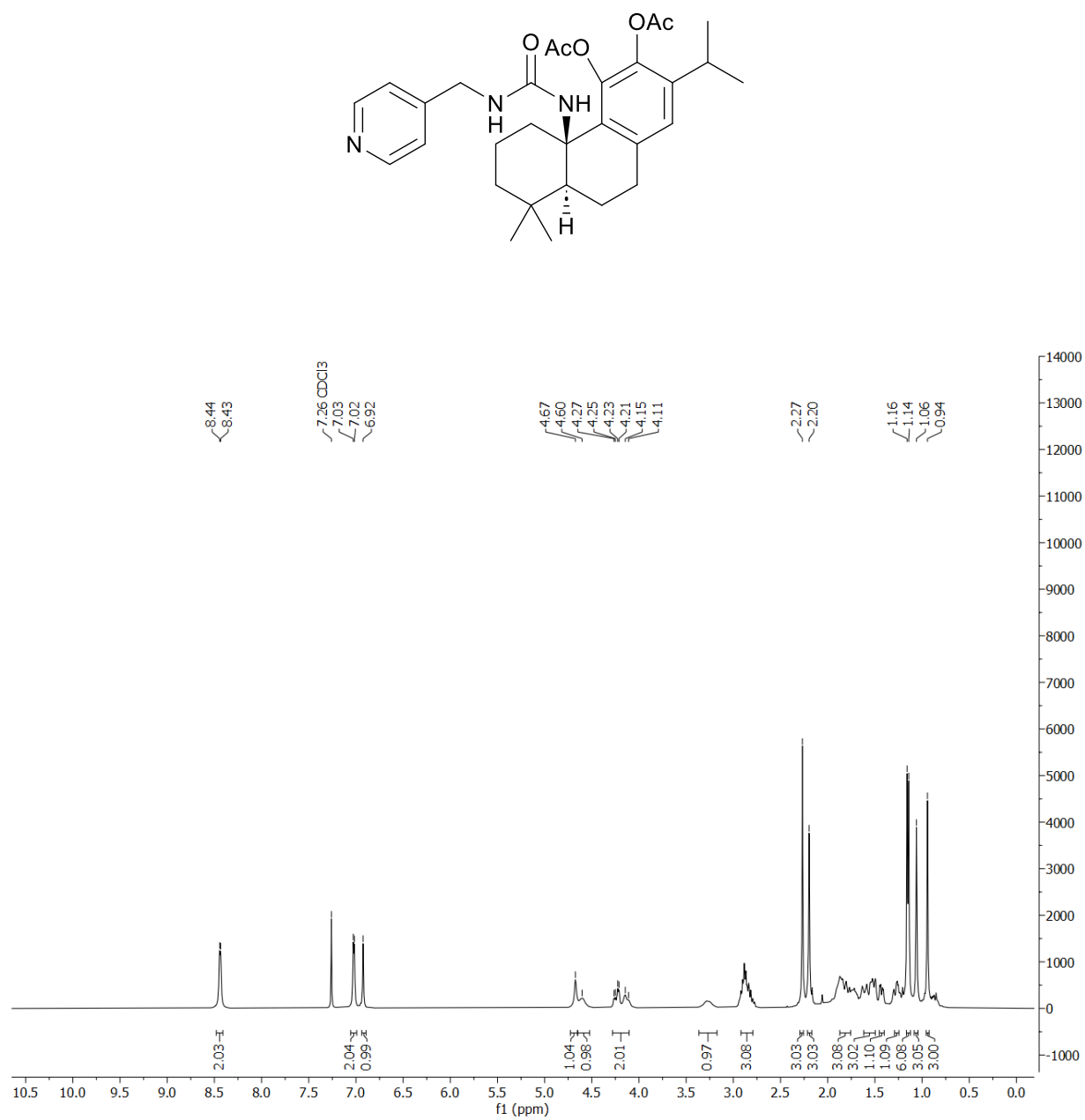


11.6. HMBC spectrum for compound **14** recorded in CDCl<sub>3</sub>

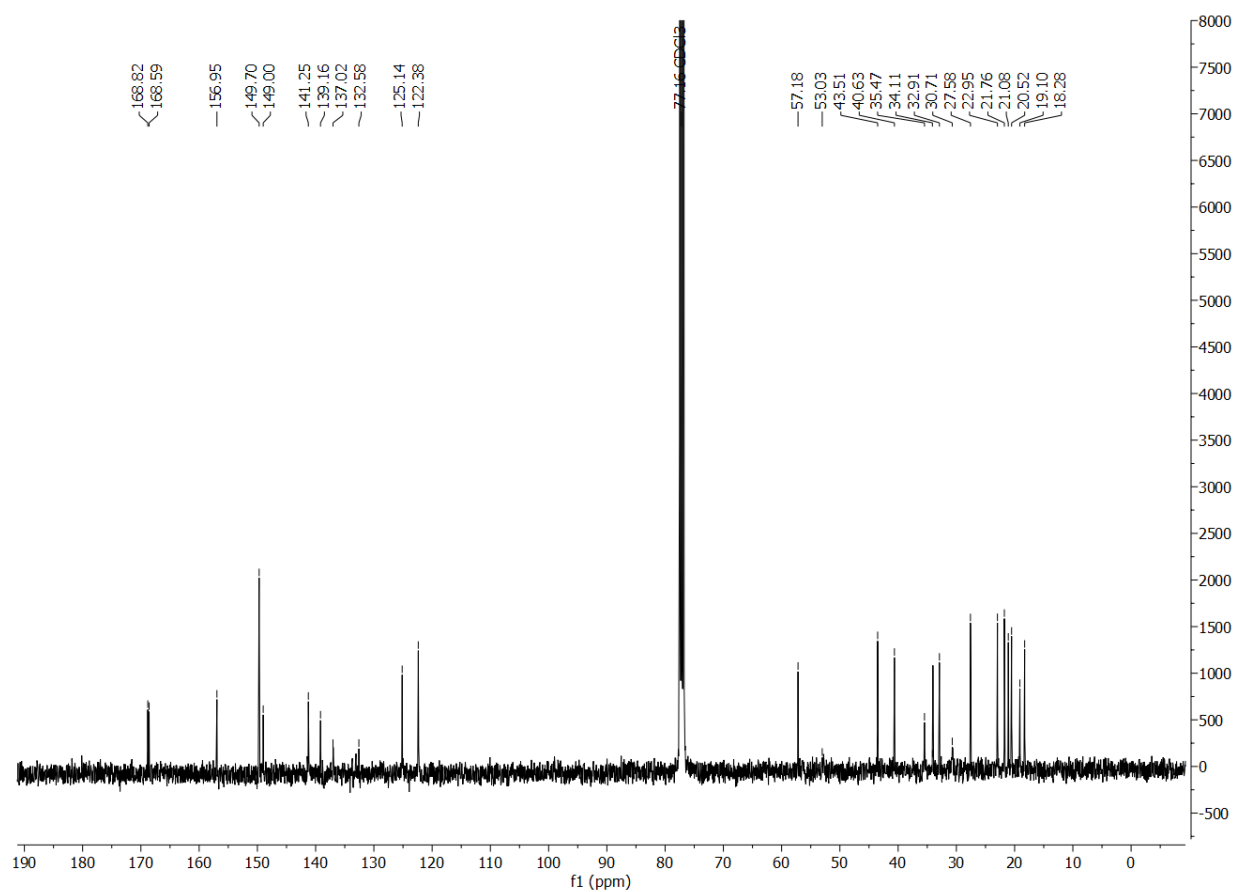
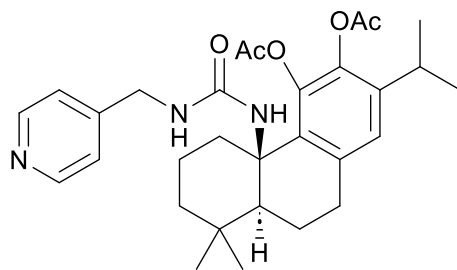


## 12. NMR data for compound **15**

12.1.  $^1\text{H}$  spectrum for compound **15** recorded in  $\text{CDCl}_3$



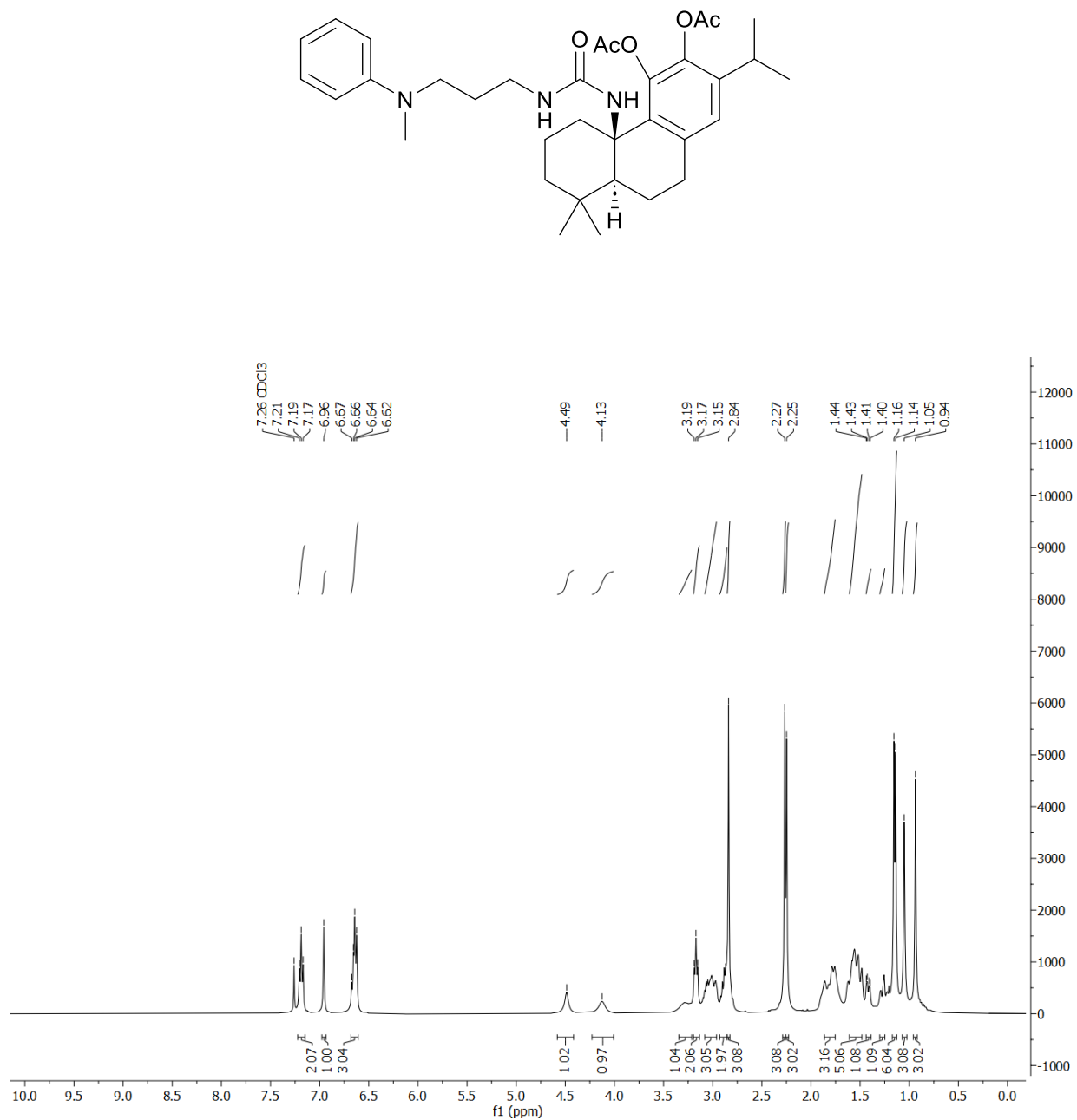
12.2.  $^{13}\text{C}$  spectrum for compound **15** recorded in  $\text{CDCl}_3$



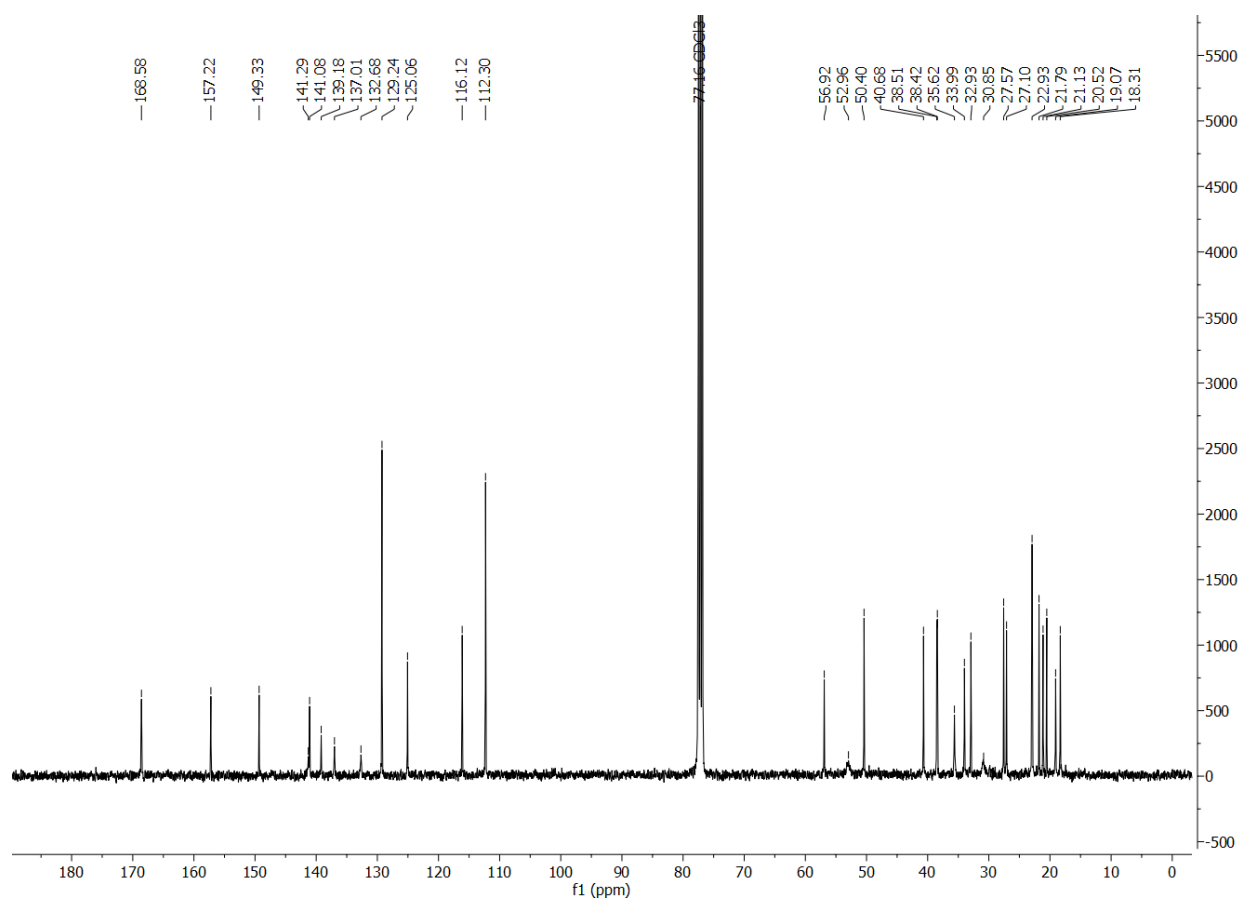
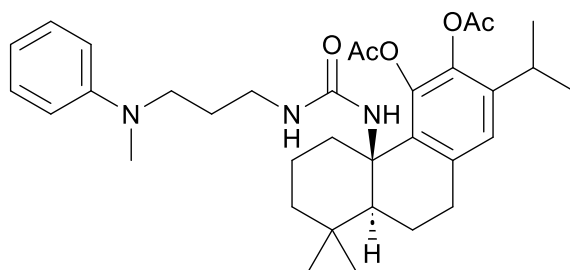


### 13. NMR data for compound **16**

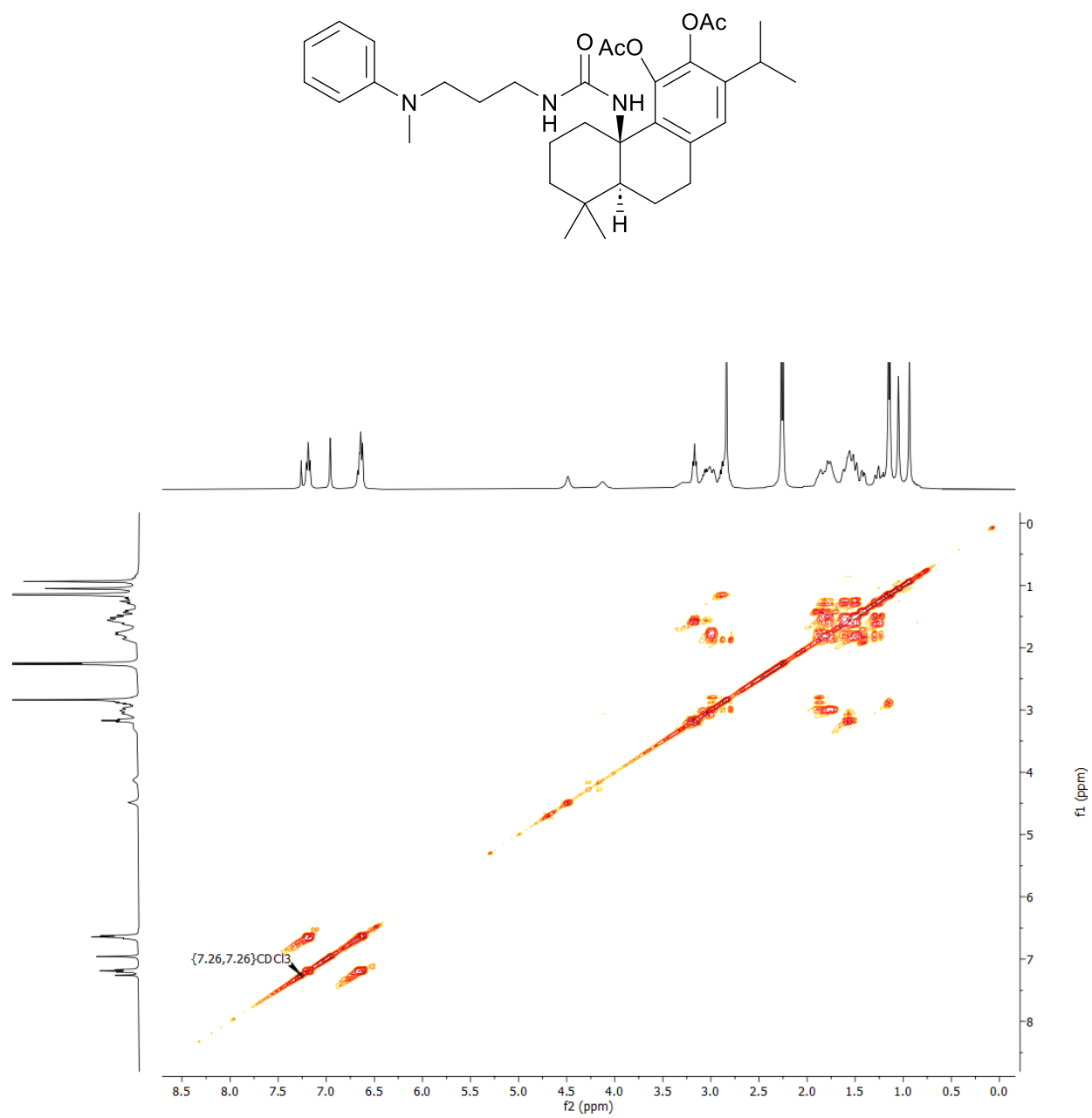
13.1.  $^1\text{H}$  spectrum for compound **16** recorded in  $\text{CDCl}_3$



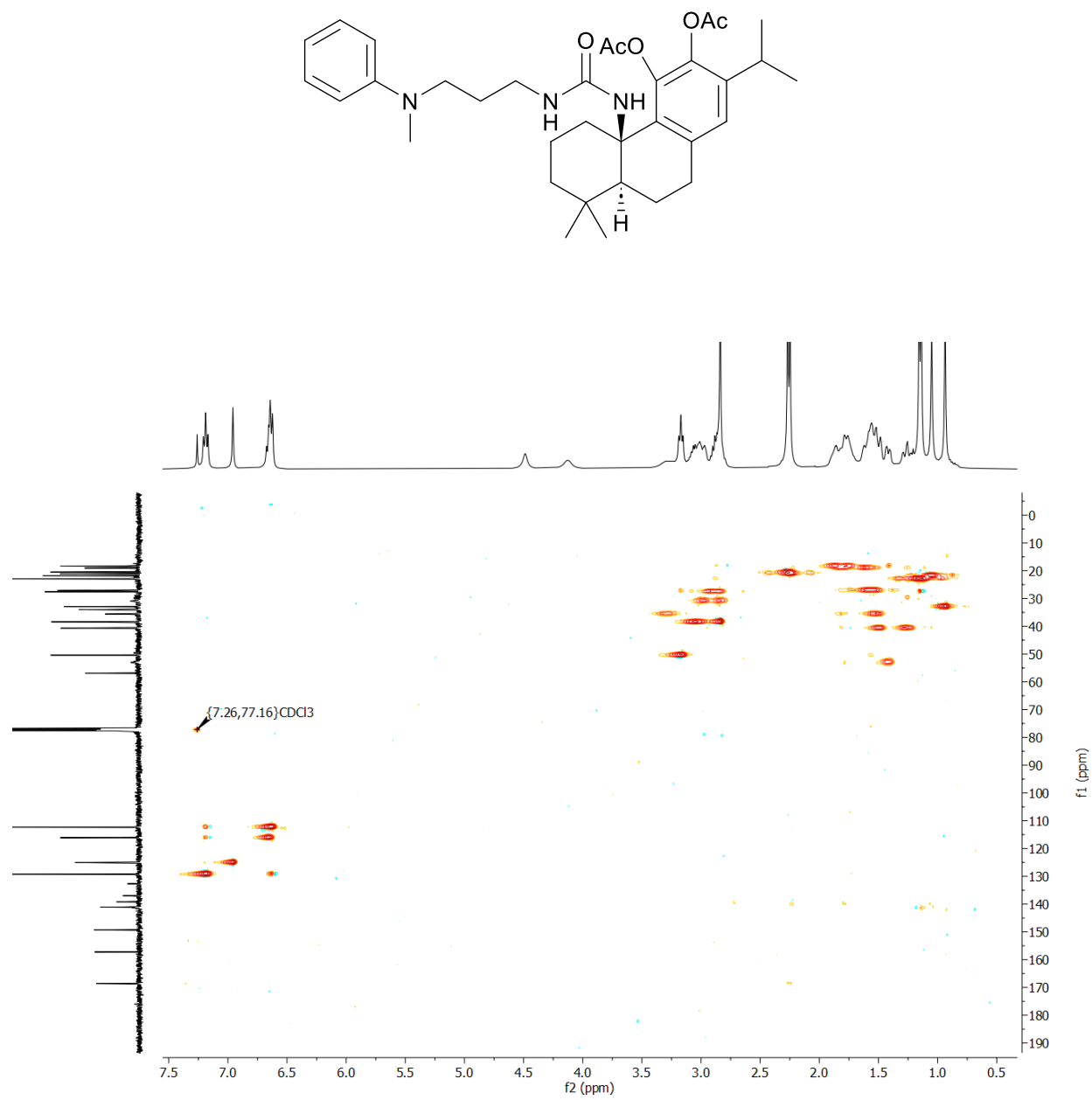
13.2.  $^{13}\text{C}$  spectrum for compound **16** recorded in  $\text{CDCl}_3$



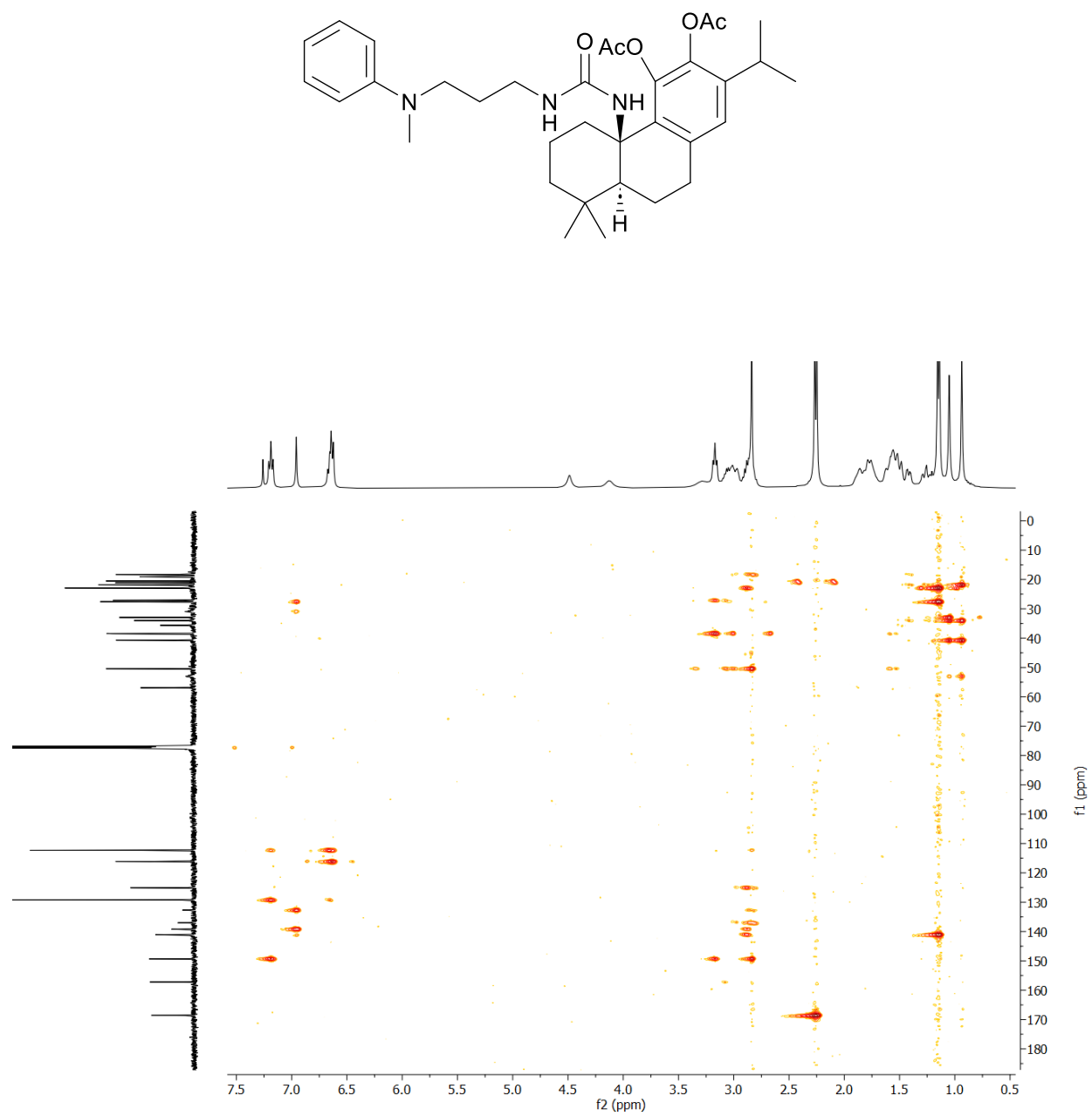
13.3. COSY spectrum for compound **16** recorded in CDCl<sub>3</sub>



13.4. HSQC spectrum for compound **16** recorded in CDCl<sub>3</sub>

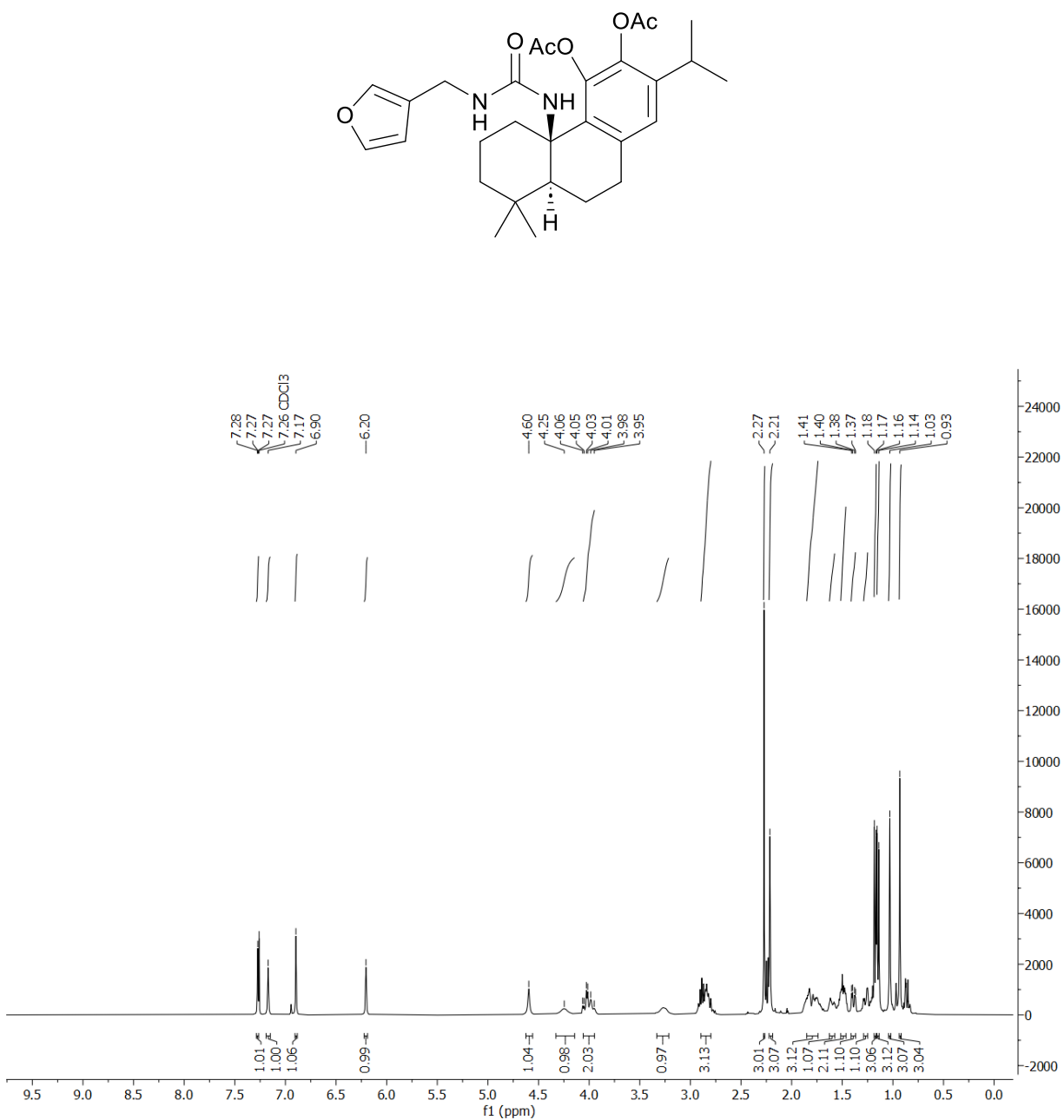


13.5. HMBC spectrum for compound **16** recorded in CDCl<sub>3</sub>

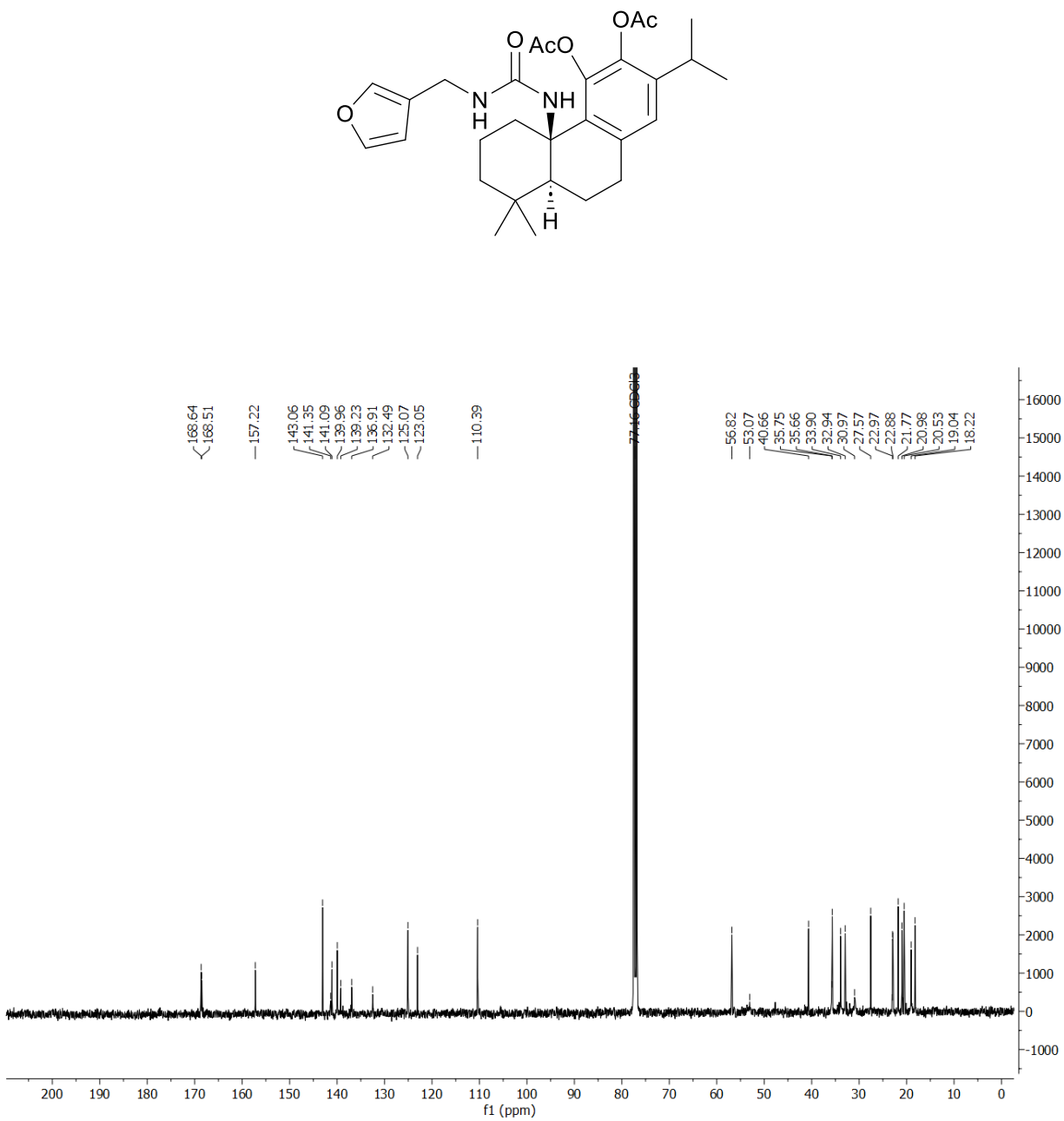


## 14. NMR data for compound **17**

14.1.  $^1\text{H}$  spectrum for compound **17** recorded in  $\text{CDCl}_3$

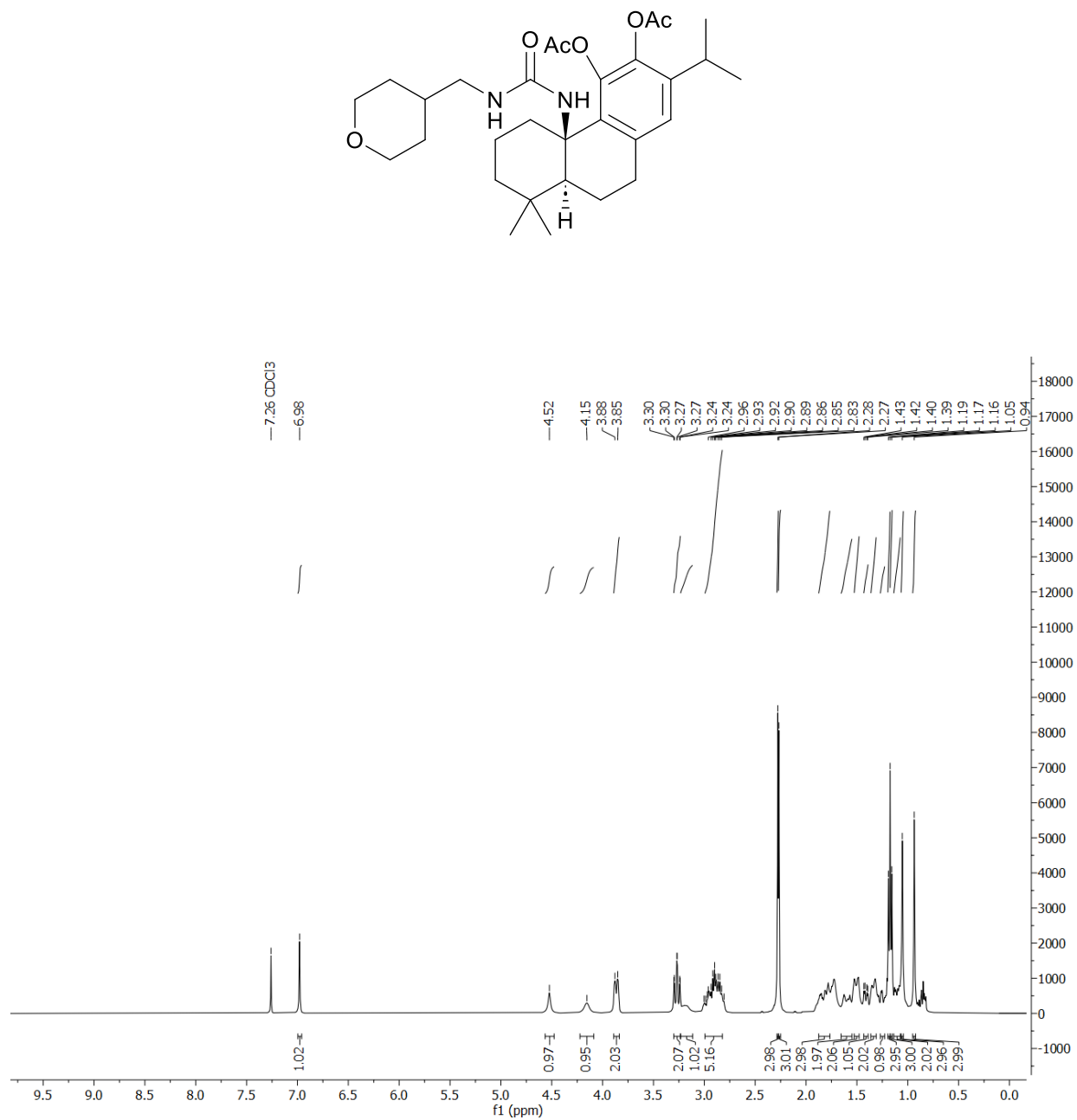


14.2.  $^{13}\text{C}$  spectrum for compound **17** recorded in  $\text{CDCl}_3$



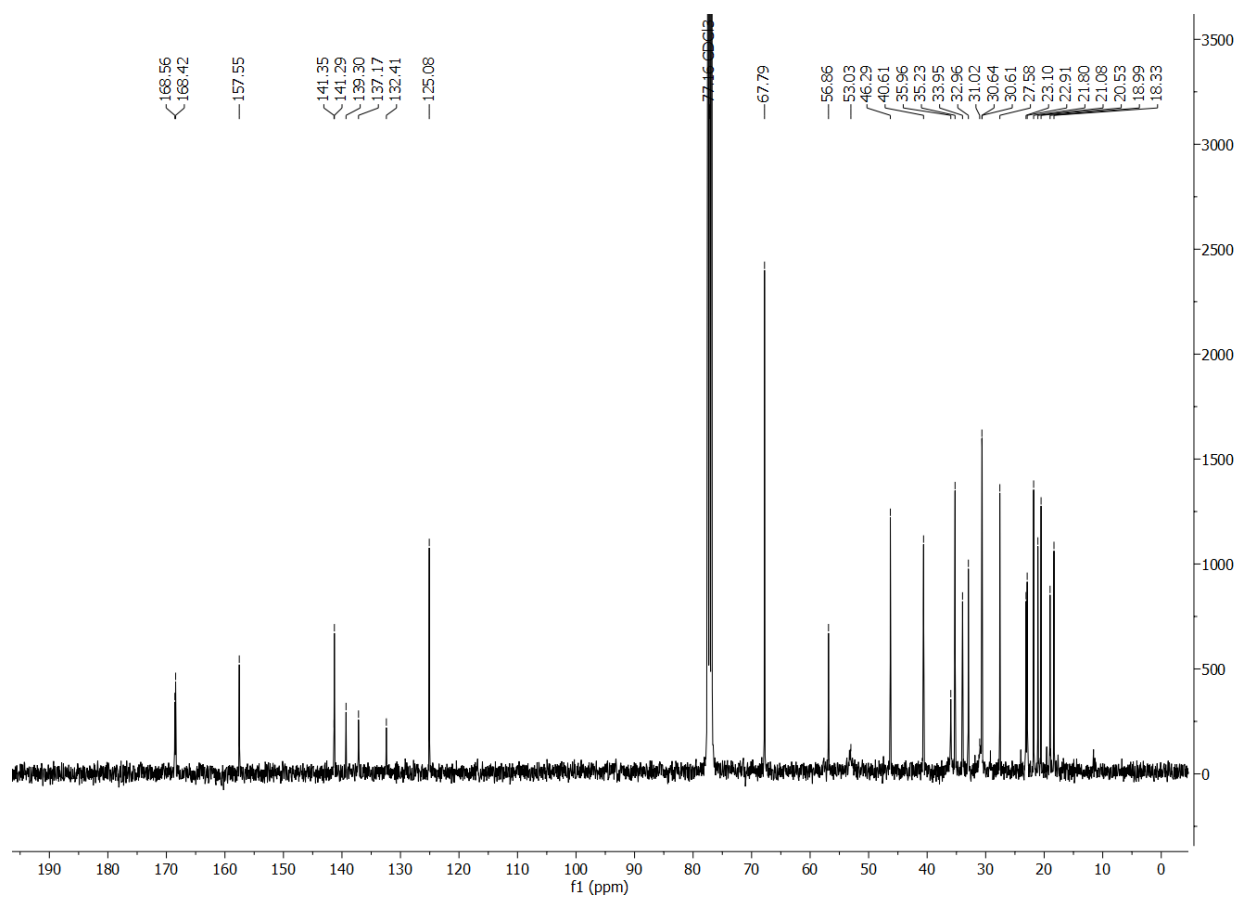
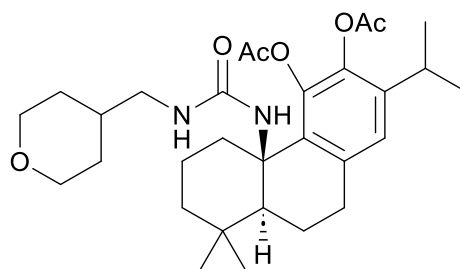
## 15. NMR data for compound **18**

15.1.  $^1\text{H}$  spectrum for compound **18** recorded in  $\text{CDCl}_3$

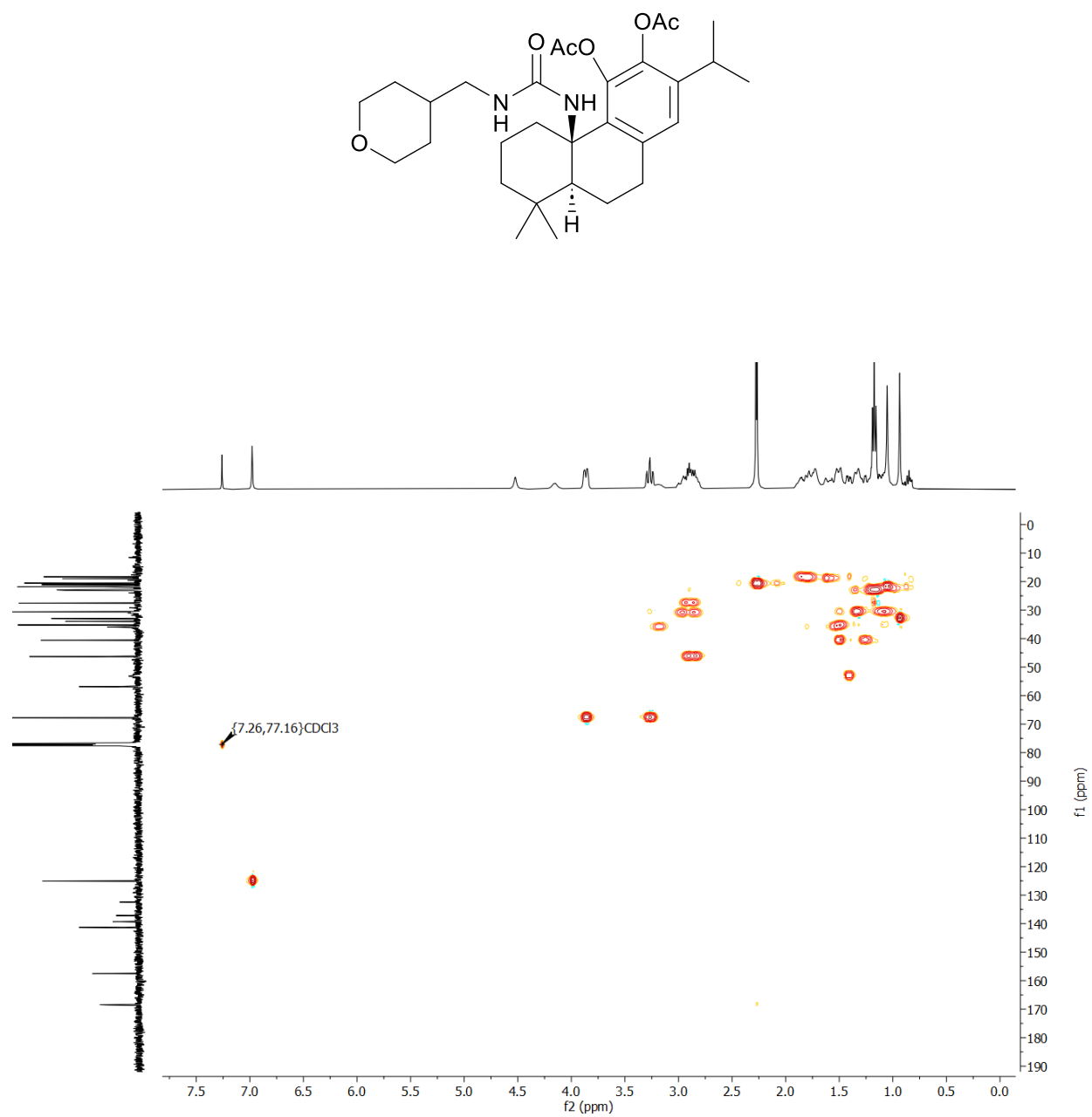




15.2.  $^{13}\text{C}$  spectrum for compound **18** recorded in  $\text{CDCl}_3$

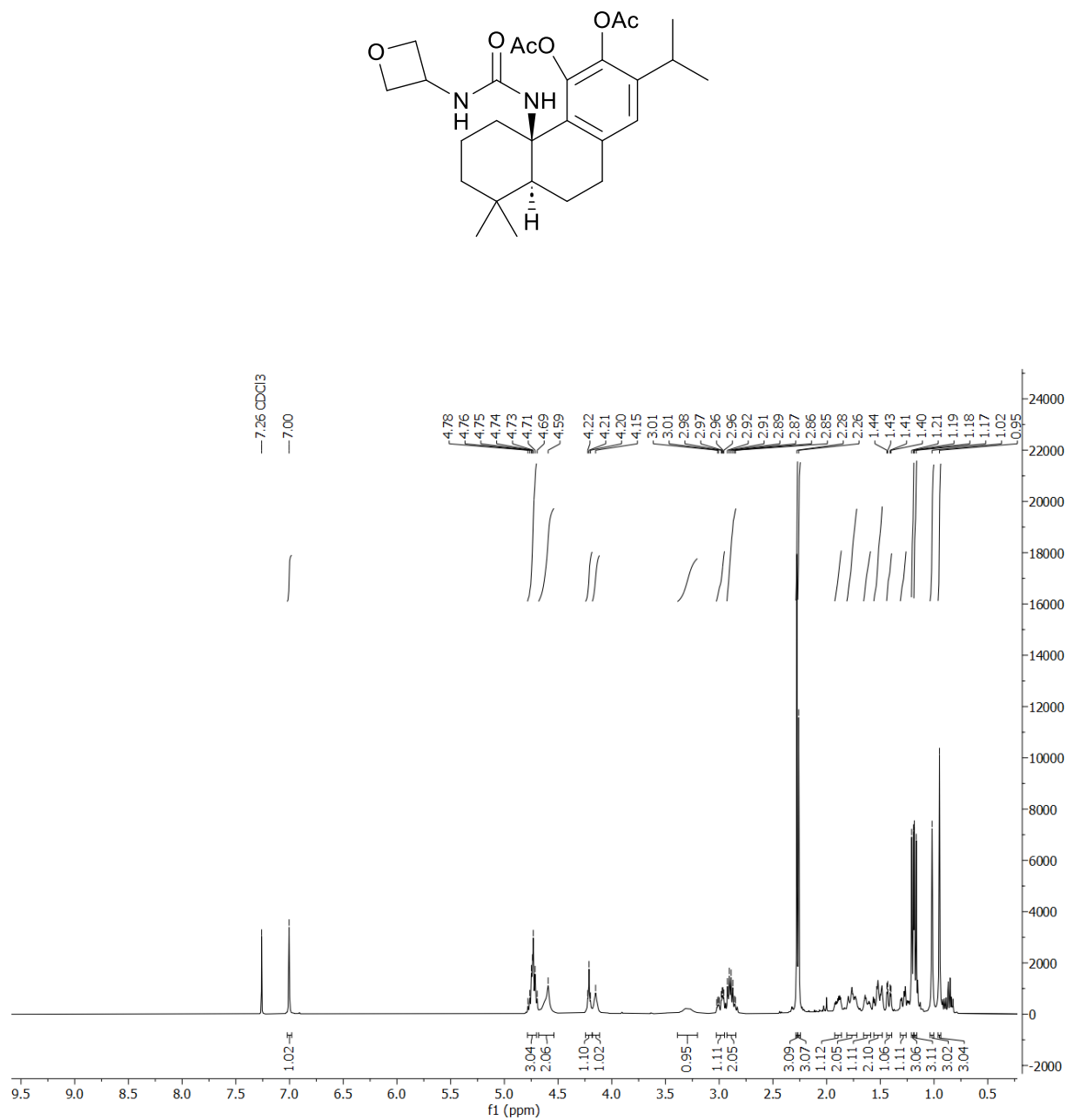


15.3. HSQC spectrum for compound **18** recorded in CDCl<sub>3</sub>

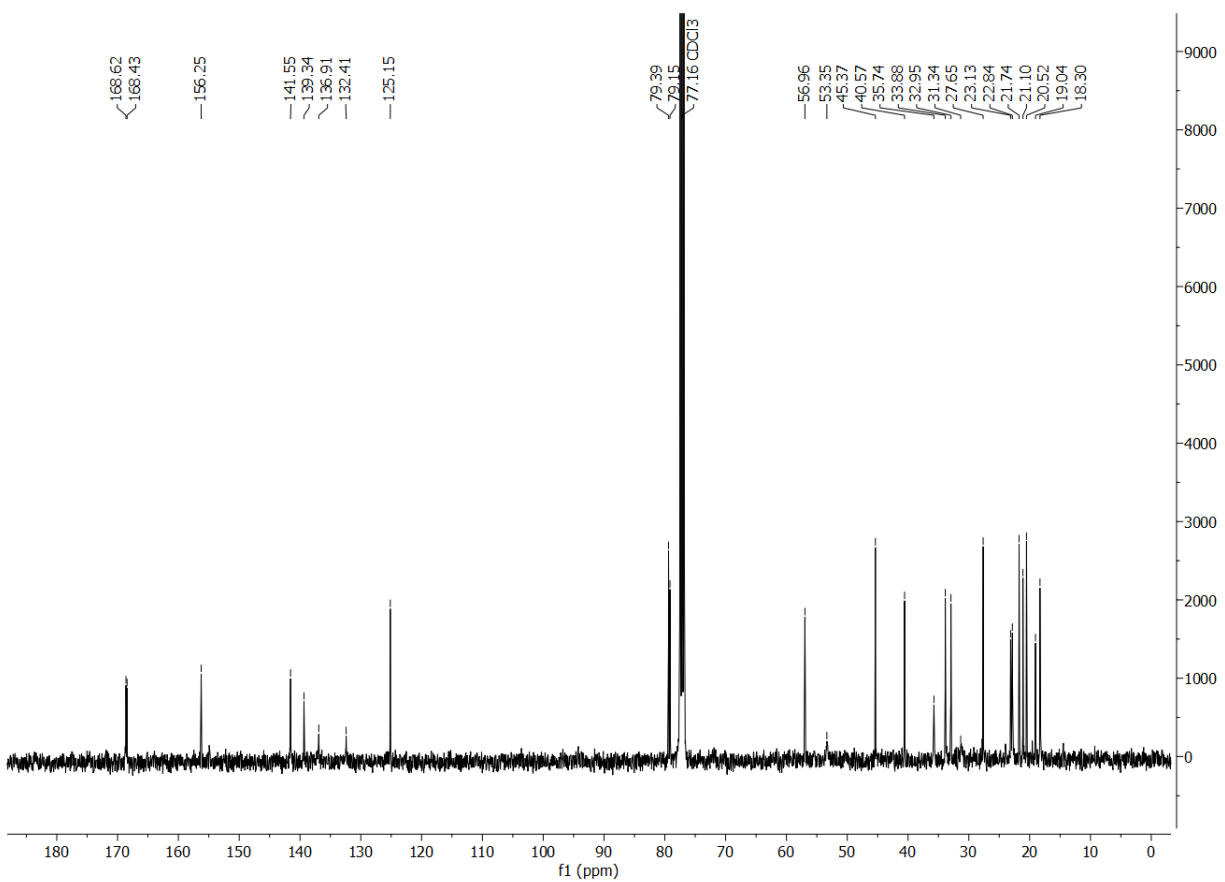
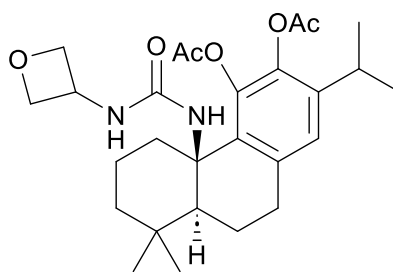


## 16. NMR data for compound **19**

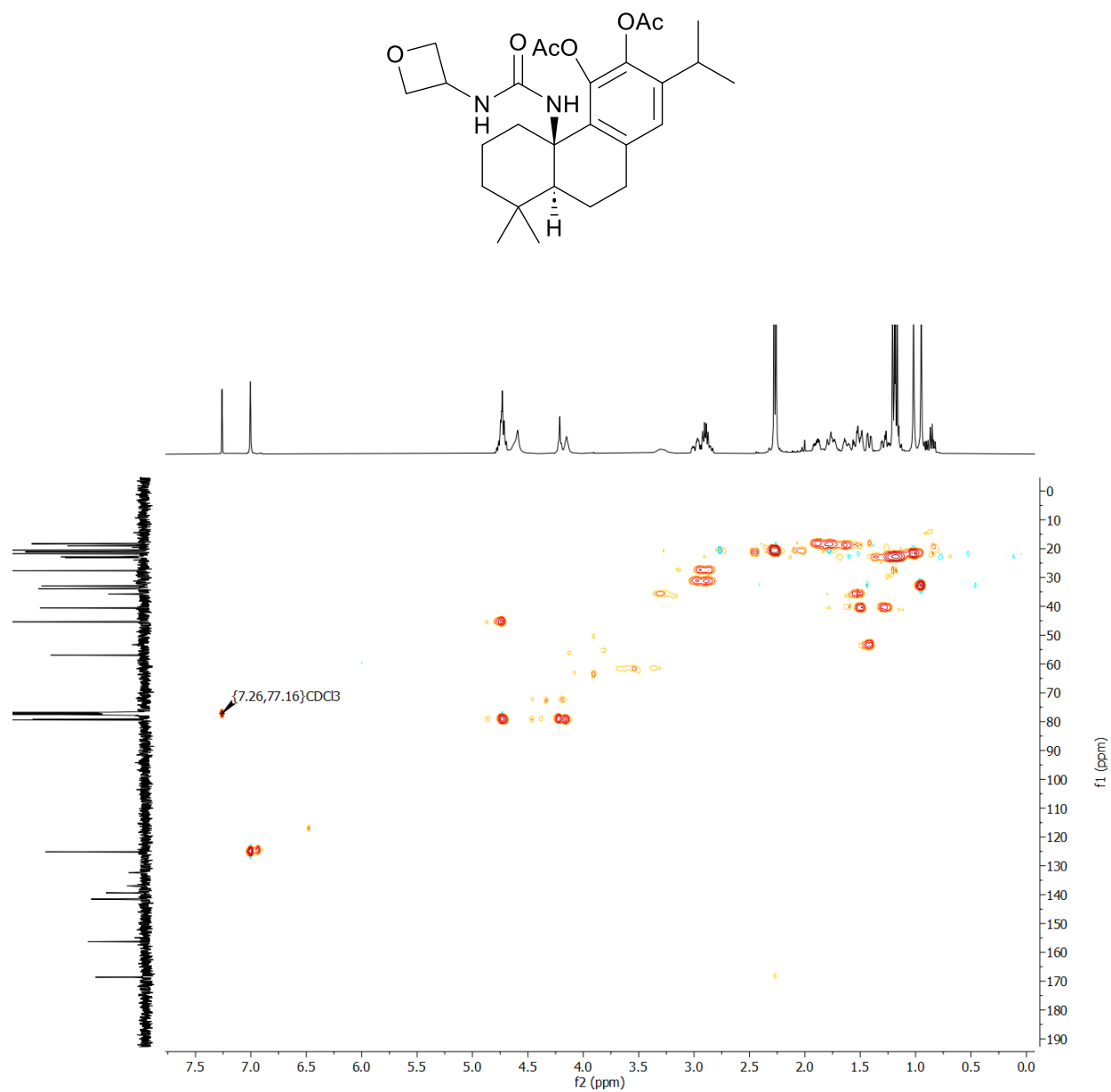
16.1.  $^1\text{H}$  spectrum for compound **19** recorded in  $\text{CDCl}_3$



16.2.  $^{13}\text{C}$  spectrum for compound **19** recorded in  $\text{CDCl}_3$

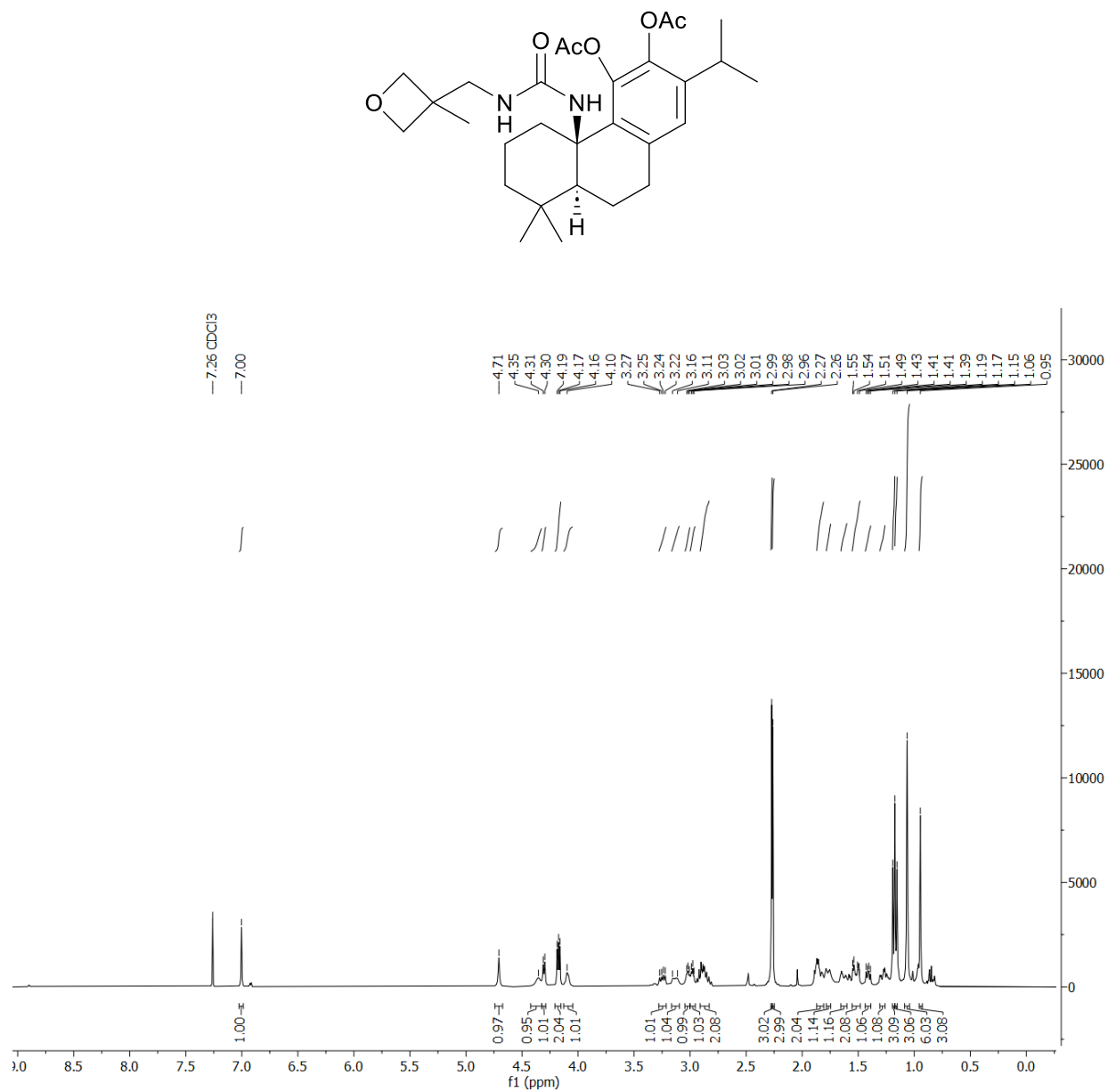


16.3. HSQC spectrum for compound **19** recorded in CDCl<sub>3</sub>

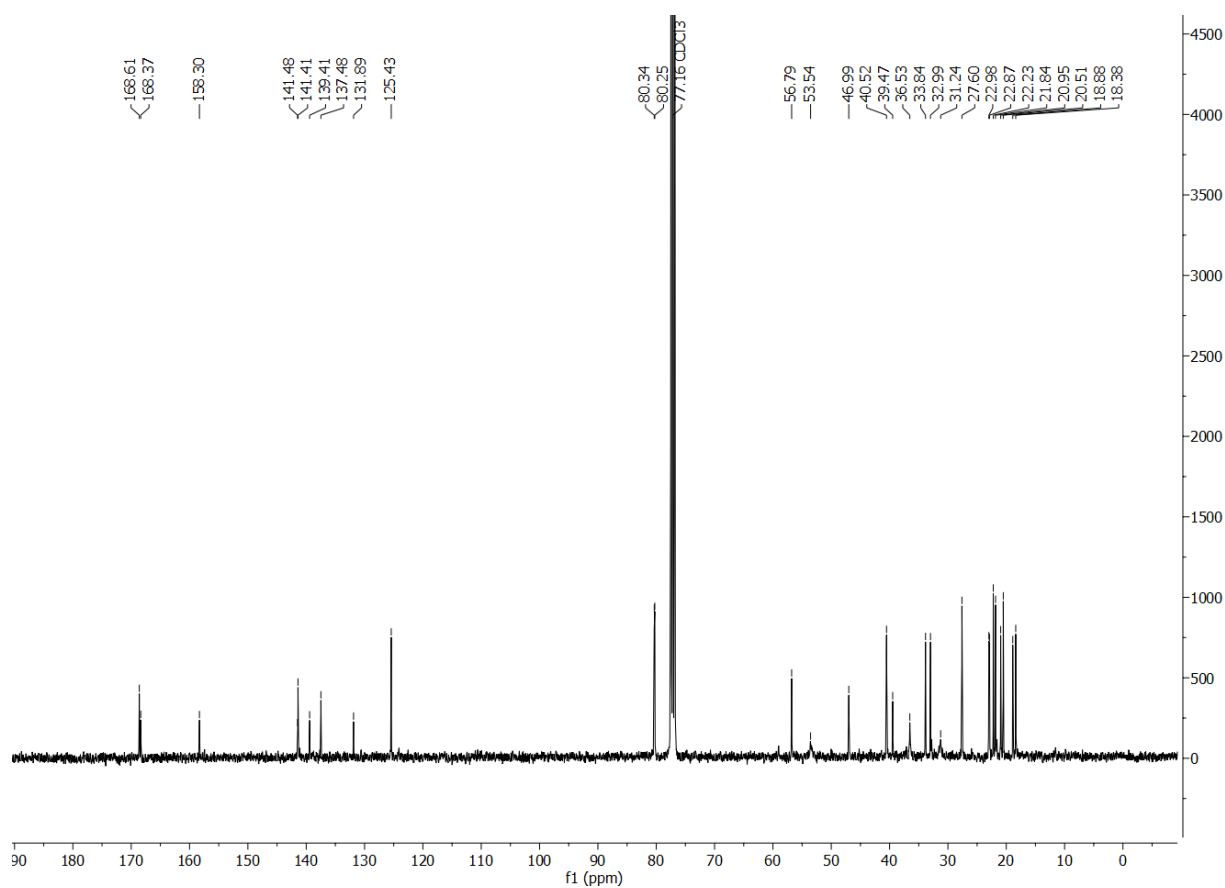
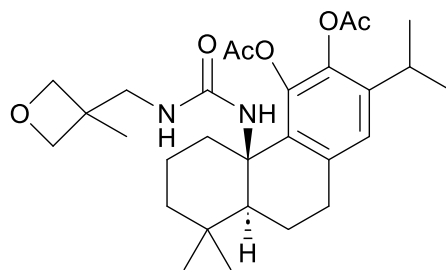


## 17. NMR data for compound **20**

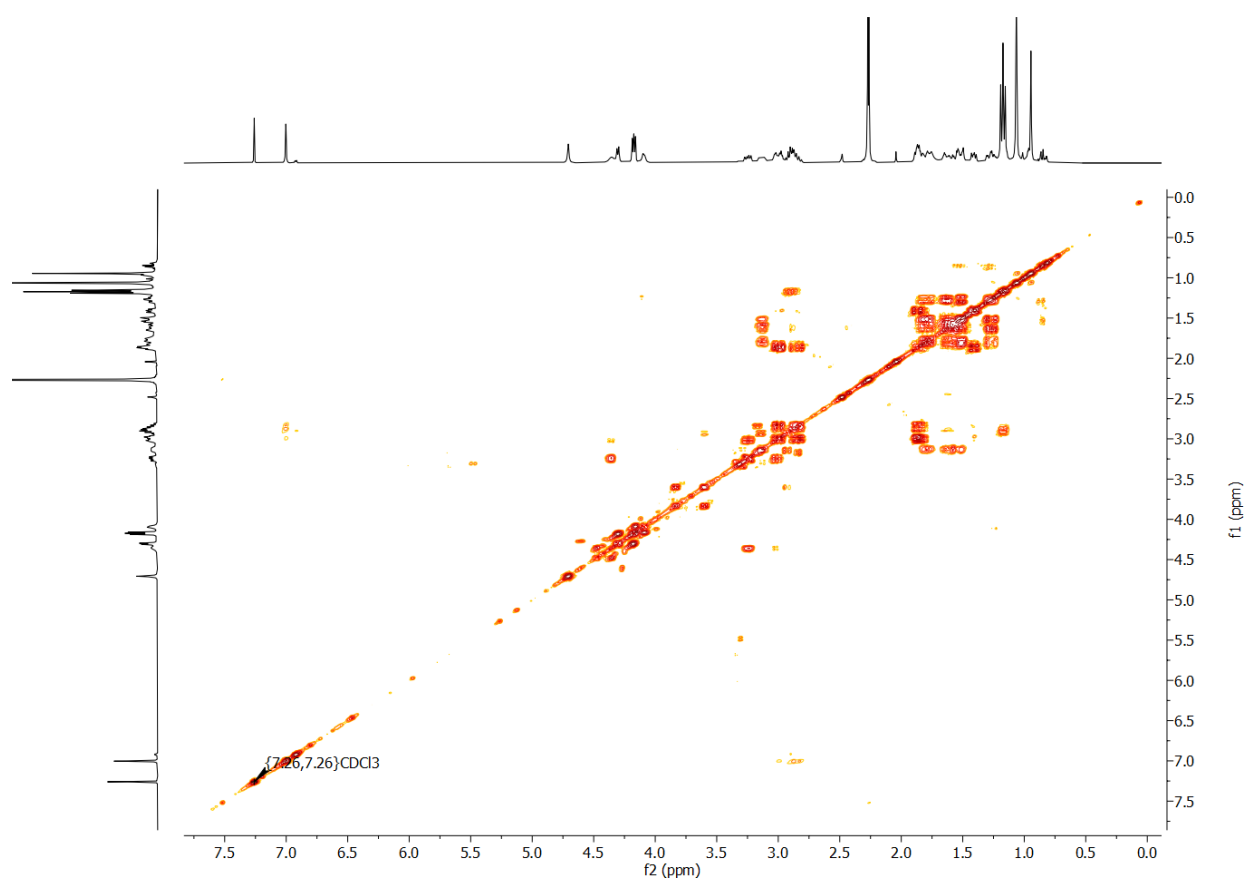
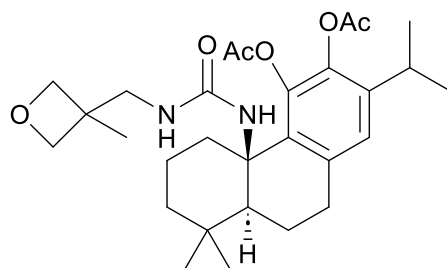
17.1.  $^1\text{H}$  spectrum for compound **20** recorded in  $\text{CDCl}_3$



17.2.  $^{13}\text{C}$  spectrum for compound **20** recorded in  $\text{CDCl}_3$

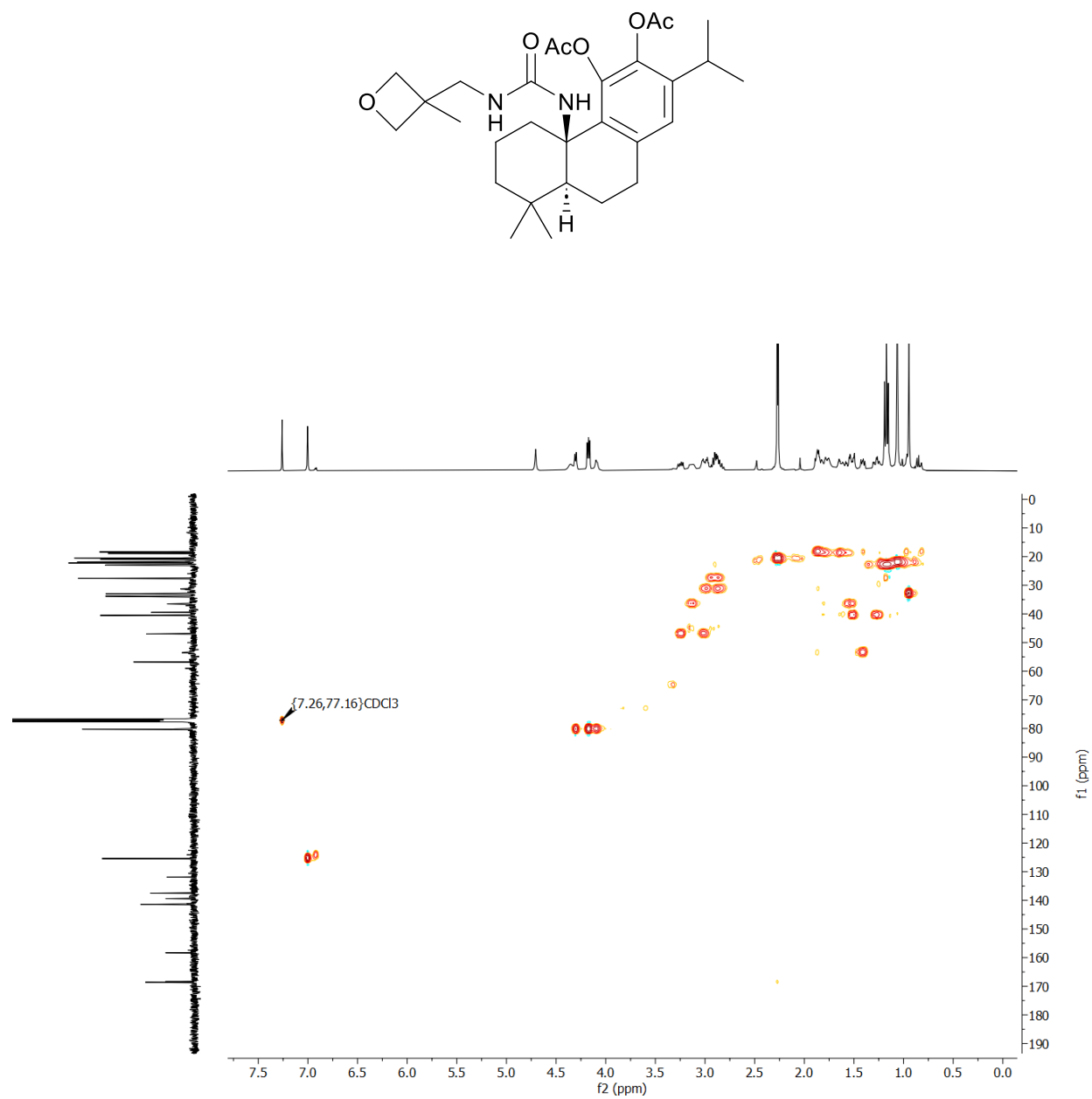


17.3. COSY spectrum for compound **20** recorded in CDCl<sub>3</sub>

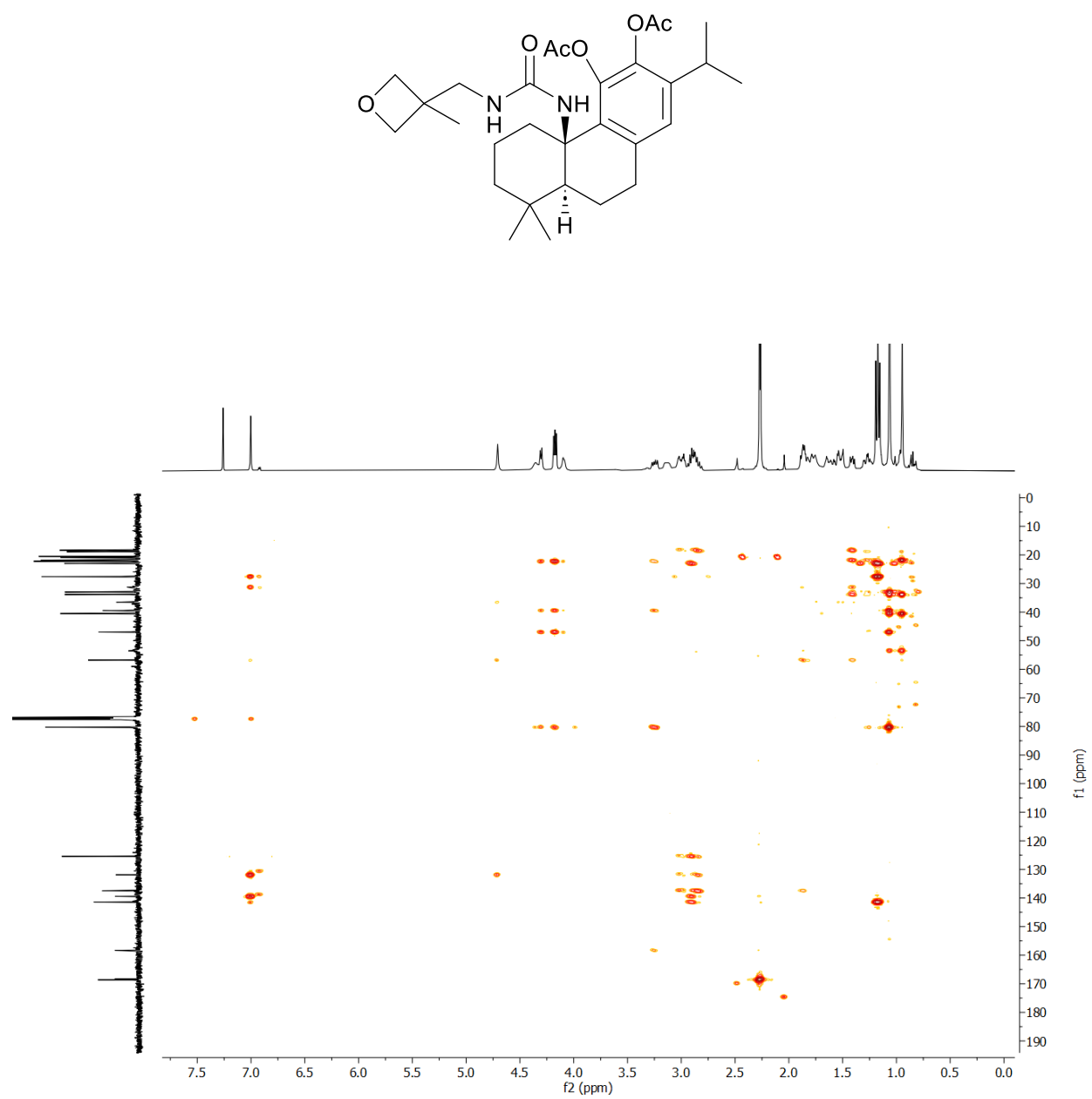




17.4. HSQC spectrum for compound **20** recorded in CDCl<sub>3</sub>

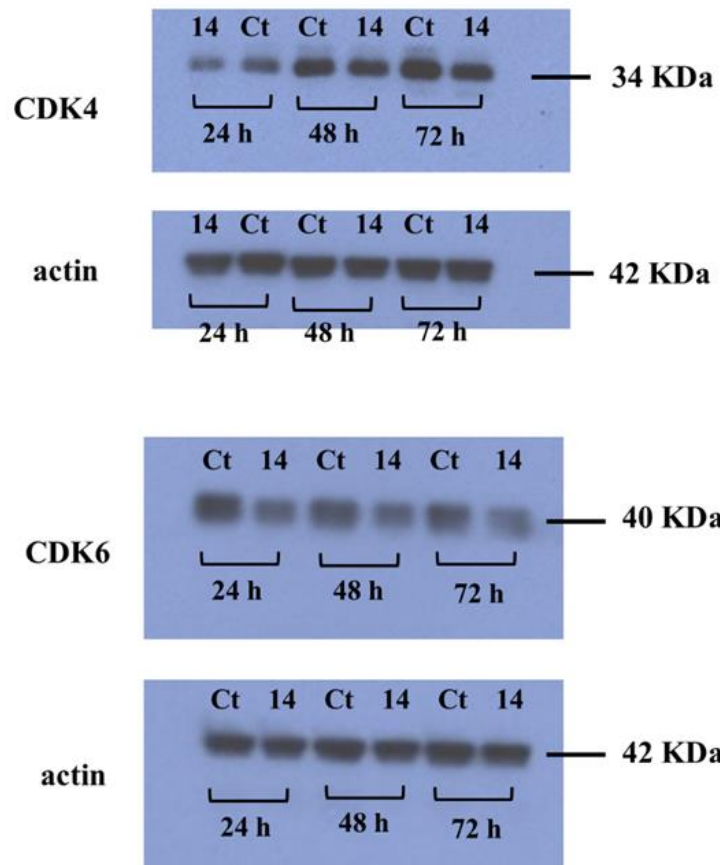


17.5. HMBC spectrum for compound **20** recorded in CDCl<sub>3</sub>

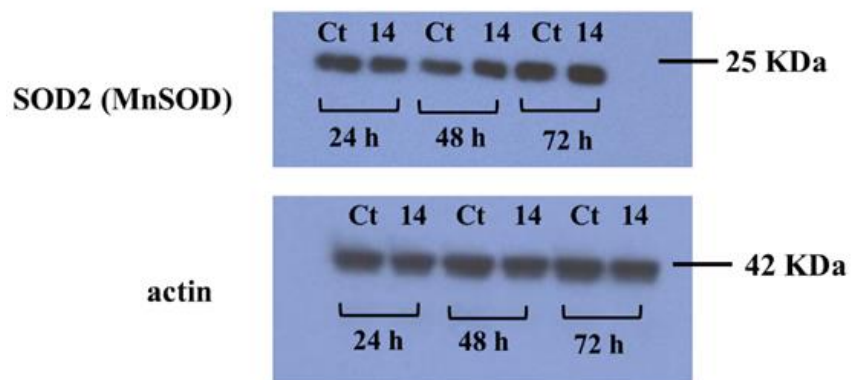


## 18. Uncropped and unprocessed western blot gels

Images of western blot gels of the **Figure 8**:

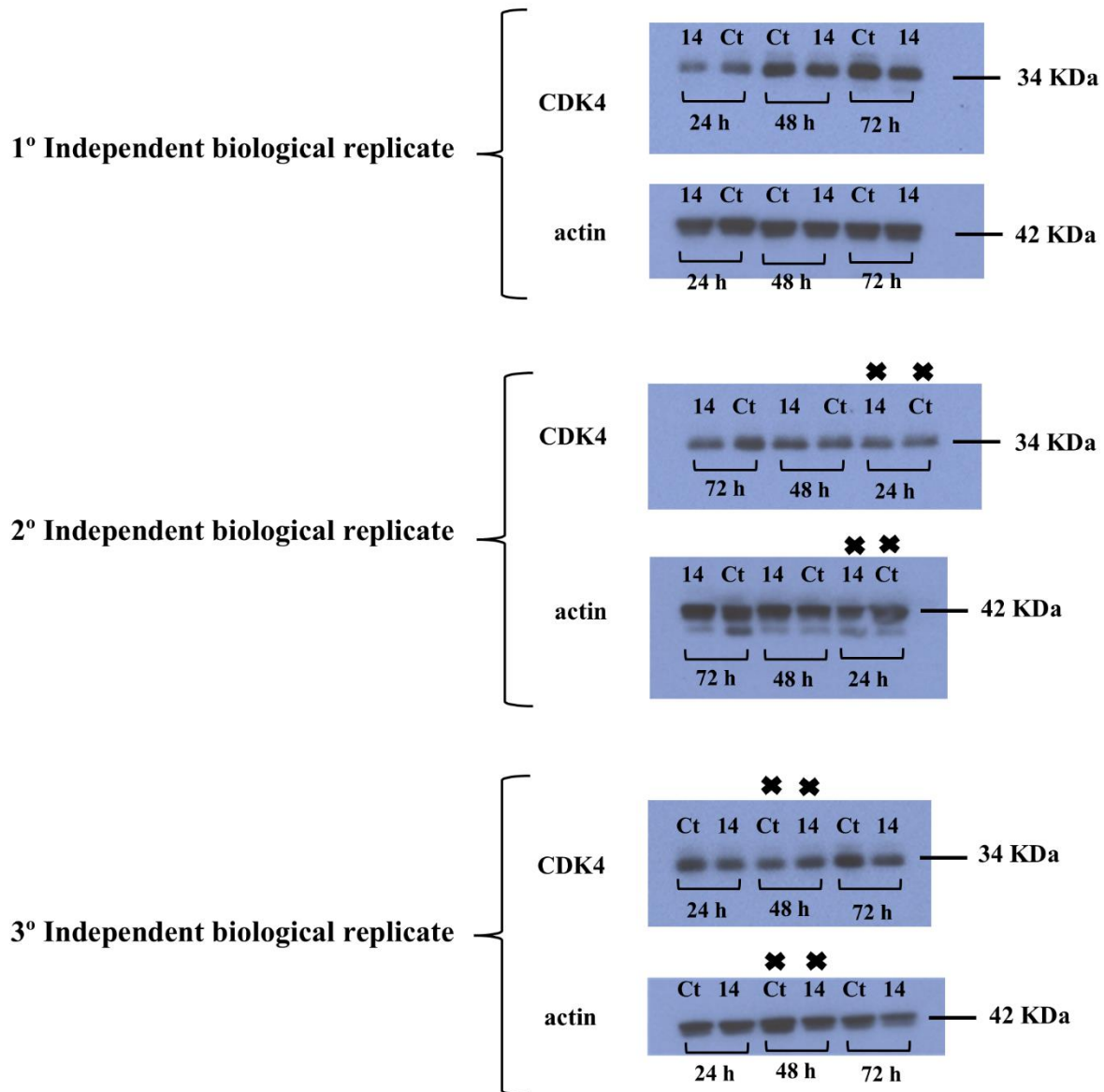


Images of western blot gels of the **Figure 12**:



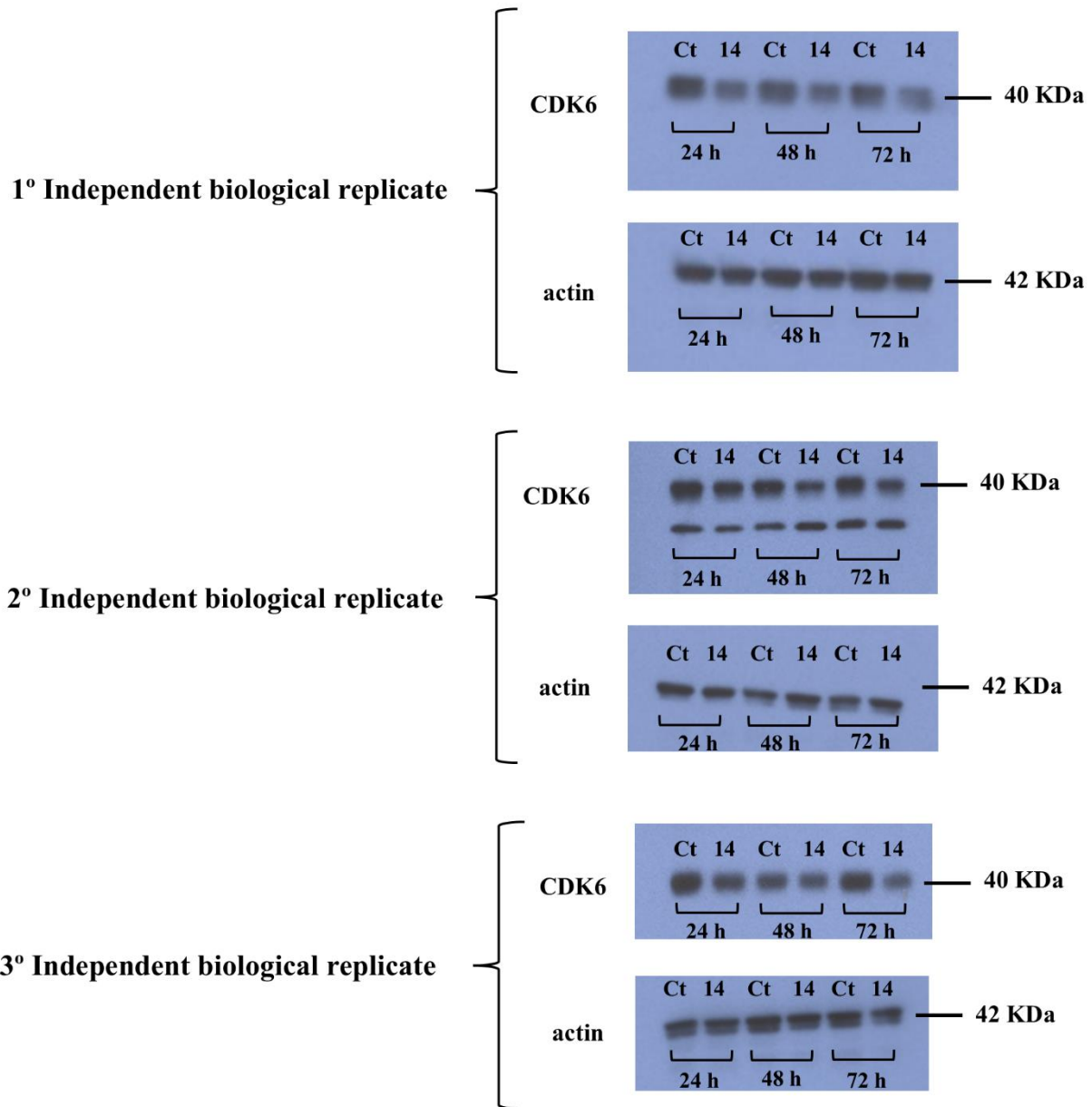
Images of the western blot gels of independent biological replicates used in the quantitative analysis are presented below:

- **CDK4**

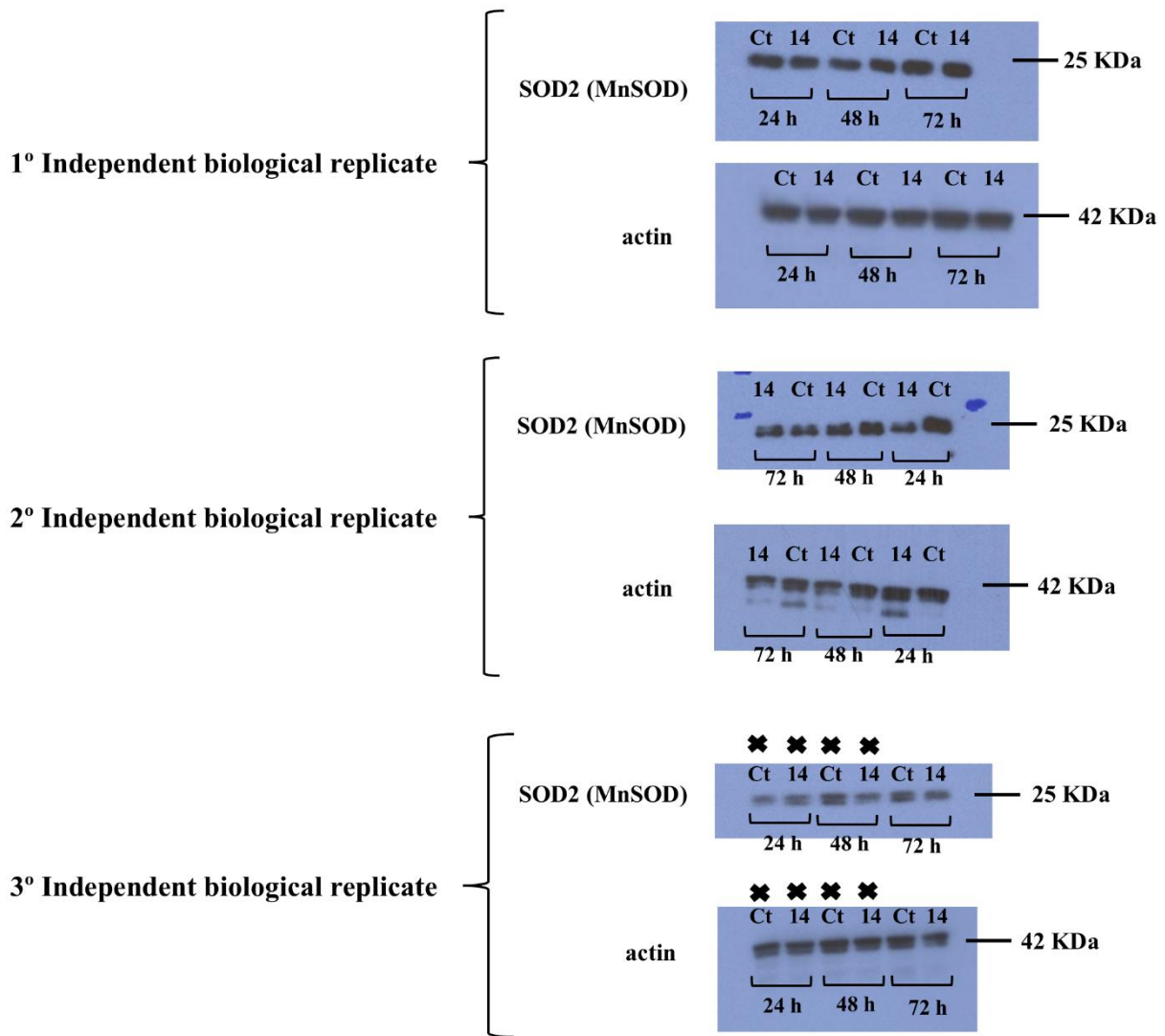


Note: The lanes marked with an “X” above the lane label on the western blot image were not included in the quantitative analysis.

- **CDK6**



- SOD2 (MnSOD)



Note: The lanes marked with an “X” above the lane label on the western blot image were not included in the quantitative analysis.