

Supplementary information.

Secondary Metabolites and Their Cytotoxic Activity of *Artemisia nitrosa* Weber. and *Artemisia marschalliana* Spreng.

Aizhan Kazymbetova^{1,2,3}, Magzhan Amangeldi^{1,2,3}, Aliya Nurlybekova^{1,4}, Ulpan Amzeyeva^{1,4}, Kunbike Baktybala^{1,4}, Chun-Ping Tang³, Chang-Qiang Ke³, Sheng Yao³, Yang Ye^{2,3 *}, Janar Jenis^{1,2,3,4 *}

¹ The Research Center for Medicinal Plants, Al-Farabi Kazakh National University, al-Farabi ave. 71, Almaty, 050040, Kazakhstan

² University of Chinese Academy of Sciences, Beijing 100049, China

³ State Key Laboratory of Drug Research, Shanghai Institute of Materia Medica, Chinese Academy of Sciences, Shanghai 201203, China

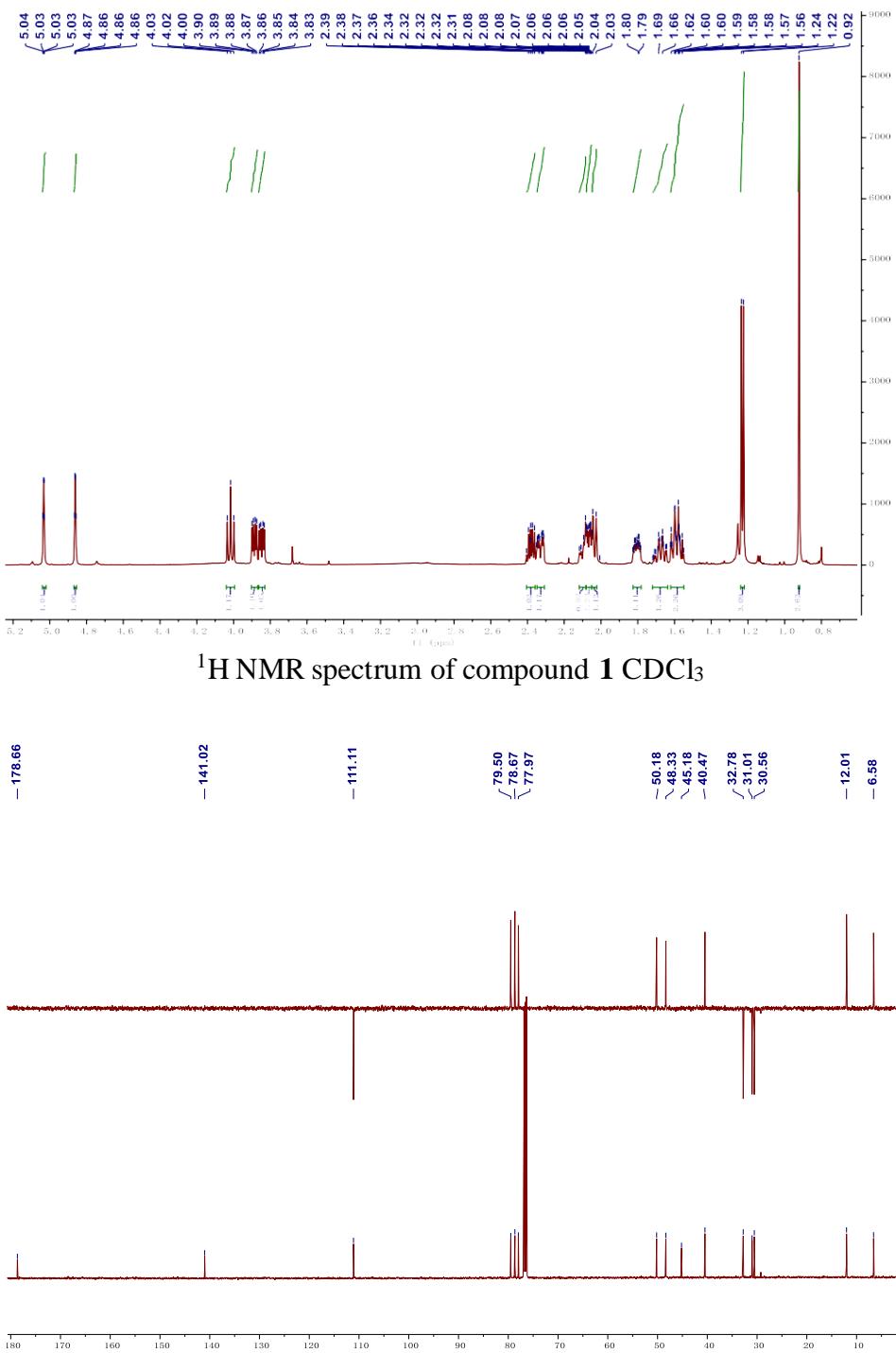
⁴ Research Institute for Natural Products & Technology, Almaty 050046, Kazakhstan

*Correspondence: ye@simm.ac.cn (Y.Y.); janarjenis@kaznu.kz (J.J.);

Content

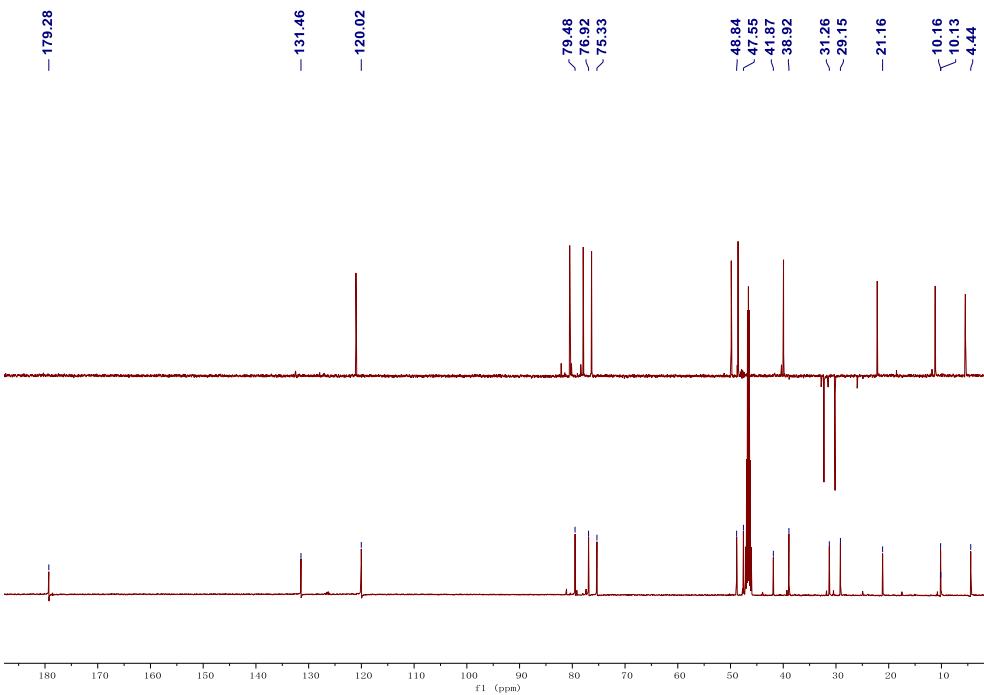
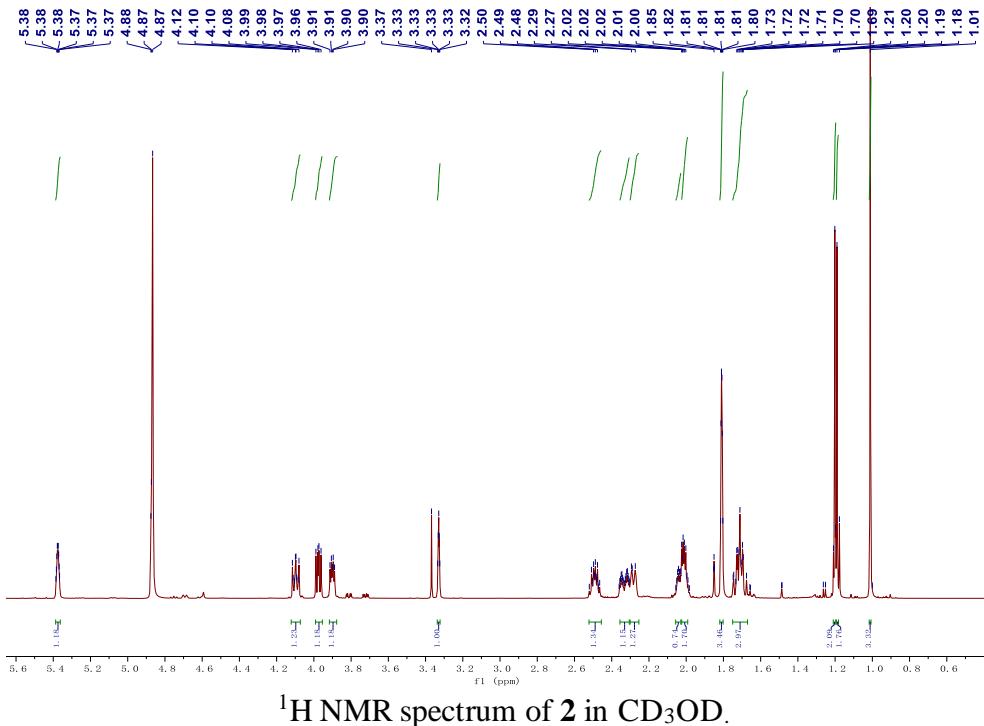
Supplementary data for <i>Artemisia nitrosa</i>.....	3
Figure S1. ^1H NMR, ^{13}C NMR and DEPT spectrum of 1 in CDCl_3	3
Figure S2. ^1H NMR, ^{13}C NMR and DEPT spectrum of 2 in CD_3OD	4
Figure S3. ^1H NMR, ^{13}C NMR and DEPT spectrum of 3 in CDCl_3	5
Figure S4. ^1H NMR, ^{13}C NMR and DEPT spectrum of 4 in CDCl_3	6
Figure S5. ^1H NMR, ^{13}C NMR and DEPT spectrum of 5 in CDCl_3	7
Figure S6. ^1H NMR, ^{13}C NMR and DEPT spectrum of 6 in CDCl_3	8
Figure S7. ^1H NMR, ^{13}C NMR and DEPT spectrum of 7 in CDCl_3	9
Figure S8. ^1H NMR, ^{13}C NMR and DEPT spectrum of 8 in CDCl_3	10
Figure S9. ^1H NMR, ^{13}C NMR and DEPT spectrum of 9 in CD_3OD	11
Figure S10. ^1H NMR, ^{13}C NMR and DEPT spectrum of 10 in CDCl_3	12
Figure S11. ^1H NMR, ^{13}C NMR, DEPT, HSQC, HMBC and ^1H - ^1H COSY spectra of 11 in CDCl_3	13
Figure S12. UV spectrum of 11	16
Figure S13. TOFMS spectral analysis of 11	17
Figure S14. ^1H NMR, ^{13}C NMR and DEPT spectrum of 12 in CDCl_3	18
Supplementary data for <i>Artemisia marschalliana</i>	19
Figure S15. ^1H NMR, ^{13}C NMR, DEPT, HSQC, HMBC and ^1H - ^1H COSY spectra of 1' in CDCl_3	19
Figure S16. UV spectrum of 1'	22
Figure S17. ESI Mass spectrum of 1'	22
Figure S18. ^1H NMR, ^{13}C NMR and DEPT spectrum of 2' in Acetone d-6.....	23
Figure S19. ^1H NMR, ^{13}C NMR and DEPT spectrum of 3' in CDCl_3	24
Figure S20. ^1H NMR, ^{13}C NMR and DEPT spectrum of 4' in CDCl_3	25
Figure S21. ^1H NMR, ^{13}C NMR and DEPT spectrum of 5' in CDCl_3	26
Figure S22. ^1H NMR, ^{13}C NMR and DEPT spectrum of 6' in CDCl_3	27
Figure S23. ^1H NMR, ^{13}C NMR and DEPT spectrum of 7' in CDCl_3	28
Figure S24. ^1H NMR, ^{13}C NMR and DEPT spectrum of 8' in CDCl_3	29
Figure S25. ^1H NMR, ^{13}C NMR and DEPT spectrum of 9' in CDCl_3	30
Figure S26. ^1H NMR, ^{13}C NMR and DEPT spectrum of 10' in CDCl_3	31
Figure S27. ^1H NMR, ^{13}C NMR and DEPT spectrum of 11' in CDCl_3	32
Figure S28. ^1H NMR, ^{13}C NMR and DEPT spectrum of 12' in CDCl_3	33
Figure S29. ^1H NMR, ^{13}C NMR and DEPT spectrum of 13' in CDCl_3	34
Figure S30. Inhibitory Effects of <i>A.nitrosa</i> compounds on LPS-Enhanced Inflammatory Mediators.....	35
Figure S31. Picture of the whole plant of <i>Artemisia nitrosa</i>	36
Figure S32. Picture of the whole plant of <i>Artemisia marschalliana</i>	36

Supplementary data for *Artemisia nitrosa*



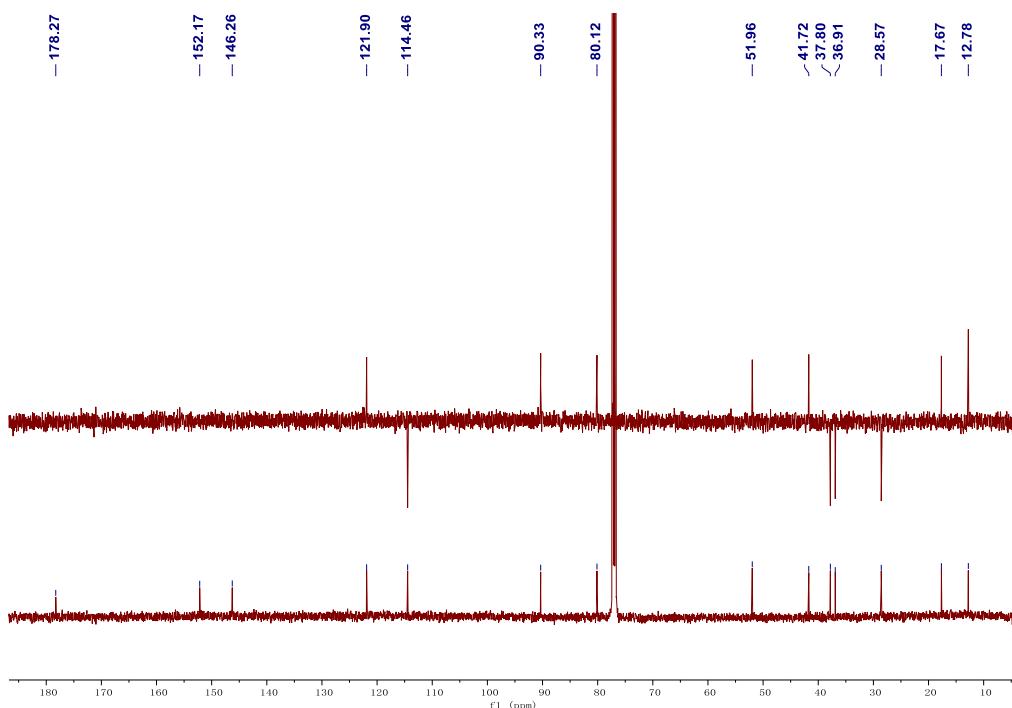
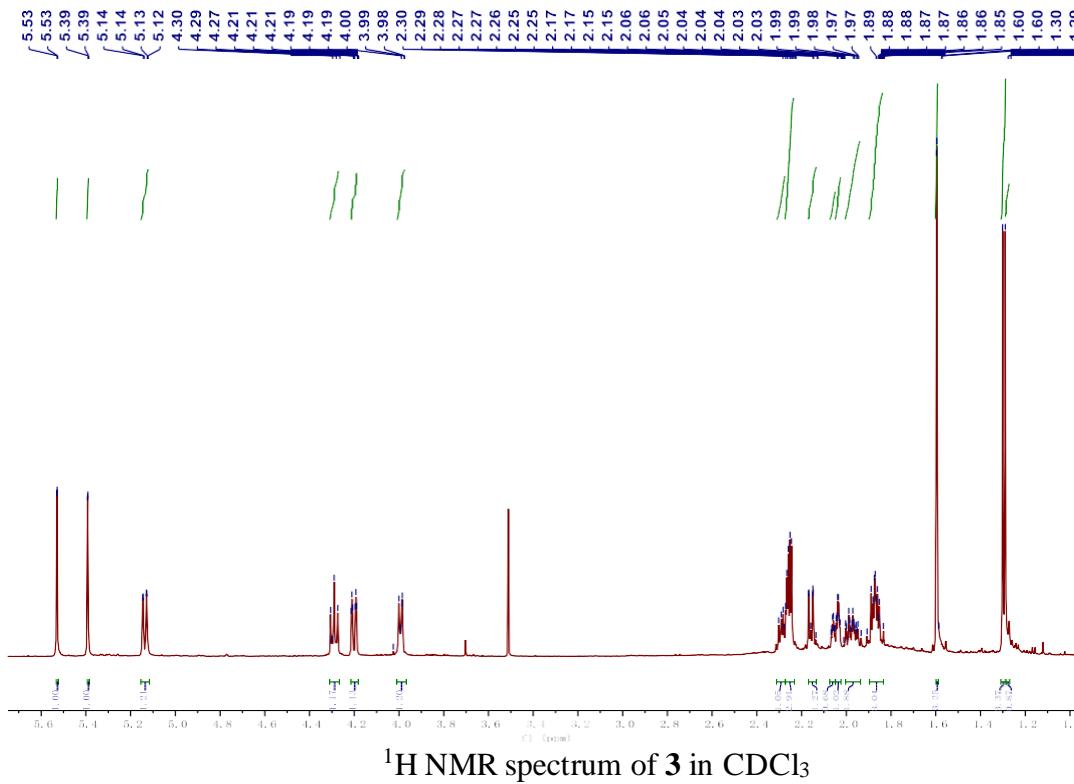
^{13}C NMR, DEPT spectrum of **1** in CDCl_3

Figure S1. ^1H NMR, ^{13}C NMR, DEPT spectrum of **1** in CDCl_3



¹³C NMR, DEPT spectrum of **2** in CD₃OD.

Figure S2. ¹H NMR, ¹³C NMR, DEPT spectrum of **2** in CD₃OD.



¹³C NMR, DEPT spectrum of **3** in CDCl₃.

Figure S3. ^1H NMR, ^{13}C NMR, DEPT spectrum of **3** in CDCl_3 .

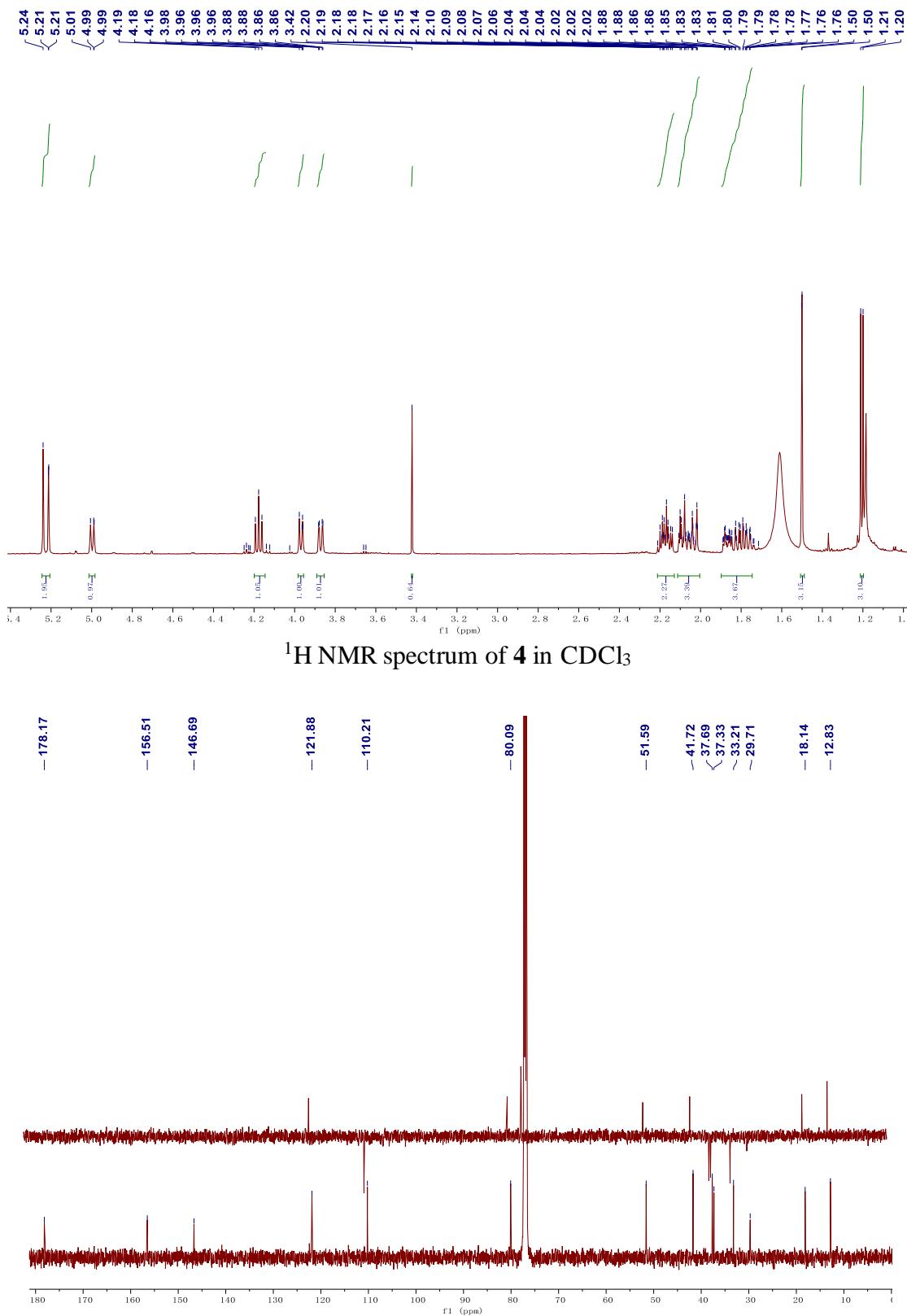


Figure S4. ¹H NMR, ¹³C NMR, DEPT spectrum of **4** in CDCl_3 .

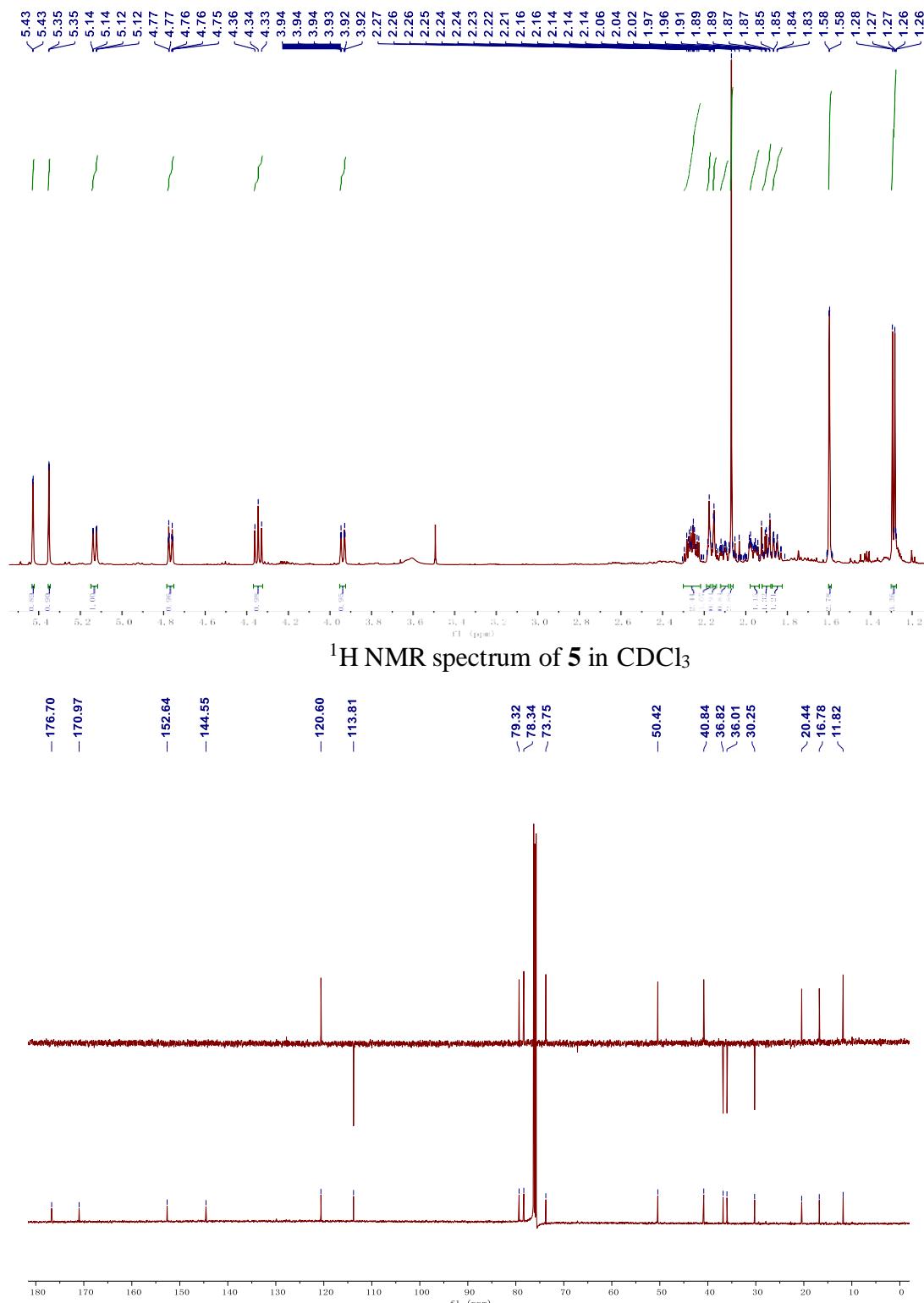
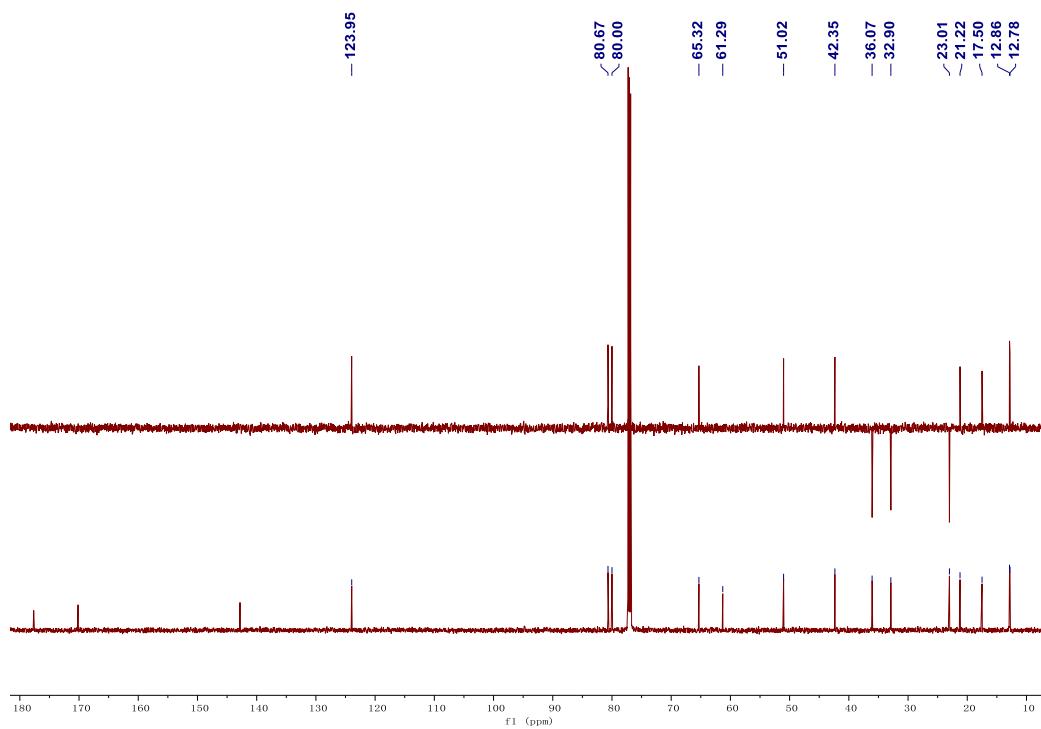
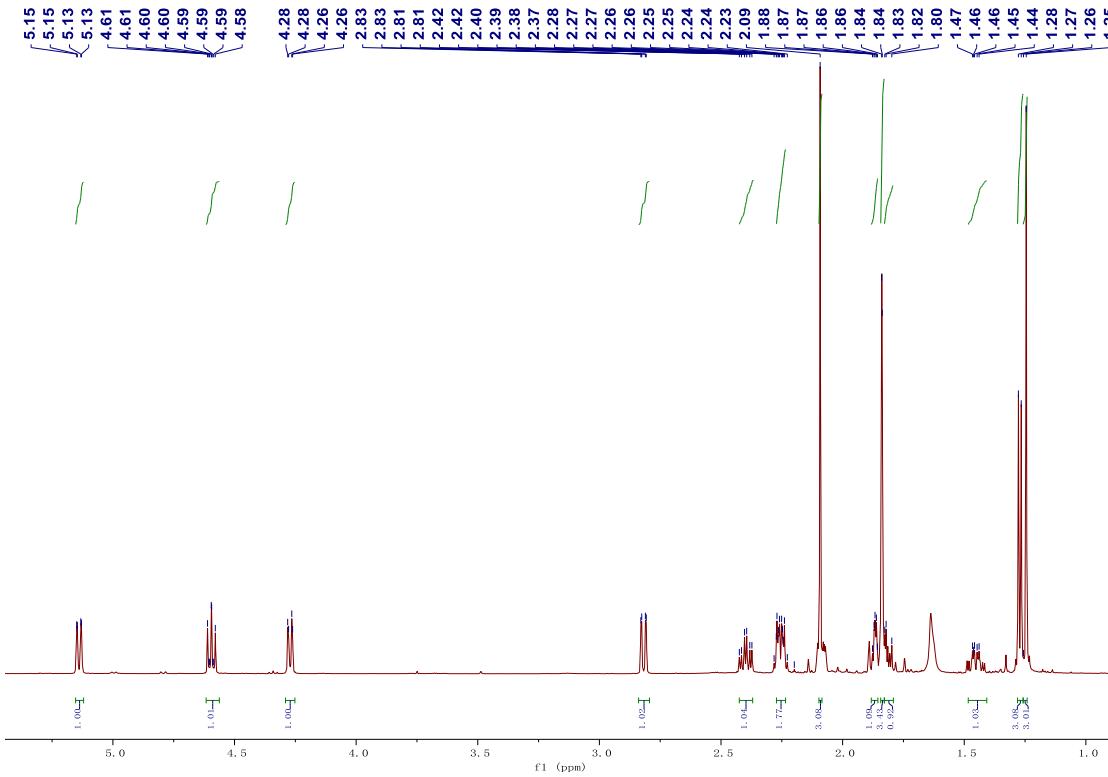


Figure S5. ¹H NMR, ¹³C NMR, DEPT spectrum of **5** in CDCl₃.



¹³C NMR, DEPT spectrum of **6** in CDCl₃.
Figure S6. ¹H NMR, ¹³C NMR, DEPT spectrum of **6** in CDCl₃.

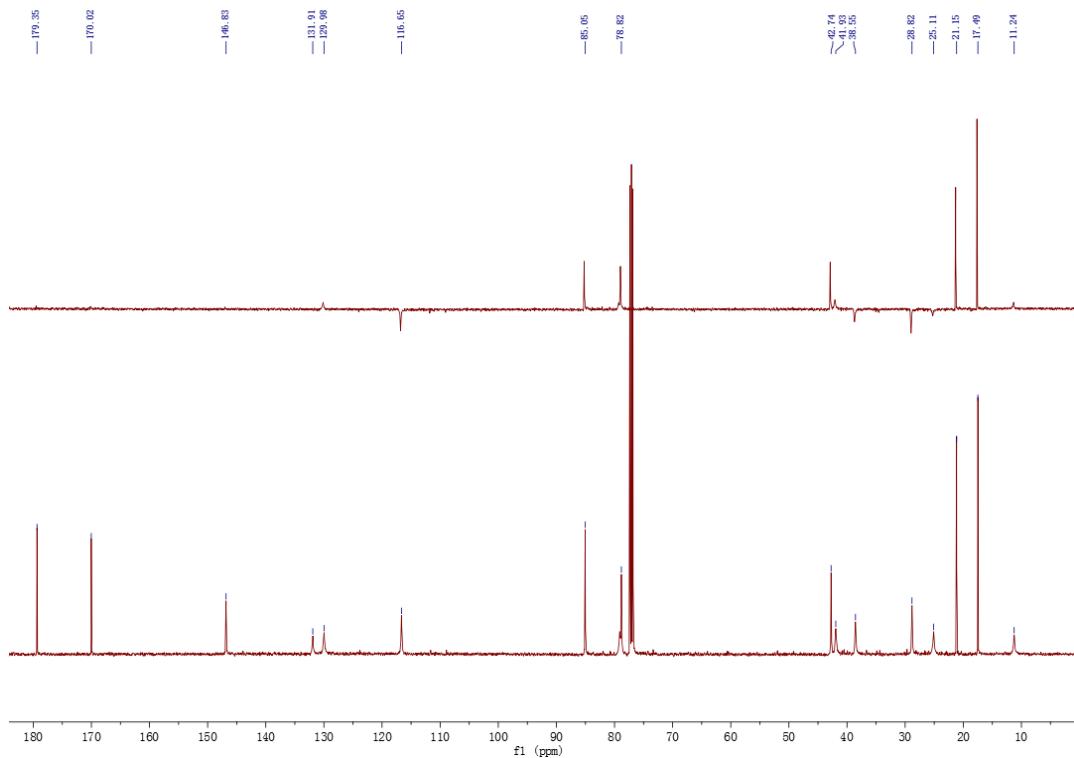
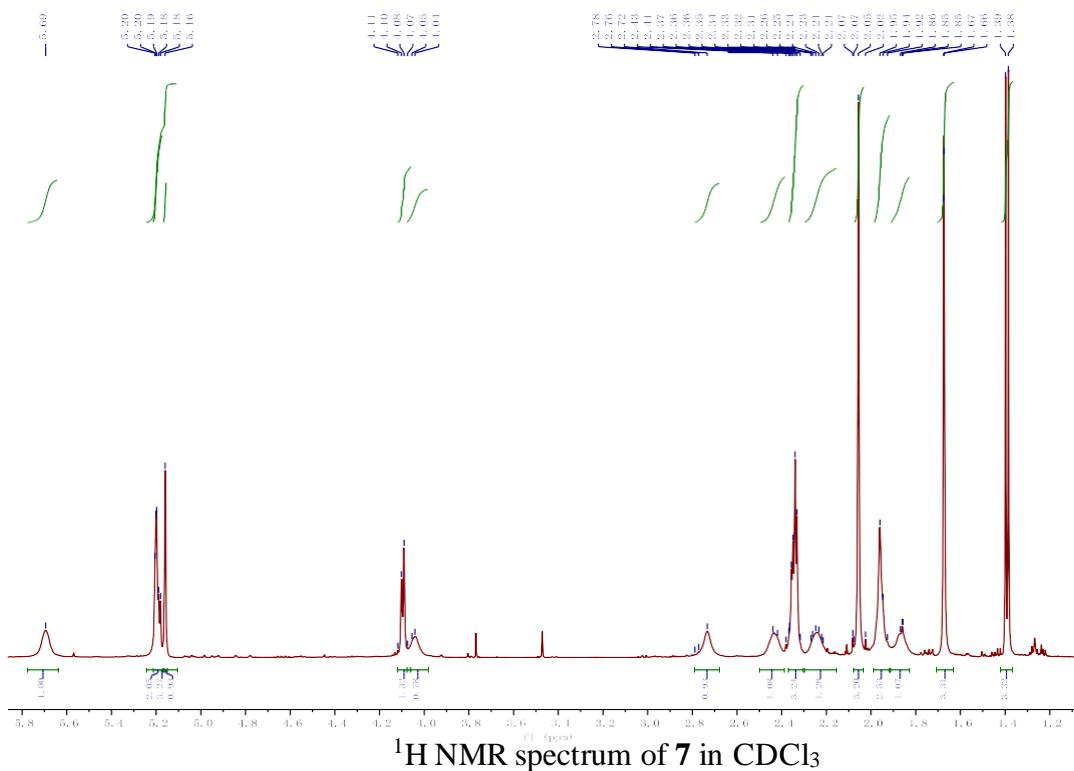
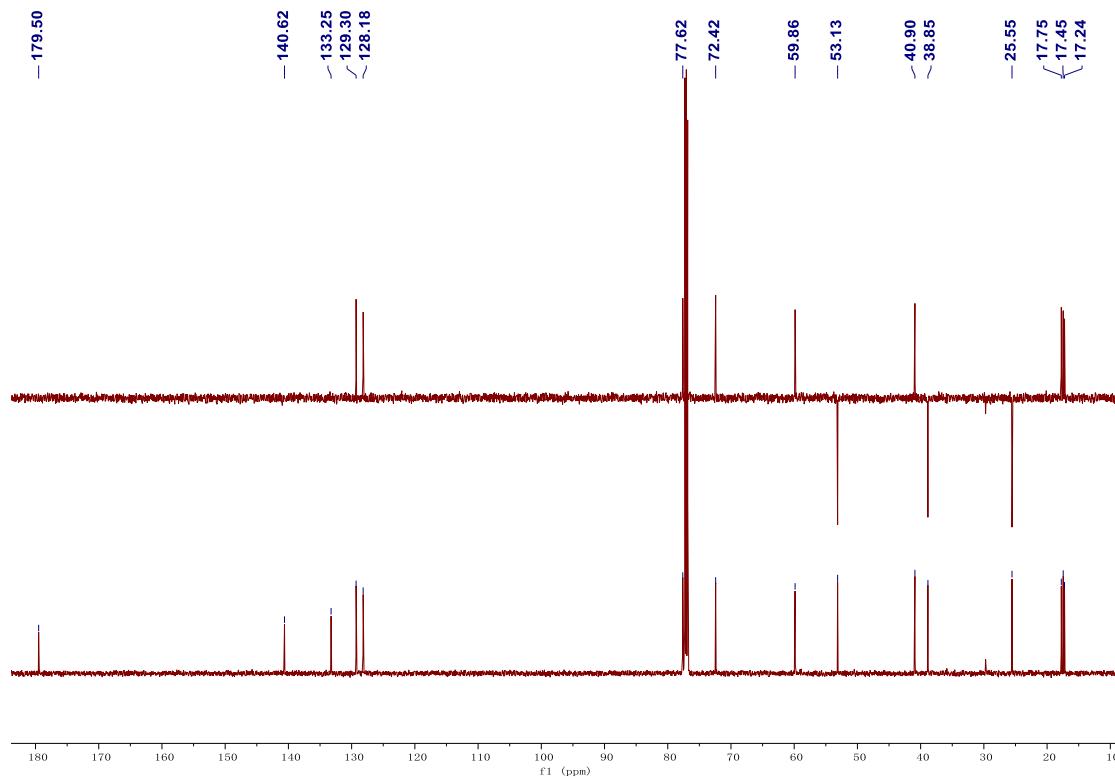
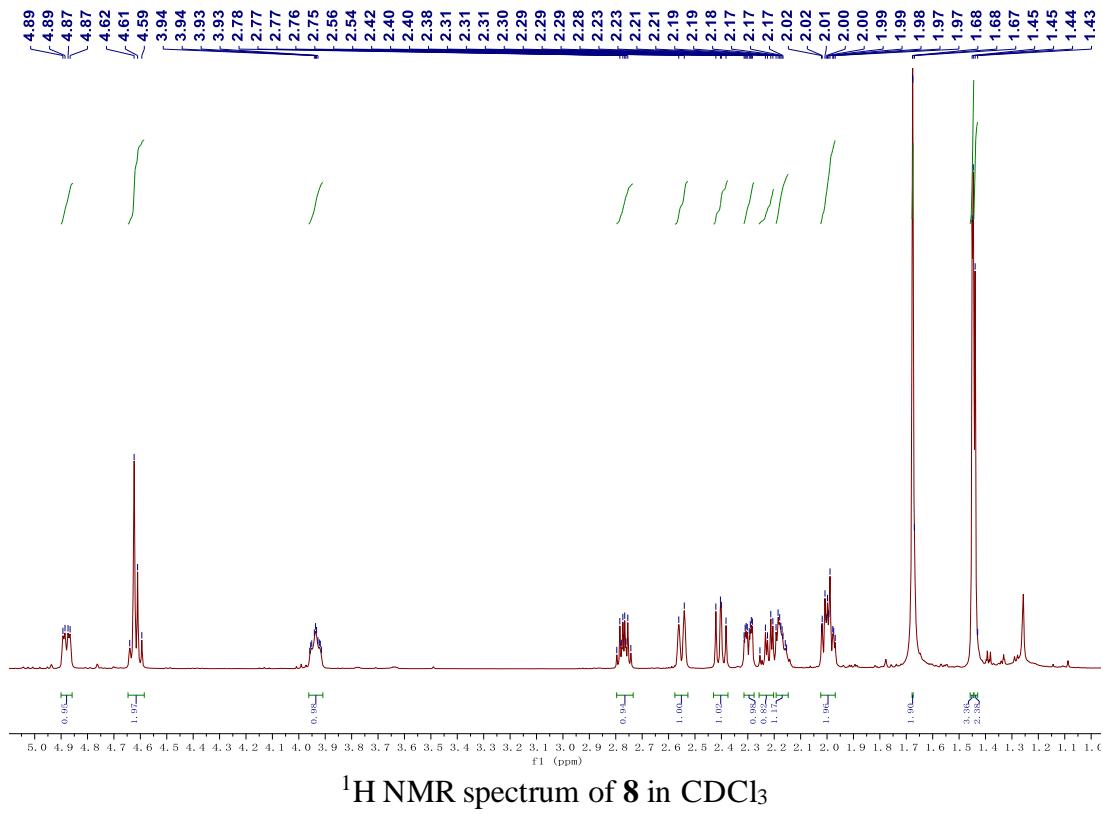


Figure S7. ^1H NMR, ^{13}C NMR, DEPT spectrum of **7** in CDCl_3



^{13}C NMR, DEPT spectrum of **8** in CDCl_3 .

Figure S8. ^1H NMR, ^{13}C NMR, DEPT spectrum of **8** in CDCl_3 .

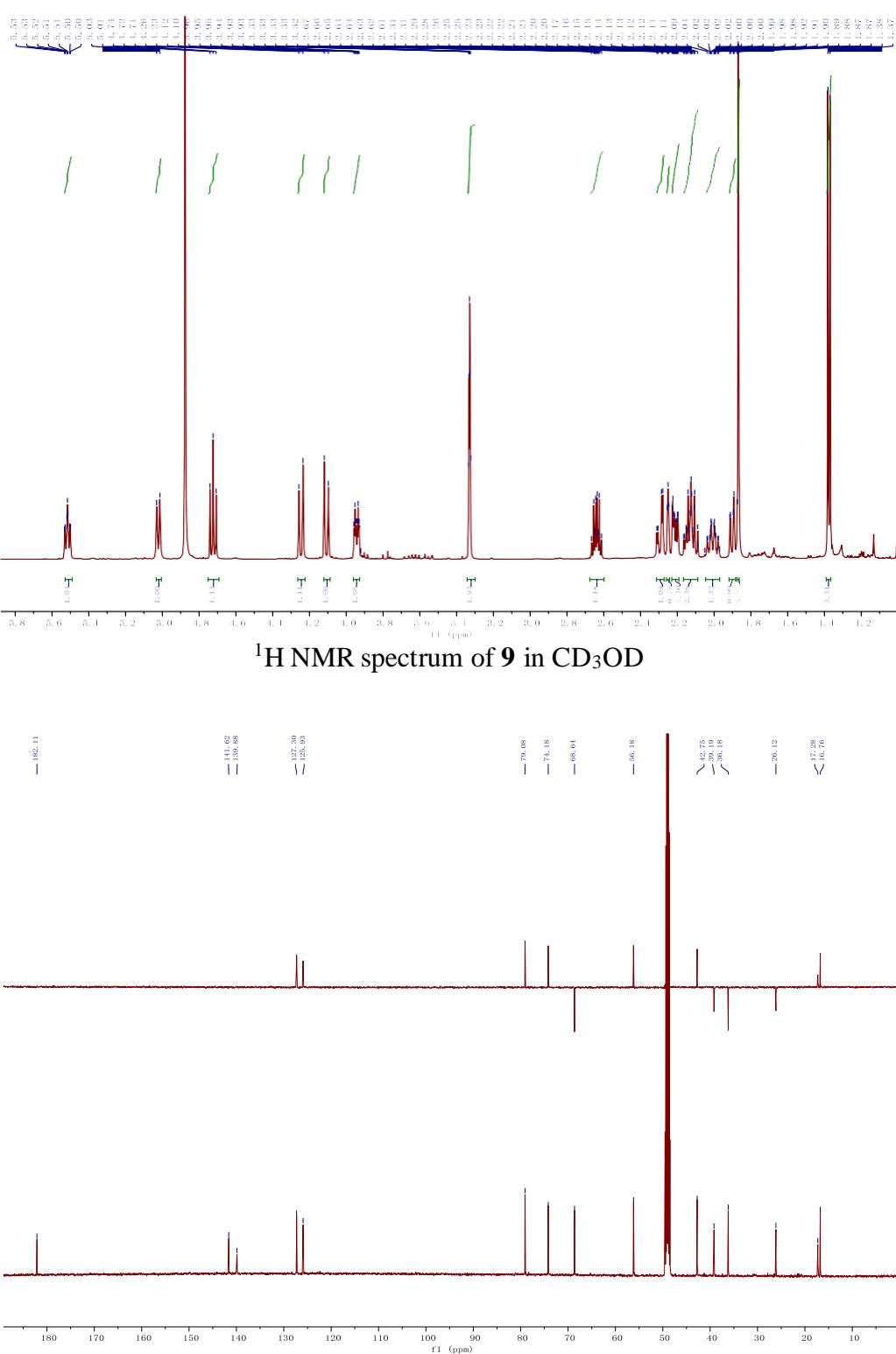
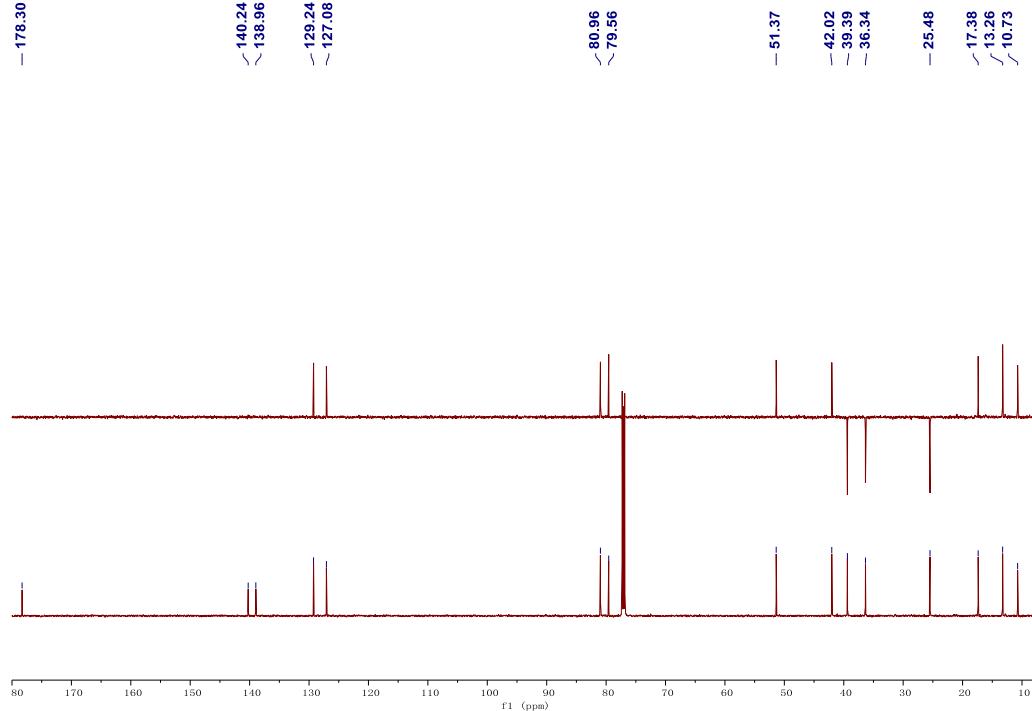
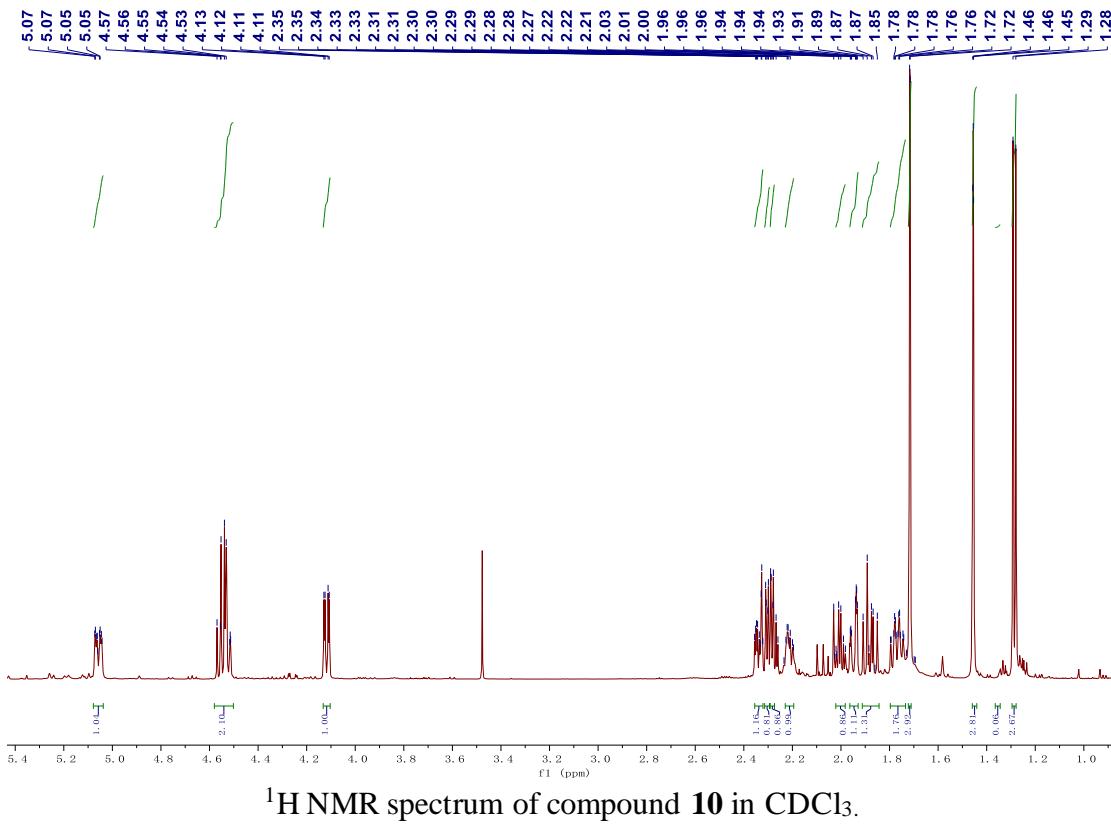
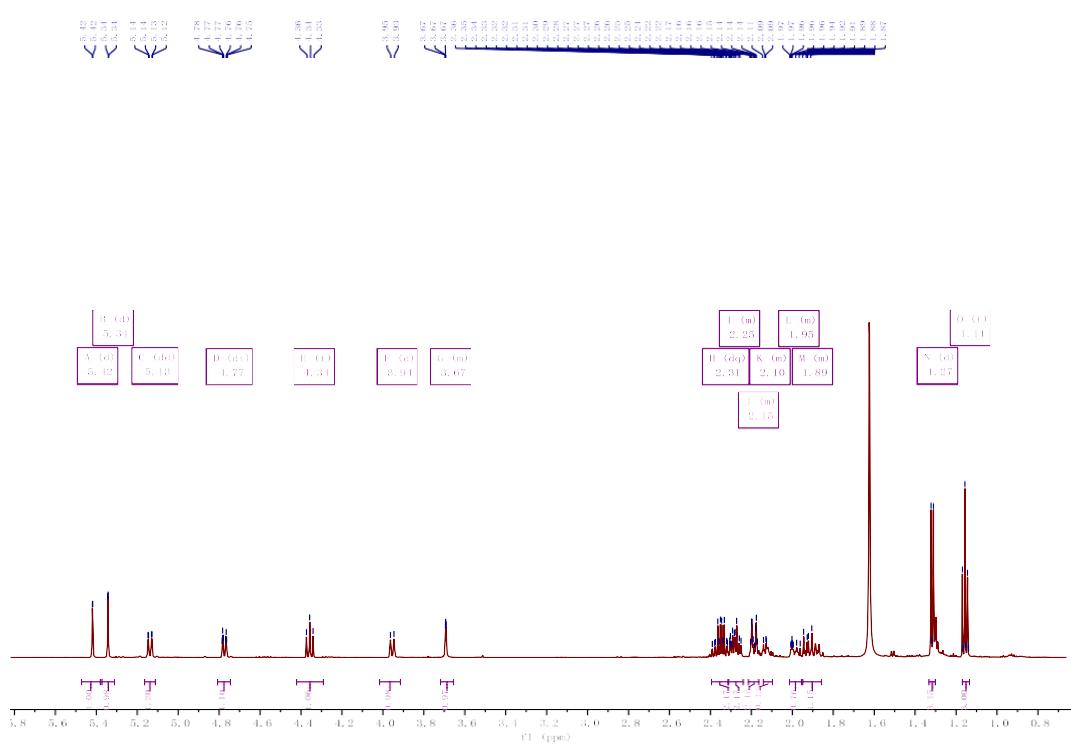


Figure S9. ¹H NMR, ¹³C NMR, DEPT spectrum of **9** in CD₃OD.

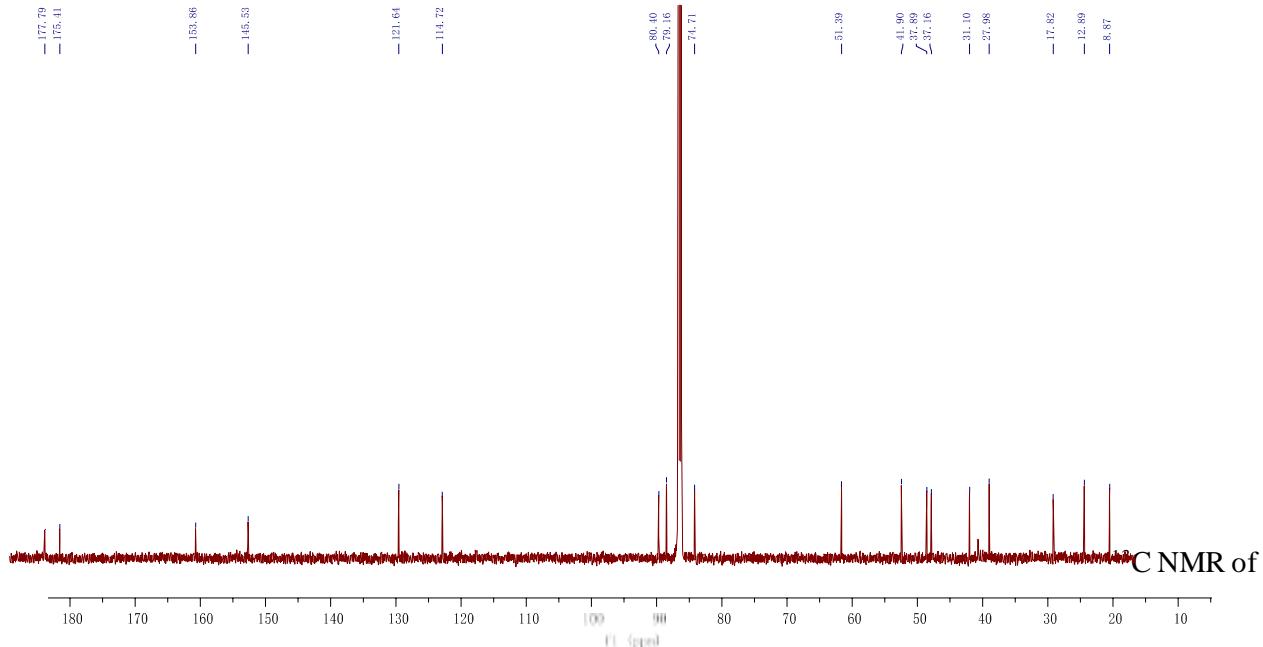


¹³C NMR, DEPT spectrum of compound **10** in CDCl₃

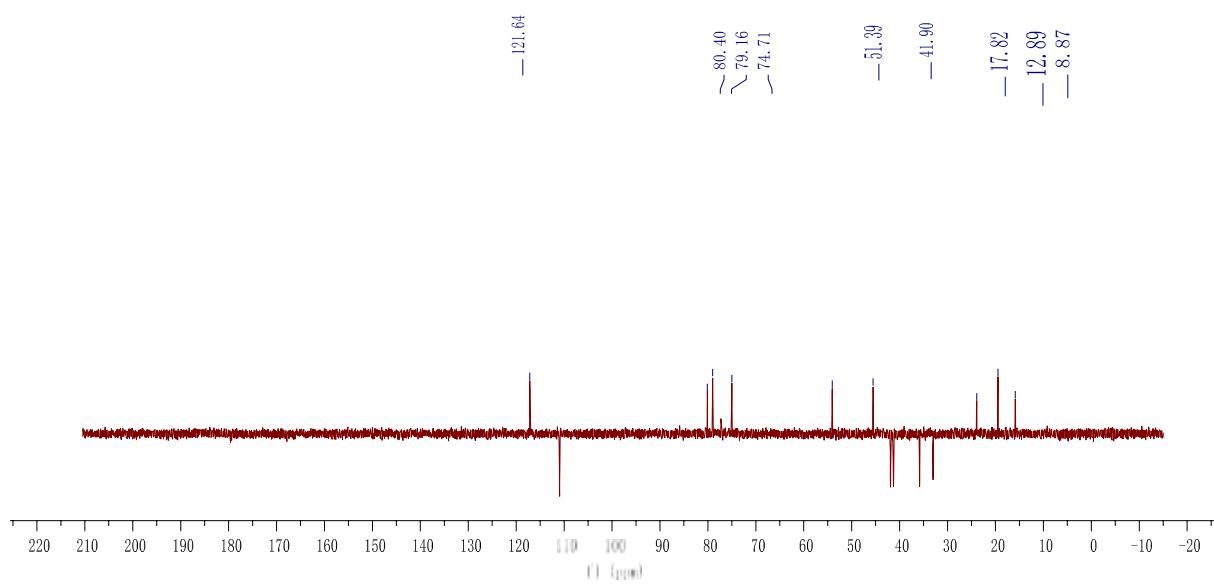
Figure S10. ¹H NMR, ¹³C NMR, DEPT spectrum of compound **10** in CDCl₃.



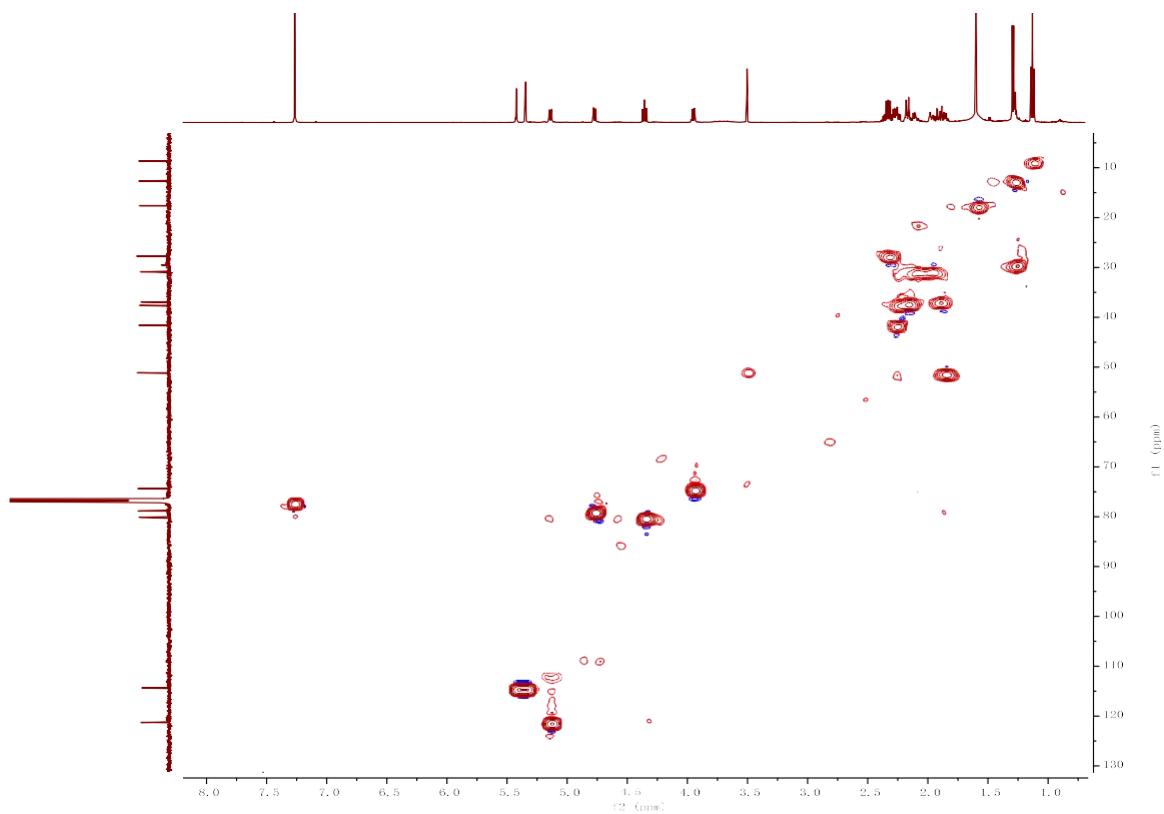
¹H NMR of Compound 11



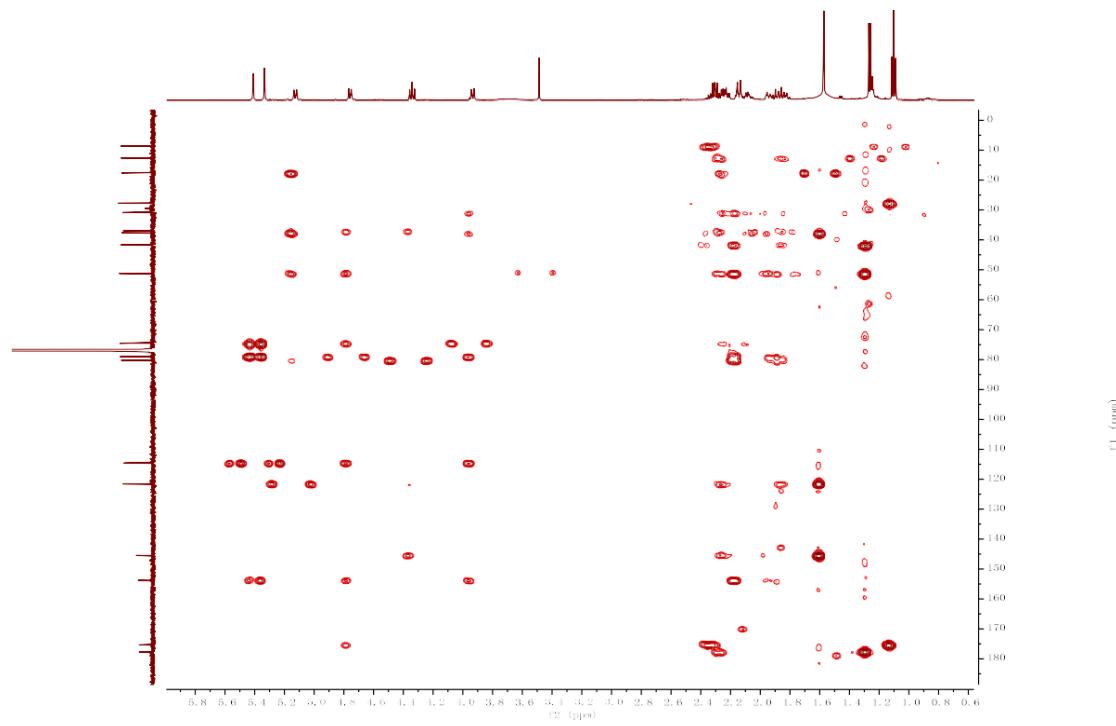
Compound 11



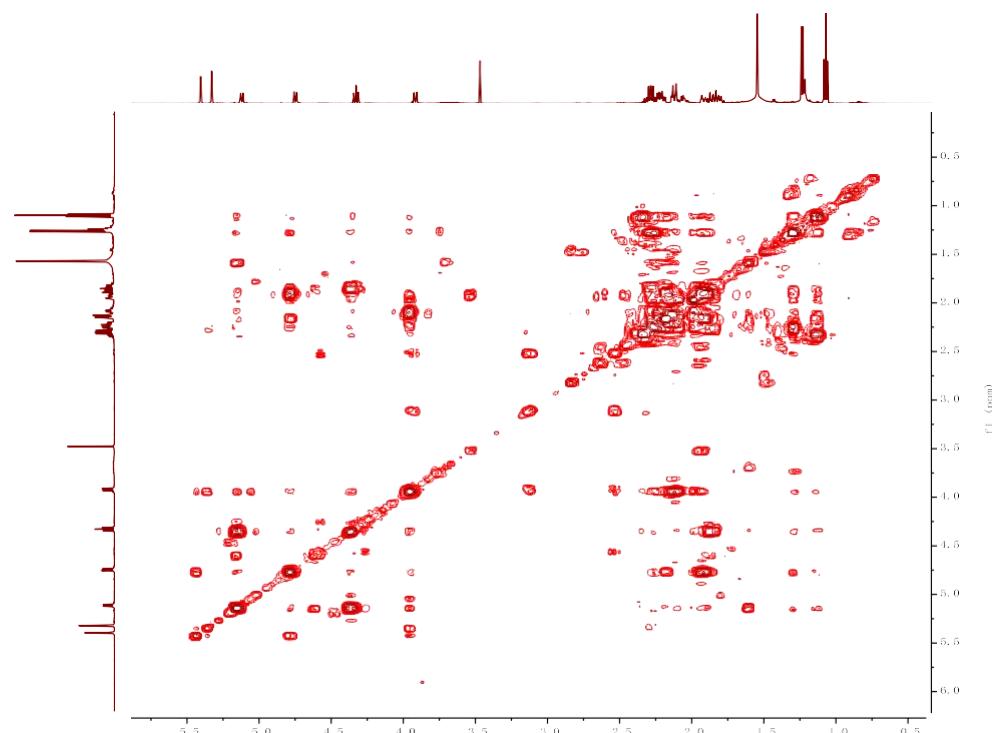
DEPT of Compound **11**



HSQC of Compound **11**



HMBC of Compound 11



^1H - ^1H COSY of Compound

Figure S11. ^1H NMR, ^{13}C NMR, DEPT, HSQC, HMBC and ^1H - ^1H COSY spectra of **11** in CDCl_3

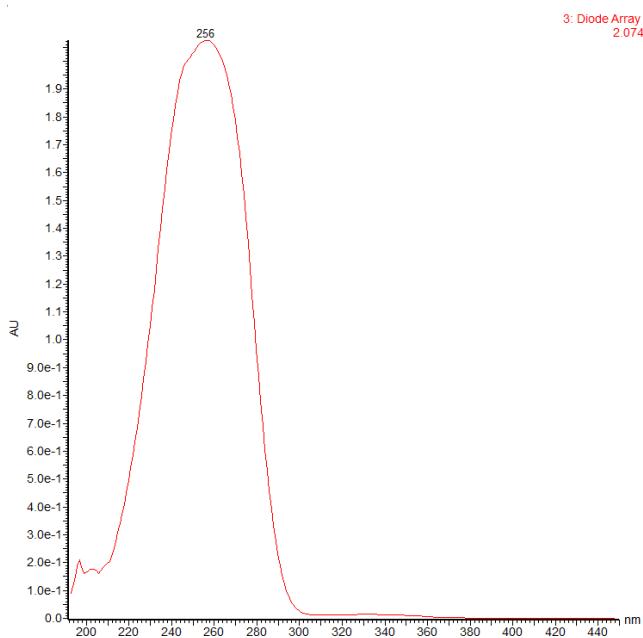


Figure S12. UV spectrum of **11** in MeOH.

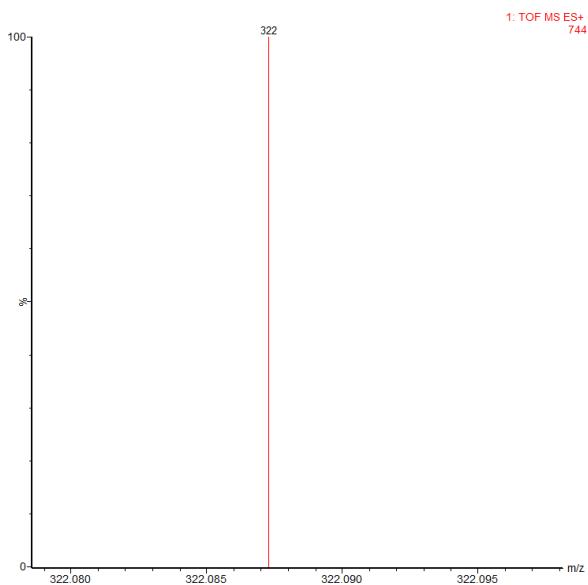
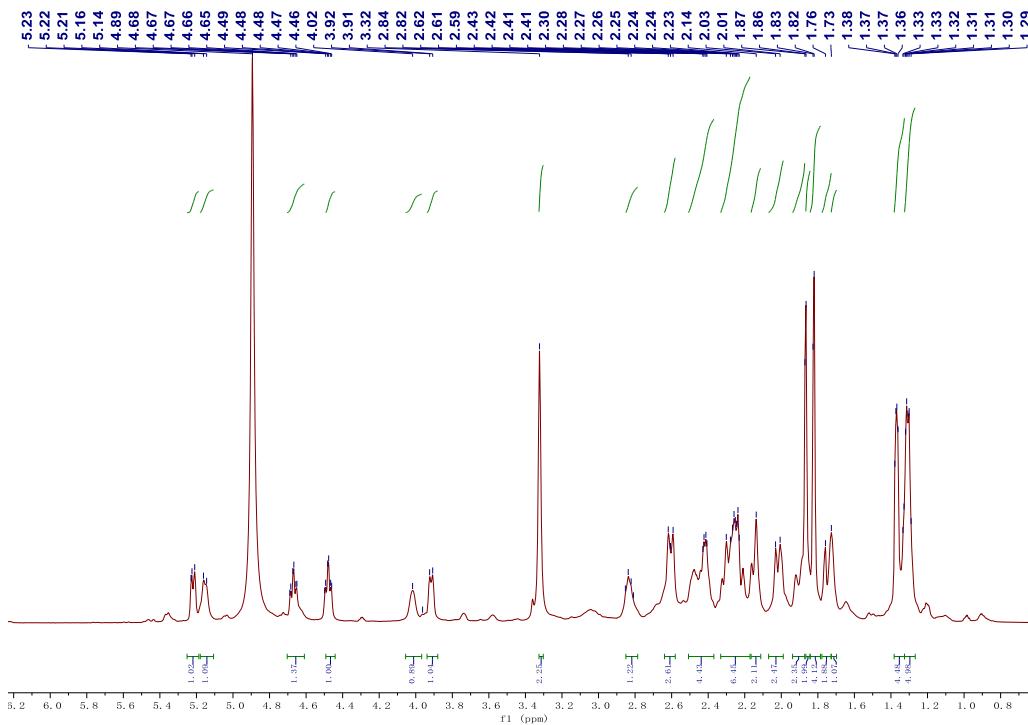
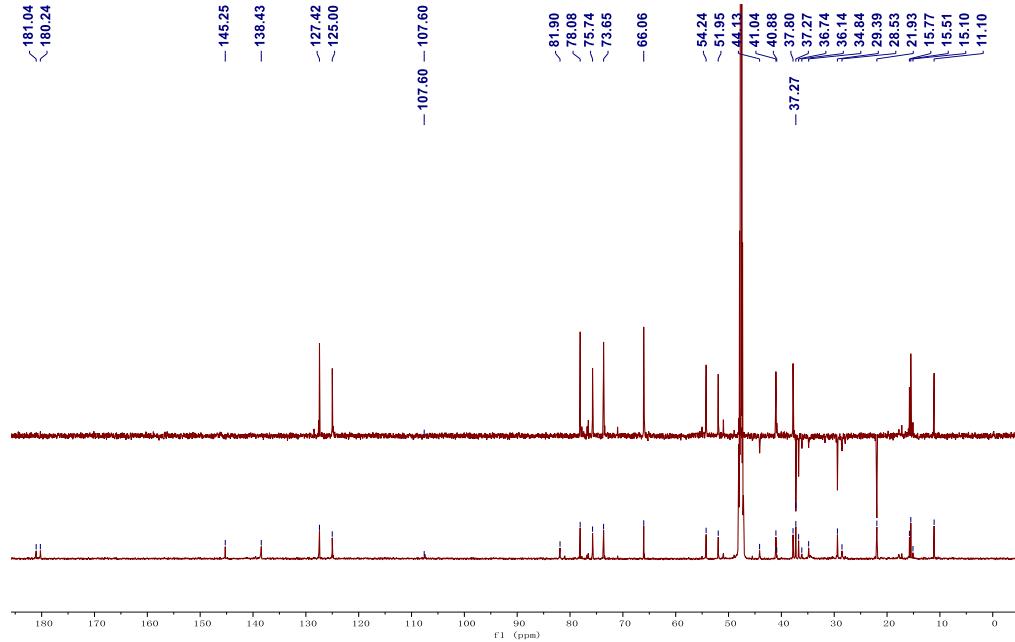


Figure S13. TOFMS spectral analysis of **11**.



^1H NMR spectrum of **12** in CDCl_3 .

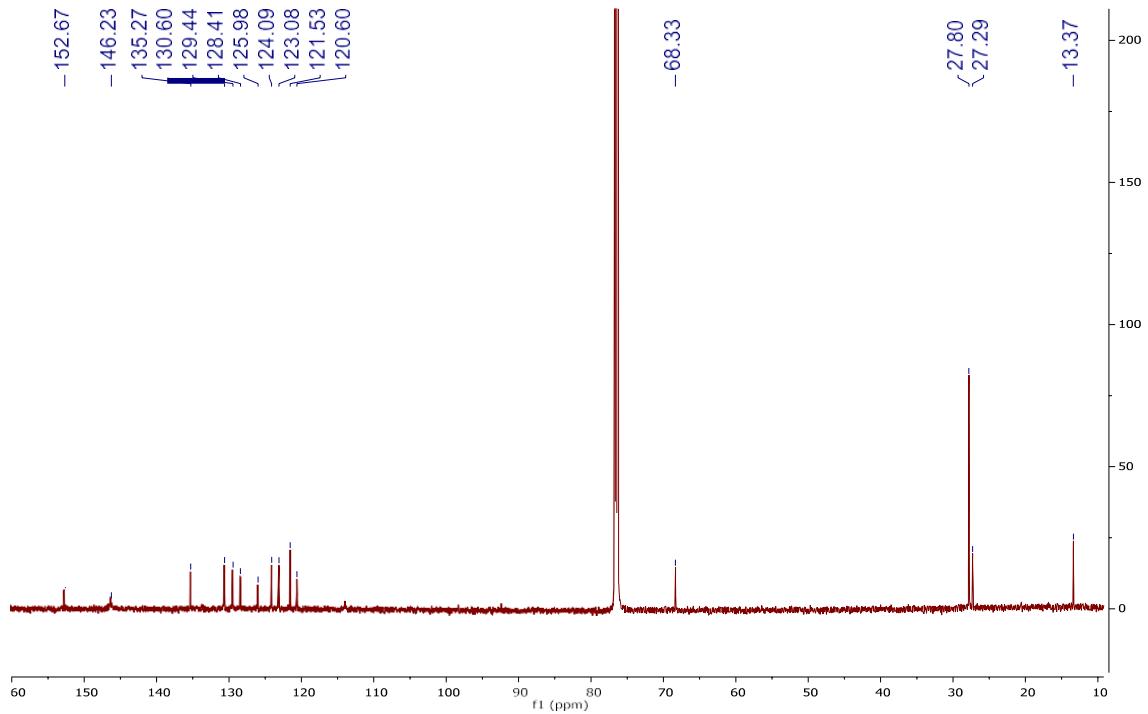
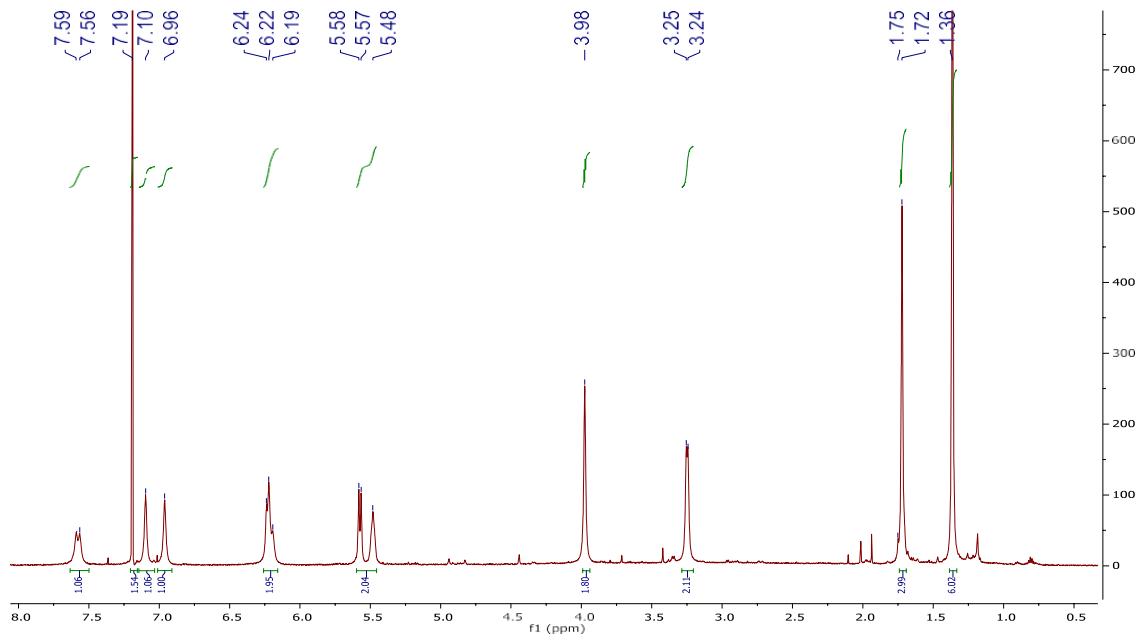


^{13}C NMR and DEPT spectrum of **12** in CDCl_3

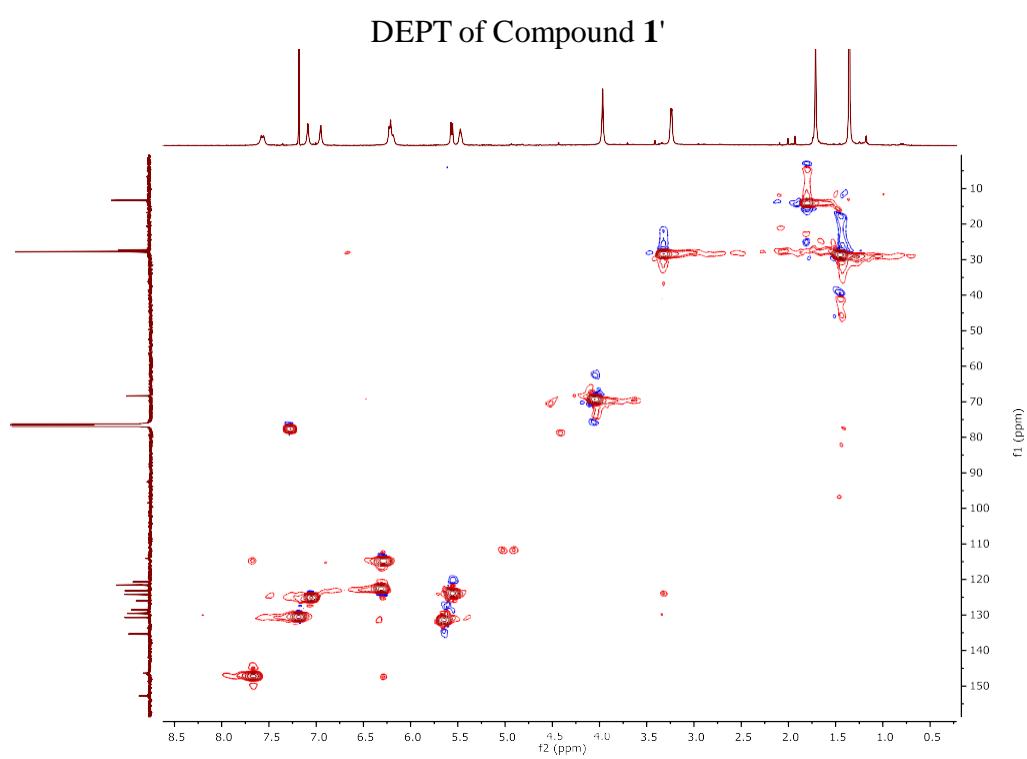
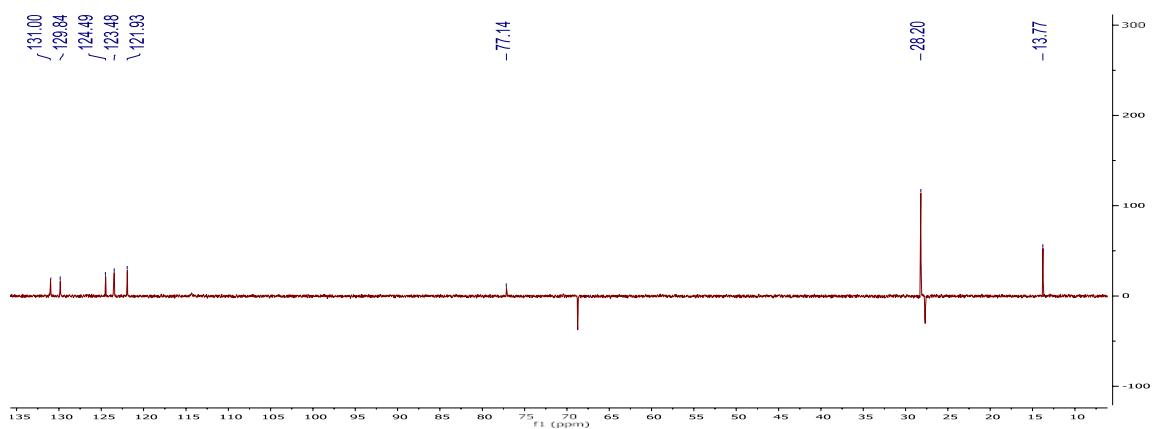
Figure S14. ^1H NMR, ^{13}C NMR, and DEPT spectrum of **12** in CDCl_3 .

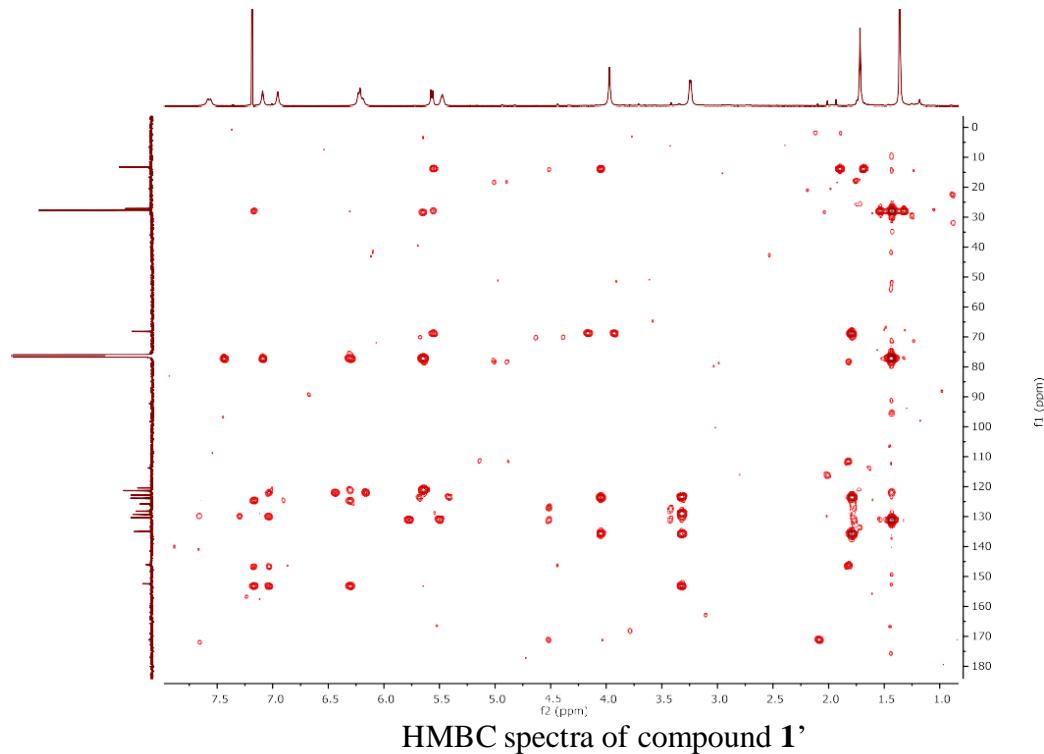
Supplementary data for *Artemisia marschalliana*

^1H NMR of Compound **1'**

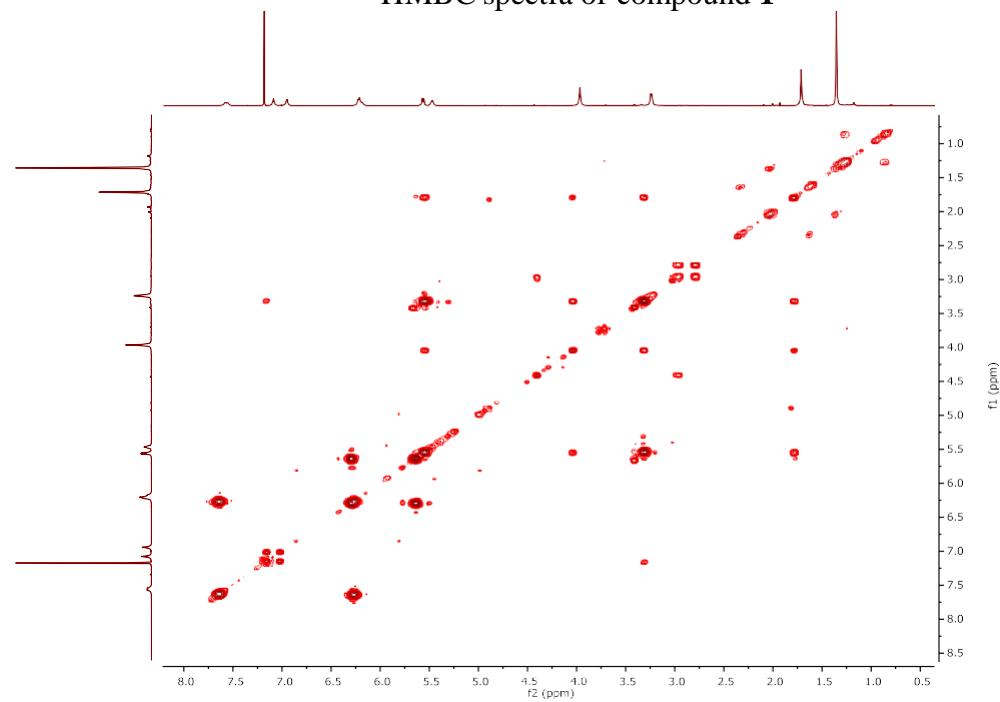


^{13}C NMR of Compound **1'**





HMBC spectra of compound **1'**



1H - 1H COSY spectra of compound **1'**

Figure S15. 1H NMR, ^{13}C NMR, DEPT, HSQC, HMBC and 1H - 1H COSY spectra of **1'** in $CDCl_3$

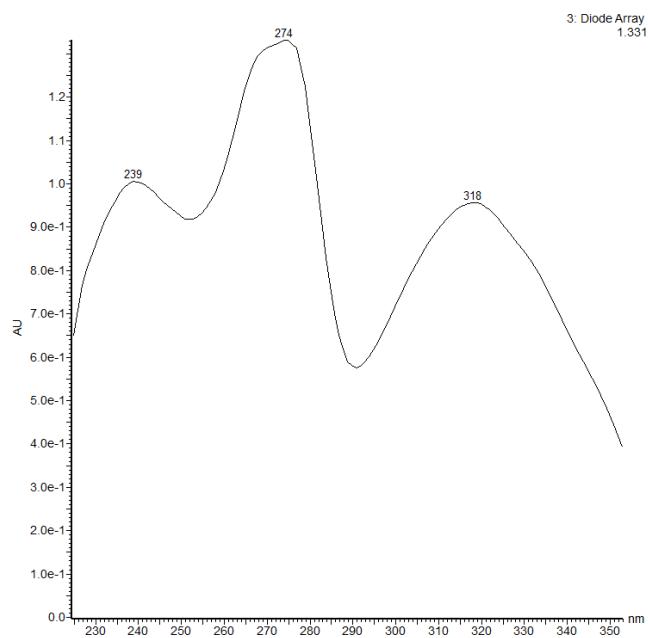


Figure S16. UV spectrum of Compound 1' in MeOH.

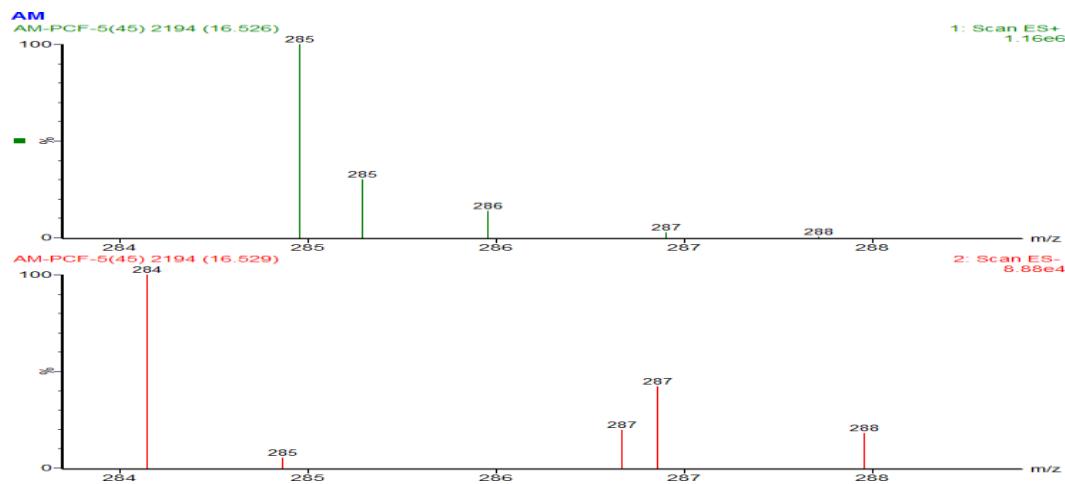
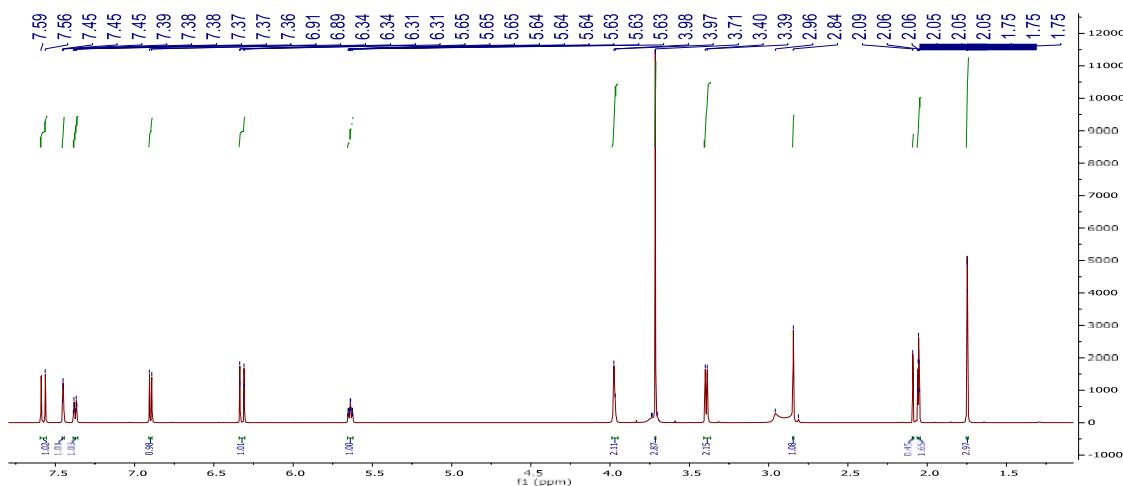
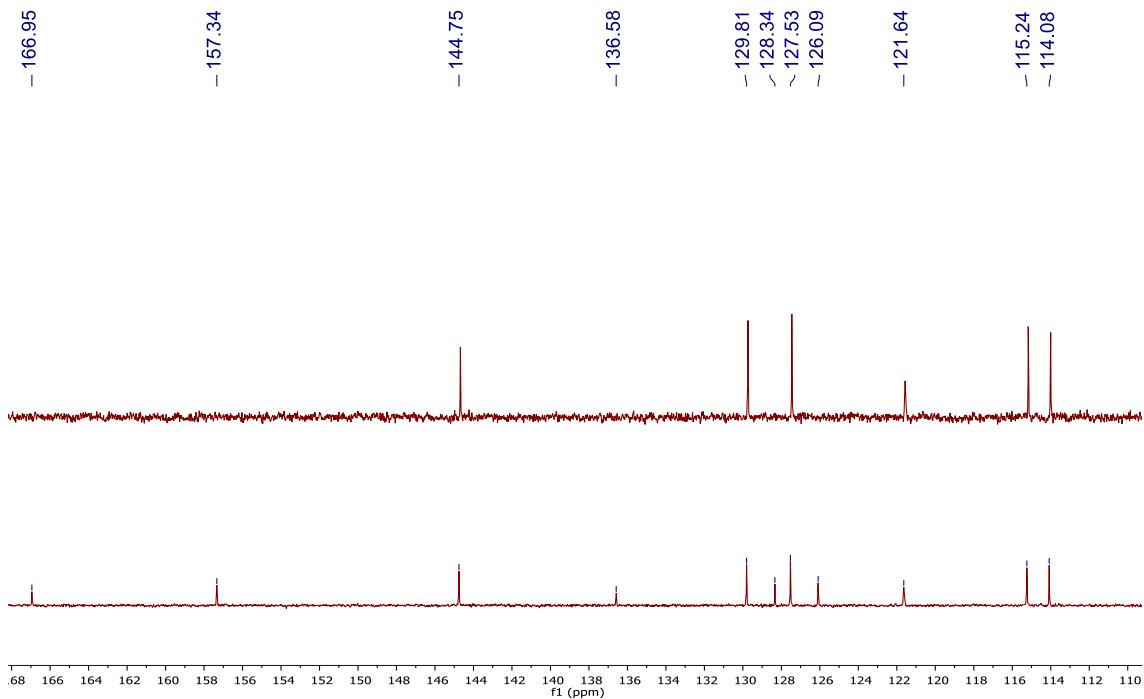


Figure S17. ESI-MS spectrum of Compound 1'.

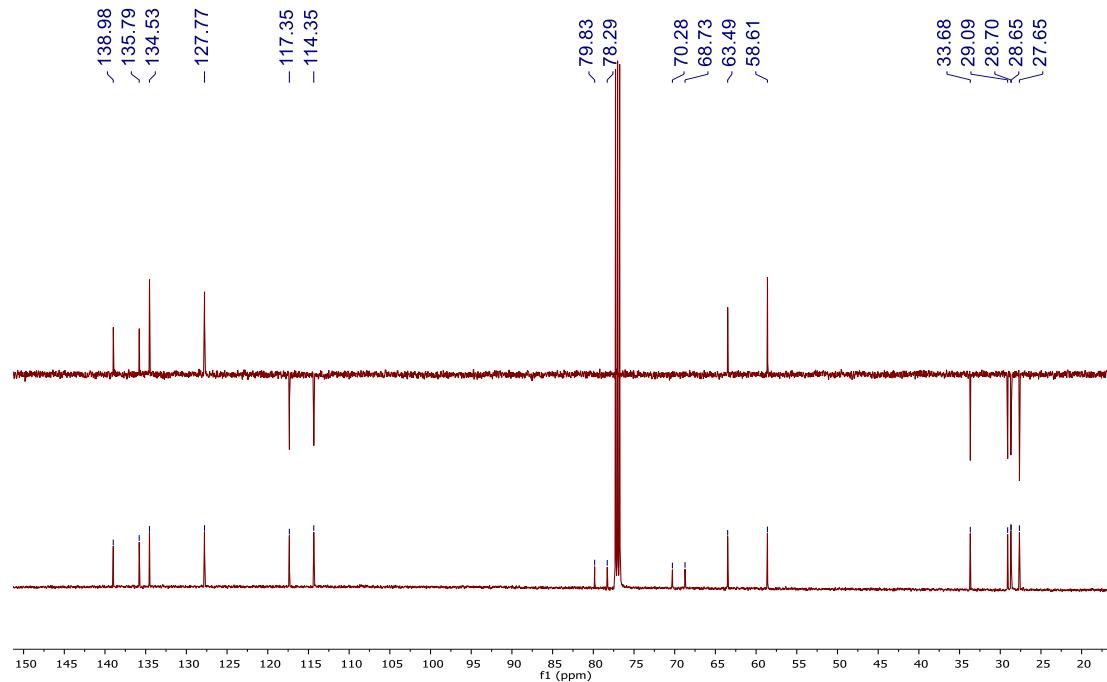
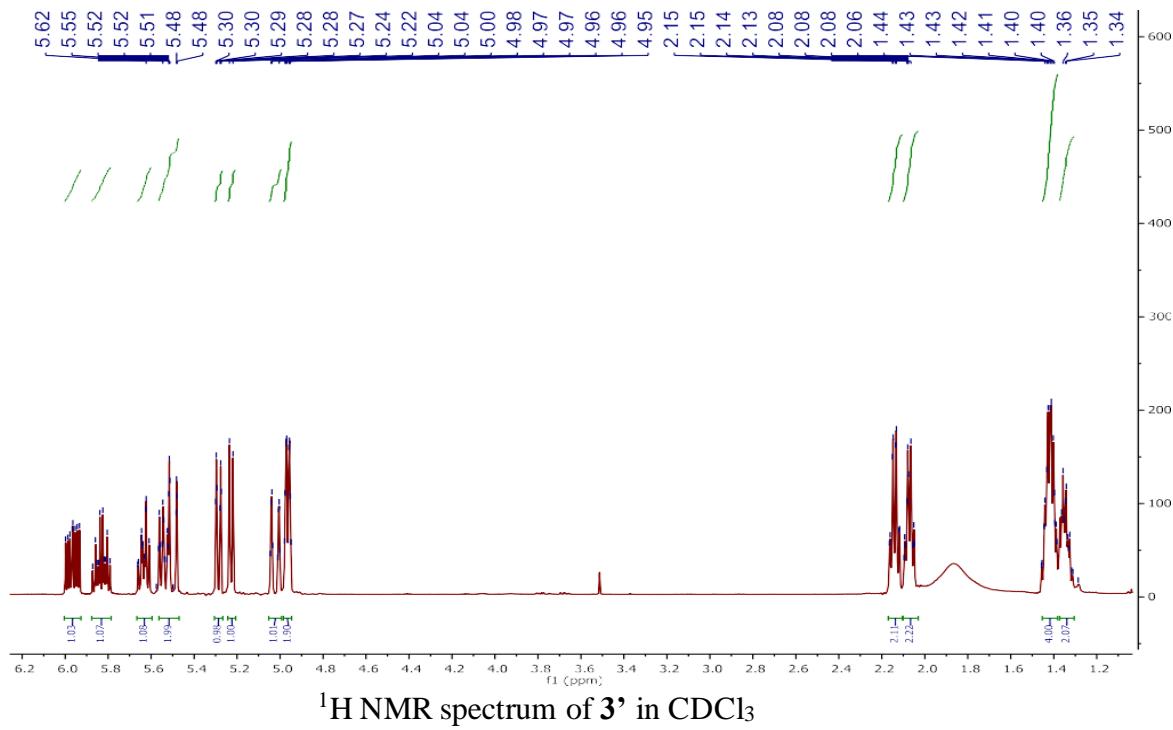


^1H NMR spectrum of **2'** in Acetone d-6



^{13}C NMR, DEPT spectrum of **2'** in Acetone d-6.

Figure S18. ^1H NMR, ^{13}C NMR, DEPT spectrum of **2'** in Acetone d-6.



^{13}C NMR and DEPT spectrum of **3'** in CDCl_3 .

Figure S19. ^1H NMR, ^{13}C NMR and DEPT spectrum of **3'** in CDCl_3

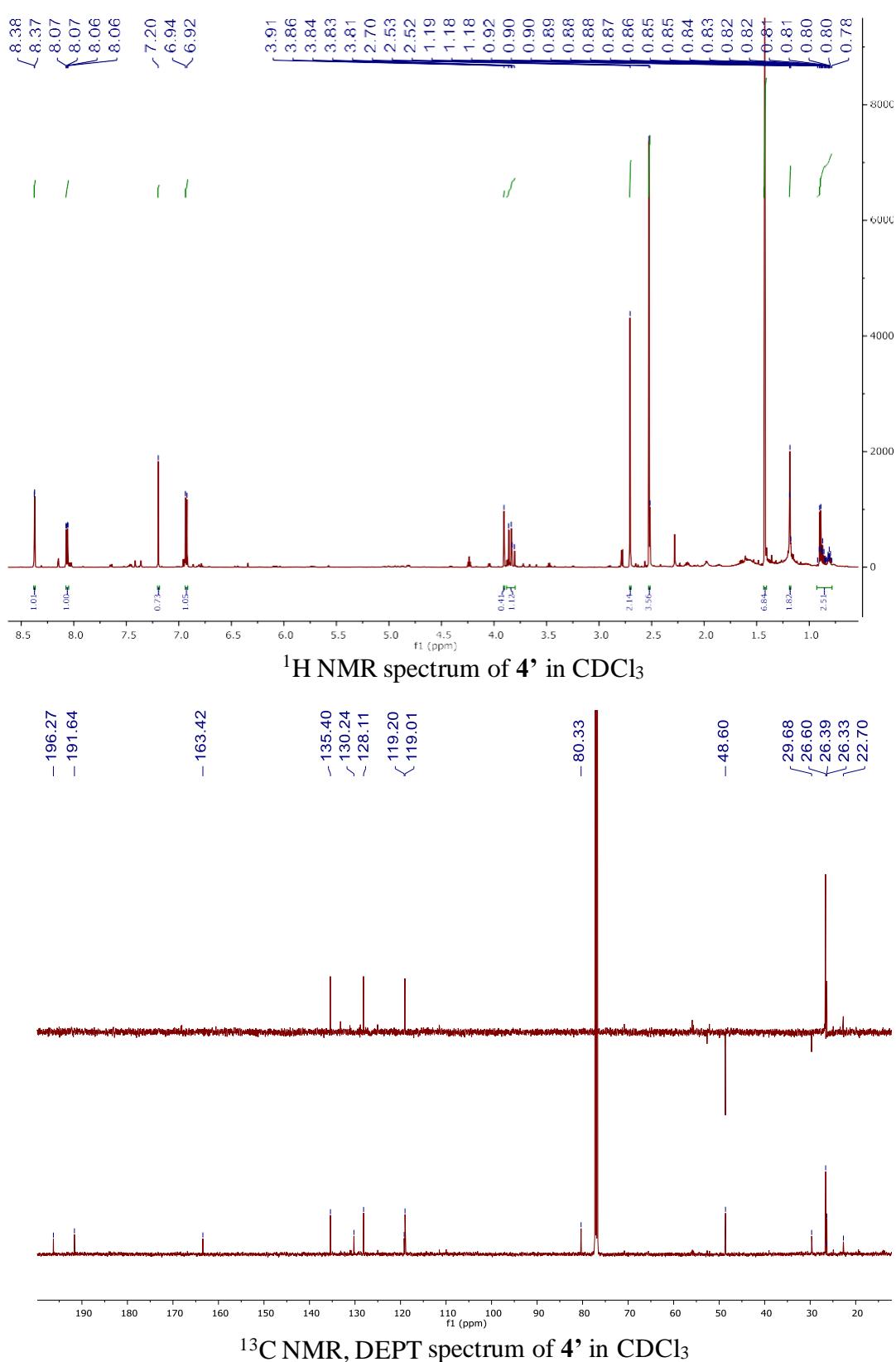
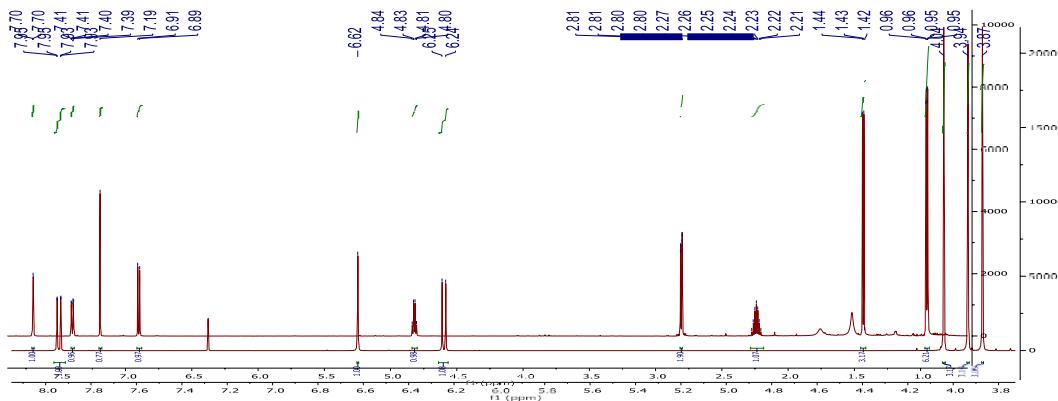
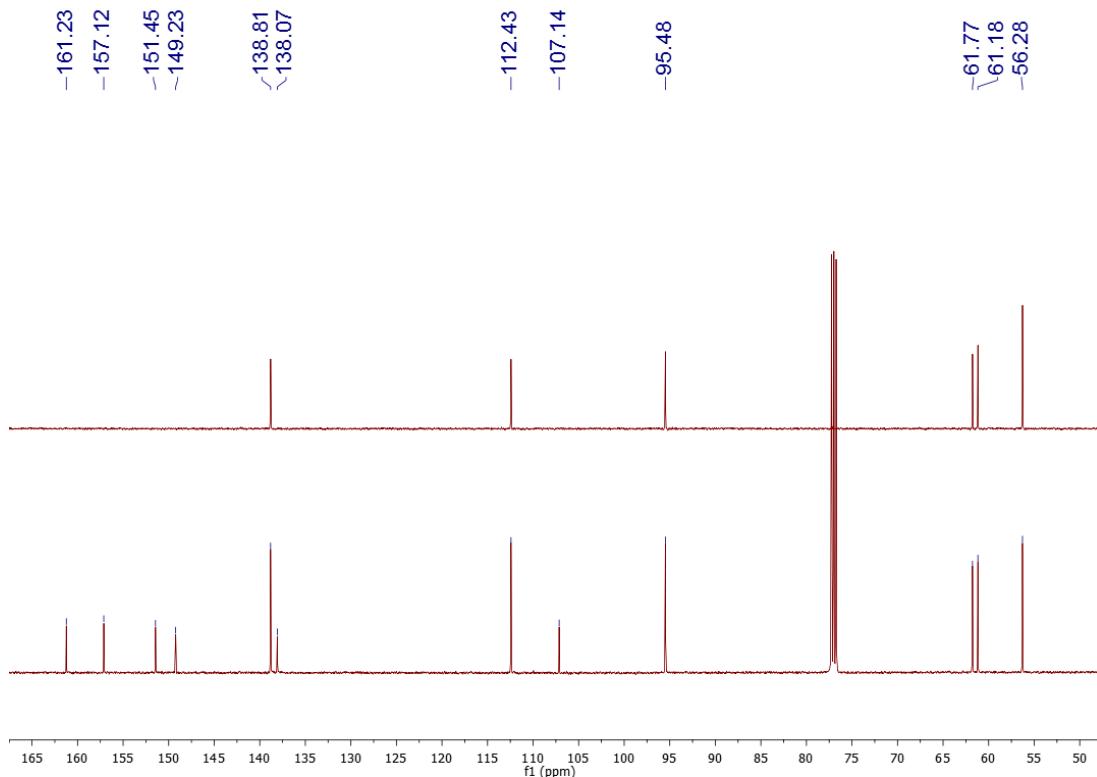


Figure S20. ¹H NMR, ¹³C NMR, DEPT spectrum of **4'** in CDCl_3



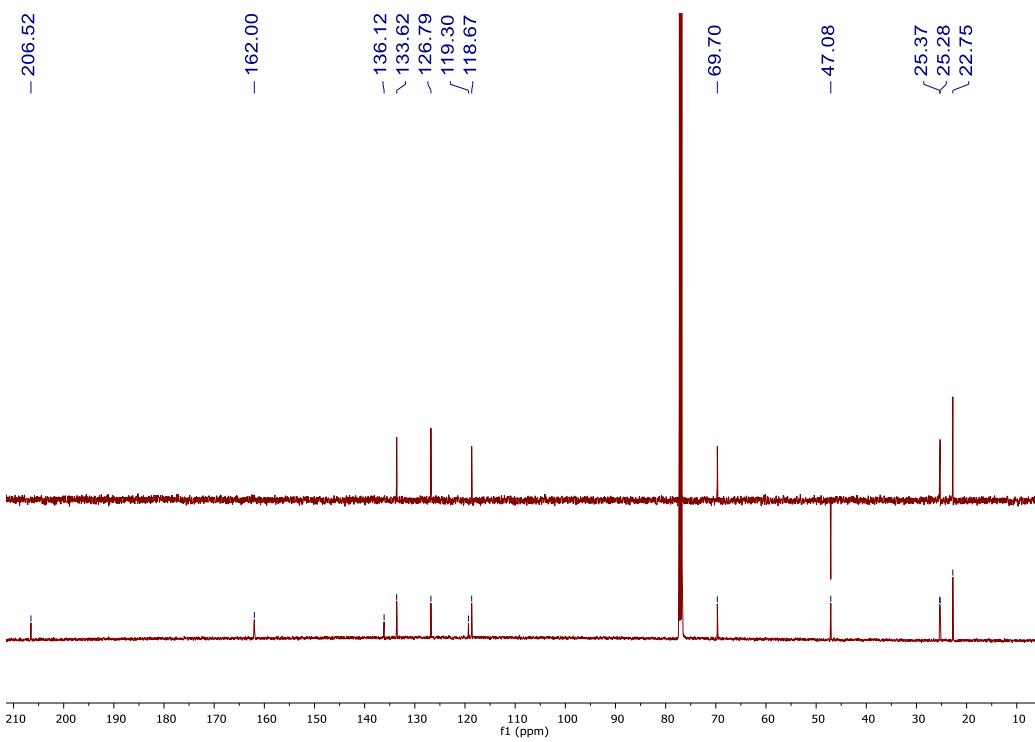
¹H NMR spectrum of **5'** in CDCl_3



¹³C NMR, DEPT spectrum of **5'** in CDCl_3 .

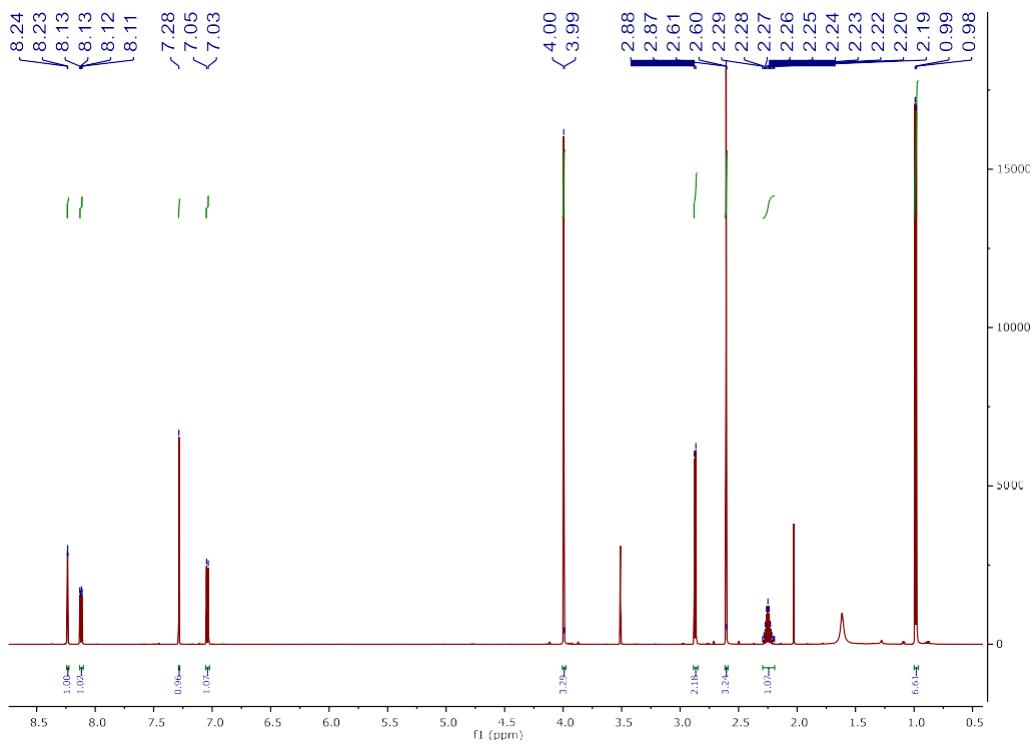
Figure S21. ¹H NMR, ¹³C NMR, DEPT spectrum of **5'** in CDCl_3 .

¹H NMR spectrum of **6'** in CDCl_3

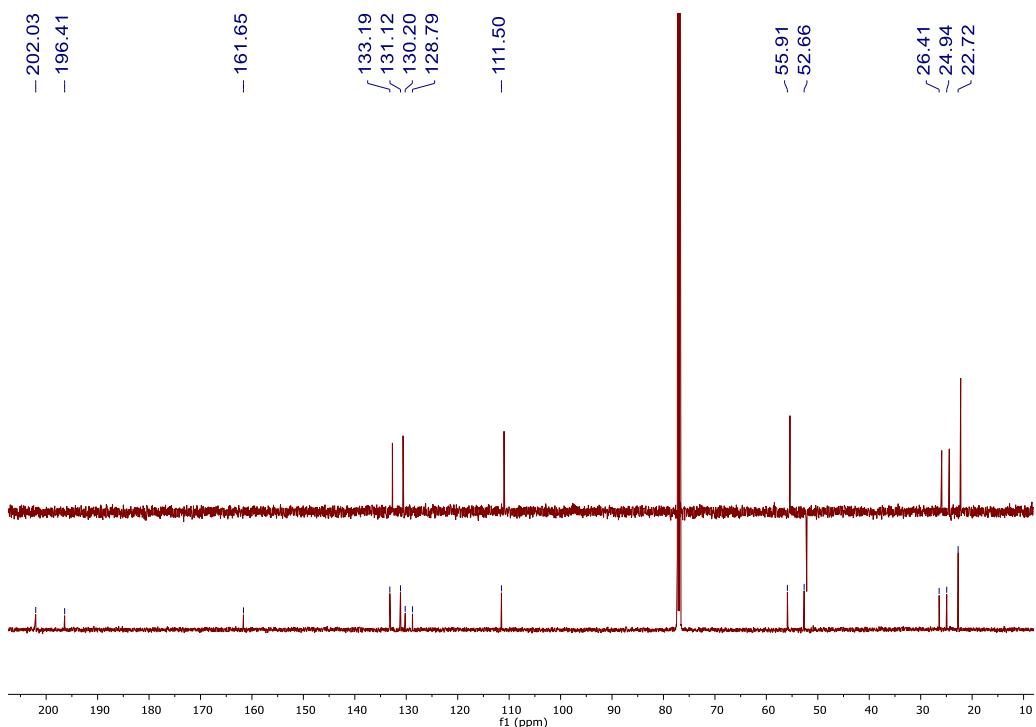


¹³C NMR, DEPT spectrum of **6'** in CDCl₃

Figure S22. ¹H NMR, ¹³C NMR, DEPT spectrum of **6'** in CDCl₃.

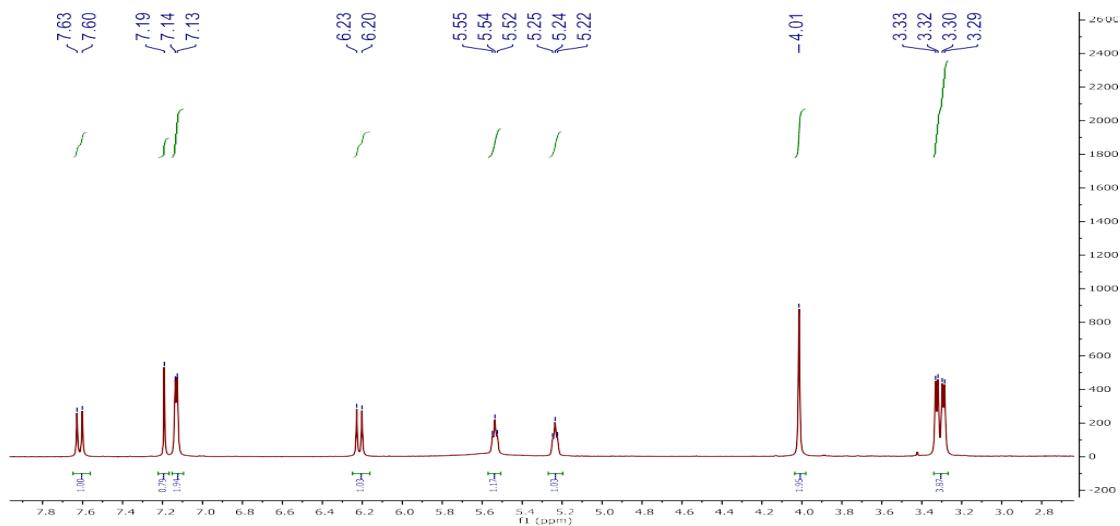


¹H NMR spectrum of **7'** in CDCl₃

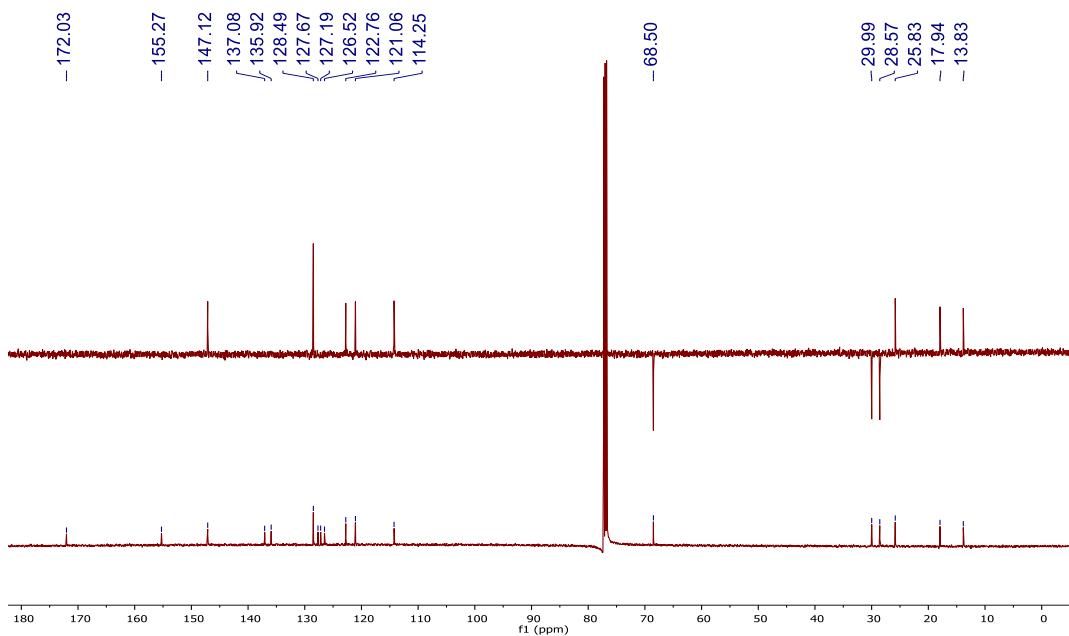


^{13}C NMR, DEPT spectrum of **7'** in CDCl_3

Figure S23. ^1H NMR, ^{13}C NMR, DEPT spectrum of **7'** in CDCl_3

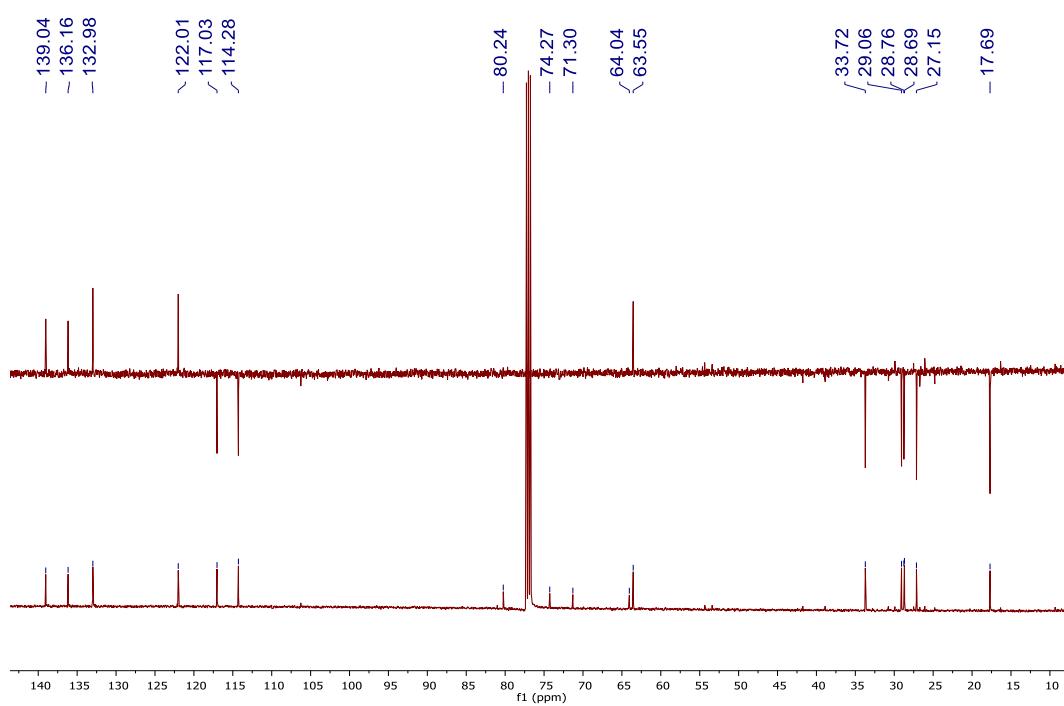
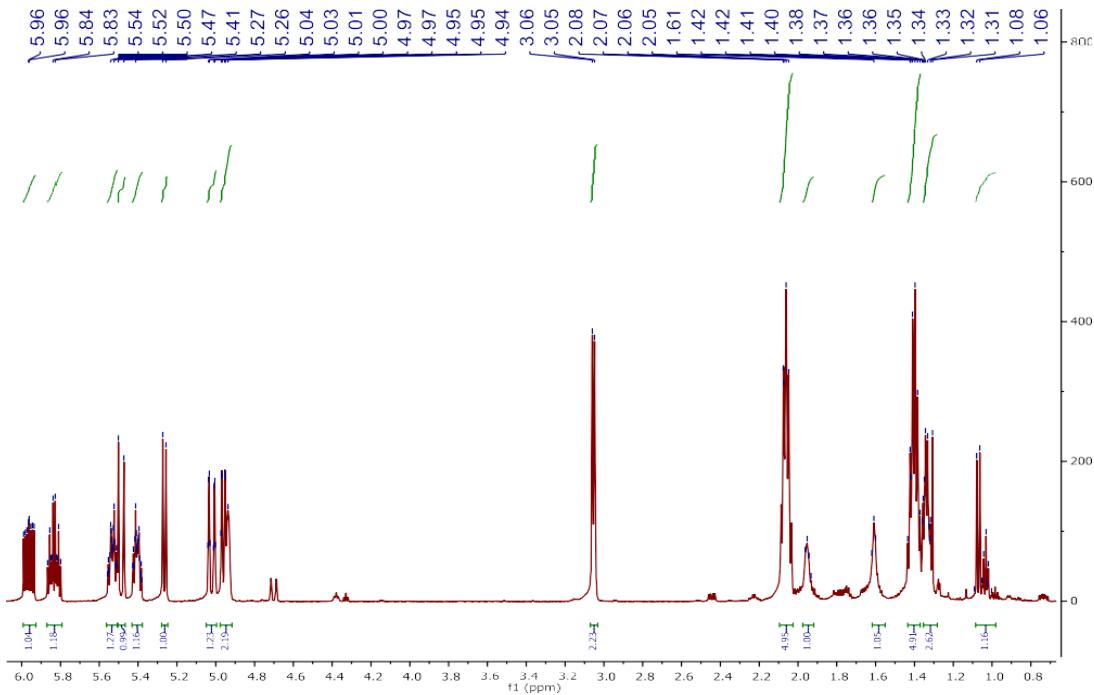


^1H NMR spectrum of **8'** in CDCl_3



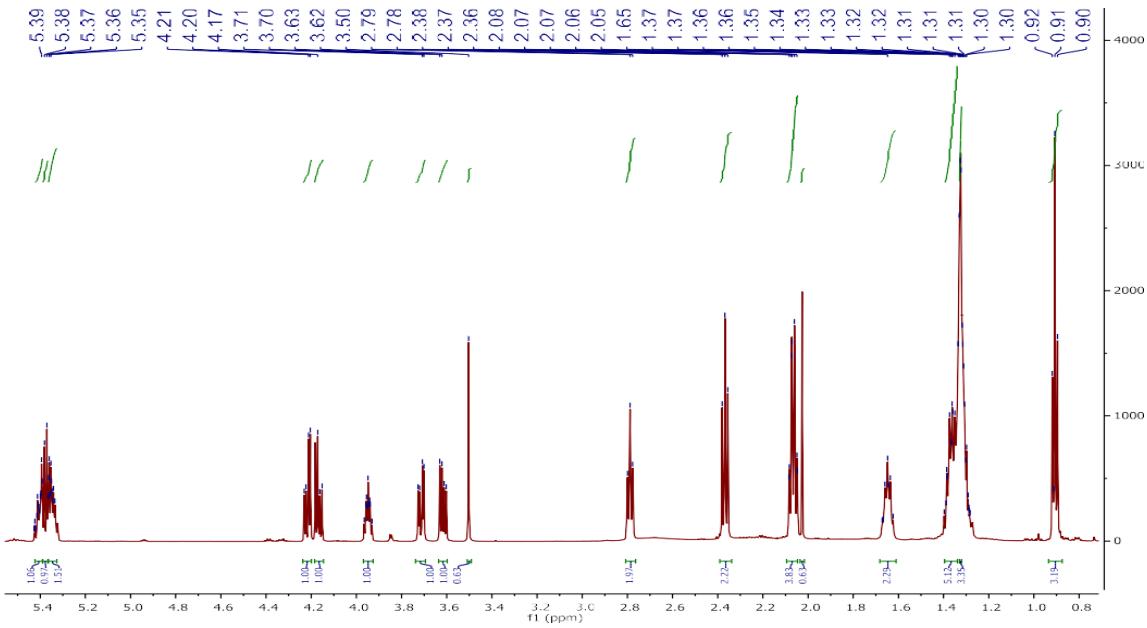
^{13}C NMR, DEPT spectrum of **8'** in CDCl_3

Figure S24. ^1H NMR, ^{13}C NMR, DEPT spectrum of **8'** in CDCl_3

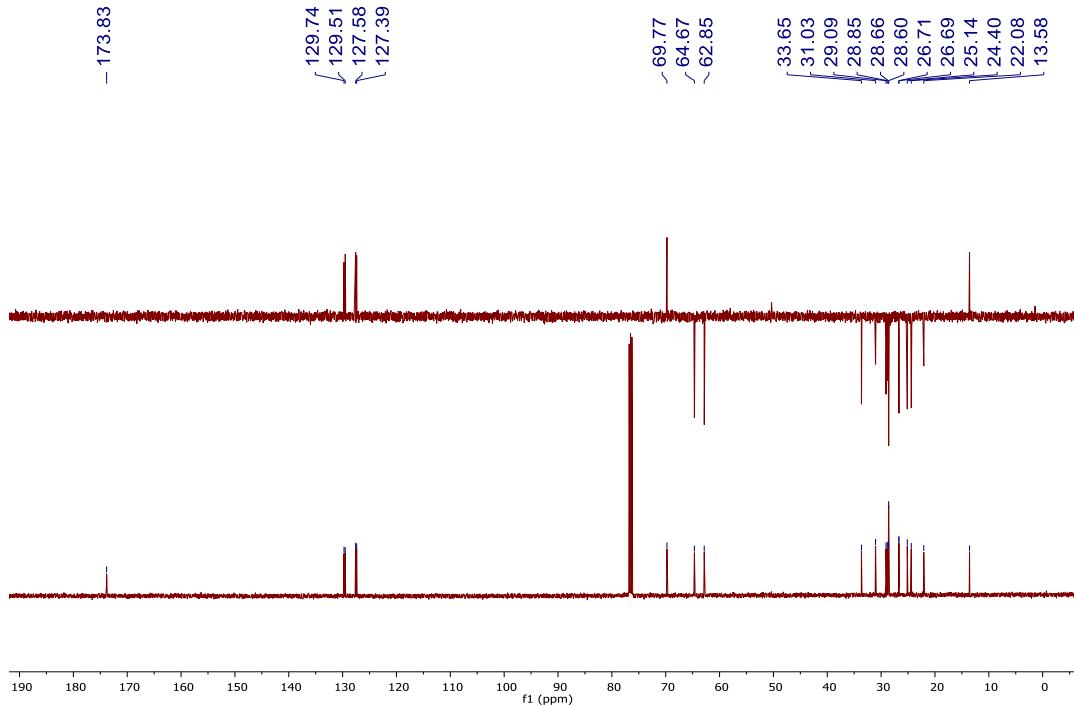


¹³C NMR, DEPT spectrum of **9'** in CDCl₃

Figure S25. ¹H NMR, ¹³C NMR, DEPT spectrum of **9'** in CDCl₃

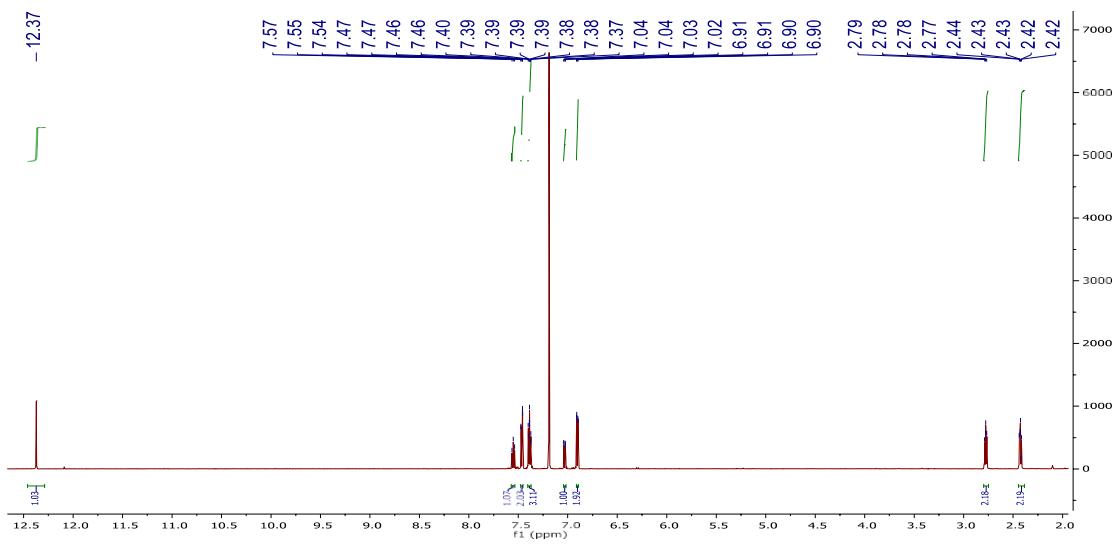


^1H NMR spectrum of **10'** in CDCl_3 .

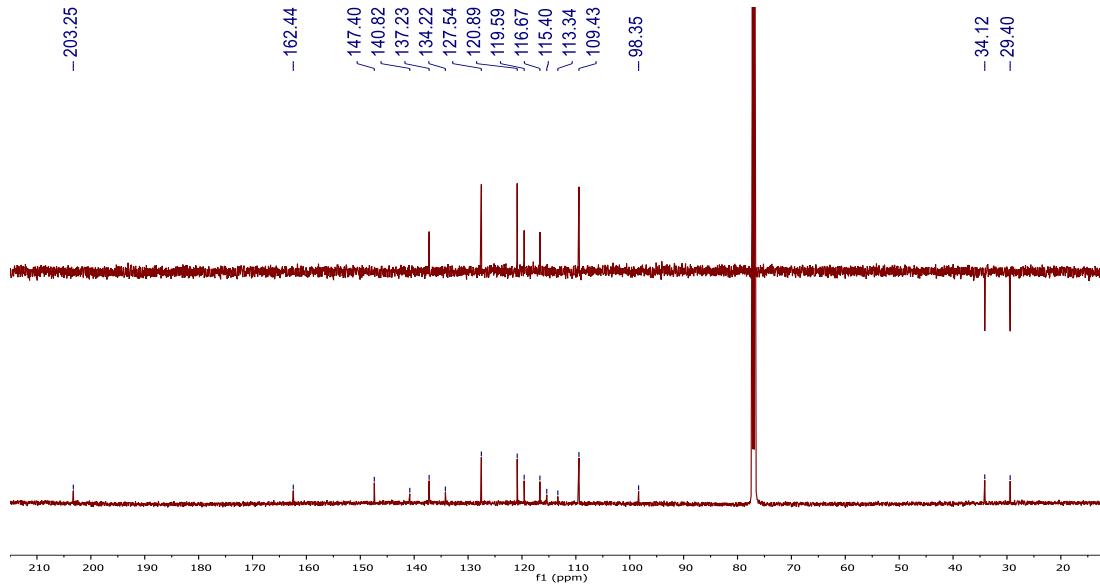


^{13}C NMR, DEPT spectrum of **10'** in CDCl_3 .

Figure S26. ^1H NMR, ^{13}C NMR, DEPT spectrum of **10'** in CDCl_3

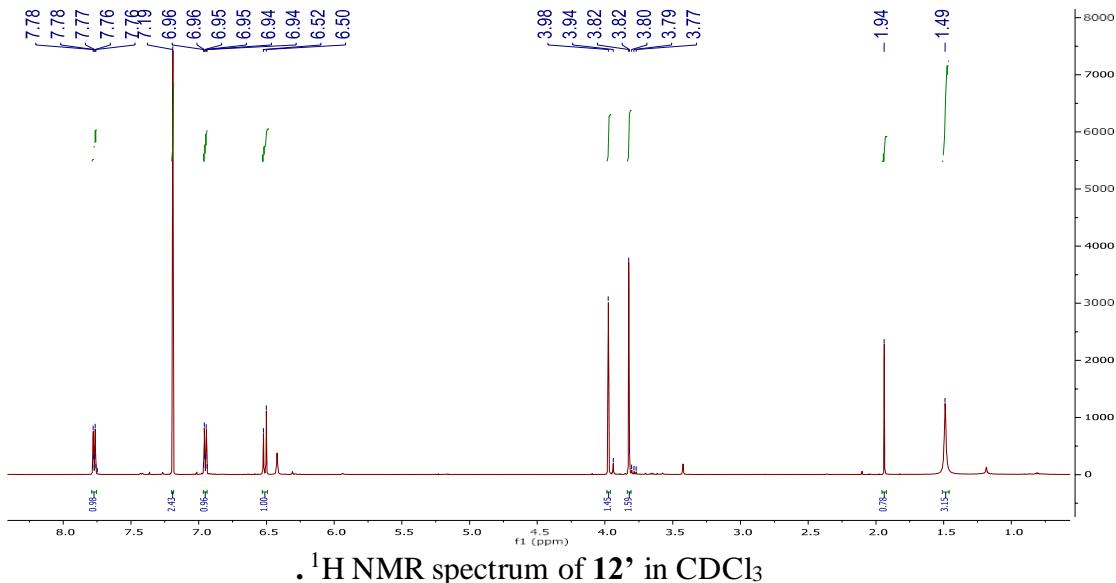


^1H NMR spectrum of **11'** in CDCl_3 .

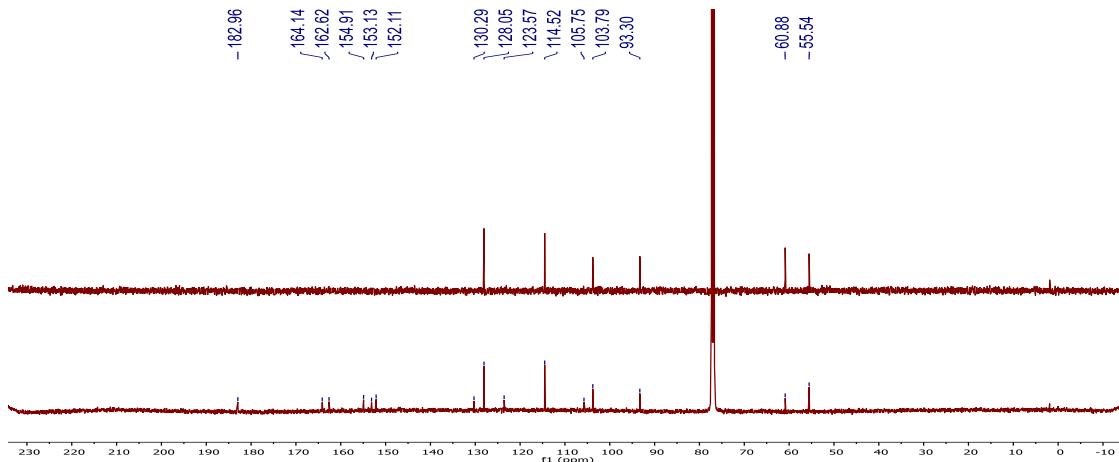


^{13}C NMR, DEPT spectrum of **11'** in CDCl_3 .

Figure S27. ^1H NMR, ^{13}C NMR, DEPT spectrum of **11'** in CDCl_3 .

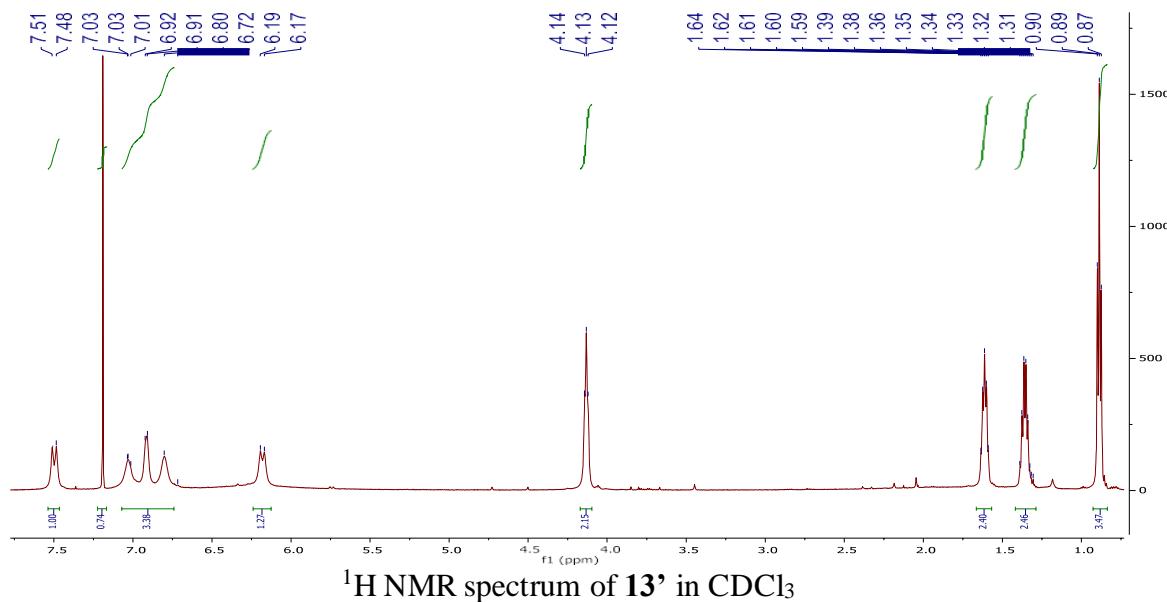


^1H NMR spectrum of **12'** in CDCl_3

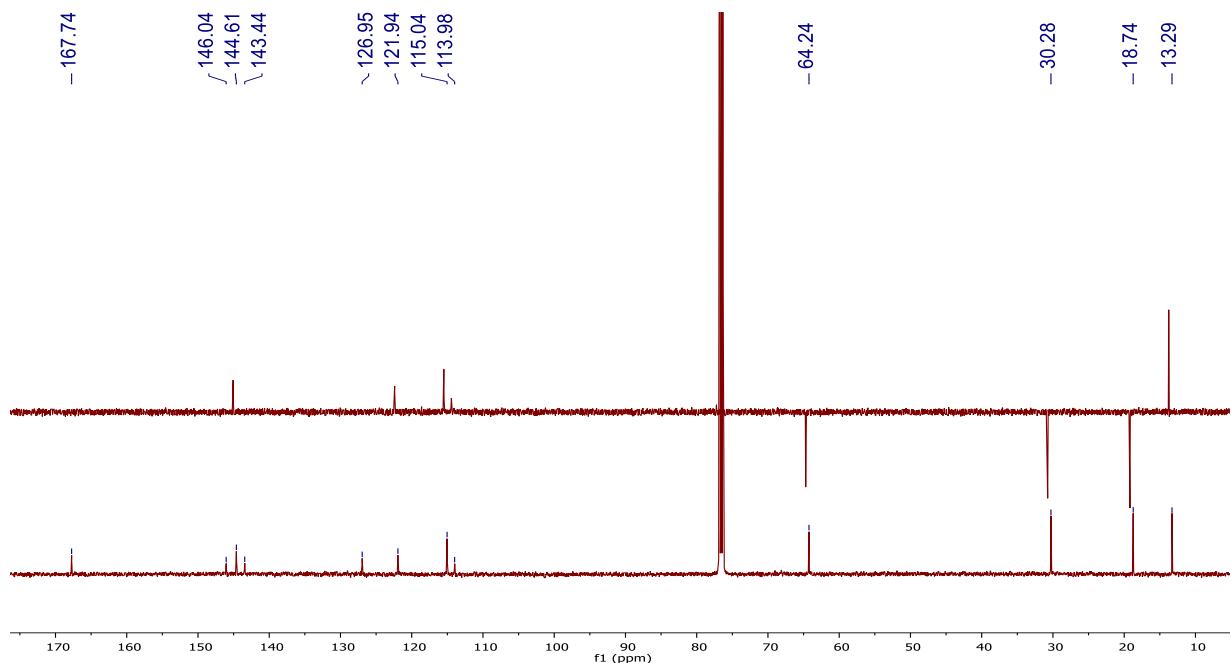


^{13}C NMR, DEPT spectrum of **12'** in CDCl_3 .

Figure S28. ^1H NMR, ^{13}C NMR, DEPT spectrum of **12'** in CDCl_3 .



^1H NMR spectrum of **13'** in CDCl_3



^{13}C NMR, DEPT spectrum of **13'** in CDCl_3

Figure S29. ^1H NMR, ^{13}C NMR, DEPT spectrum of **13'** in CDCl_3

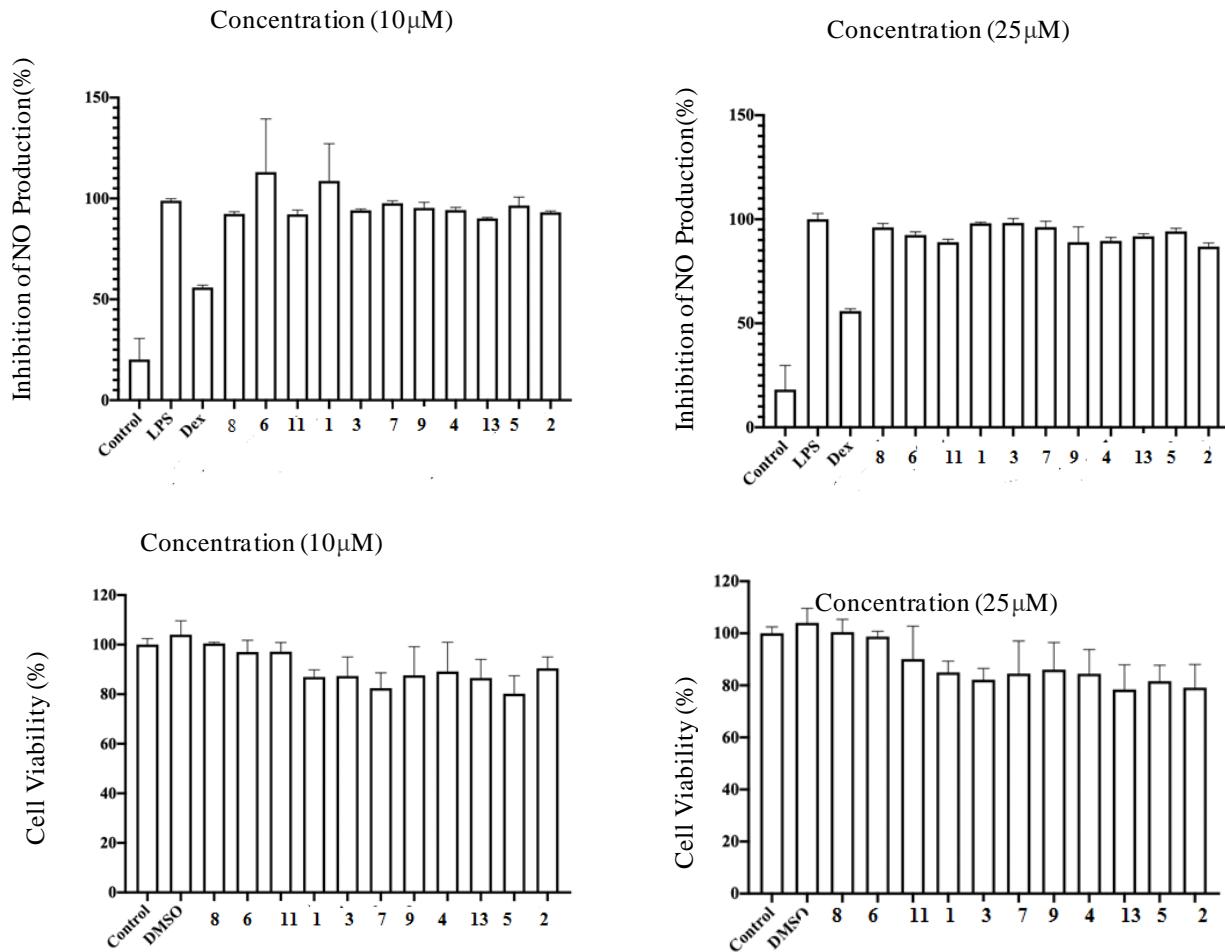


Figure S30. Inhibitory Effects of *A.nitrosa* compounds on LPS-Enhanced Inflammatory Mediators



Figure S31. Pictures of the whole plant of *Artemisia nitrosa*.



Figure S32. Pictures of the whole plant of *Artemisia marschalliana*.