Supplementary Materials

Polyphenols from acorn leaves (Quercus liaotungensis) protect pancreatic beta cells and their inhibitory activity against *α*-glucosidase and protein tyrosine phosphatase 1B

Jing Xu[a,b], Xude Wang[a,b], Jiayin Yue[a,b], Yuanyuan Sun[a,b], Xiaoshu Zhang[a,b*], Yuqing Zhao[a, b*]

[a] *School of Functional Food and Wine, Shenyang Pharmaceutical University, Shenyang 110016, People's Republic of China.*

[b] *Key Laboratory of Structure-based Drug Design and Discovery of Ministry of Education, Shenyang Pharmaceutical University, Shenyang 110016, China.*

* Corresponding author.

Tel: +86-24-23986521, Fax: +86-24-23986521, email: zyq4885@126.com *(Y. Zhao) or Tel: +86-24-23986522, Fax: +86-24-23986521, email: xiaoshu2397@163.com *(X. Zhang)

CONTENT

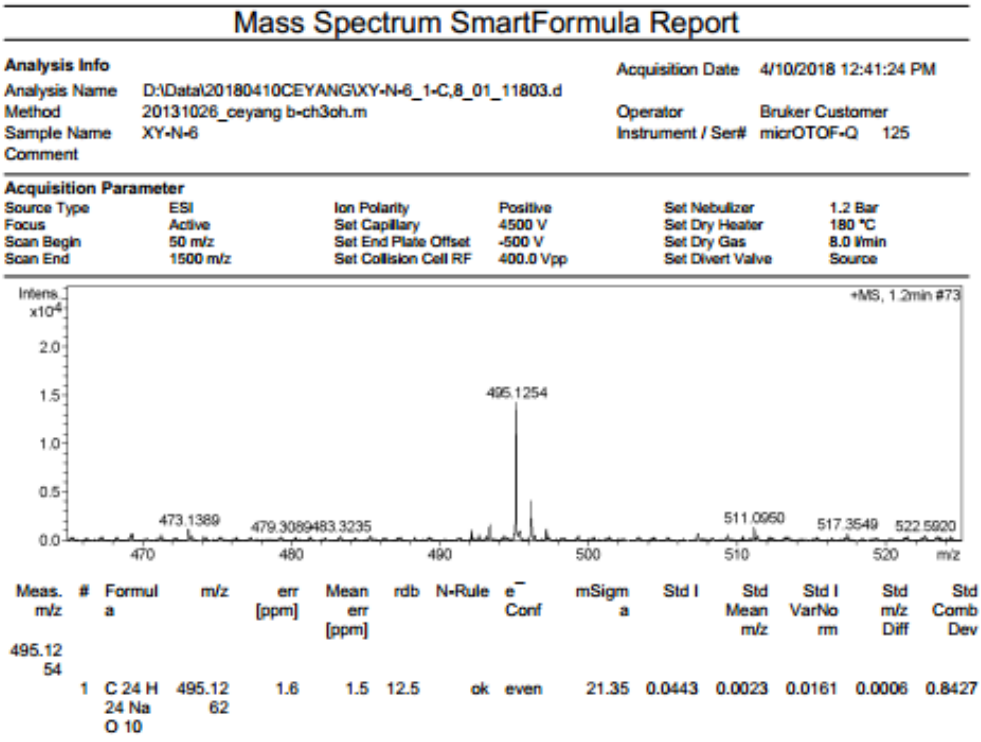

Figure S1. HR-ESI-MS of Compound 1

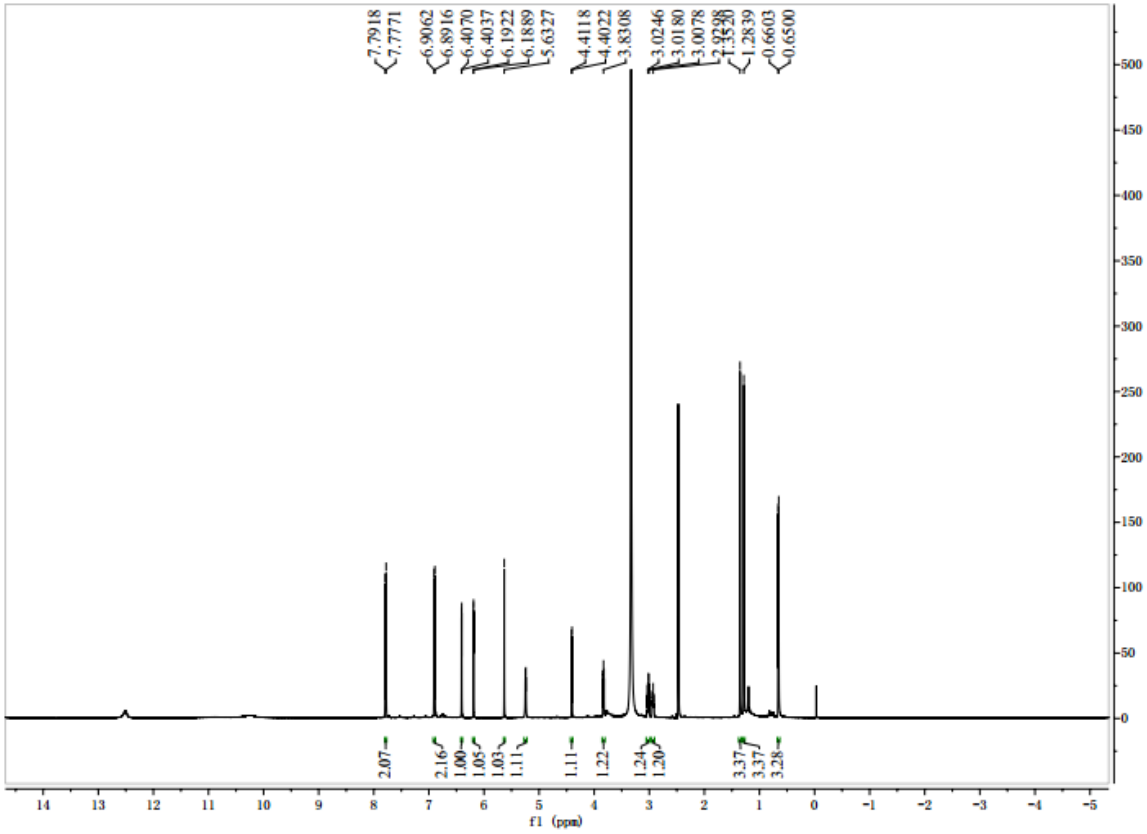

Figure S2. ^{1}H-NMR of Compound 1 (600MHz, DMSO-d_6)

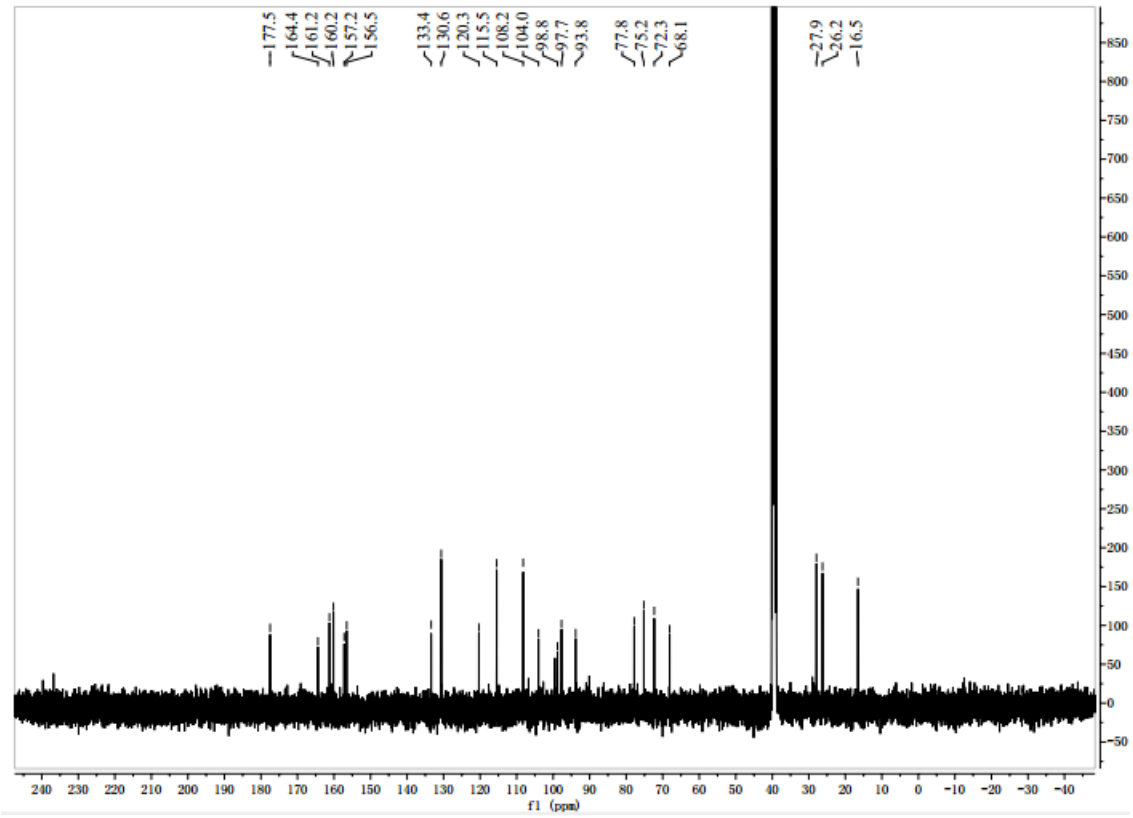

Figure S3. ^{13}C-NMR of Compound 1 (100MHz, DMSO-d_6)

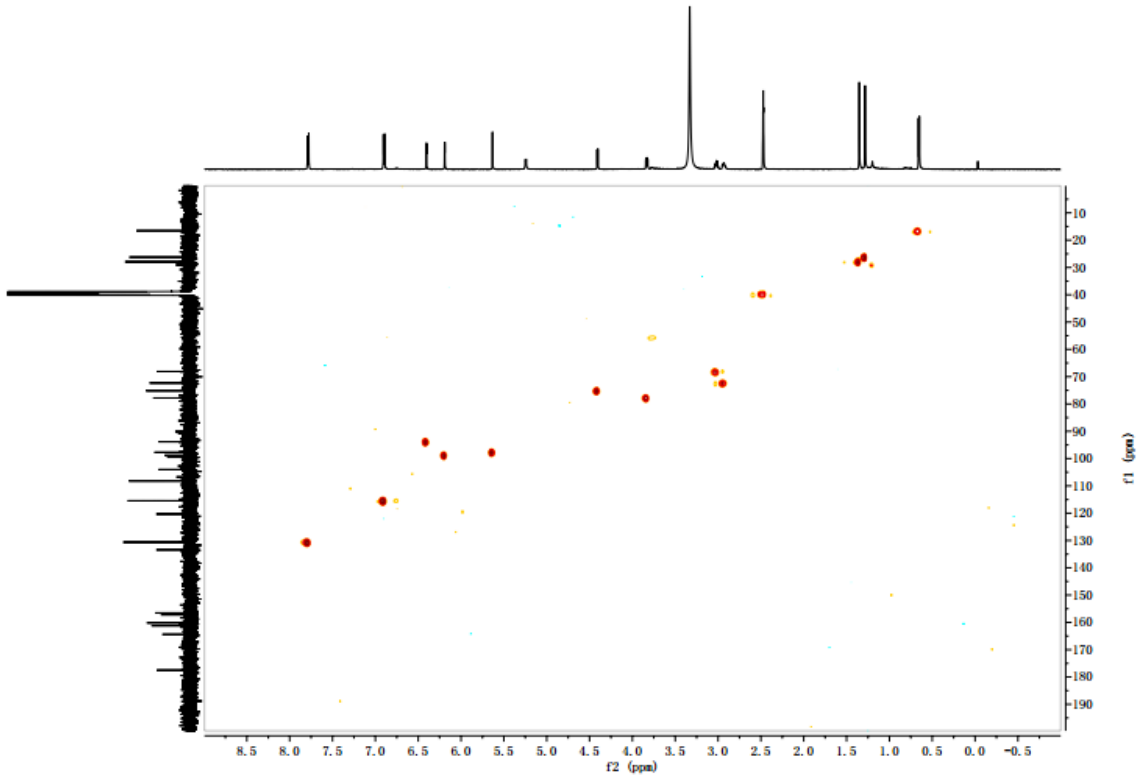

Figure S4. HSQC of Compound 1

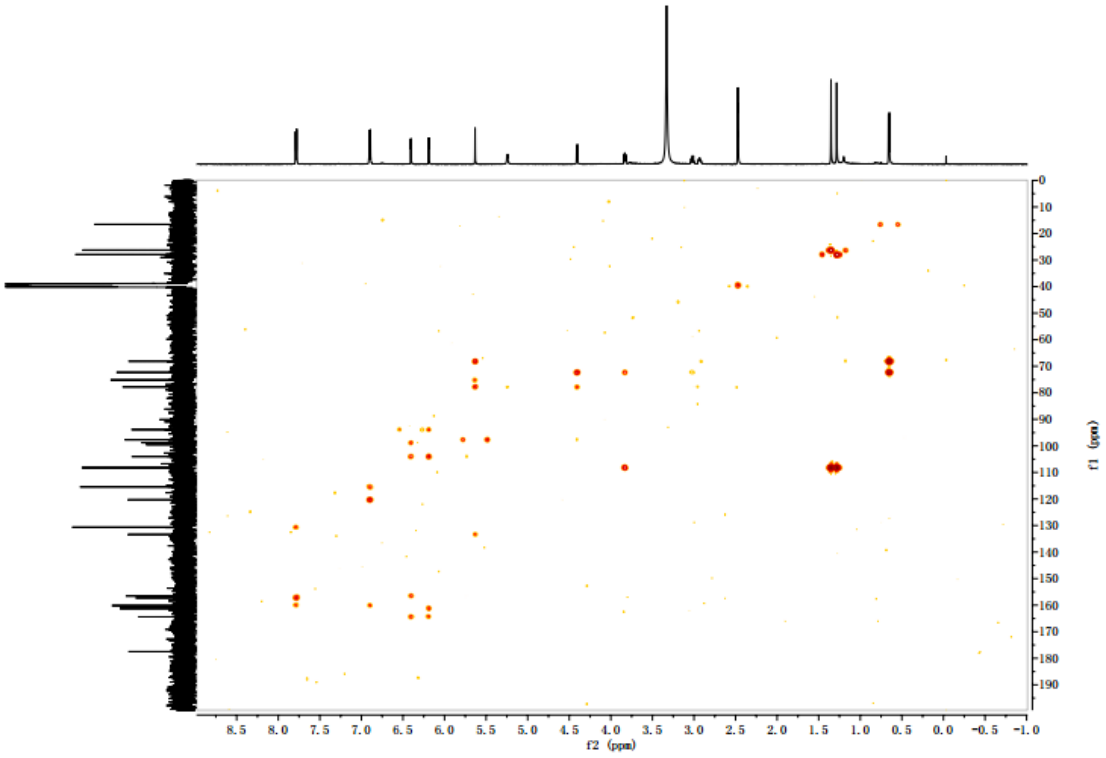

Figure S5. HMBC of Compound 1

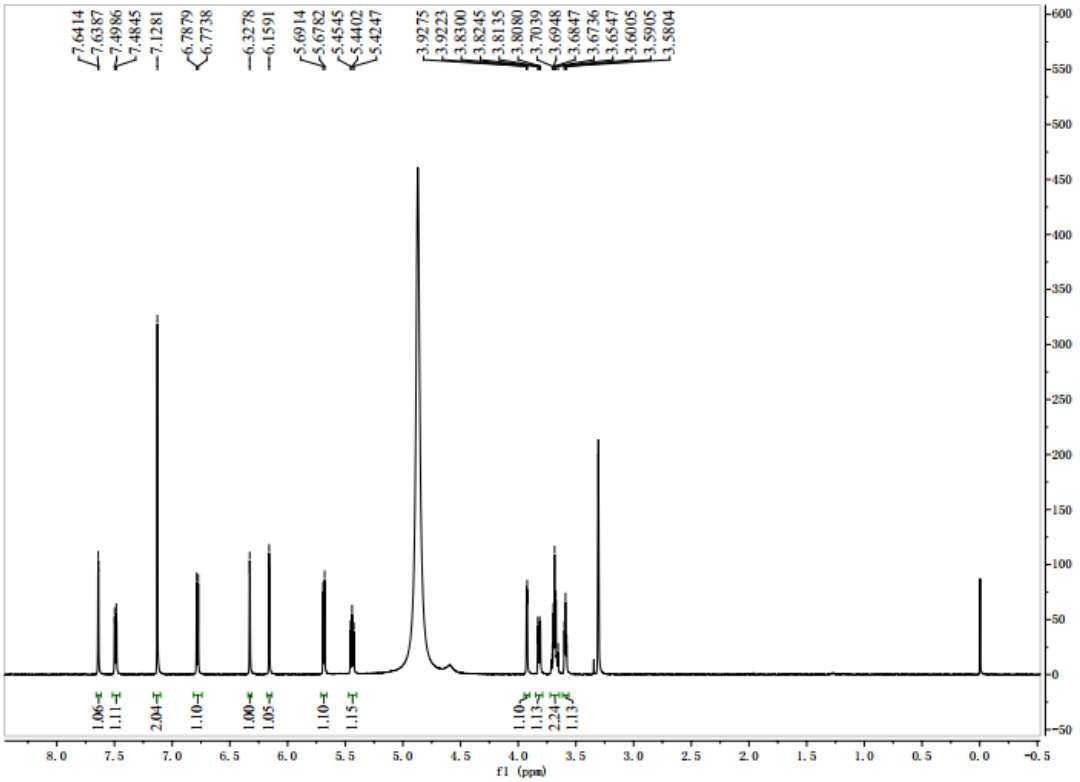

Figure S6. ^{1}H-NMR of Compound 2 (600MHz, CD_3OD)

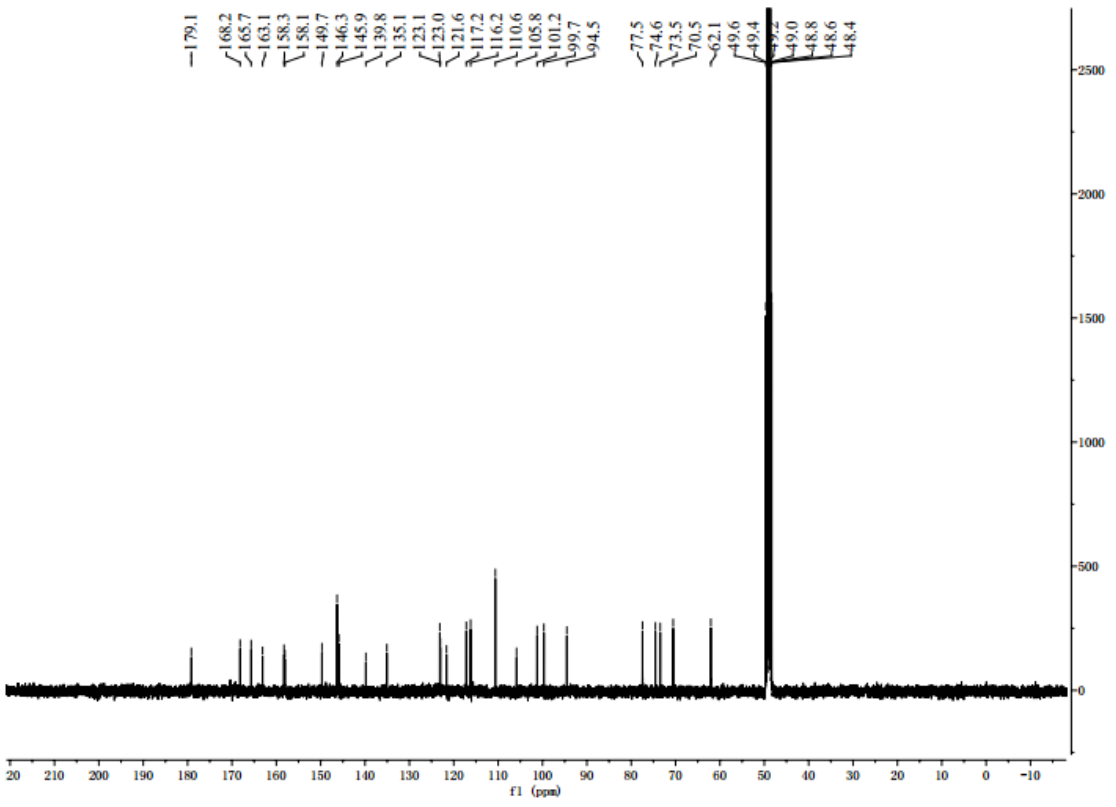

Figure S7. ^{13}C-NMR of Compound 2 (100MHz, CD_3OD)

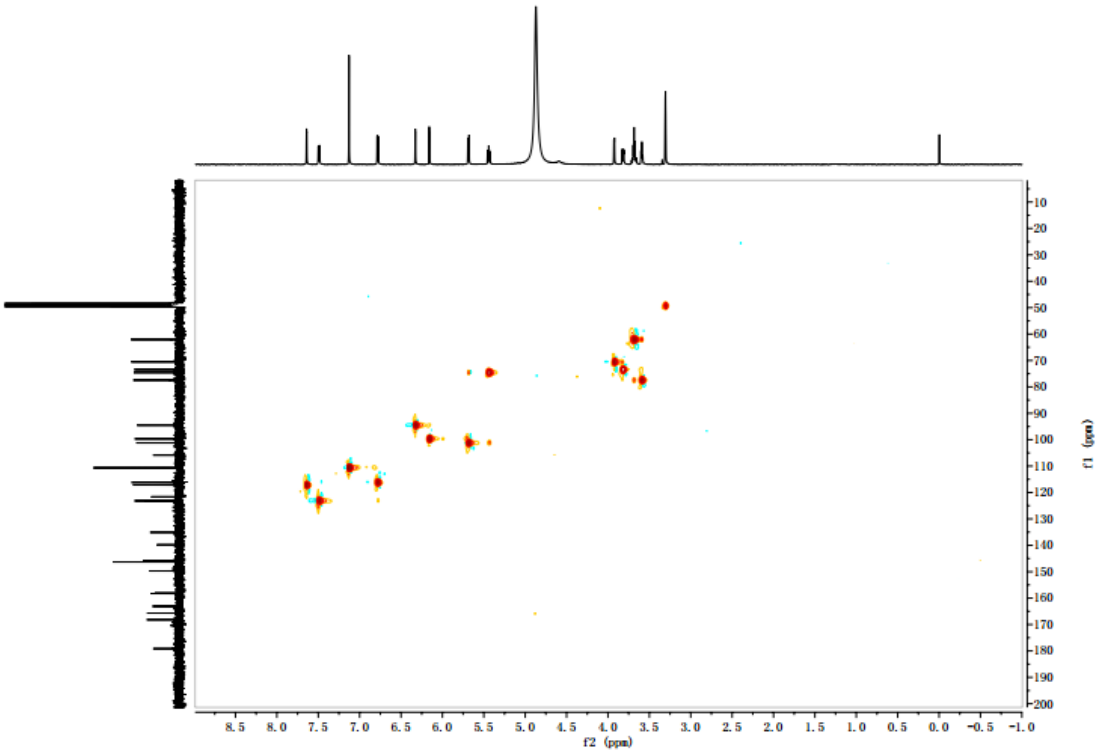

Figure S8. HSQC of Compound 2

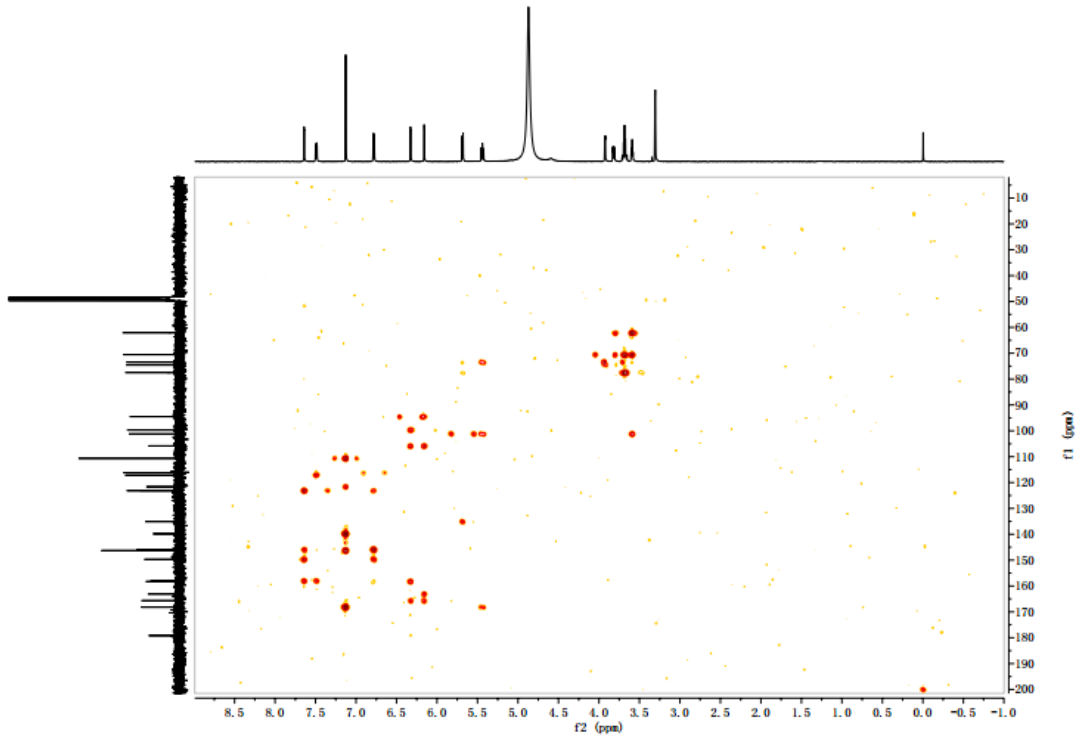

Figure S9. HMBC of Compound 2

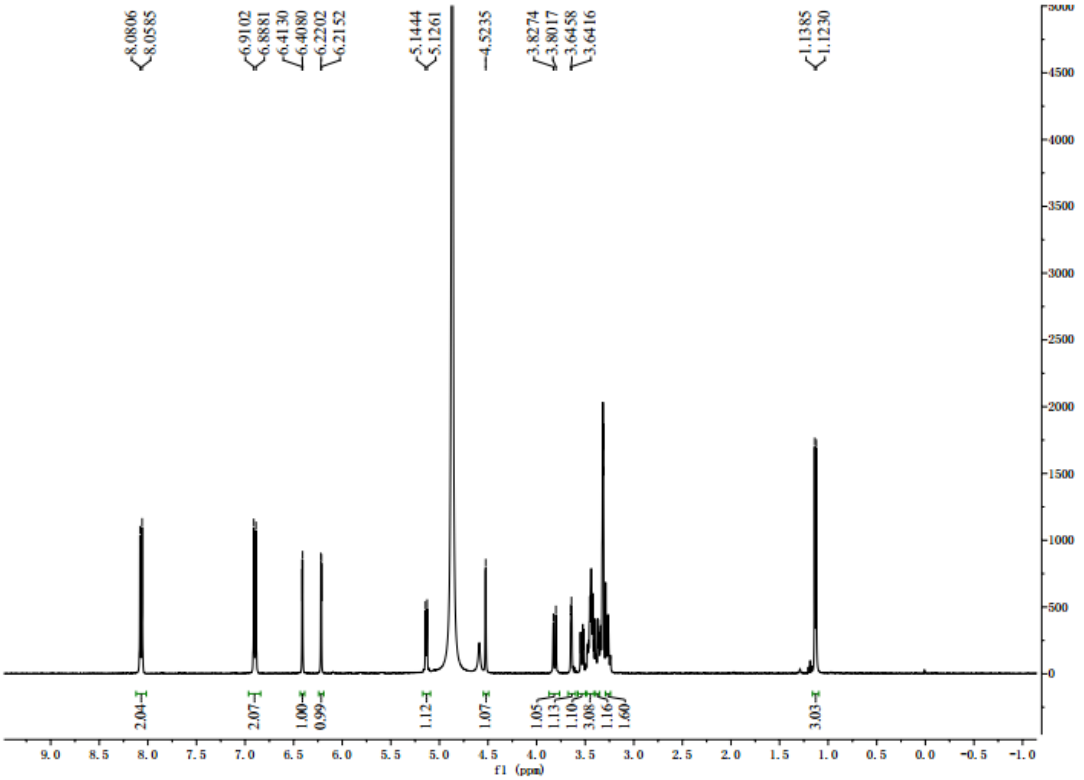

Figure S10. ^{1}H-NMR of Compound 3 (400MHz, CD_3OD)

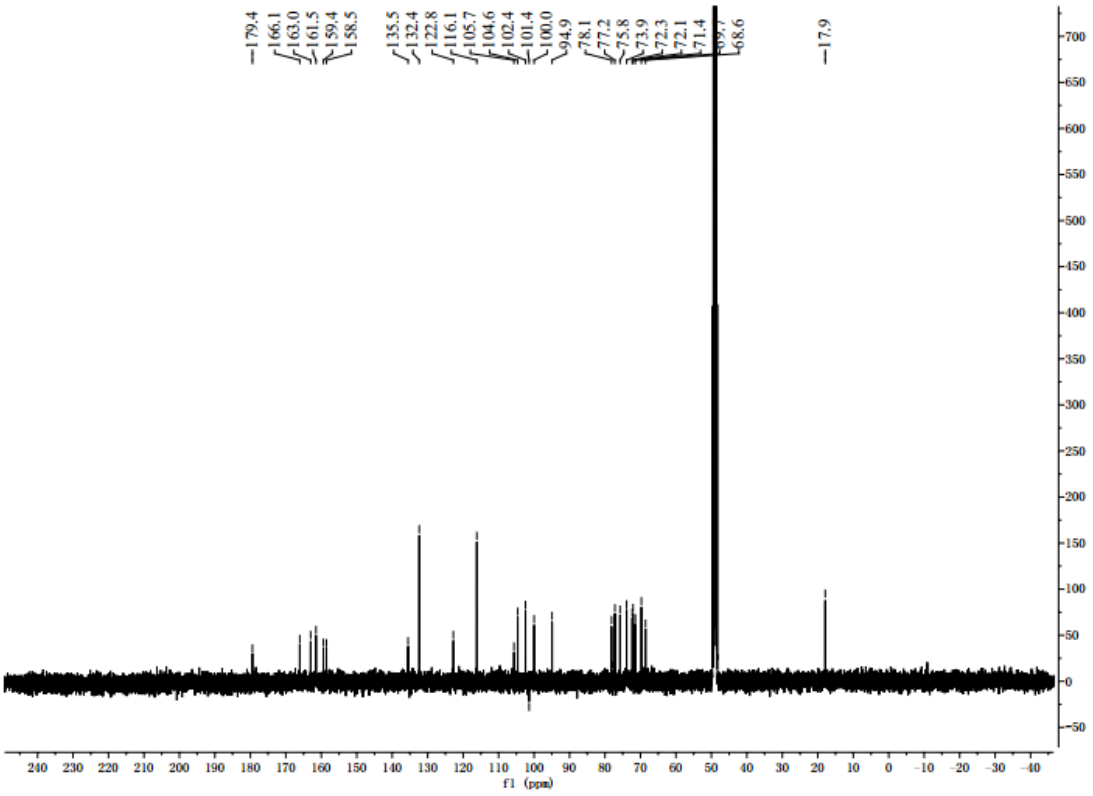

Figure S11. ^{13}C-NMR of Compound 3 (100MHz, CD_3OD)

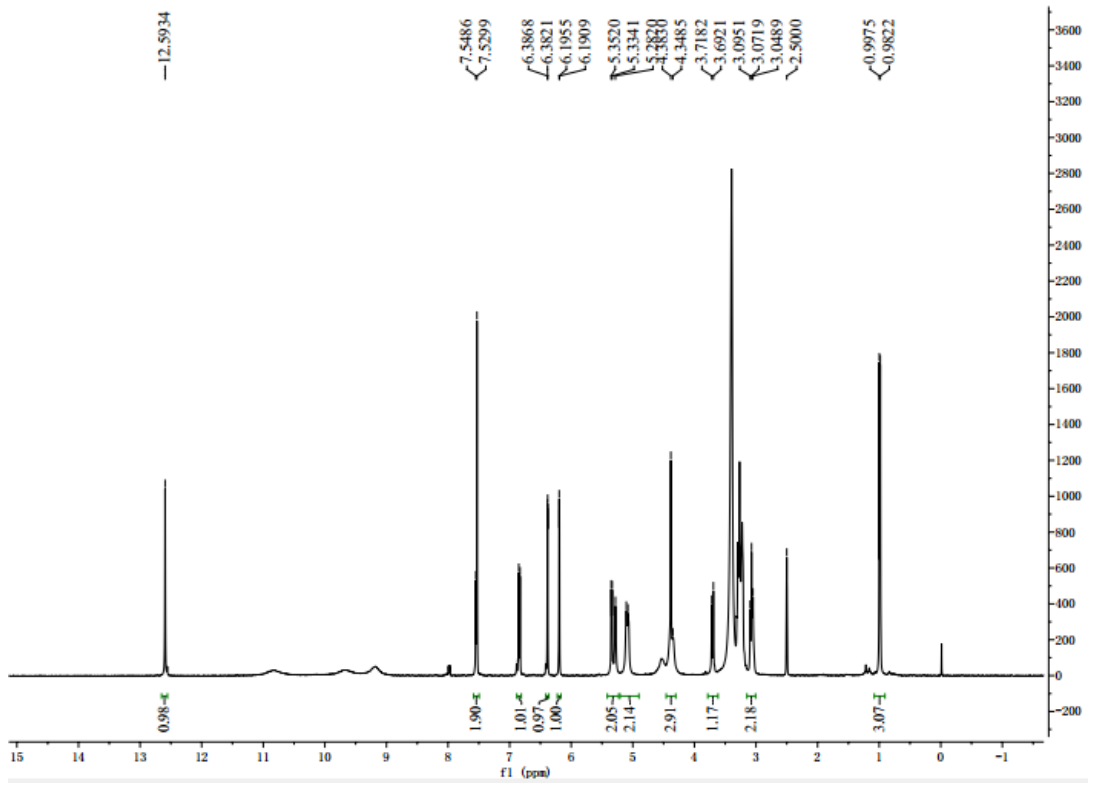

Figure S12. ^{1}H-NMR of Compound 4 (400MHz, DMSO-d_6)

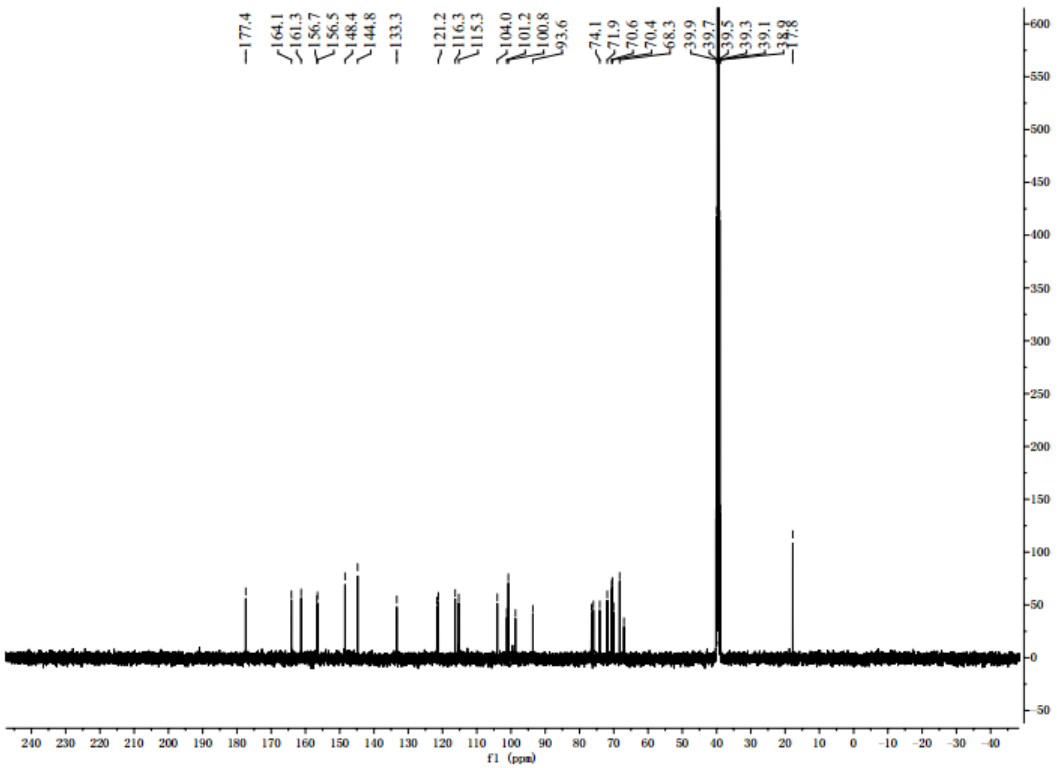

Figure S13. ^{13}C-NMR of Compound 4 (100MHz, DMSO-d_6)

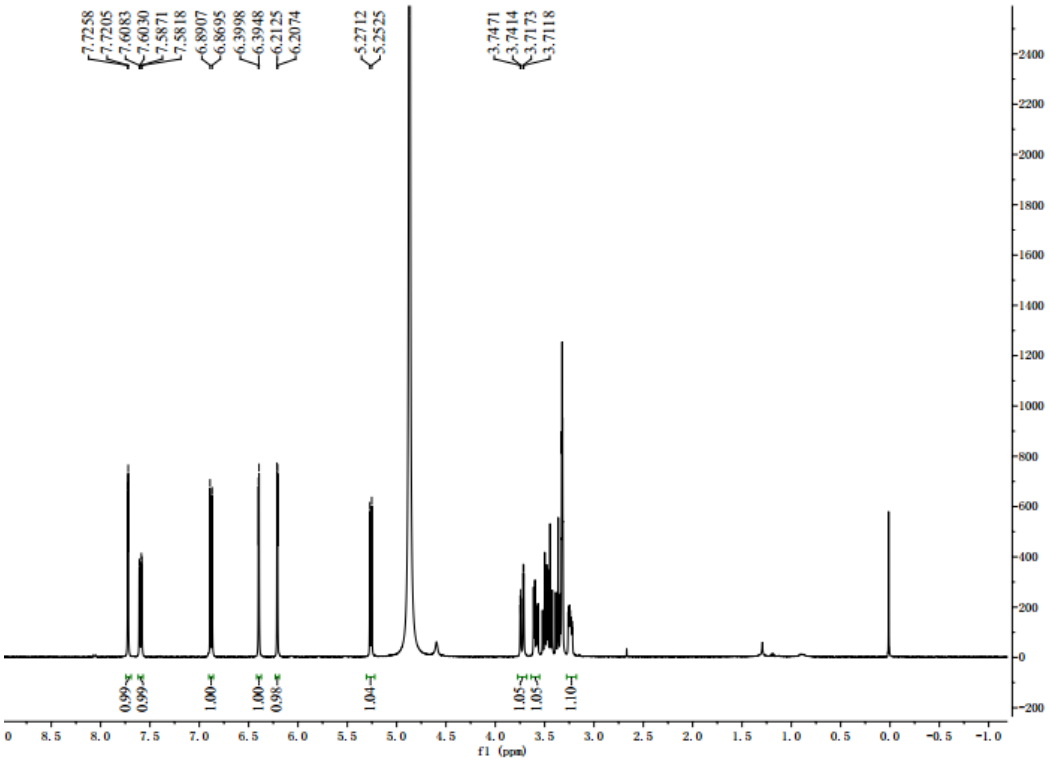

Figure S14. ^{1}H-NMR of Compound 5 (400MHz, CD_3OD)

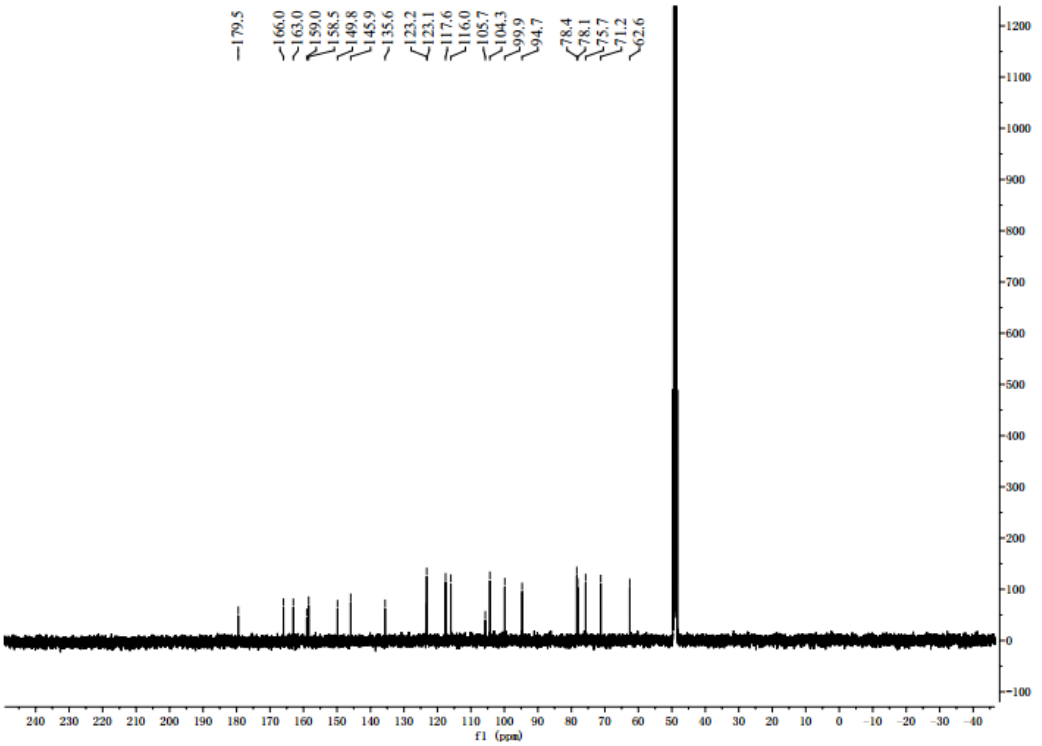

Figure S15. ^{13}C-NMR of Compound 5 (100MHz, CD_3OD)

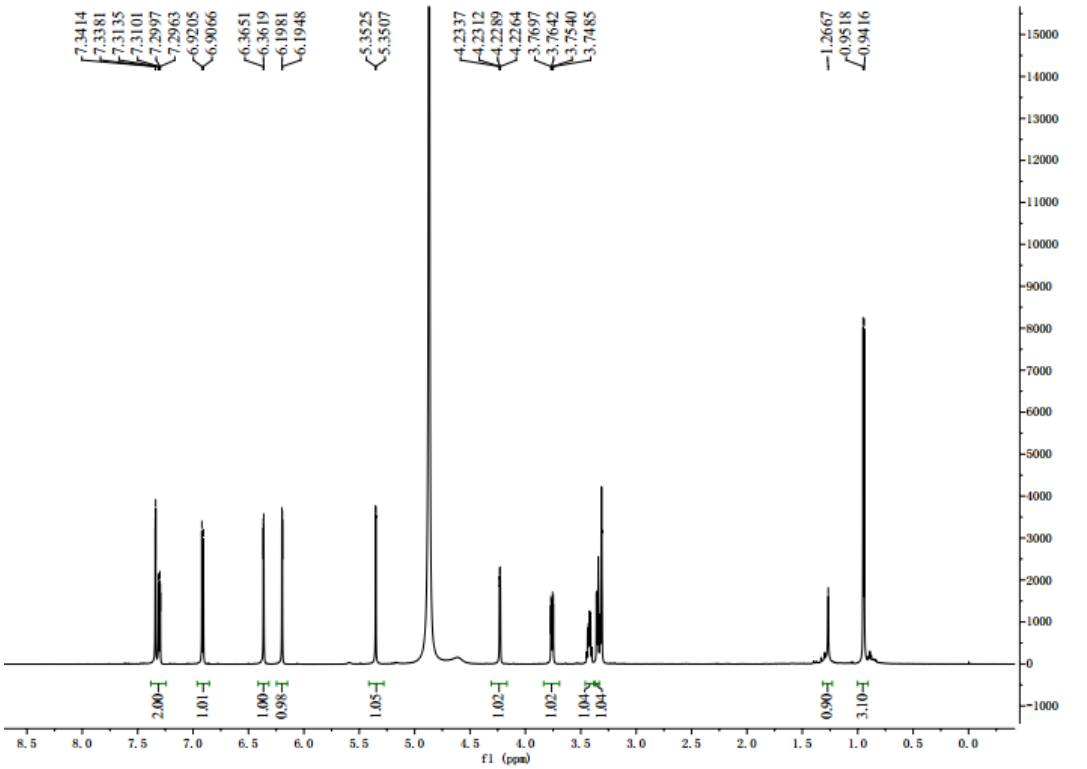

Figure S16. ^{1}H-NMR of Compound 6 (400MHz, CD_3OD)

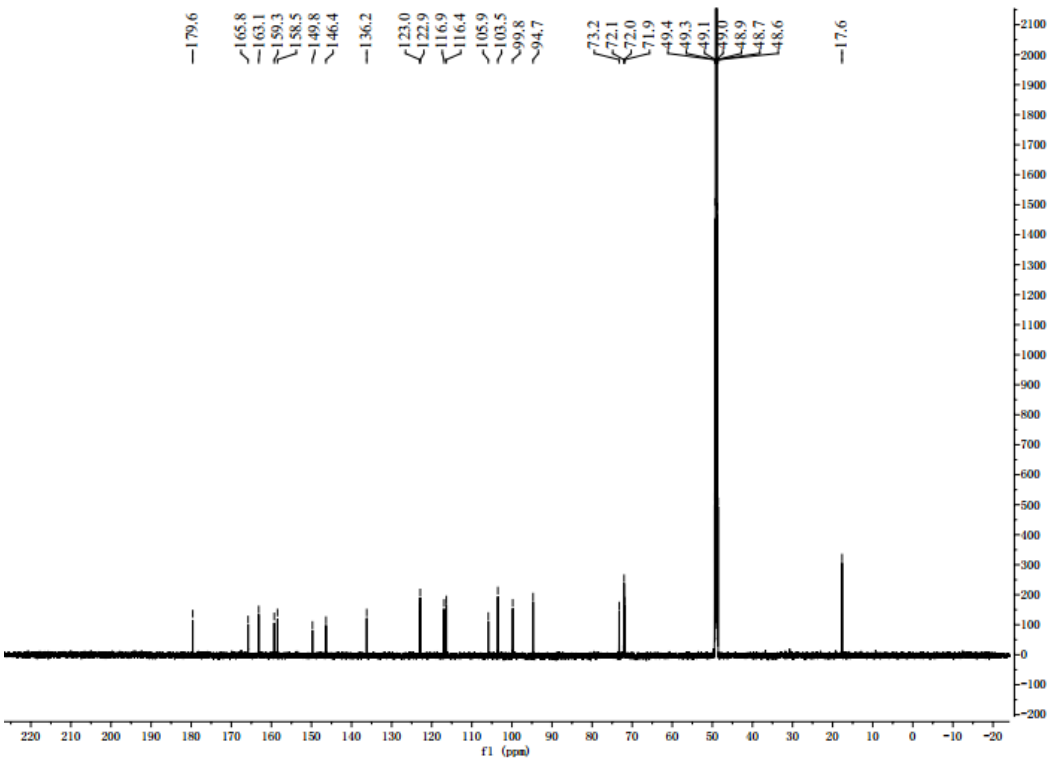

Figure S17. ^{13}C-NMR of Compound 6 (100MHz, CD_3OD)

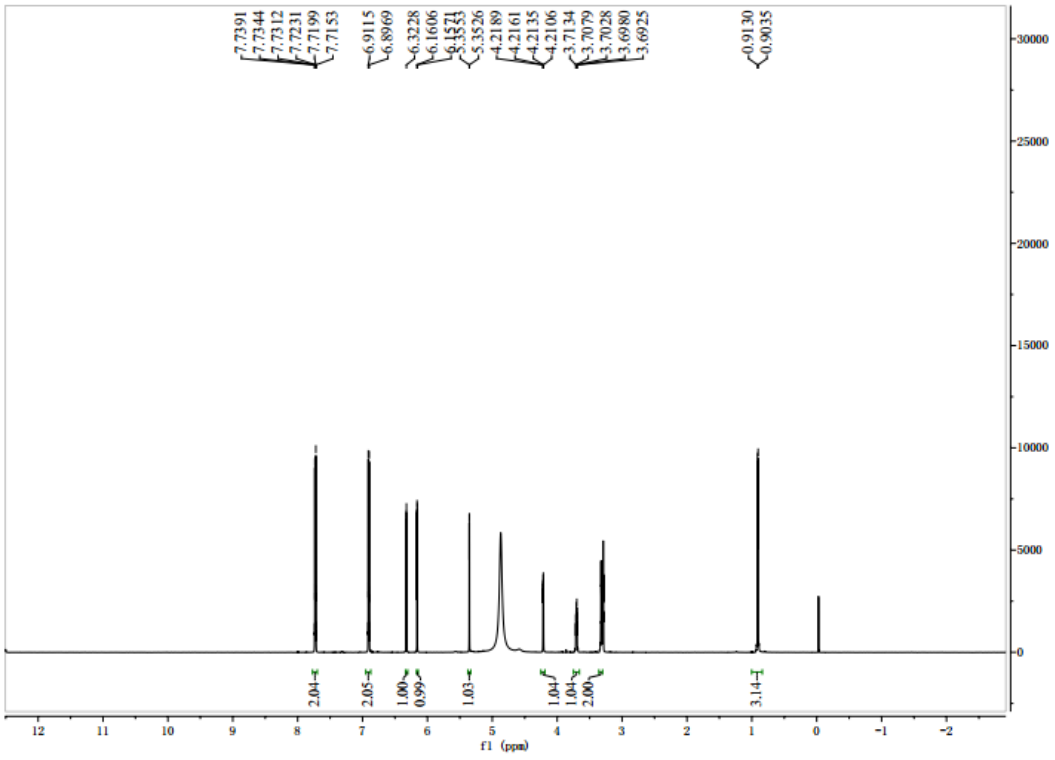

Figure S18. ^{1}H-NMR of Compound 7 (400MHz, CD_3OD)

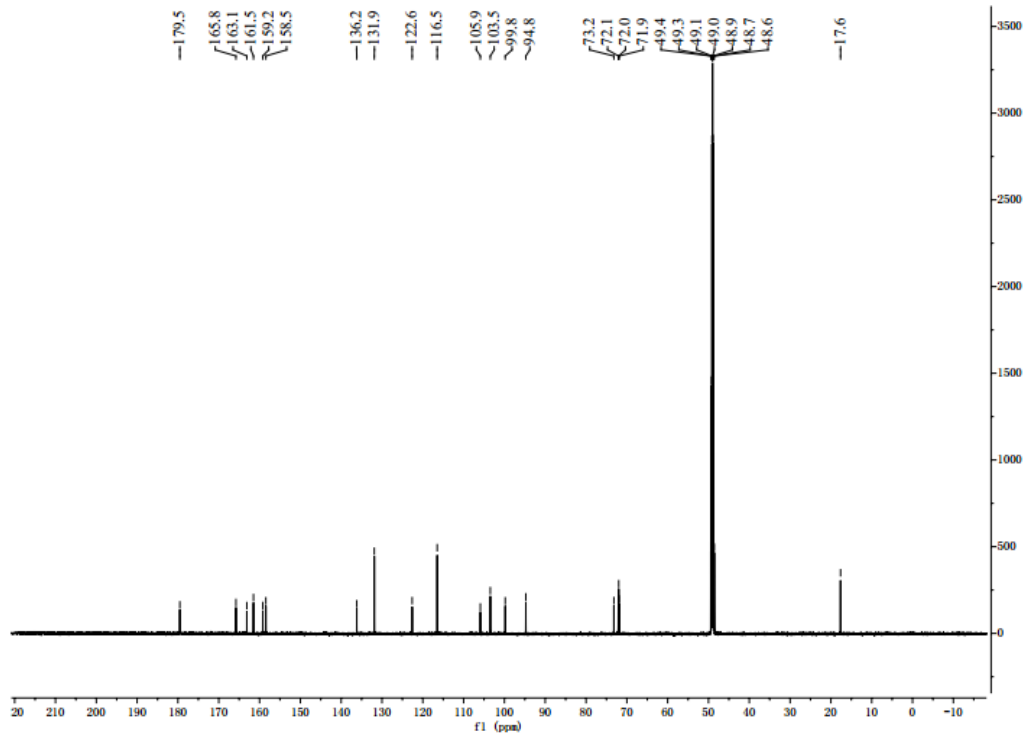

Figure S19. ^{13}C-NMR of Compound 7 (100MHz, CD_3OD)

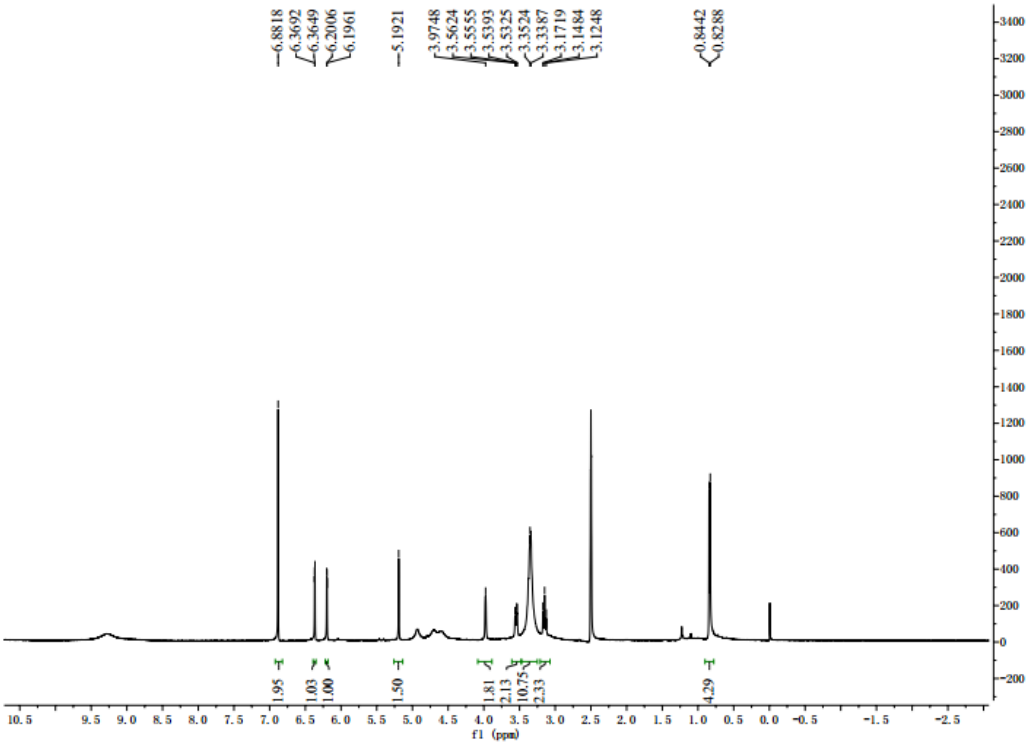

Figure S20. ^{1}H-NMR of Compound 8 (400MHz, DMSO-d_6)

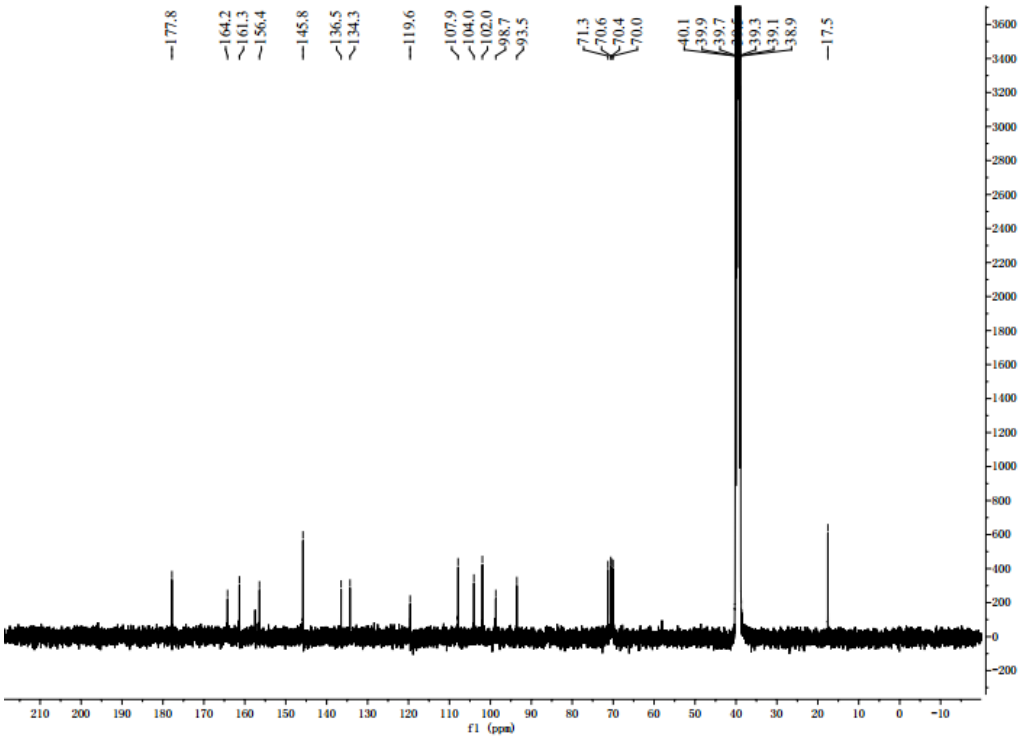

Figure S21. ^{13}C-NMR of Compound 8 (100MHz, DMSO-d_6)

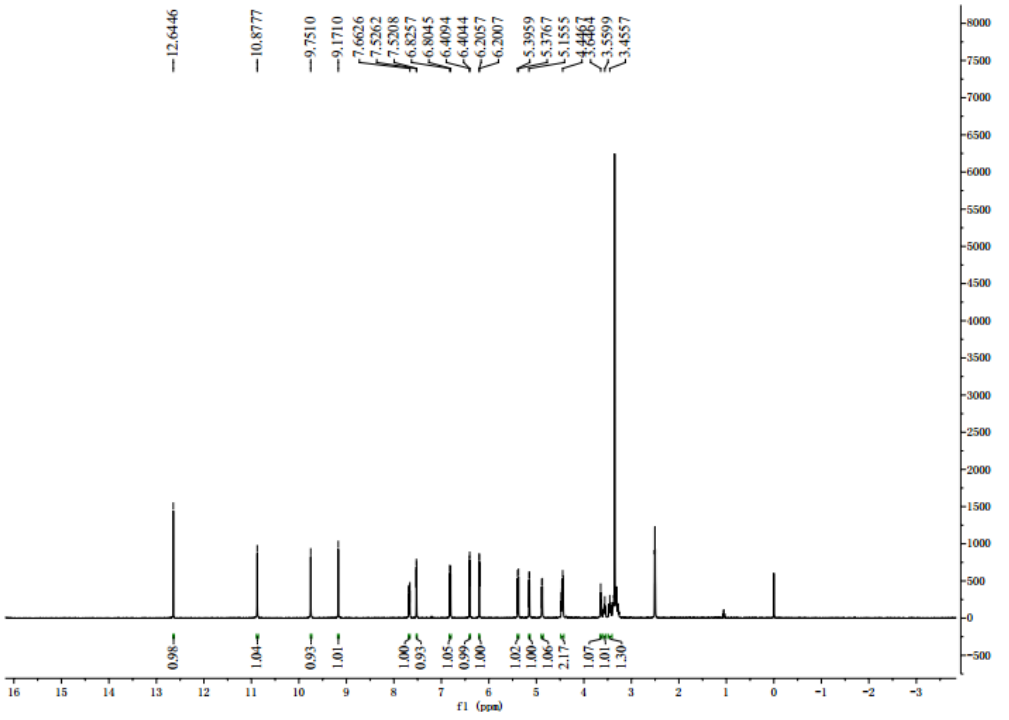

Figure S22. ^{1}H-NMR of Compound 9 (400MHz, DMSO-d_6)

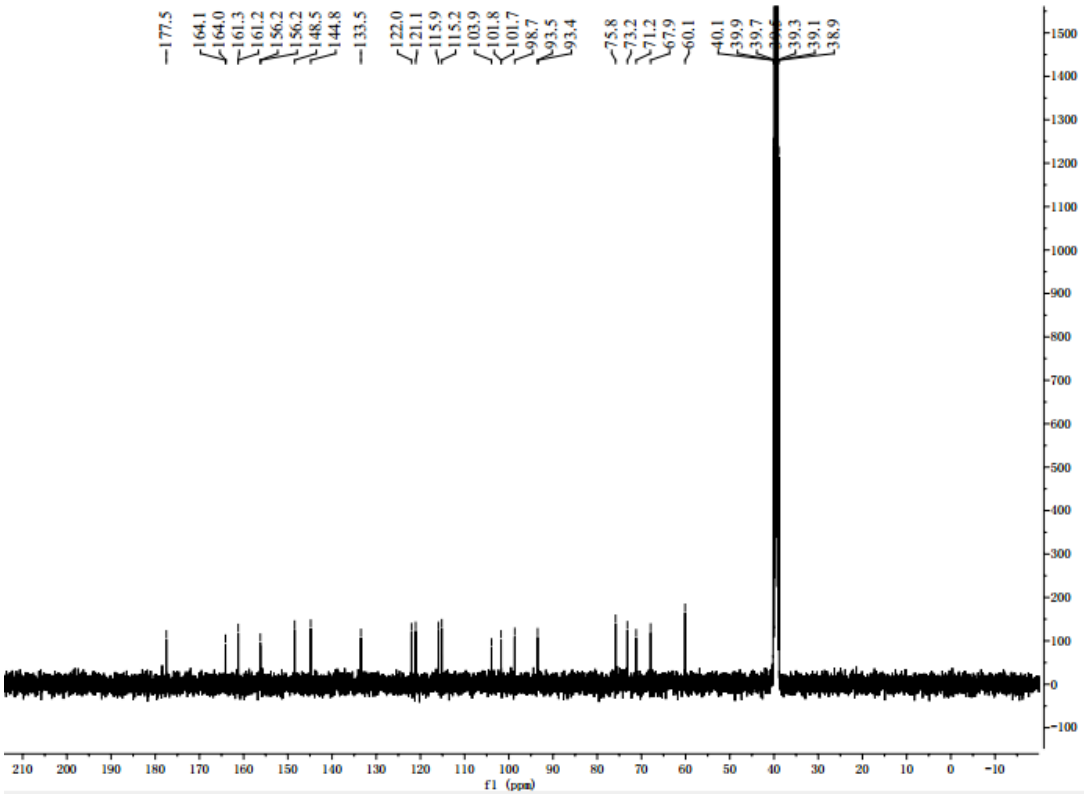

Figure S23. **^{13}C-NMR of Compound 9 (100MHz, DMSO-d_6)**

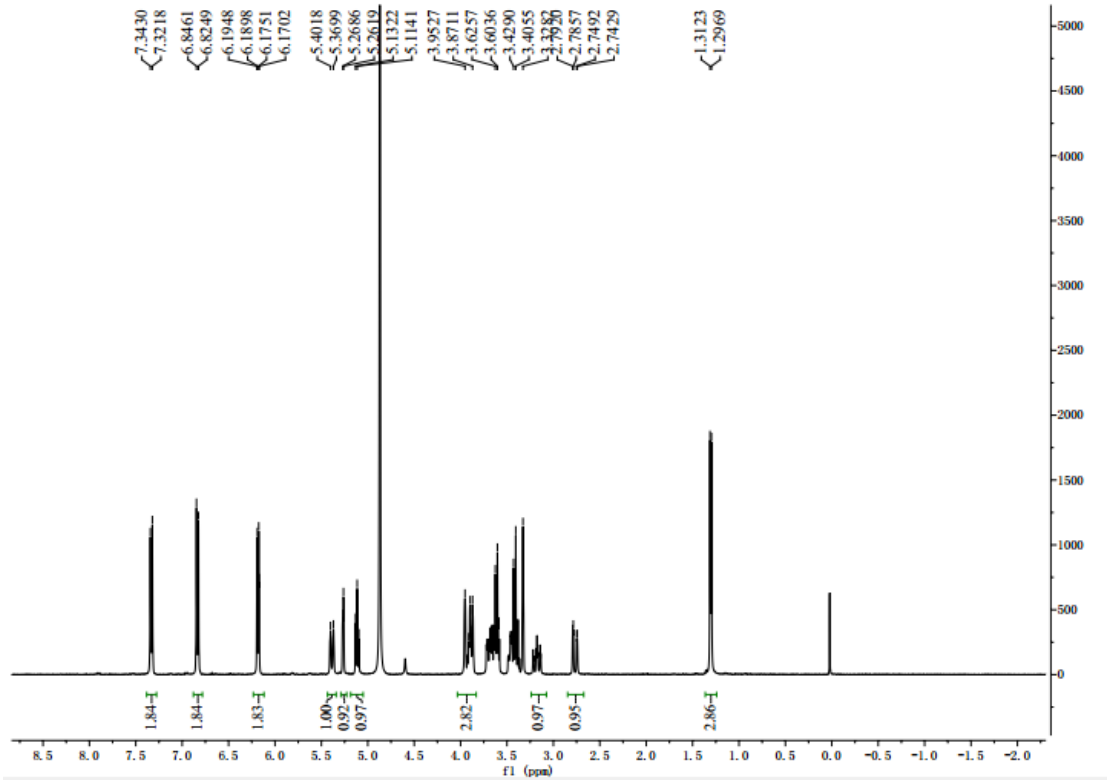

Figure S24. **^{1}H-NMR of Compound 10 (400MHz, CD_3OD)**

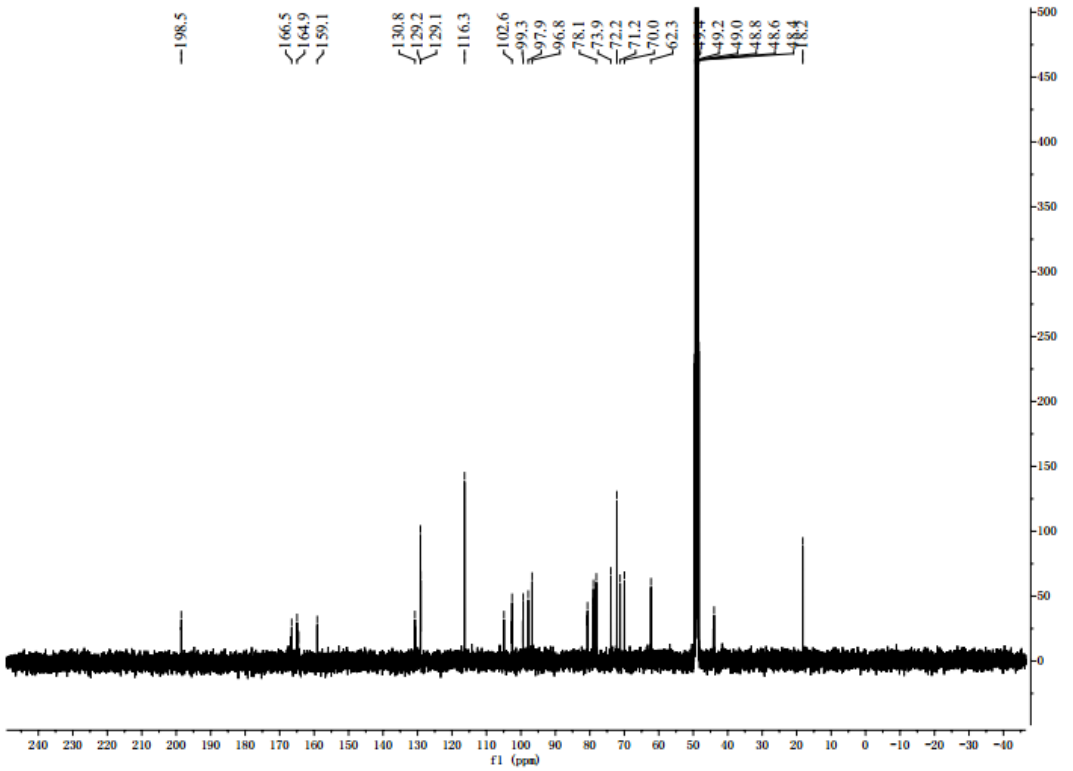

Figure S25. ^{13}C-NMR of Compound 10 (100MHz, CD_3OD)

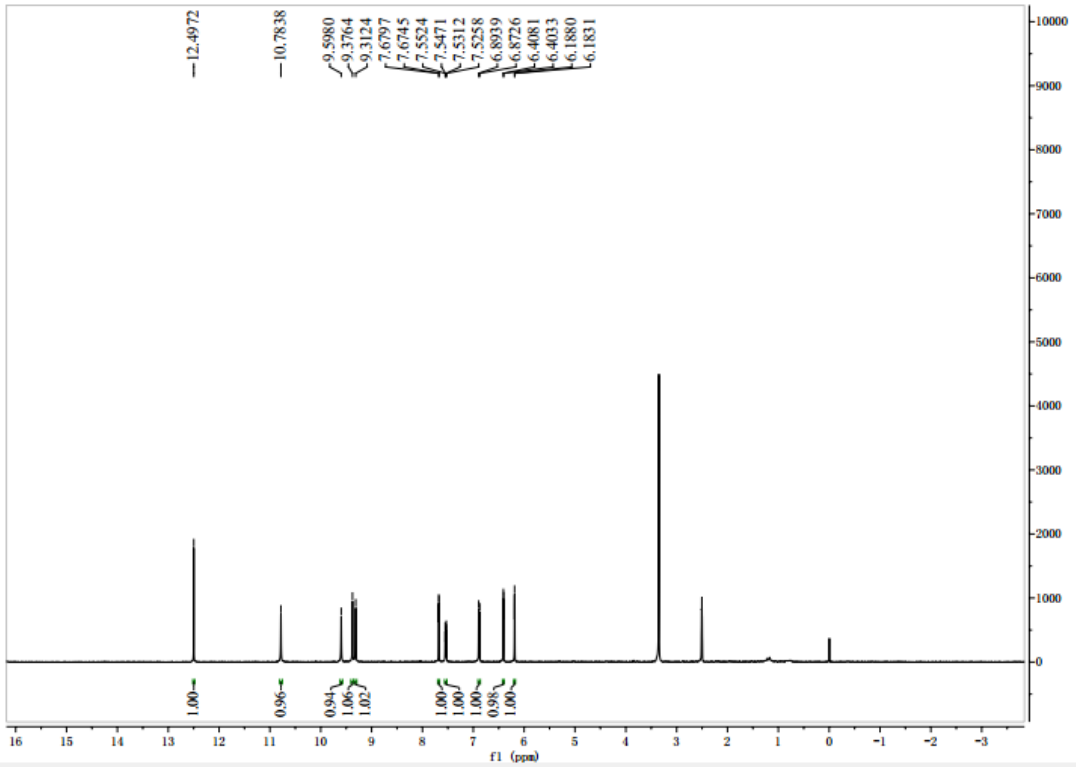

Figure S26. ^{1}H-NMR of Compound 11 (400MHz, DMSO-d_6)

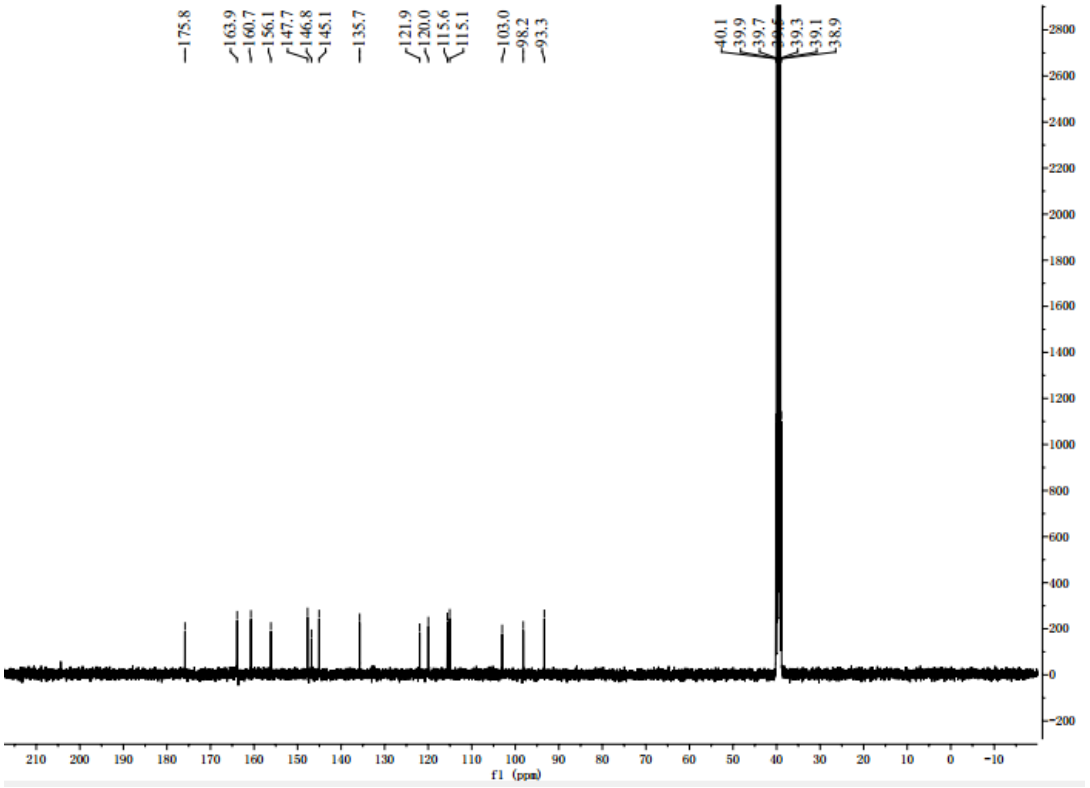

Figure S27. ^{13}C-NMR of Compound 11 (100MHz, DMSO-d_6)

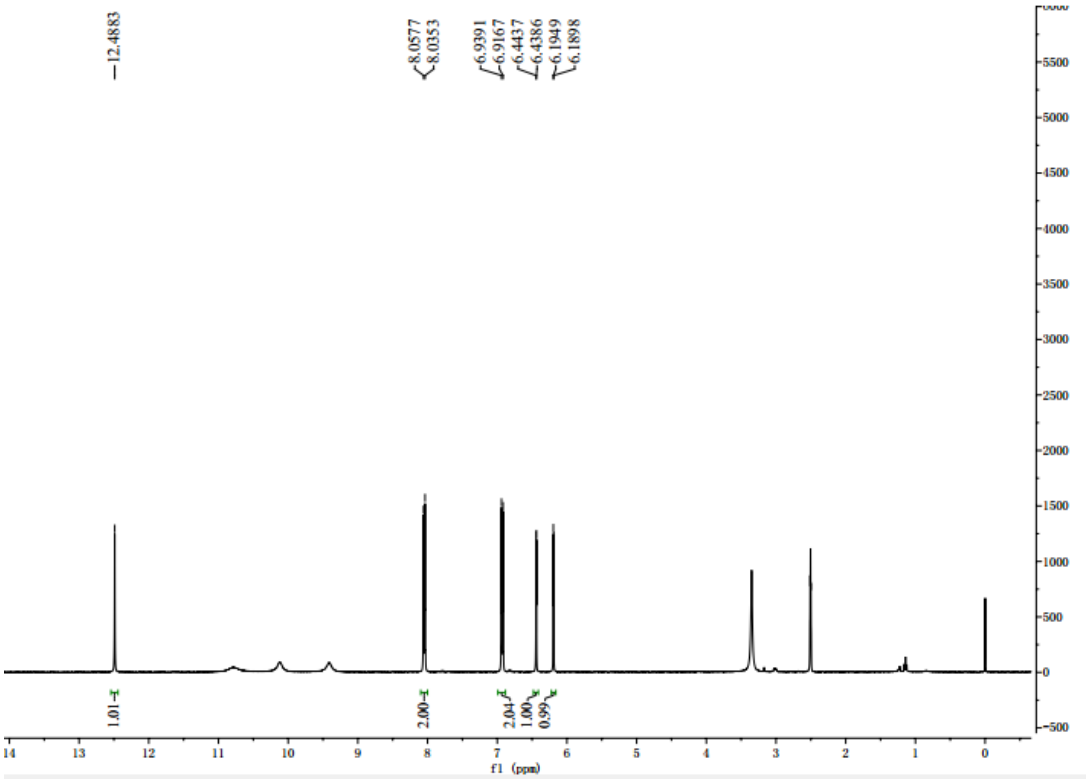

Figure S28. ^{1}H-NMR of Compound 12 (400MHz, DMSO-d_6)

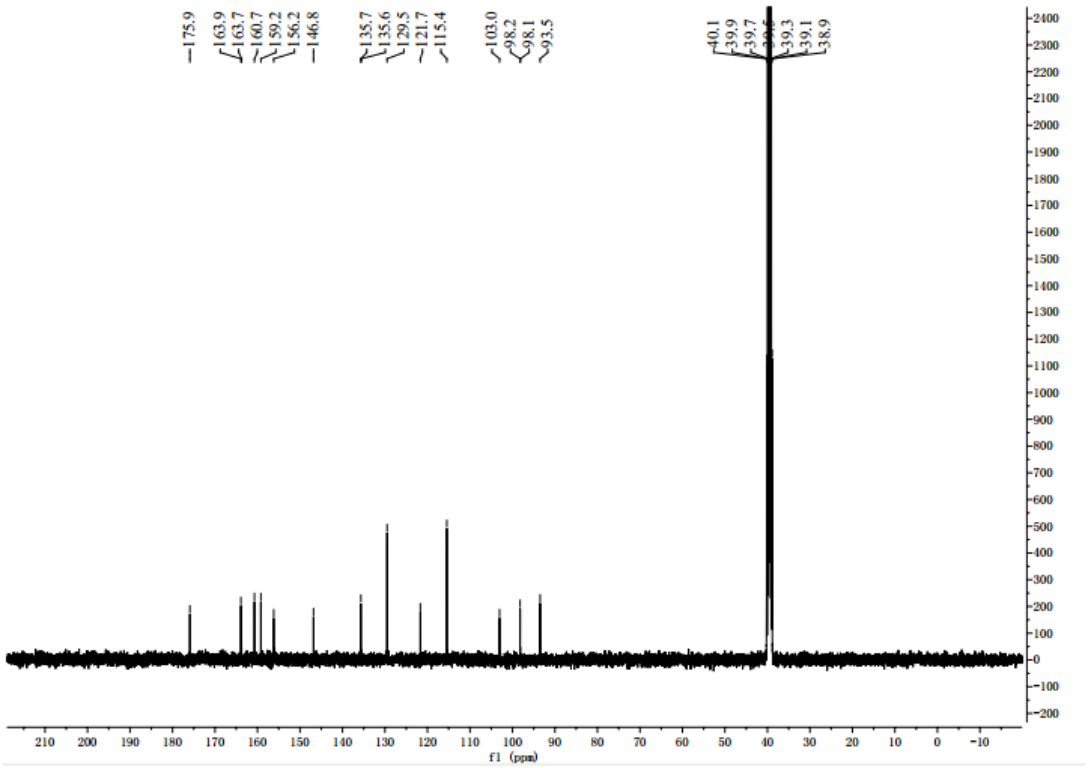

Figure S29. ^{13}C-NMR of Compound 12 (100MHz, DMSO-d_6)

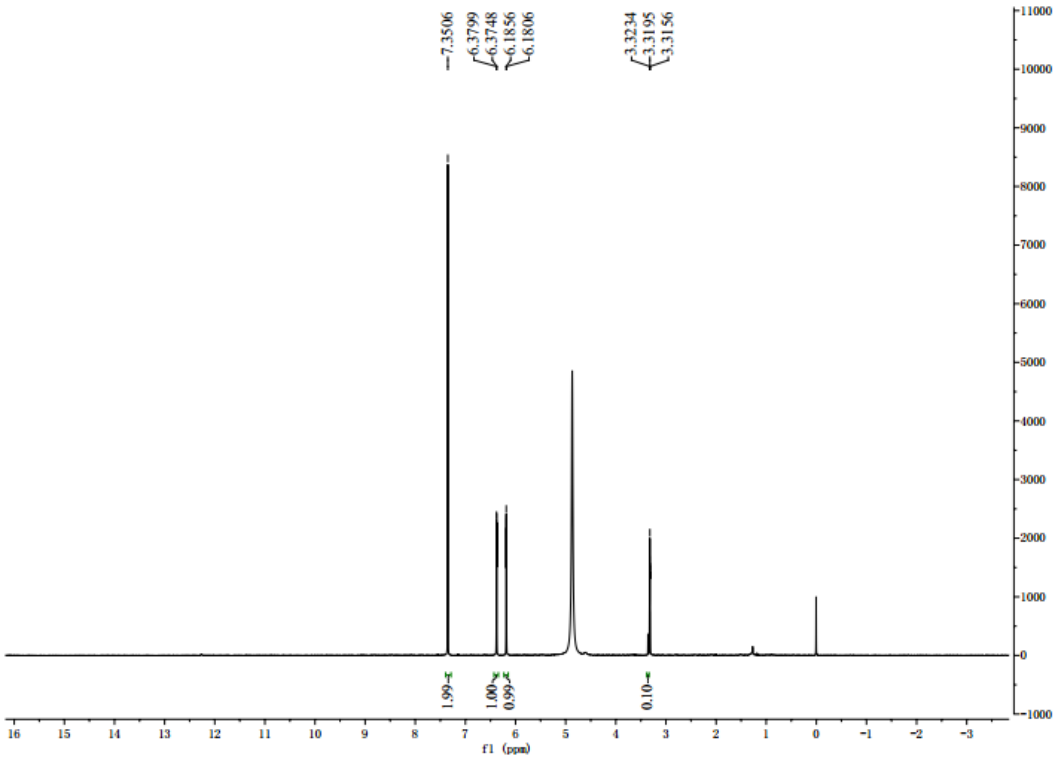

Figure S30. ^{1}H-NMR of Compound 13 (400MHz, CD_3OD)

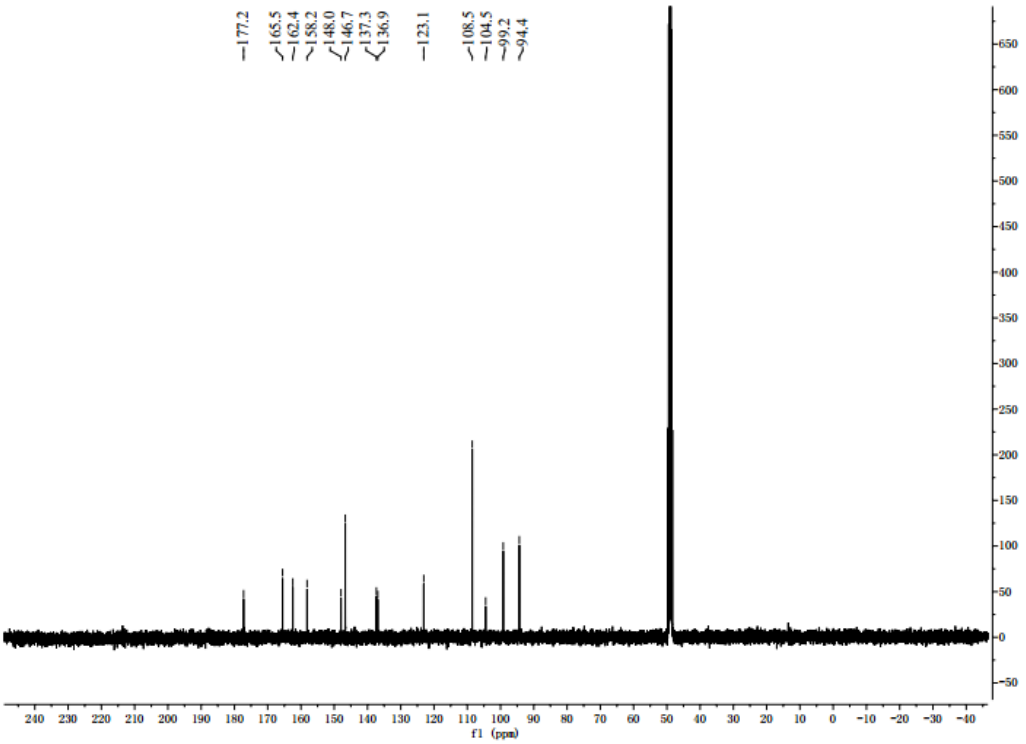

Figure S31. **^{13}C-NMR of Compound 13 (100MHz, CD_3OD)**

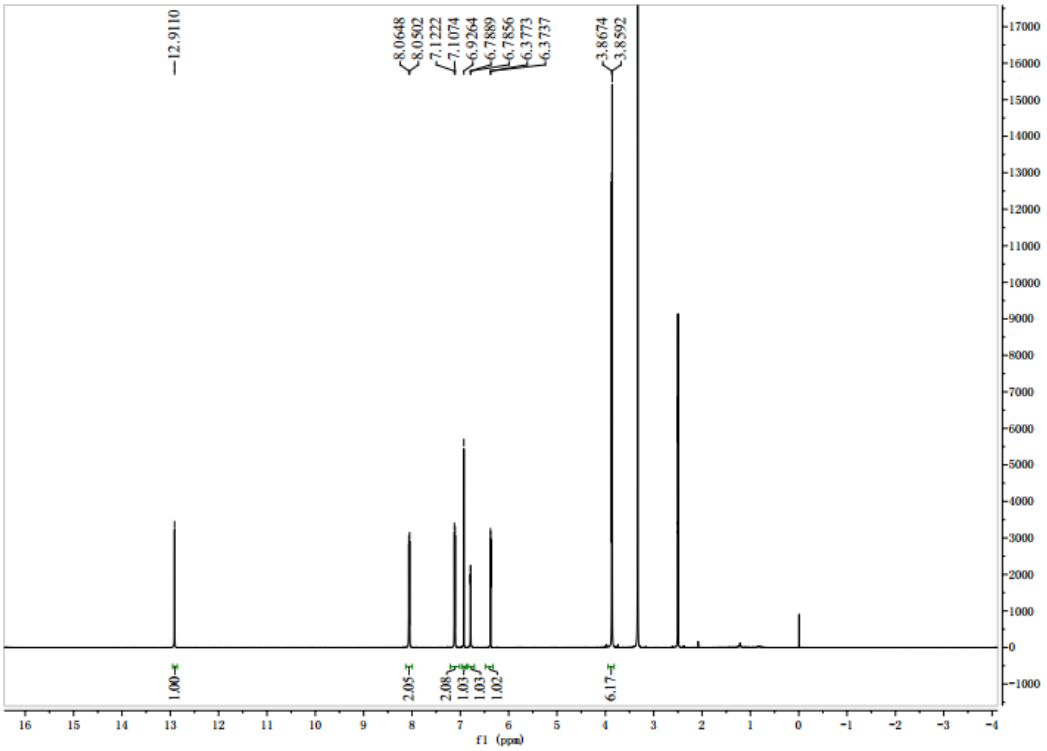

Figure S32. **^{1}H-NMR of Compound 14 (400MHz, DMSO-d_6)**

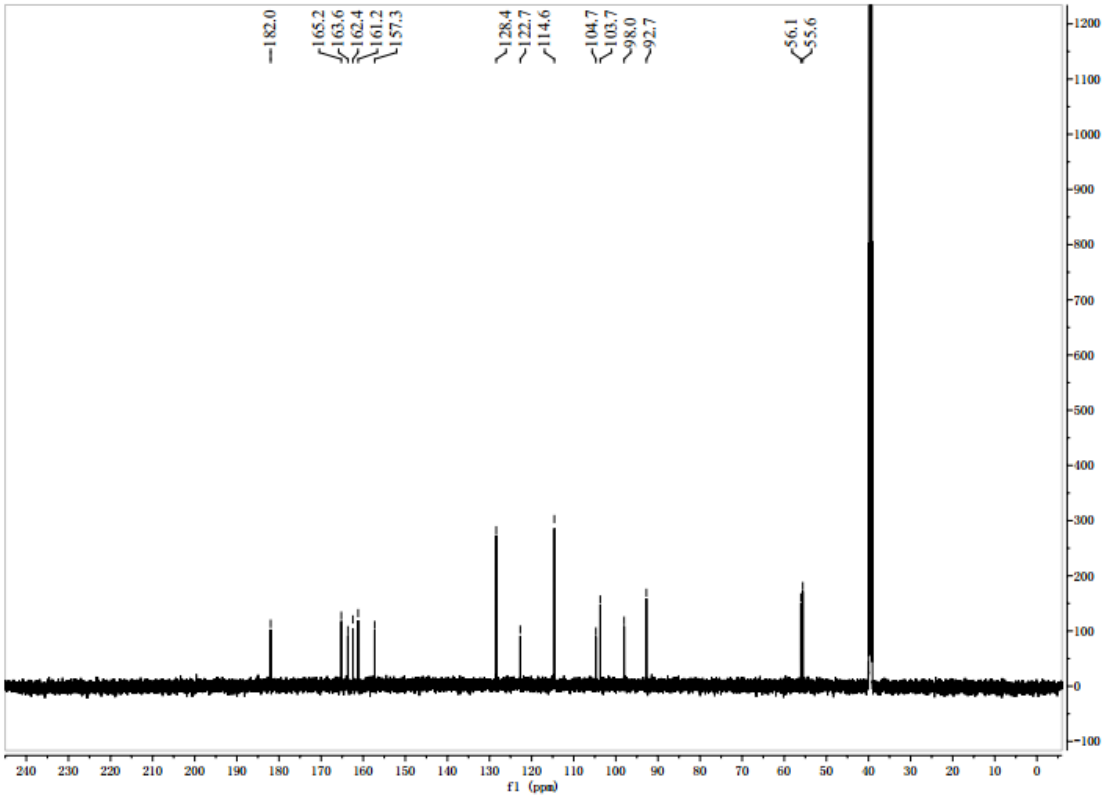

Figure S33. ^{13}C-NMR of Compound 14 (100MHz, DMSO-d_6)

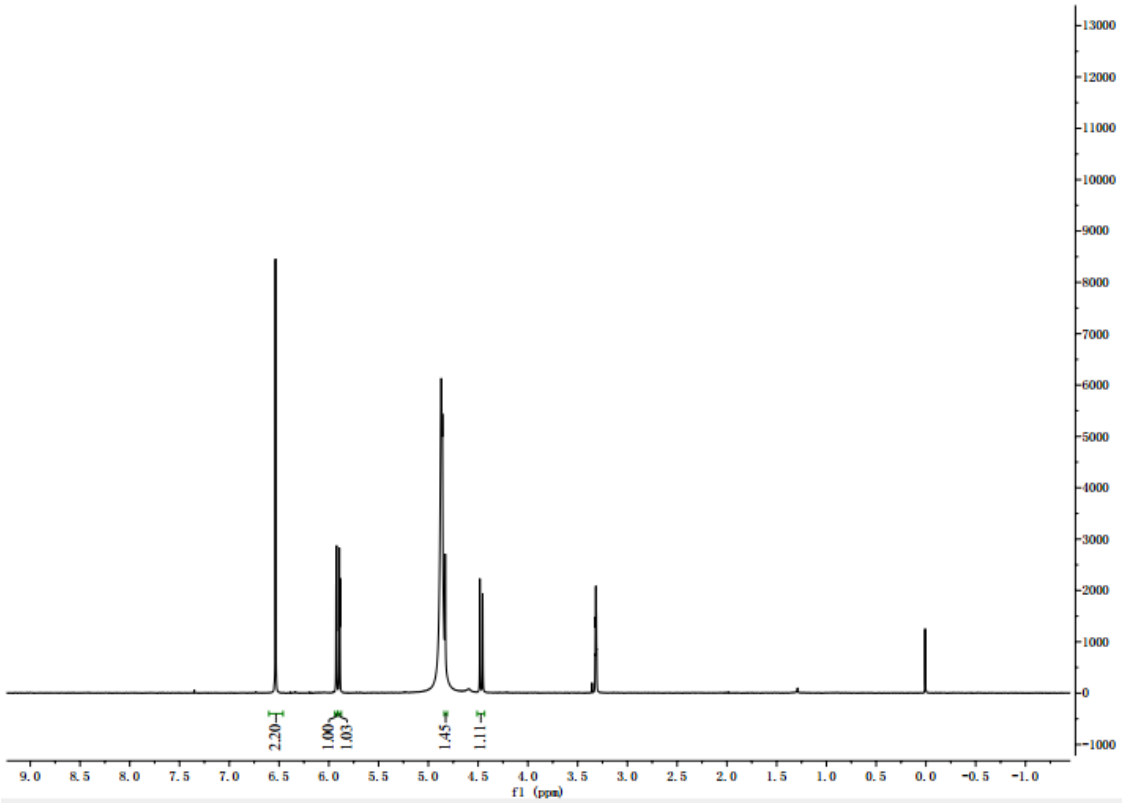

Figure S34. ^{1}H-NMR of Compound 15 (400MHz, CD_3OD)

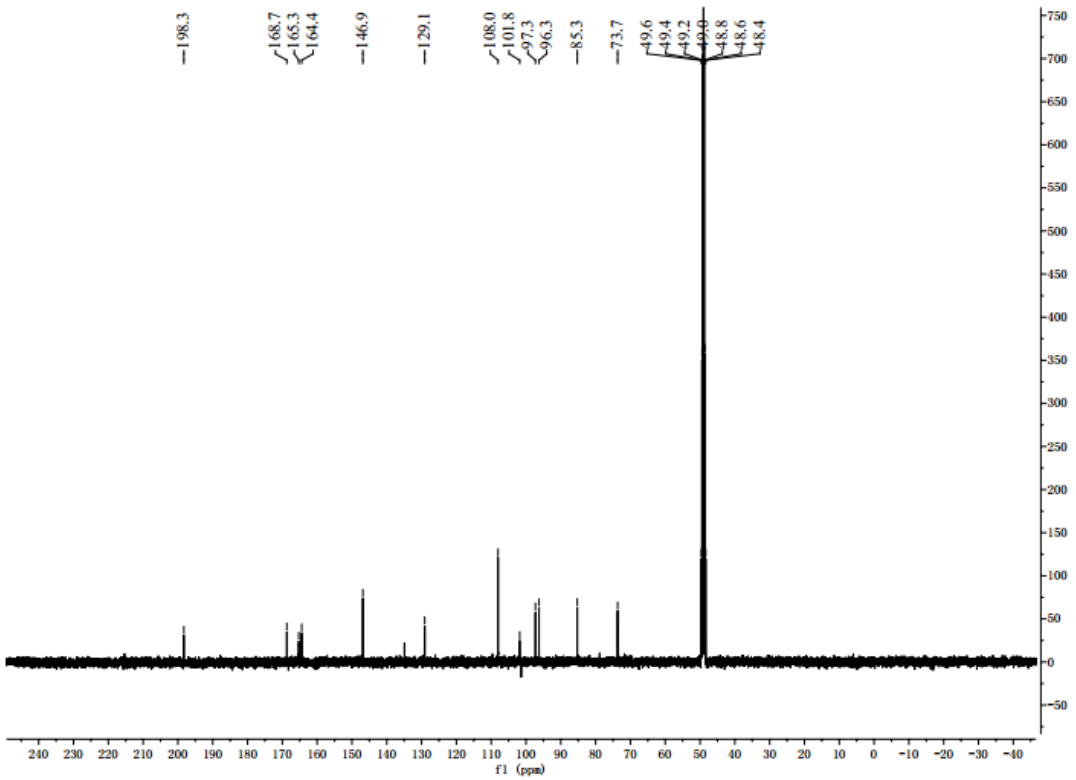

Figure S35. ^{13}C-NMR of Compound 15 (100MHz, CD_3OD)

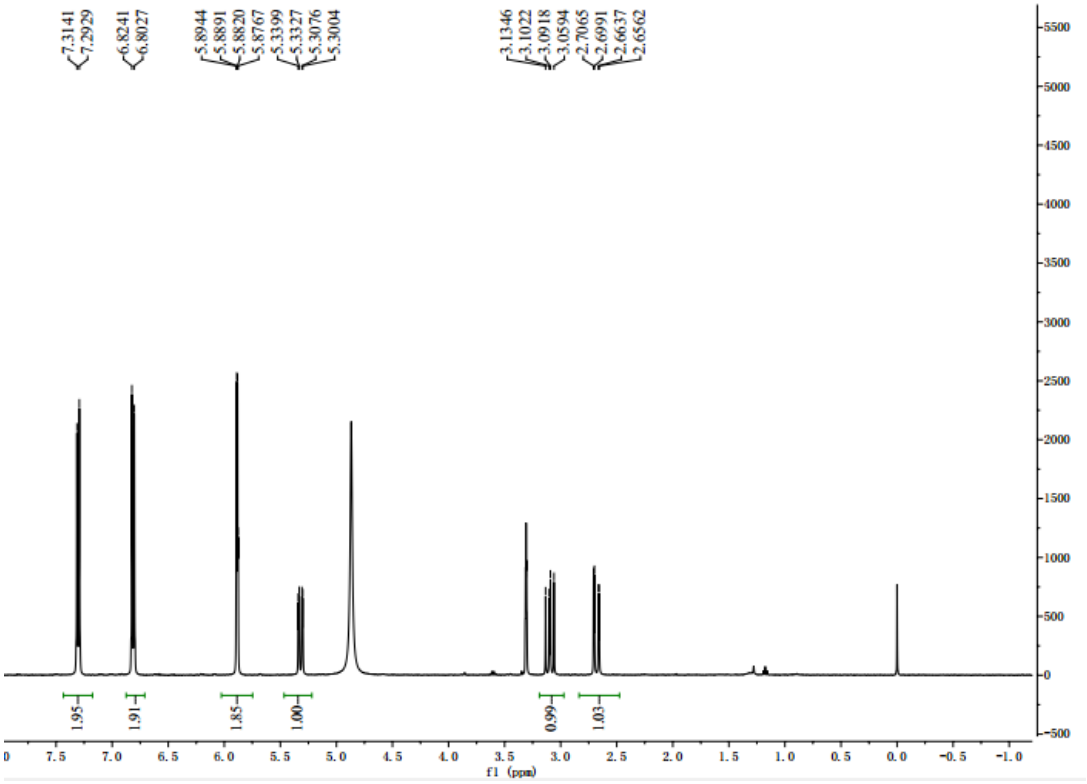

Figure S36. ^{1}H-NMR of Compound 16 (400MHz, CD_3OD)

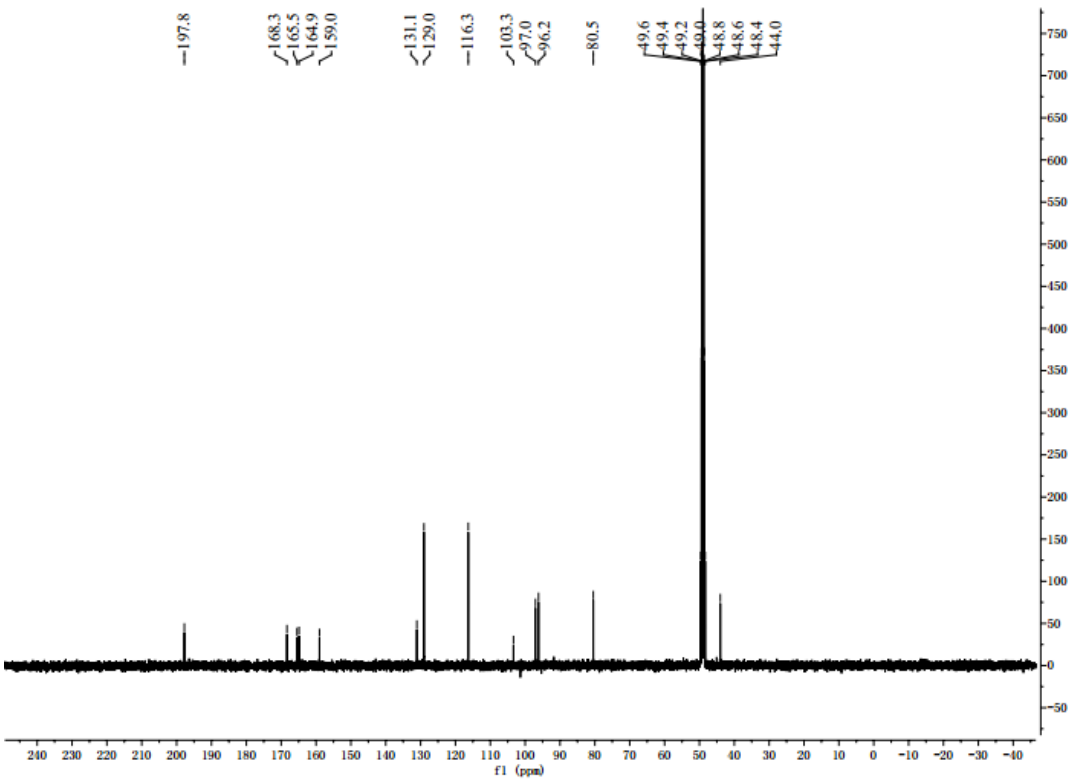

Figure S37. ^{13}C-NMR of Compound 16 (100MHz, CD_3OD)

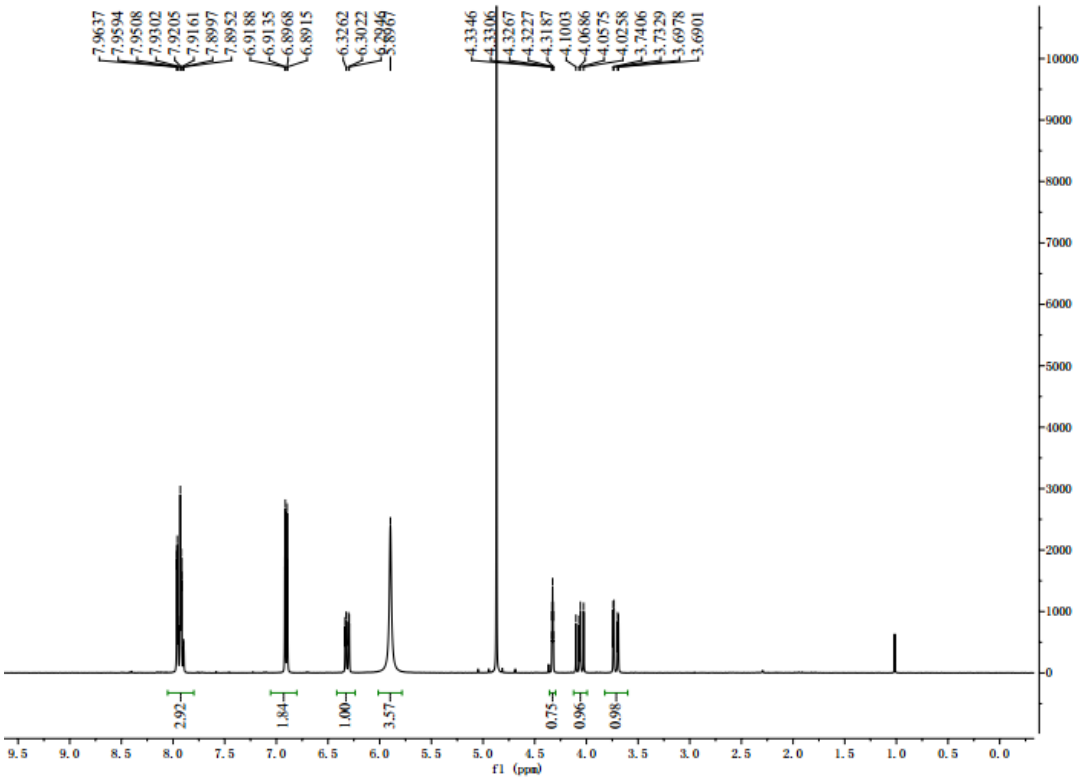

Figure S38. ^{1}H-NMR of Compound 17 (400MHz, CD_3OD)

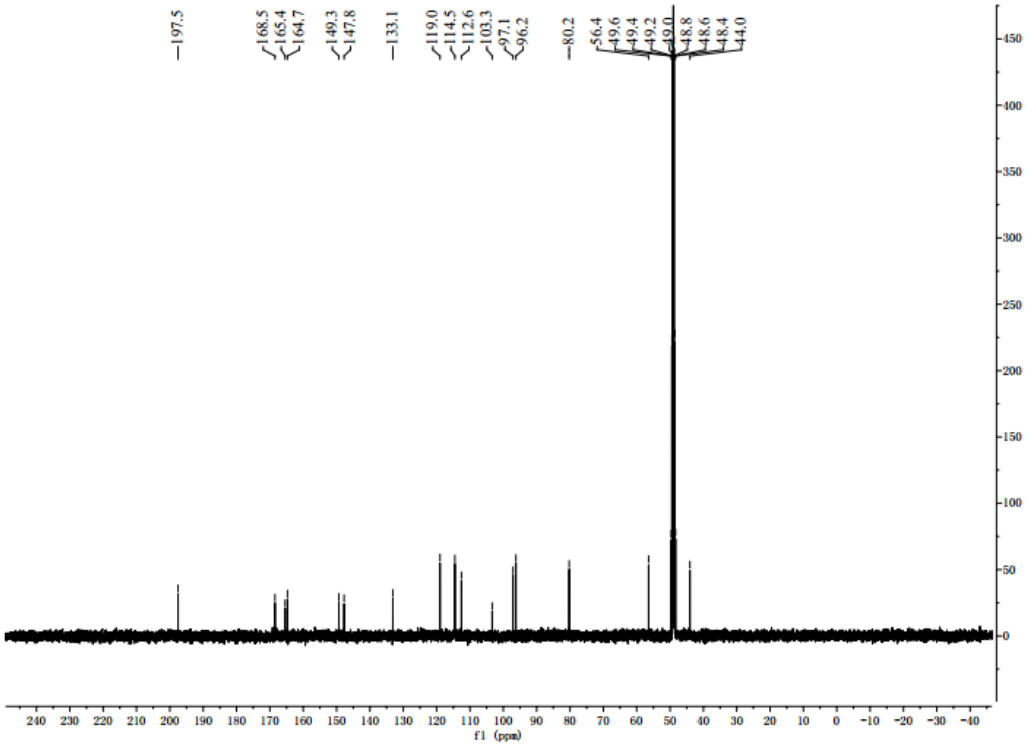

Figure S39. ^{13}C-NMR of Compound 17 (100MHz, CD_3OD)

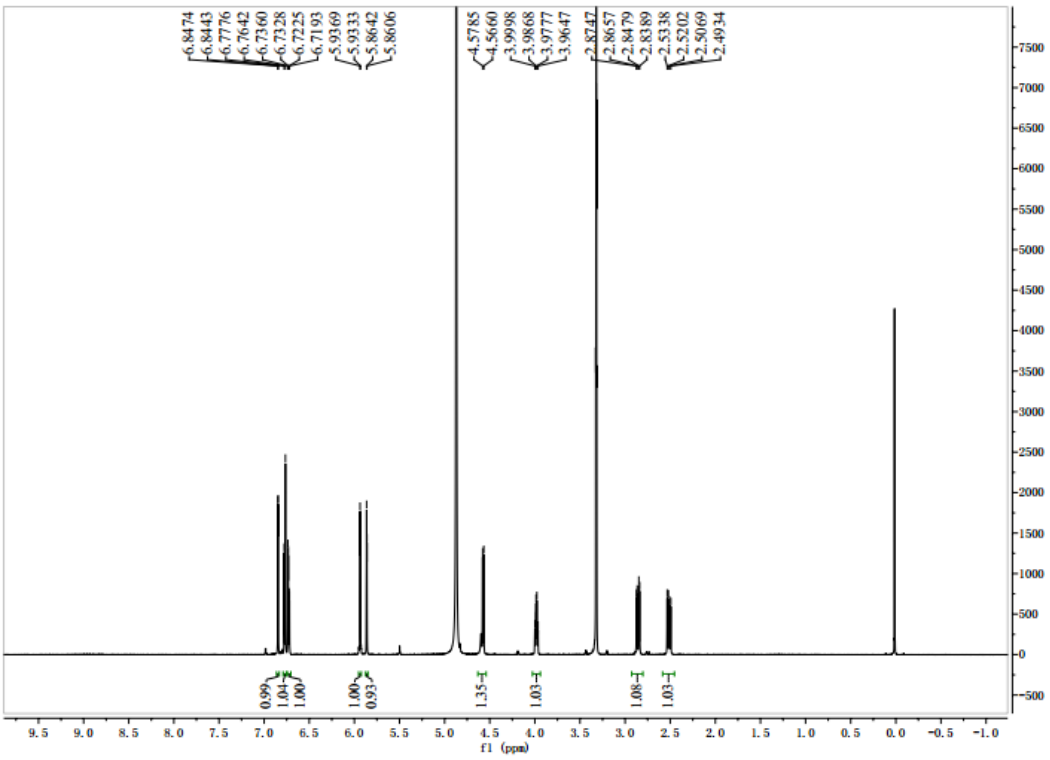

Figure S40. ^{1}H-NMR of Compound 18 (400MHz, CD_3OD)

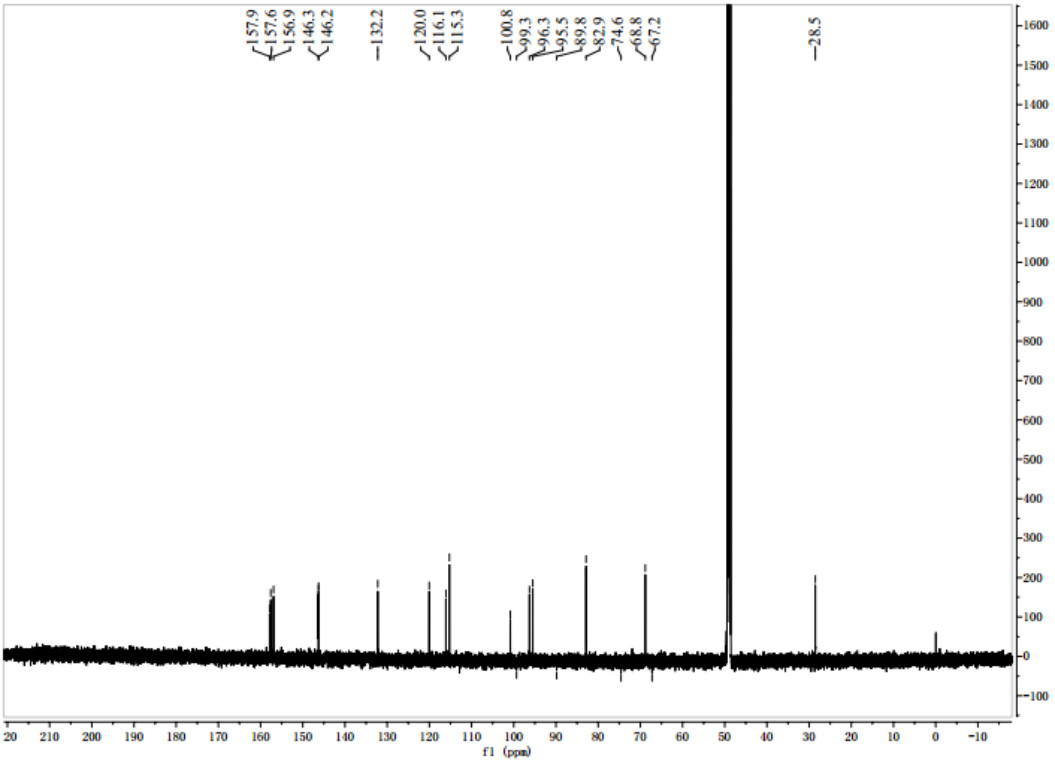

Figure S41. ^{13}C-NMR of Compound 18 (100MHz, CD_3OD)

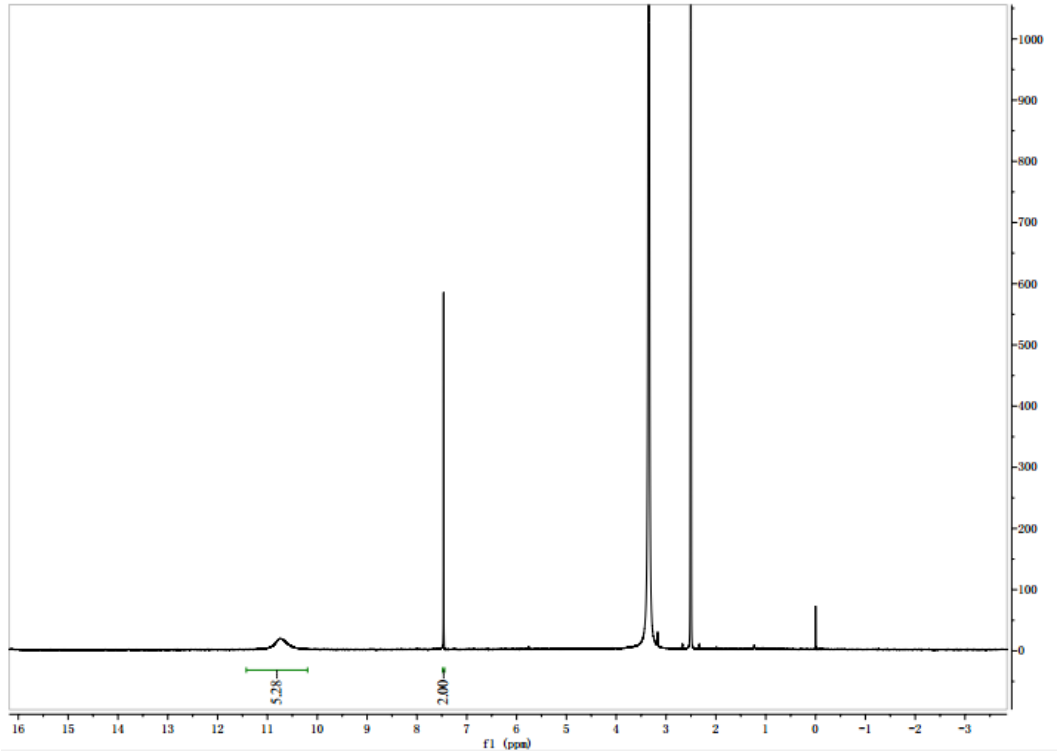

Figure S42. ^{1}H-NMR of Compound 19 (400MHz, DMSO-d_6)

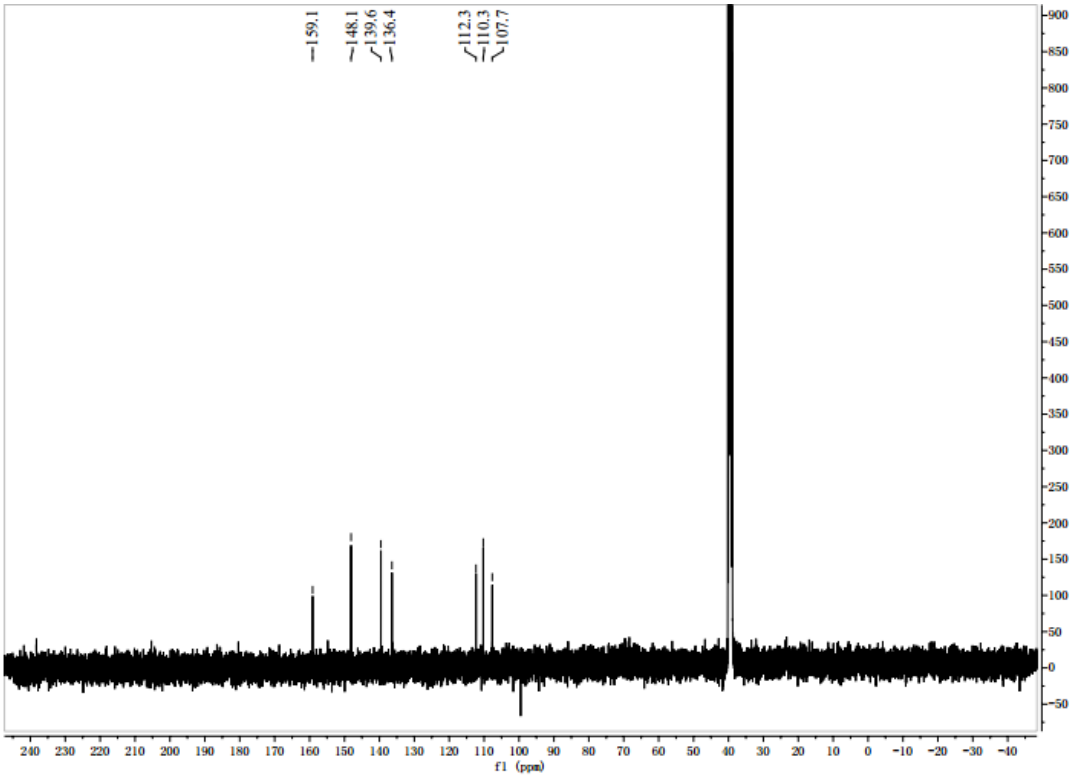

Figure S43. ^{13}C-NMR of Compound 19 (100MHz, DMSO-d_6)

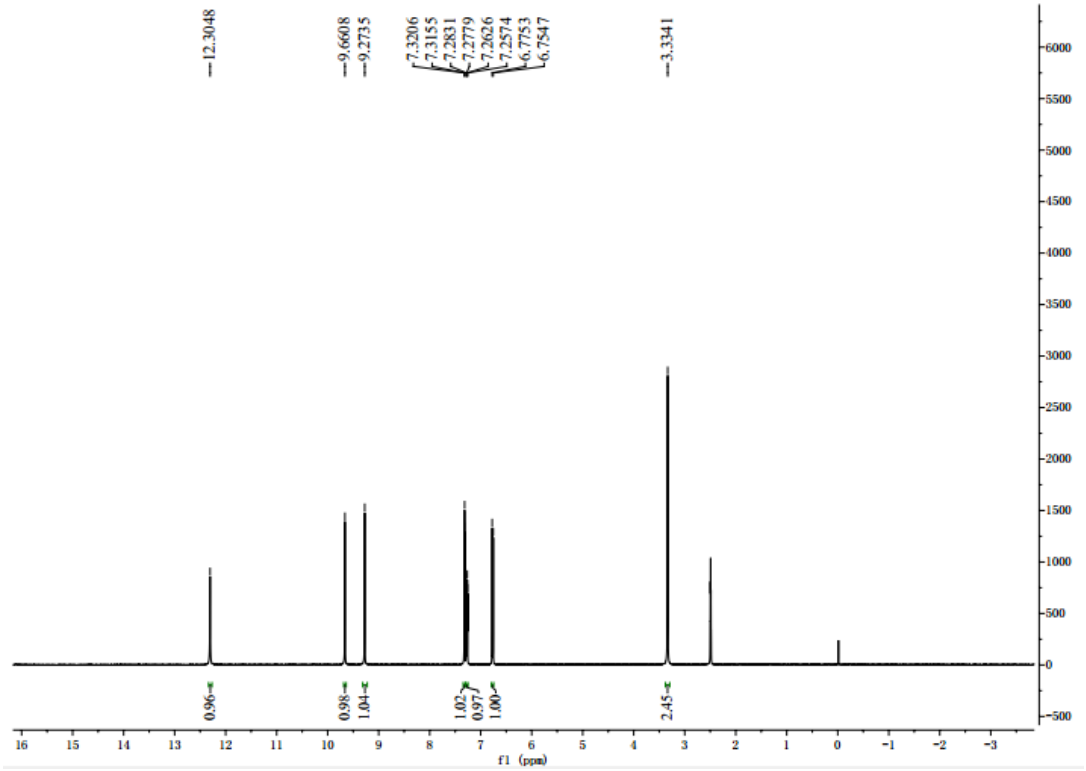

Figure S44. ^{1}H-NMR of Compound 20 (400MHz, DMSO-d_6)

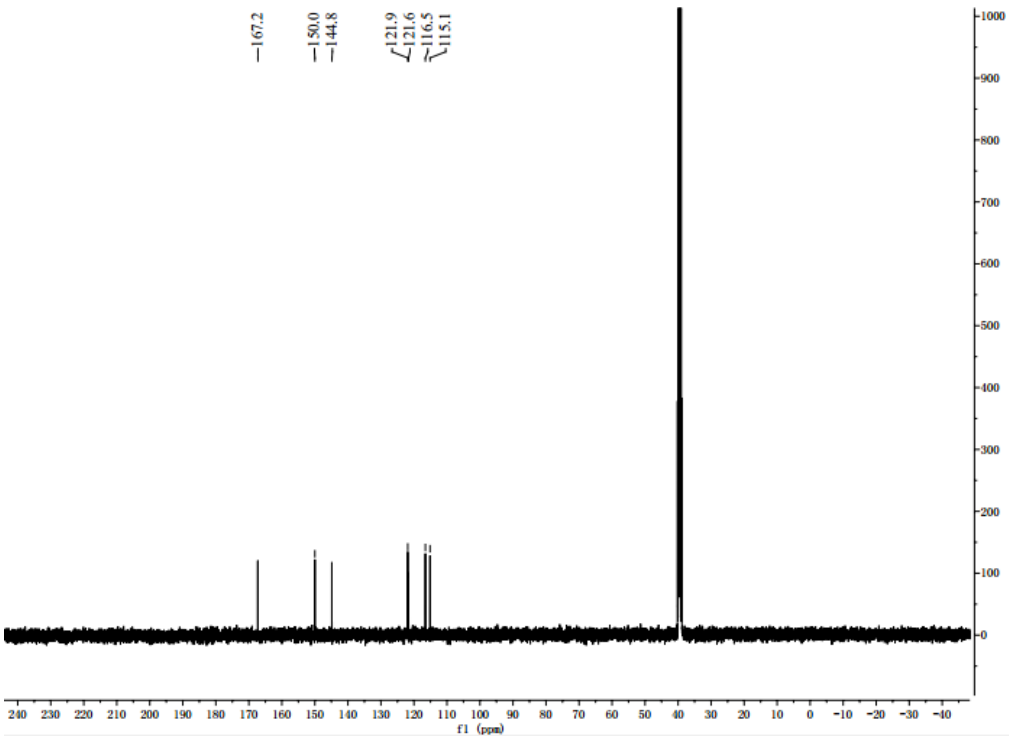

Figure S45. ^{13}C-NMR of Compound 20 (100MHz, DMSO-d_6)

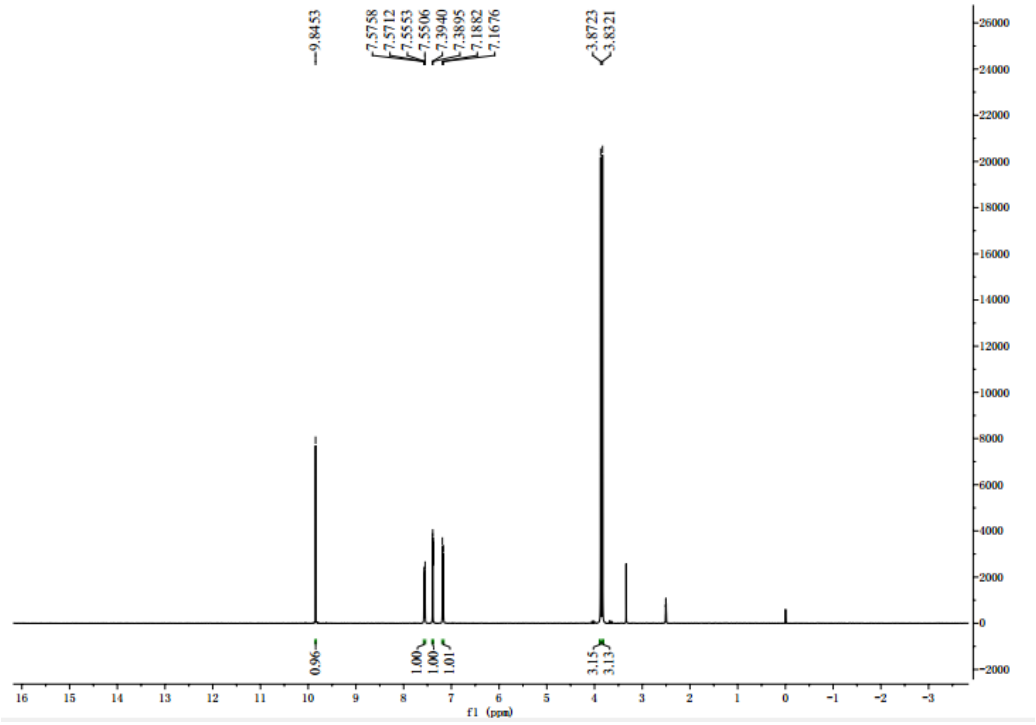

Figure S46. ^{1}H-NMR of Compound 21 (400MHz, DMSO-d_6)

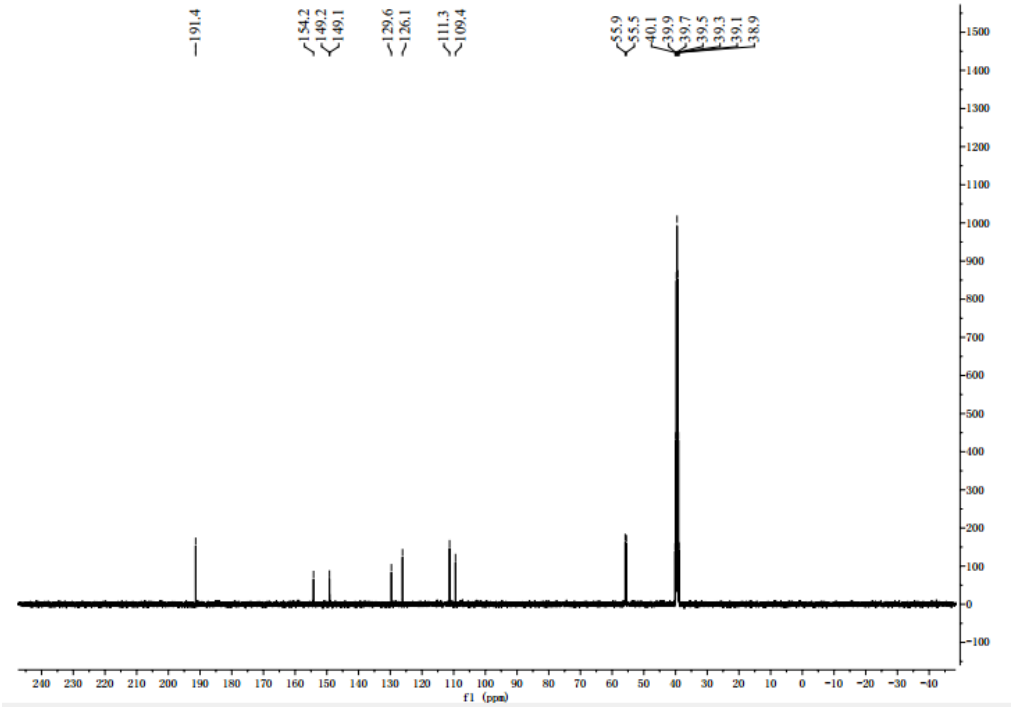

Figure S47. ^{13}C-NMR of Compound 21 (100MHz, DMSO-d_6)

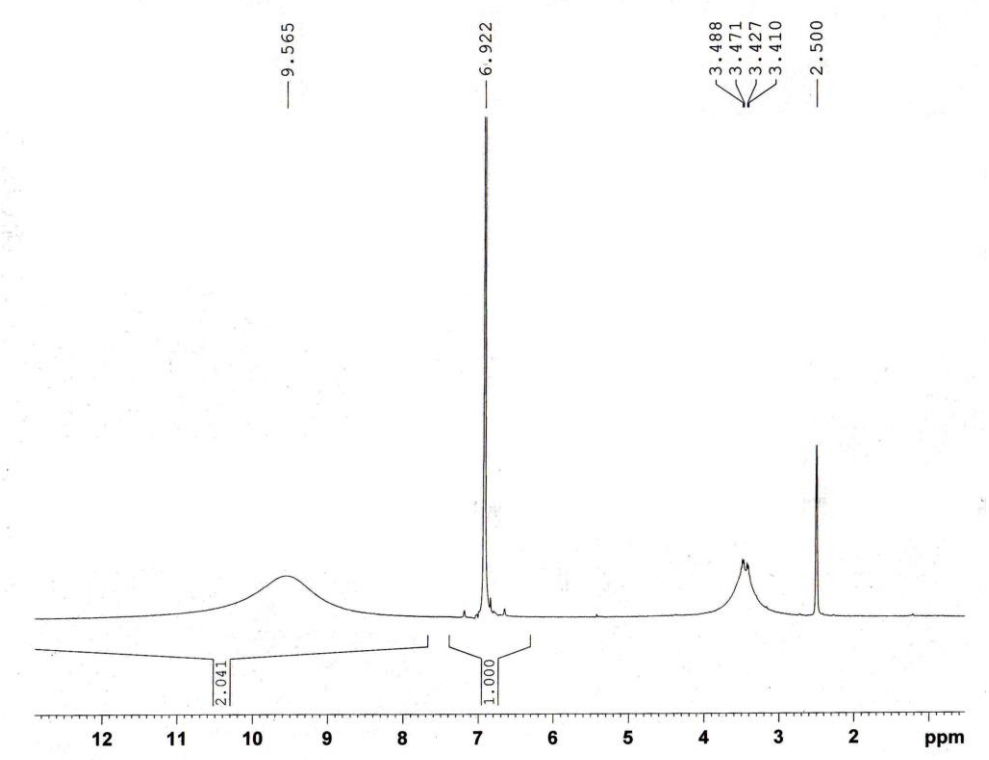

Figure S48. ^{1}H-NMR of Compound 22 (400MHz, DMSO-d_6)

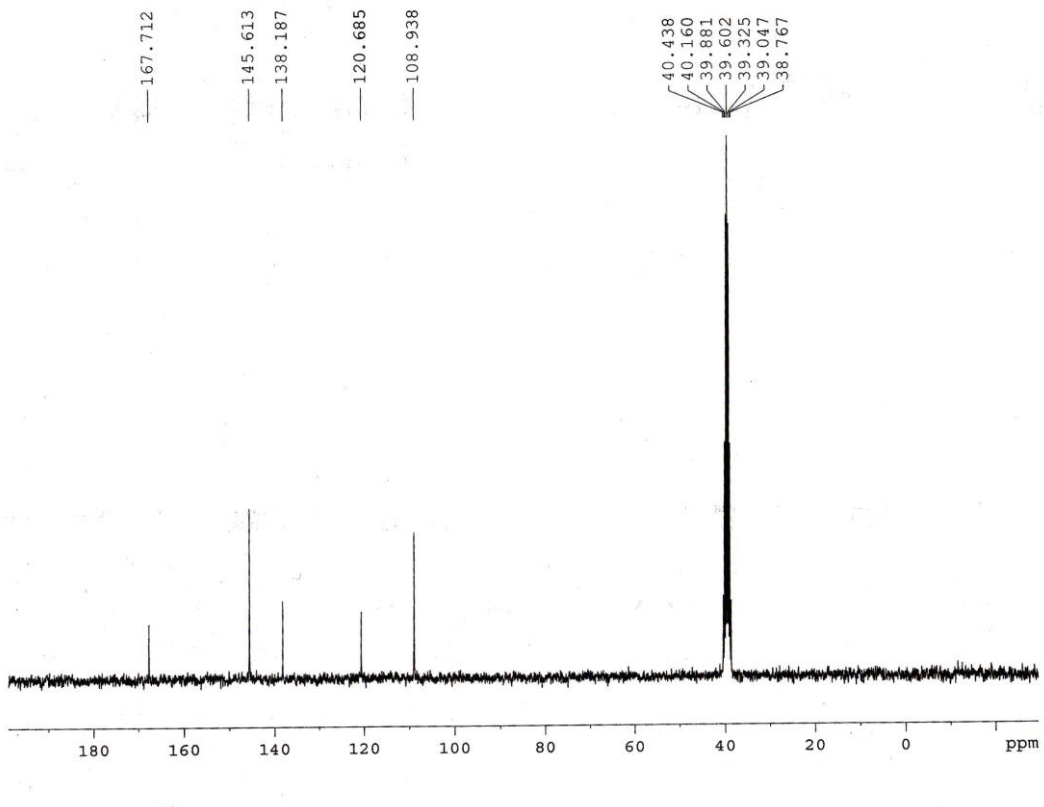

Figure S49. **^{13}C-NMR of Compound 22 (100MHz, DMSO-d_6)**

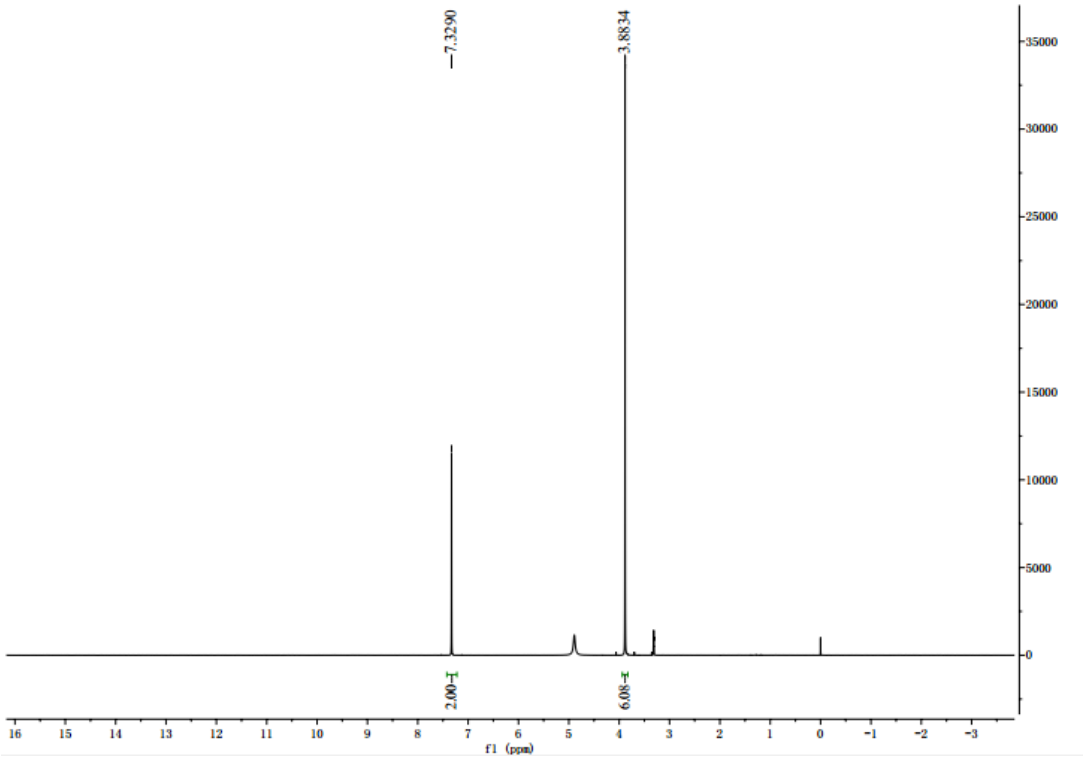

Figure S50. **^{1}H-NMR of Compound 23 (400MHz, CD_3OD)**

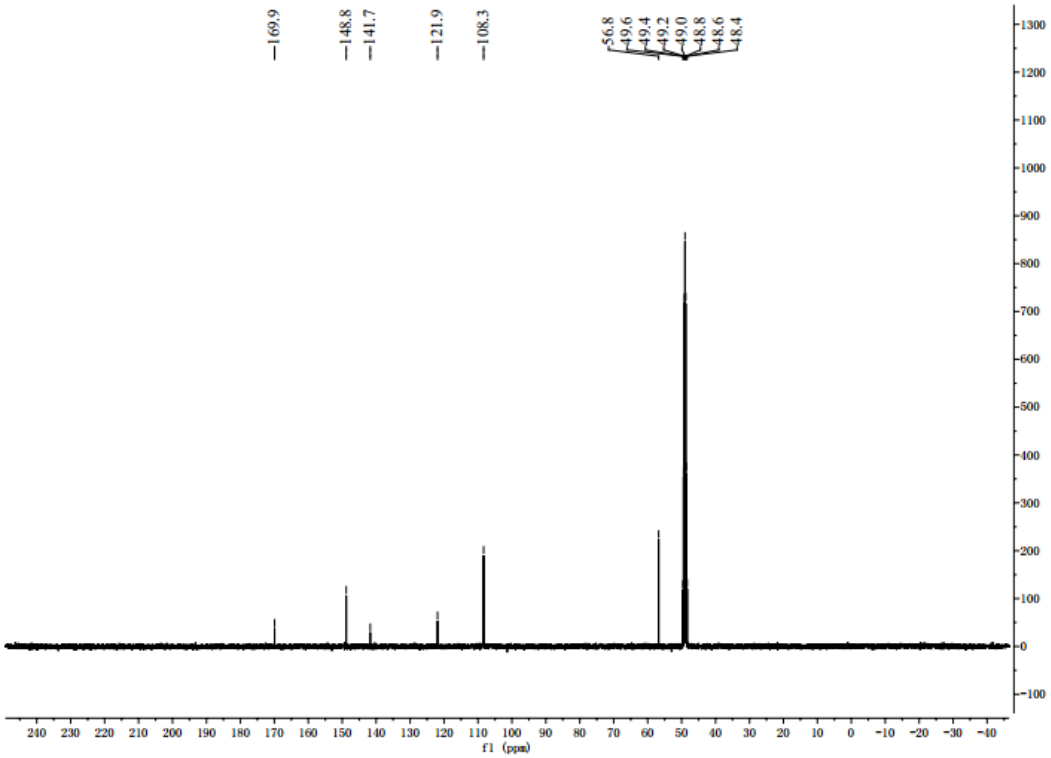

Figure S51. ^{13}C-NMR of Compound 23 (100MHz, CD_3OD)

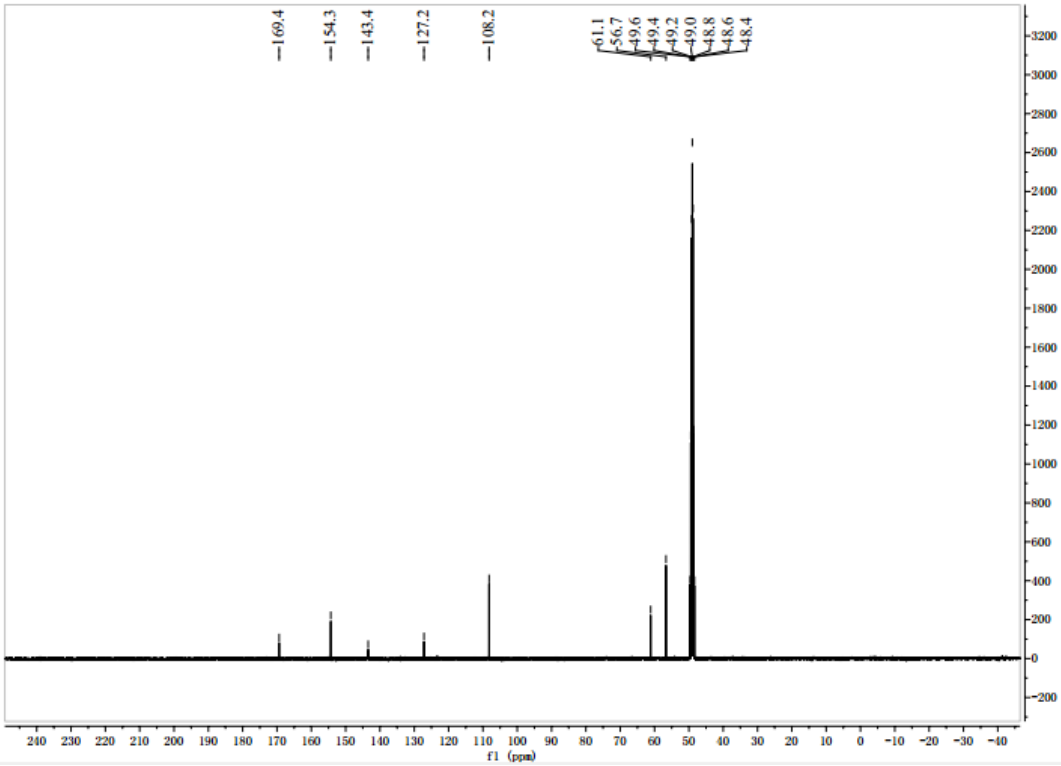

Figure S52. ^{13}C-NMR of Compound 24 (100MHz, CD_3OD)

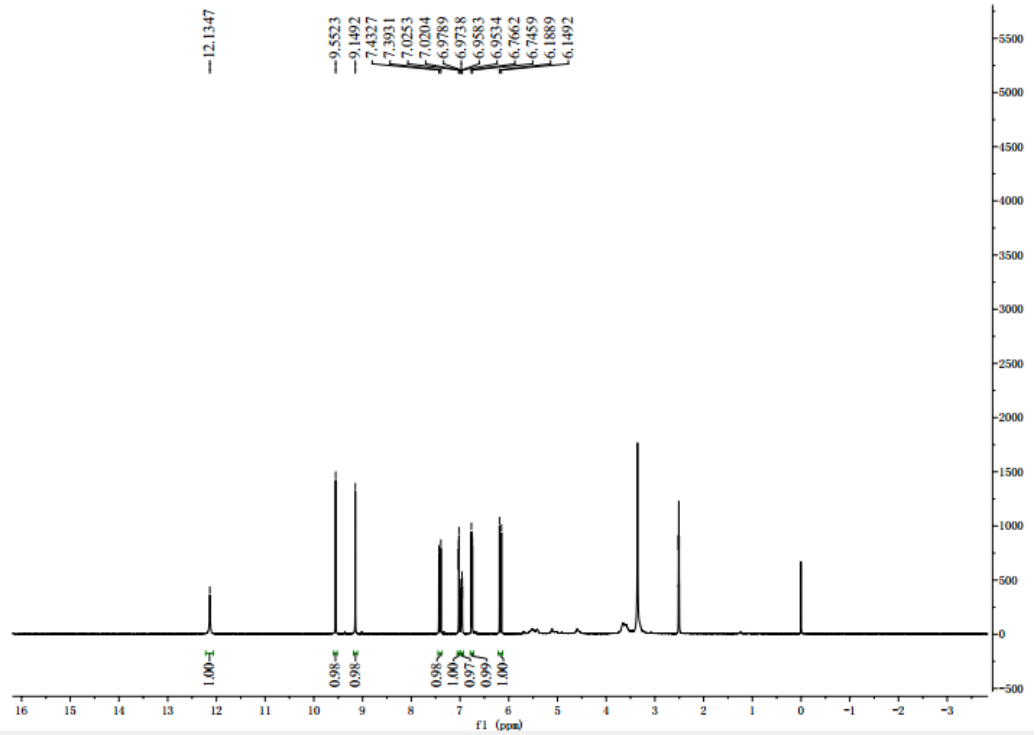

Figure S53. ^{1}H-NMR of Compound 25 (400MHz, DMSO-d_6)

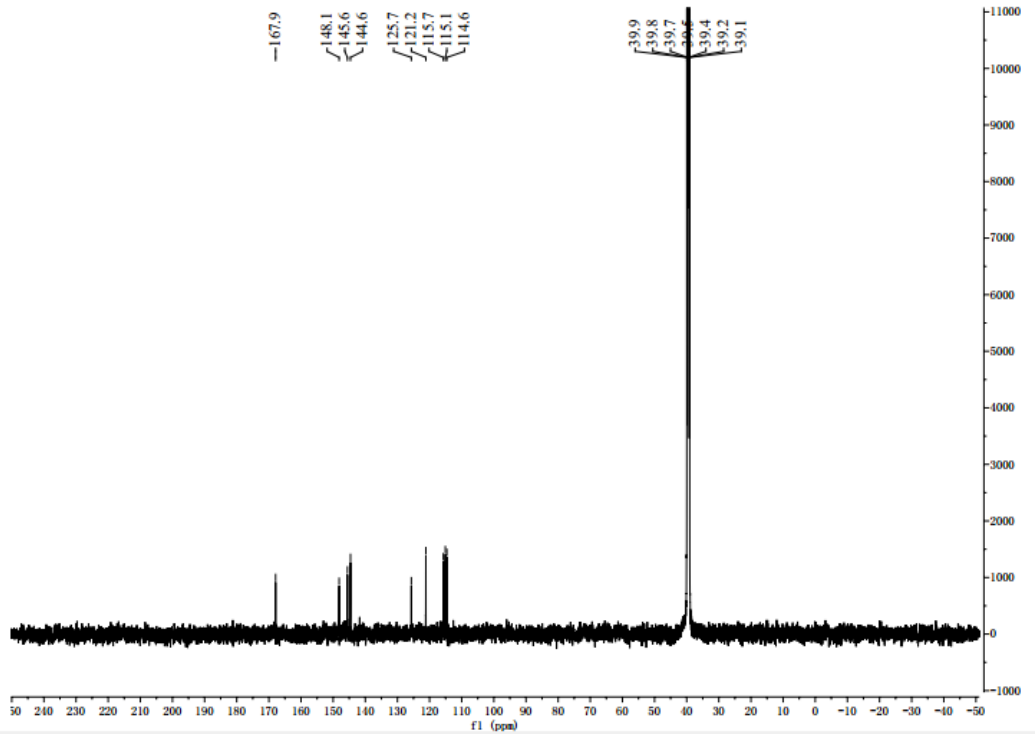

Figure S54. ^{13}C-NMR of Compound 25 (100MHz, DMSO-d_6)

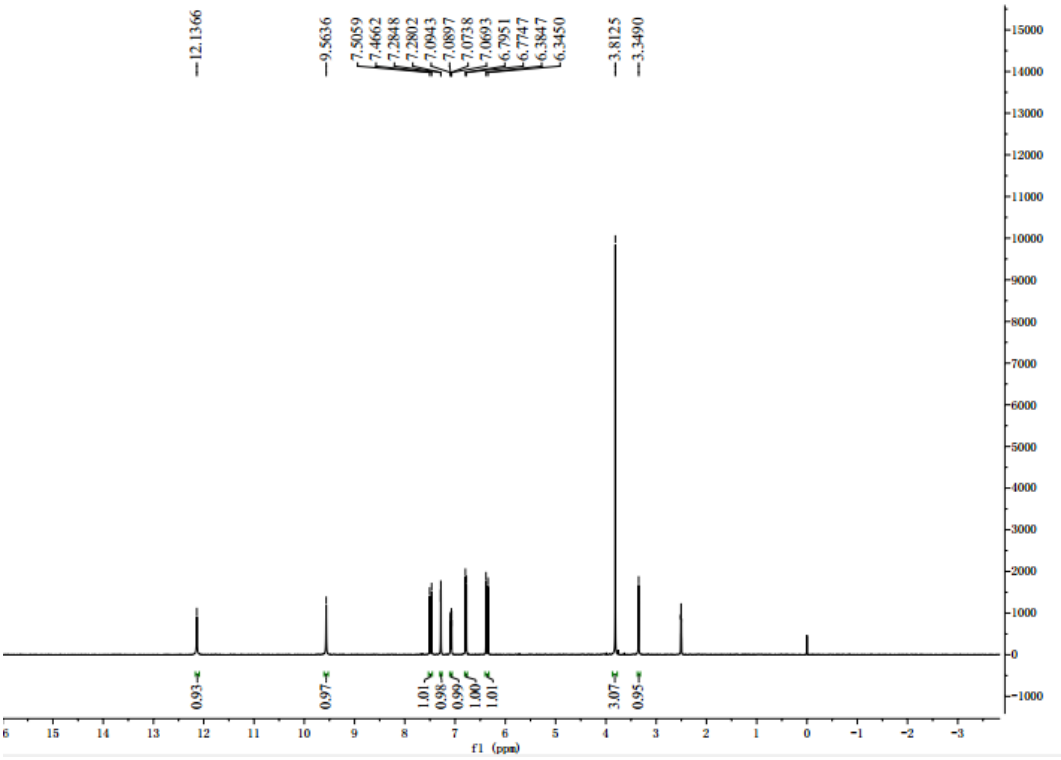

Figure S55. ^{1}H-NMR of Compound 26 (400MHz, DMSO-d_6)

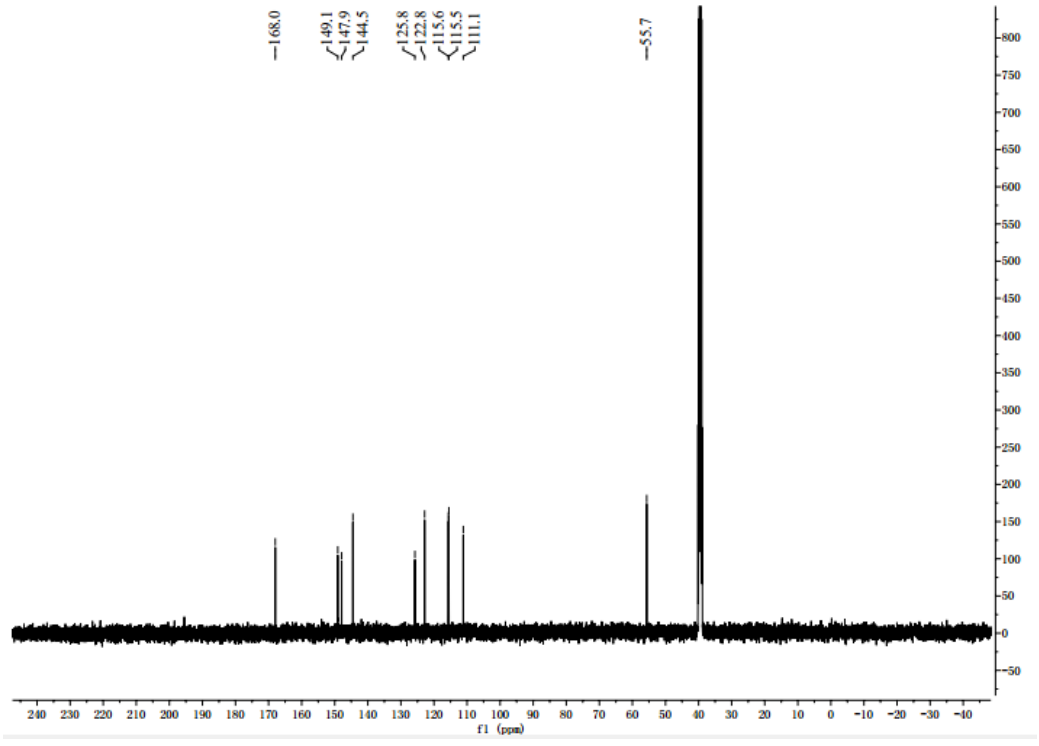

Figure S56. ^{13}C-NMR of Compound 26 (100MHz, DMSO-d_6)