

Supplementary Information

Synthesis and Biological Evaluation of Novel Betulin Derivatives with Aromatic Hydrazone Side Chain as Potential Anticancer Agents

Jiafeng Wang,^a Jiale Wu,^a Yinglong Han,^a Jie Zhang,^a Yu Lin,^a Haijun Wang,^a Jing Wang^a and Ming Bu  ^{*,a}

^aCollege of Pharmacy, Qiqihar Medical University, 161006 Qiqihar, China

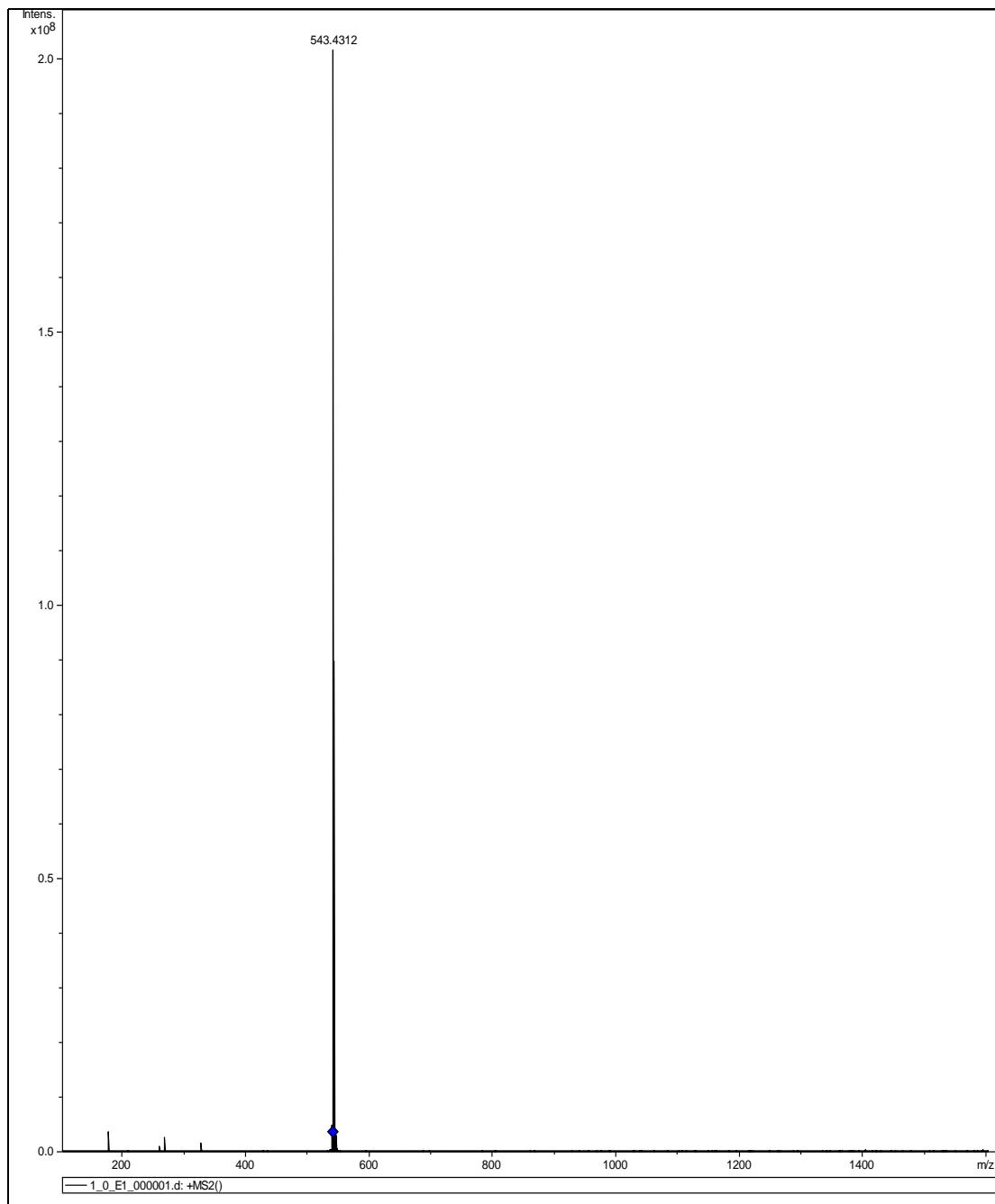


Figure S1. High resolution mass spectrum of compound 7a.

*e-mail: buming@qmu.edu.cn

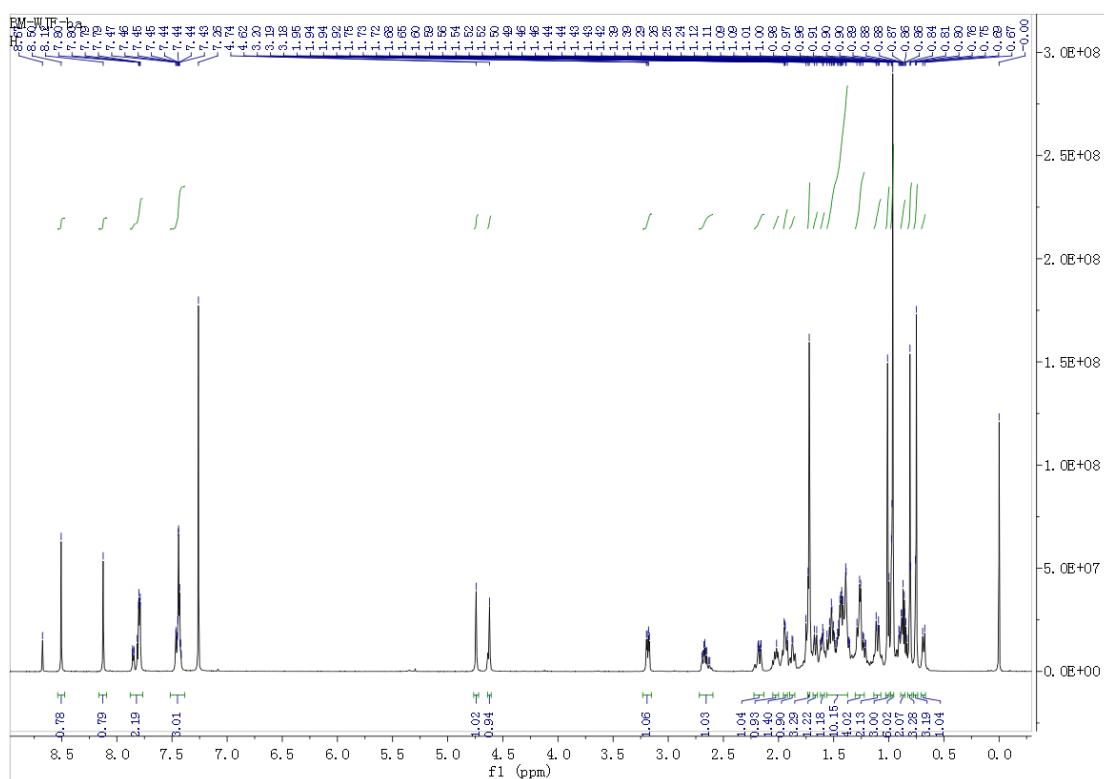


Figure S2. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7a**.

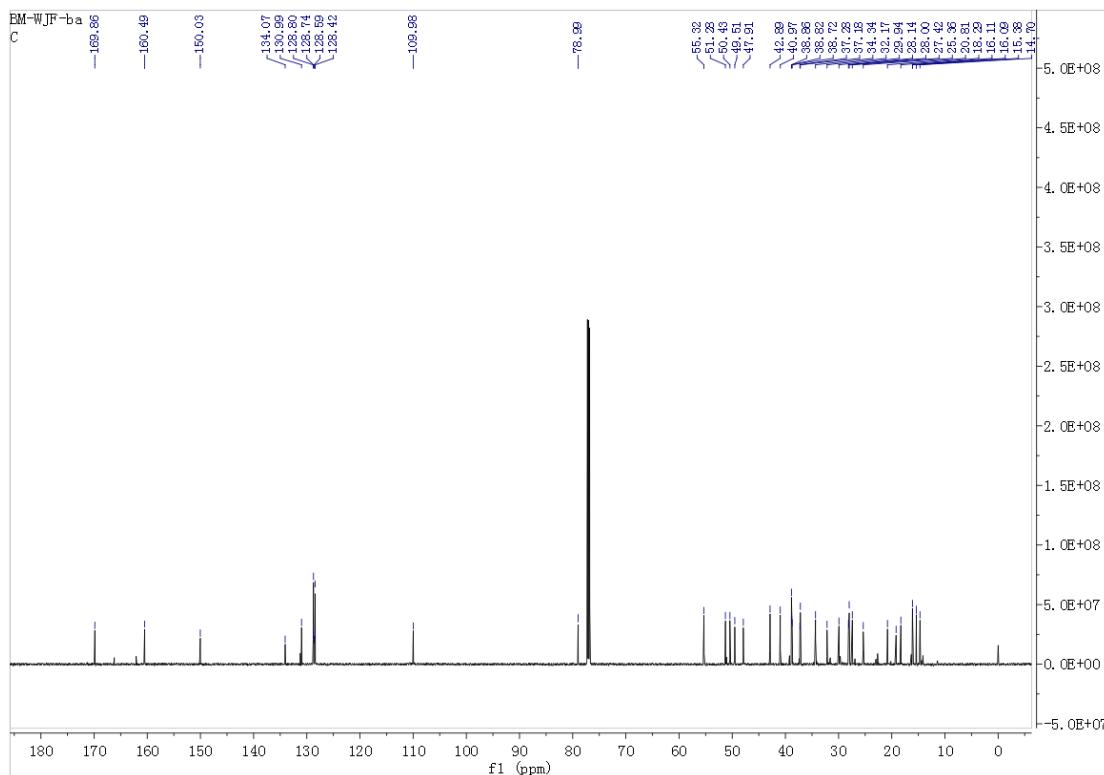


Figure S3. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7a**.

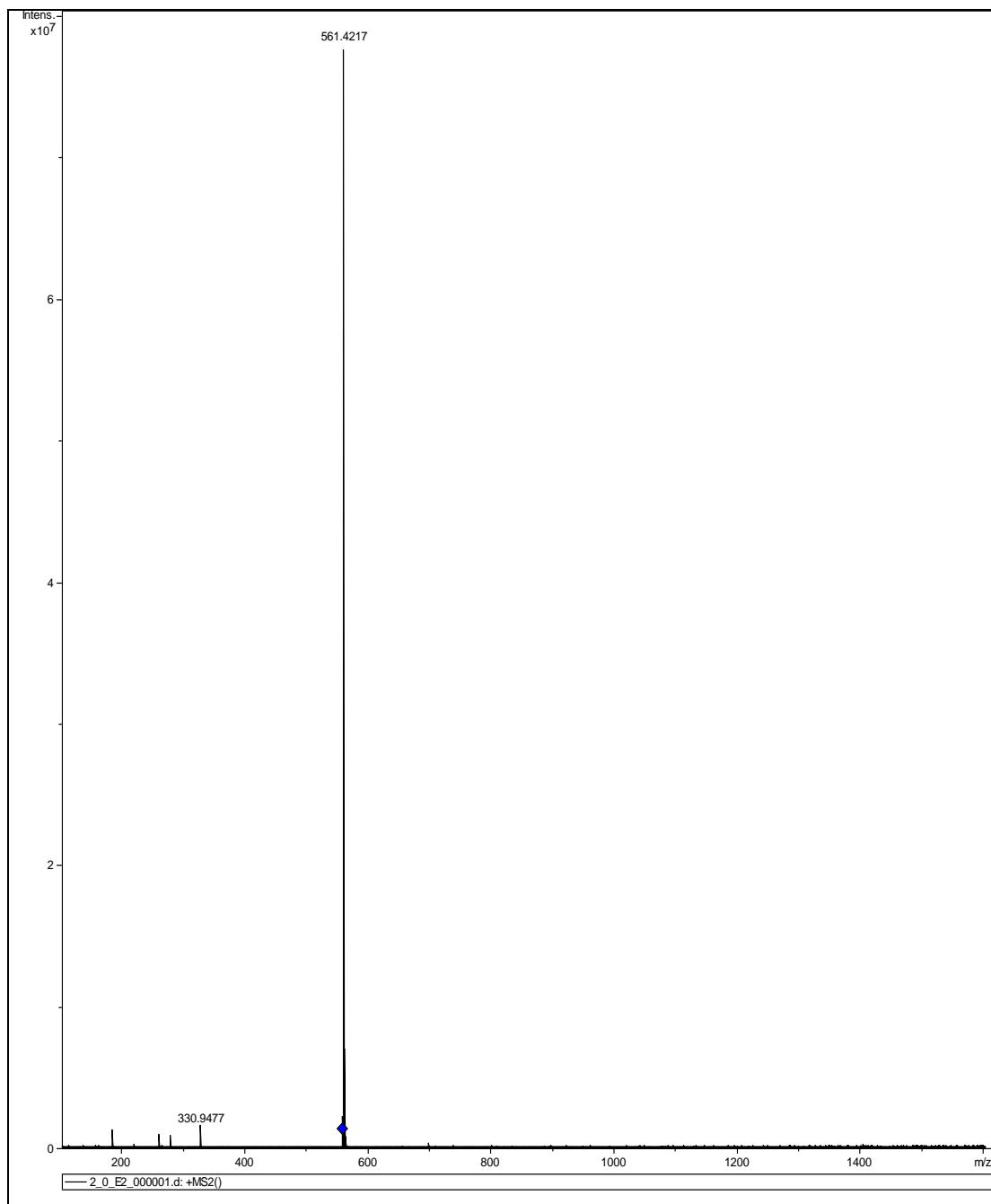


Figure S4. High resolution mass spectrum of compound **7b**.

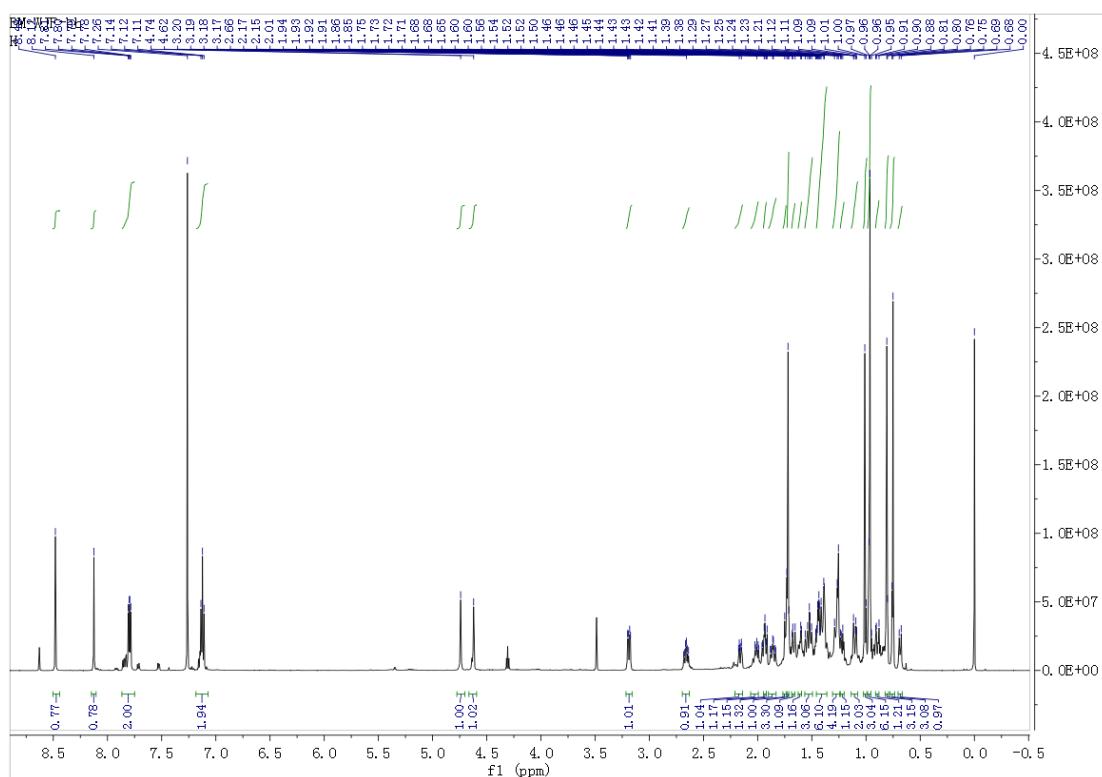


Figure S5. ^1H NMR spectrum (600 MHz, CDCl_3) of compound 7b.

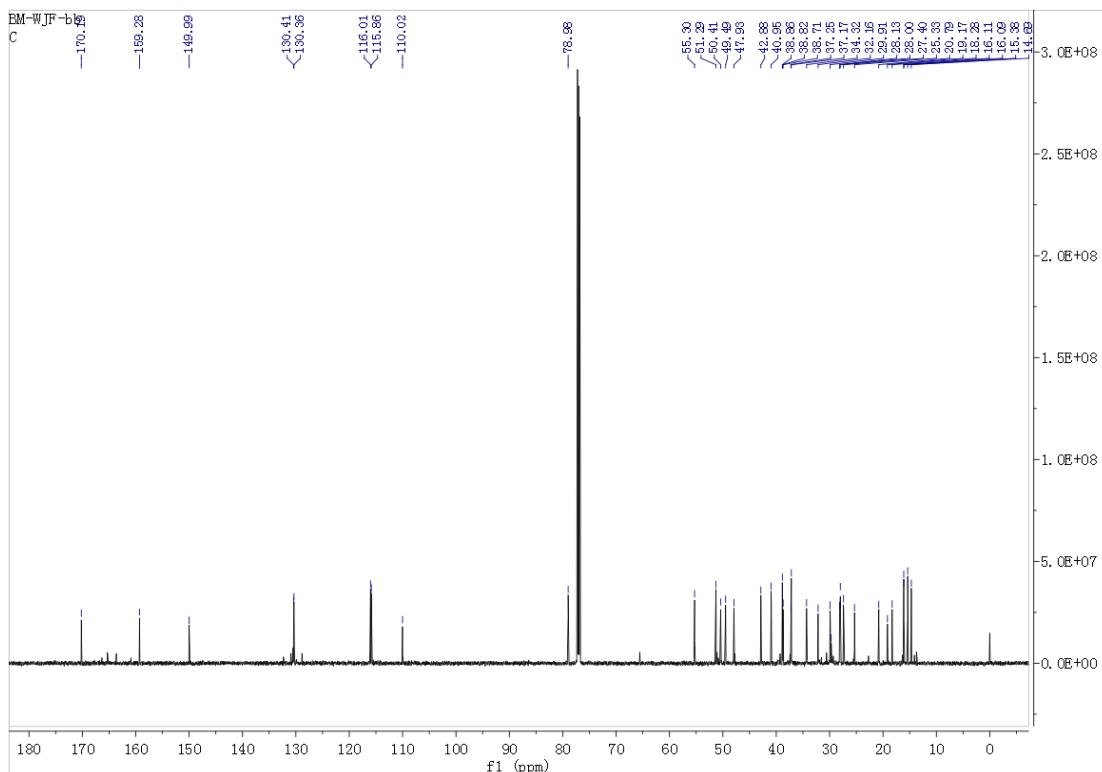


Figure S6. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound 7b.

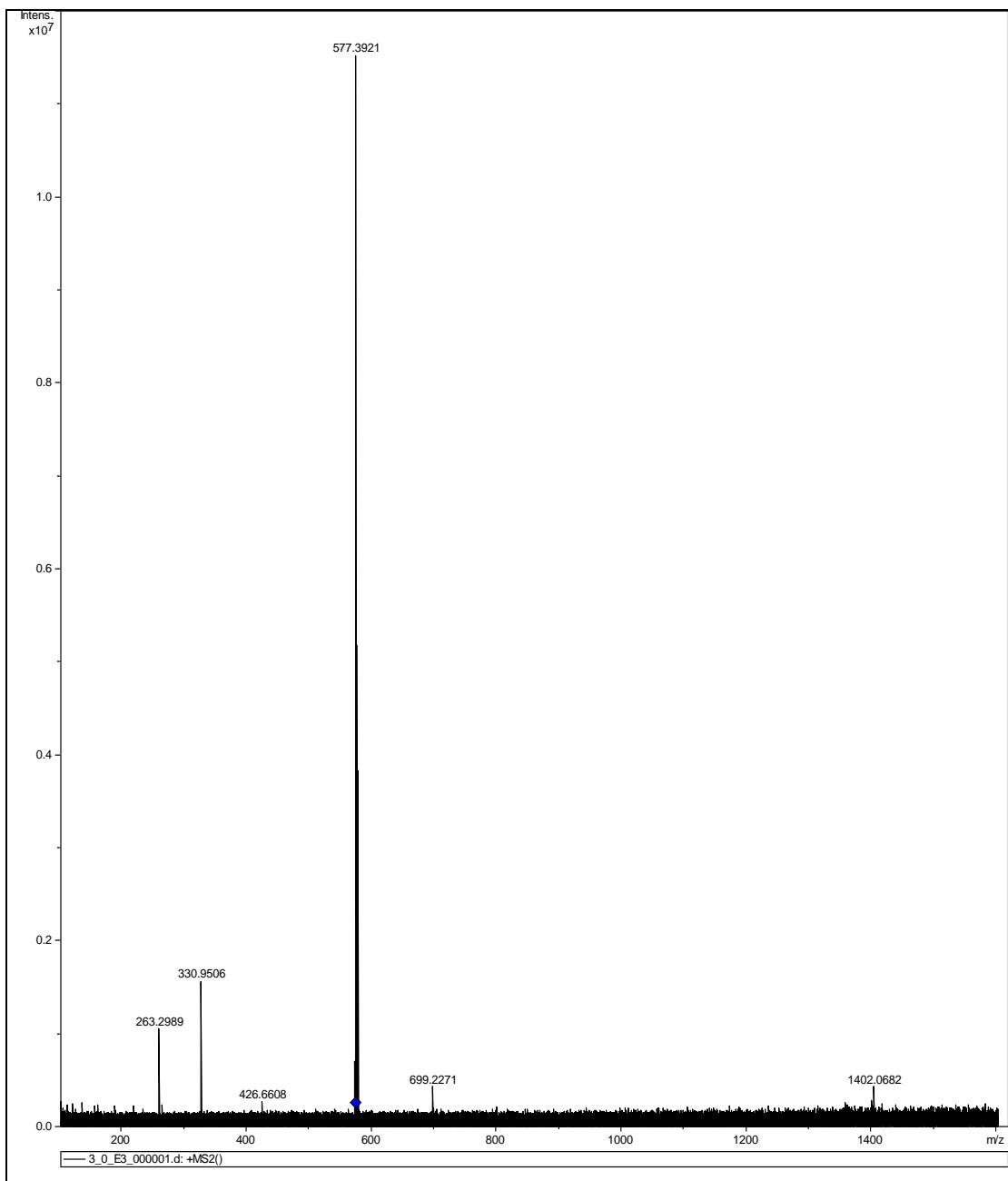


Figure S7. High resolution mass spectrum of compound **7c**.

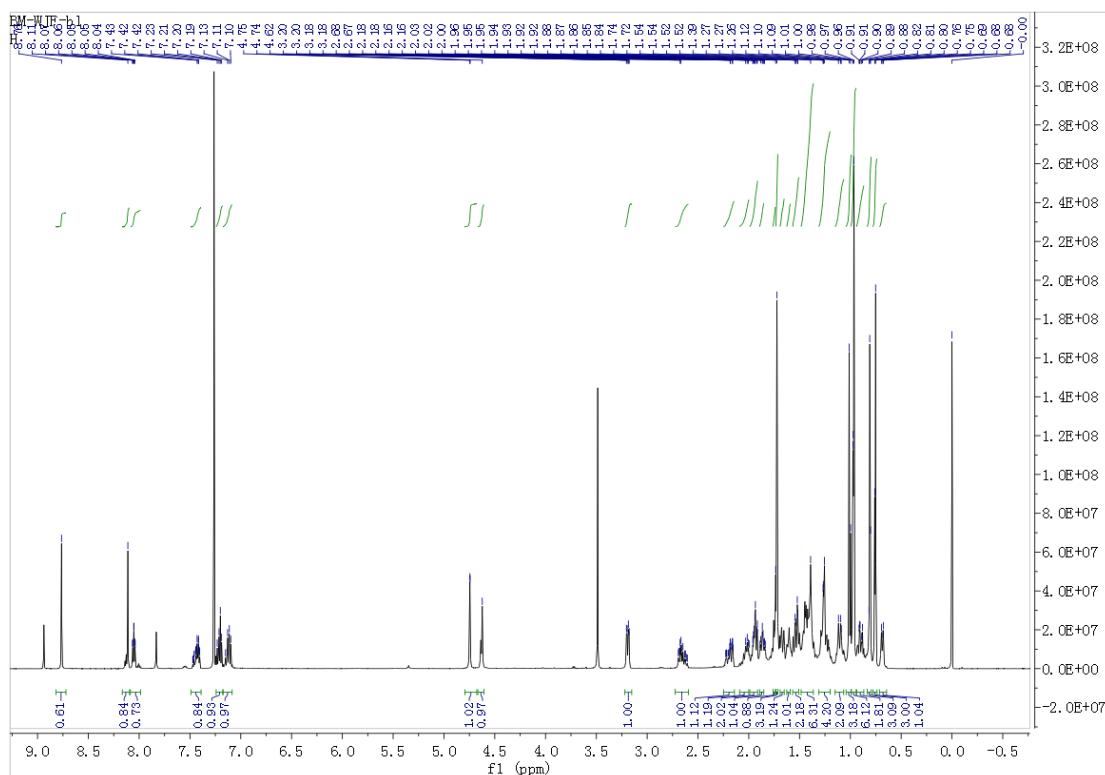


Figure S8. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7c**.

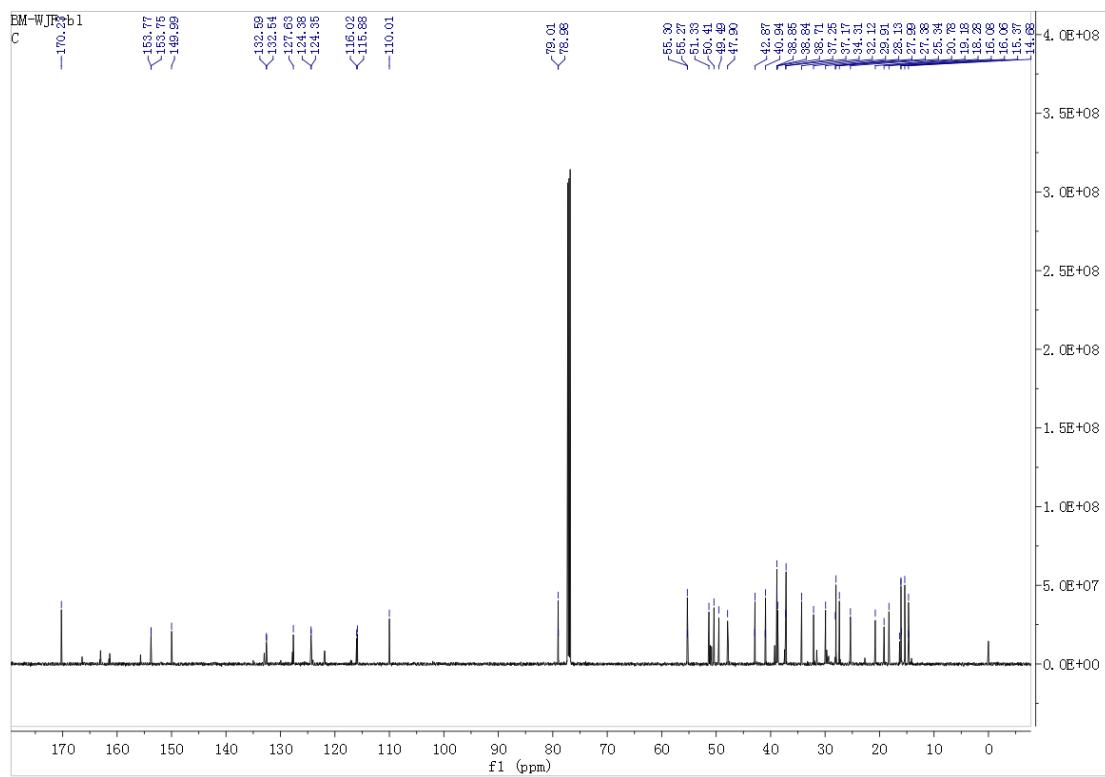


Figure S9. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7c**.

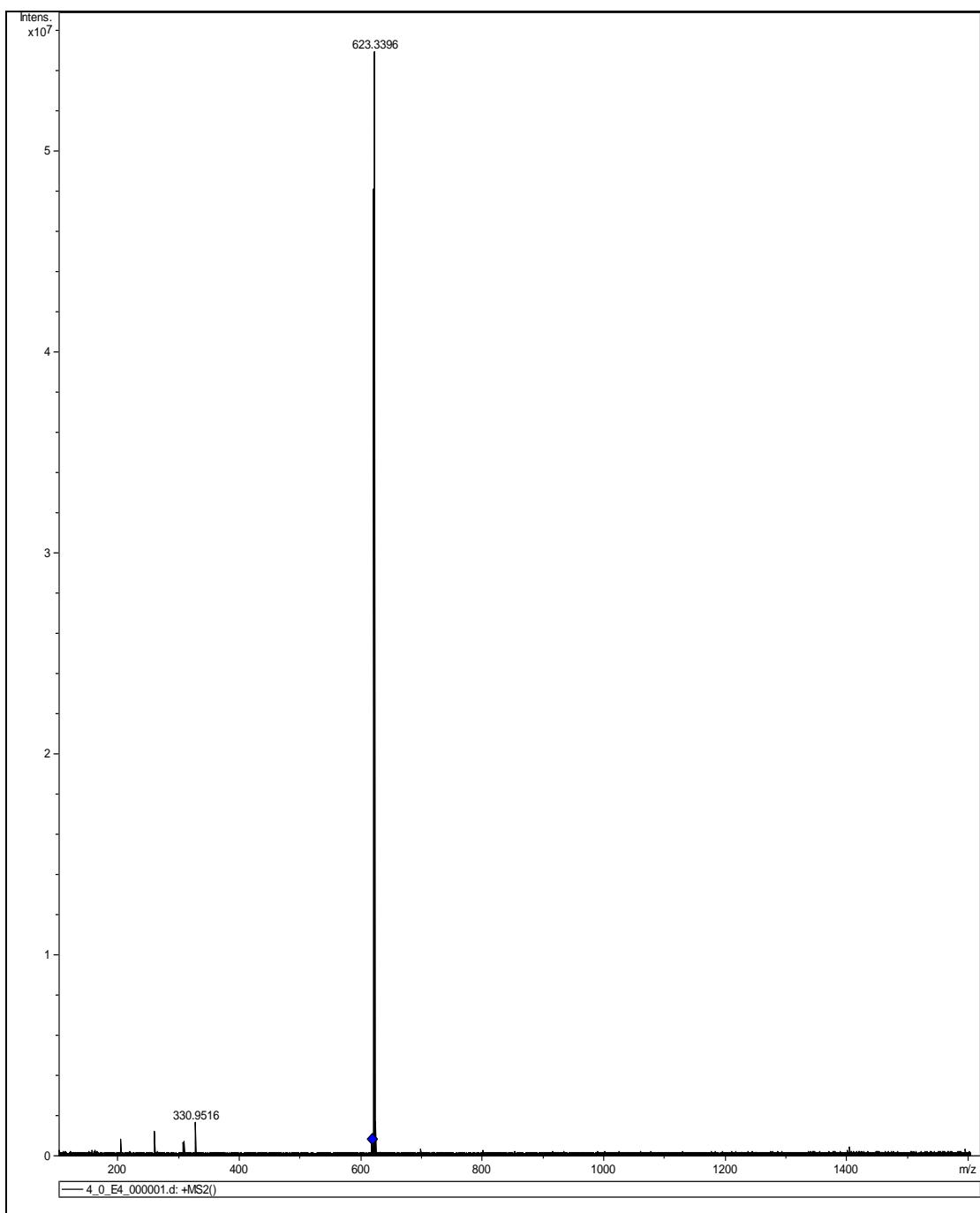


Figure S10. High resolution mass spectrum of compound **7d**.

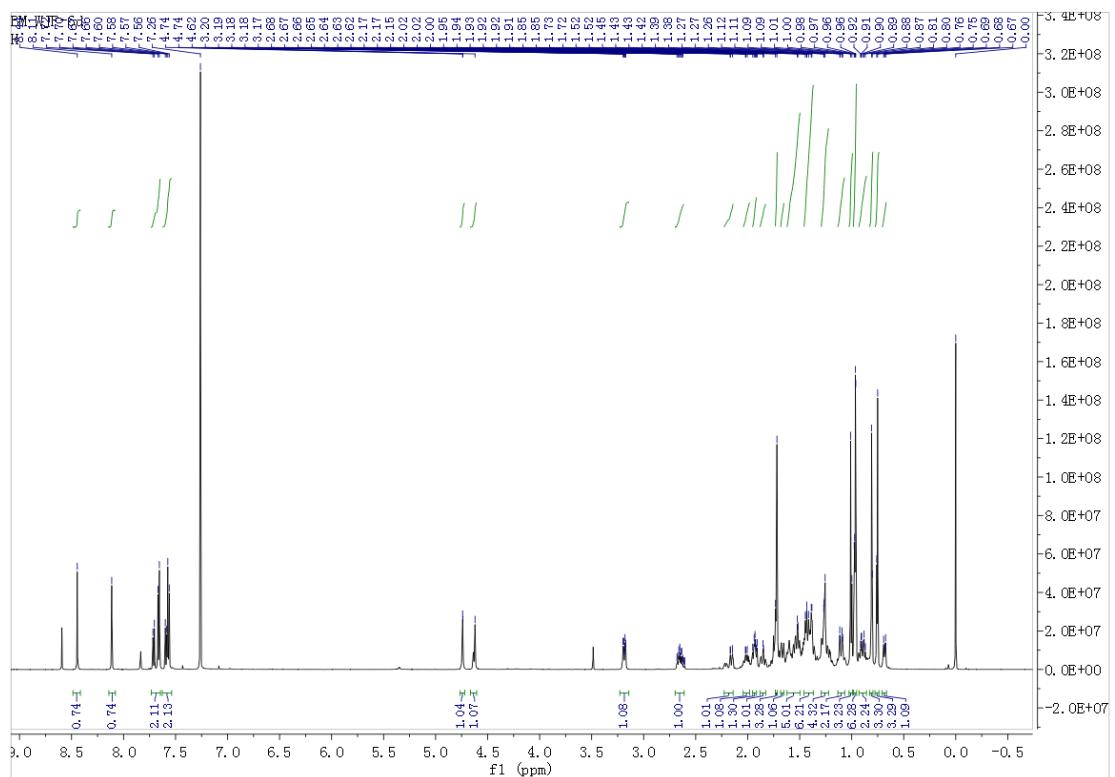


Figure S11. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7d**.

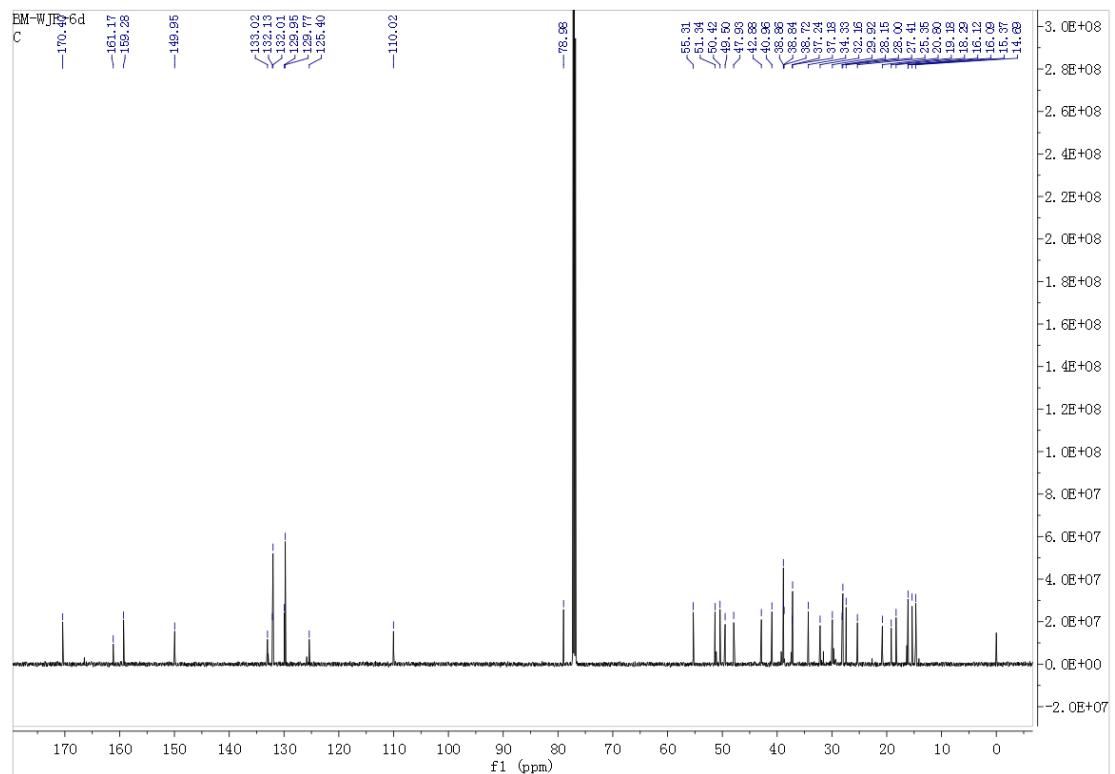


Figure S12. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7d**.

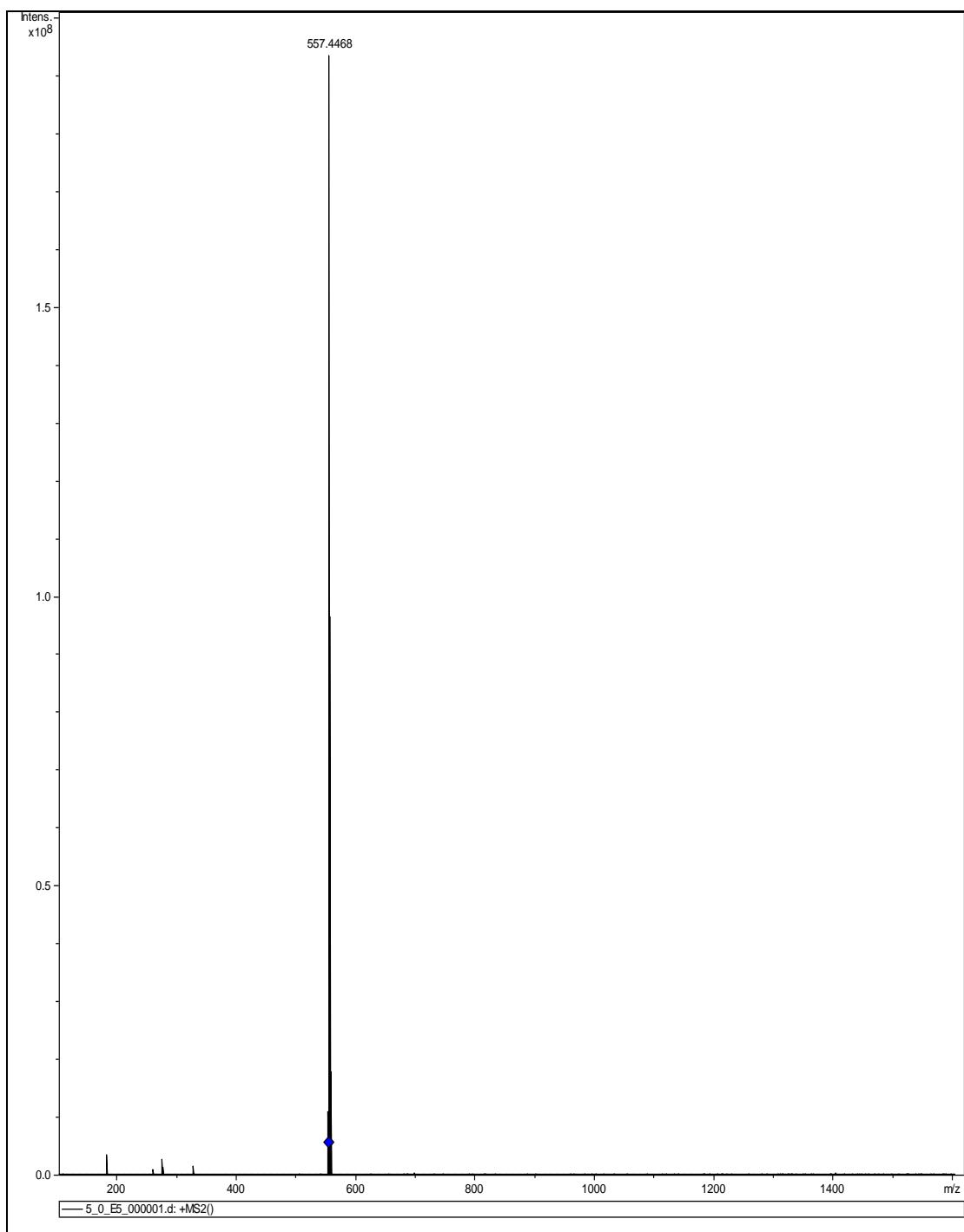


Figure S13. High resolution mass spectrum of compound 7e.

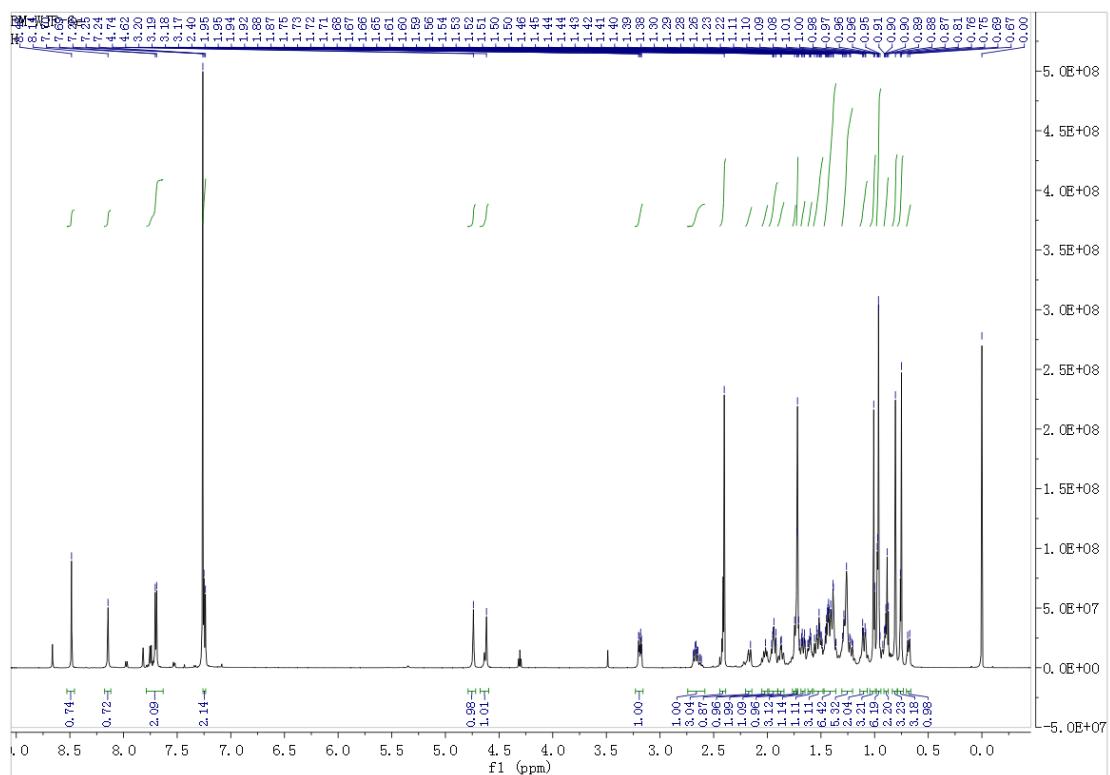


Figure S14. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7e**.

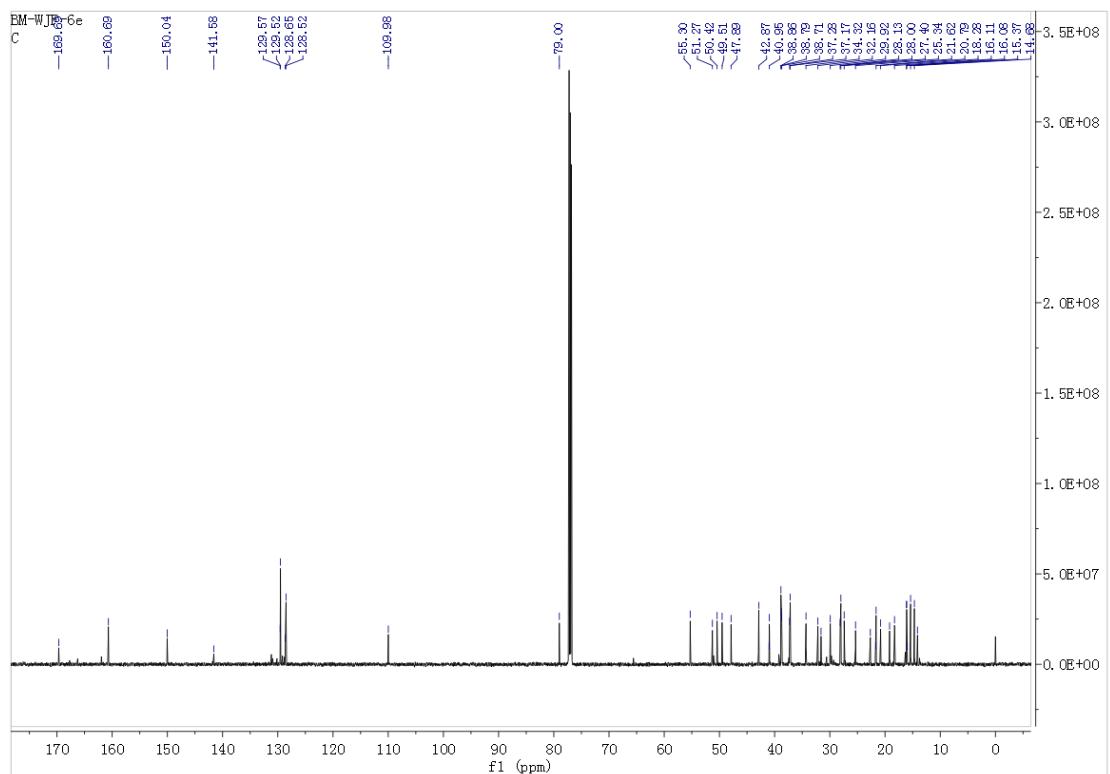


Figure S15. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7e**.

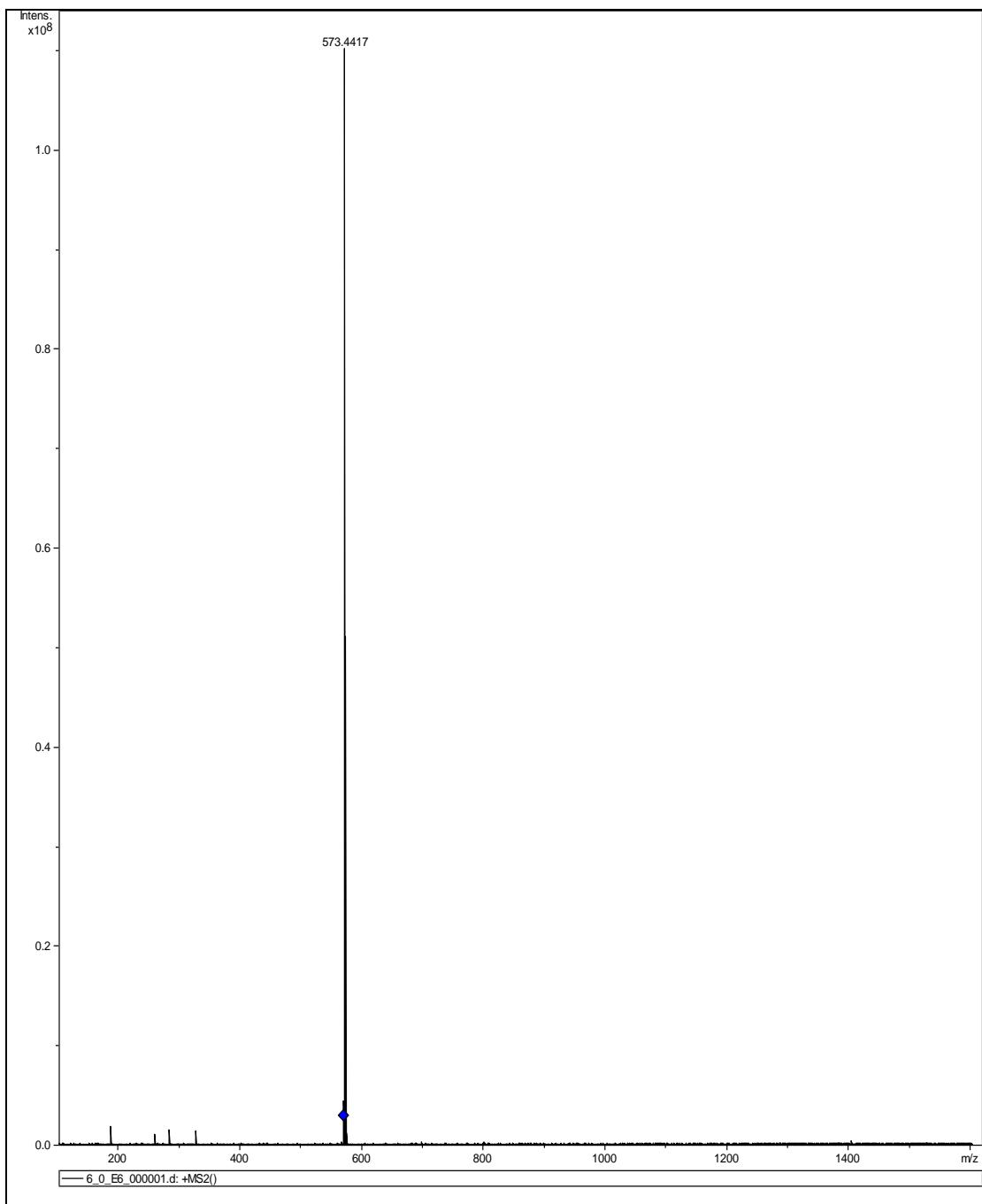


Figure S16. High resolution mass spectrum of compound **7f**.

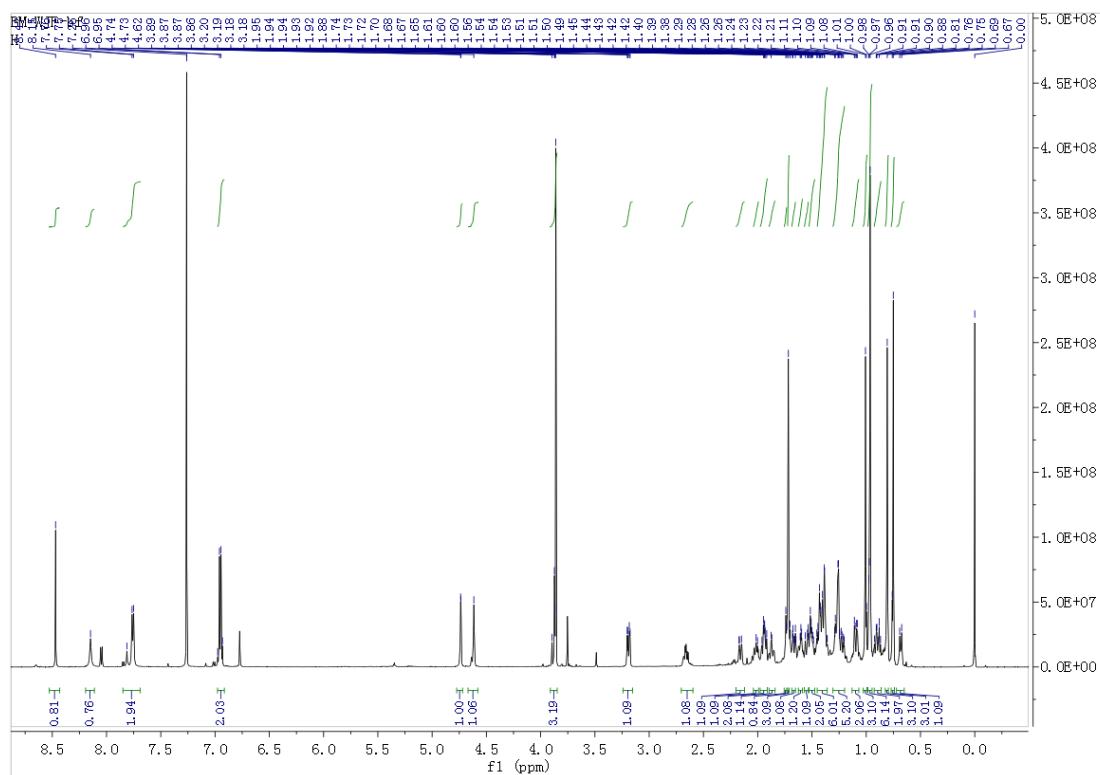


Figure S17. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7f**.

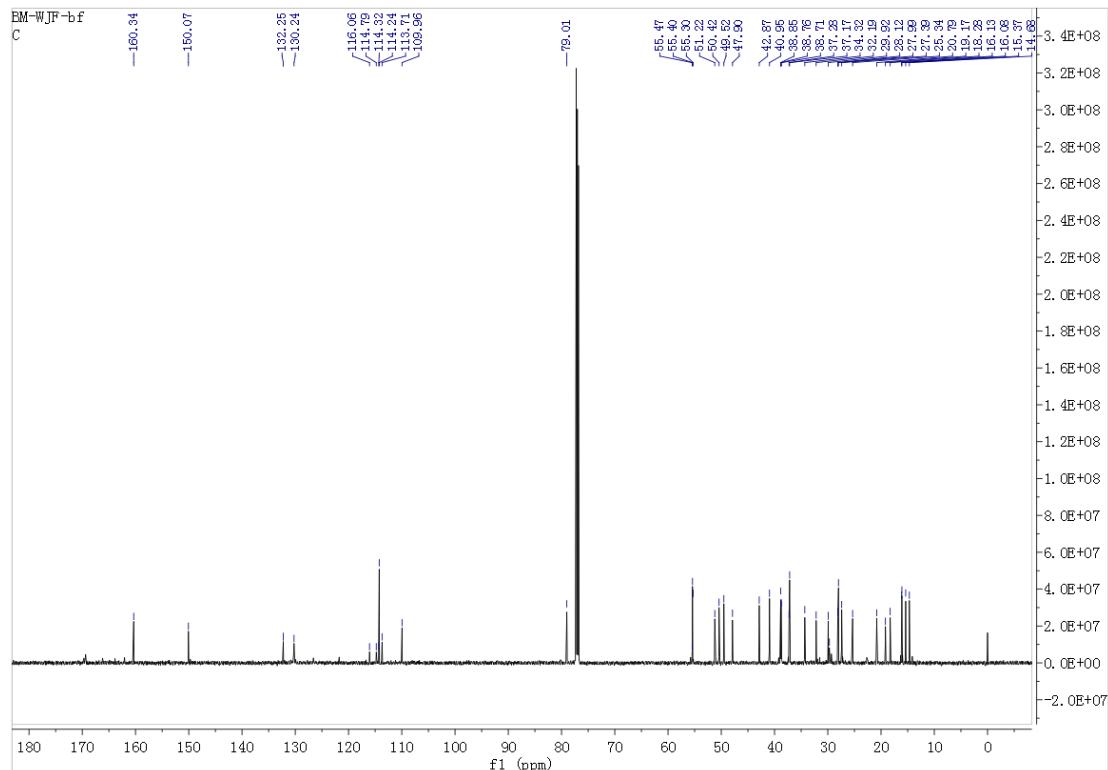


Figure S18. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7f**.

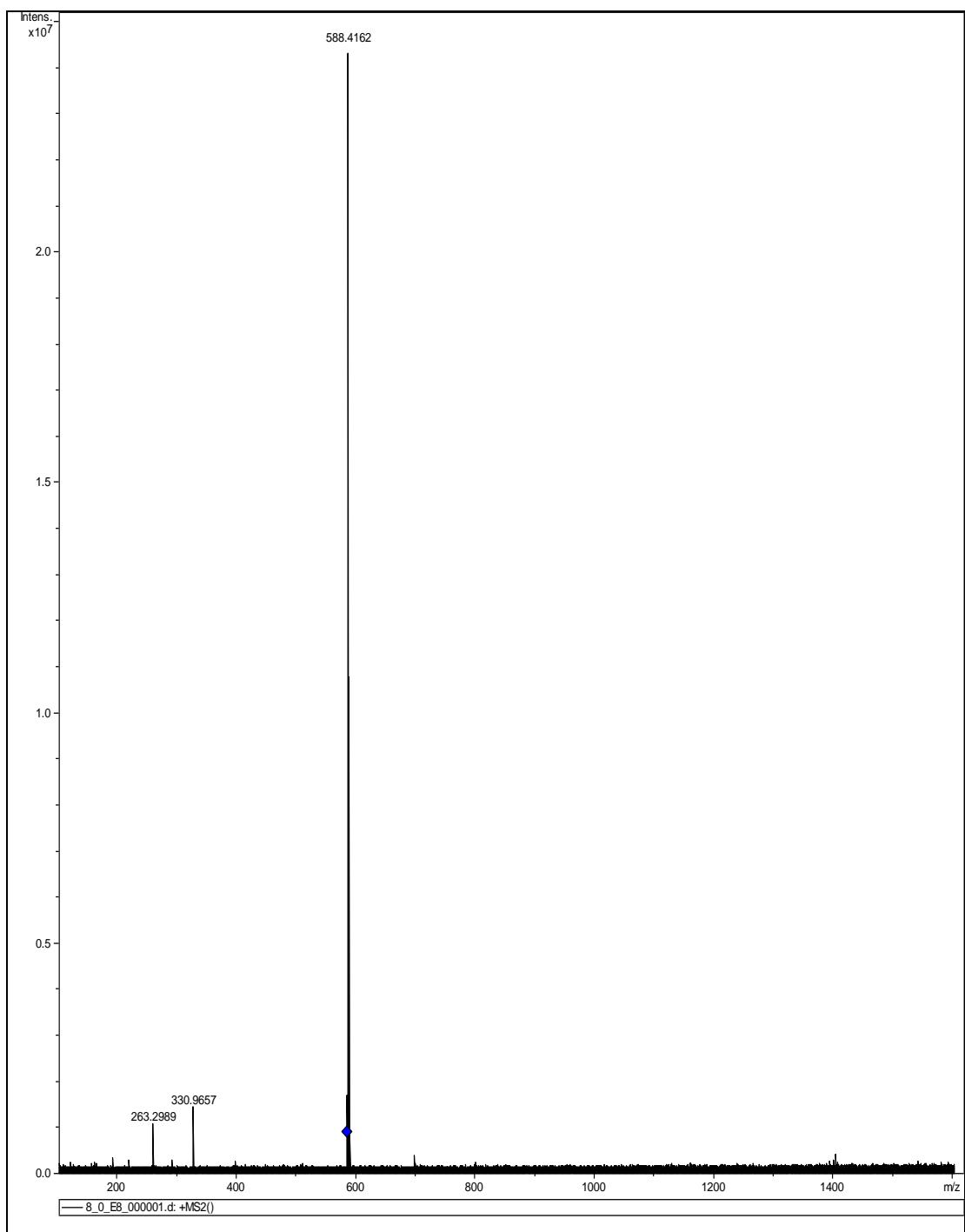


Figure S19. High resolution mass spectrum of compound 7g.

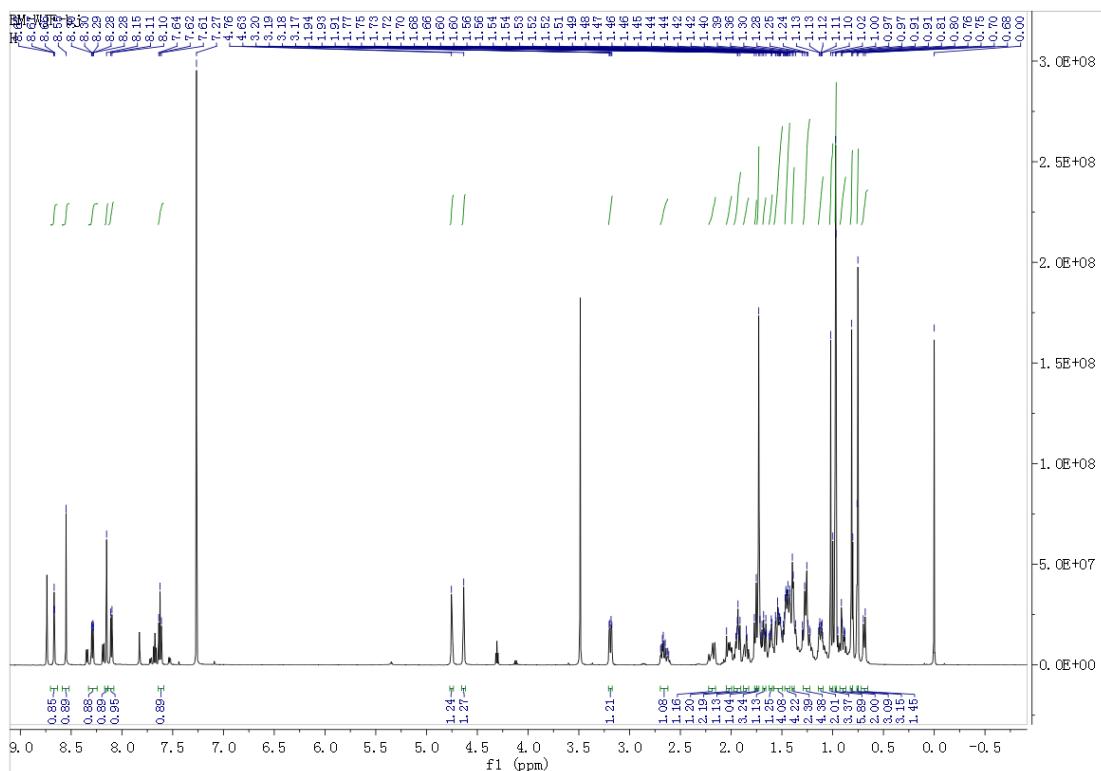


Figure S20. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7g**.

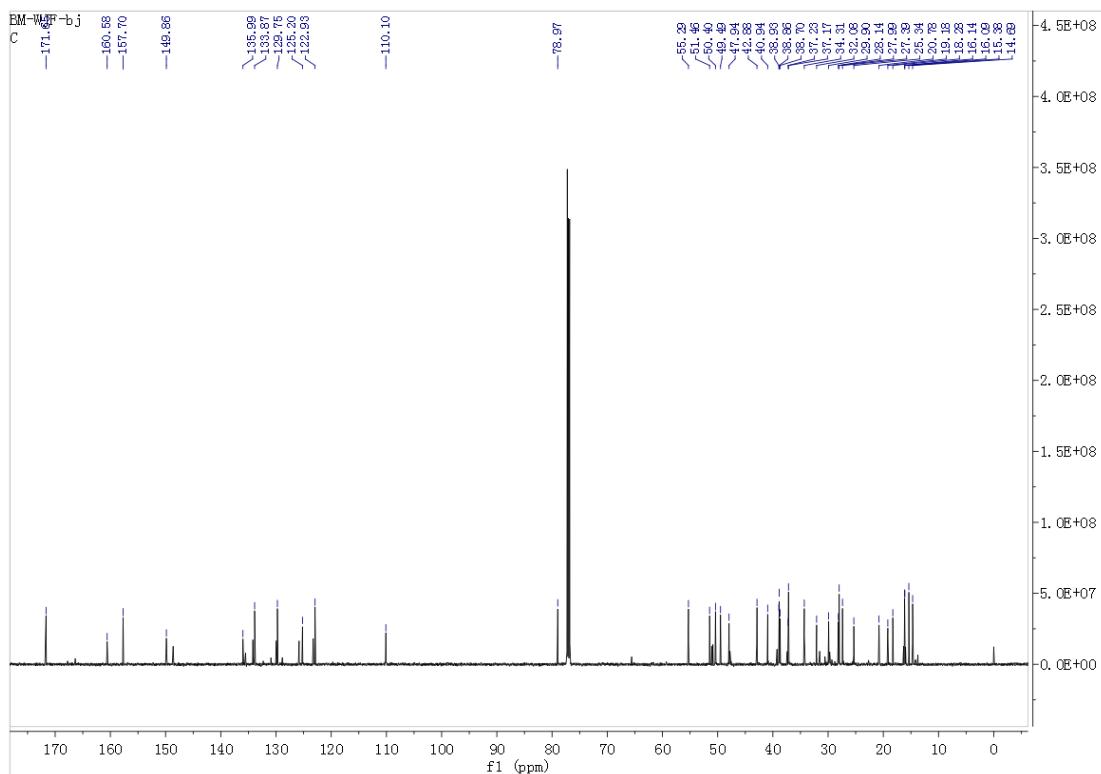


Figure S21. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7g**.

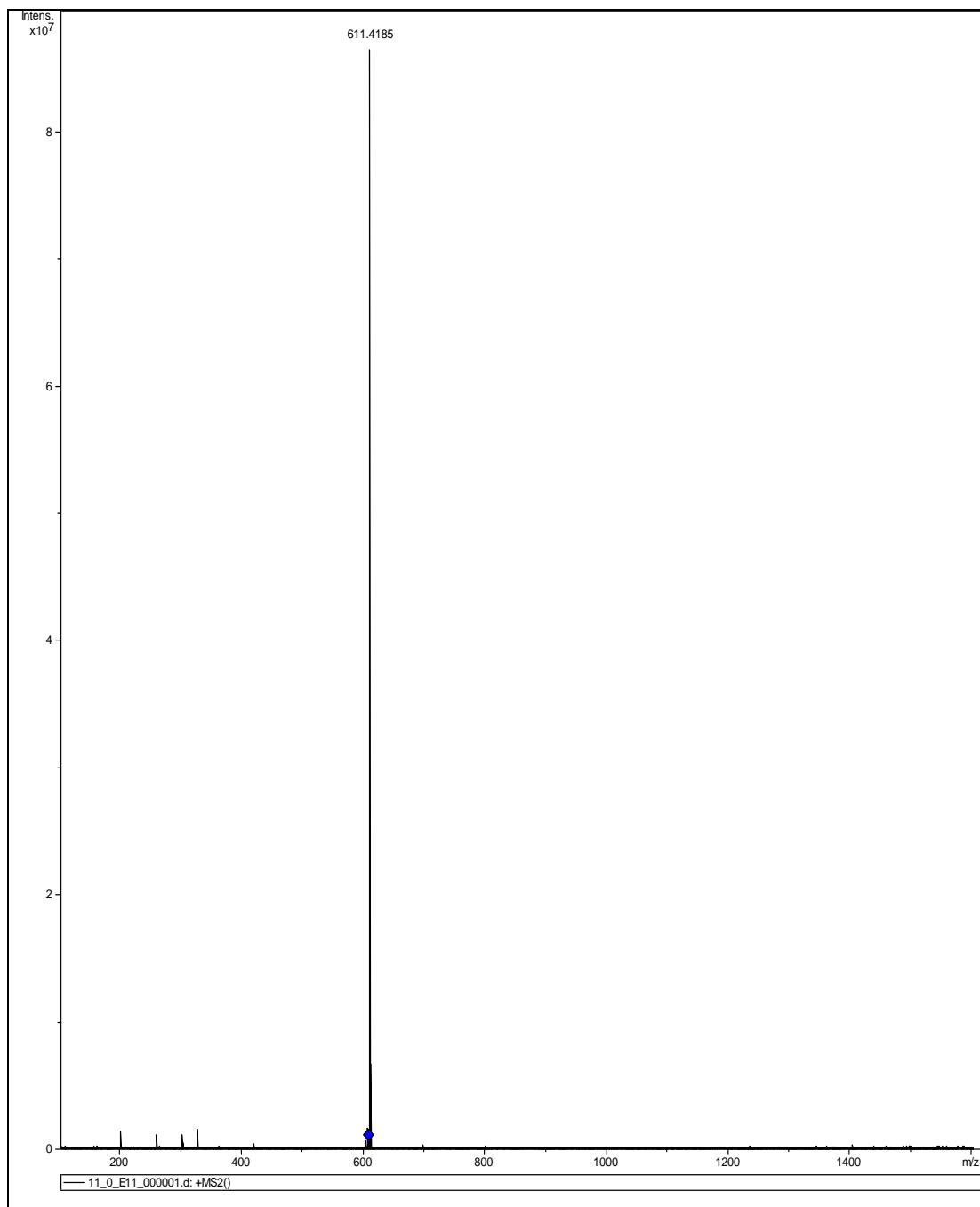


Figure S22. High resolution mass spectrum of compound **7h**.

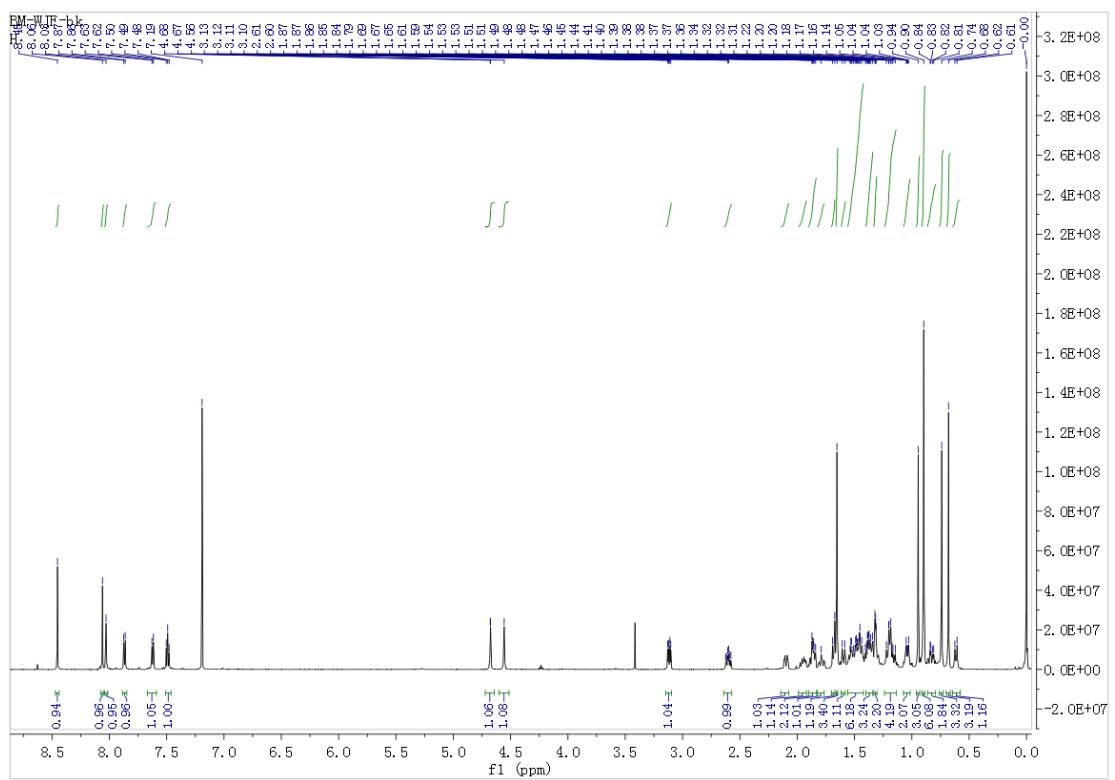


Figure S23. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7h**.

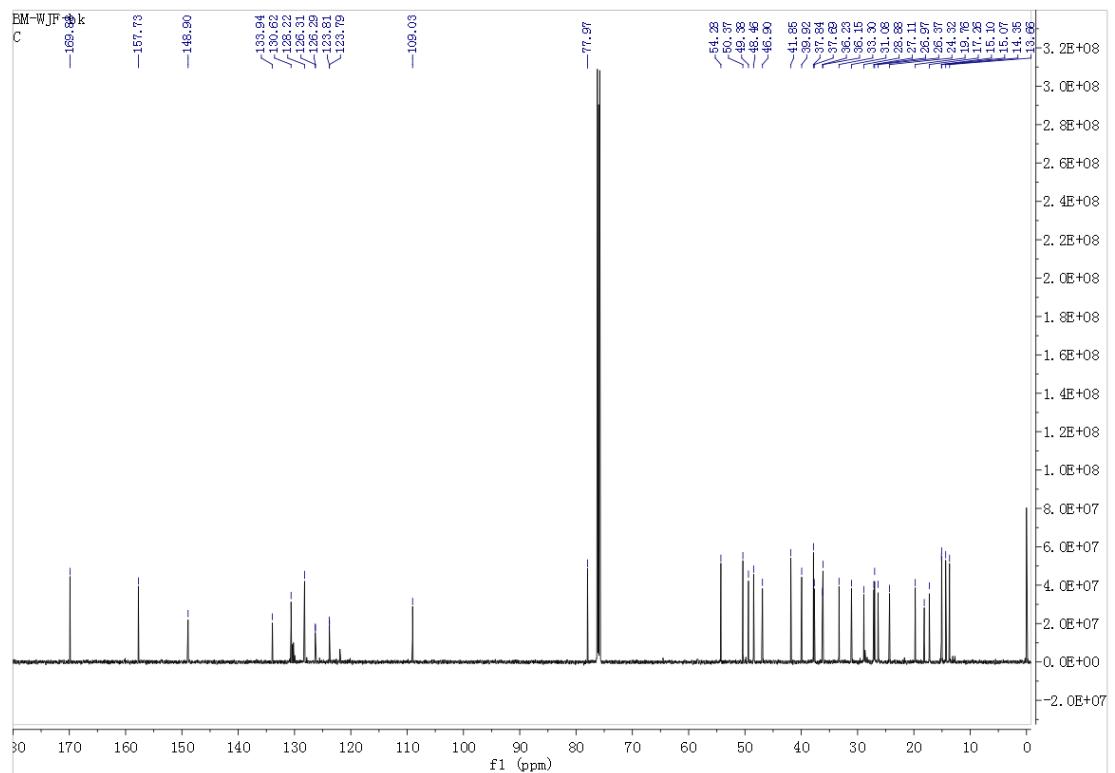


Figure S24. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7h**.

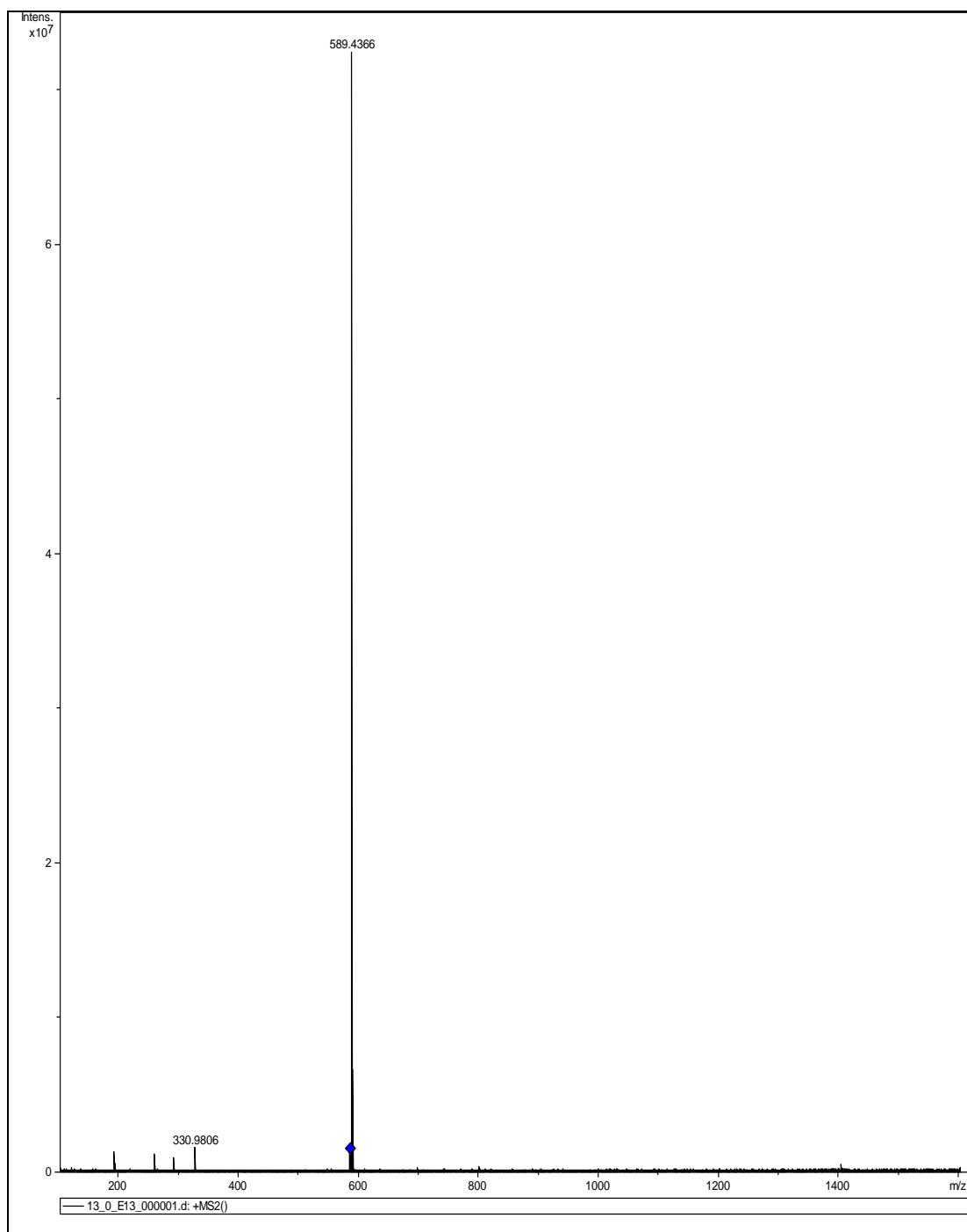


Figure S25. High resolution mass spectrum of compound **7i**.

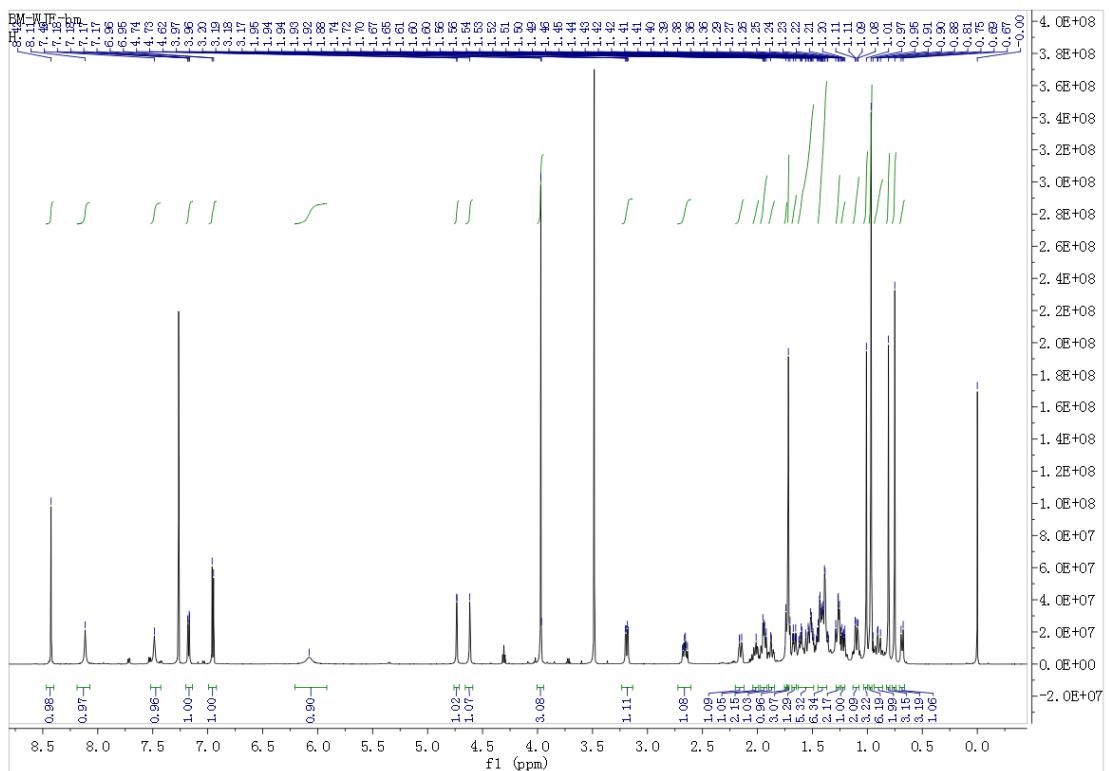


Figure S26. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7i**.

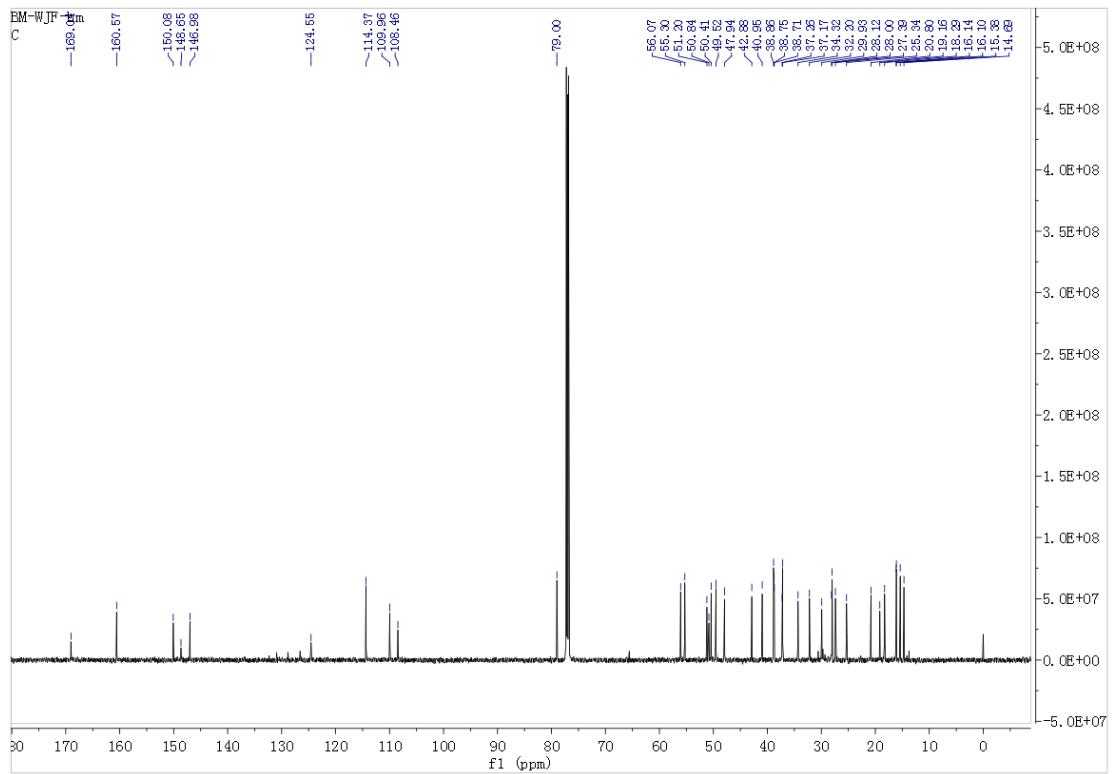


Figure S27. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound 7i.

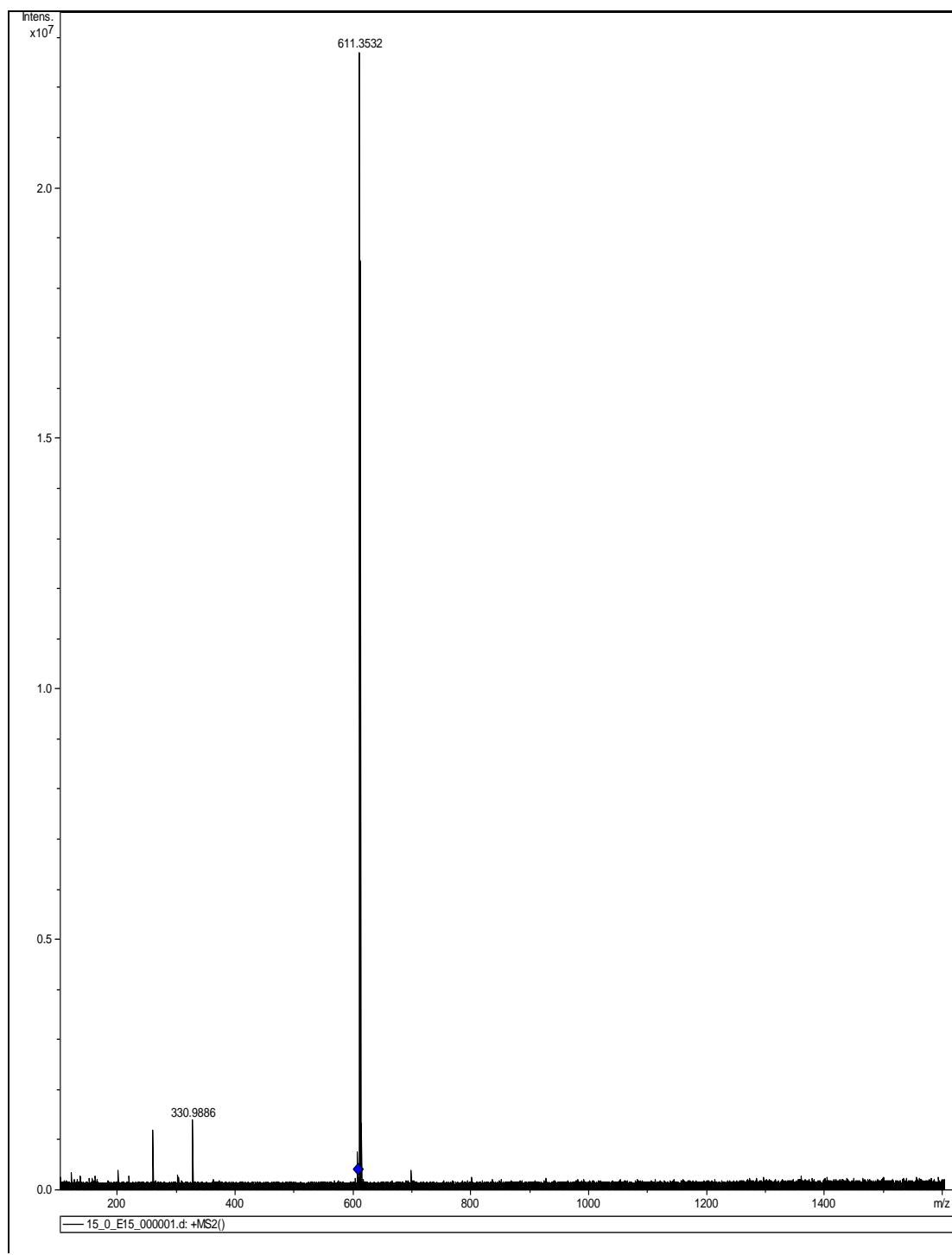


Figure S28. High resolution mass spectrum of compound **7j**.

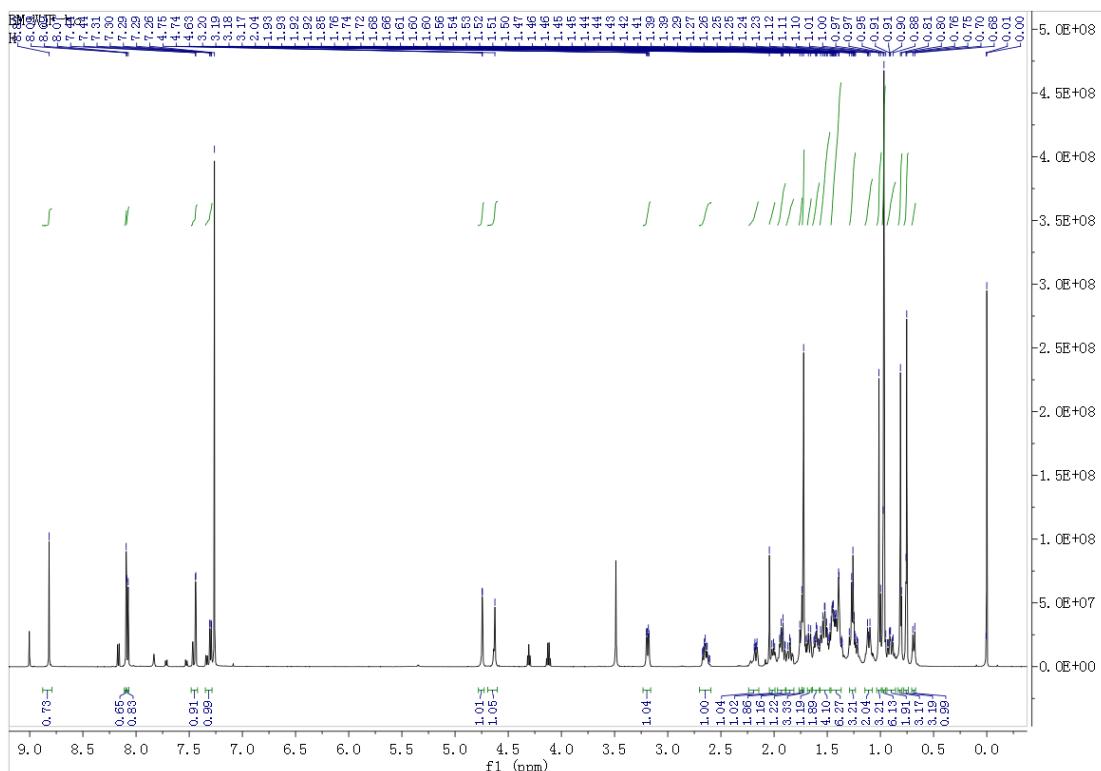


Figure S29. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7j**.

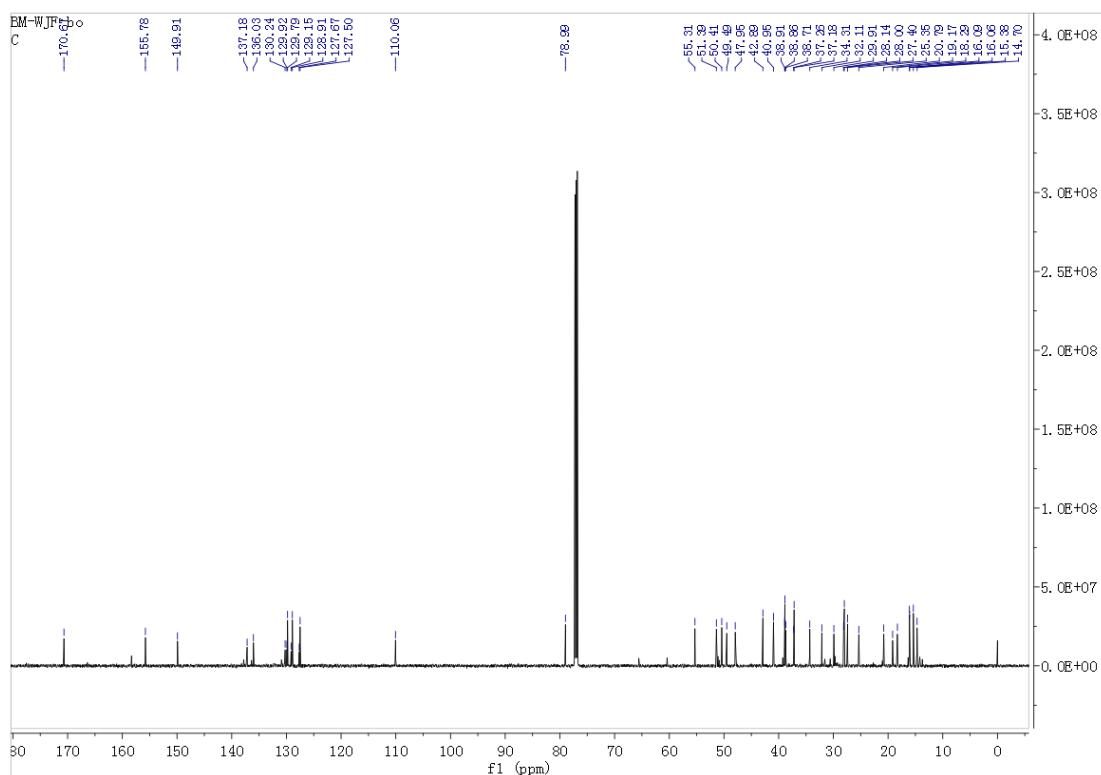


Figure S30. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7j**.

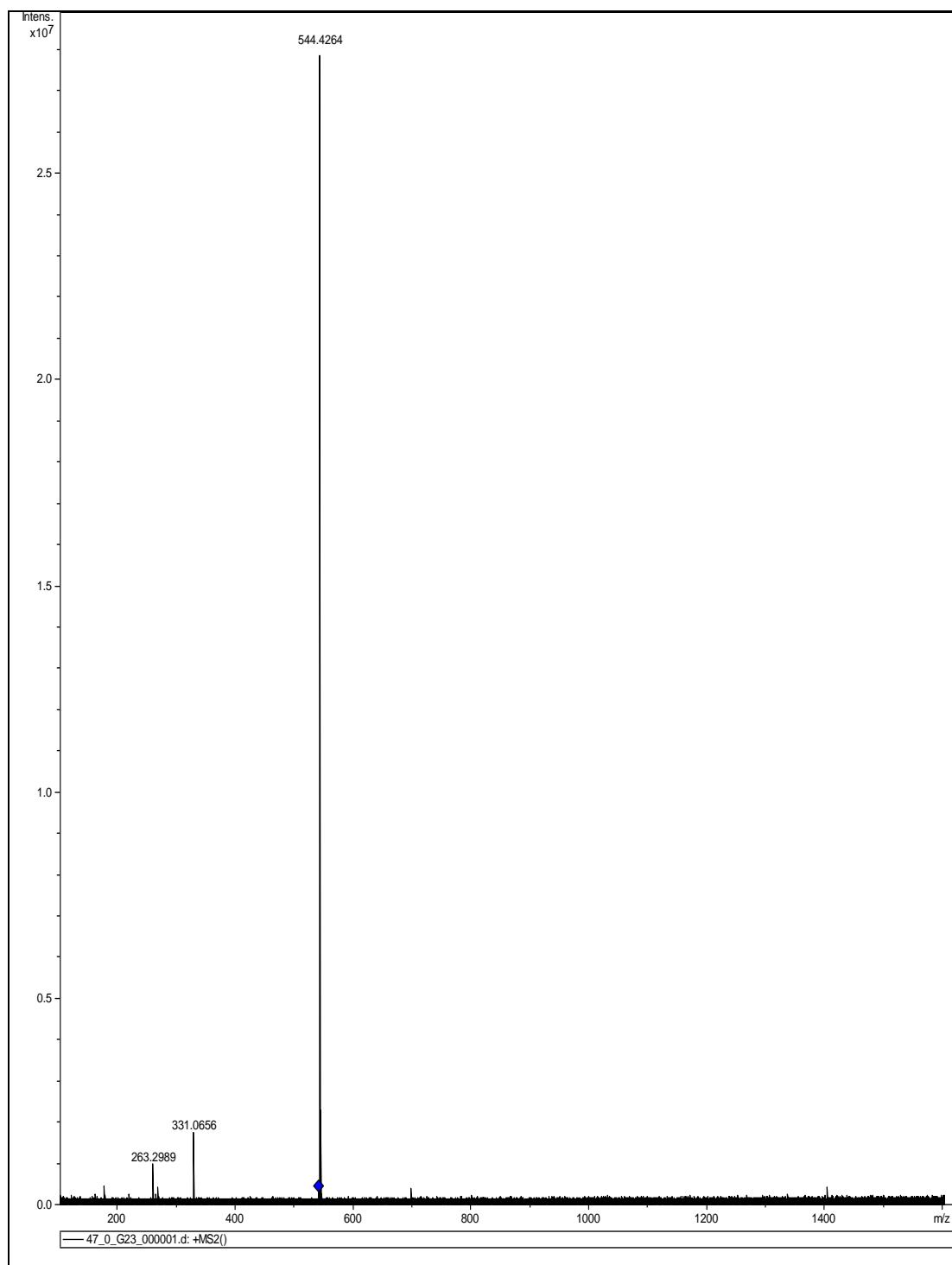


Figure S31. High resolution mass spectrum of compound **7k**.

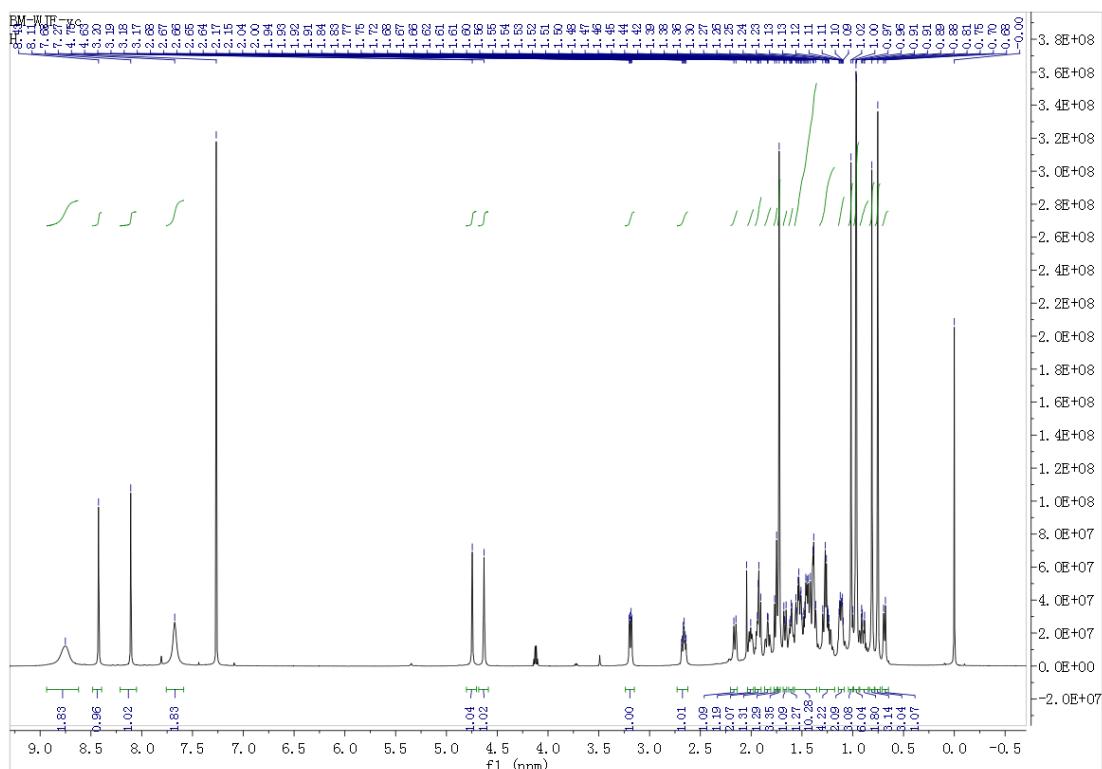


Figure S32. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7k**.

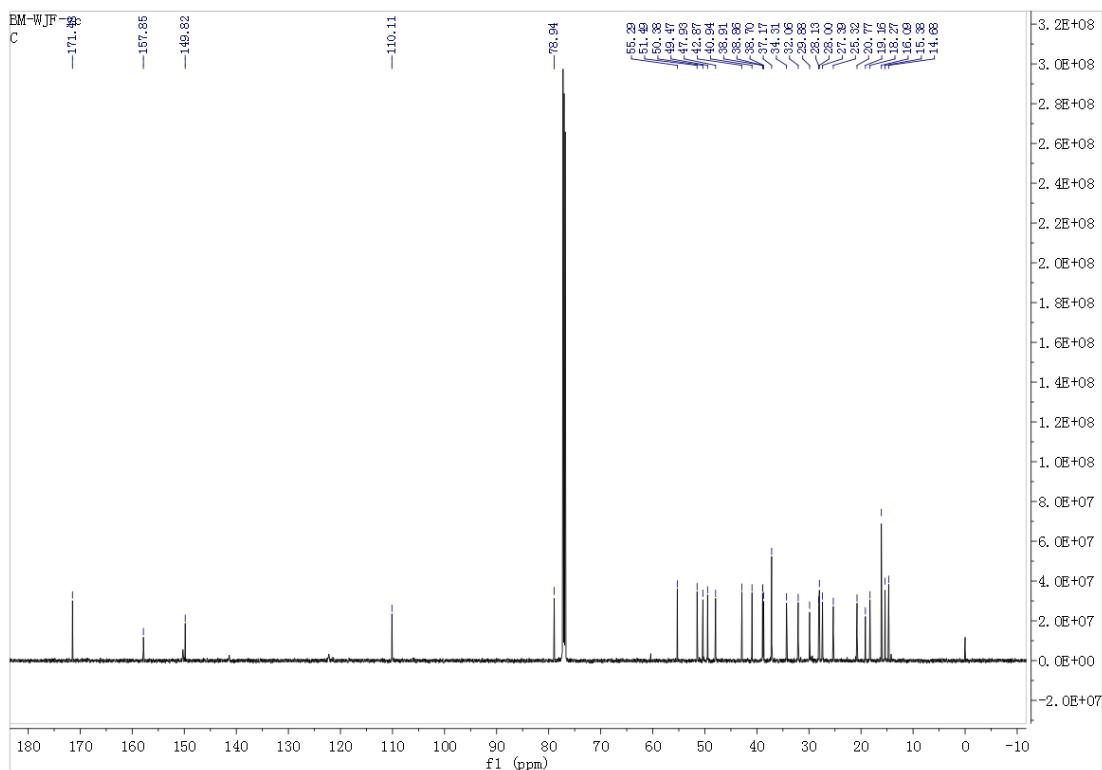


Figure S33. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7k**.

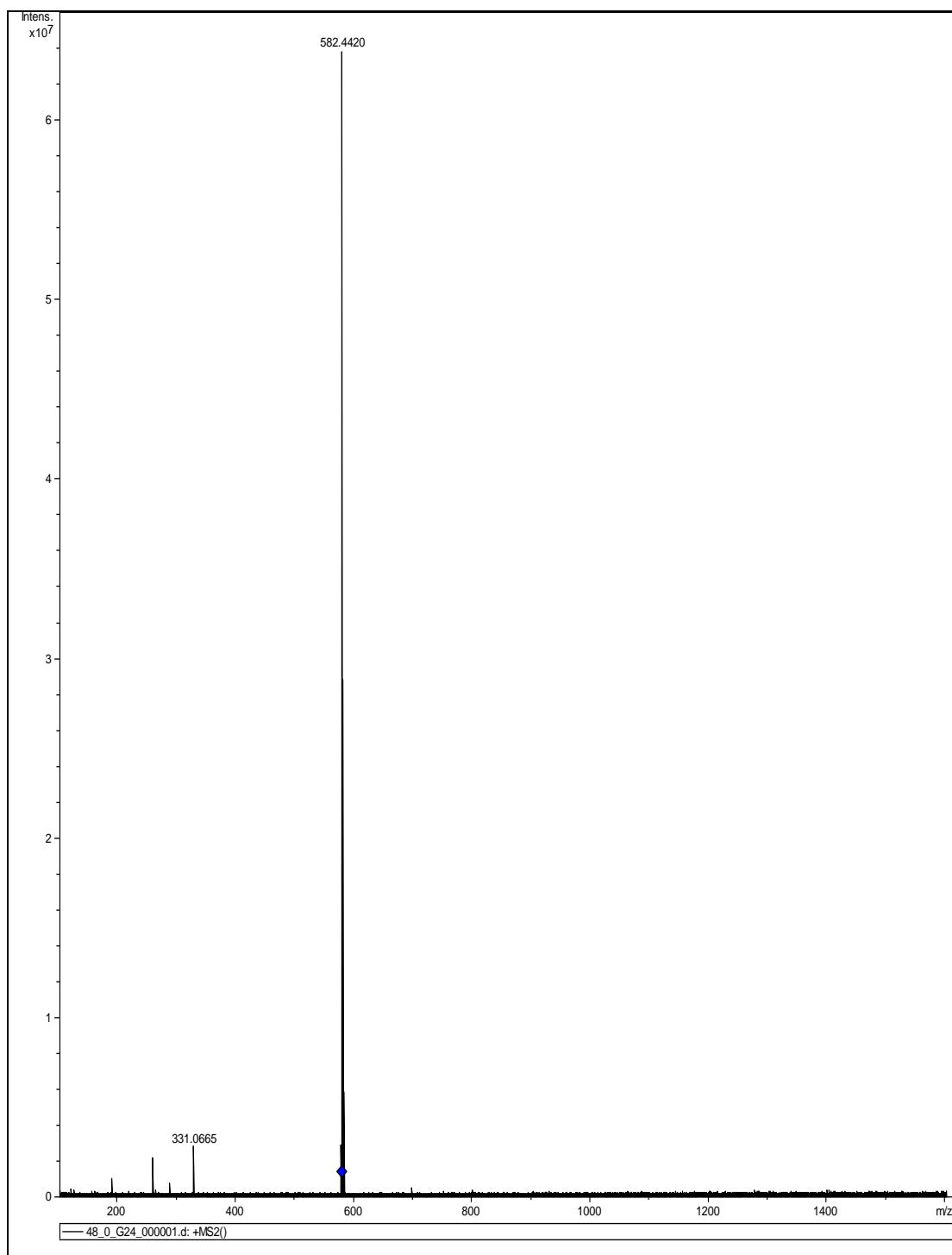


Figure S34. High resolution mass spectrum of compound **7l**.

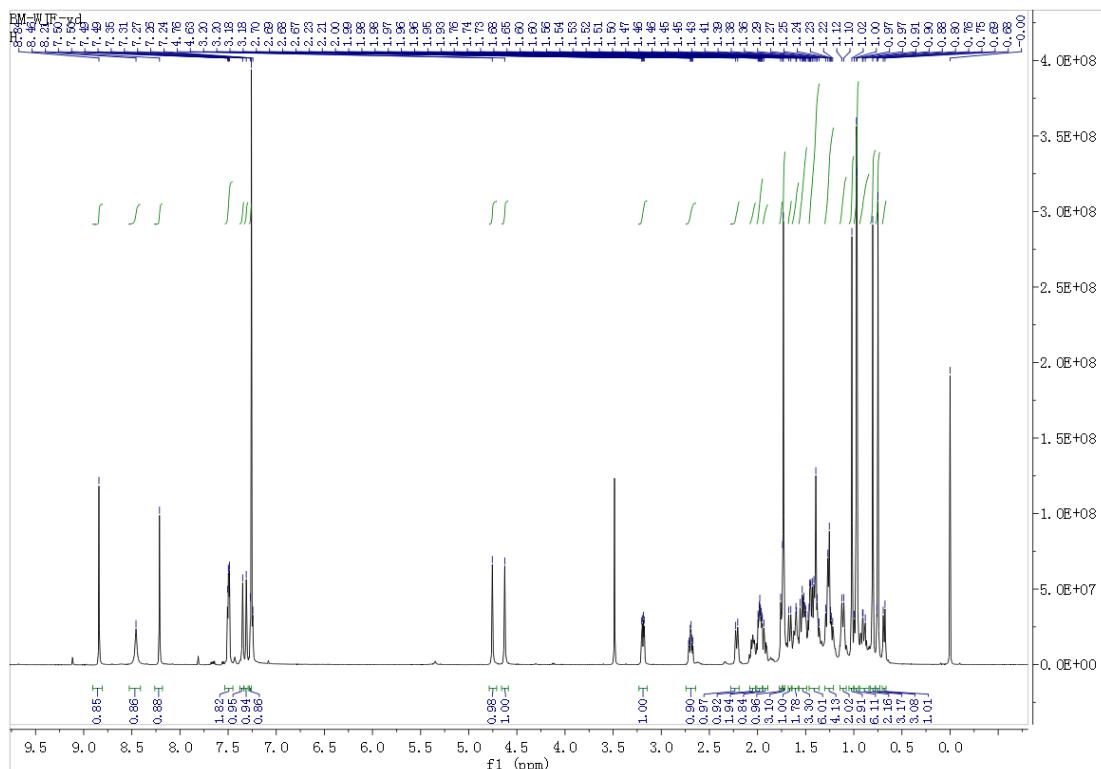


Figure S35. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7l**.

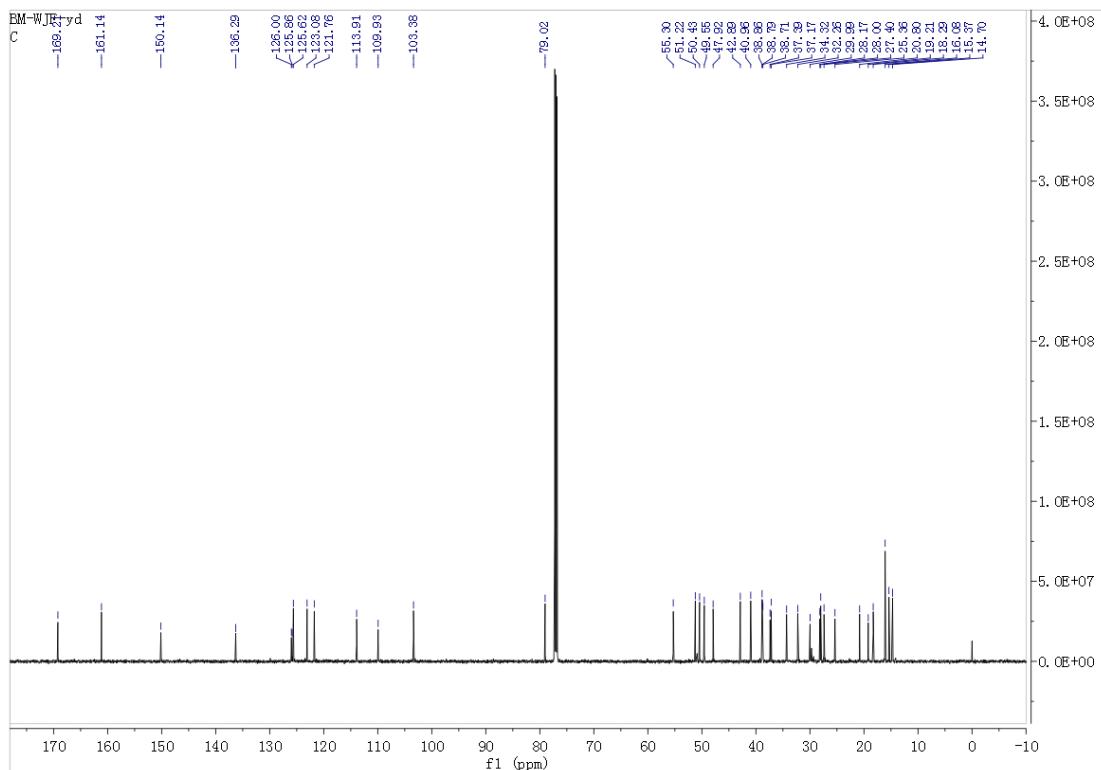


Figure S36. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7l**.

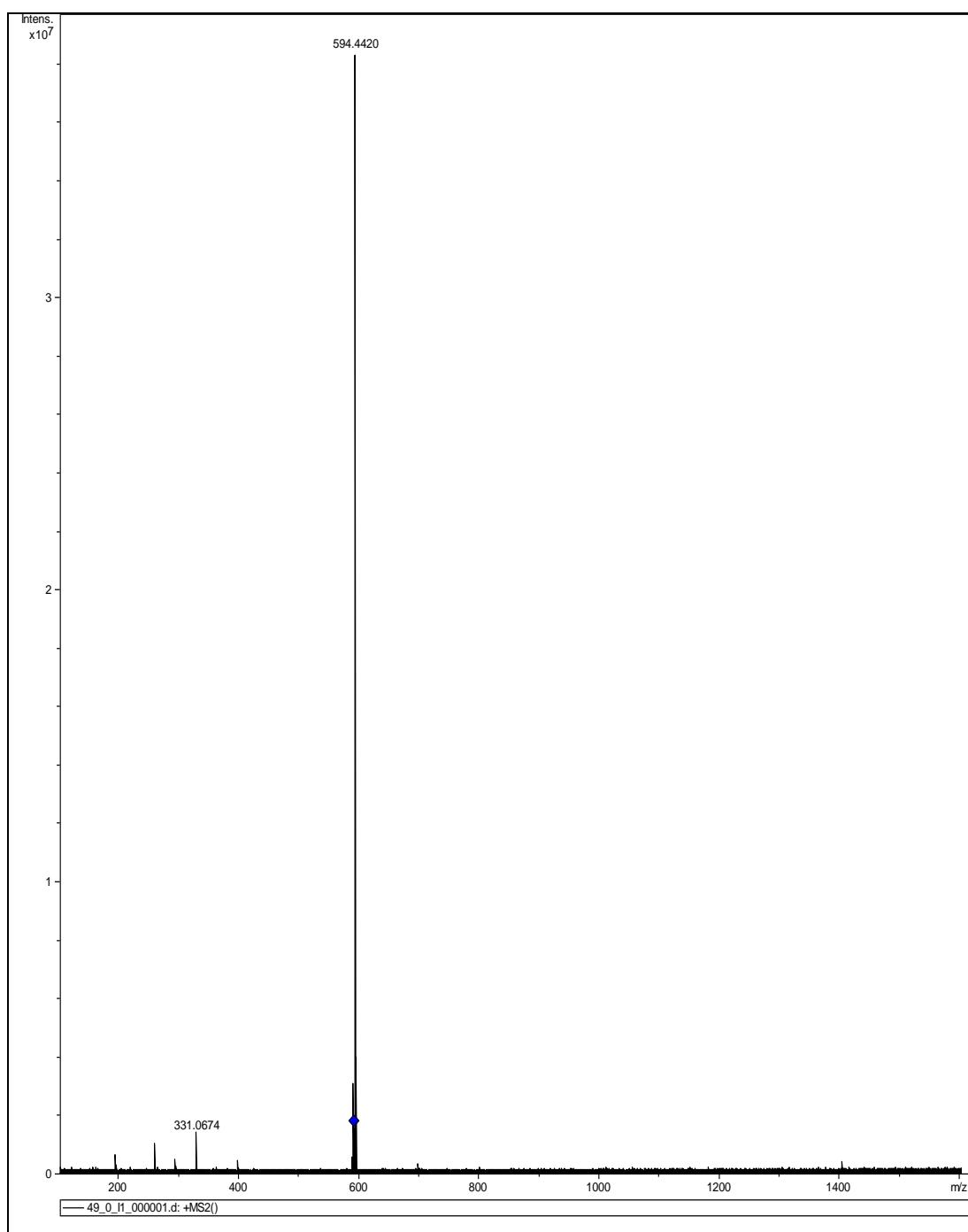


Figure S37. High resolution mass spectrum of compound **7m**.

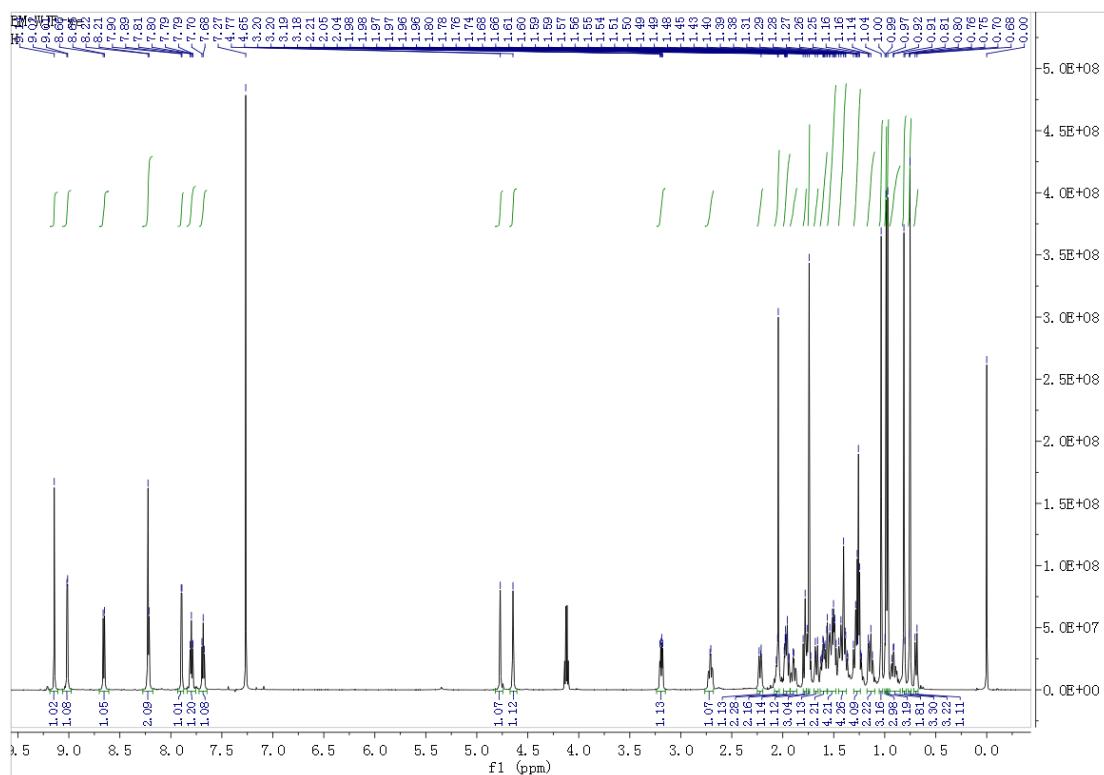


Figure S38. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7m**.

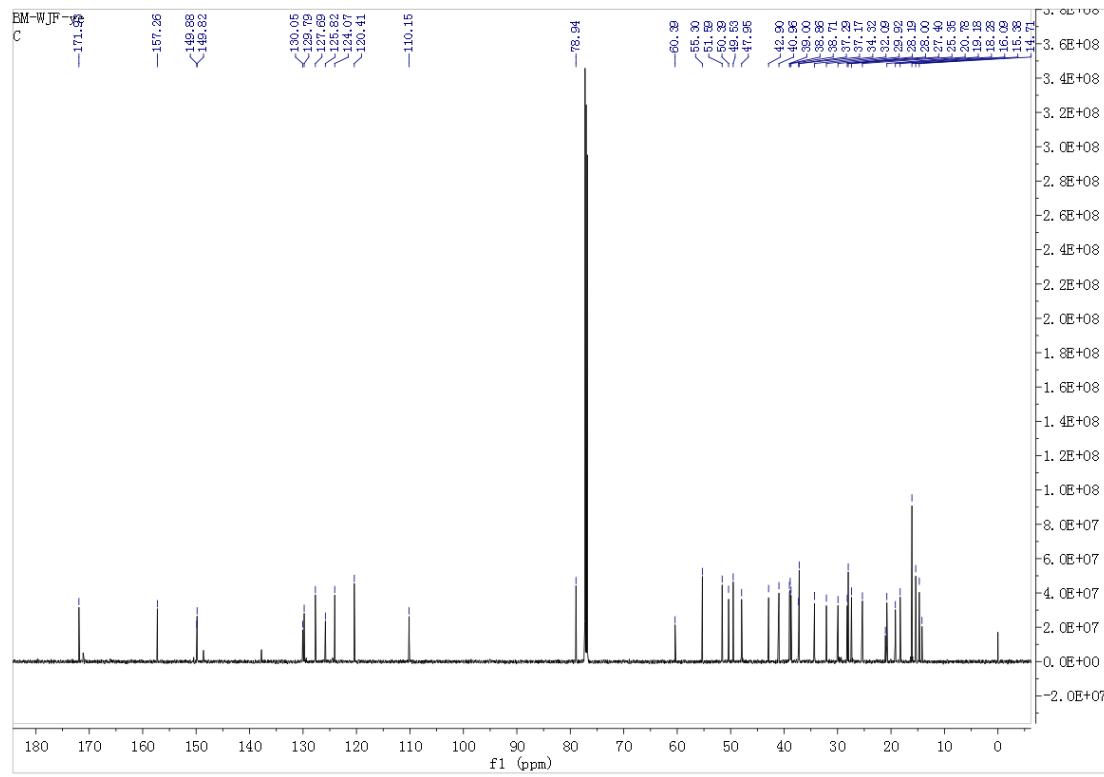


Figure S39. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7m**.

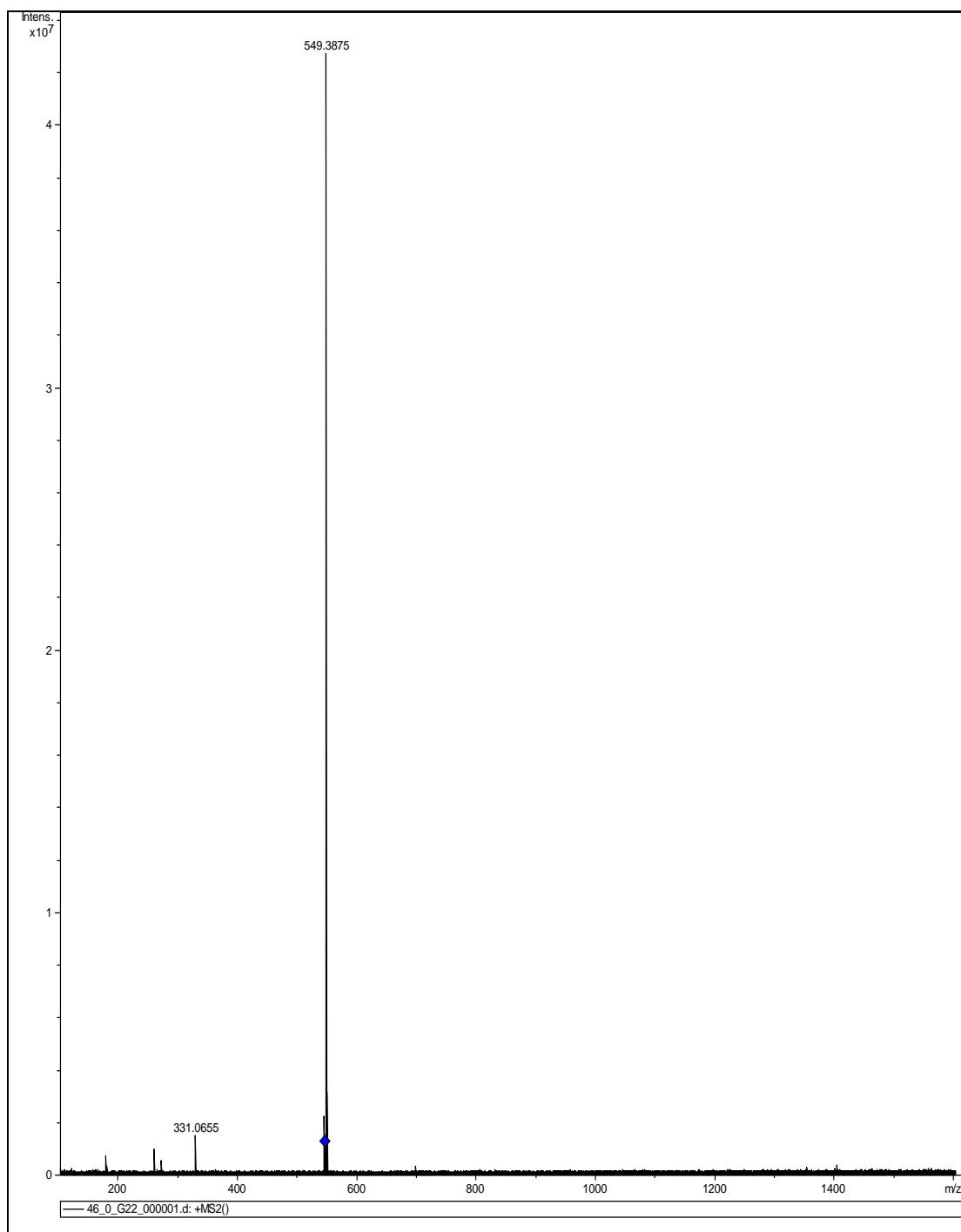


Figure S40. High resolution mass spectrum of compound **7n**.

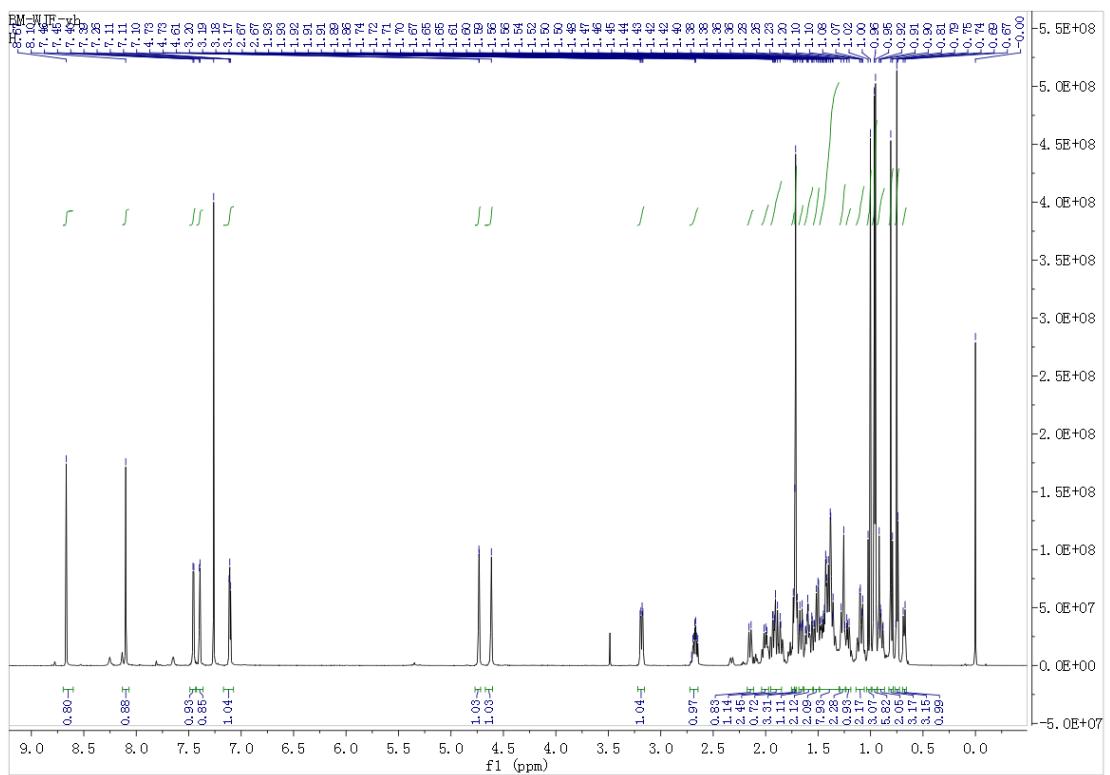


Figure S41. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7n**.

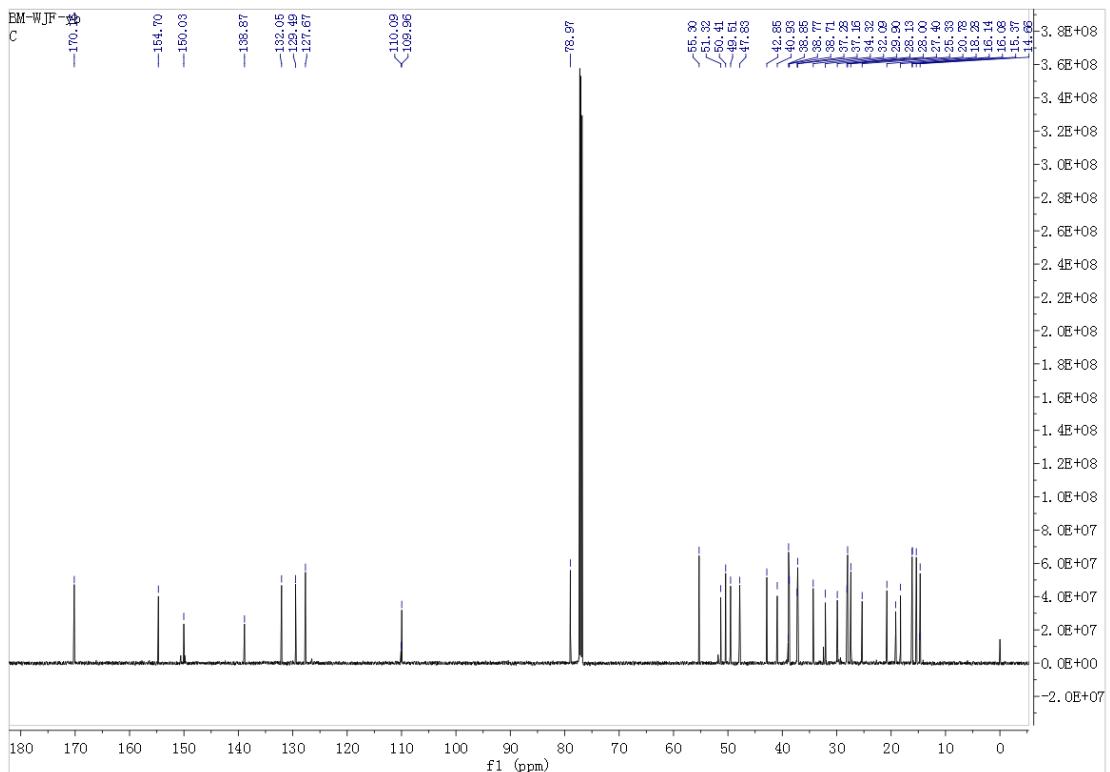


Figure S42. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7n**

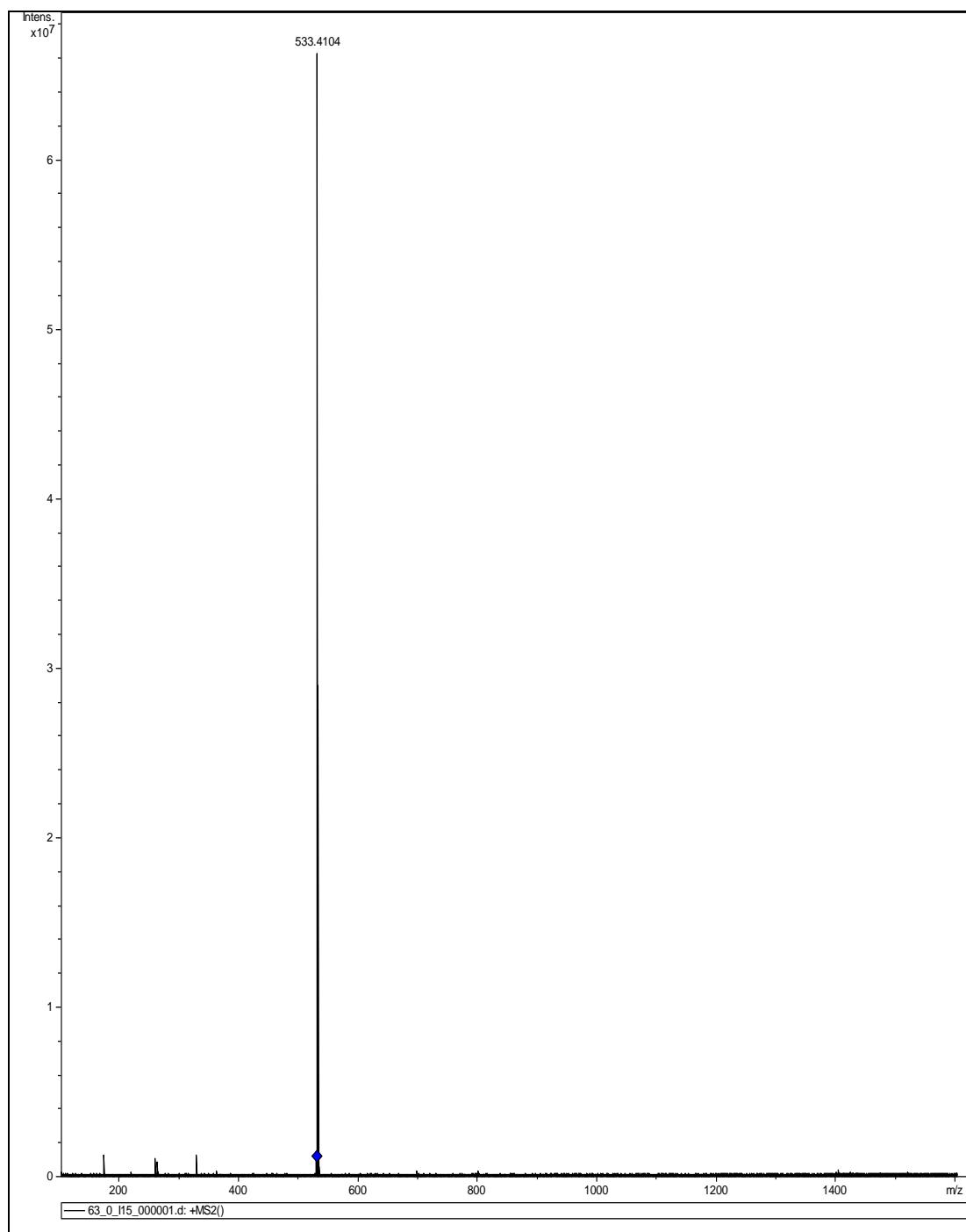


Figure S43. High resolution mass spectrum of compound **7o**.

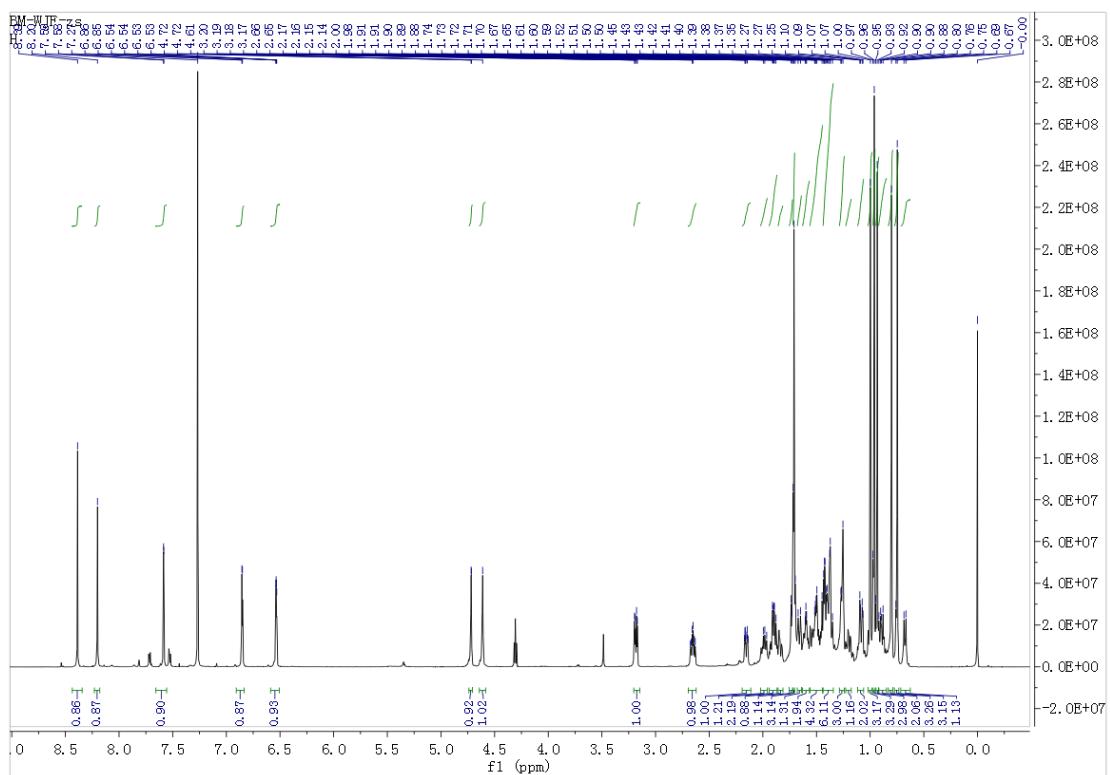


Figure S44. ^1H NMR spectrum (600 MHz, CDCl_3) of compound **7o**.

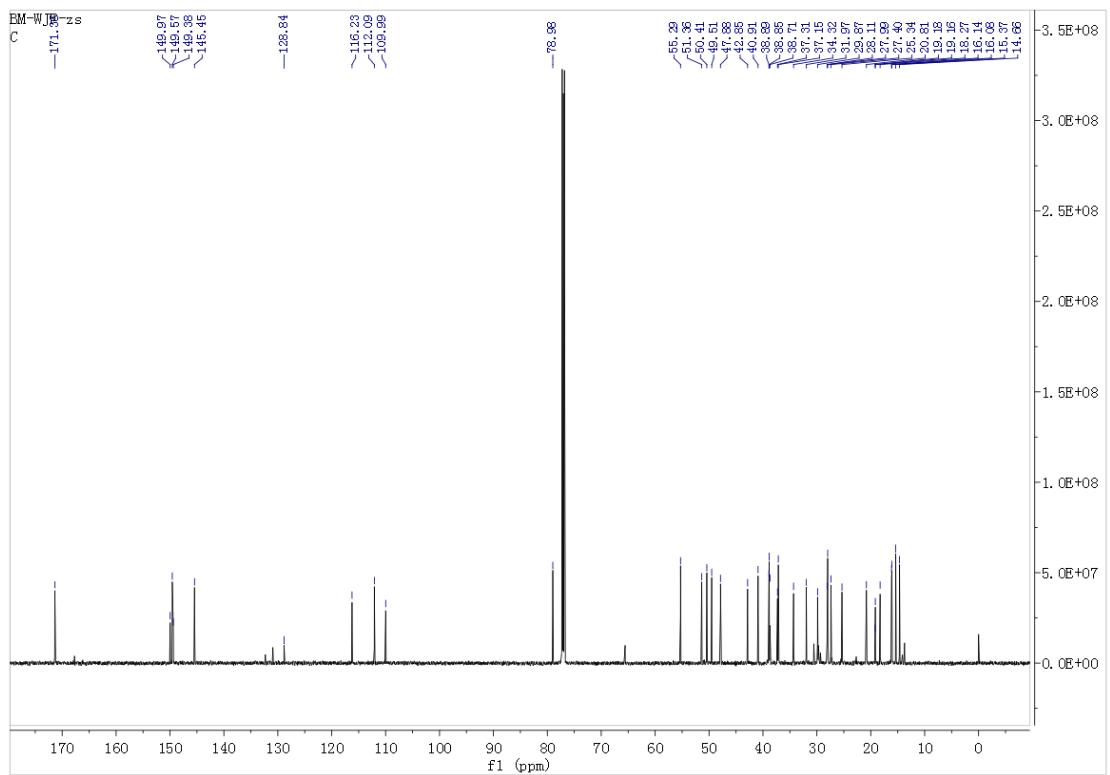


Figure S45. ^{13}C NMR spectrum (150 MHz, CDCl_3) of compound **7o**.



This is an open-access article distributed under the terms of the Creative Commons Attribution Licence.