

Metal Halide Hydrates as Lewis Acid Catalysts for the Conjugated Friedel-Crafts Reactions of Indoles and Activated Olefins

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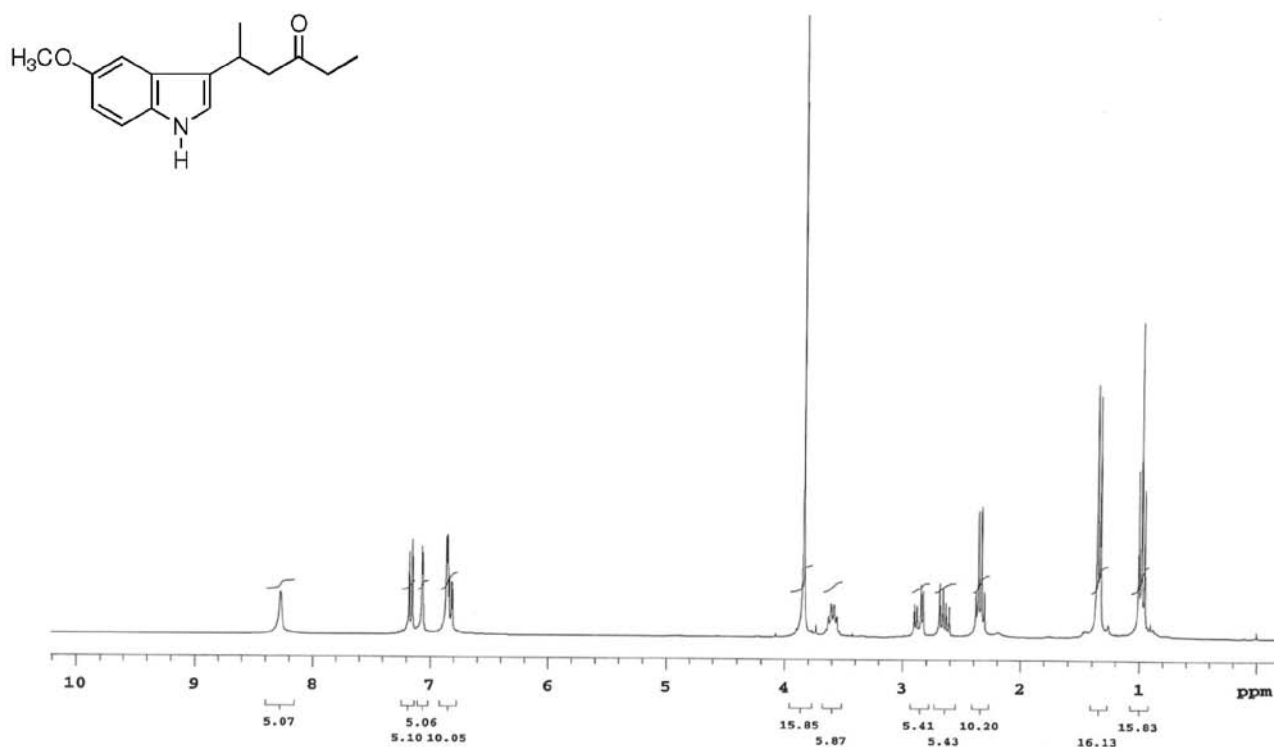


Figure S1. ¹H NMR (CDCl₃) of compound 3f.

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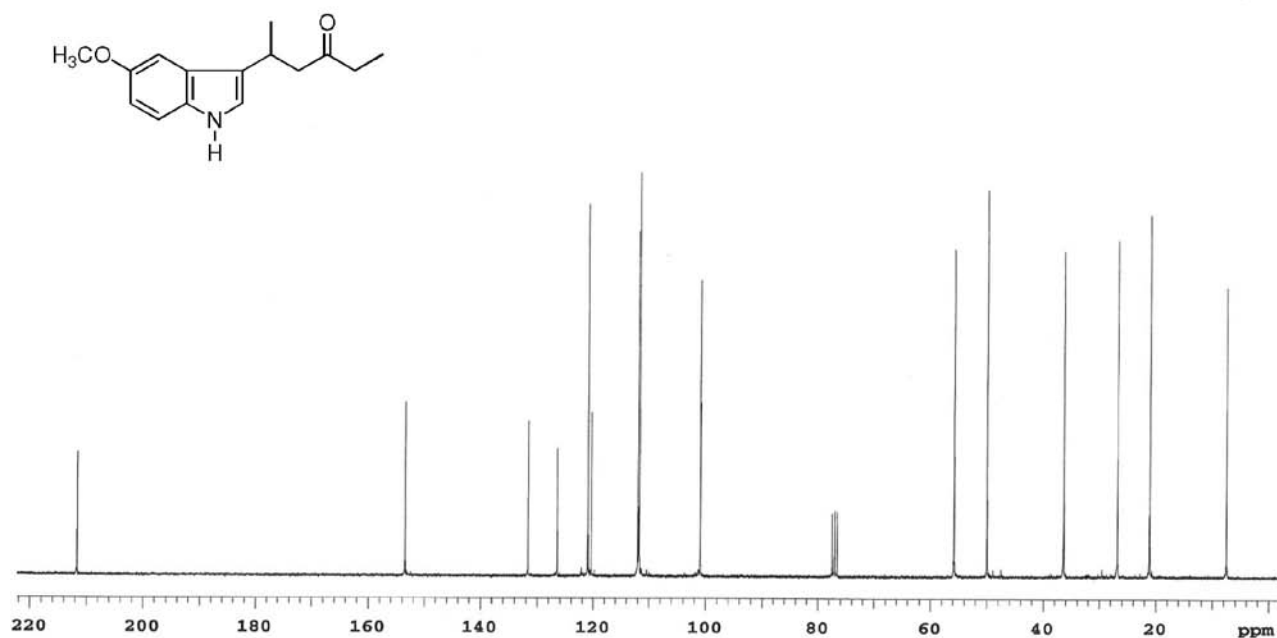


Figure S2. ¹³C NMR (CDCl₃) of compound 3f.

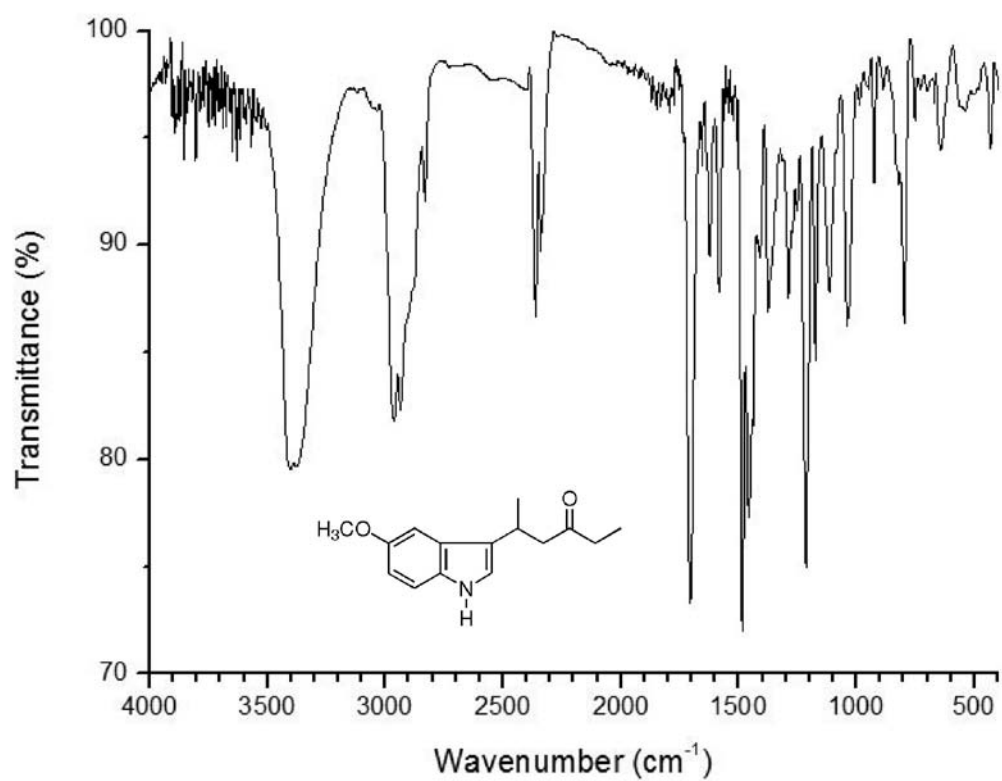


Figure S3. IR (neat) of compound 3f.

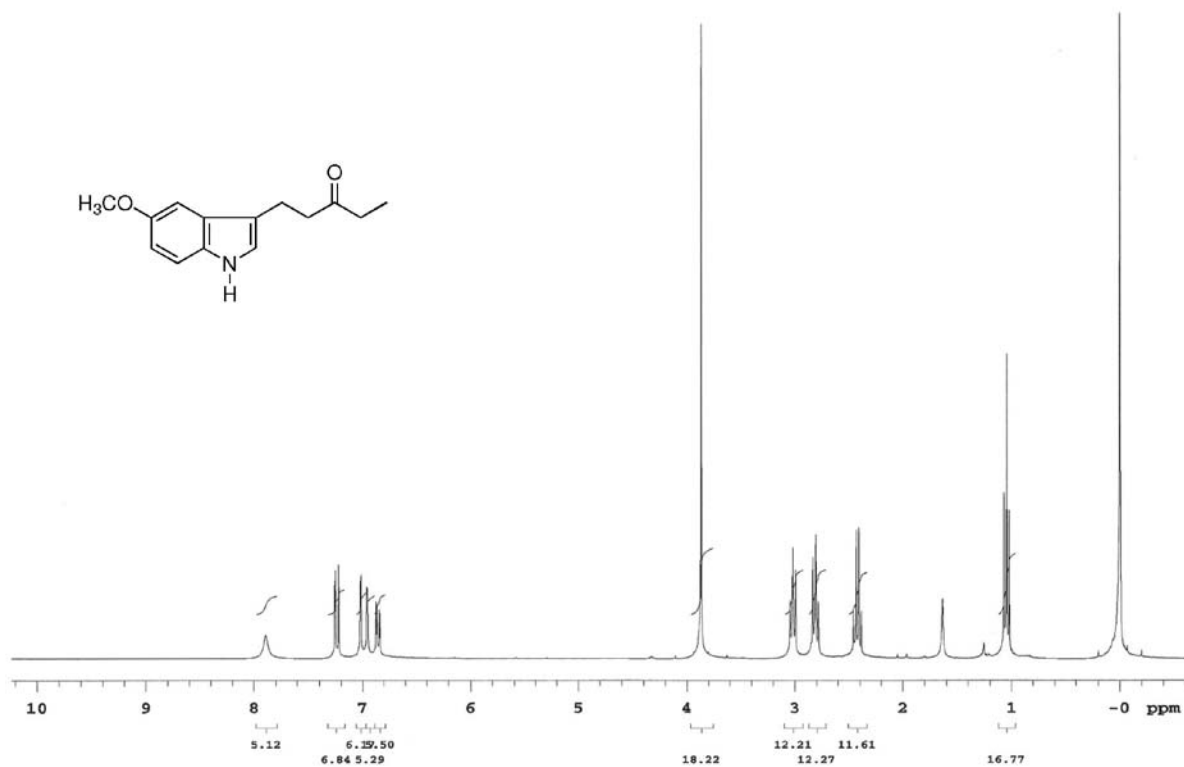


Figure S4. ¹H NMR (CDCl₃) of compound 3g

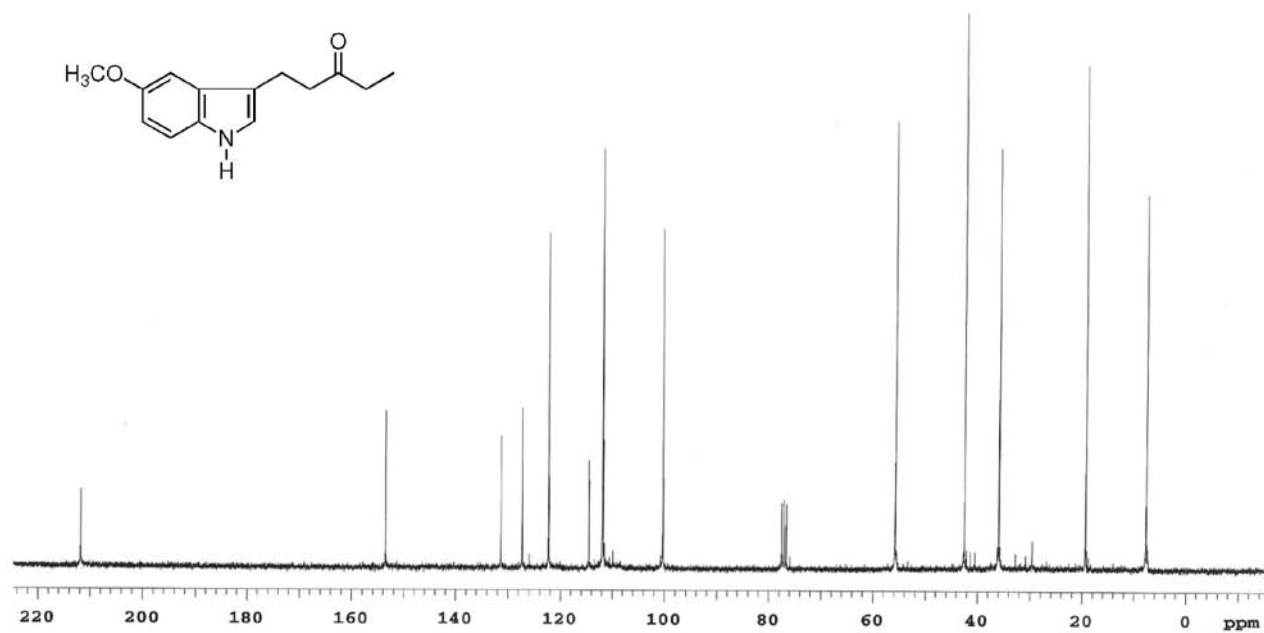


Figure S5. ¹³C NMR (CDCl₃) of compound 3g

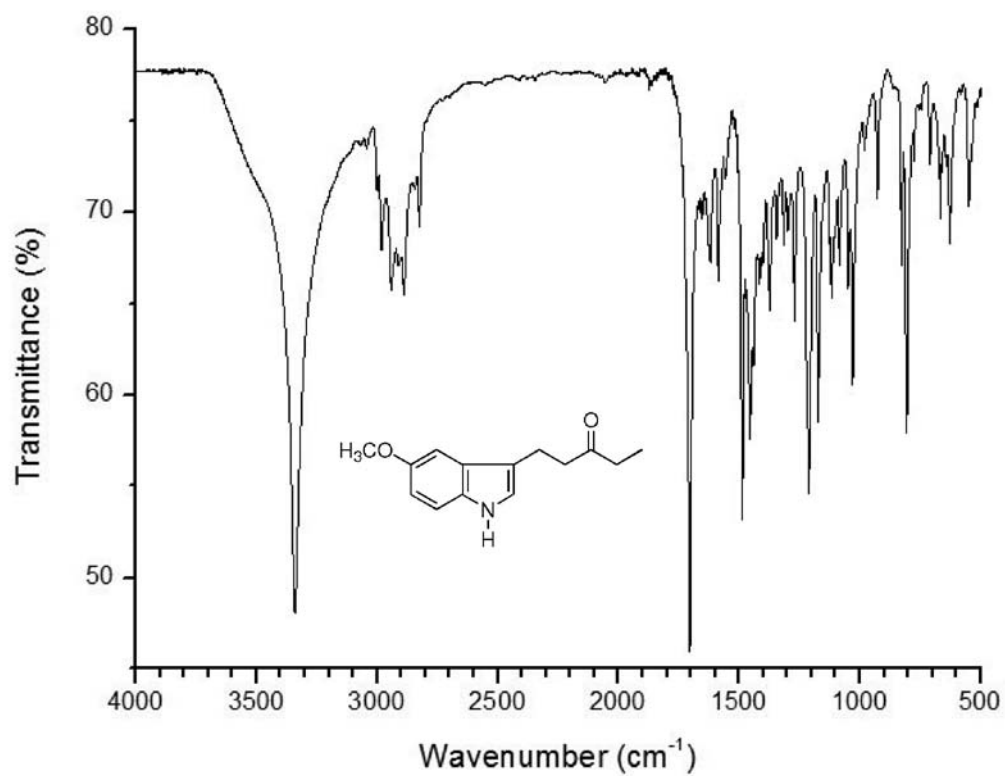


Figure S6. IR (KBr) of compound **3g**.

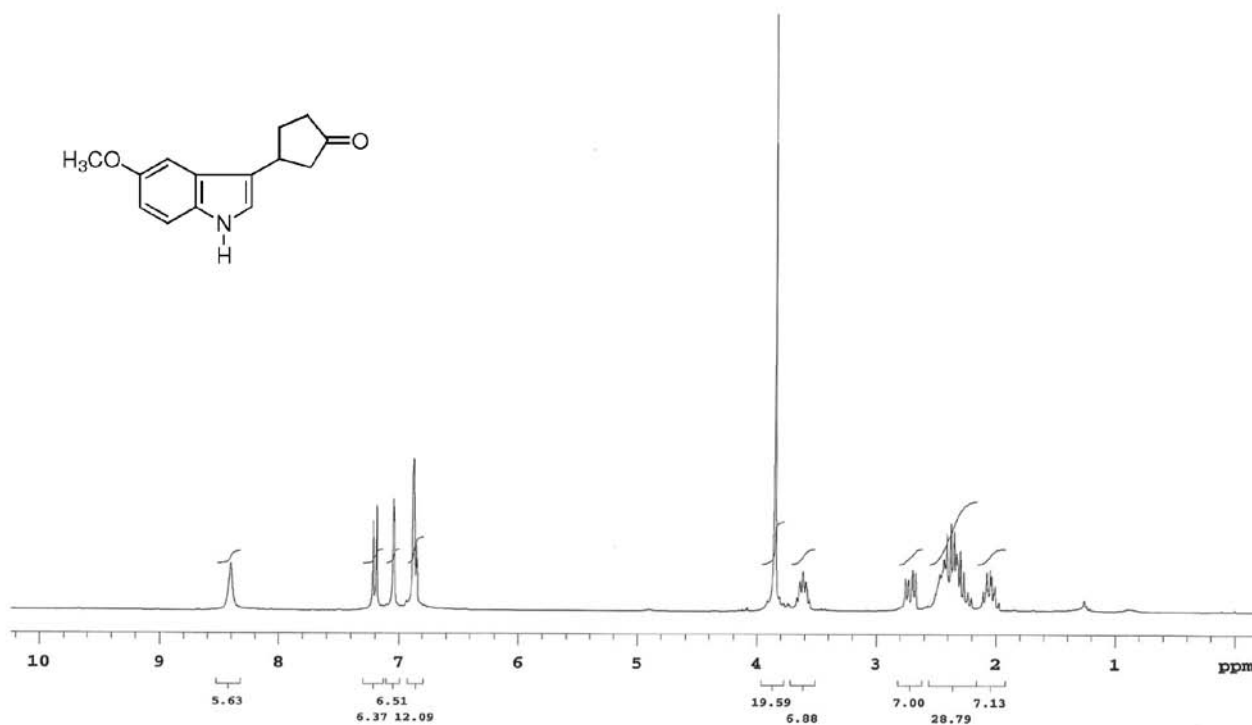


Figure S7. ^1H NMR (CDCl_3) of compound **3i**.

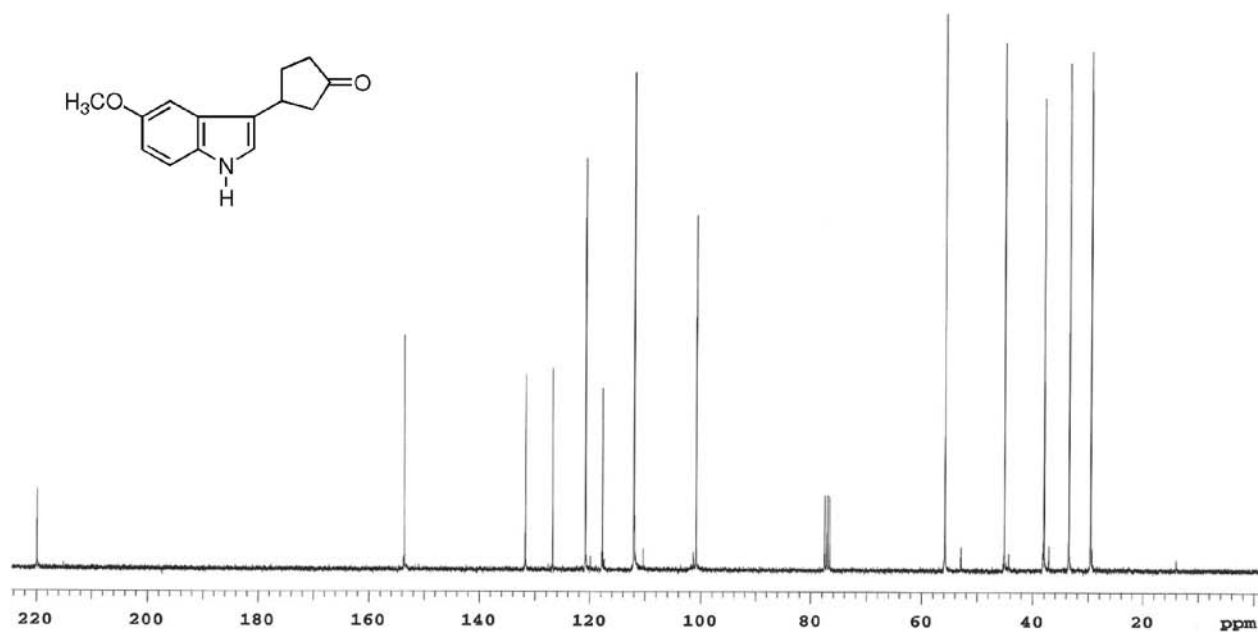


Figure S8. ^{13}C NMR (CDCl_3) of compound **3i**

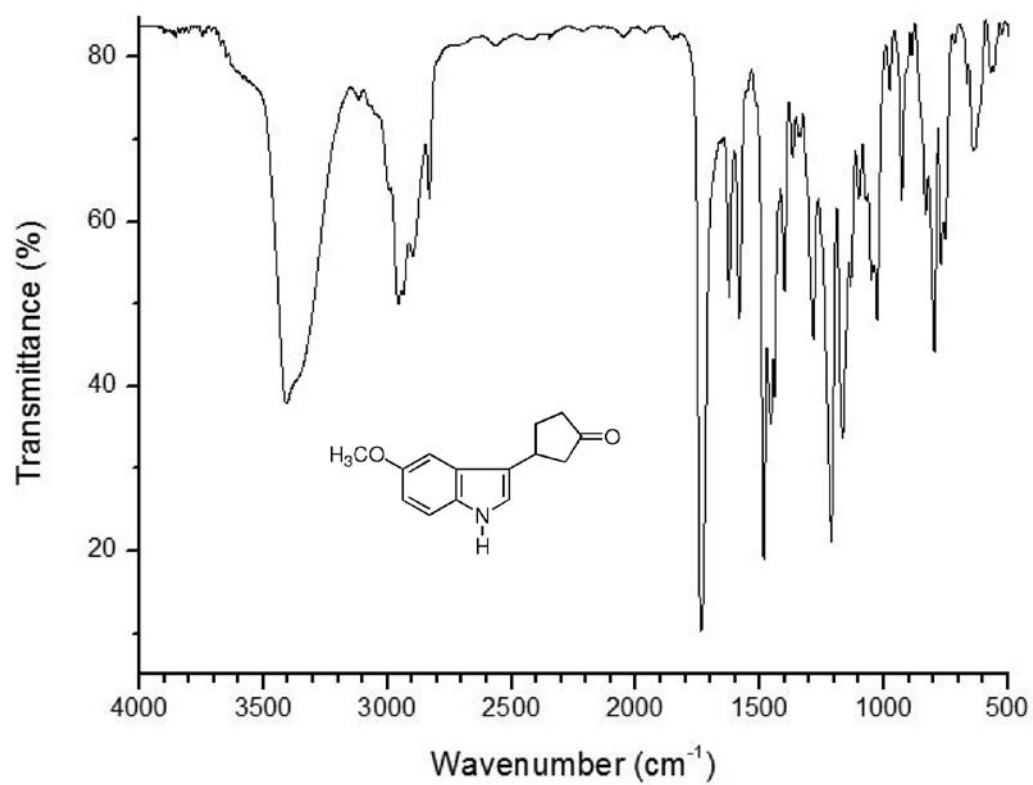


Figure S9. IR (neat) of compound **3i**.

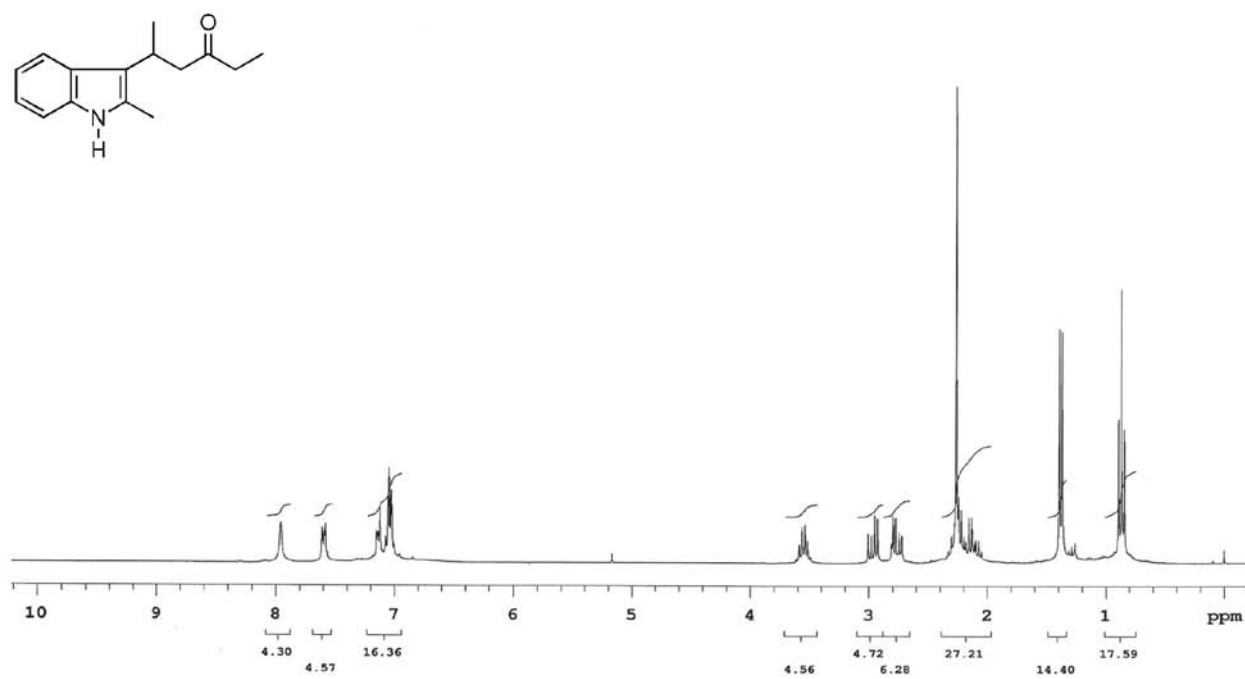


Figure S10. ¹H NMR (CDCl₃) of compound **3k**.

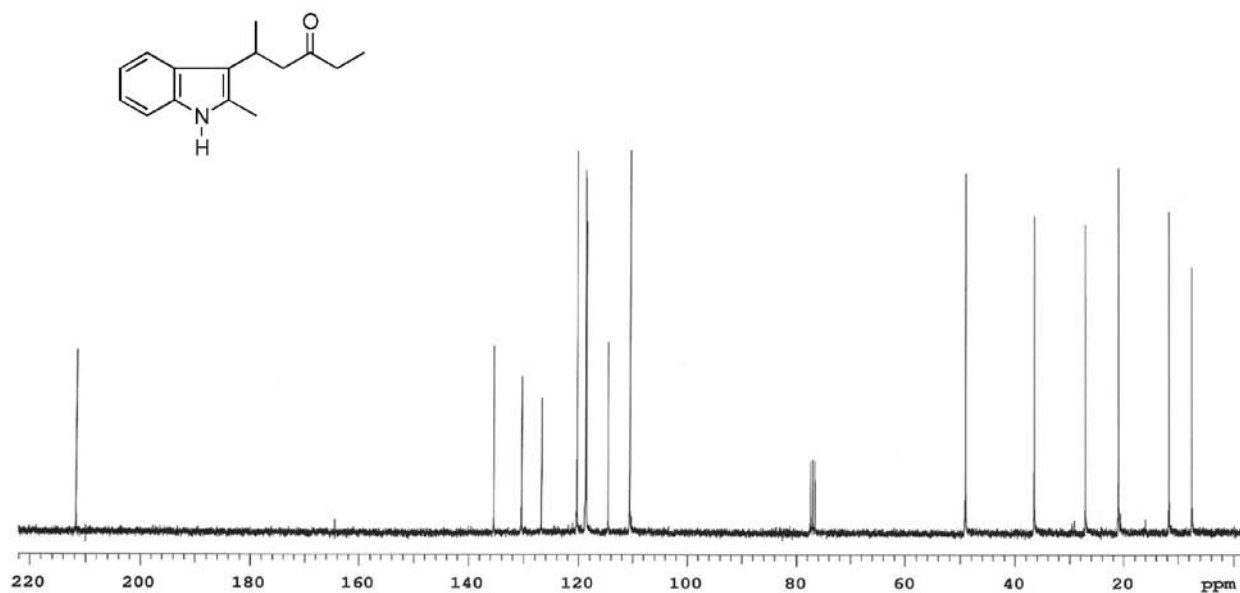
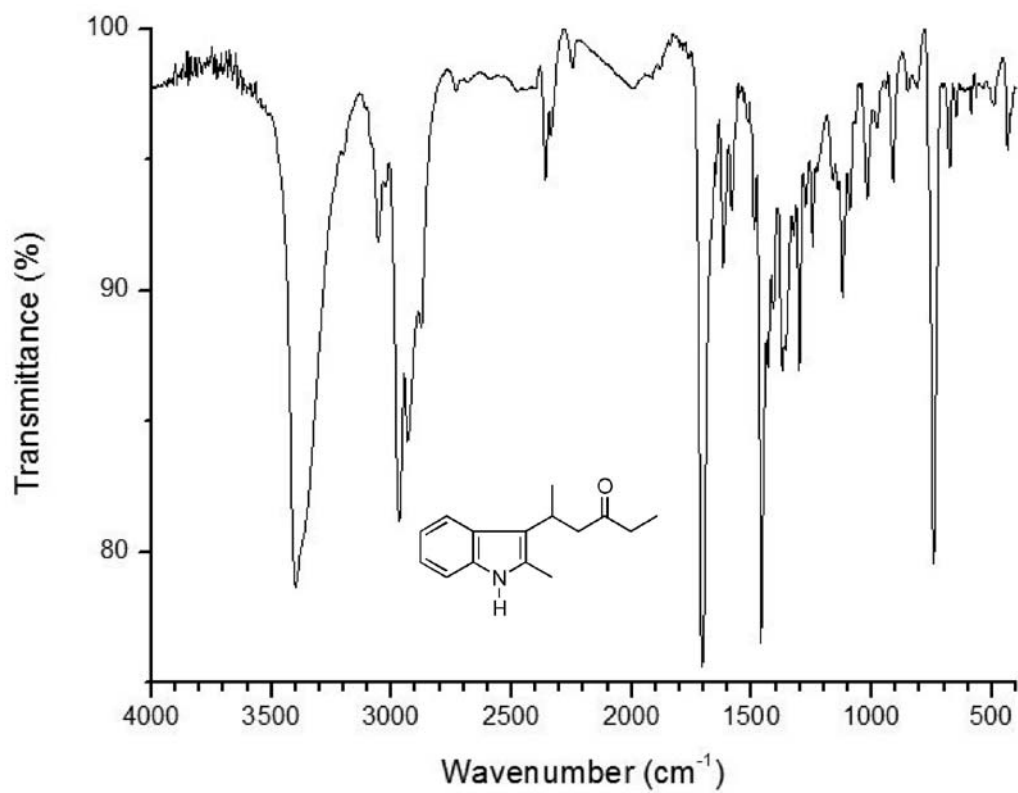
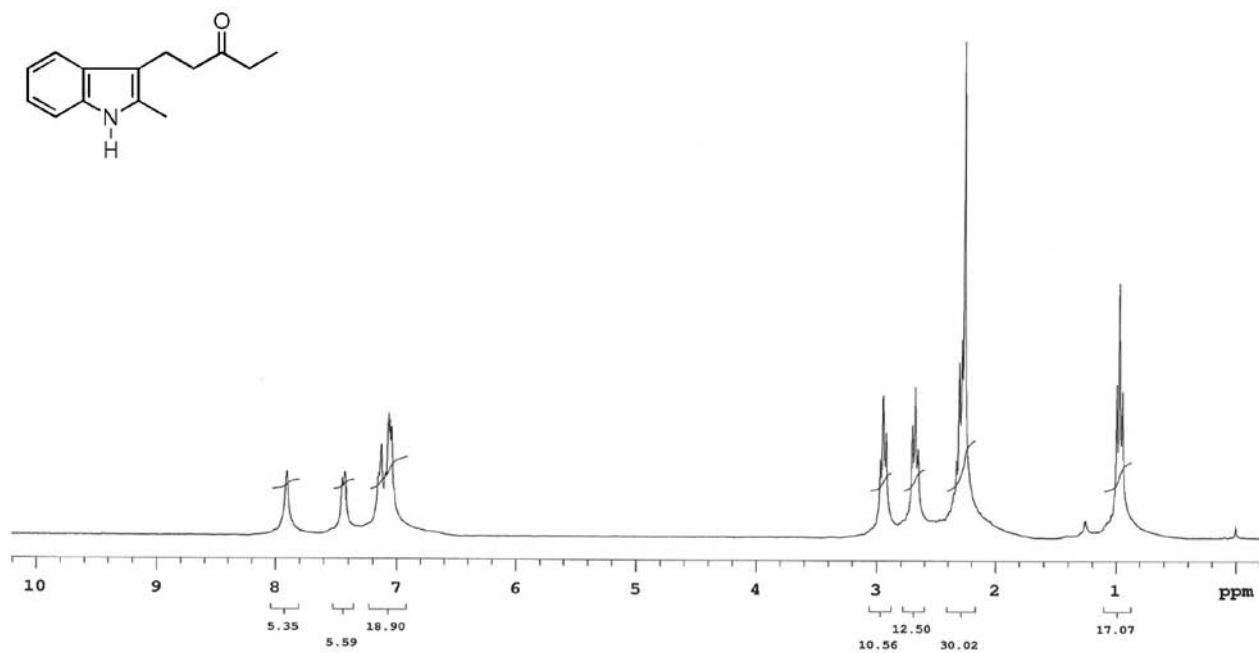


Figure S11. ¹³C NMR (CDCl₃) of compound **3k**.

**Figure S12.** IR (neat) of compound **3k**.**Figure S13.** ^1H NMR (CDCl_3) of compound **3l**.

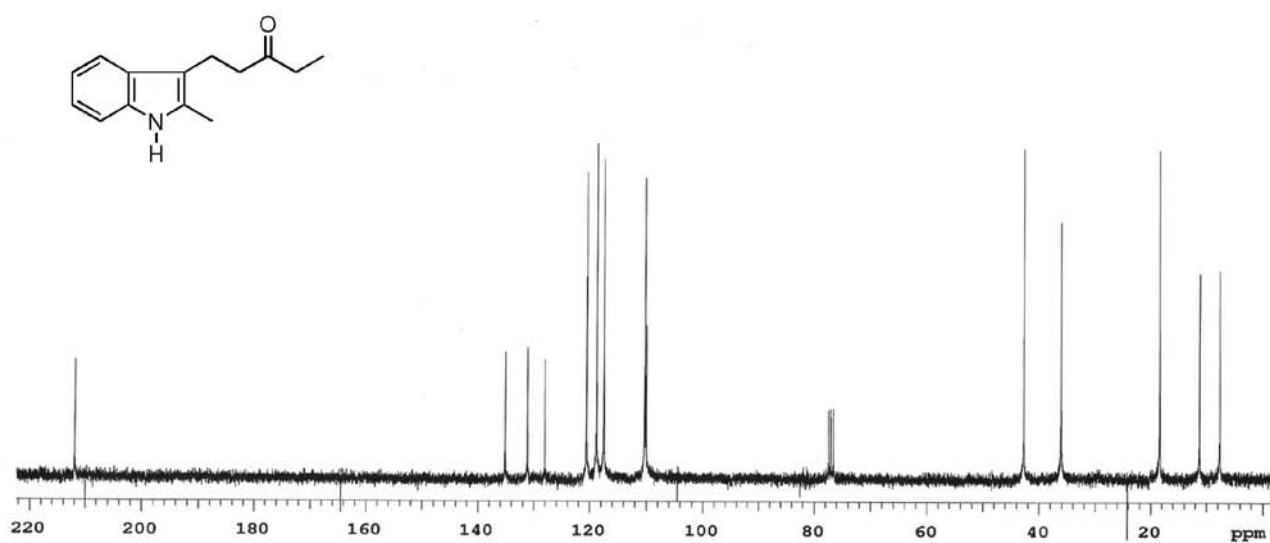


Figure S14. ^{13}C NMR (CDCl_3) of compound **3l**.

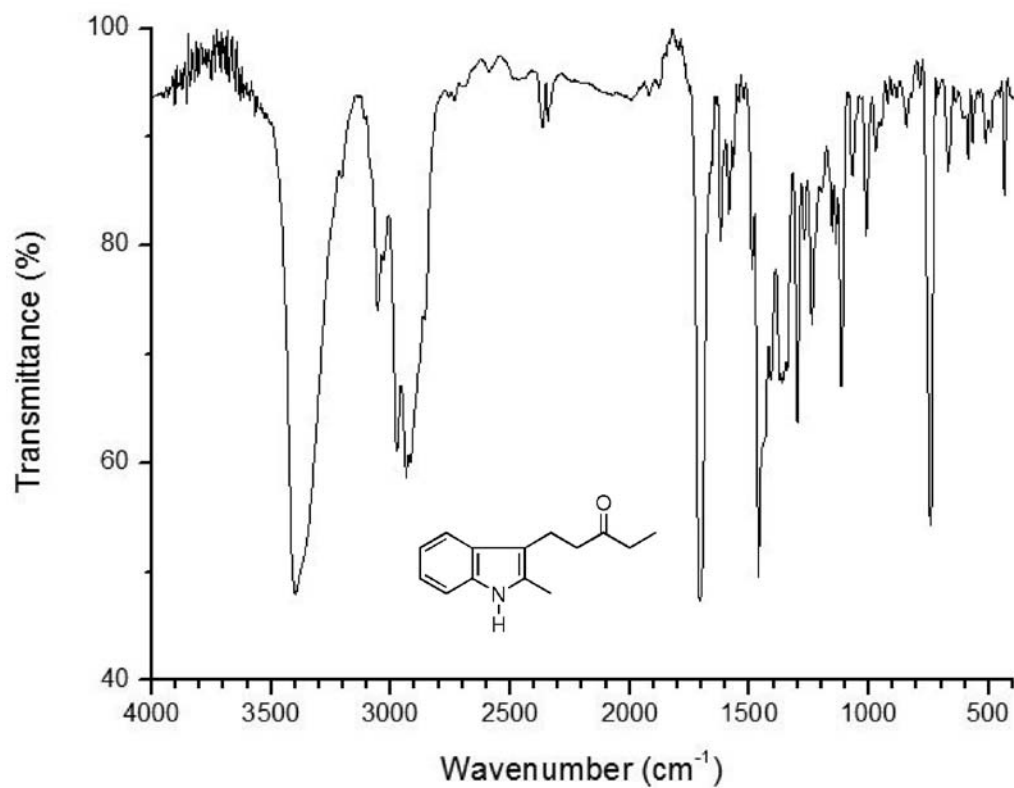


Figure S15. IR (neat) of compound **3l**.

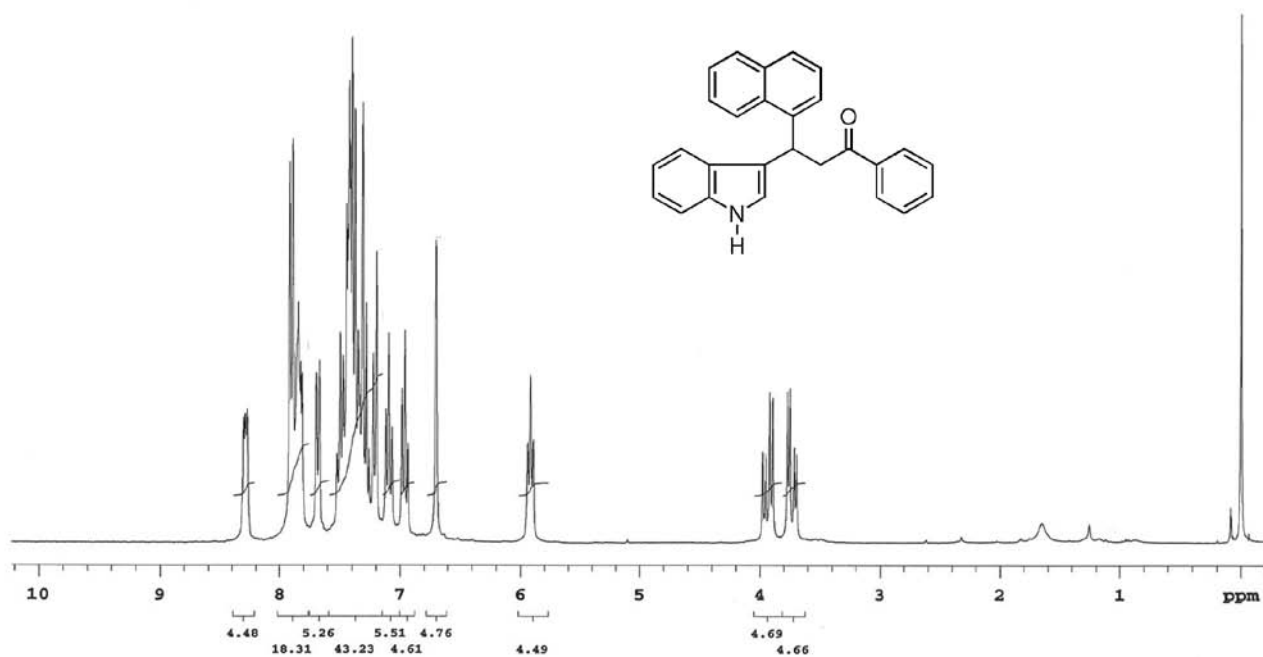


Figure S16. ¹H NMR (CDCl₃) of compound 3s.

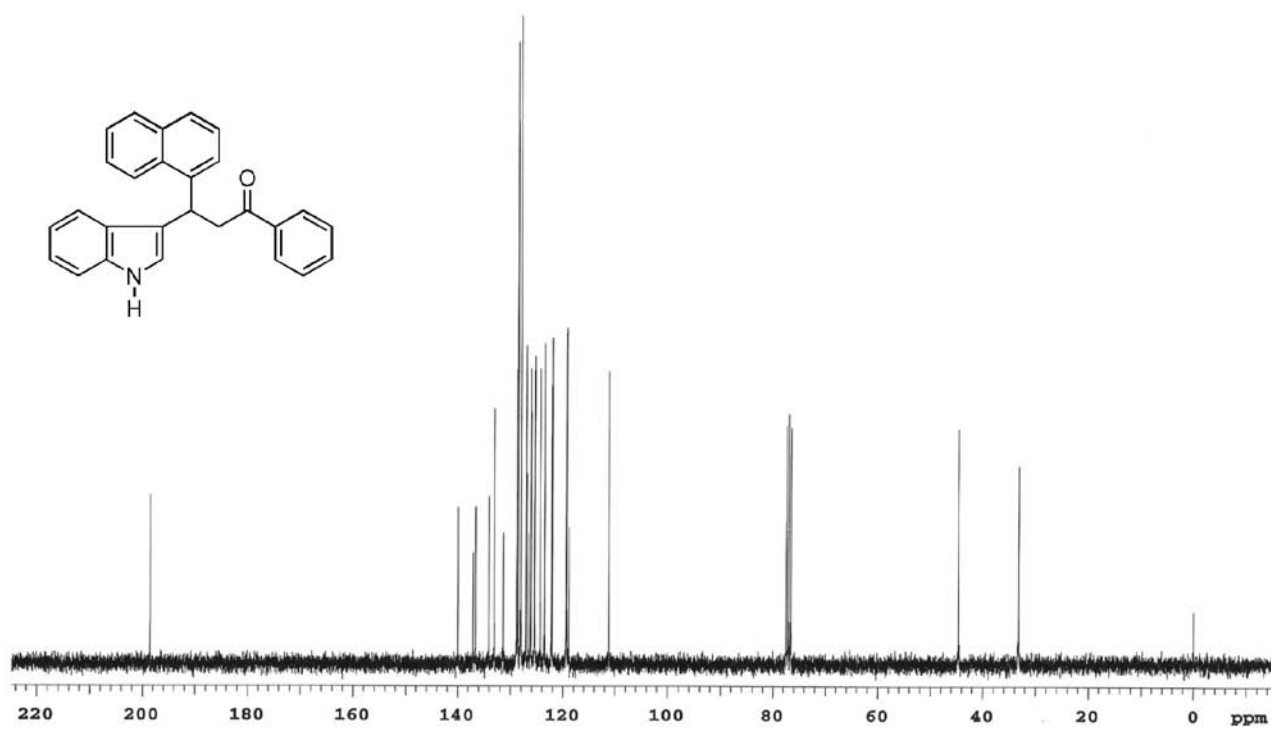


Figure S17. ¹³C NMR (CDCl₃) of compound 3s.

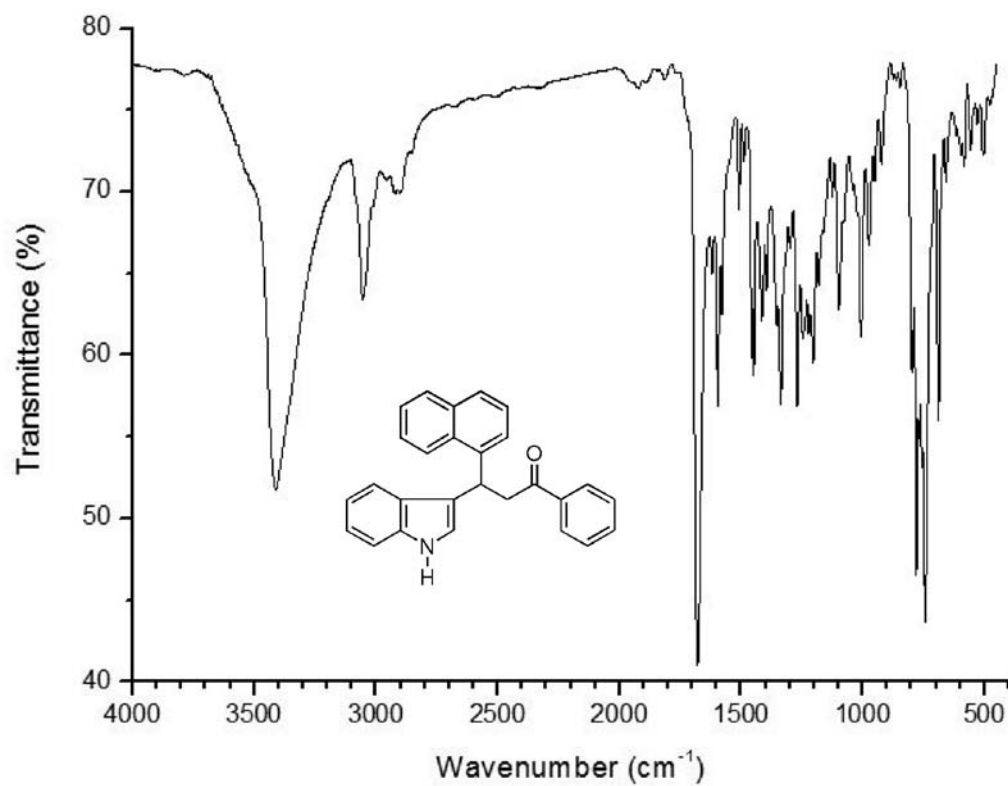


Figure S18. IR (KBr) of compound 3s.

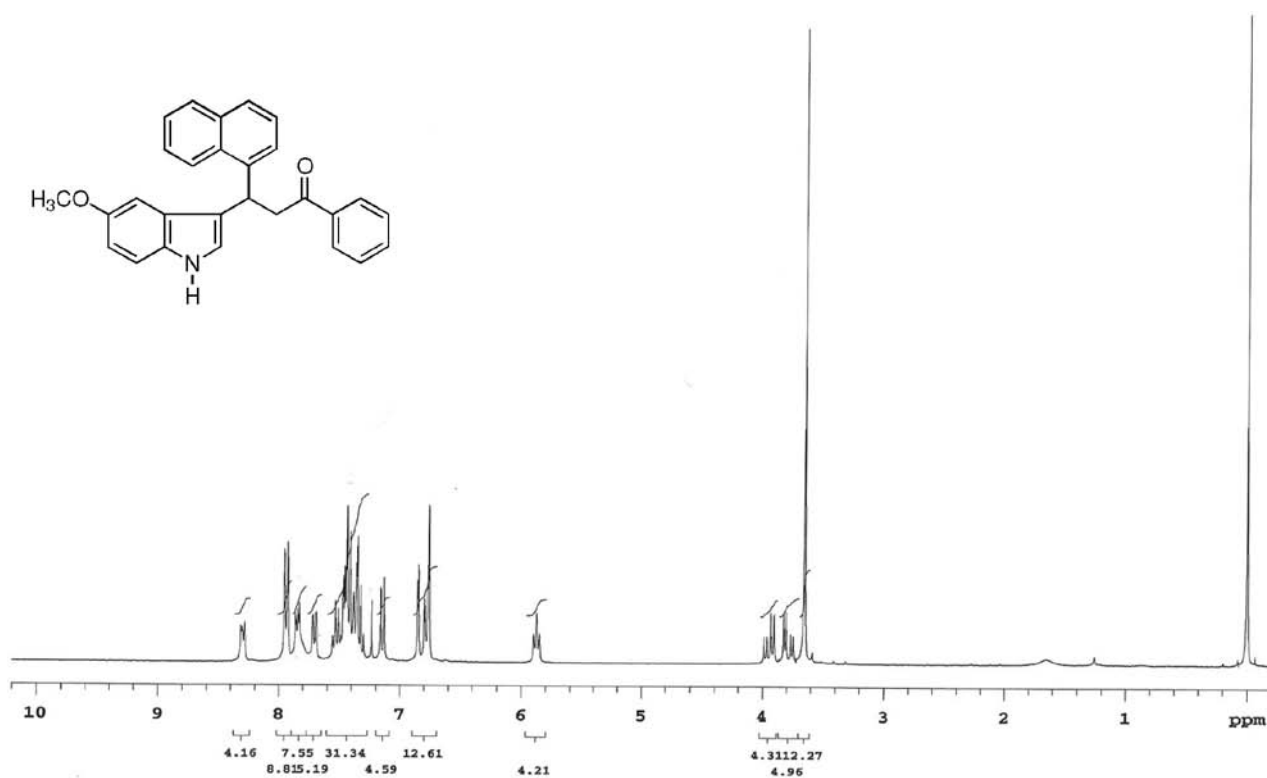


Figure S19. ^1H NMR (CDCl_3) of compound 3w.

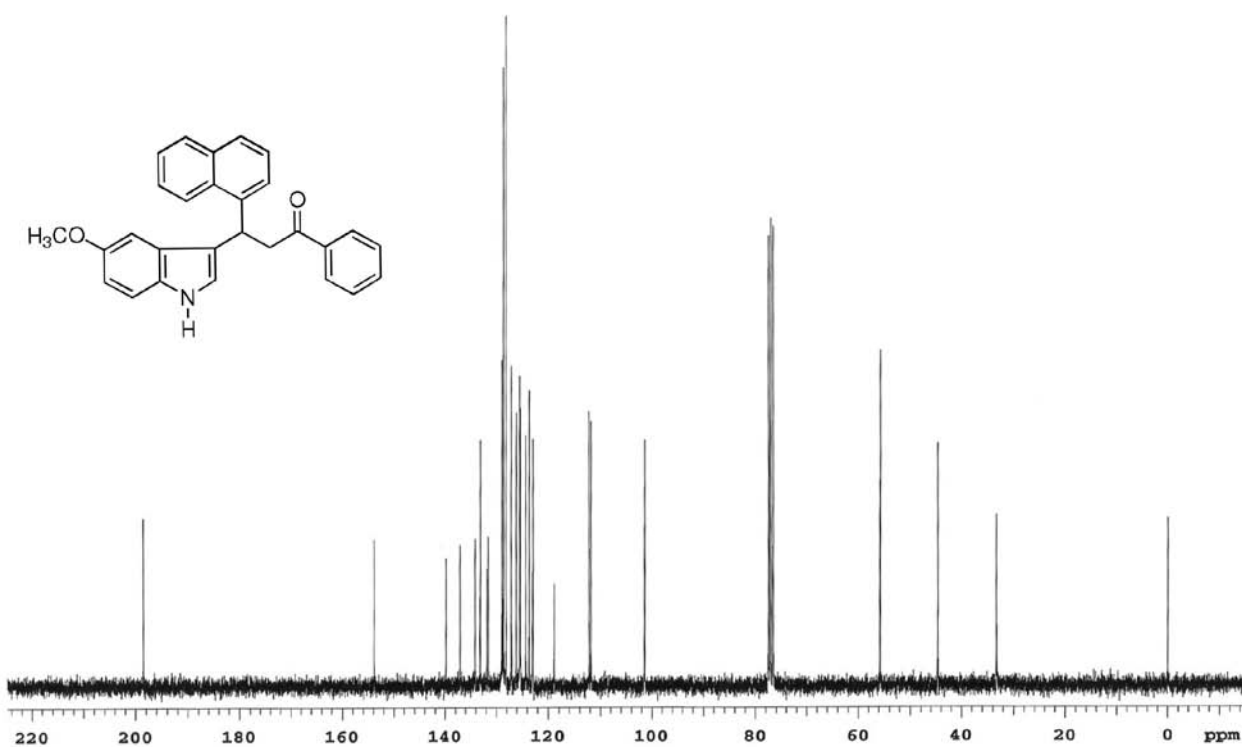


Figure S20. ^{13}C NMR (CDCl_3) of compound 3w.

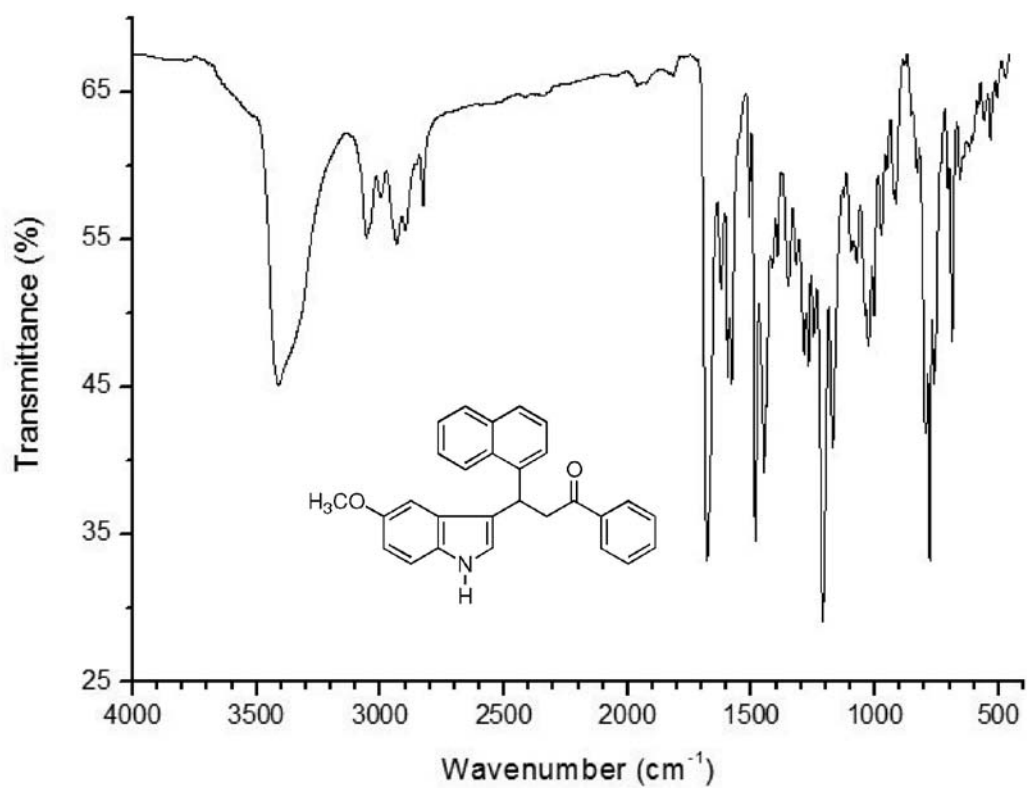


Figure S21. IR (KBr) of compound 3w.

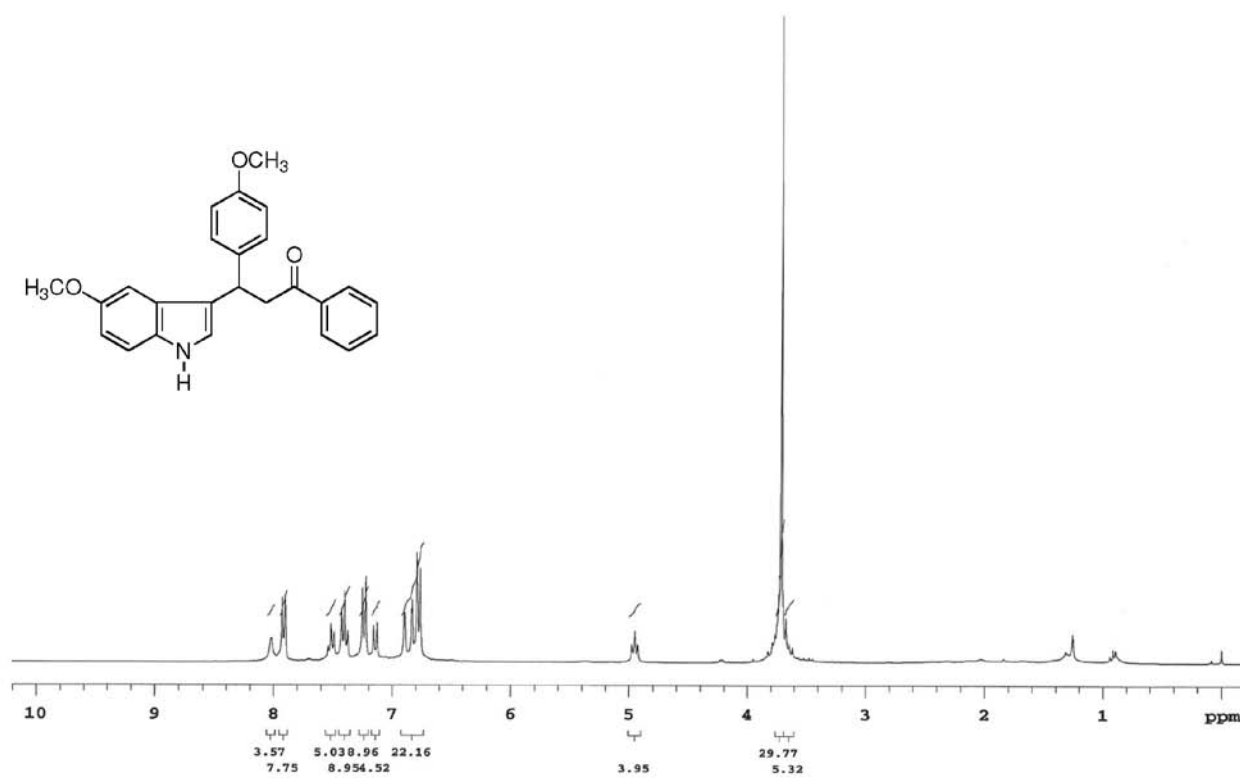


Figure S22. ¹H NMR (CDCl₃) of compound **3x**.

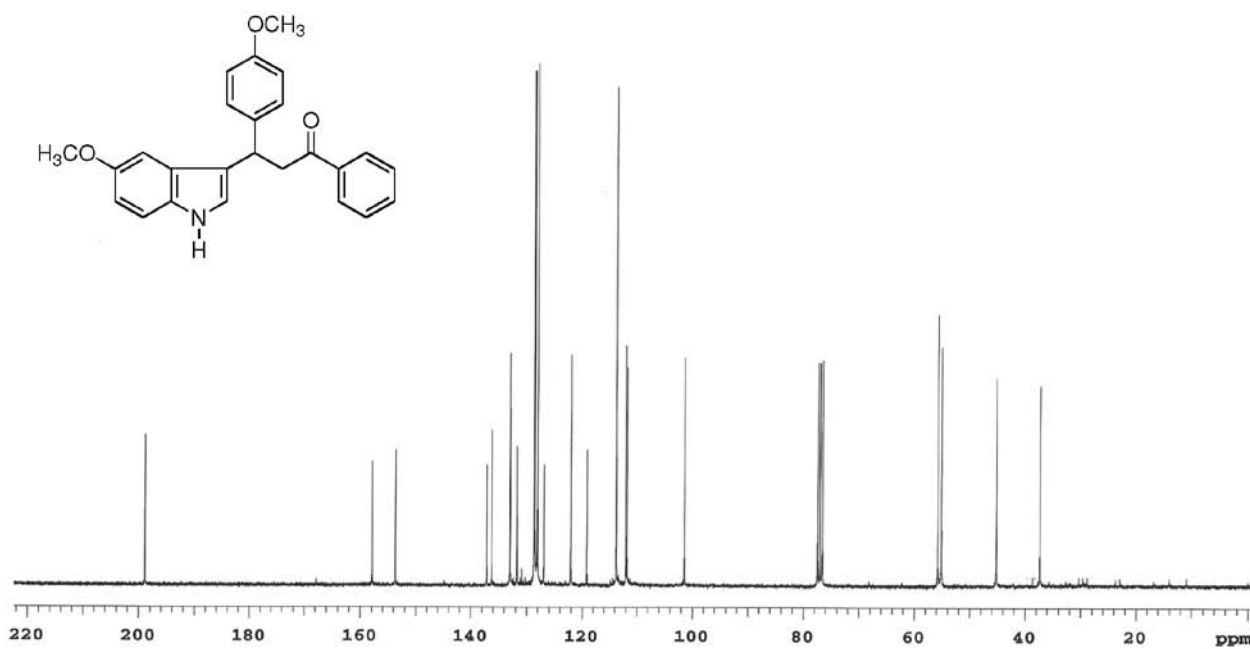
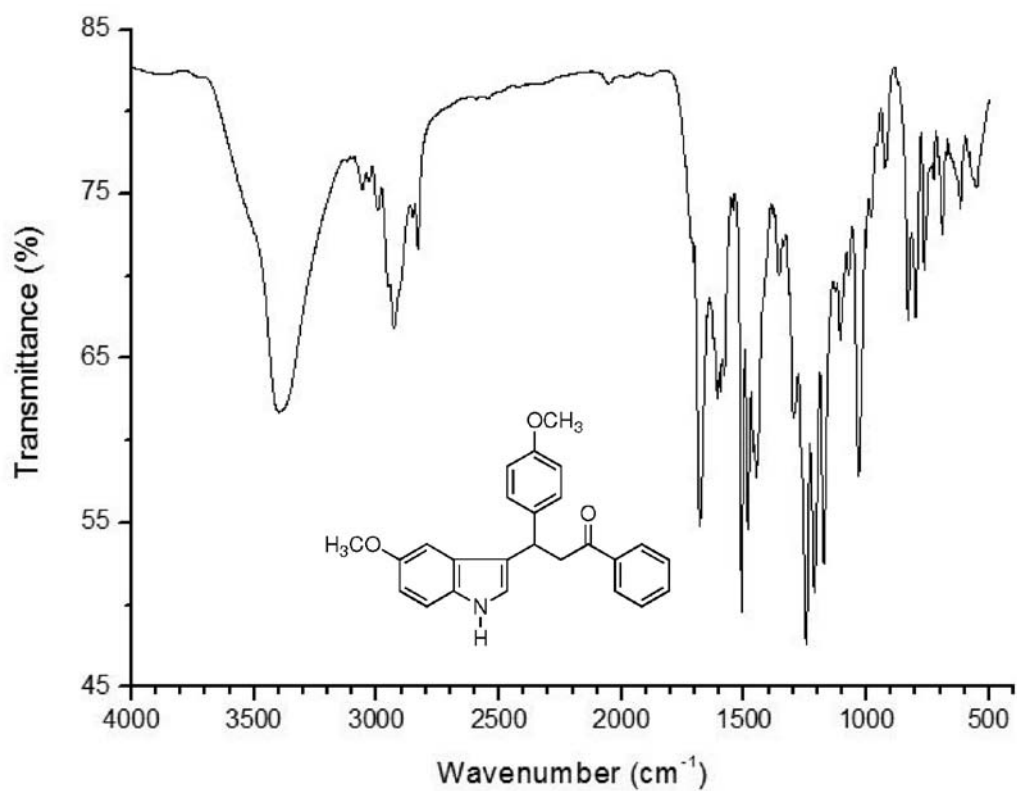
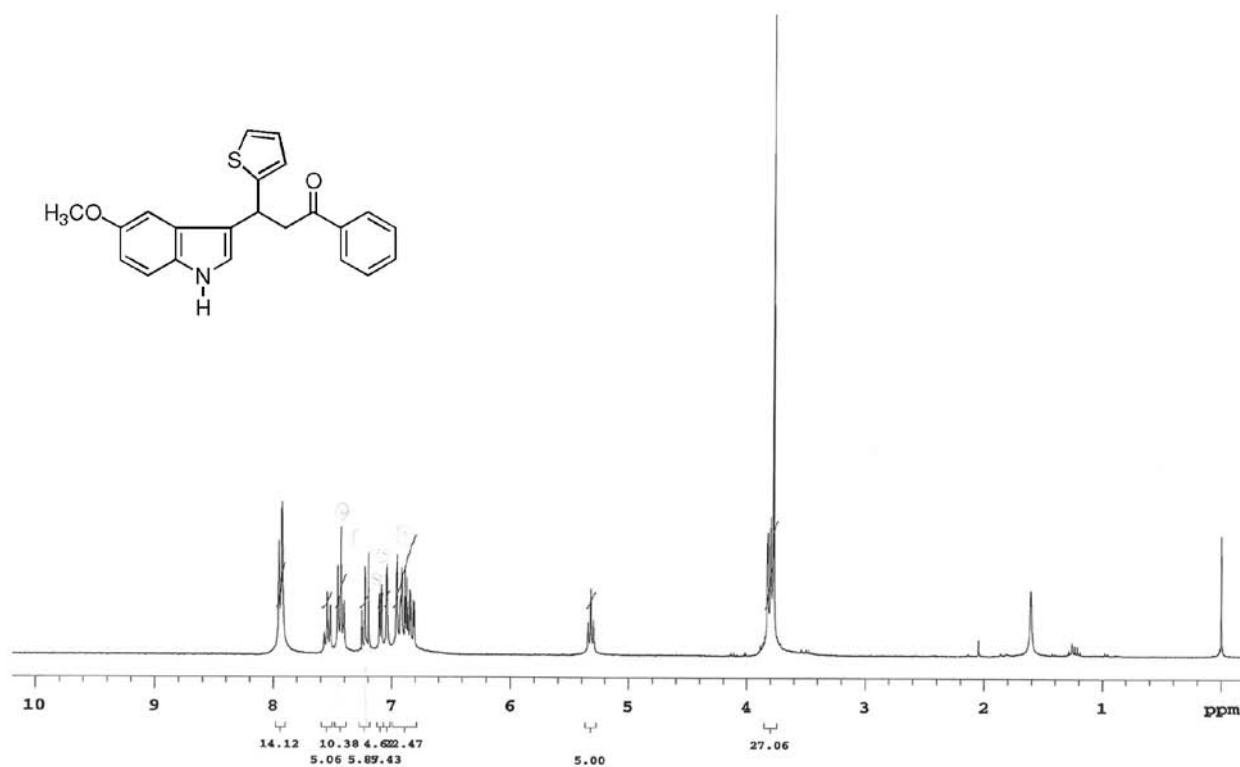


Figure S23. ¹³C NMR (CDCl₃) of compound **3x**.

**Figure S24.** IR (KBr) of compound 3x.**Figure S25.** ¹H NMR (CDCl₃) of compound 3y.

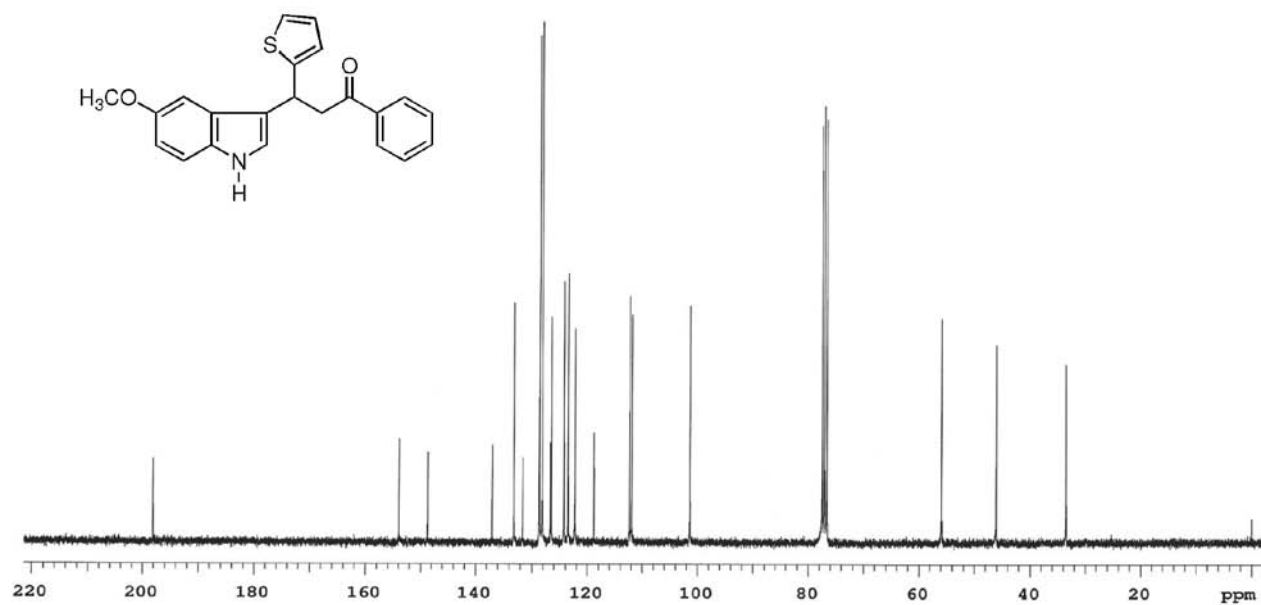


Figure S26. ^{13}C NMR (CDCl_3) of compound **3y**.

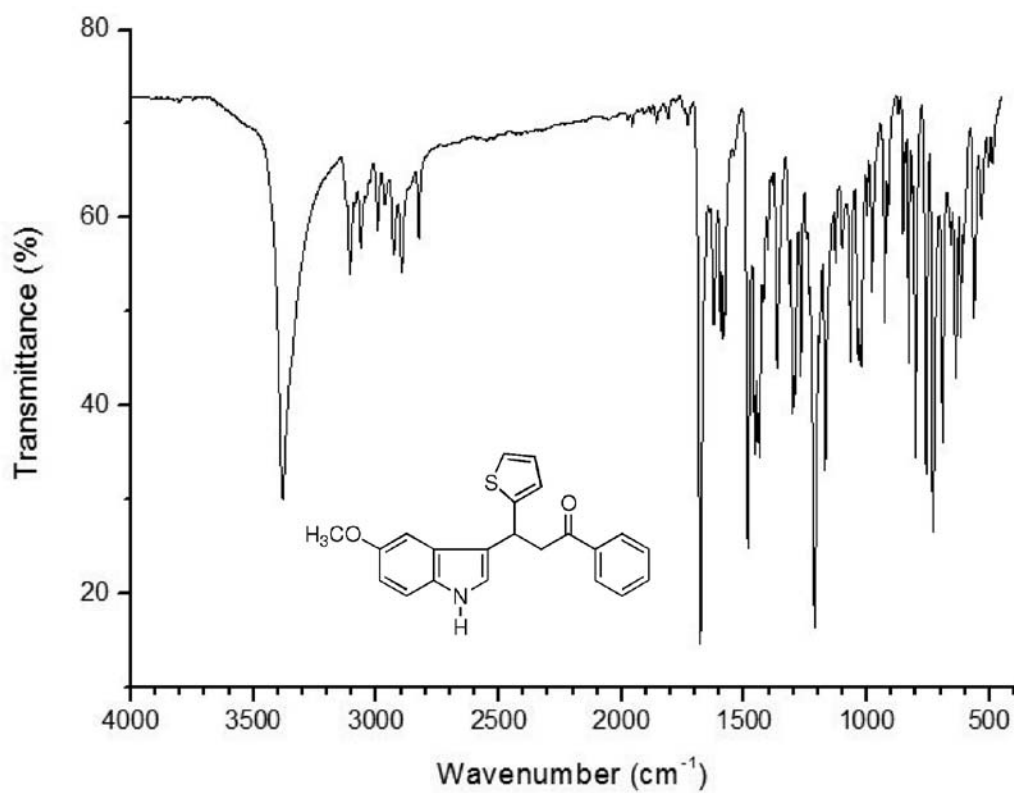


Figure S27. IR (KBr) of compound **3y**.

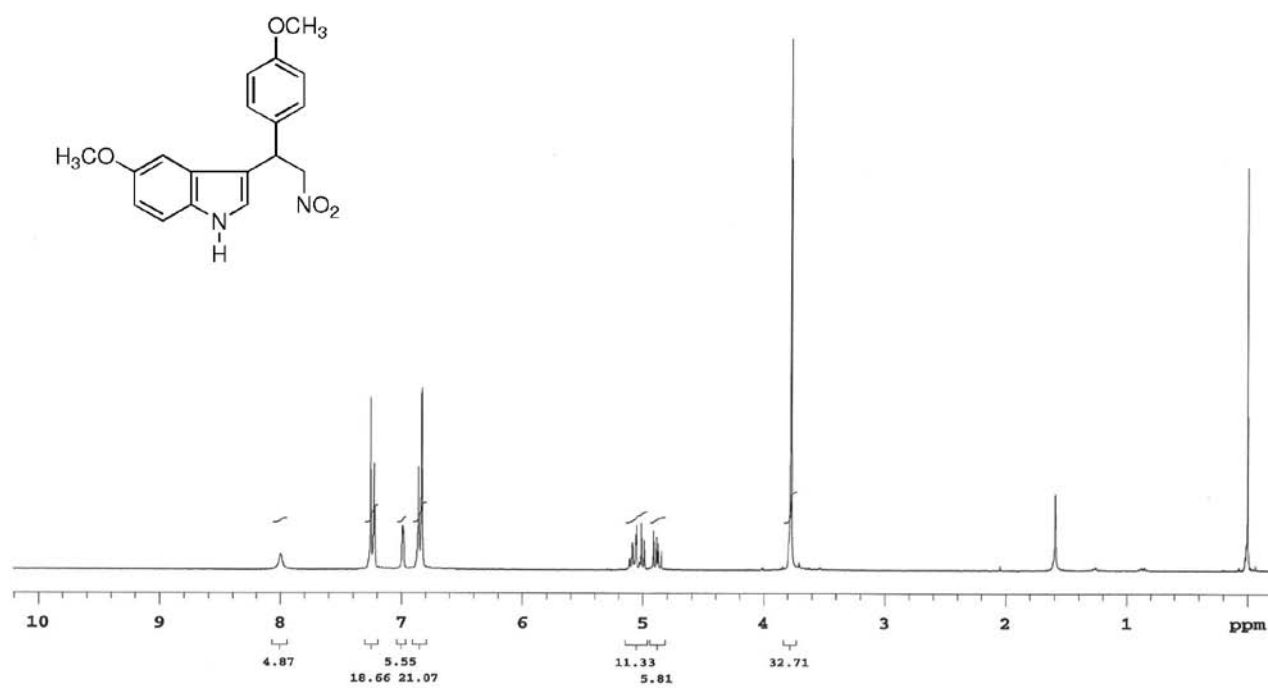


Figure S28. ¹H NMR (CDCl₃) of compound **5i**.

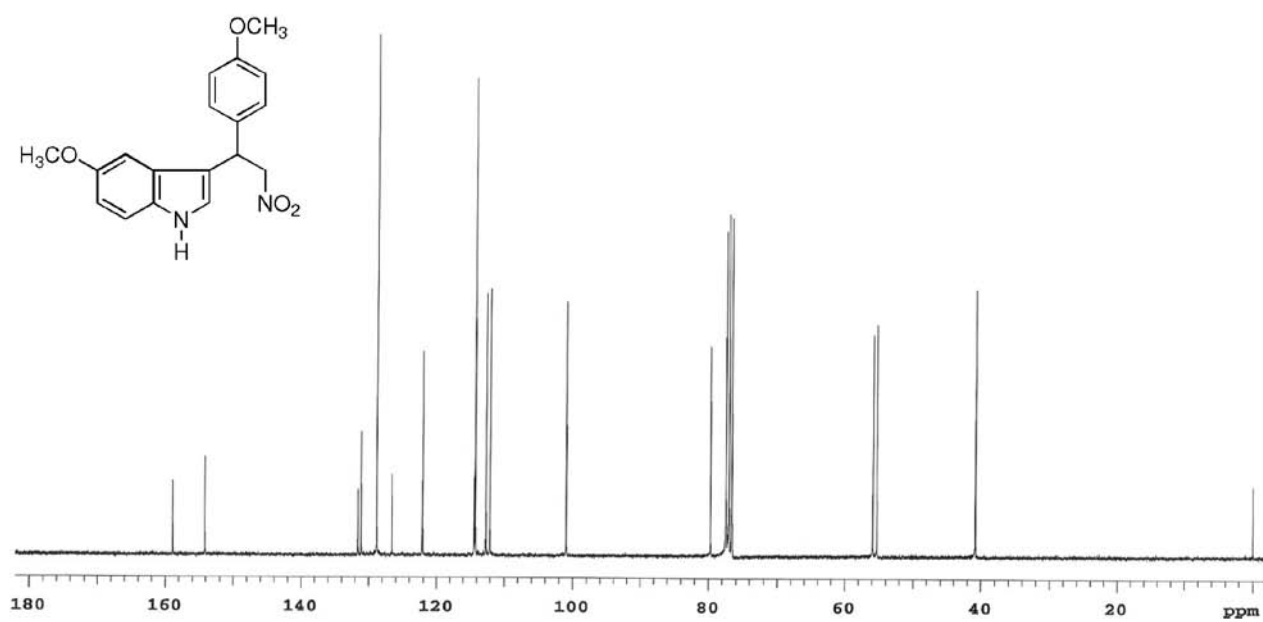
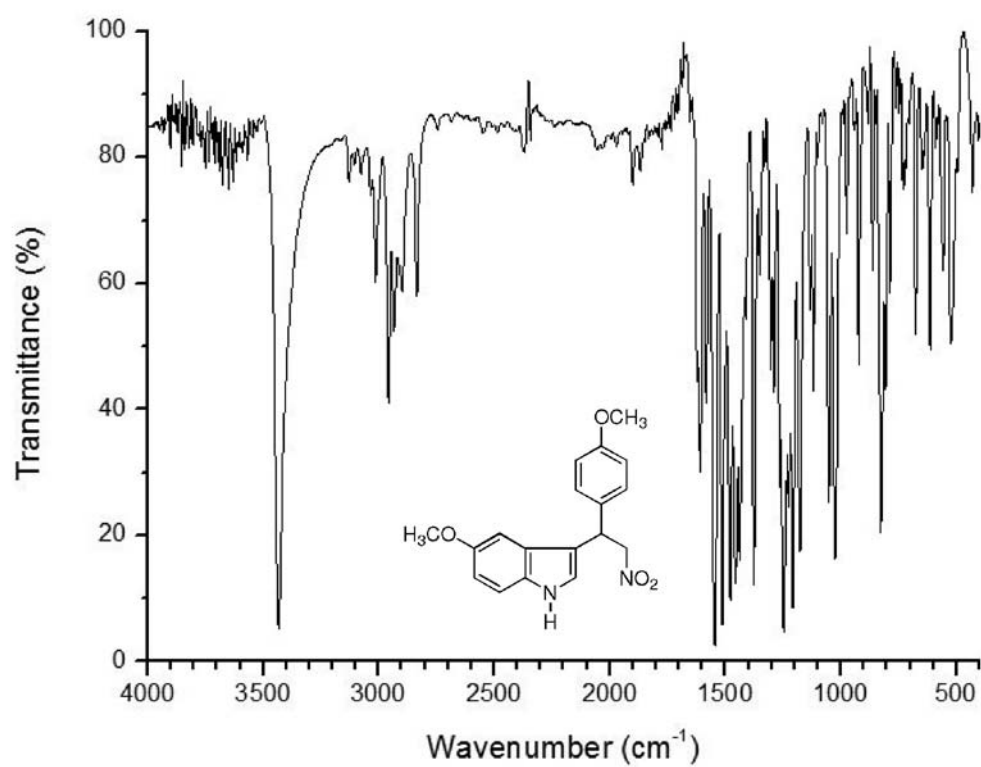
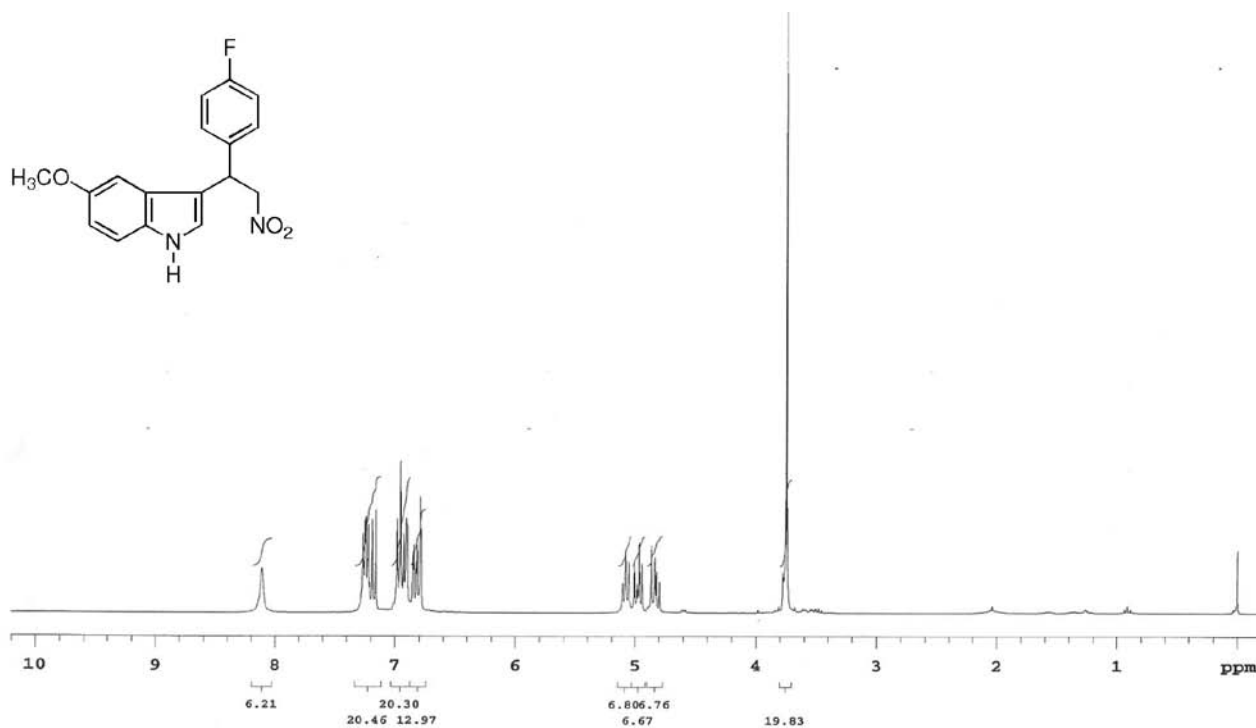


Figure S29. ¹³C NMR (CDCl₃) of compound **5i**.

Figure S30. IR (KBr) of compound **5i**.Figure S31. ^1H NMR (CDCl_3) of compound **5j**.

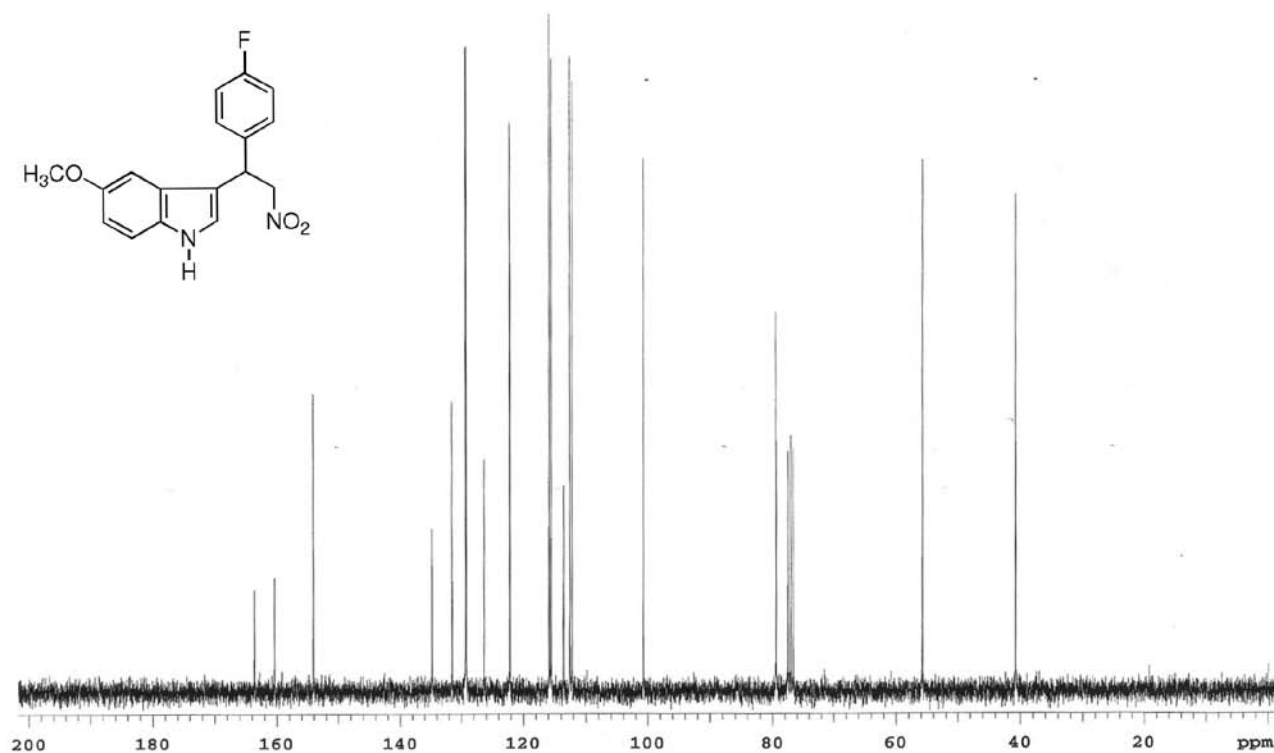


Figure S32. ^{13}C NMR (CDCl₃) of compound **5j**.

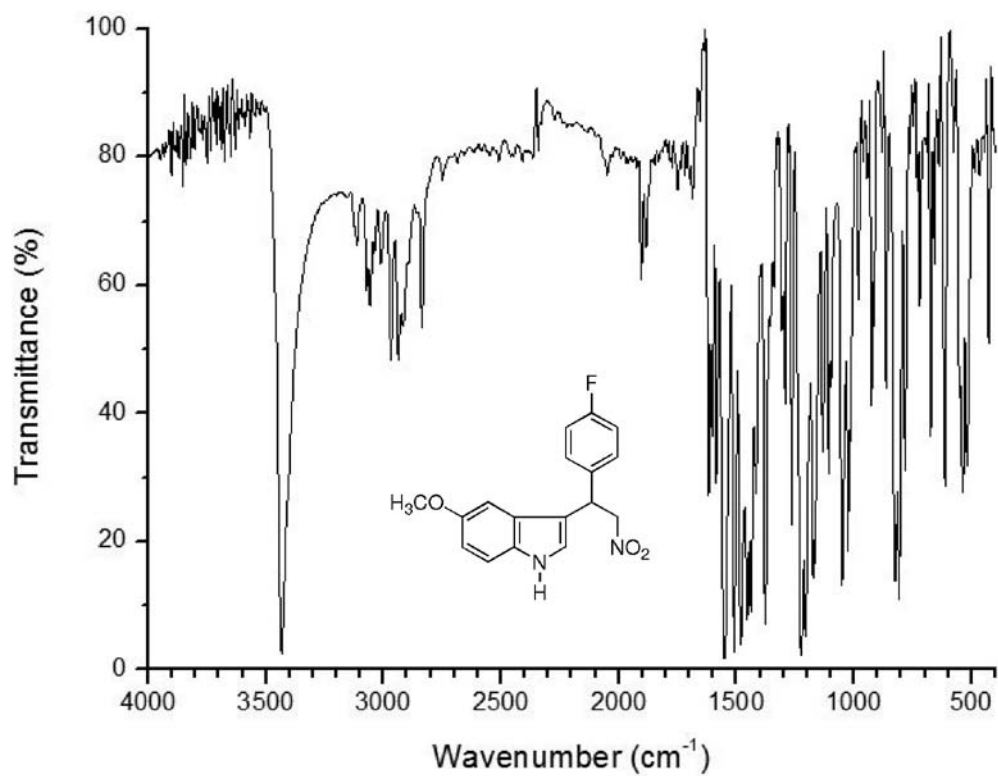


Figure S33. IR (KBr) of compound **5j**.

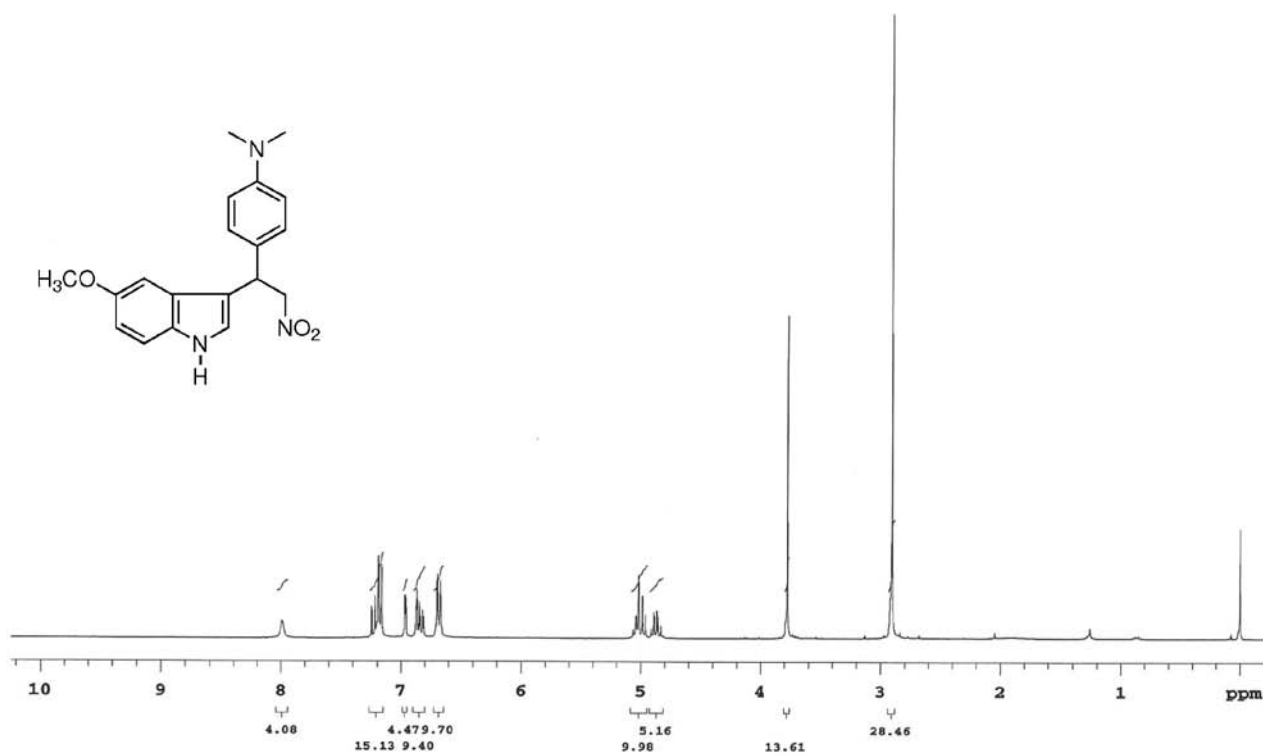


Figure S34. ^1H NMR (CDCl_3) of compound **5k**.

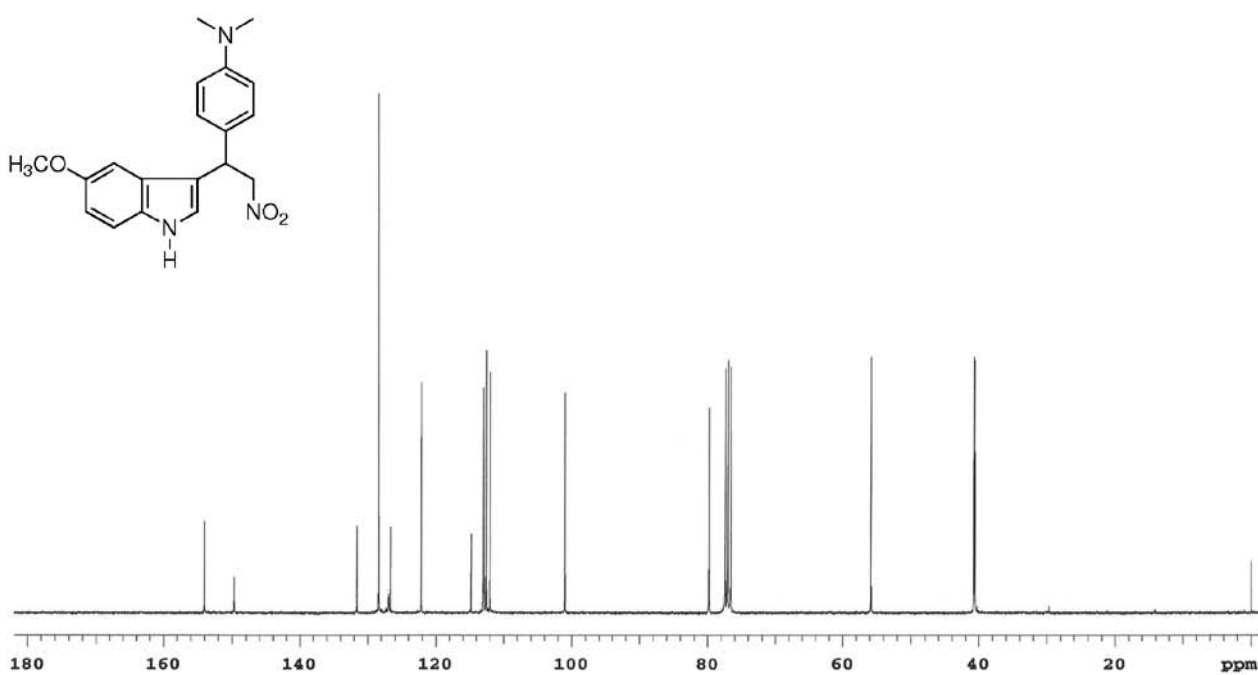
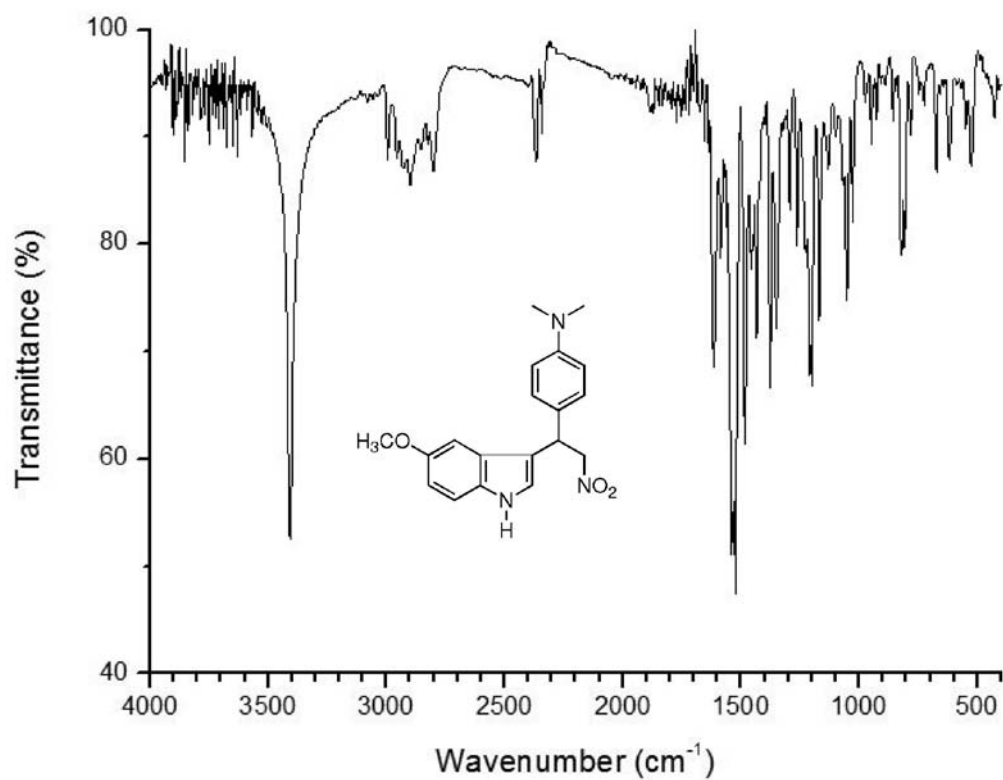
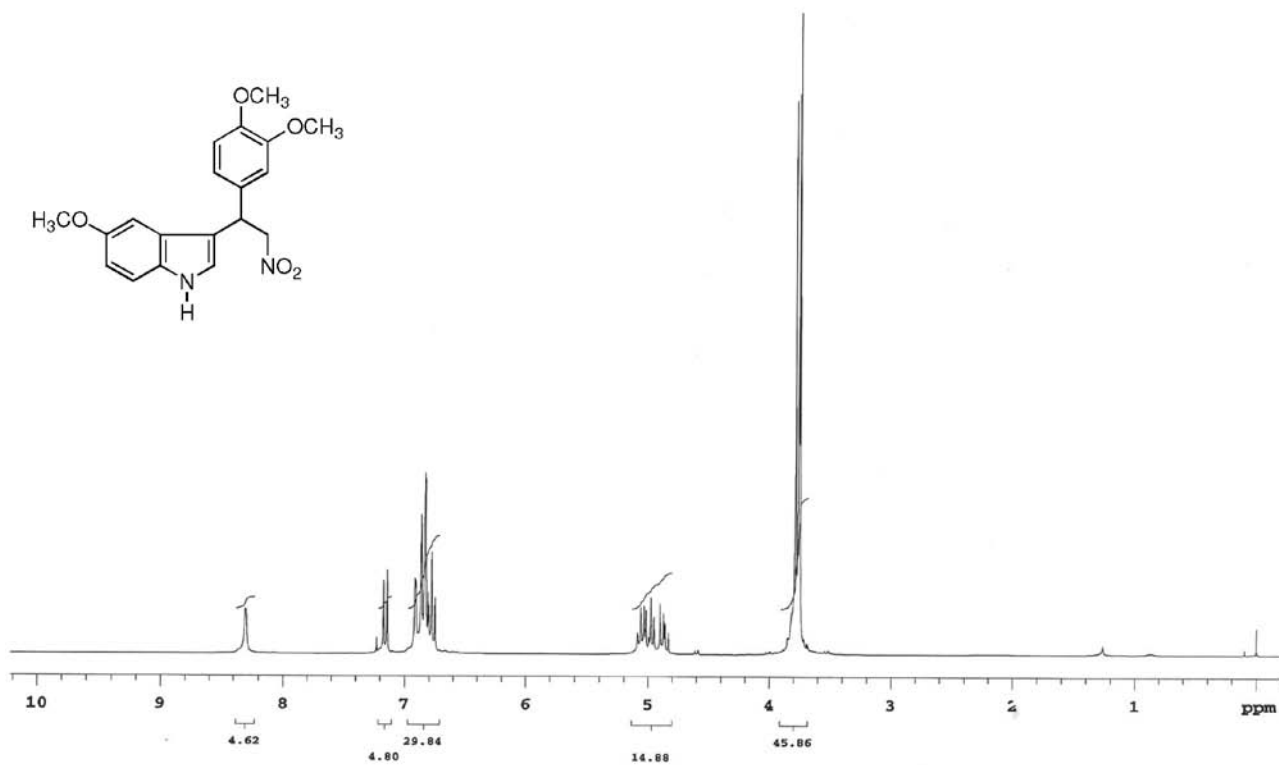


Figure S35. ^{13}C NMR (CDCl_3) of compound **5k**.

**Figure S36.** IR (KBr) of compound **5k**.**Figure S37.** ¹H NMR (CDCl₃) of compound **5l**.

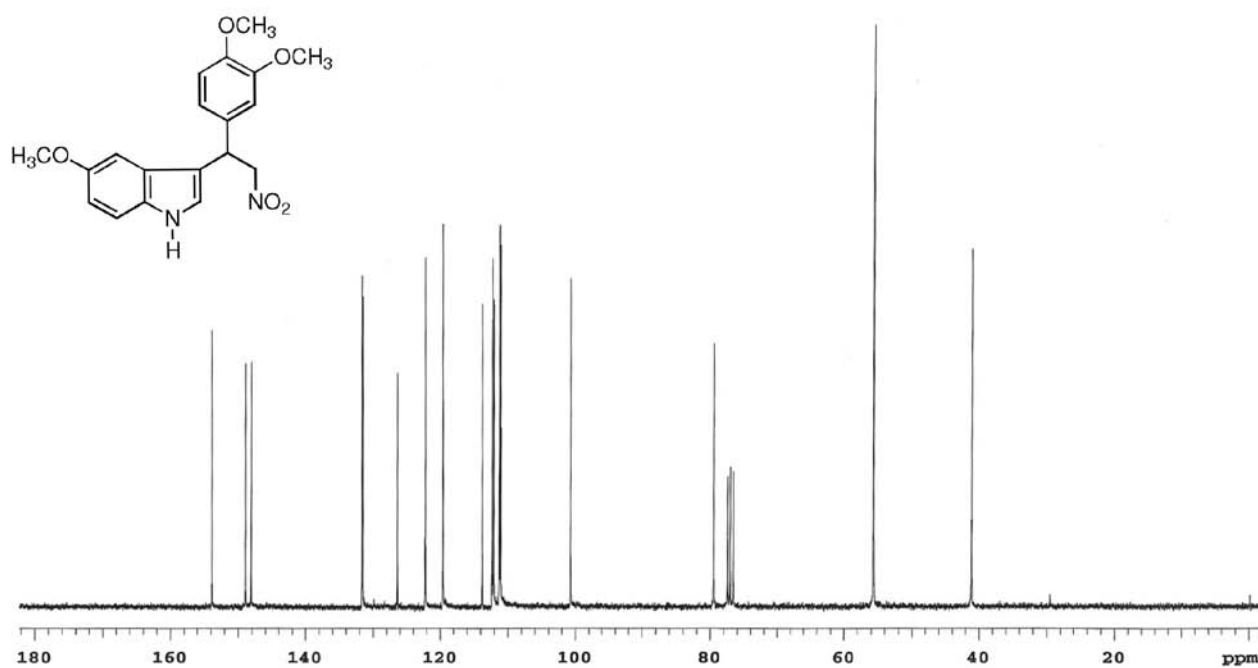


Figure S38. ^{13}C NMR (CDCl_3) of compound 5I.

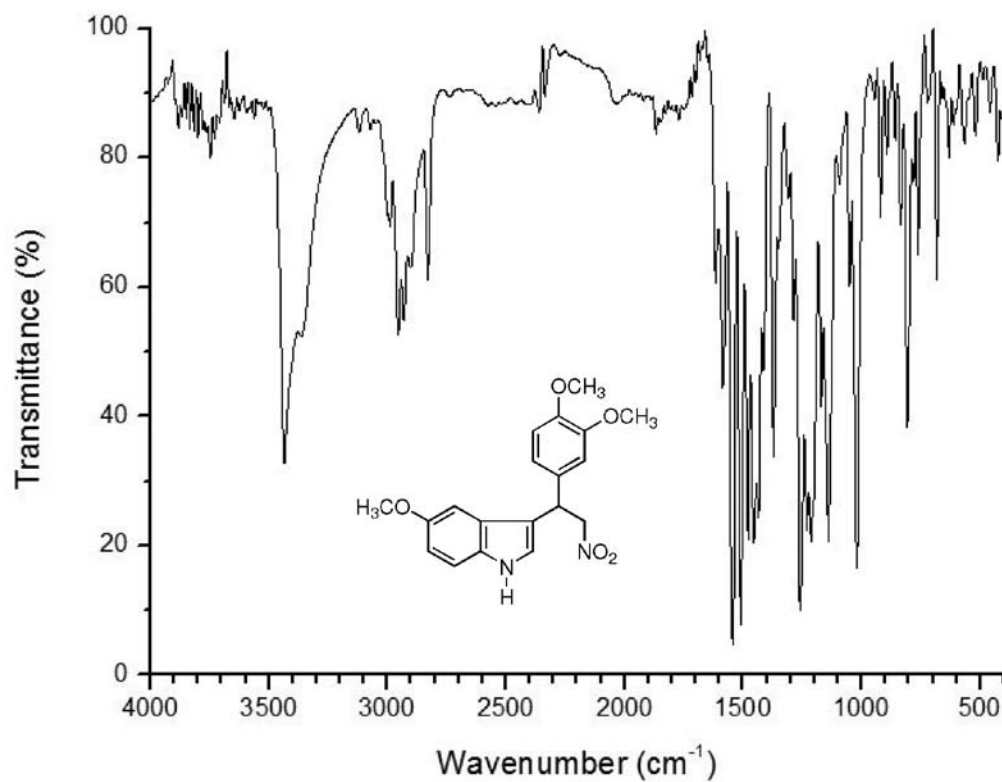


Figure S39. IR (KBr) of compound 5I.

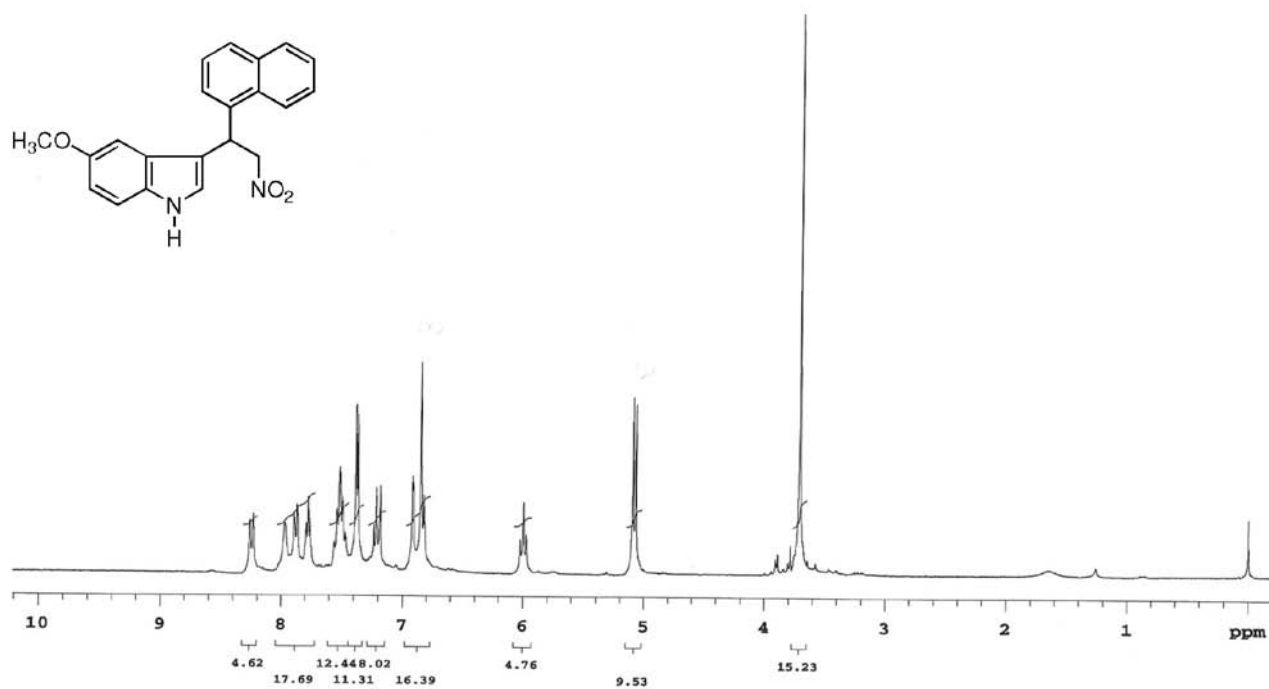


Figure S40. ¹H NMR (CDCl₃) of compound **5m**.

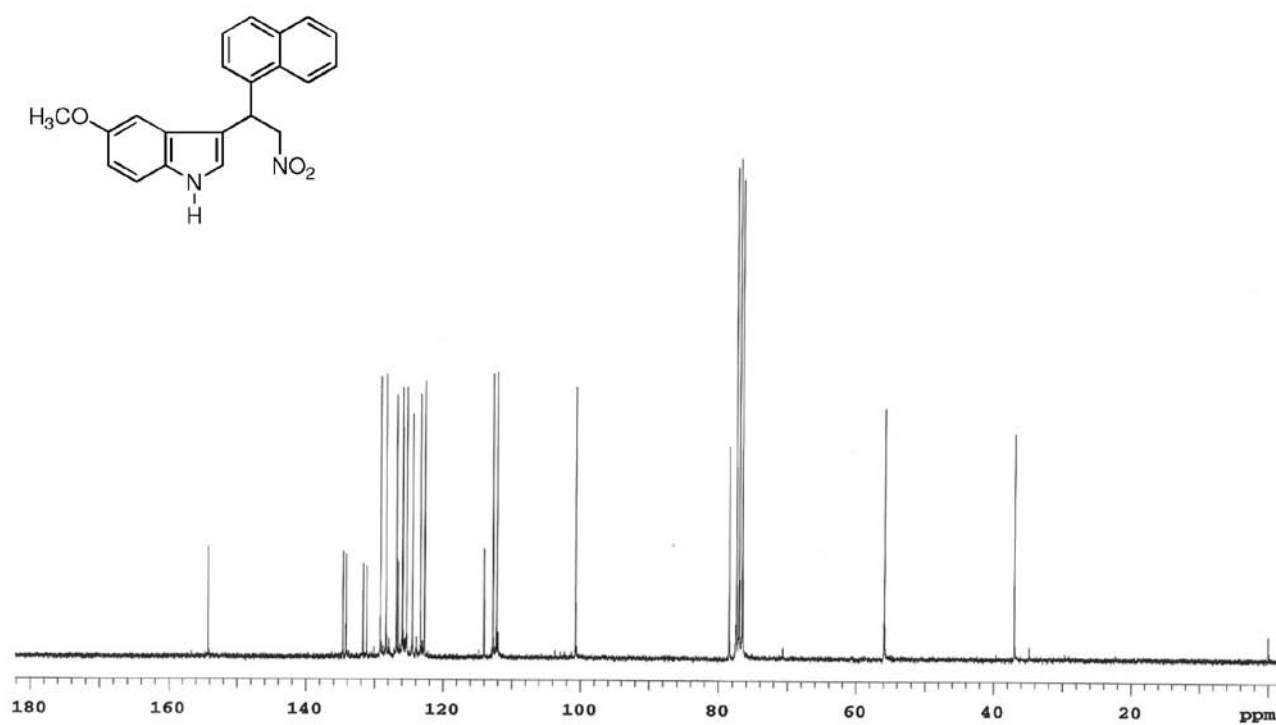


Figure S41. ¹³C NMR (CDCl₃) of compound **5m**.

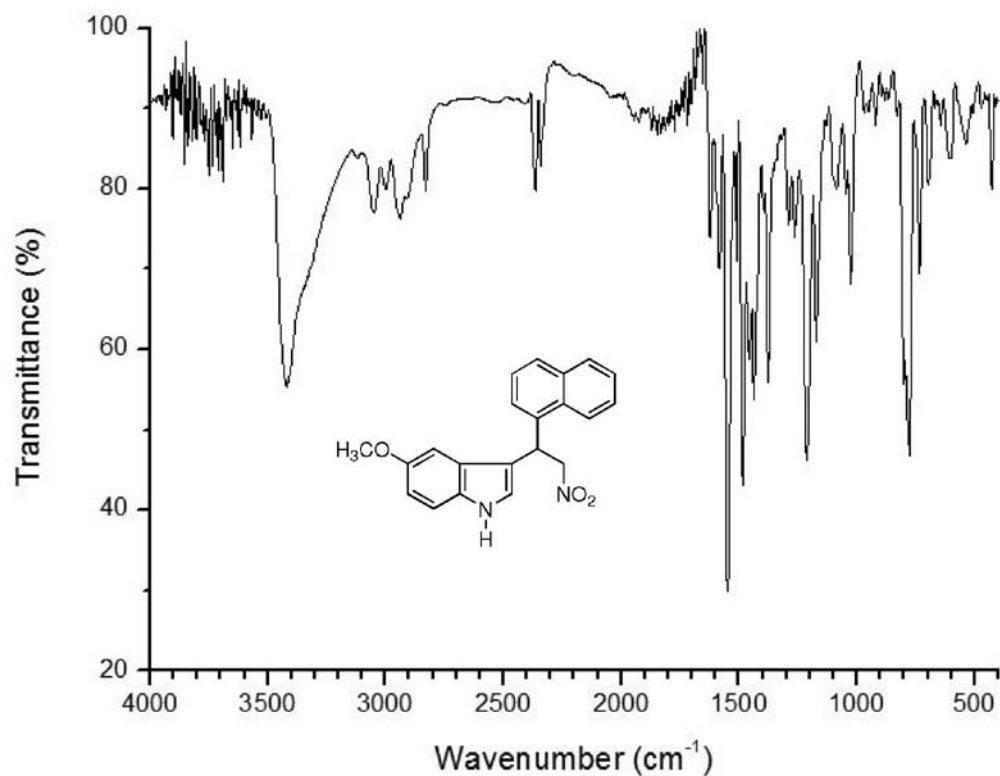


Figure S42. IR (KBr) of compound **5m**.

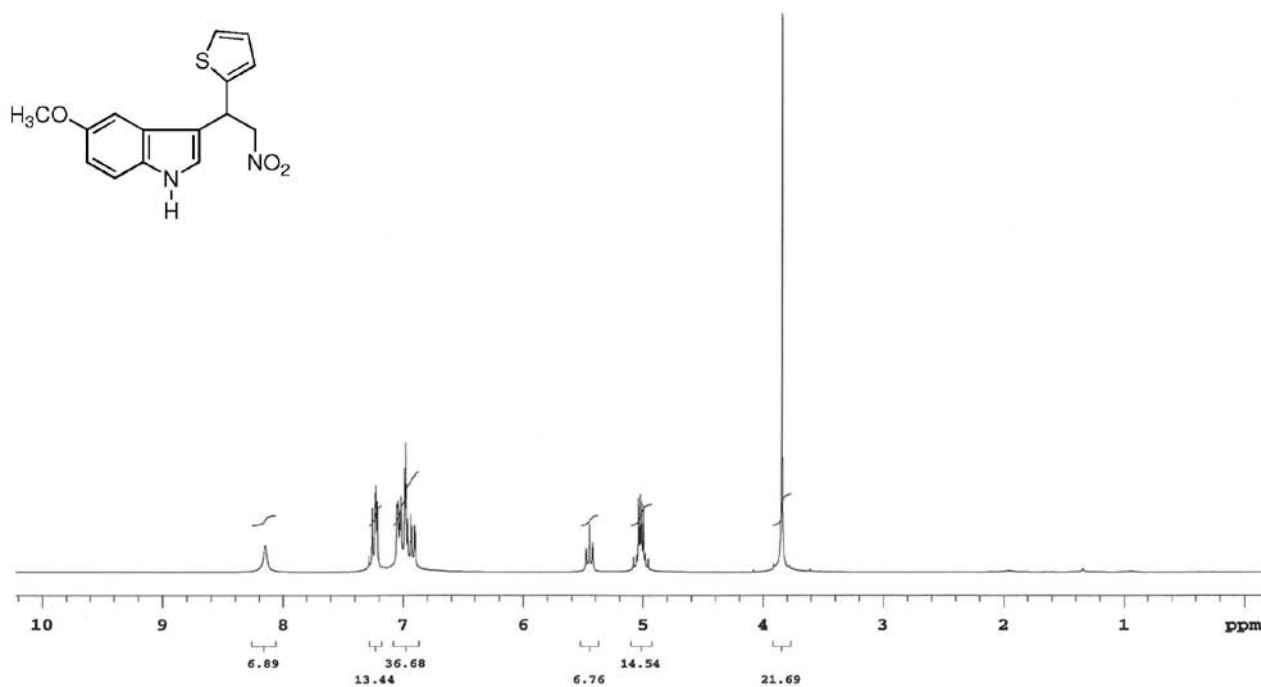


Figure S43. ¹H NMR (CDCl₃) of compound **5n**.

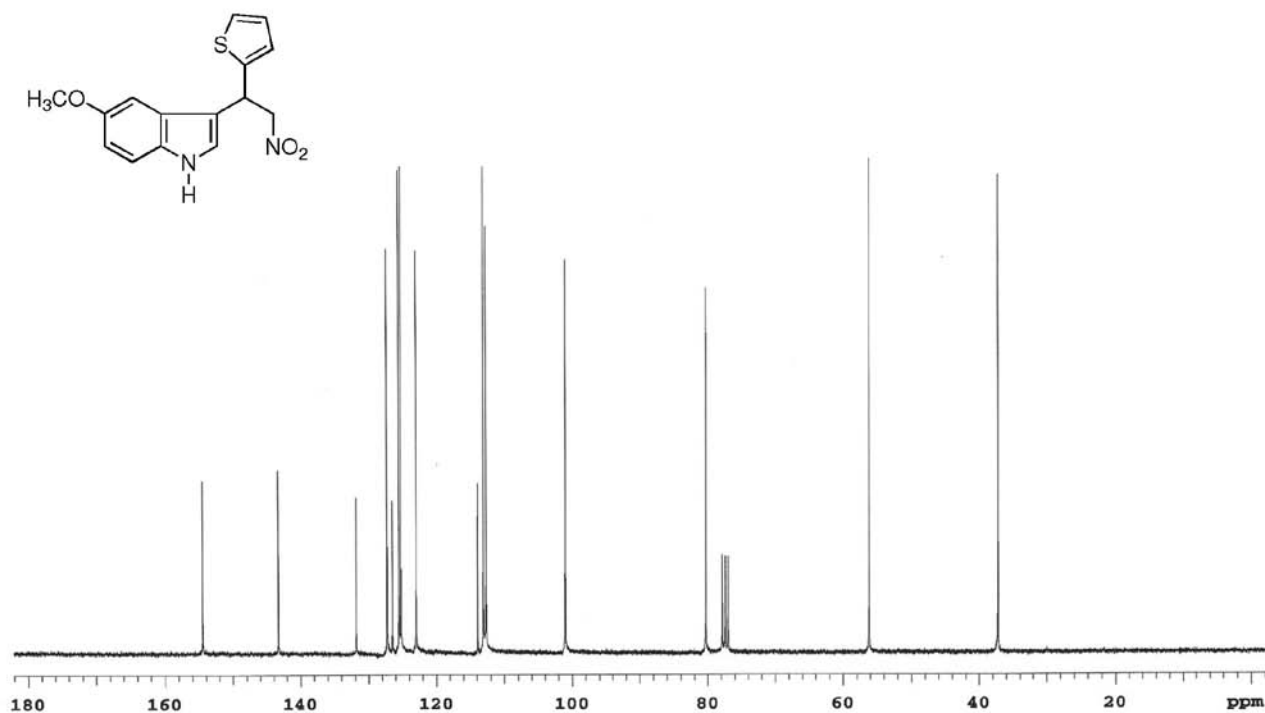


Figure S44. ^{13}C NMR (CDCl_3) of compound **5n**.

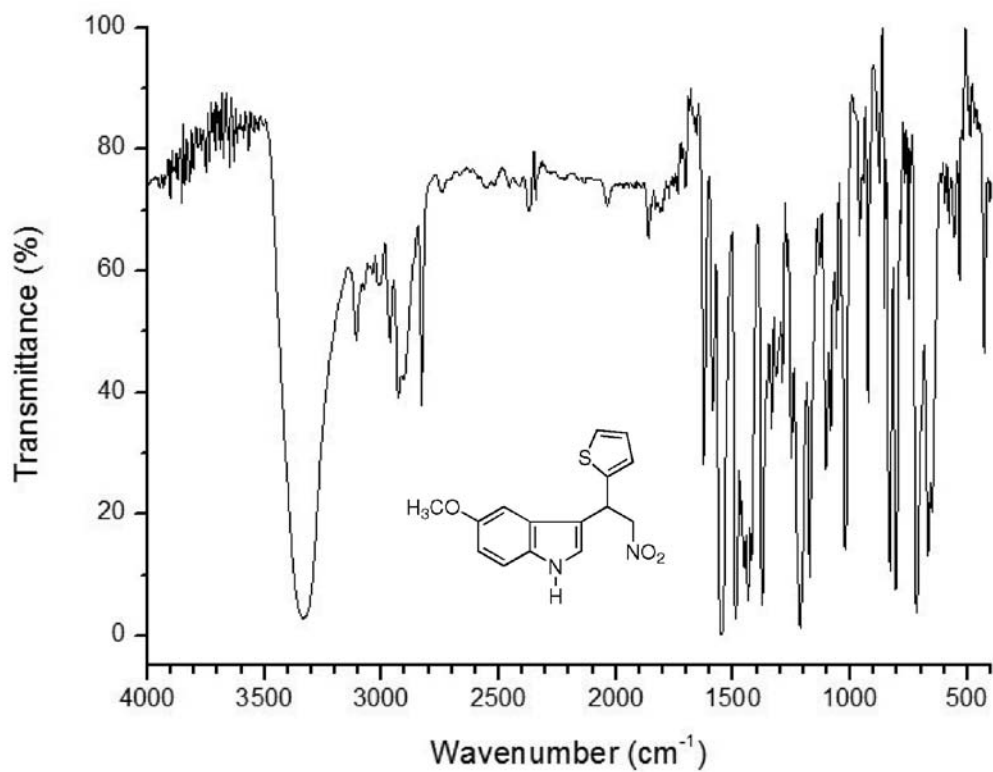


Figure S45. IR (KBr) of compound **5n**.

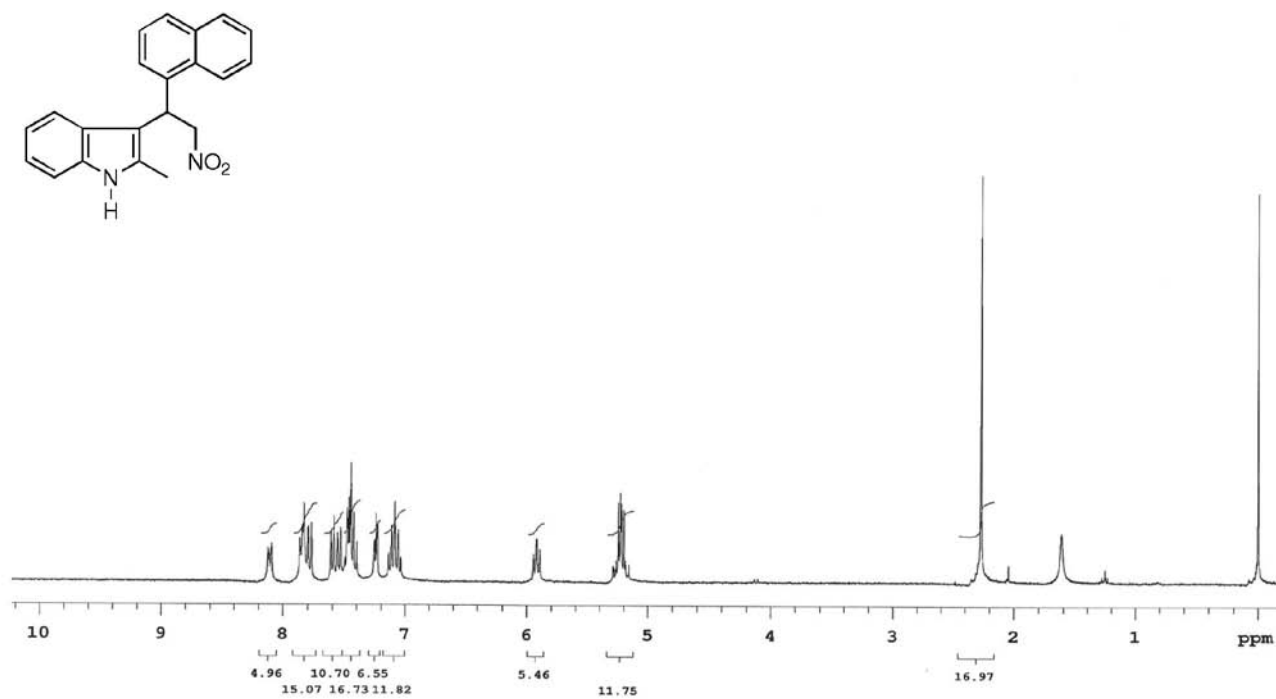


Figure S46. ^1H NMR (CDCl_3) of compound **5p**.

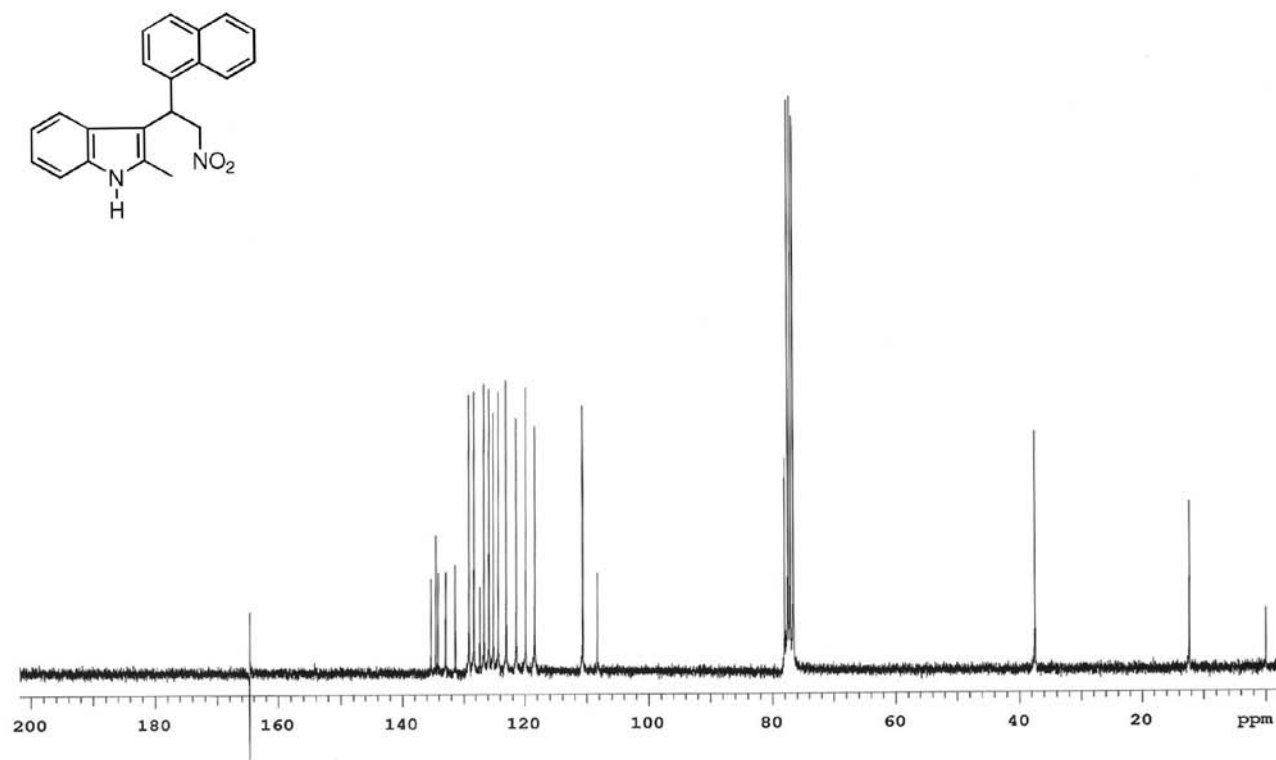
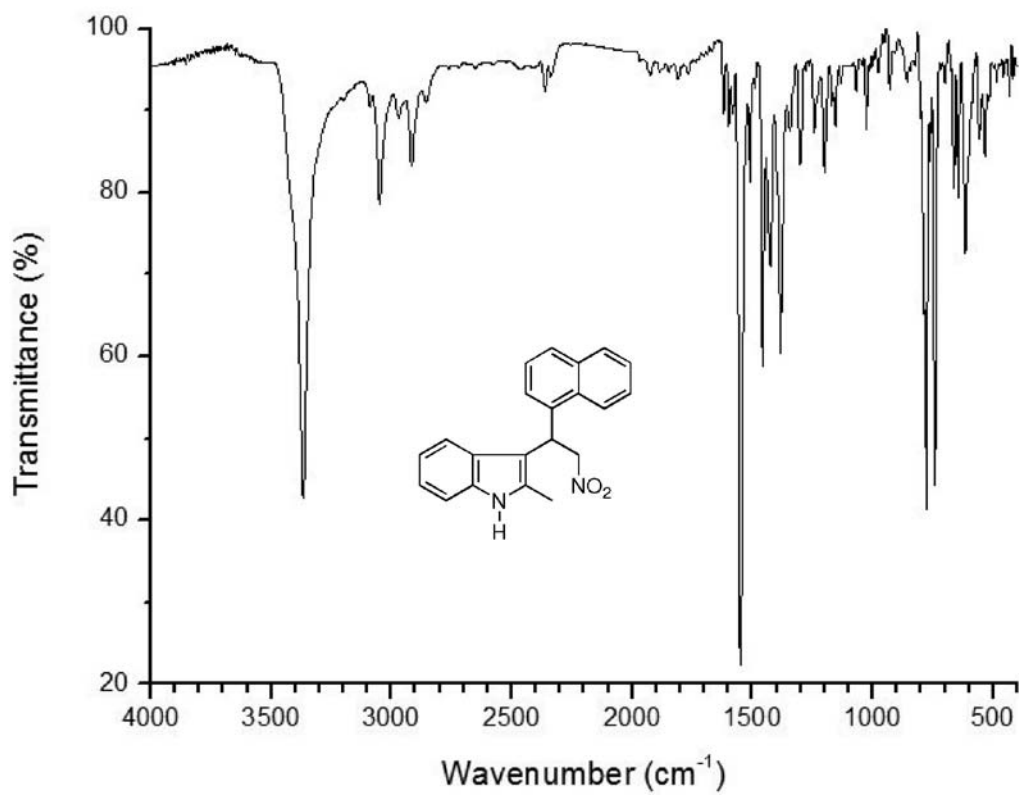
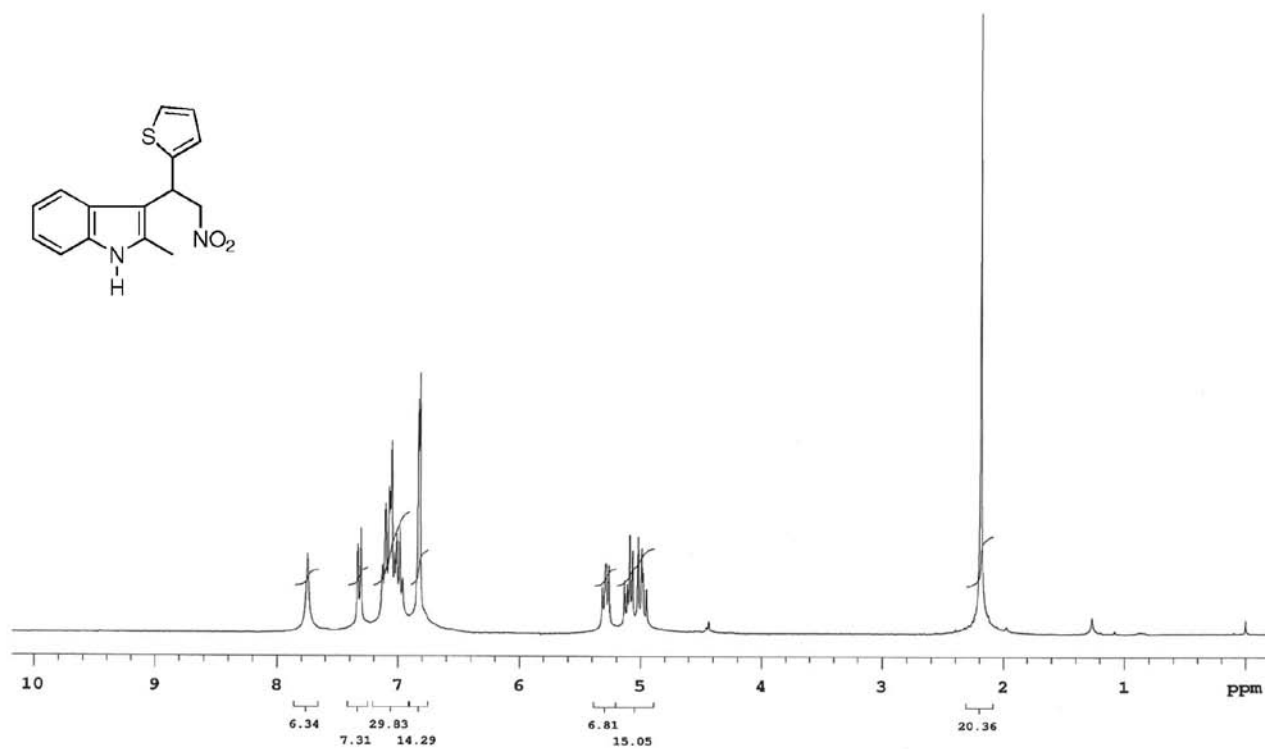


Figure S47. ^{13}C NMR (CDCl_3) of compound **5p**.

**Figure S48.** IR (KBr) of compound **5p**.**Figure S49.** ¹H NMR (CDCl₃) of compound **5q**.

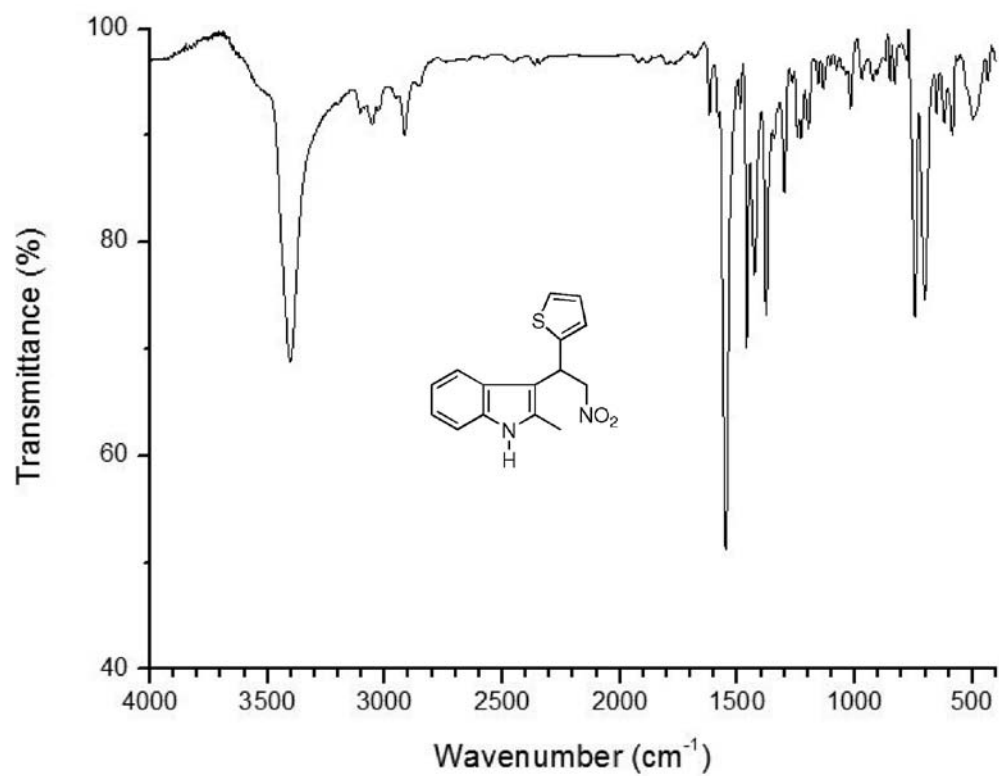


Figure S50. IR (KBr) of compound **5q**.

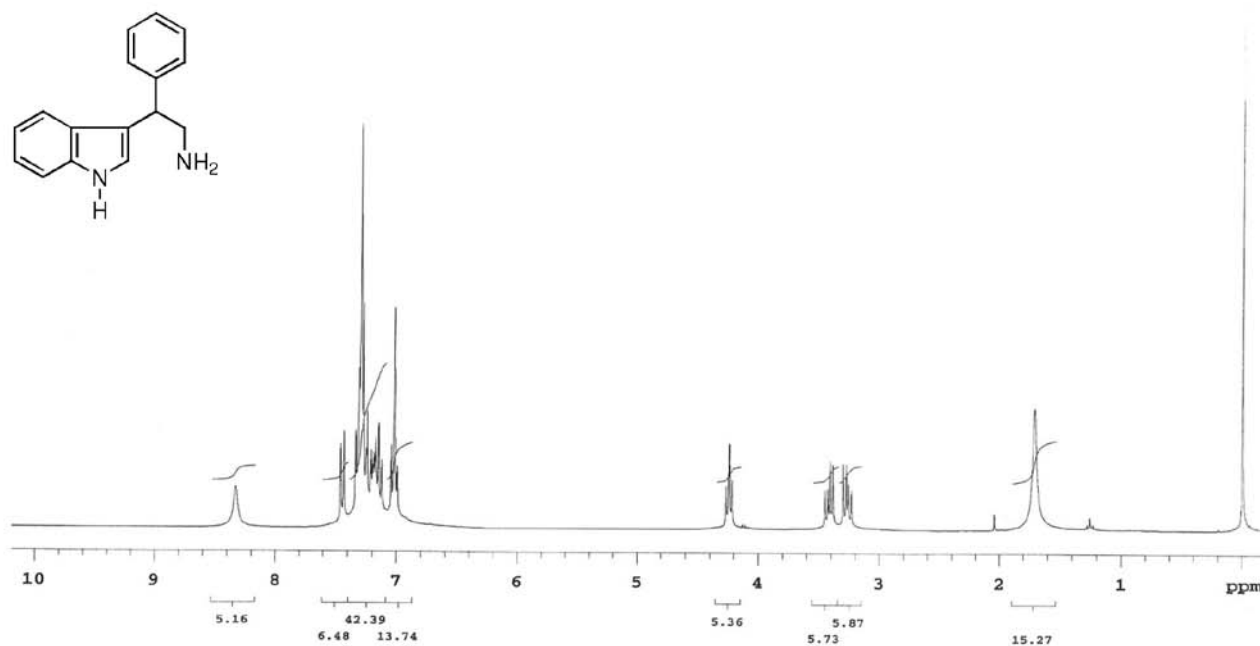


Figure S51. ¹H NMR (CDCl₃) of compound **8**.

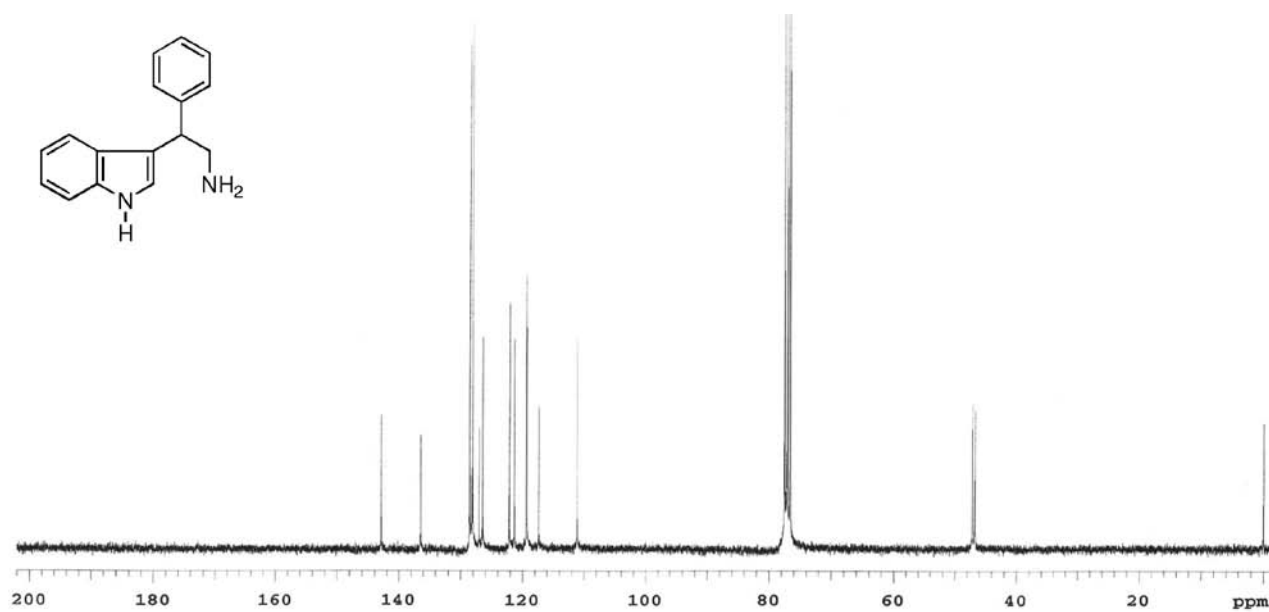


Figure S52. ¹³C NMR (CDCl₃) of compound 8.

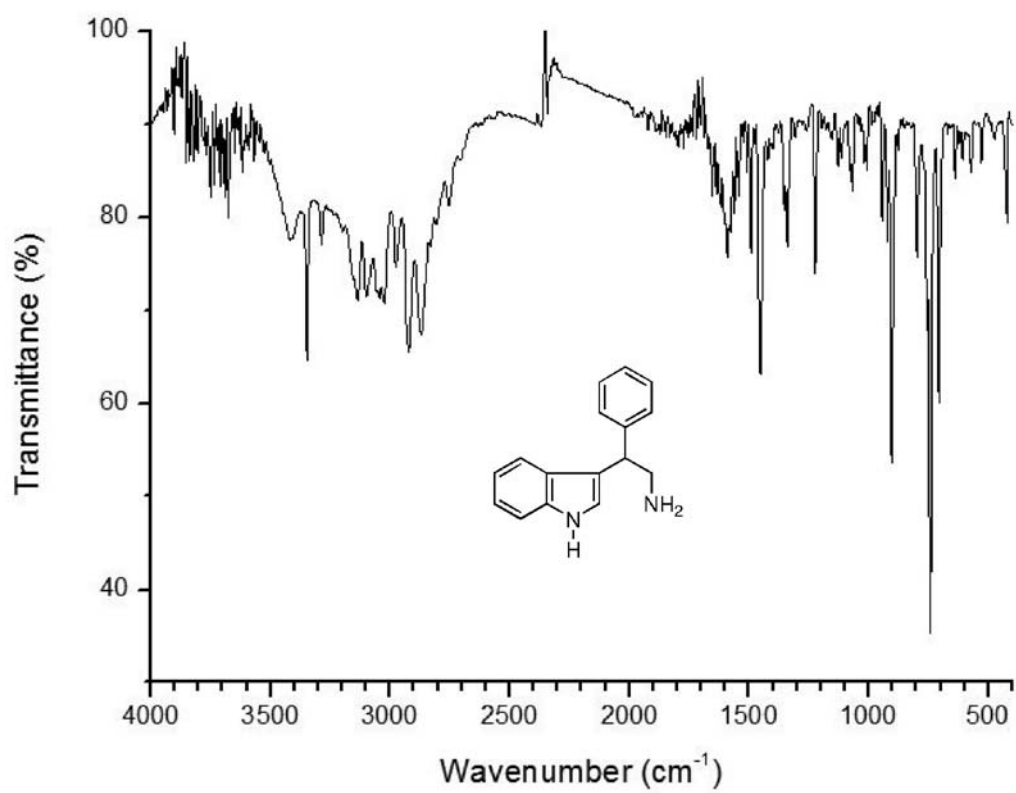


Figure S53. IR (KBr) of compound 8.

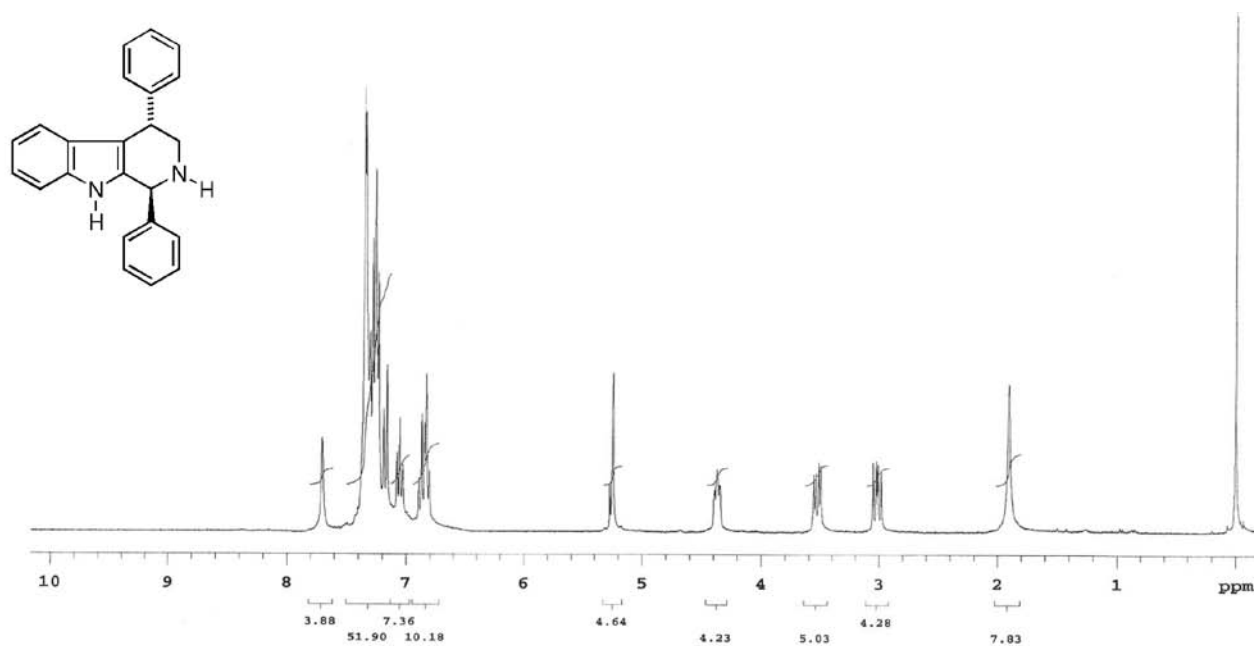


Figure S54. ^1H NMR (CDCl₃) of compound **9-trans**.

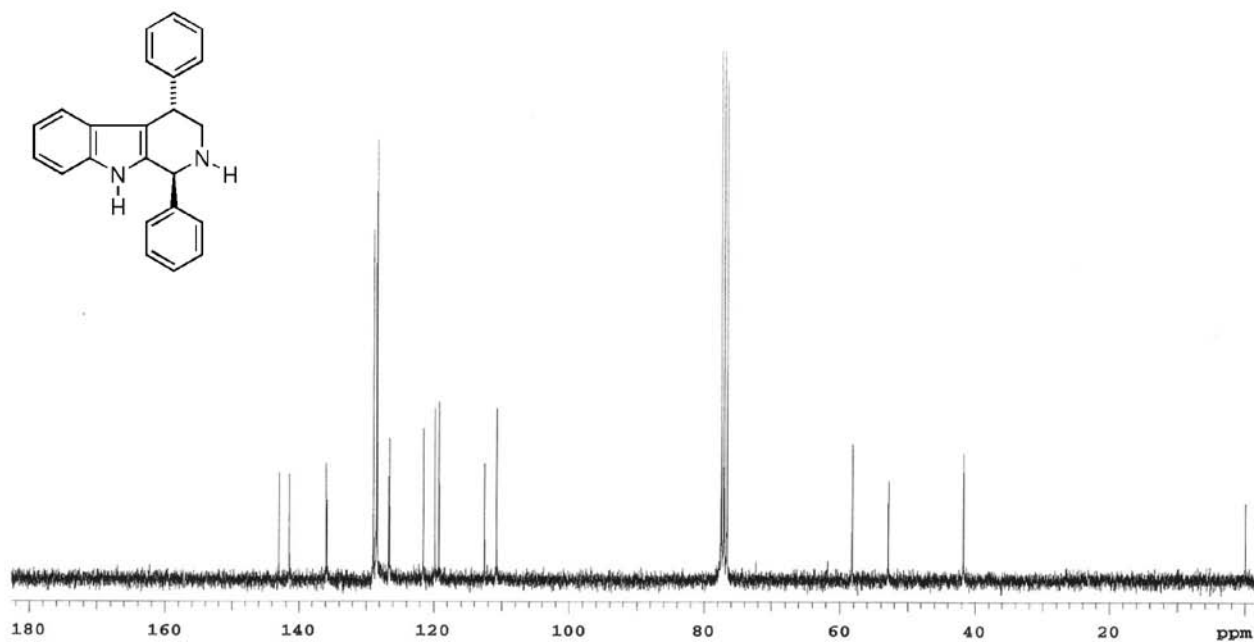
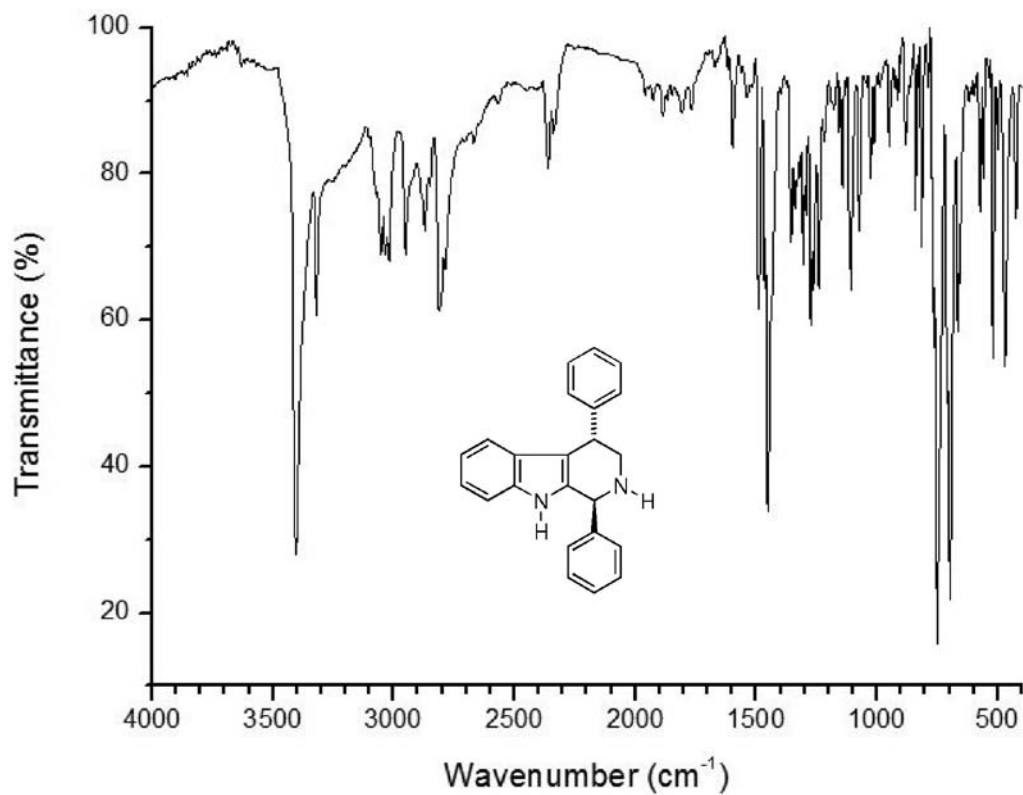
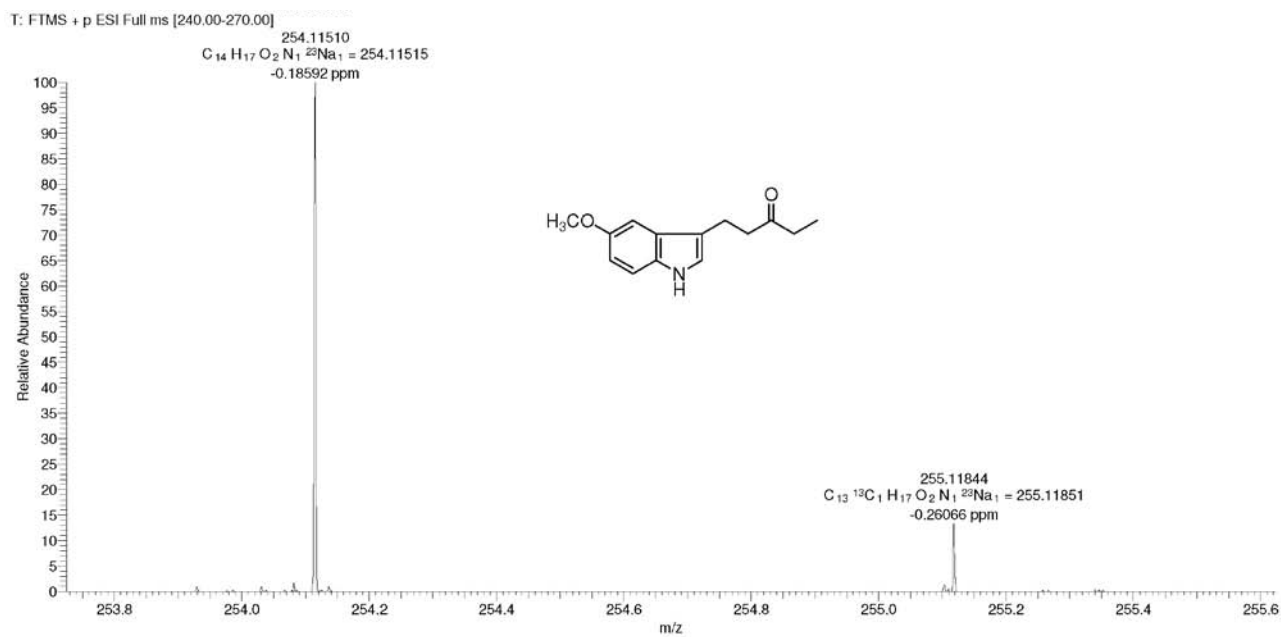


Figure S55. ^{13}C NMR (CDCl₃) of compound **9-trans**.

**Figure S56.** IR (KBr) of compound **9-trans**.**Figure S57.** HRMS of compound **3g**.

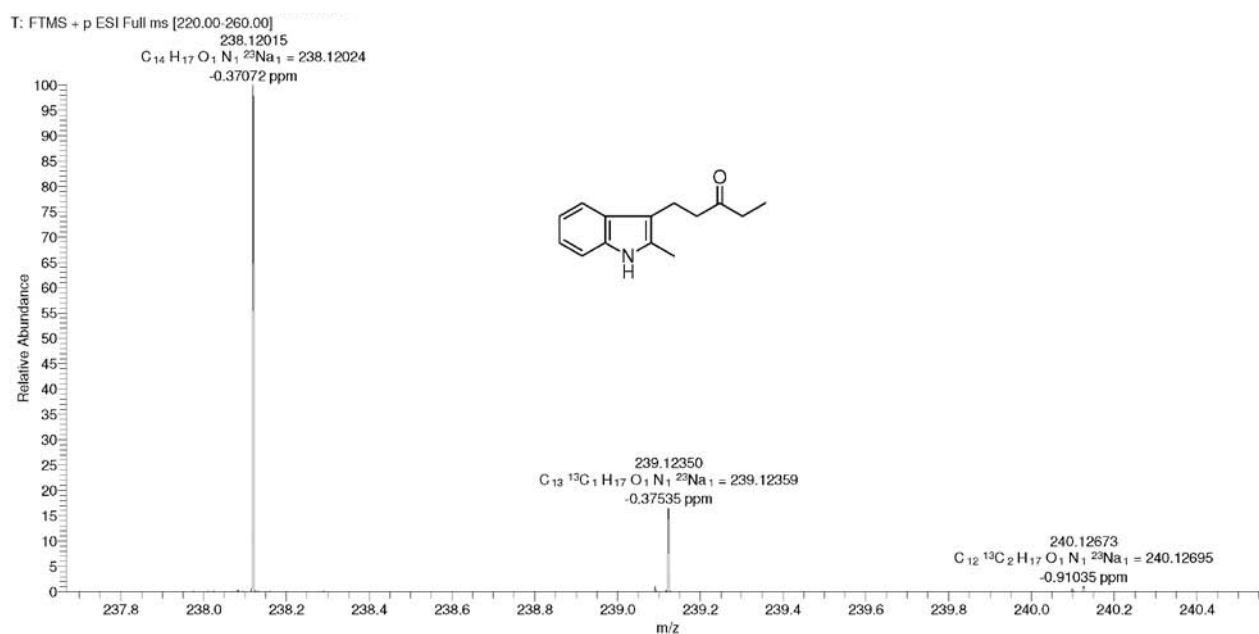


Figure S58. HRMS of compound 3l.

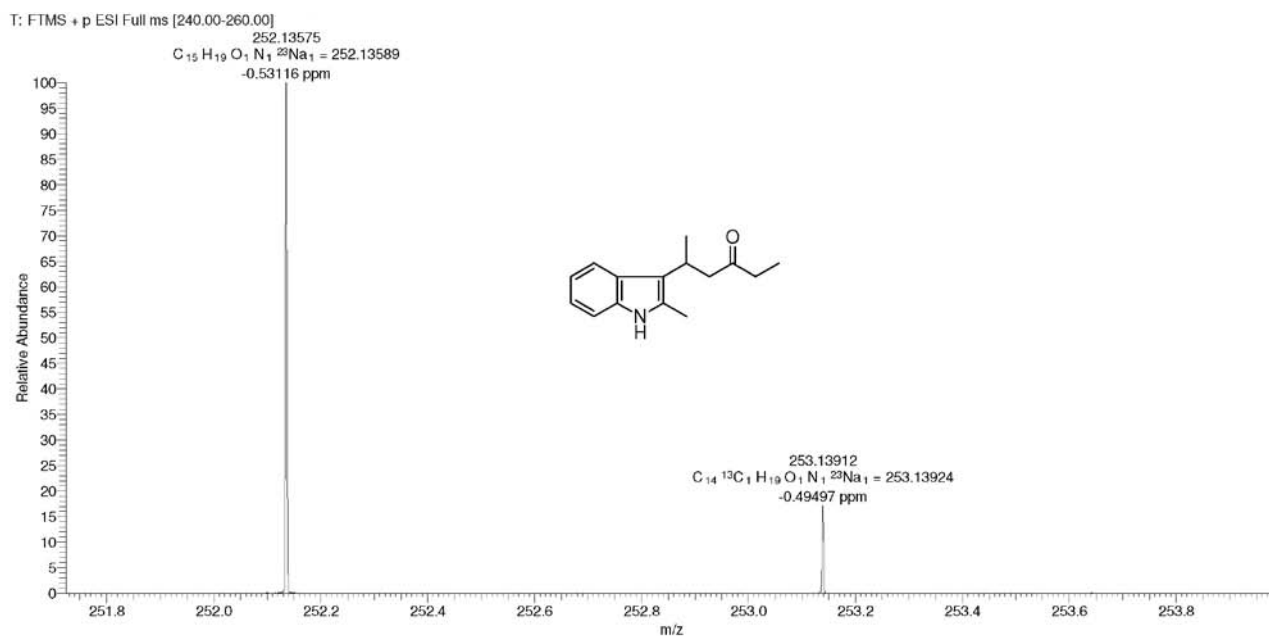


Figure S59. HRMS of compound 3k.

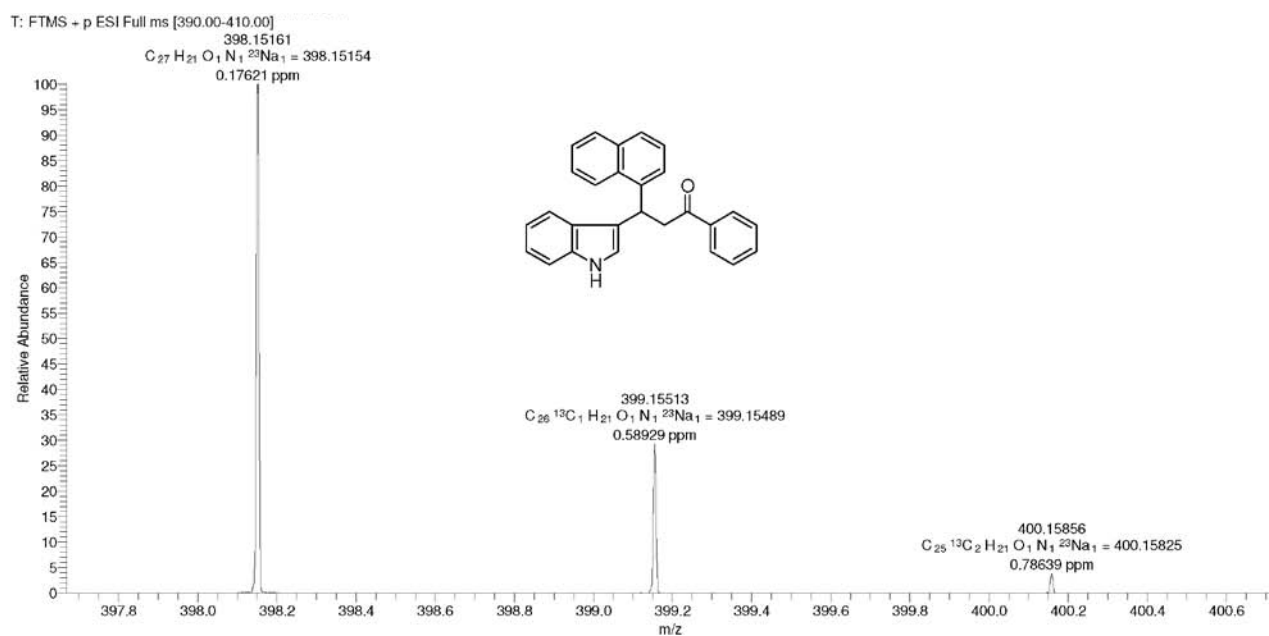


Figure S60. HRMS of compound 3s.

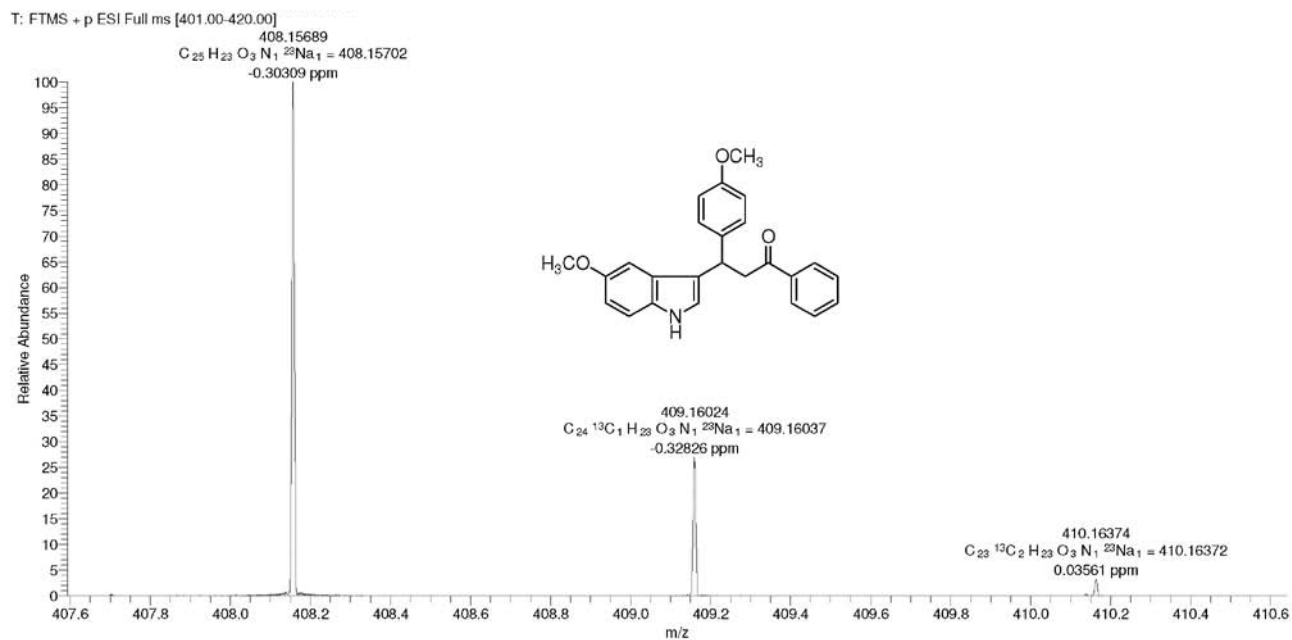


Figure S61. HRMS of compound 3x.

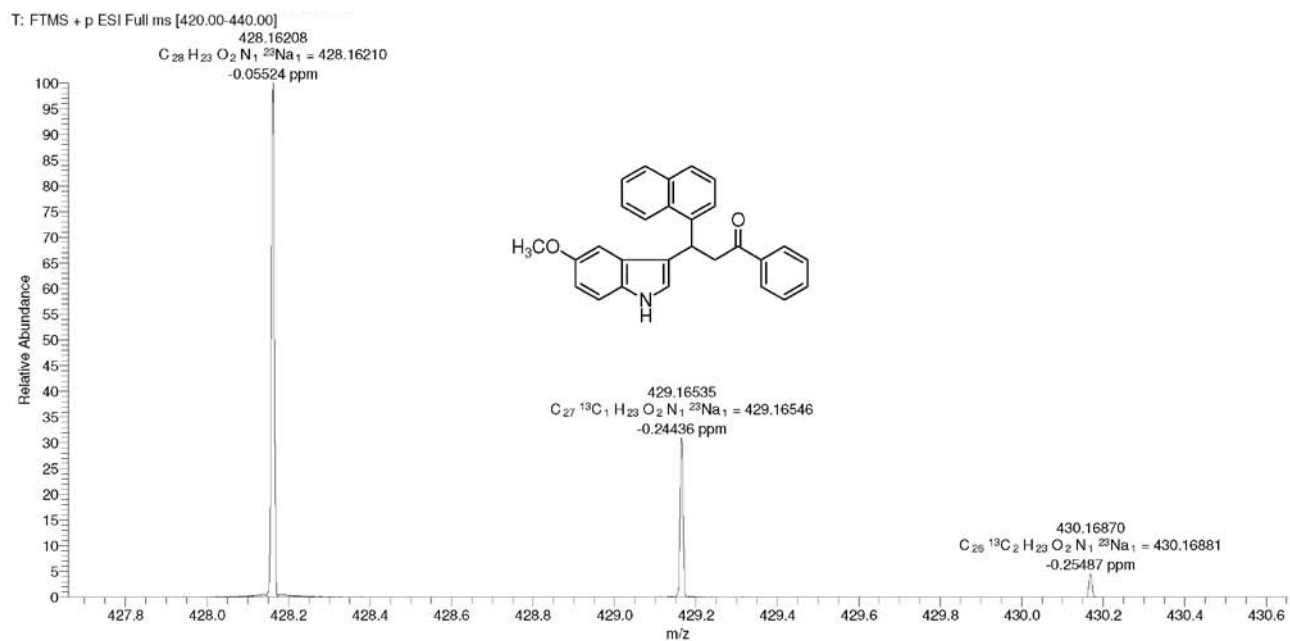


Figure S62. HRMS of compound 3w.

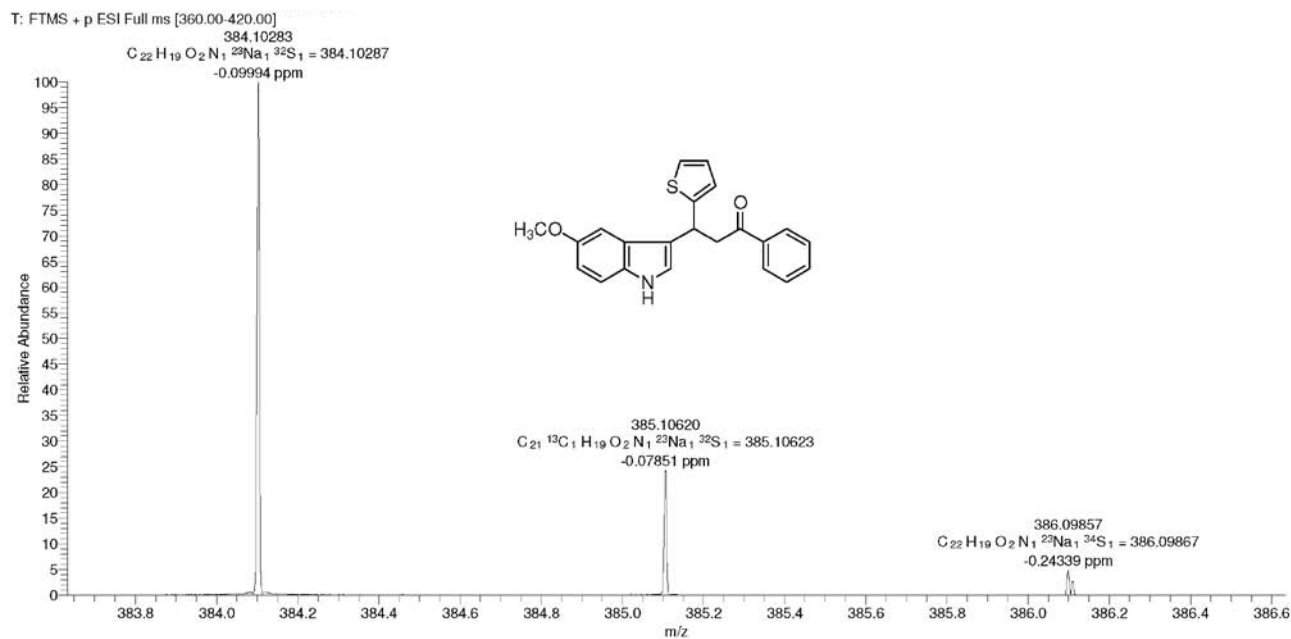
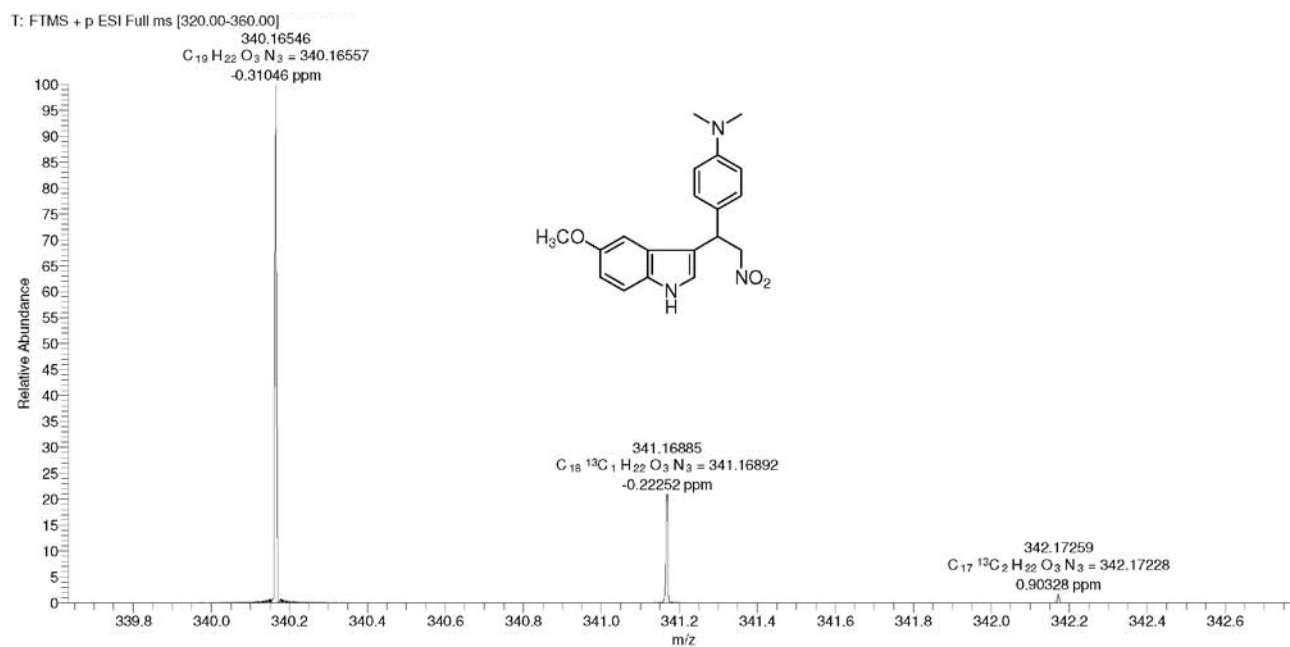
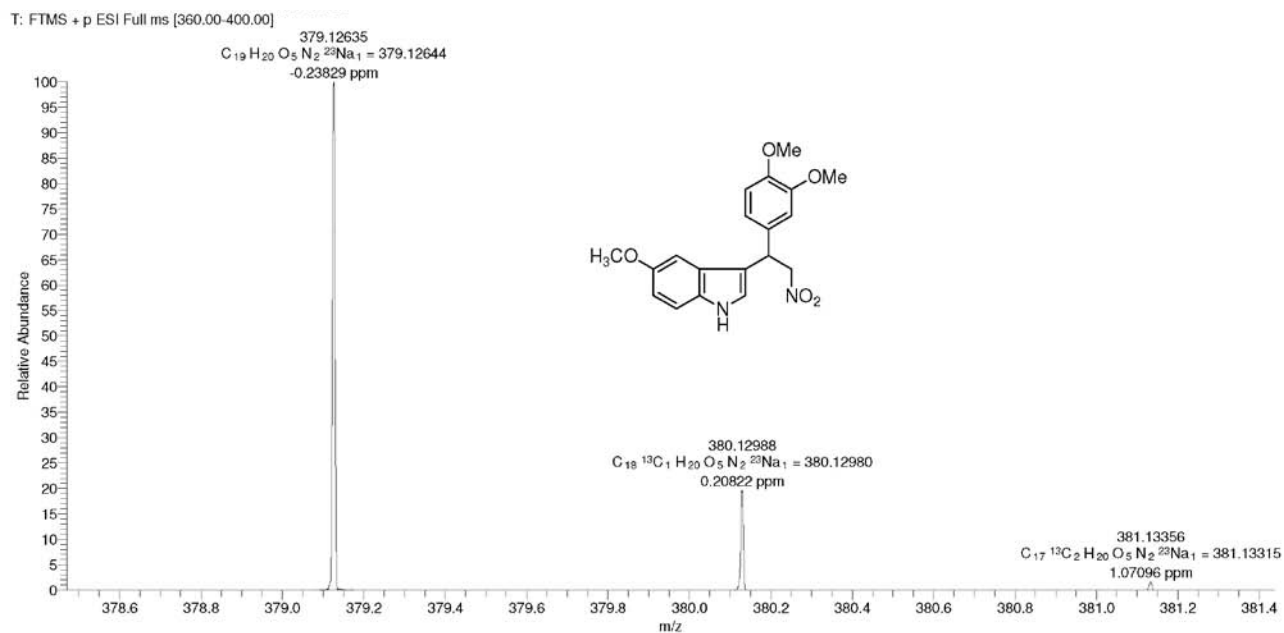


Figure S63. HRMS of compound 3y.

Figure S64. HRMS of compound **5k**.Figure S65. HRMS of compound **5l**.

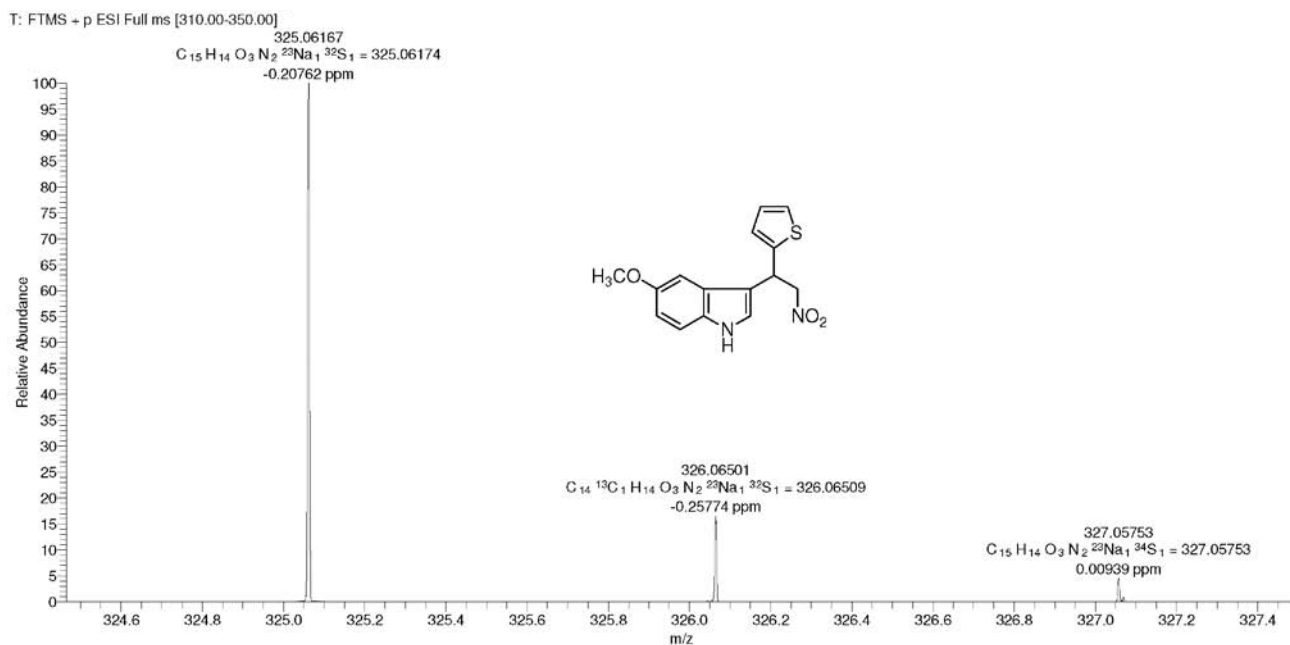


Figure S66. HRMS of compound 5n.

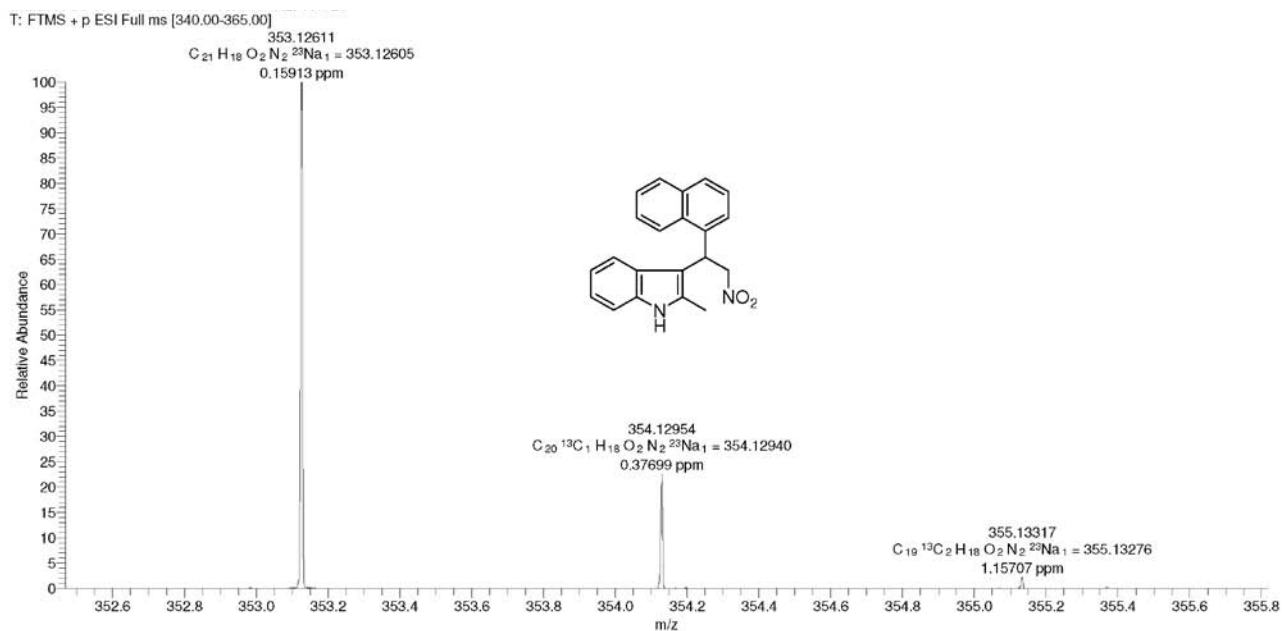
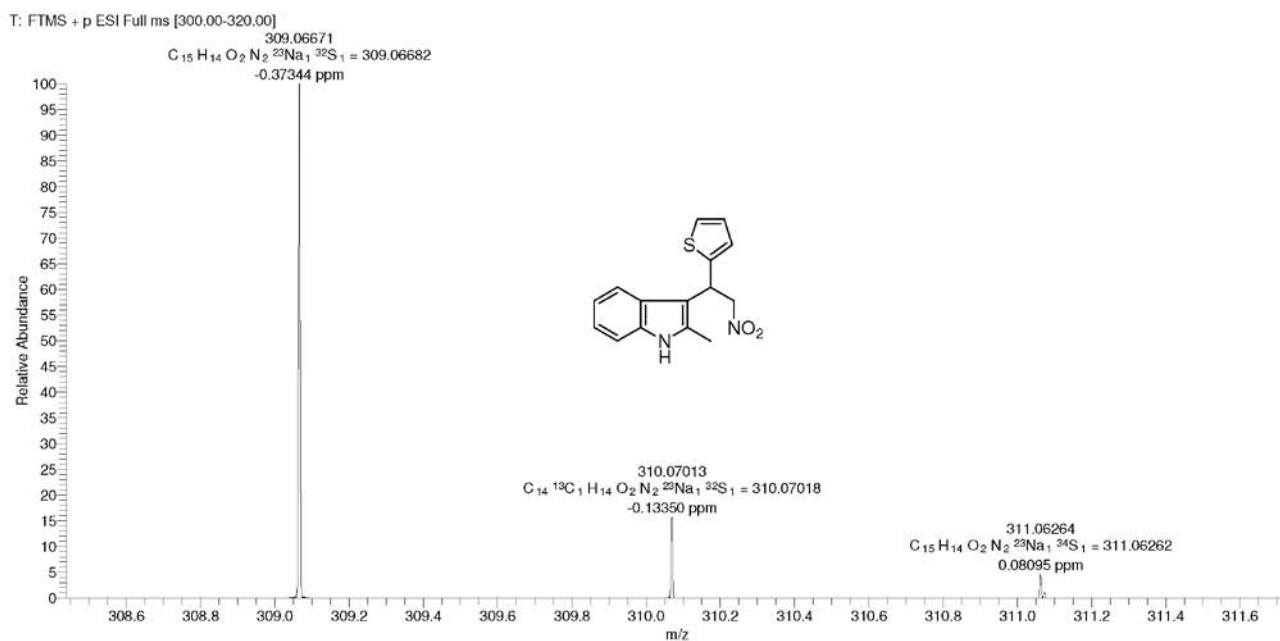


Figure S67. HRMS of compound 5p.

**Figure S68.** HRMS of compound **5q**.