Supporting Information

A Green Method to Prepare Oxindole-Fused Spirotetrahydrofuran Scaffolds through Methanesulfonic Acid Catalyzed Cyclization Reactions of 3-Allyl-3-hydroxy-2-oxindole in Water

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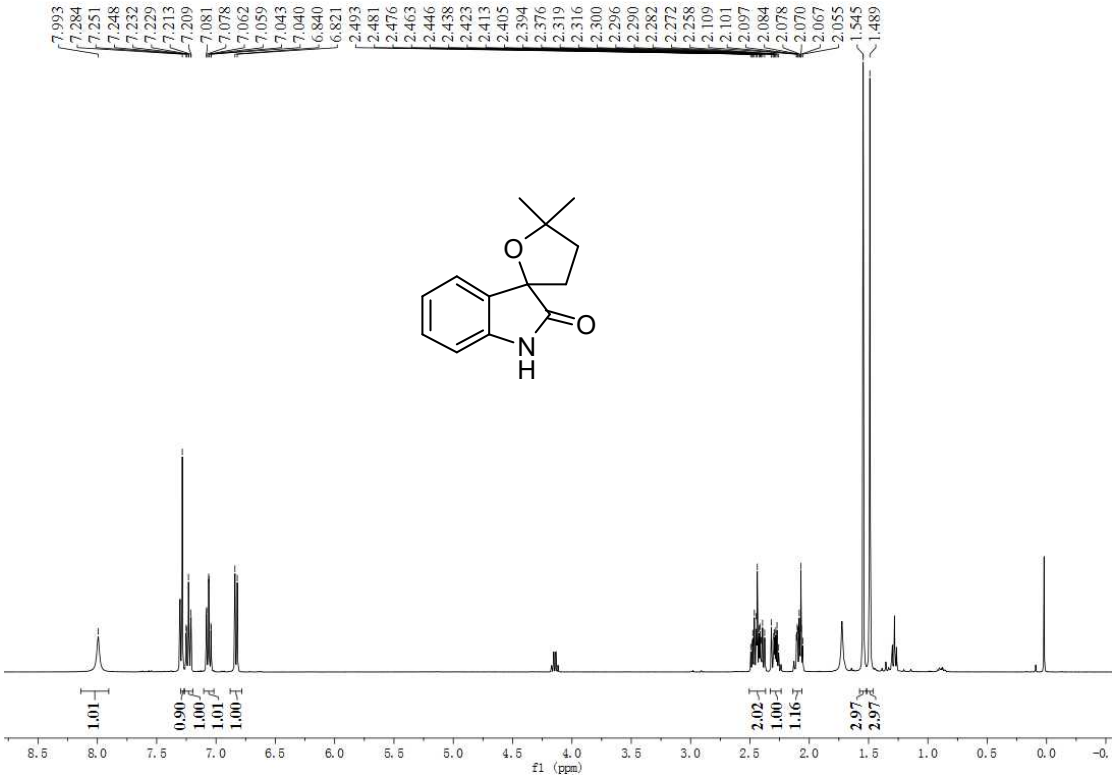

Figure S1. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2a**

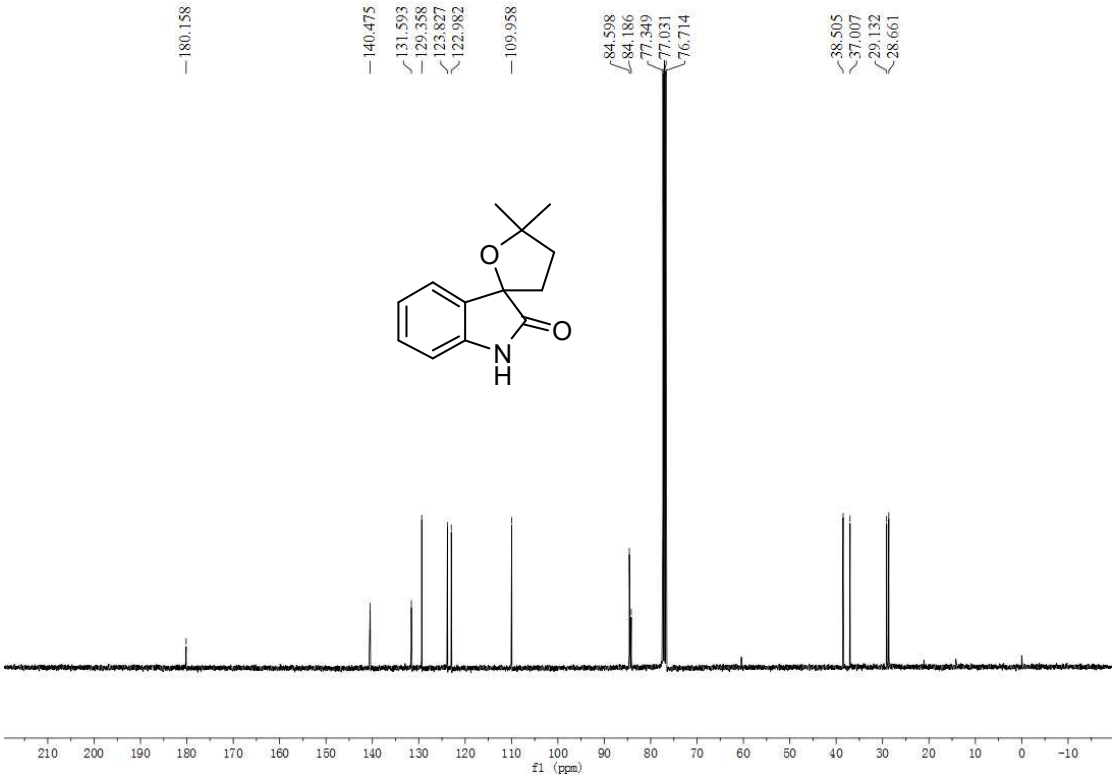

Figure S2. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2a**

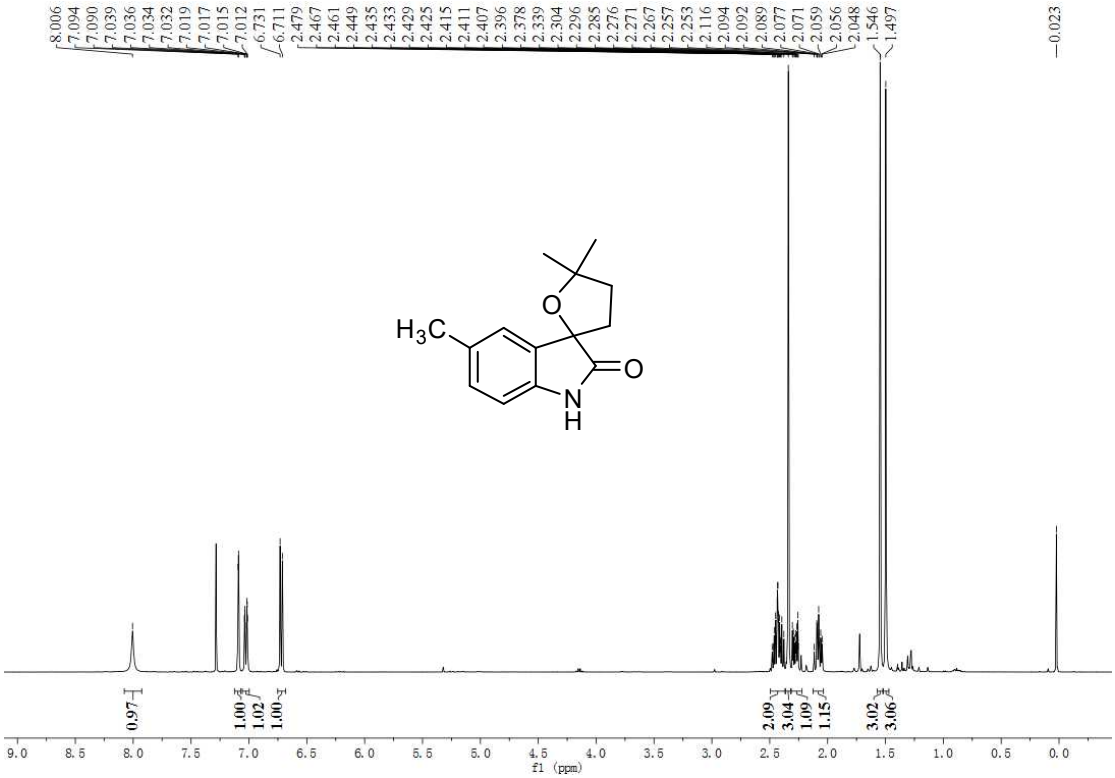

Figure S3. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2b**

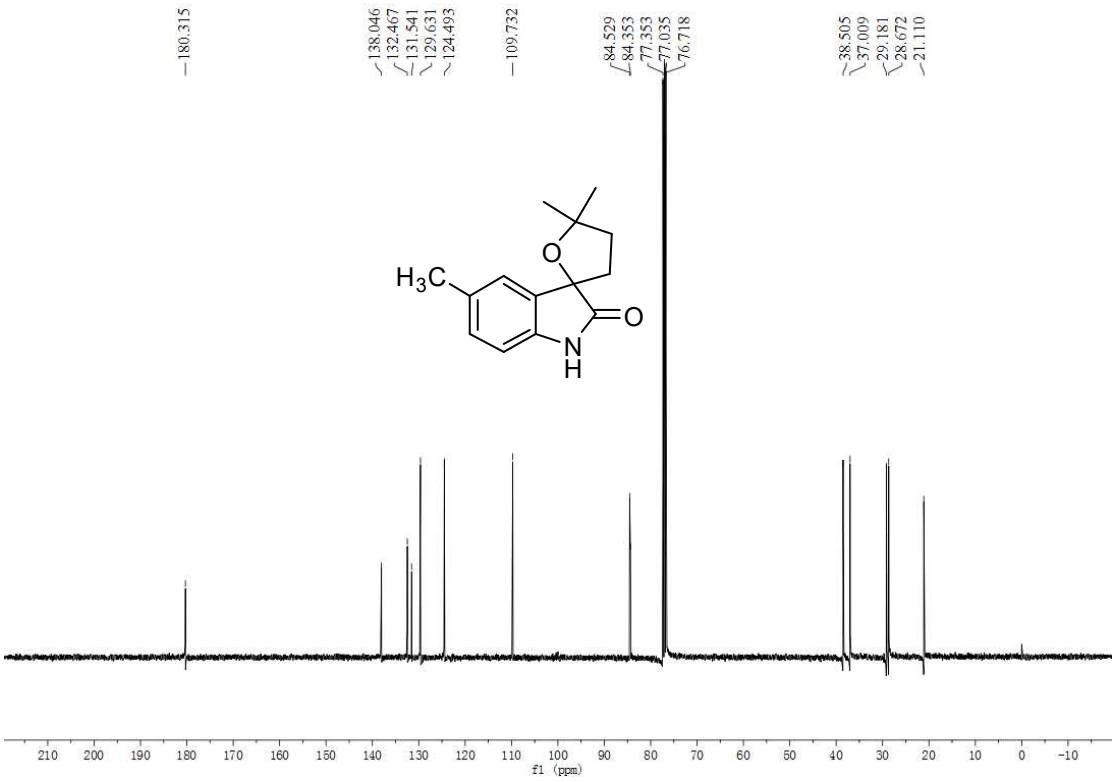

Figure S4. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2b**

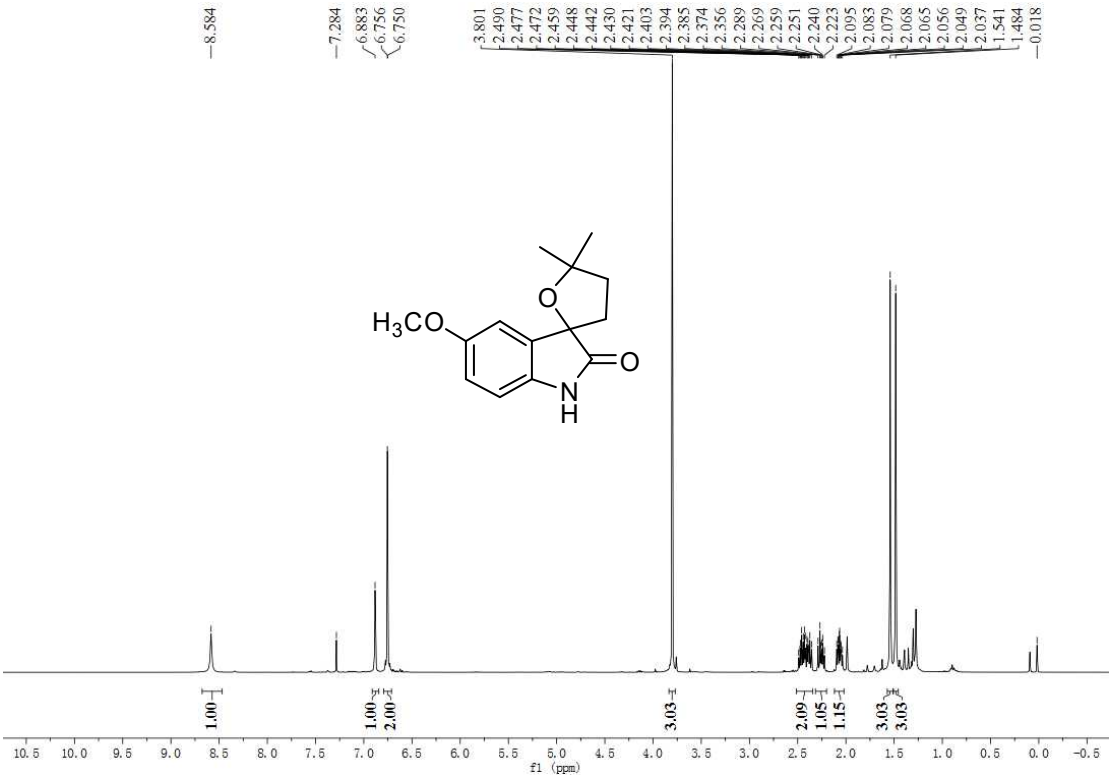

Figure S5. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2c**

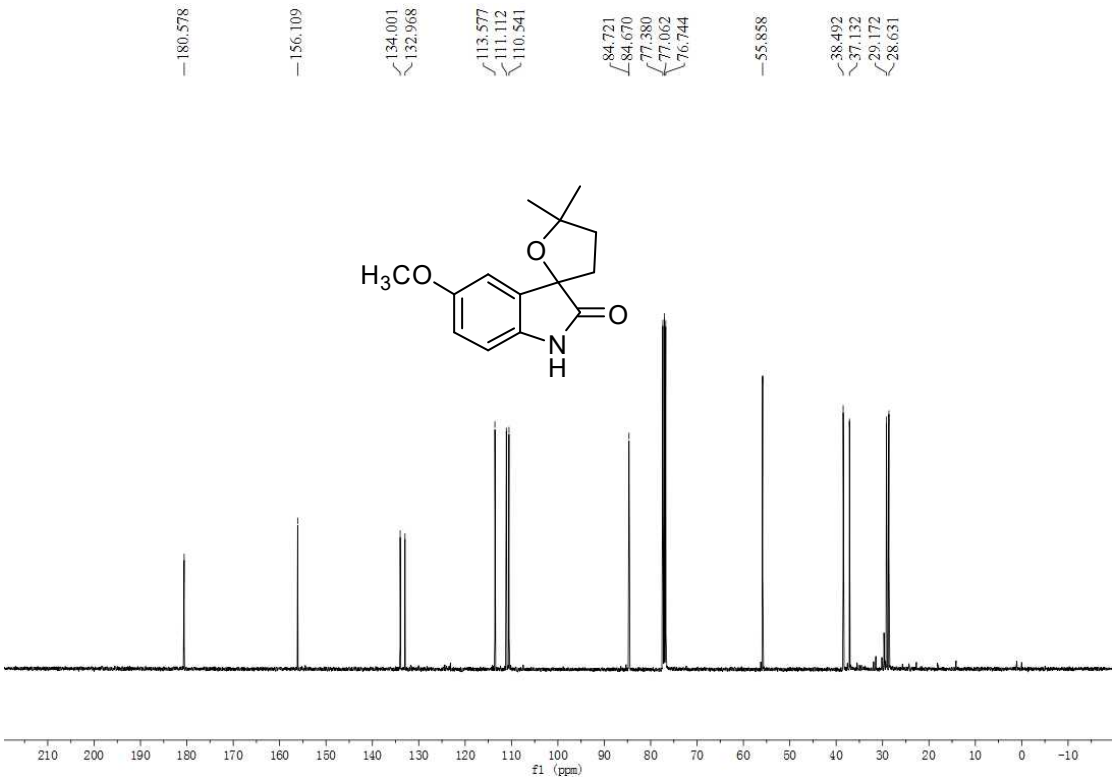

Figure S6. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2c**

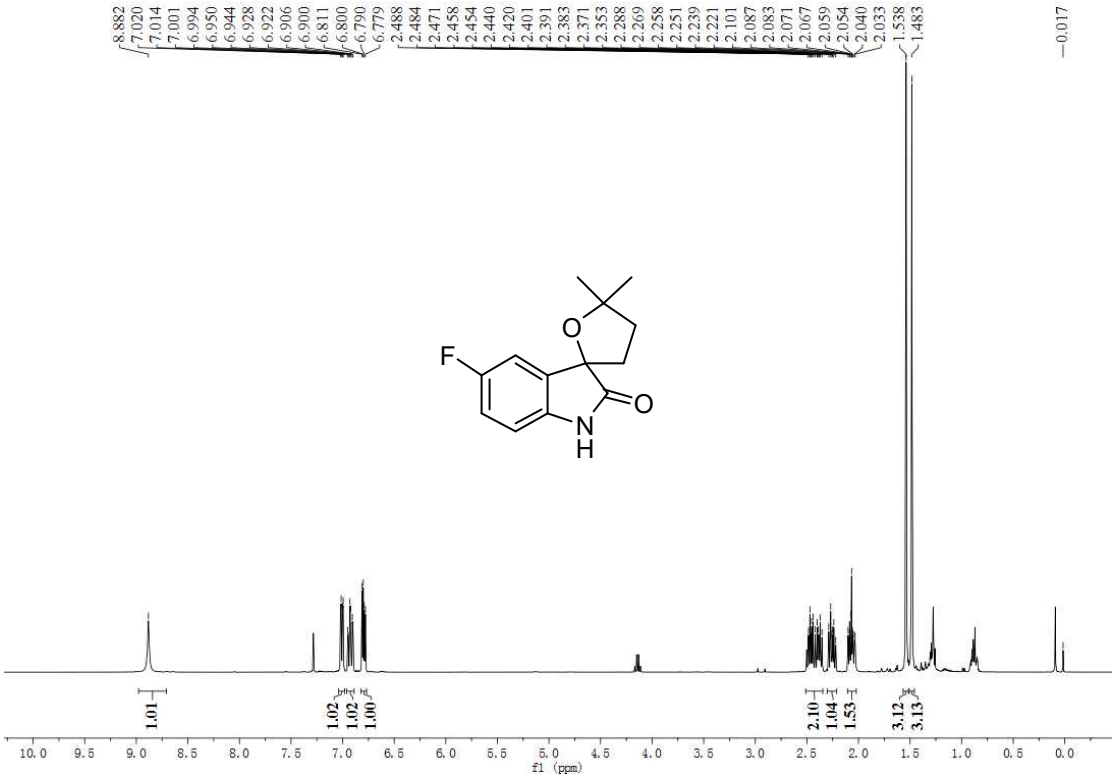

Figure S7. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2d**

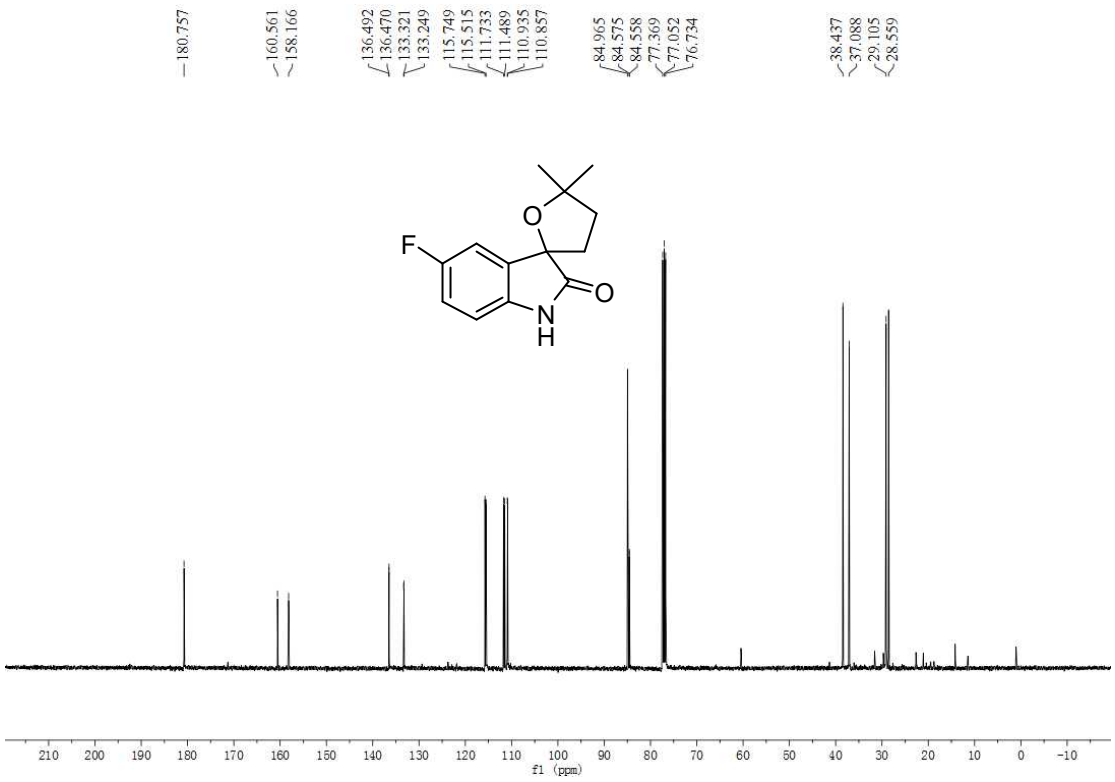

Figure S8. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2d**

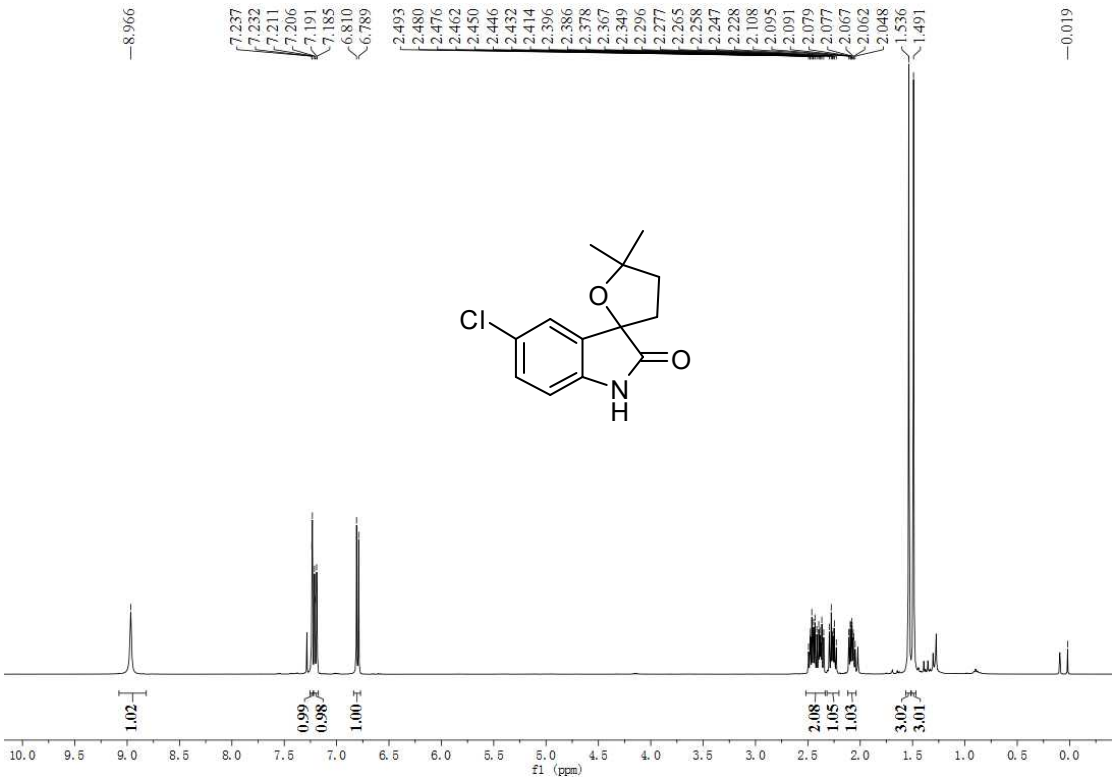

Figure S9. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2e**

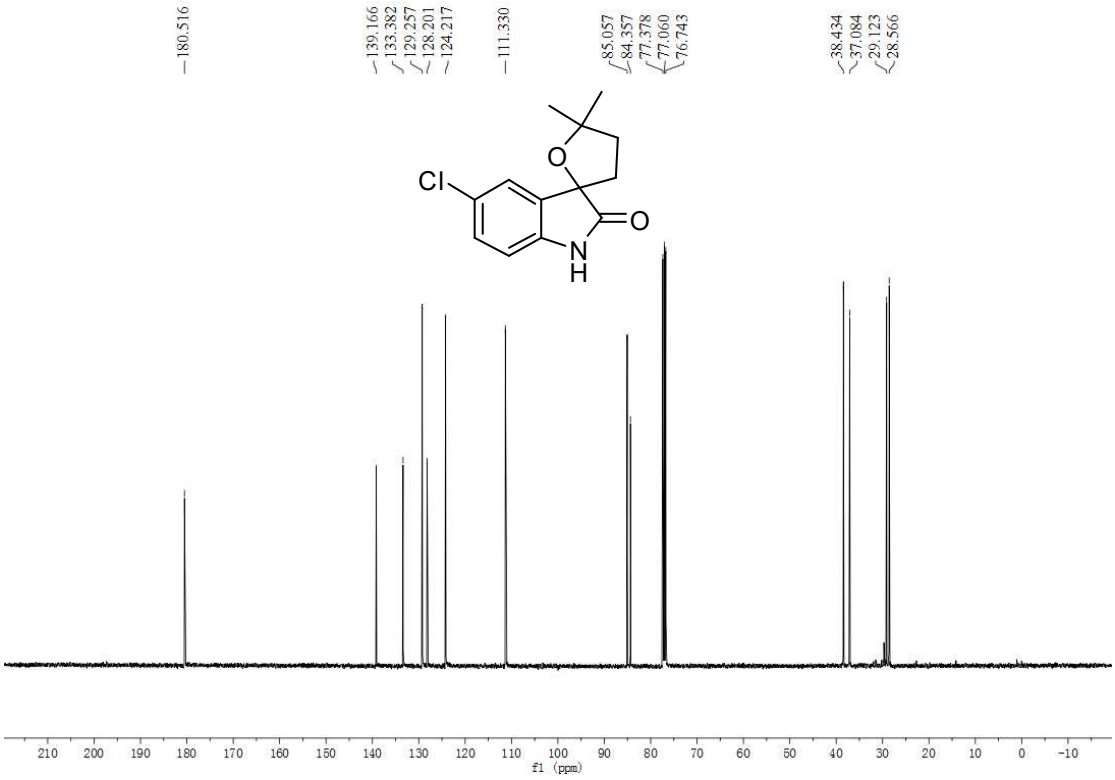

Figure S10. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2e**

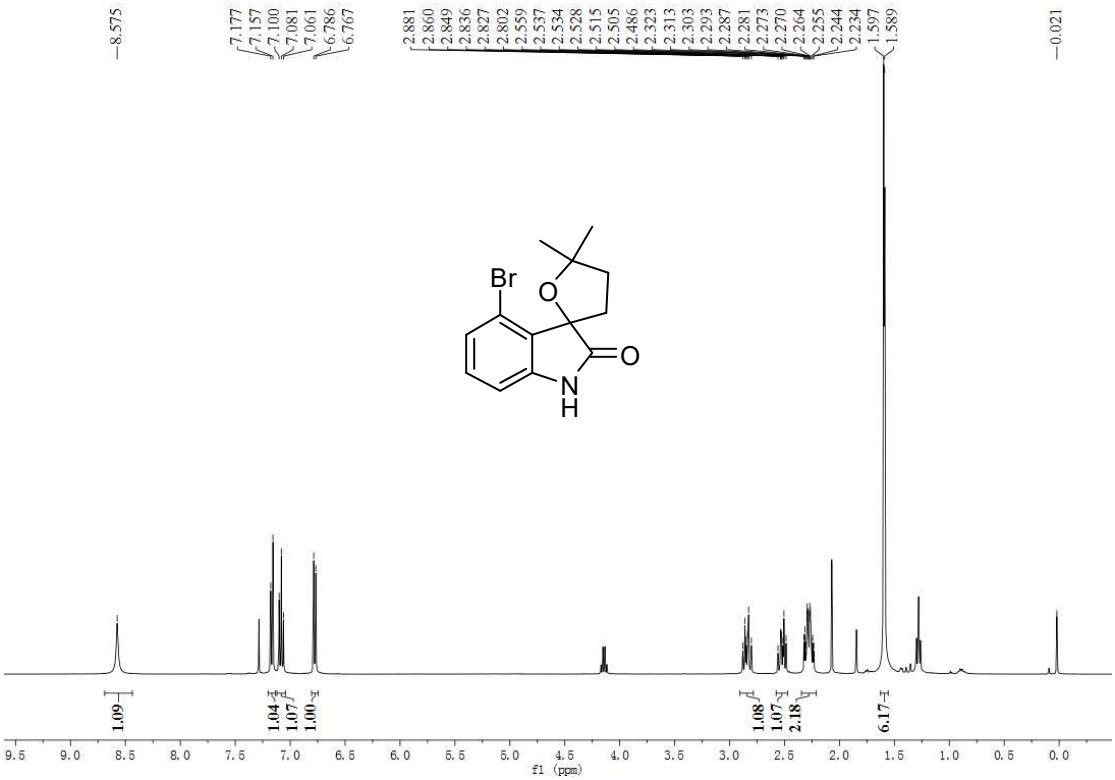

Figure S11. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2f**

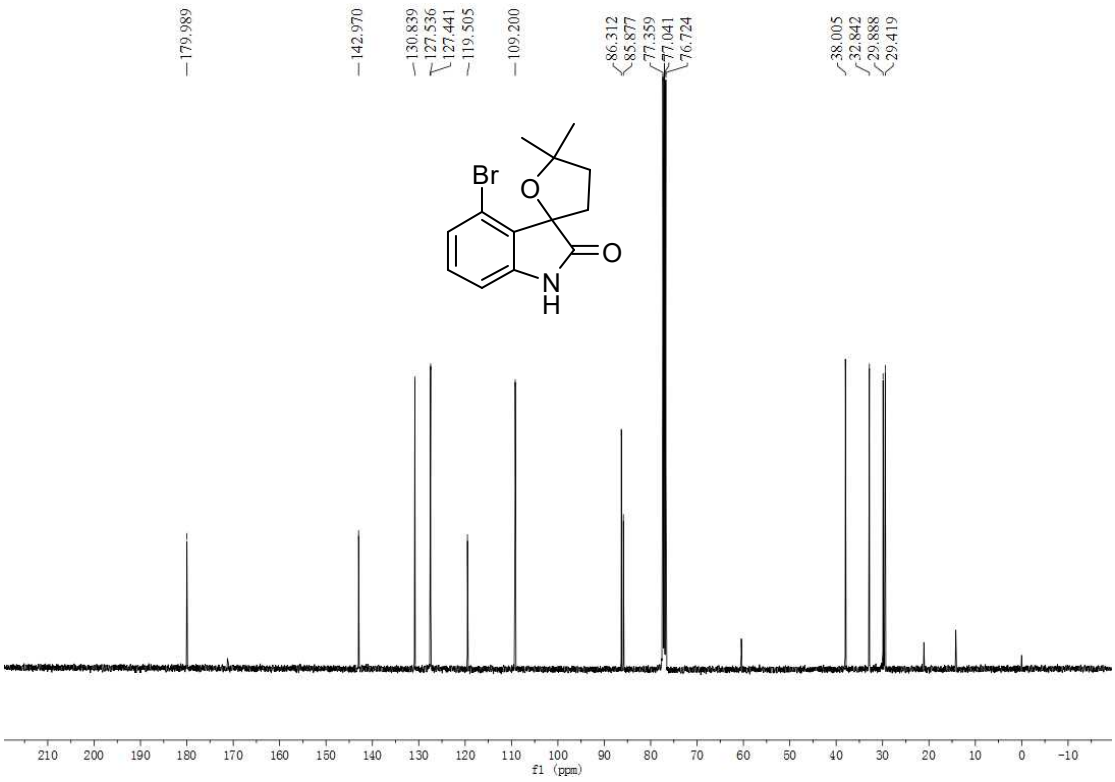

Figure S12. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2f**

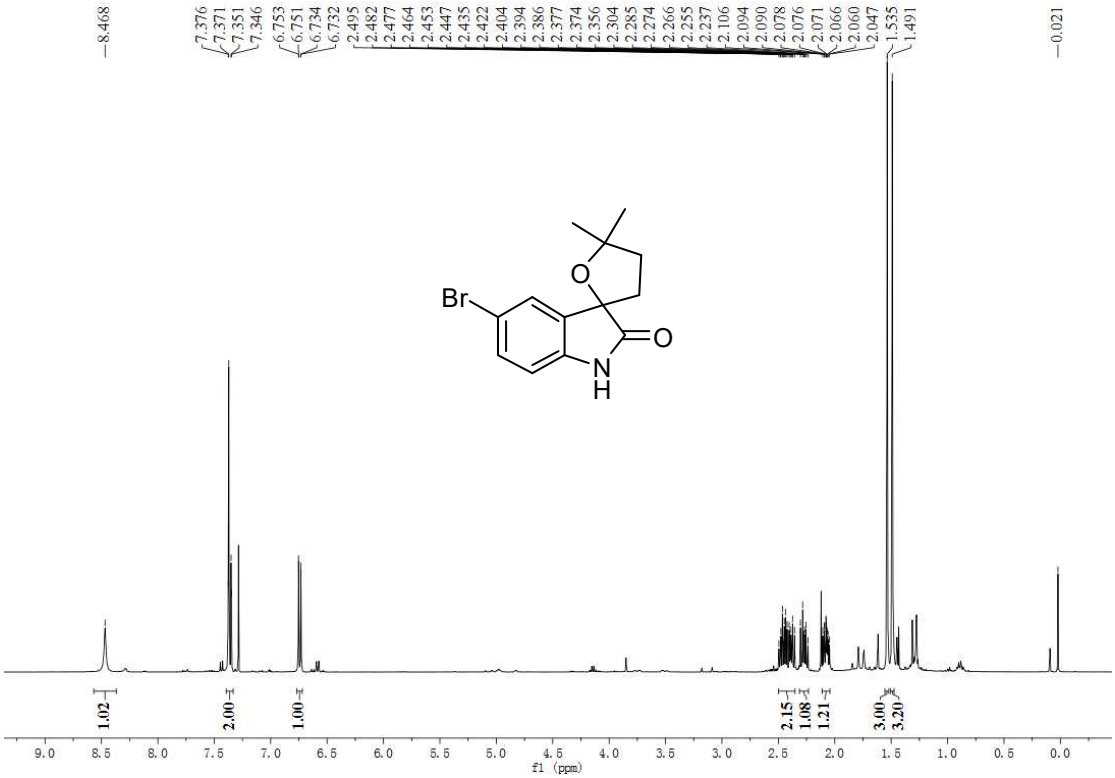

Figure S13. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2g**

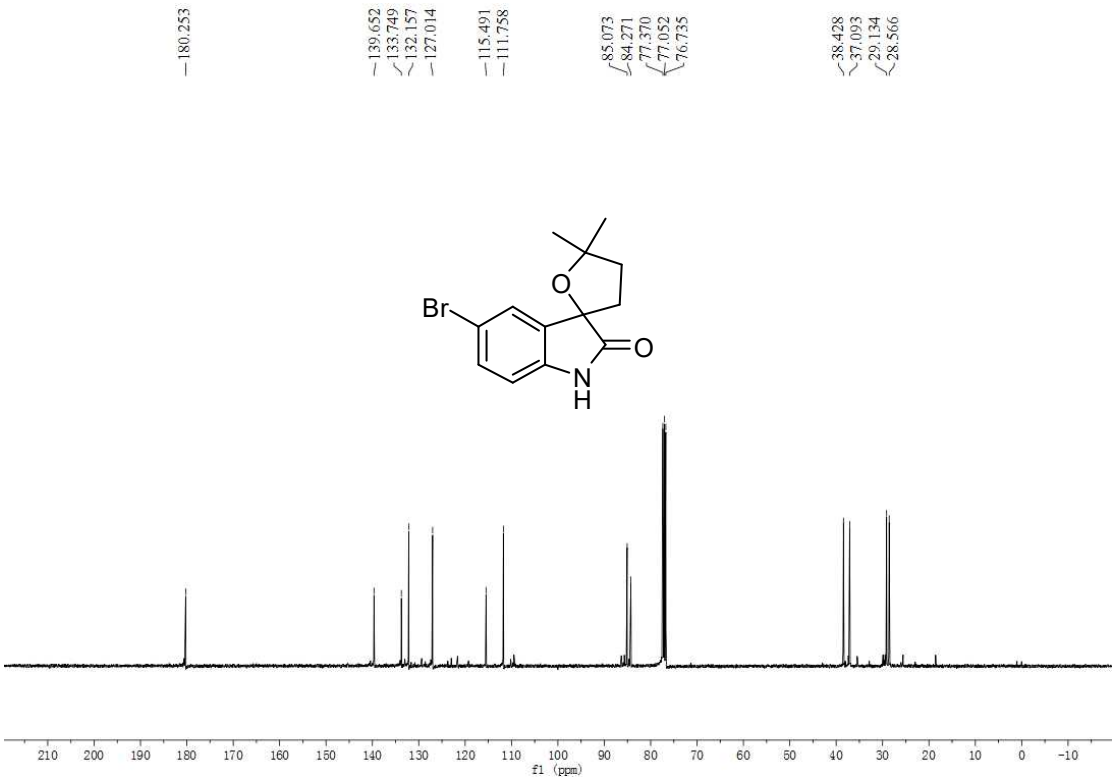

Figure S14. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2g**

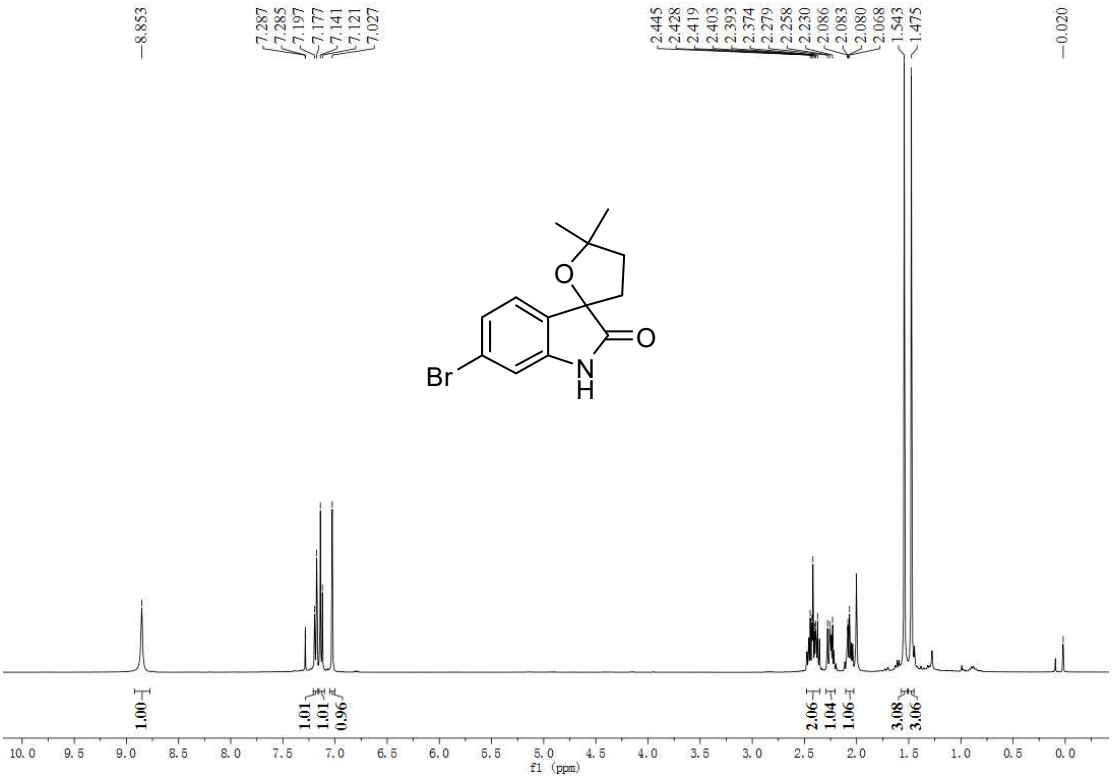

Figure S15. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2h**

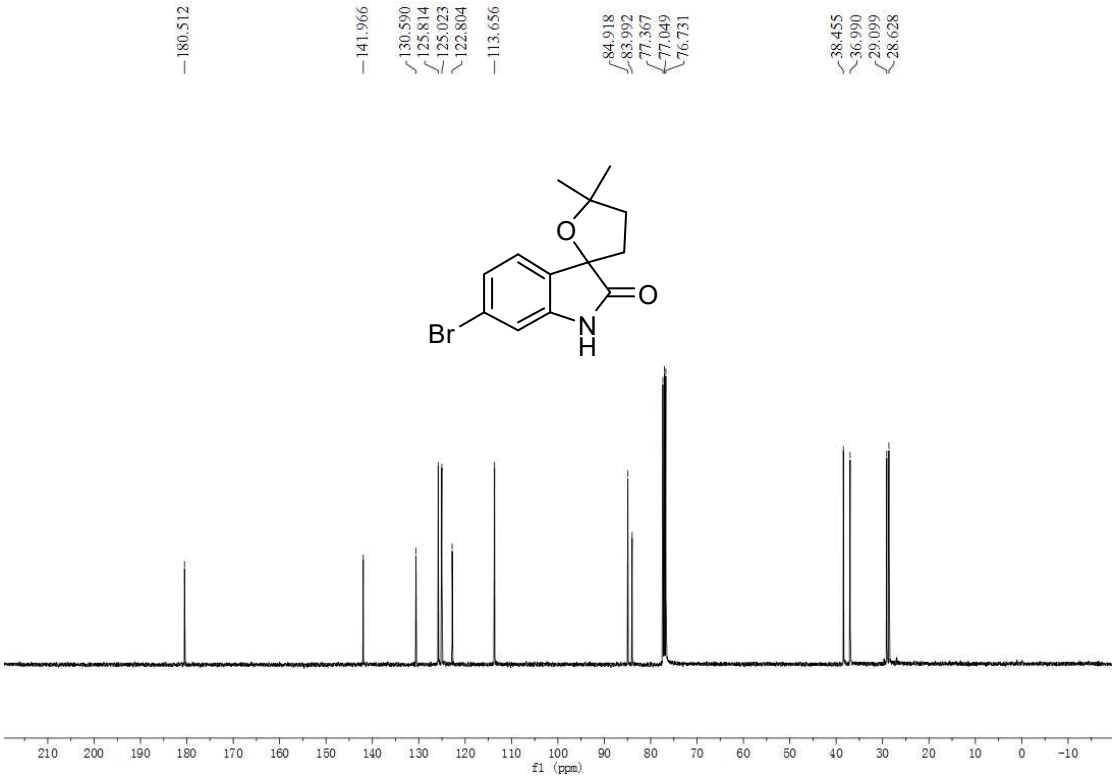

Figure S16. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2h**

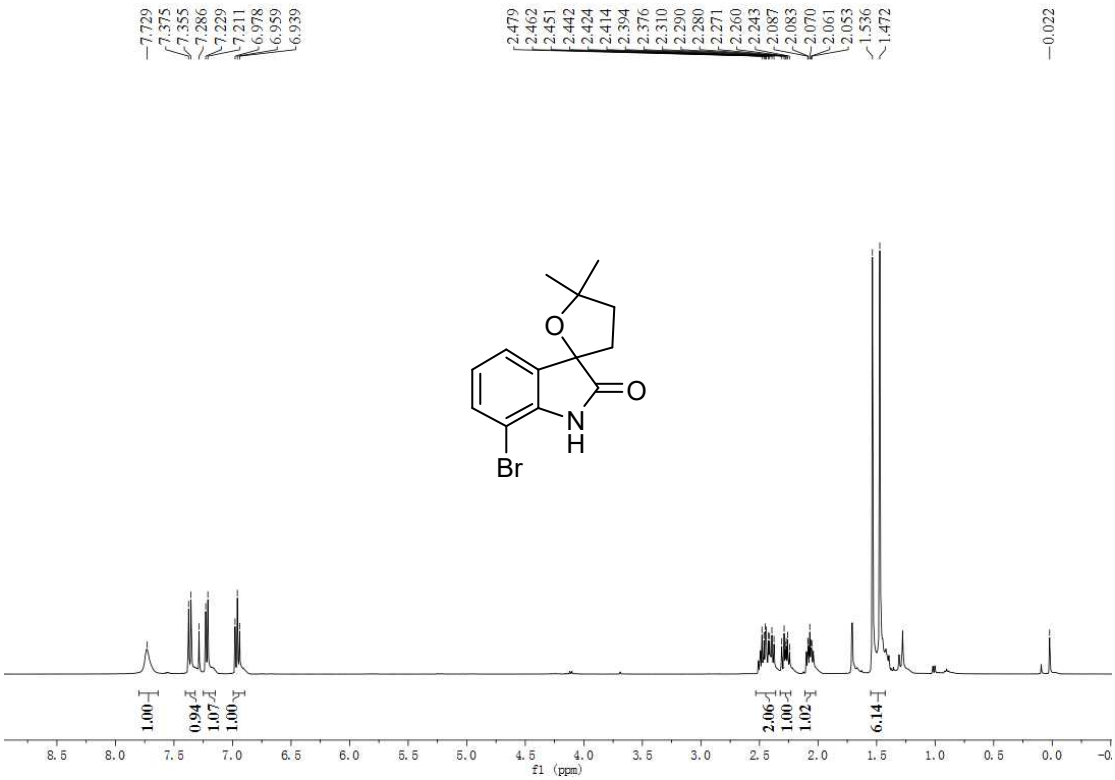

Figure S17. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2i**

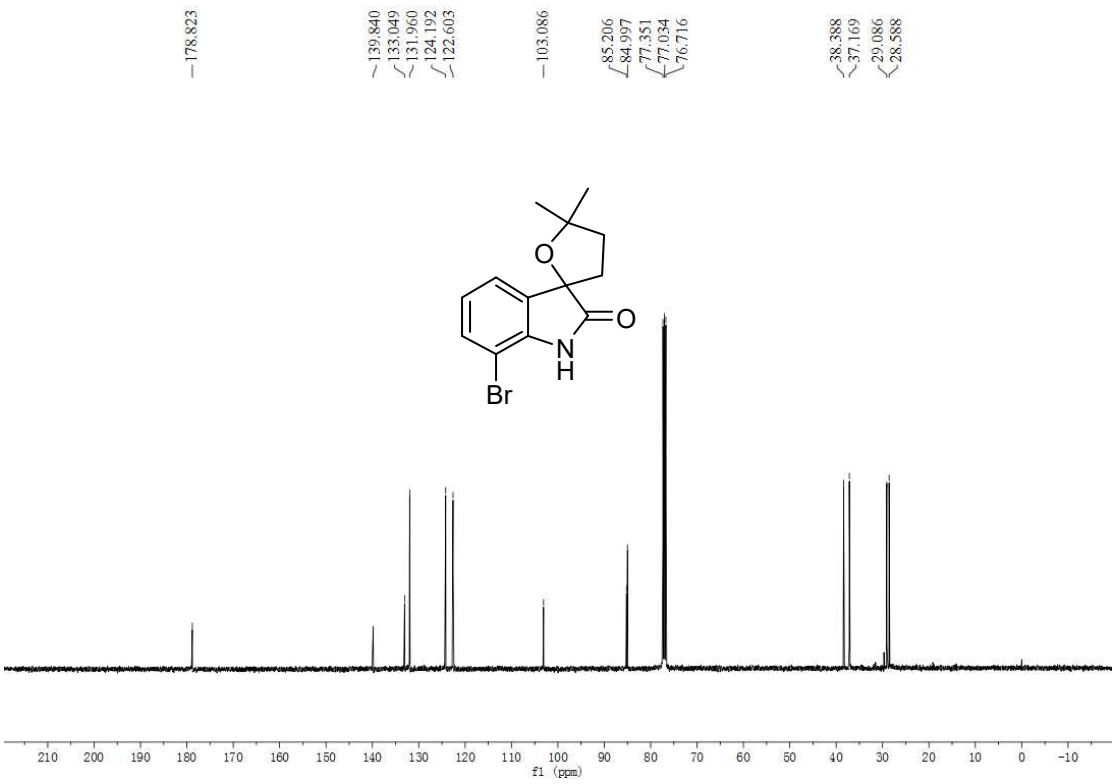

Figure S18. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2i**

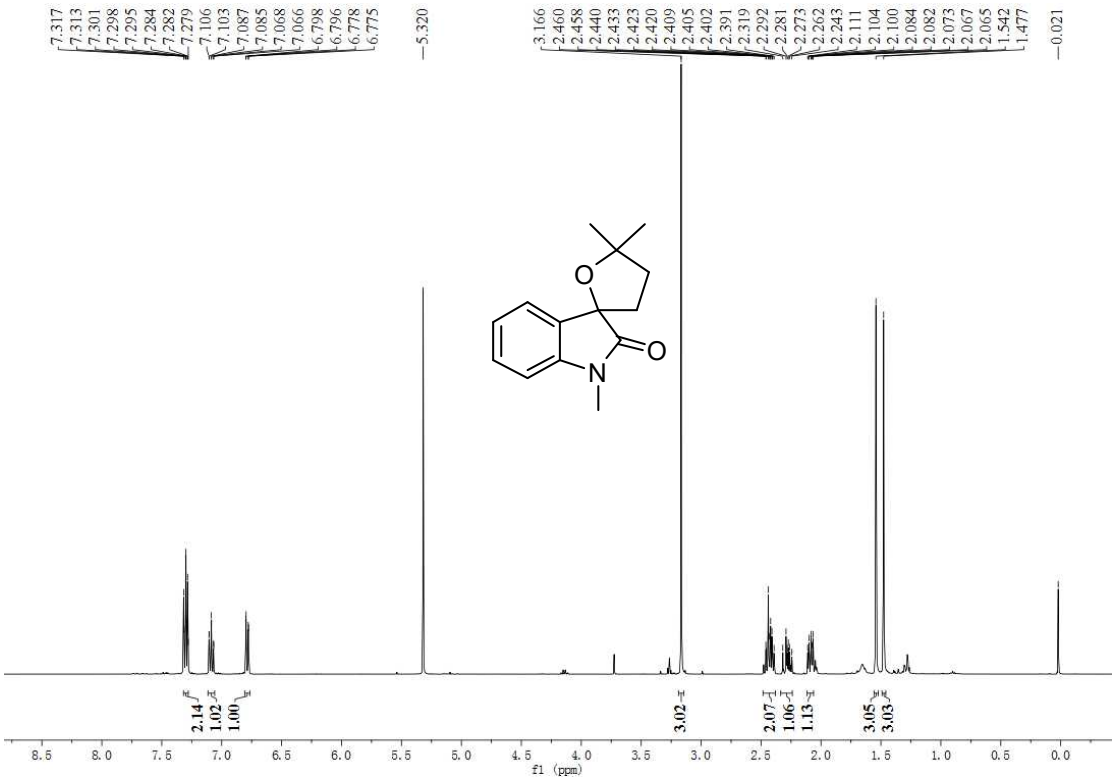

Figure S19. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2j**

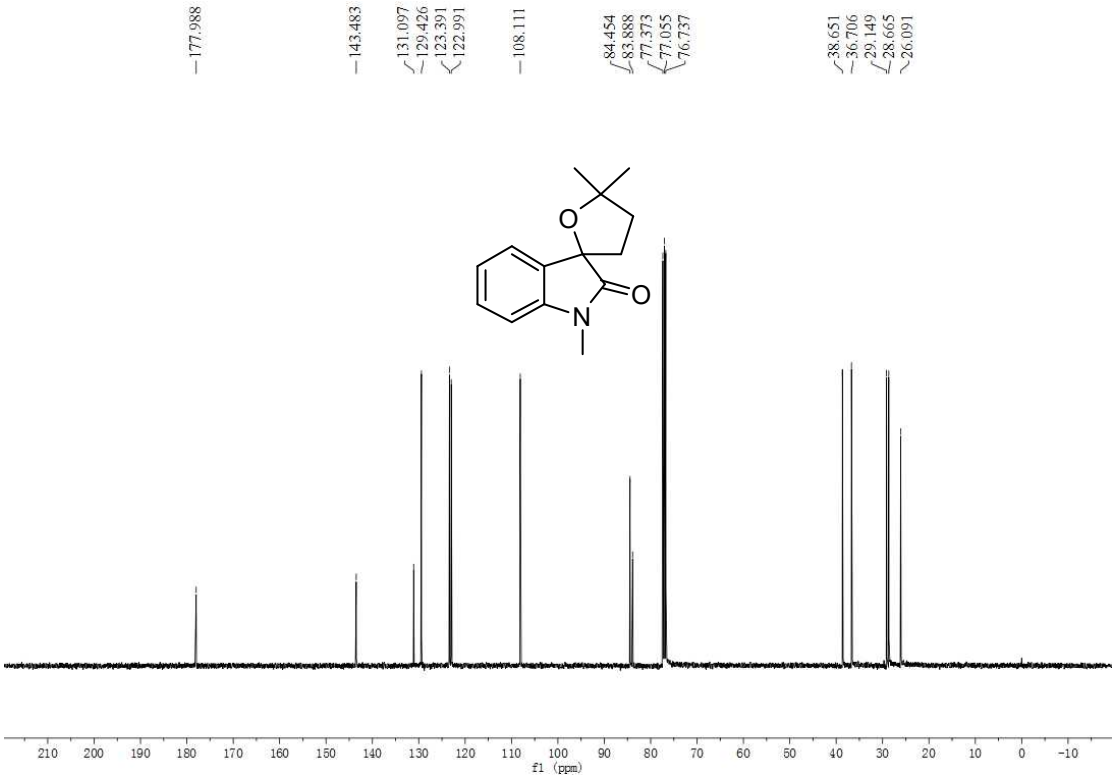

Figure S20. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2j**

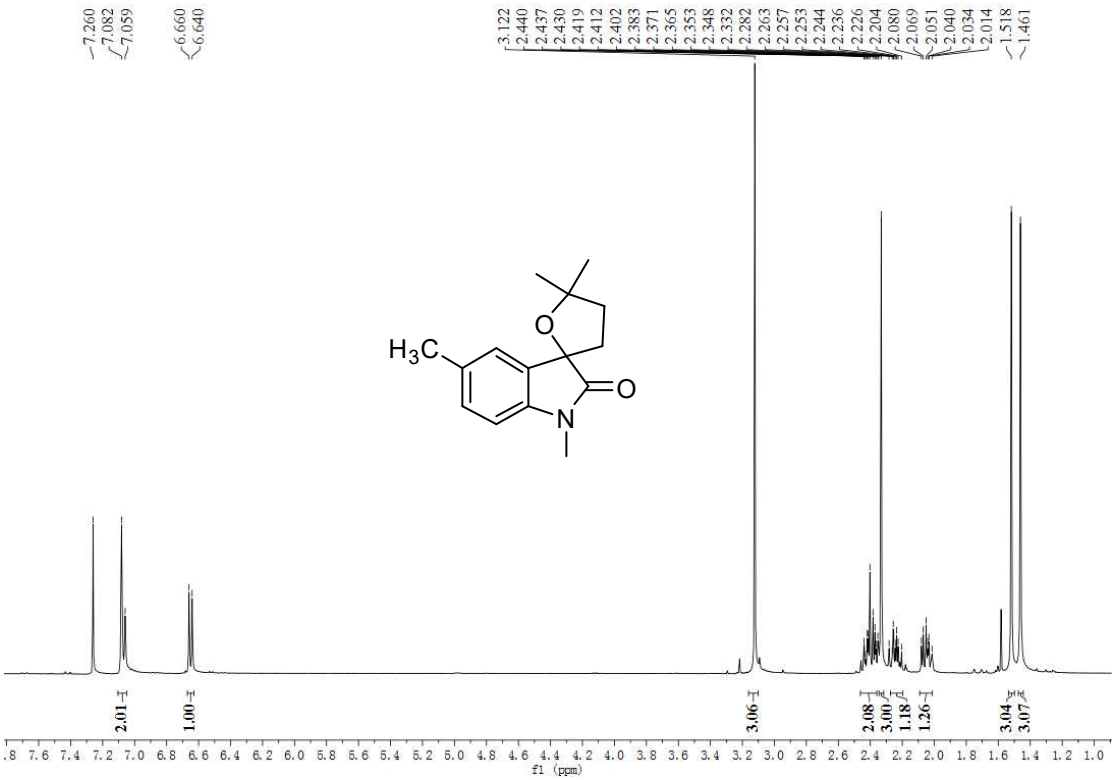

Figure S21. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2k**

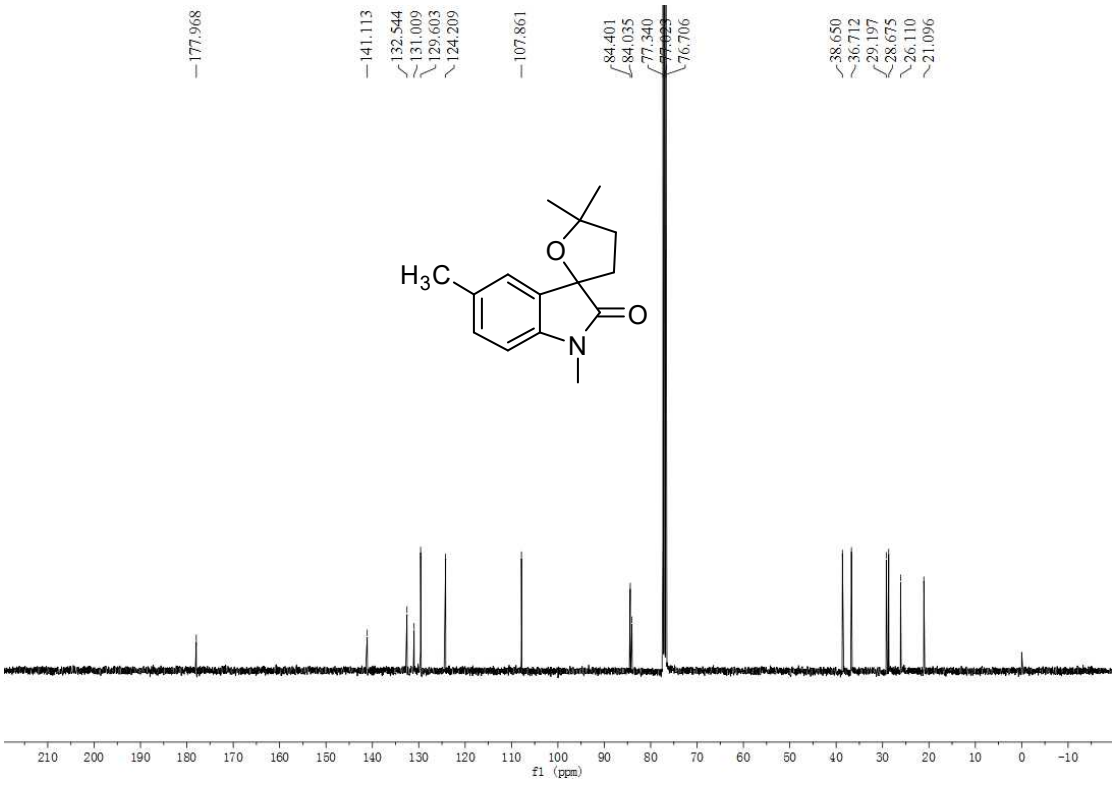

Figure S22. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2k**

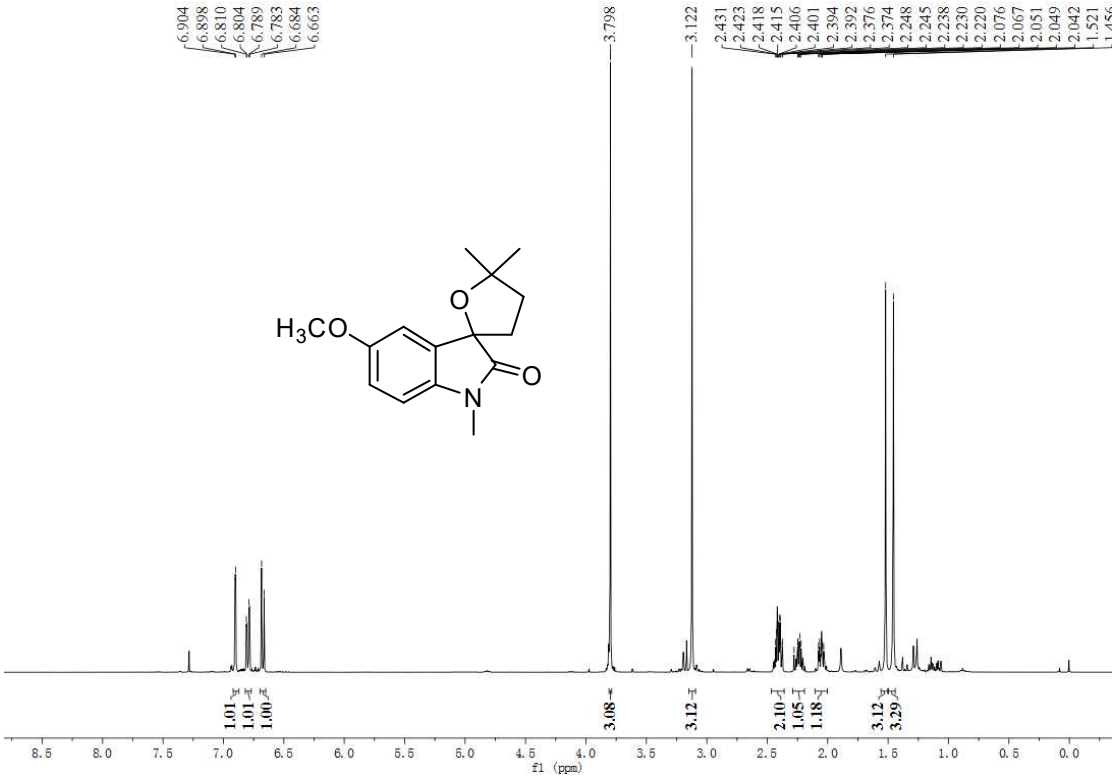

Figure S23. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2l**

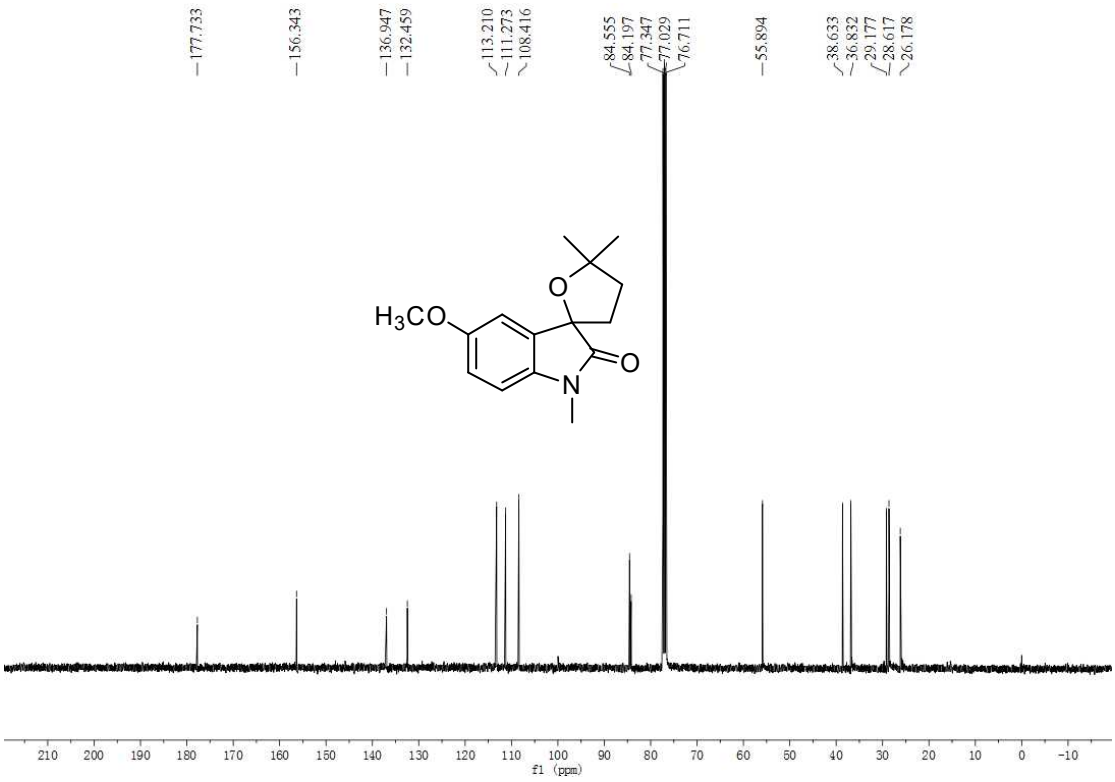

Figure S24. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2l**

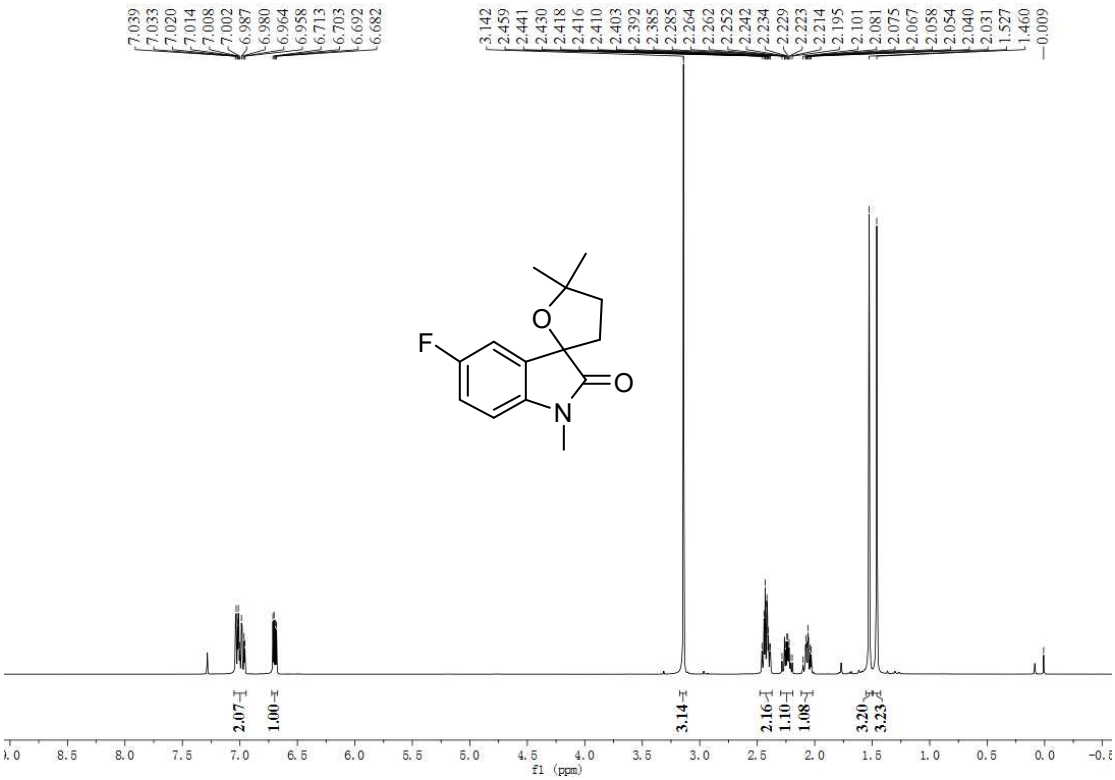

Figure S25. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2m**

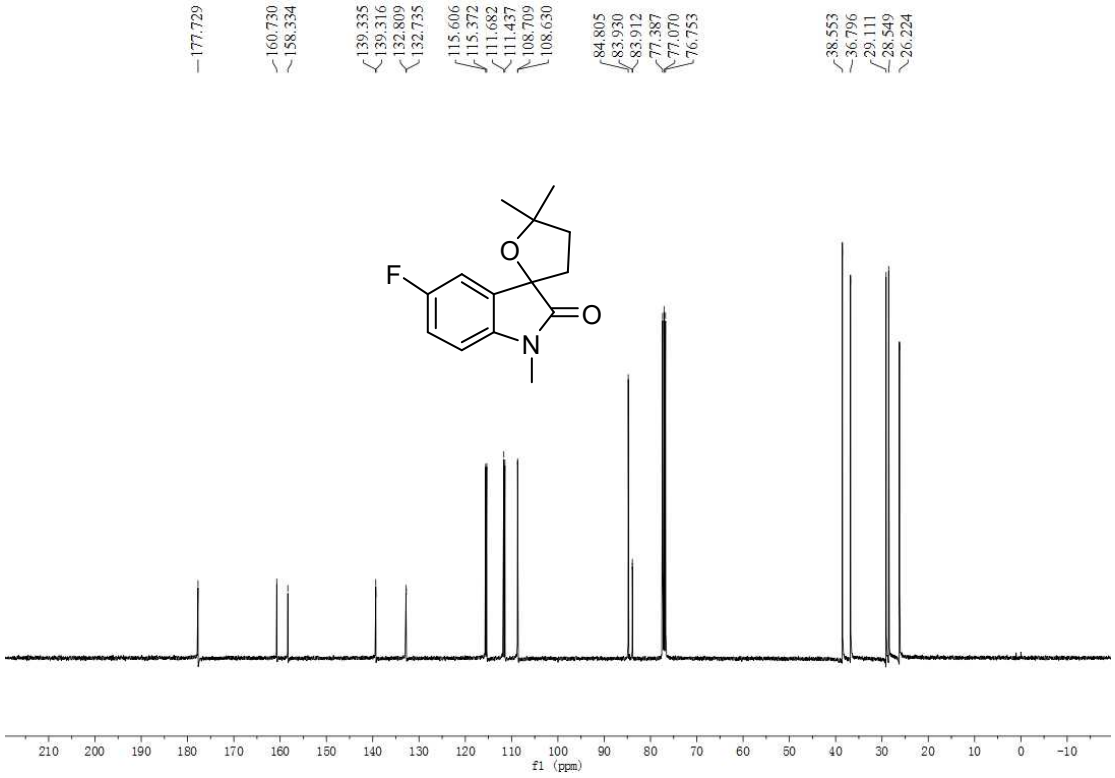

Figure S26. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2m**

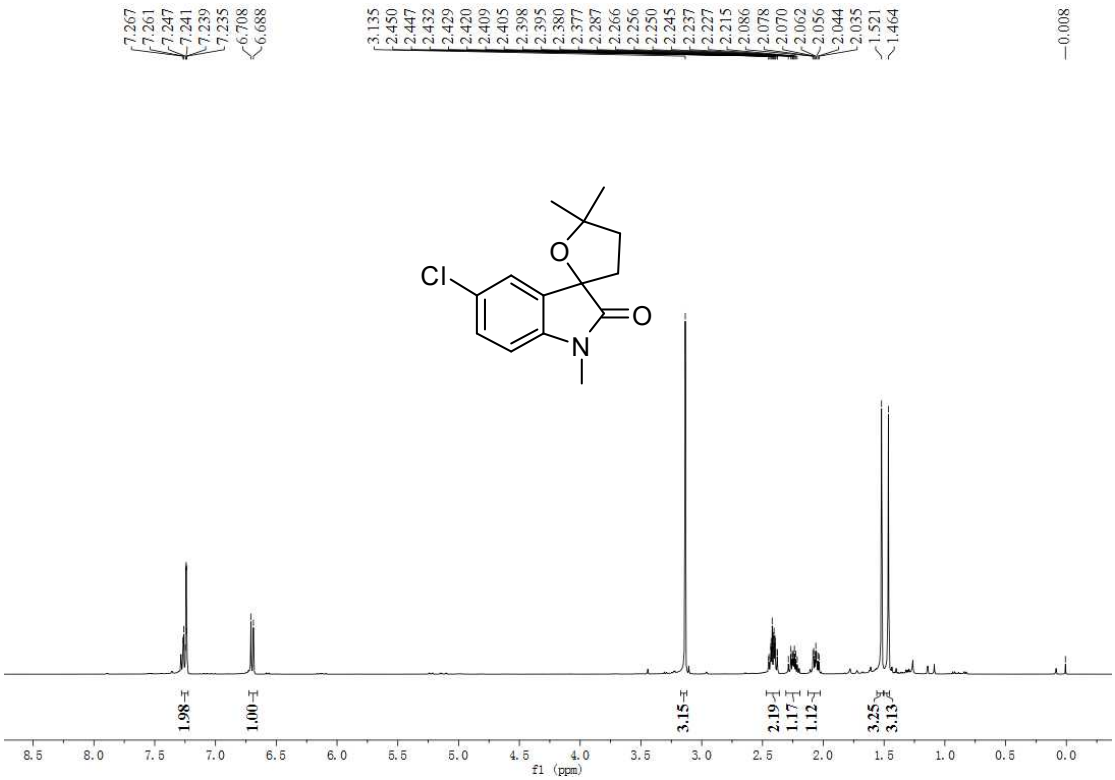

Figure S27. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2n**

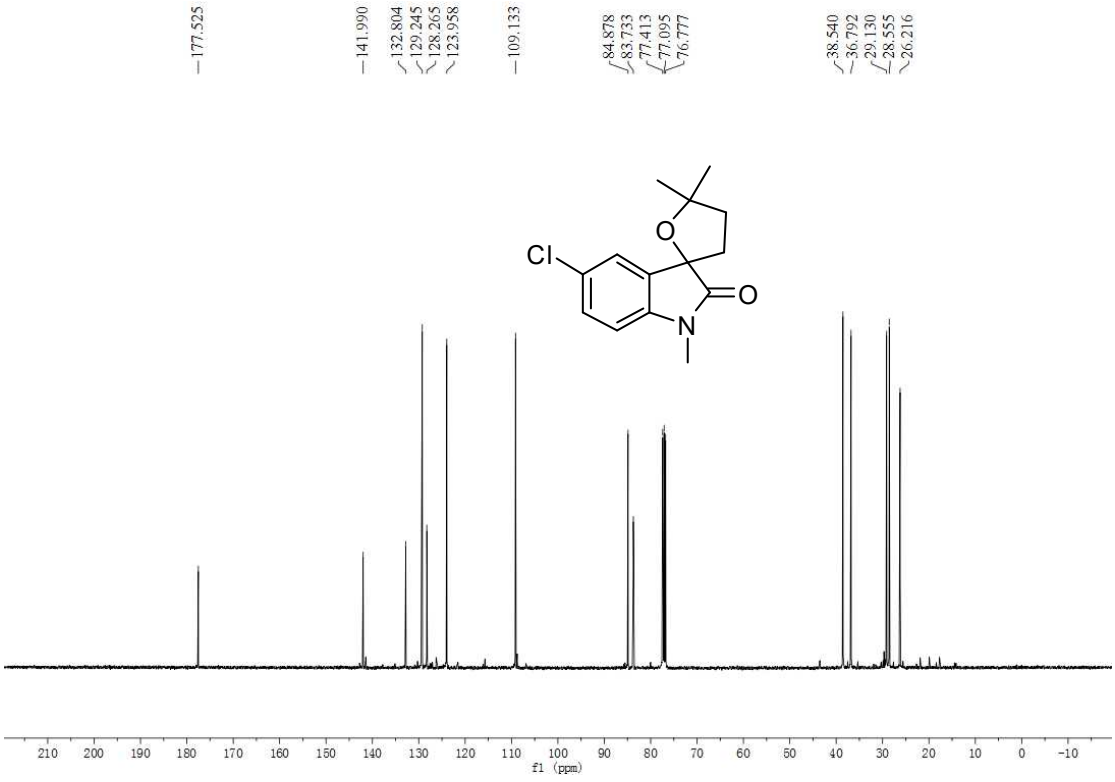

Figure S28. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2n**

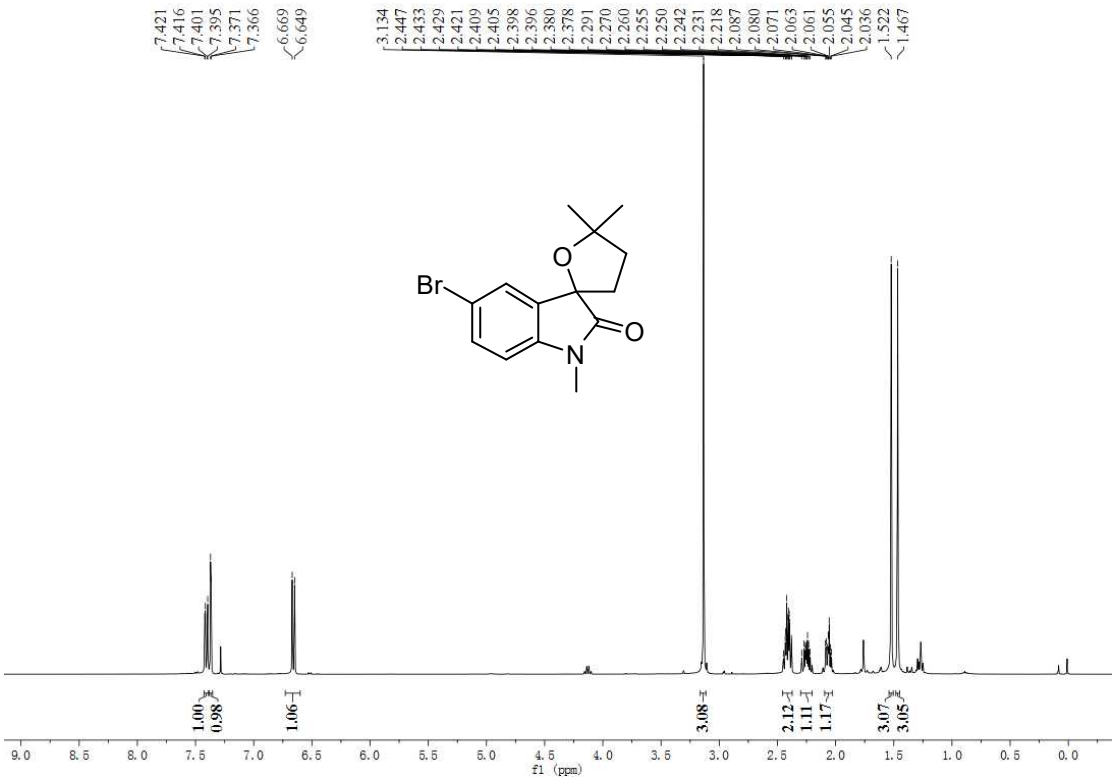

Figure S29. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2o**

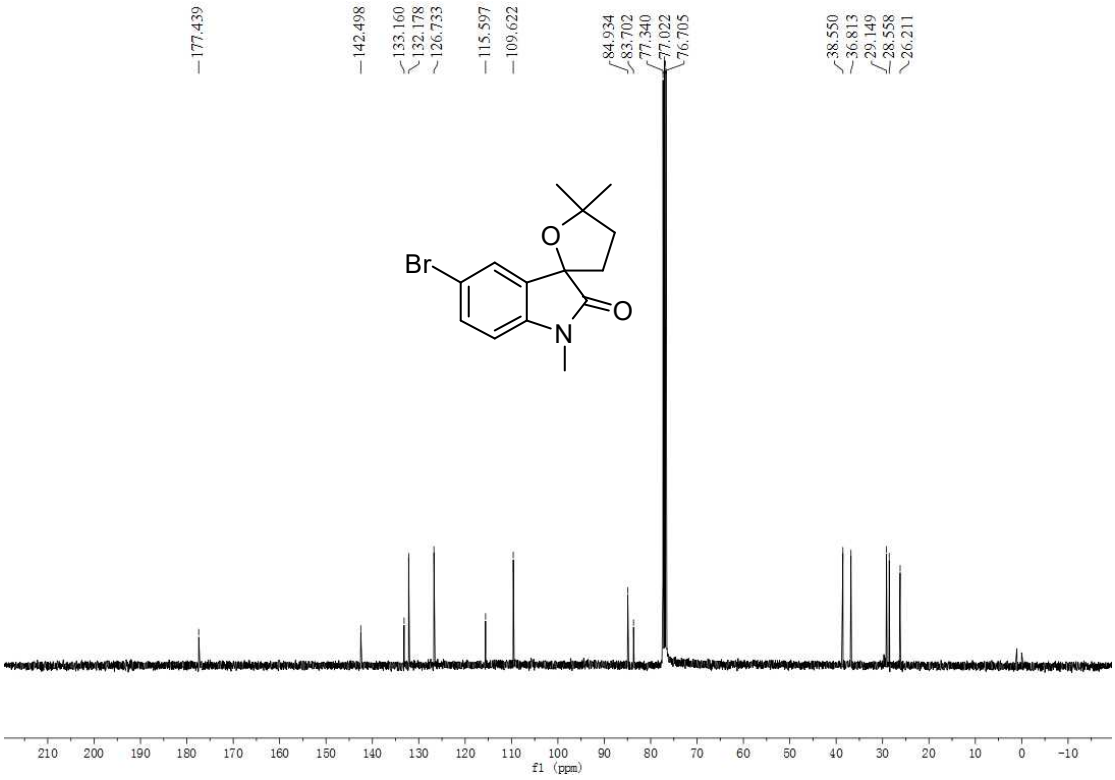

Figure S30. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2o**

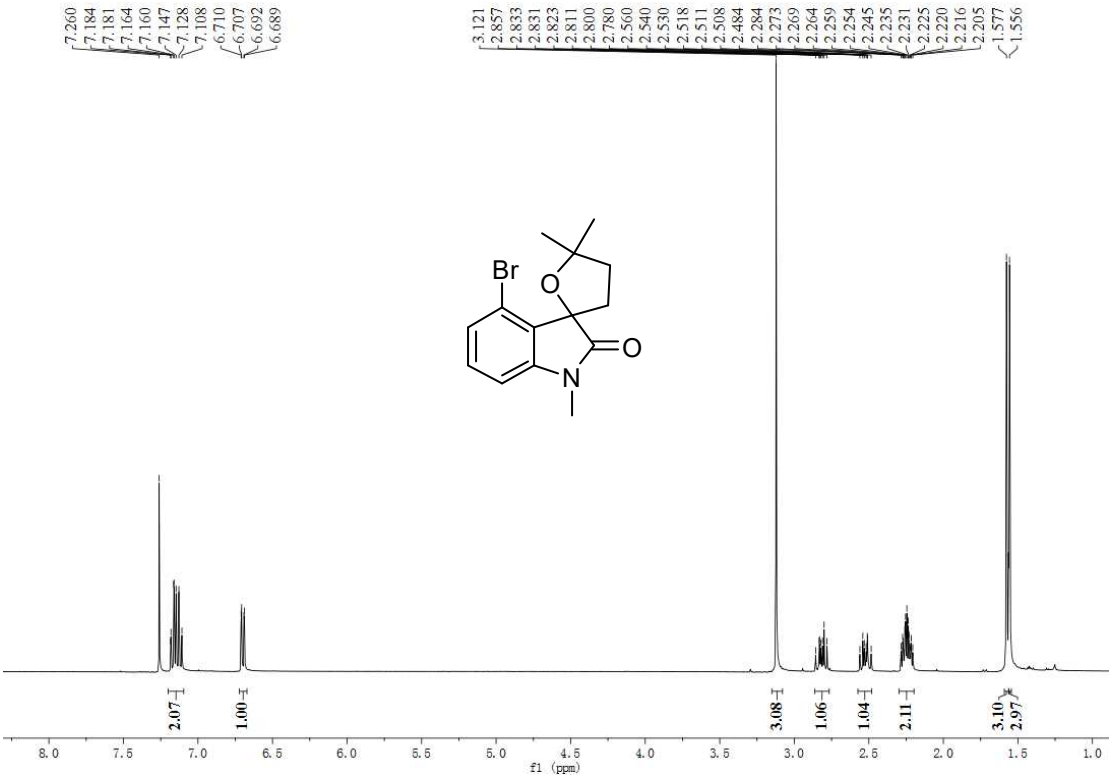

Figure S31. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2p**

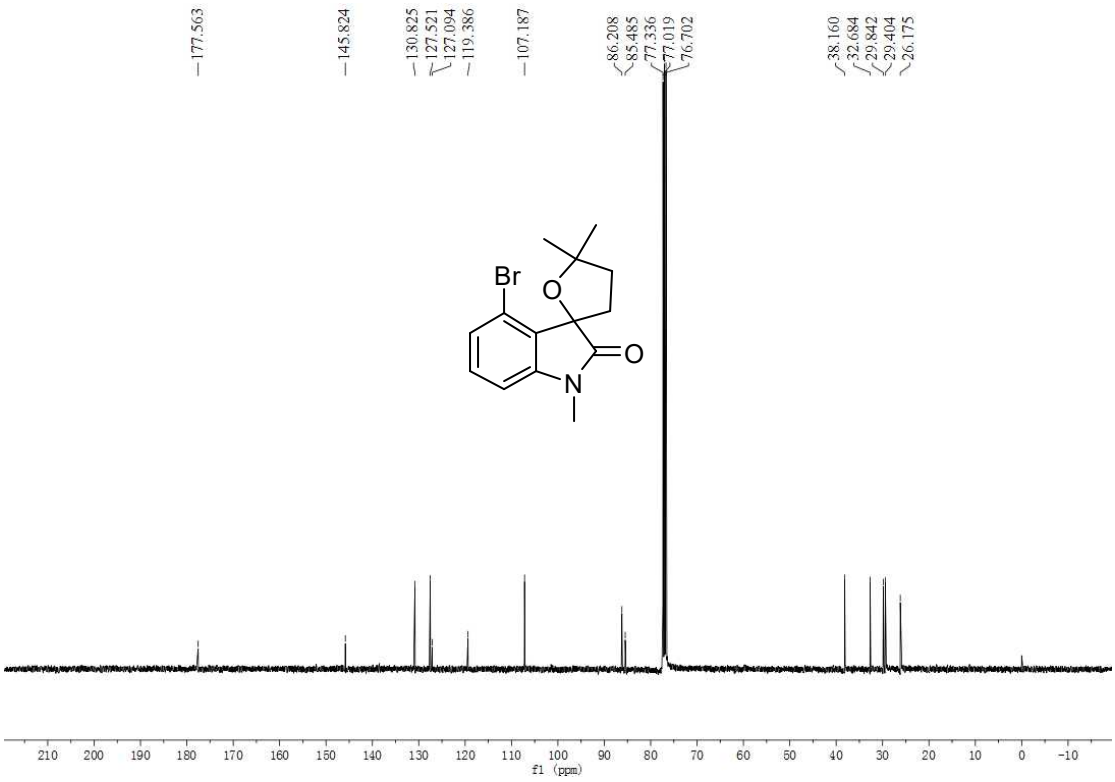

Figure S32. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2p**

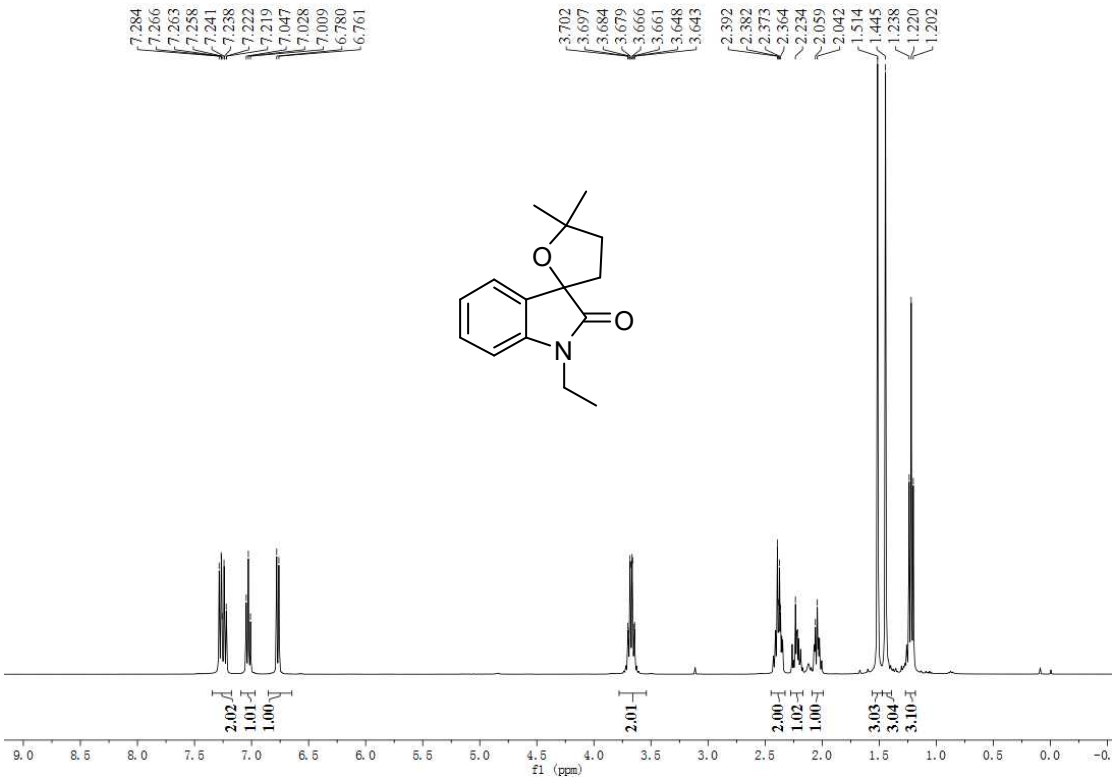

Figure S33. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2q**

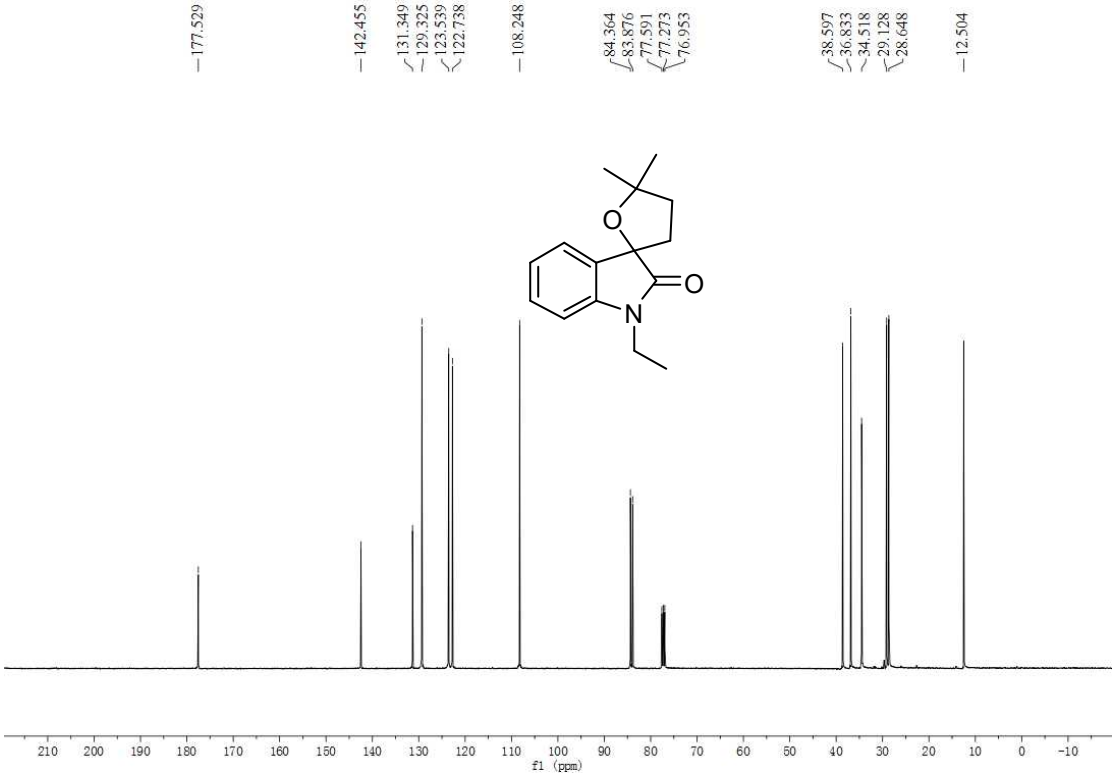

Figure S34. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2q**

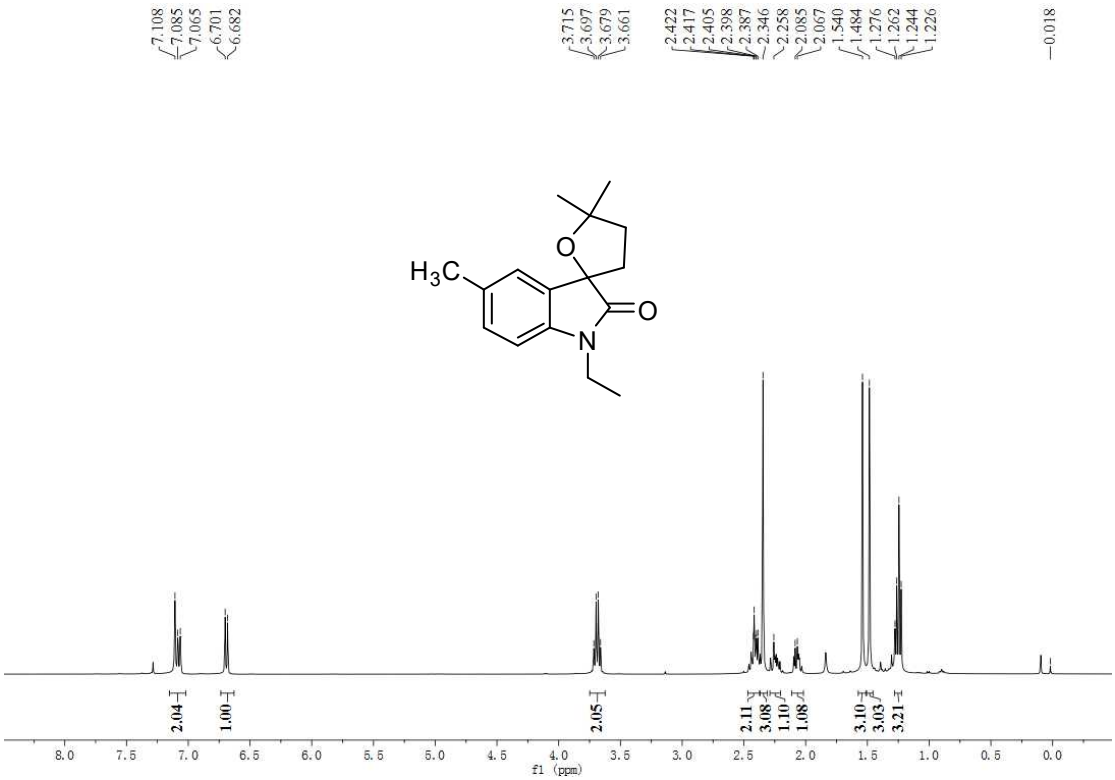

Figure S35. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2r**

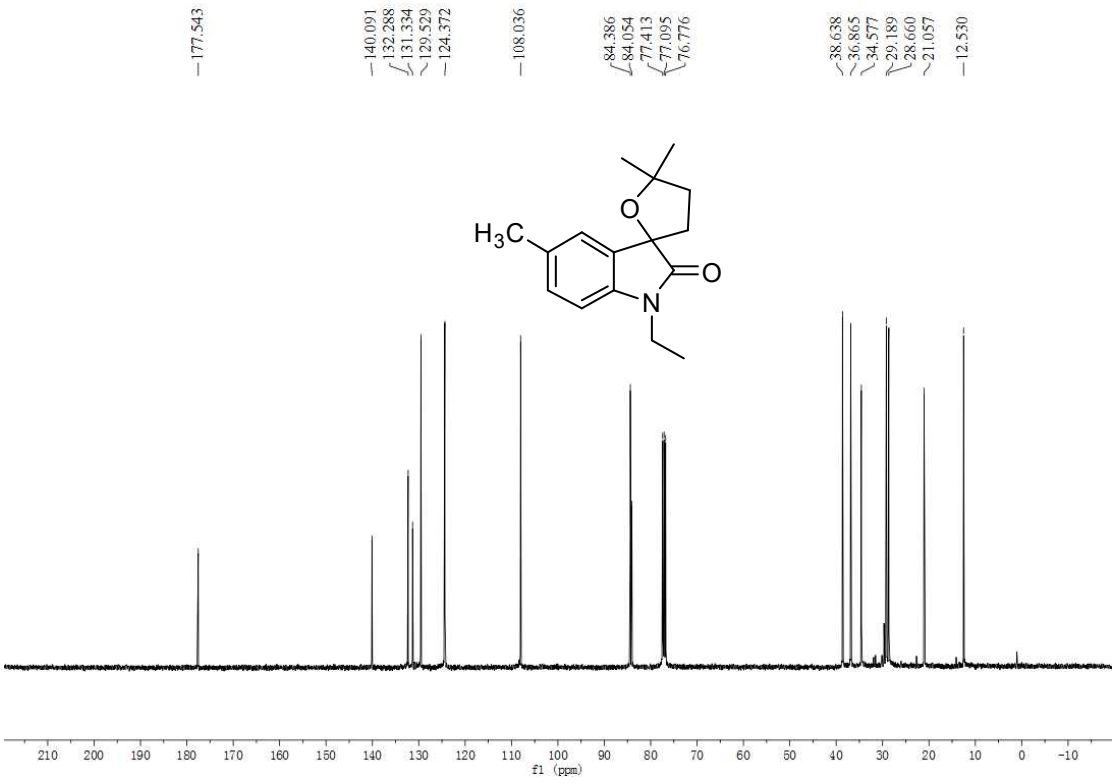

Figure S36. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2r**

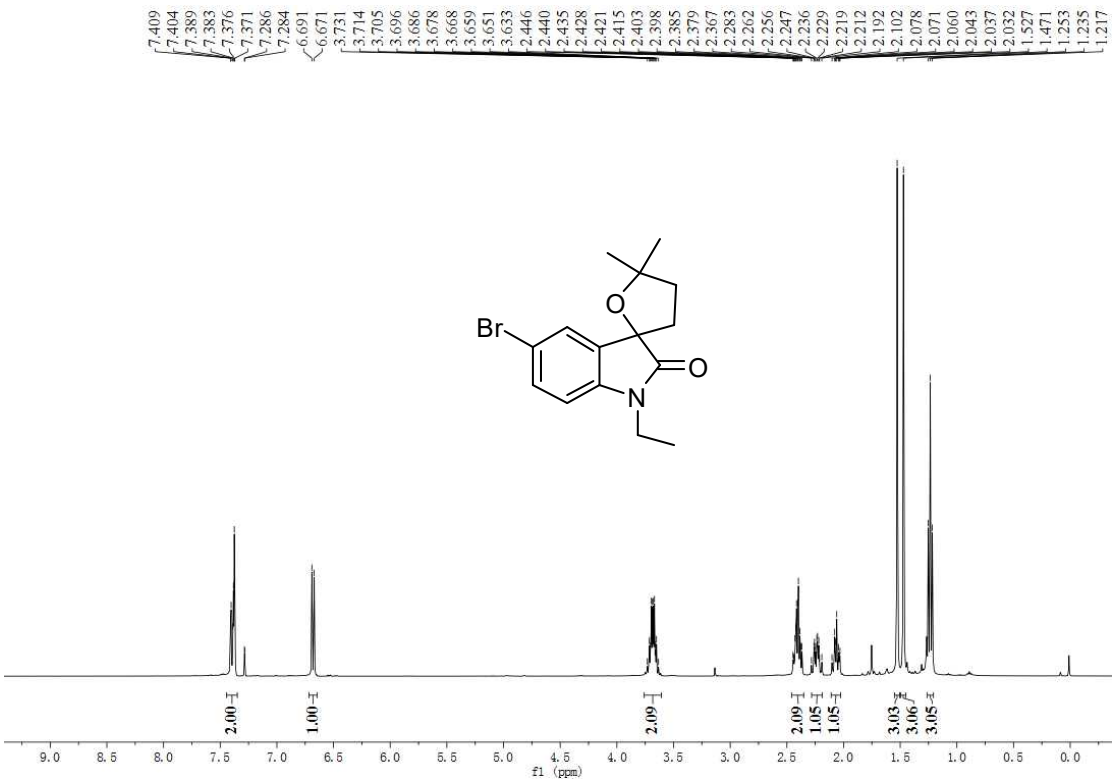

Figure S37. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2s**

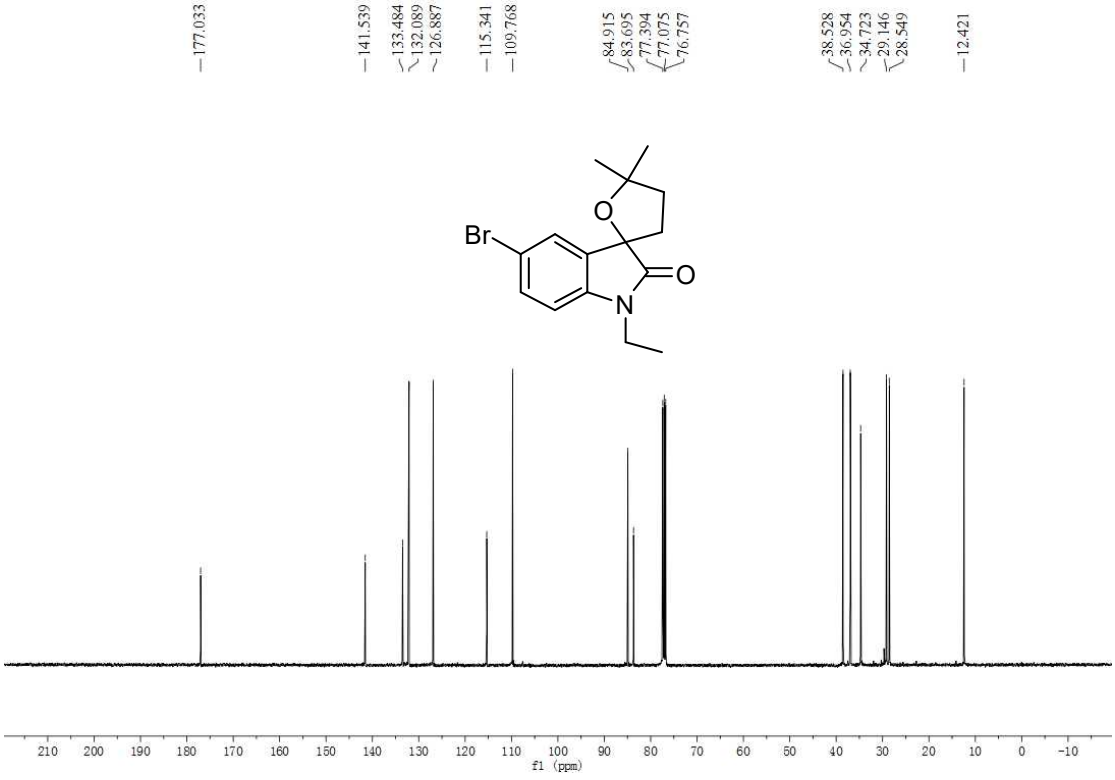

Figure S38. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2s**

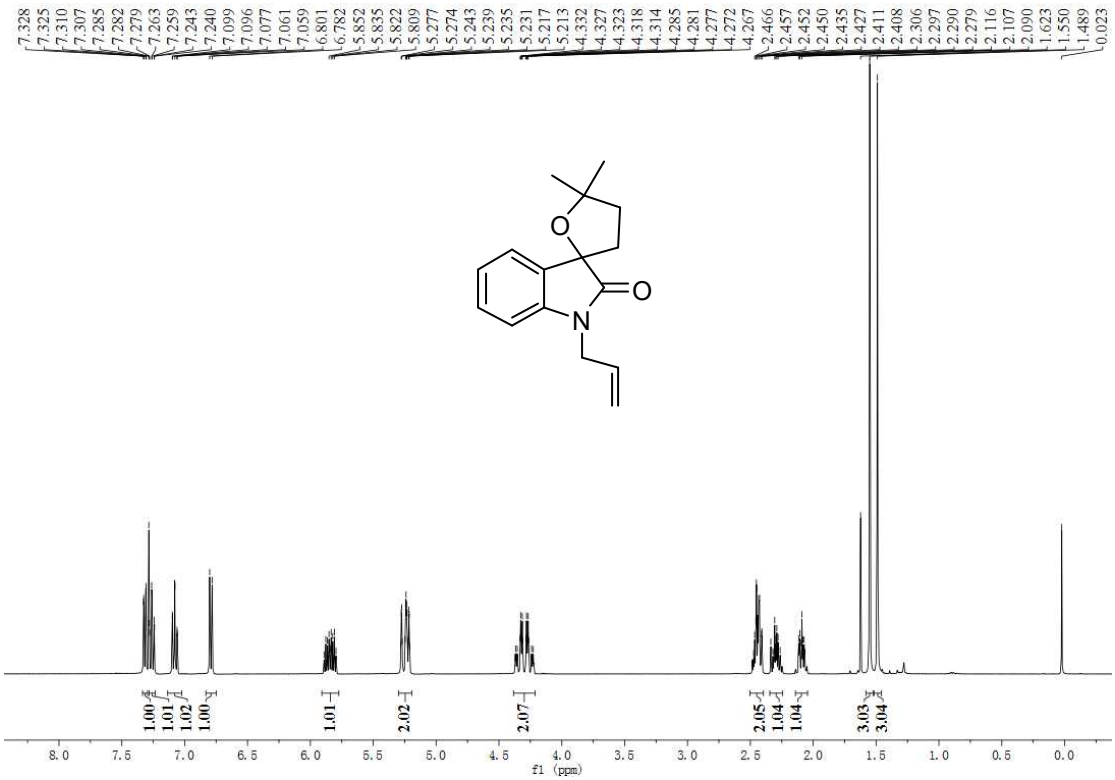

Figure S39. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2t**

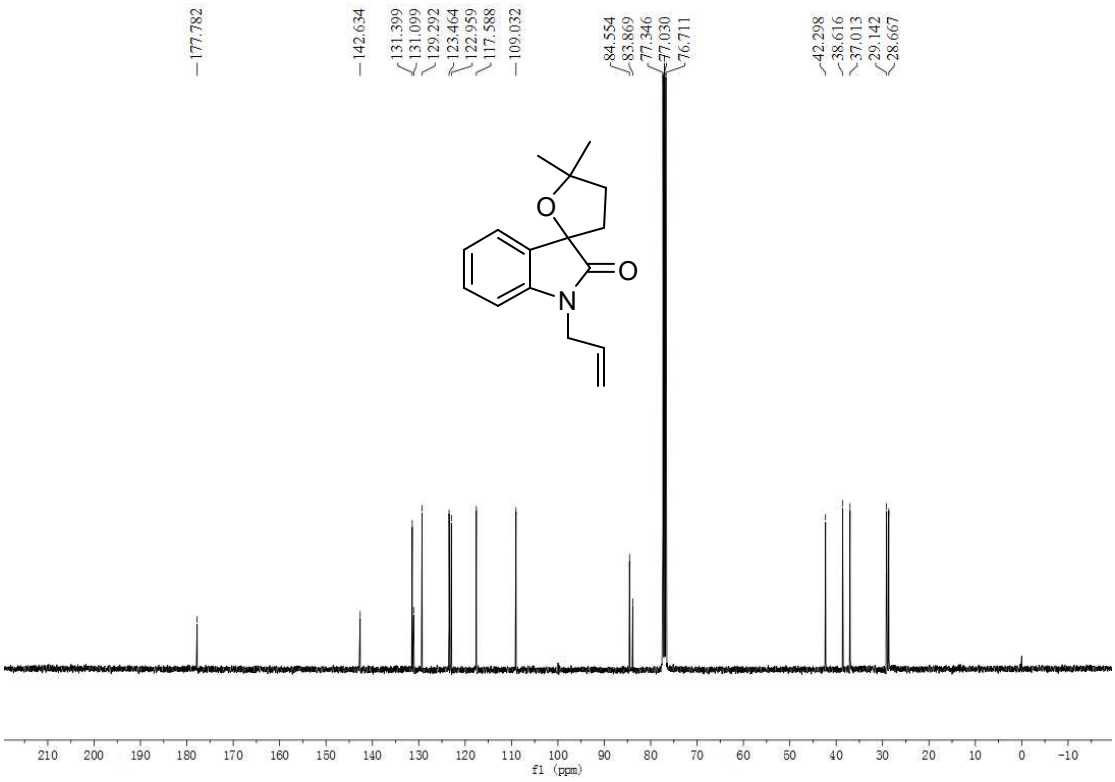

Figure S40. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2t**

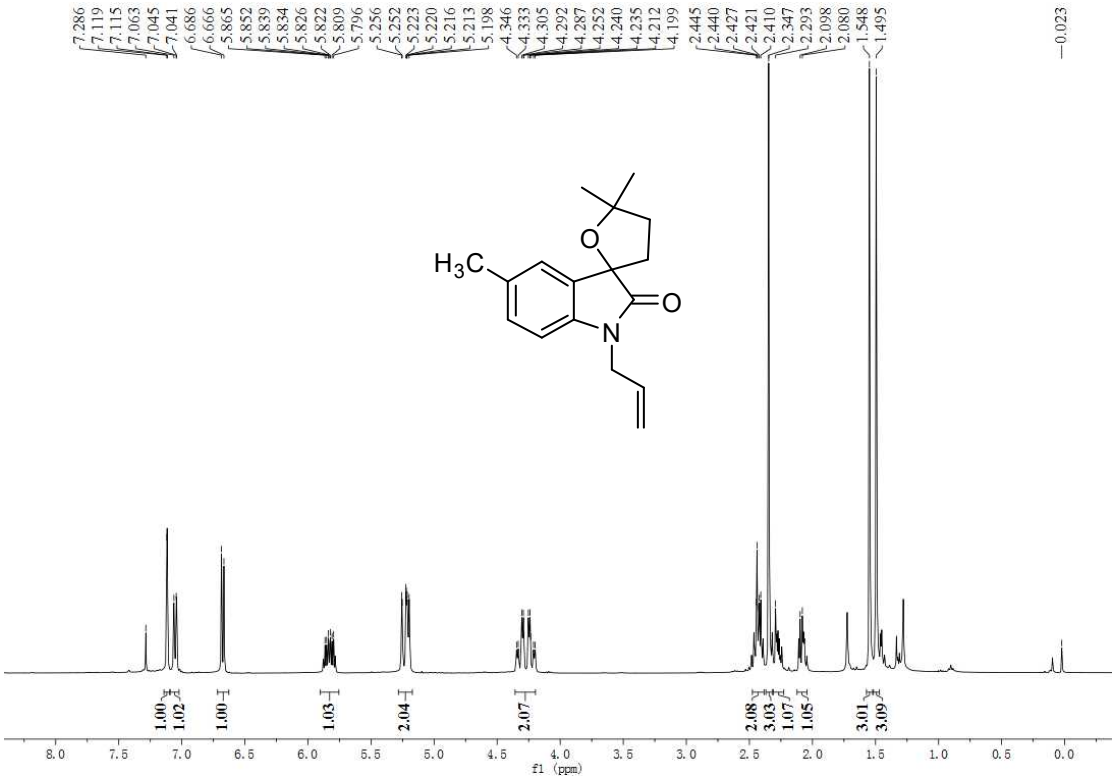

Figure S41. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2u**

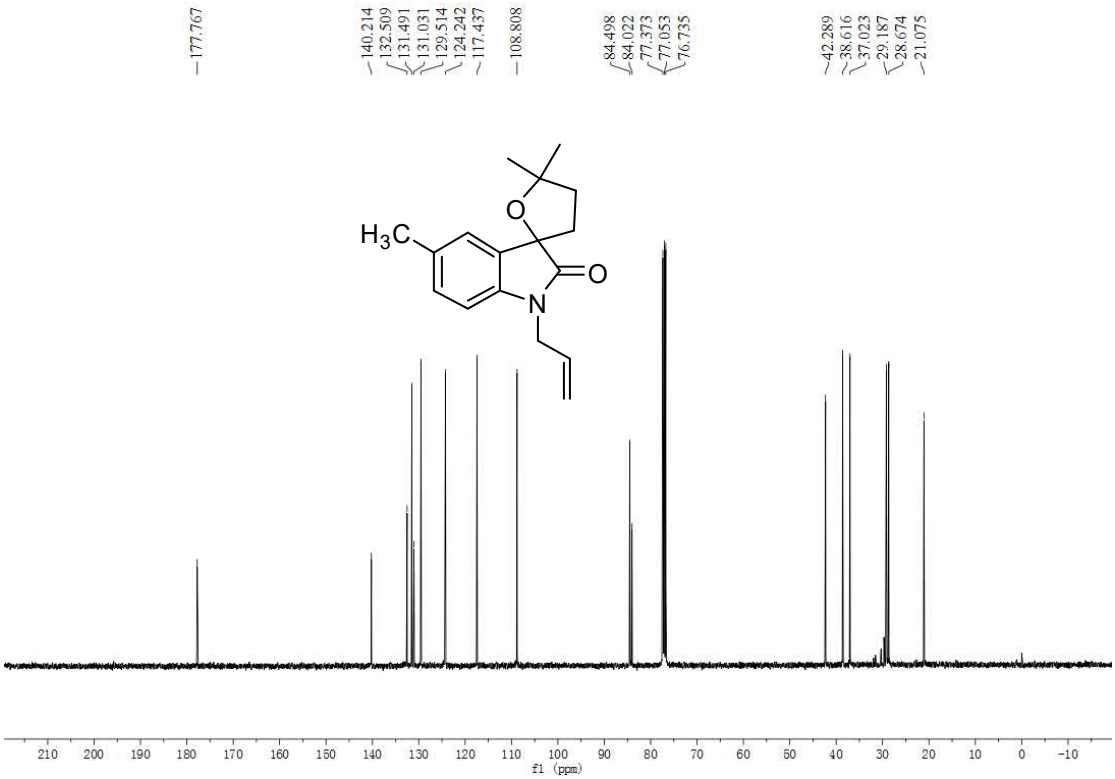

Figure S42. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2u**

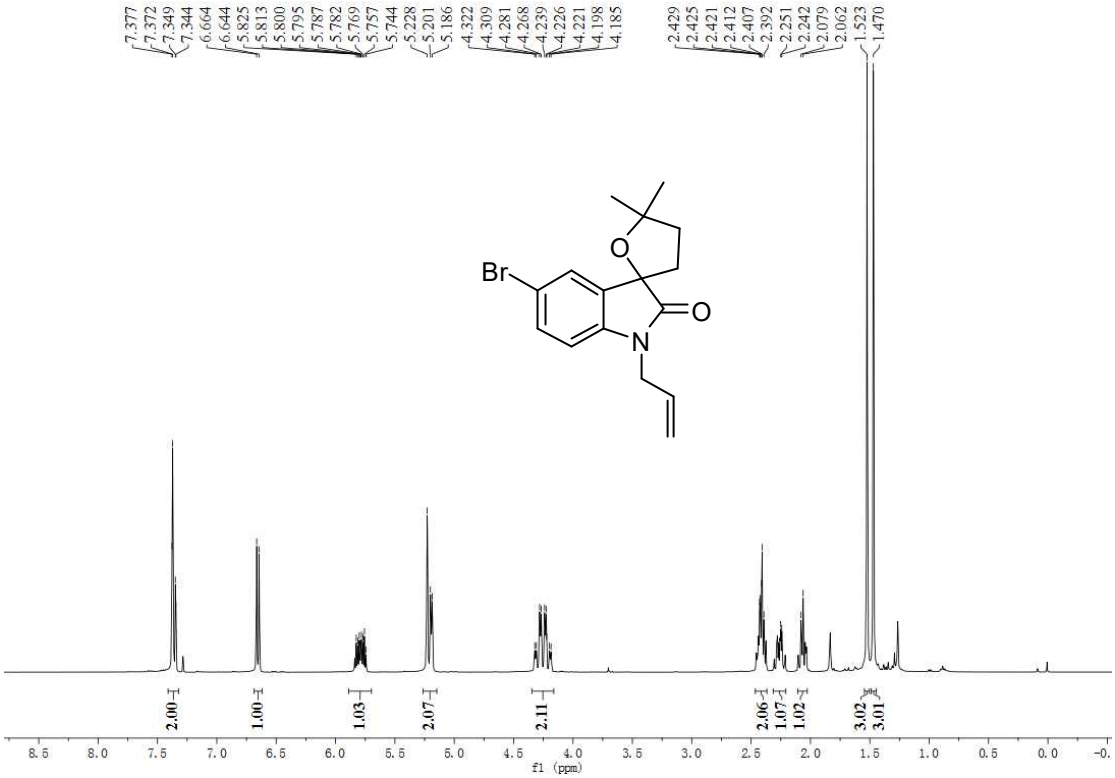

Figure S43. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2v**

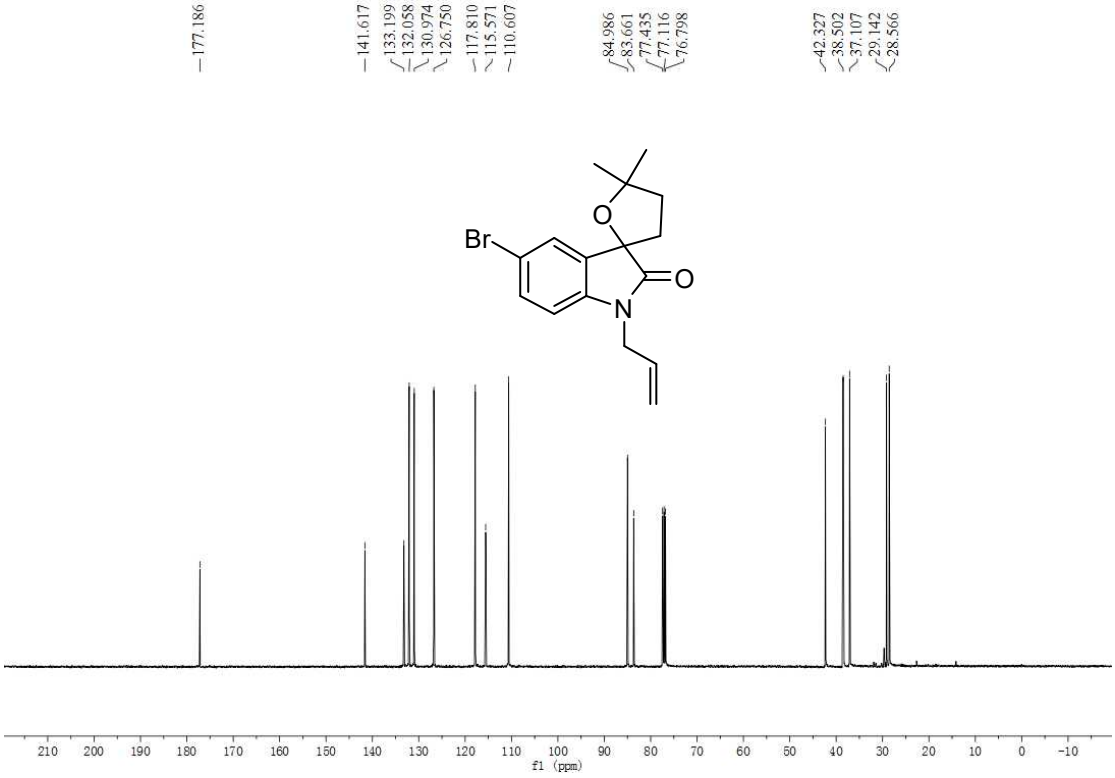

Figure S44. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2v**

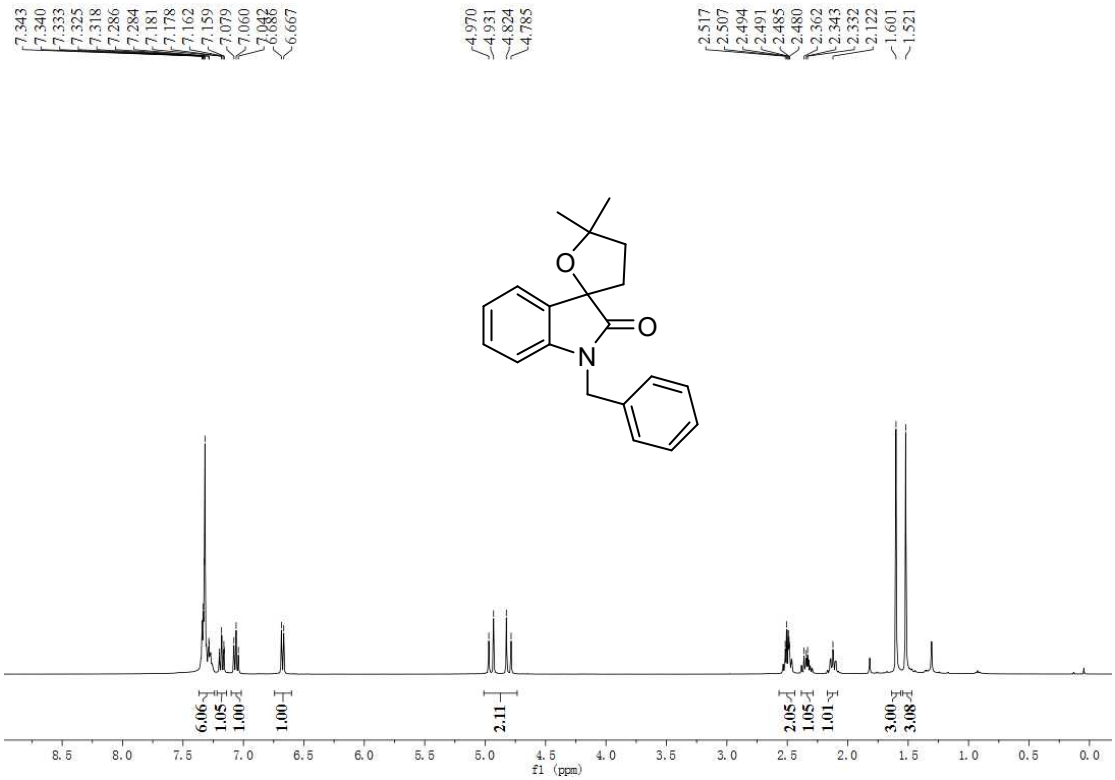

Figure S45. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **2w**

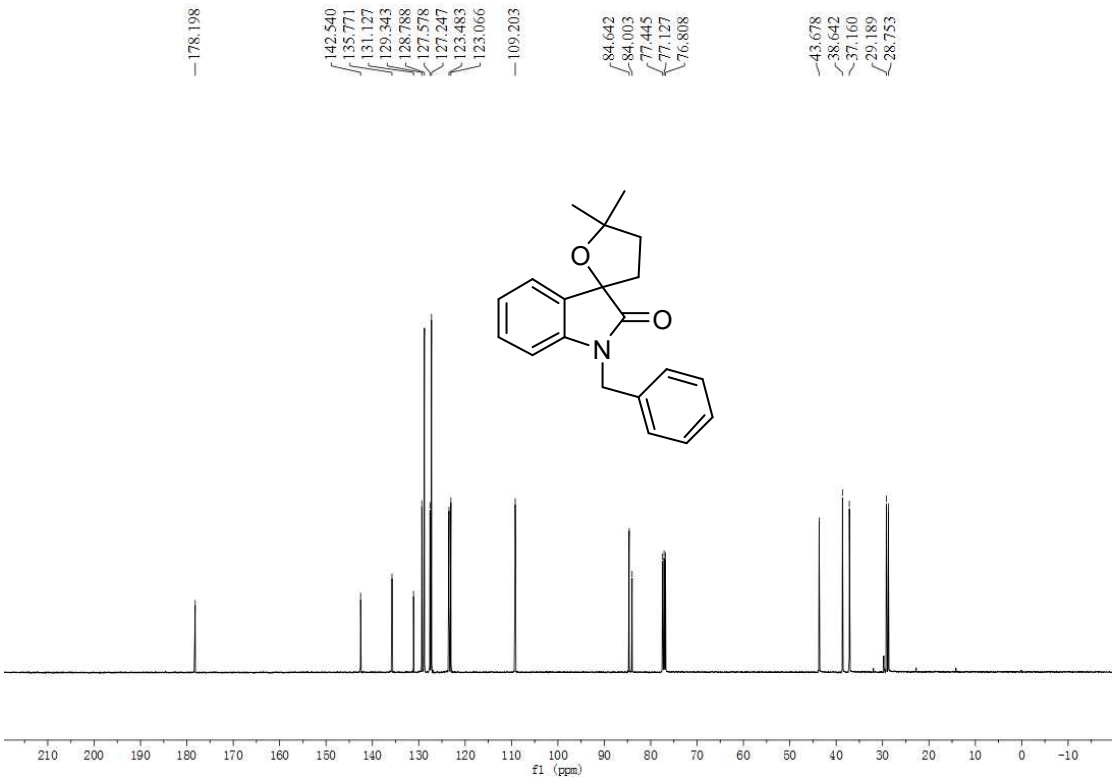

Figure S46. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **2w**

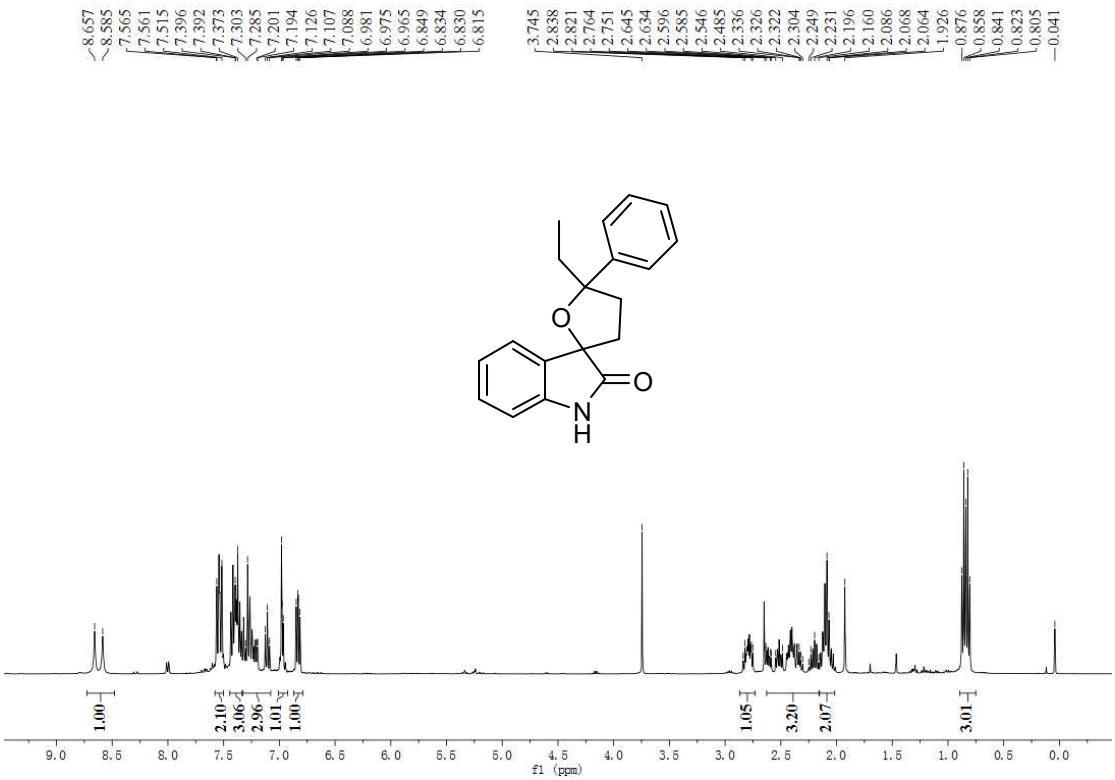

Figure S47. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **5**

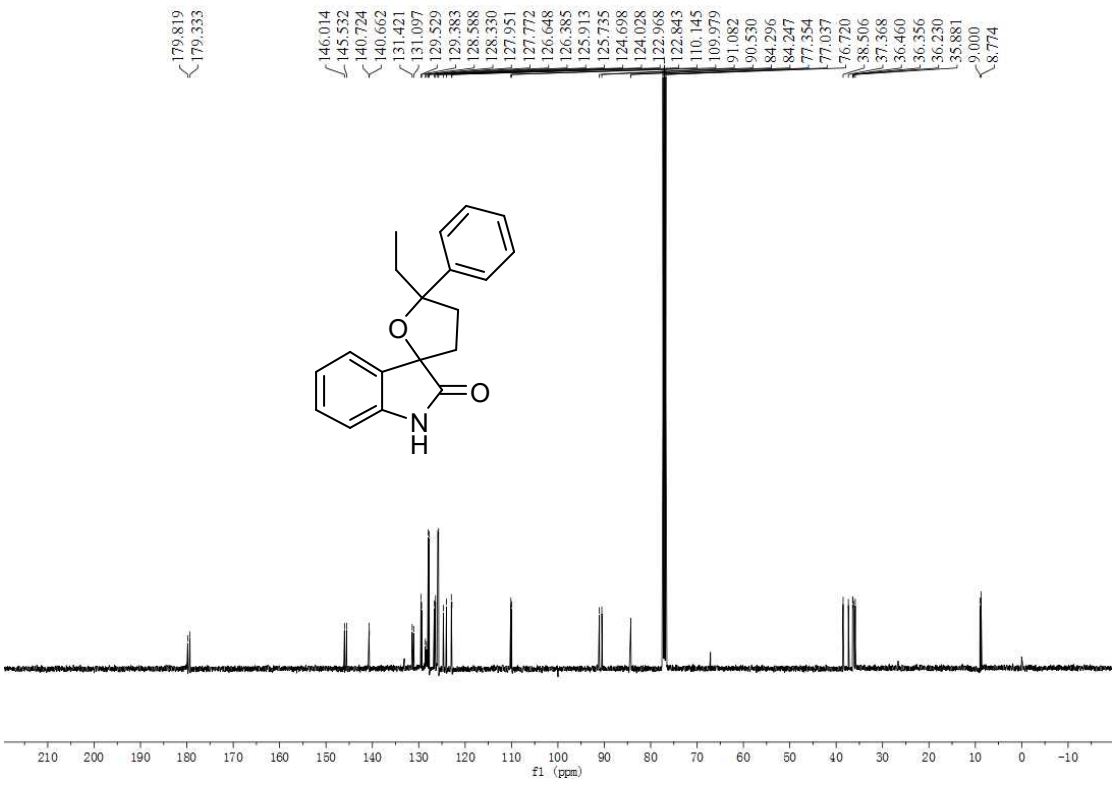

Figure S48. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **5**

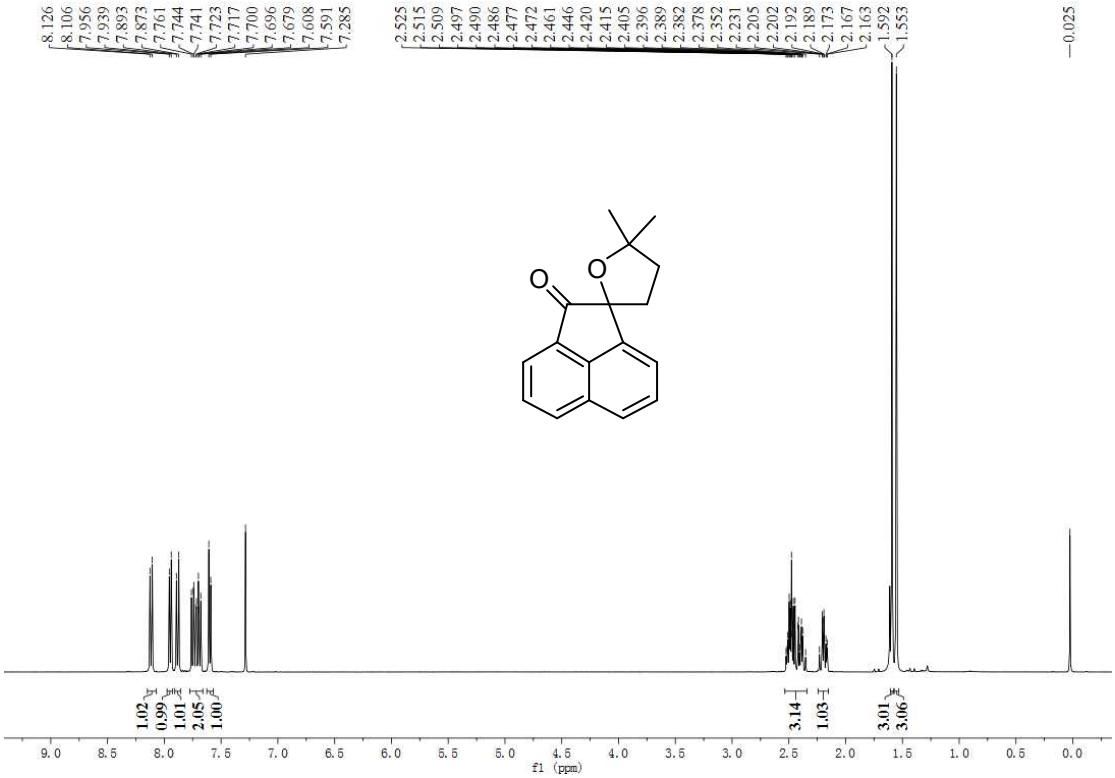

Figure S49. ^{1}H NMR Spectrum (400 MHz, $CDCl_3$) of Compound **7**

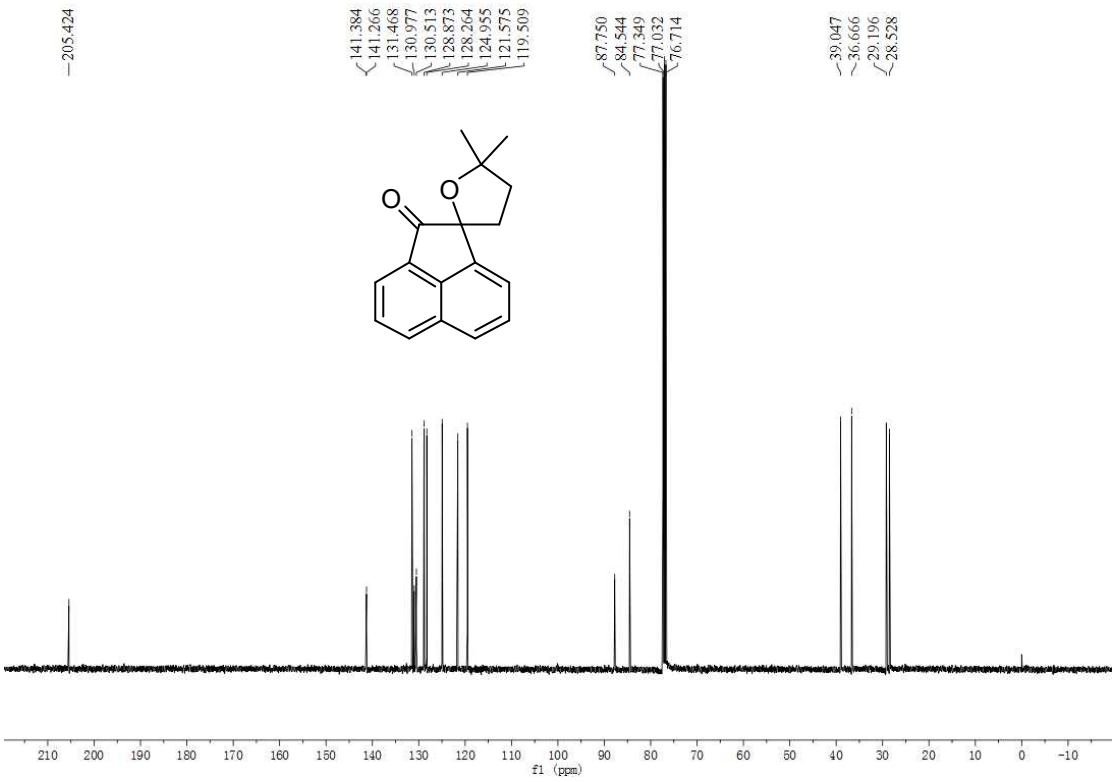

Figure S50. ^{13}C NMR Spectrum (100 MHz, $CDCl_3$) of Compound **7**

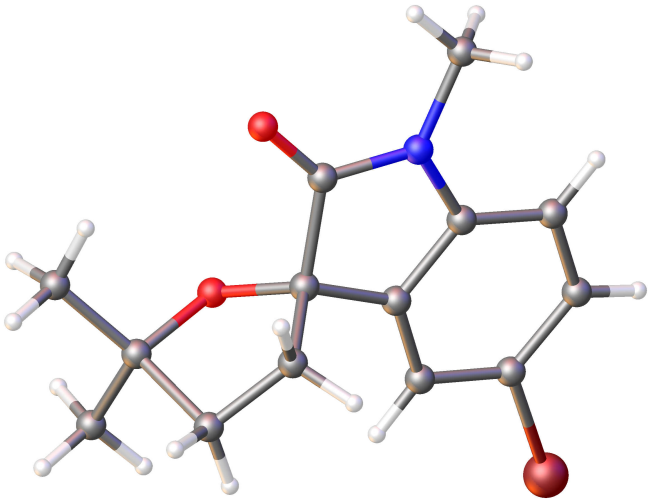

Figure S51. Crystal Structure of Compound **2o**

(Color scheme: C, gray; H, white; N, blue; O, red; Br, dark red)

Table S1. Crystal Data for Compound **2o**

Formula	$C_{14}H_{16}BrNO_2$
Formula weight	205.45
Temperature	293(2) K
Wavelength	0.71073 Å
Crystal system	Monoclinic
Space group	*P*2(1)/*c*
Unit cell dimensions	a = 9.2162(18) Å, α = 90 deg.
	b = 11.9031(18) Å, β = 95.002(15) deg.
	c = 12.665(2) Å, γ = 90 deg.
Volume	1236.7(2) Å^3
Z	6
Density (calculated)	1.479 Mg / m^3
Absorption coefficient	2.963 mm^{-1}
F(000)	624
Theta range for data collection	2.802 ° to 29.172°
Limiting indices	-11<=h<=6, -14<=k<=15, -16<=l<=17
Reflections collected	6157
Independent reflections	3147 [R(int) = 0.0452]
Data / restraints / parameters	3147 / 8 / 166
Goodness-of-fit on F^2	1.034
Final *R* indices [$I > 2\sigma(I)$]	R_1 = 0.0914, wR_2 = 0.2174
R indices (all data)	R_1 = 0.1689, wR_2 = 0.2791
Largest diff. peak and hole	1.739 and -1.082 e. Å^{-3}