

Alkylation of amines with allylic alcohols and deep eutectic solvents as metal-free and green promoters

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1. Characterisation of final products

Figure S1. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-4-(trifluoromethyl)aniline (**3a**).

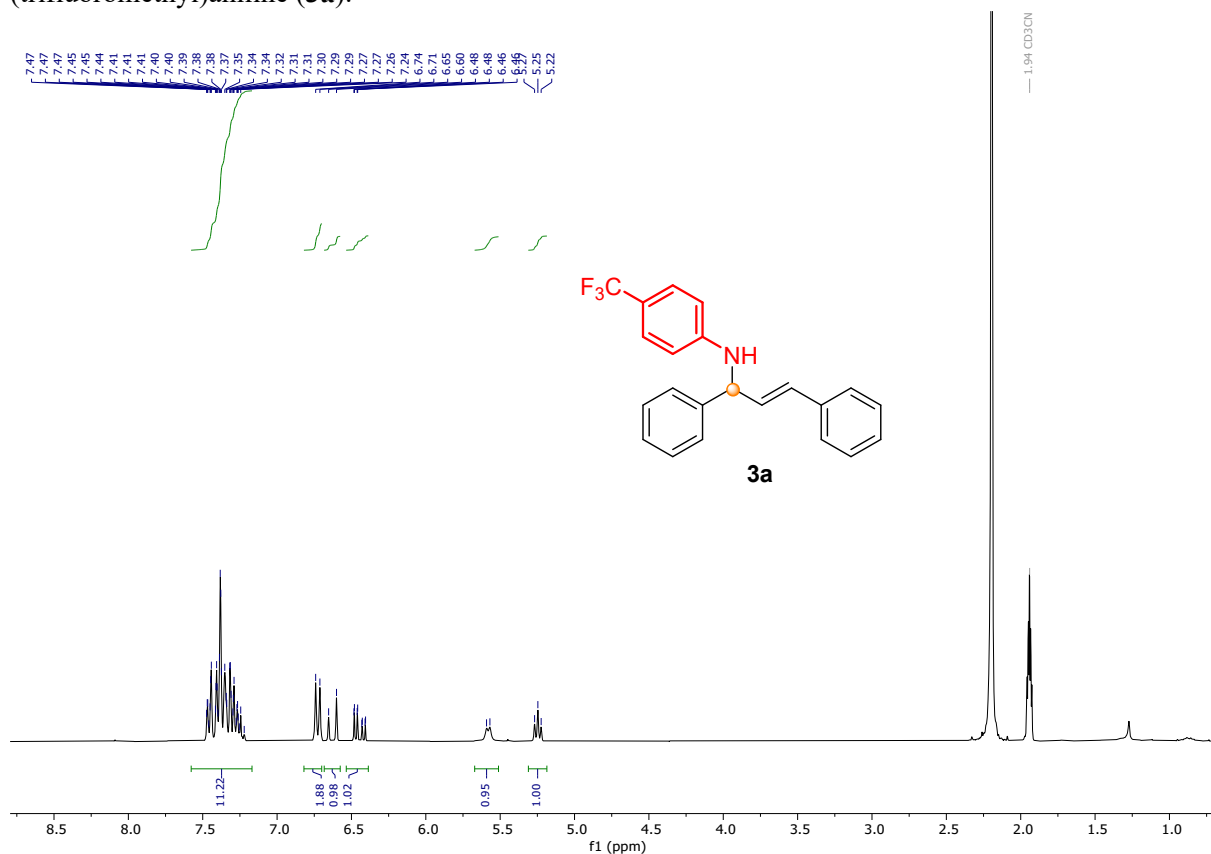


Figure S2. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-3,5-difluoroaniline (**3b**).

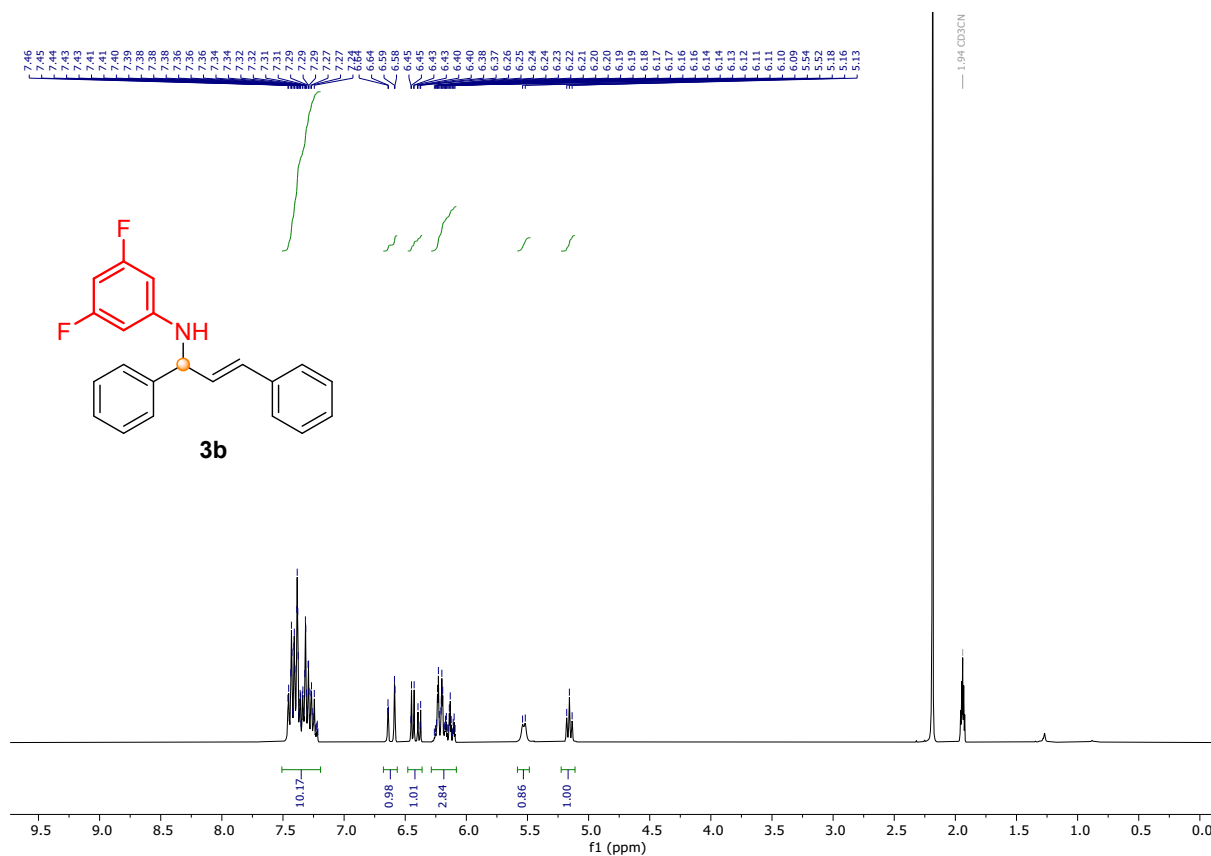


Figure S3. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-3,5-difluoroaniline (**3b**).

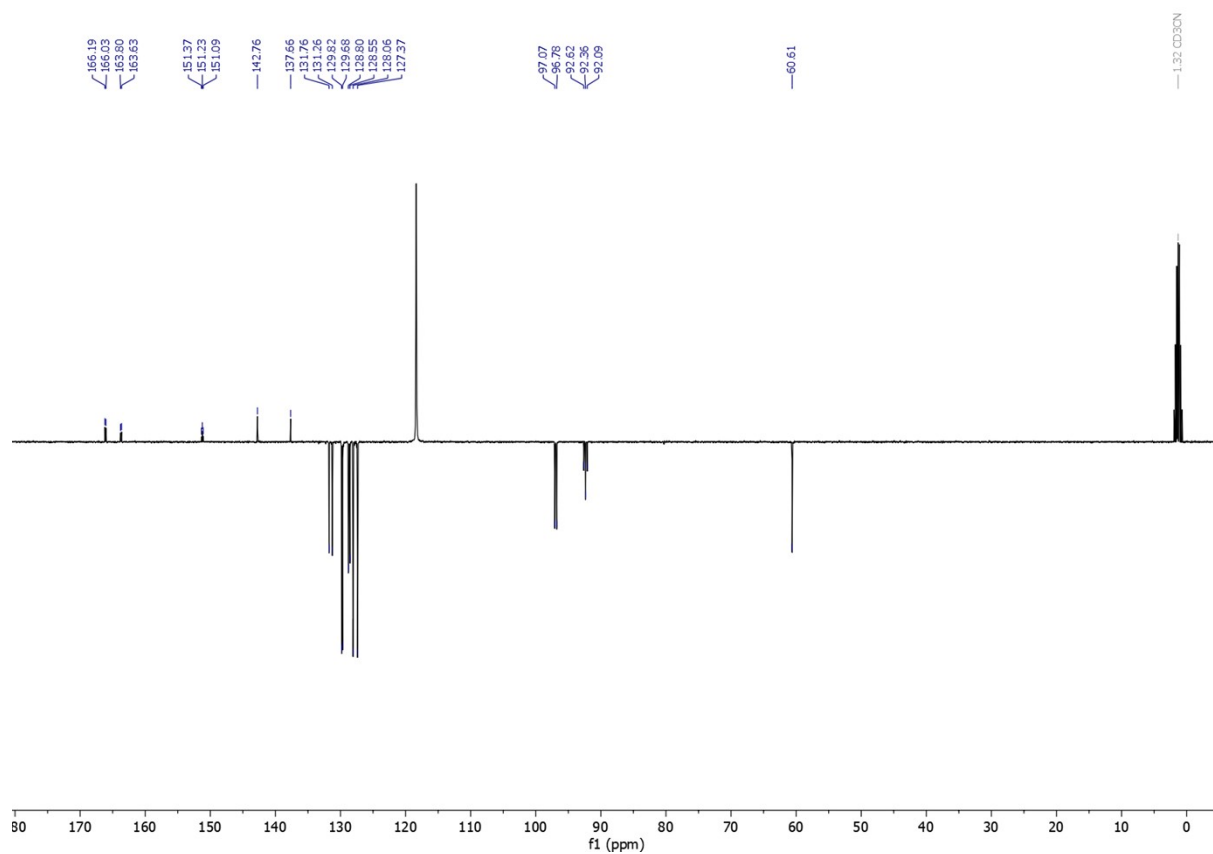


Figure S4. $^{19}\text{F}\{^1\text{H}\}$ NMR (282.4 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-3,5-difluoroaniline (**3b**).

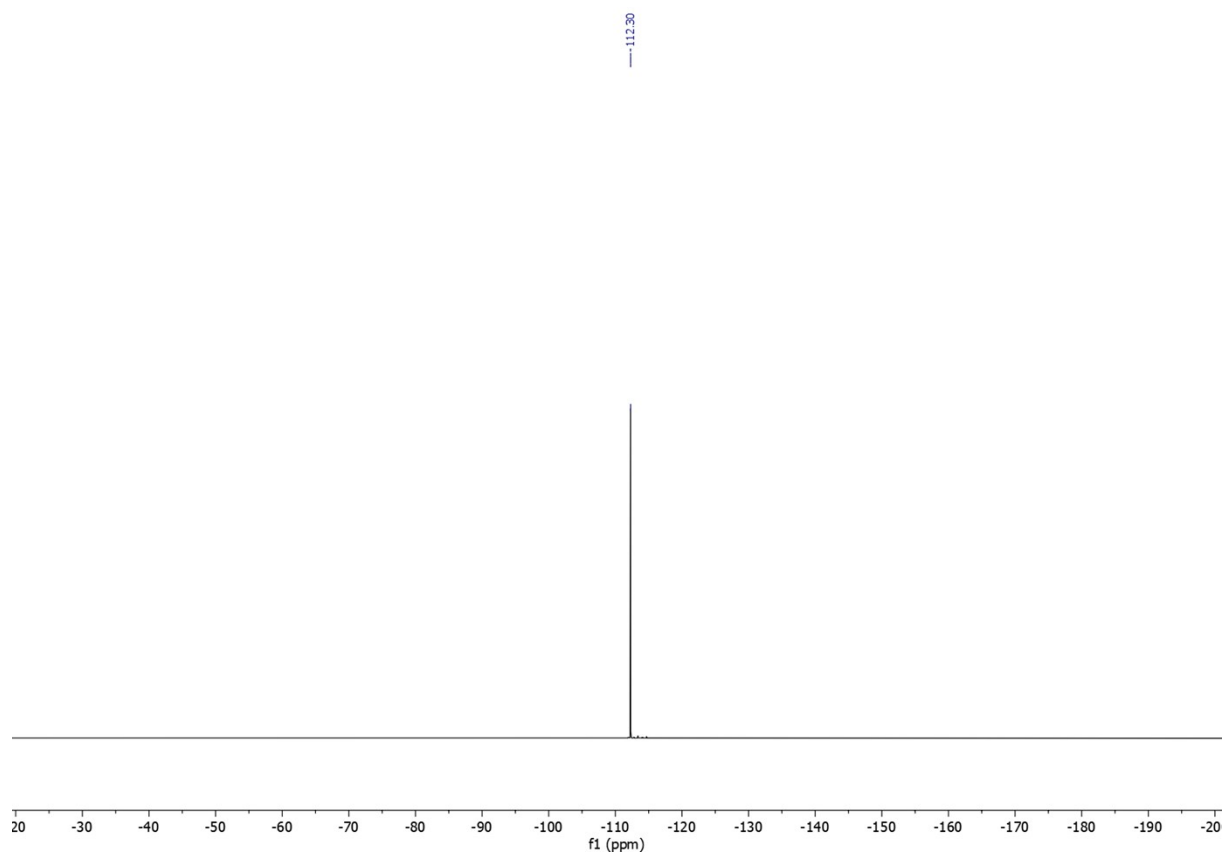


Figure S5. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-3,4,5-trifluoroaniline (**3c**).

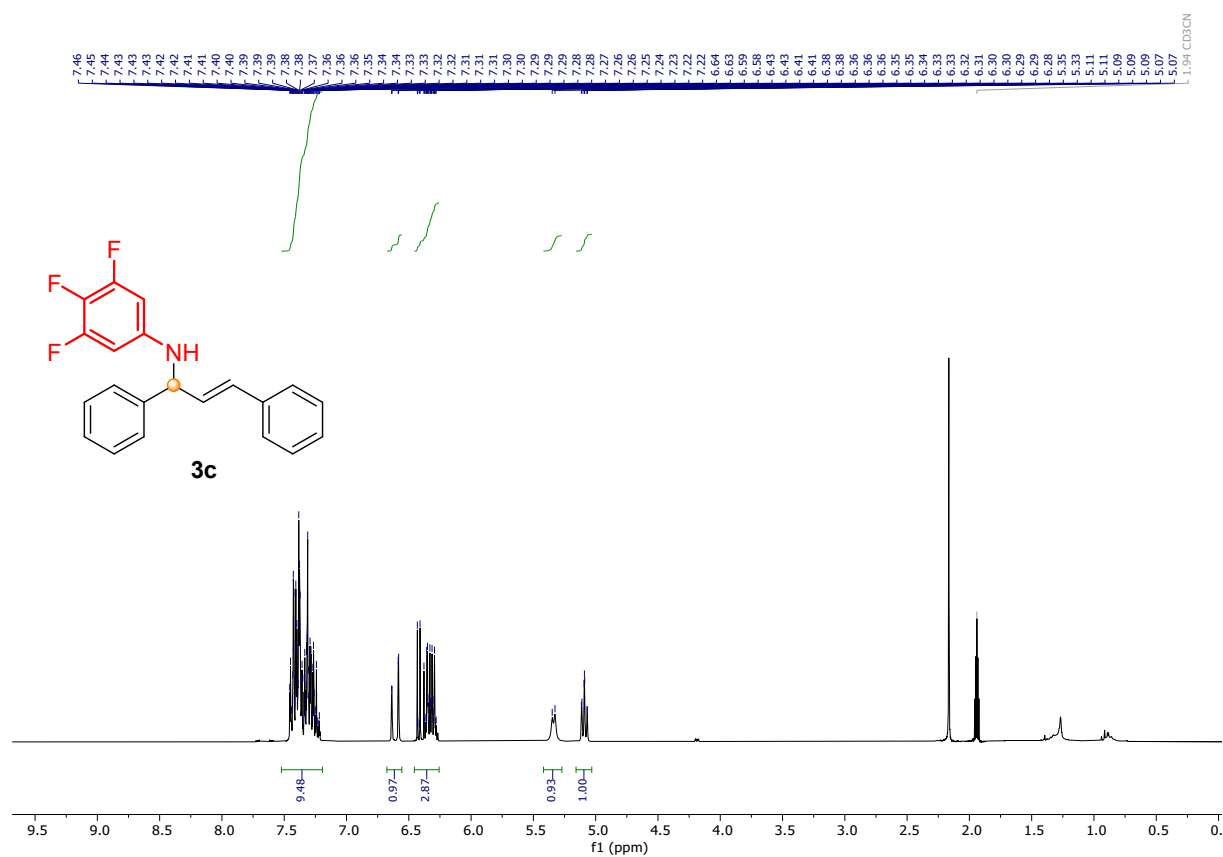


Figure S6. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-3,4,5-trifluoroaniline (**3c**).

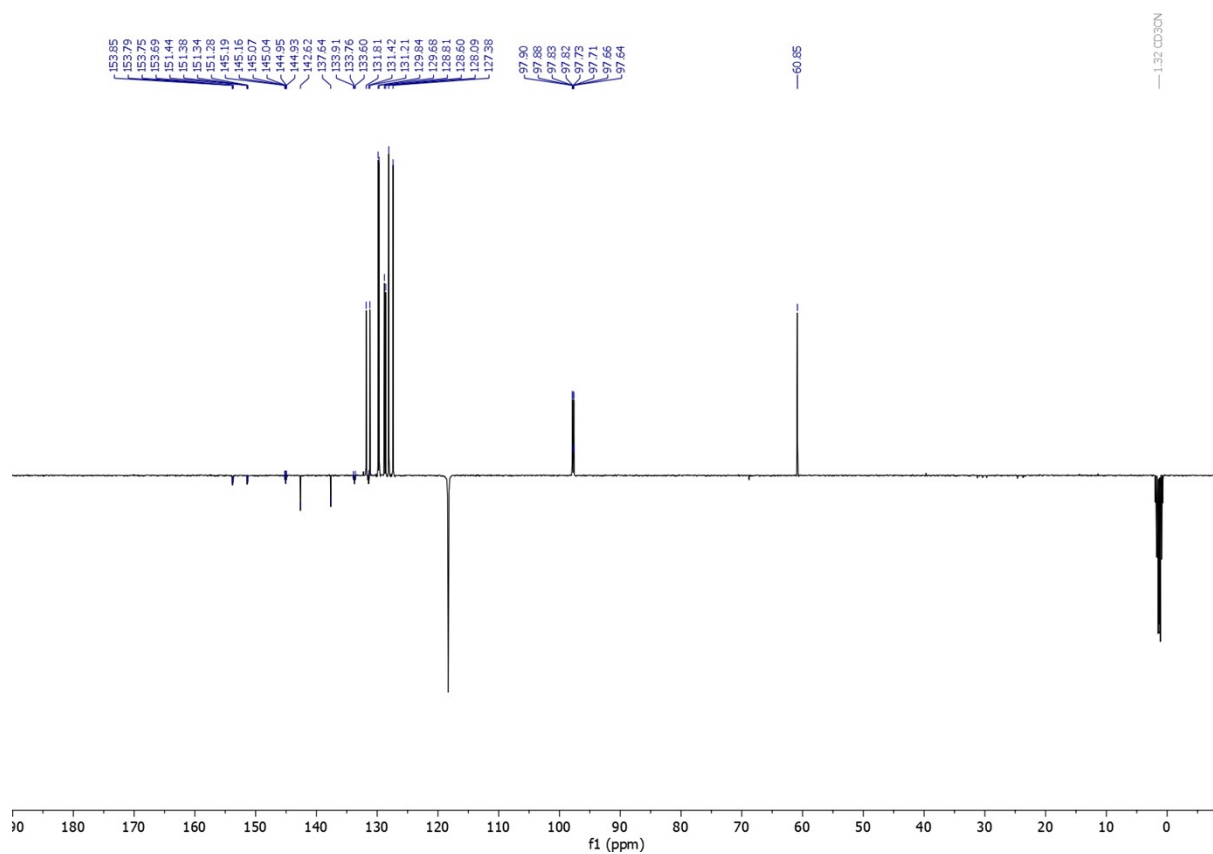


Figure S7. $^{19}\text{F}\{^1\text{H}\}$ NMR (282.4 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-3,4,5-trifluoroaniline (**3c**).

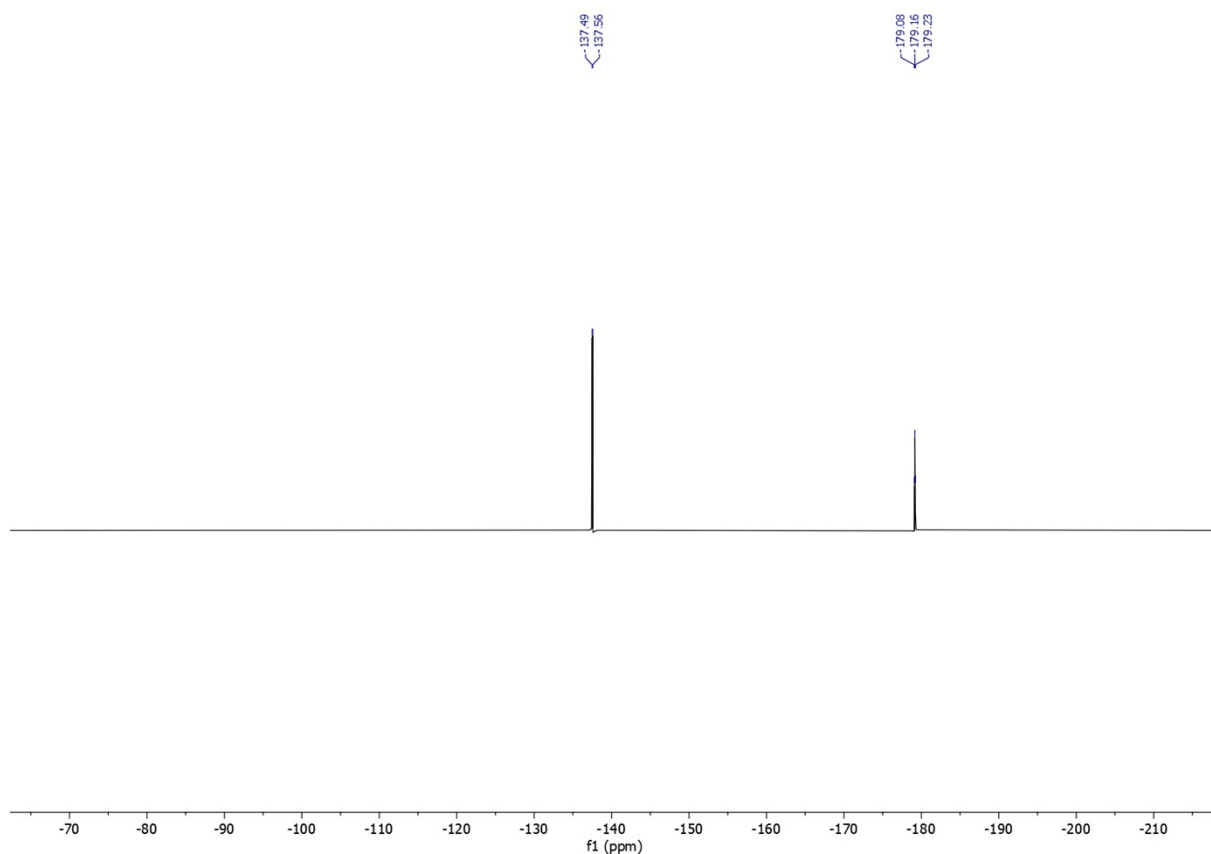


Figure S8. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-2,3,4,5,6-pentafluoroaniline (**3d**).

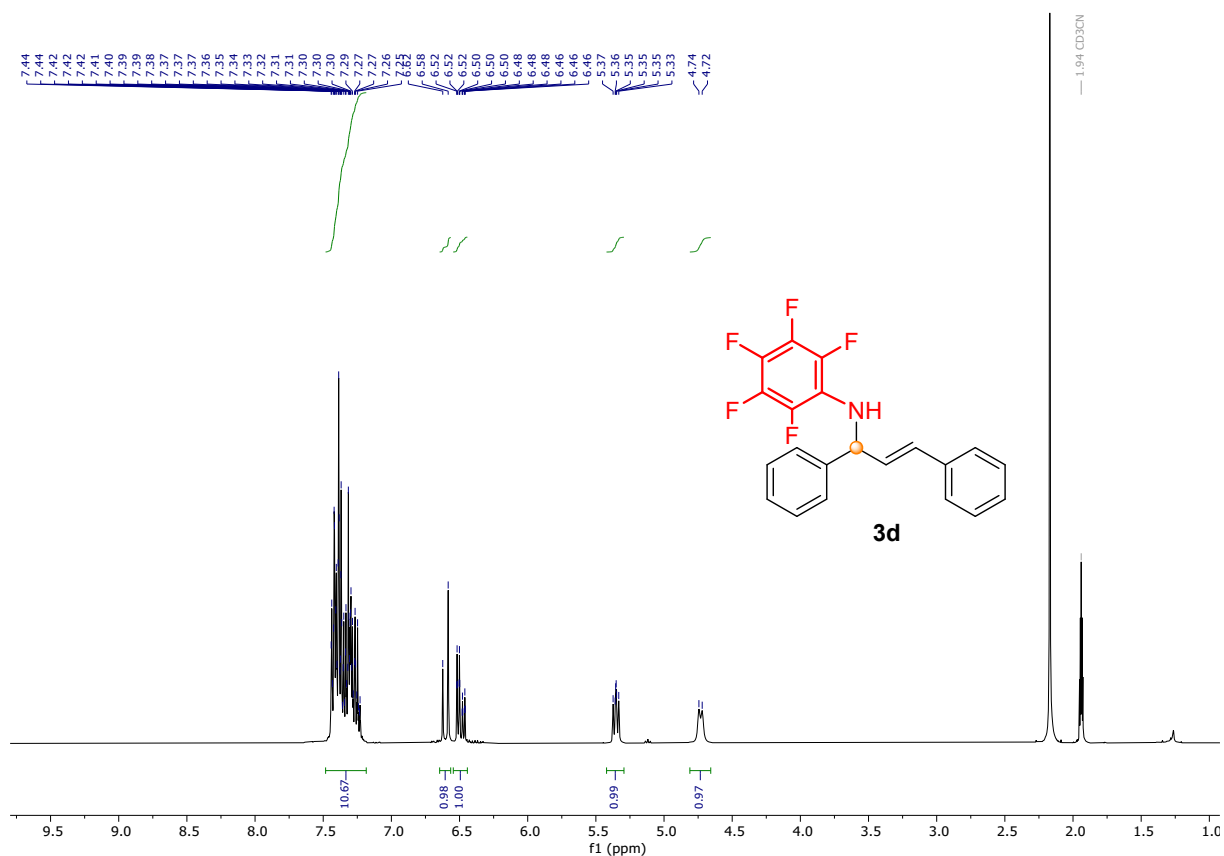


Figure S9. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-2,3,4,5,6-pentafluoroaniline (**3d**).

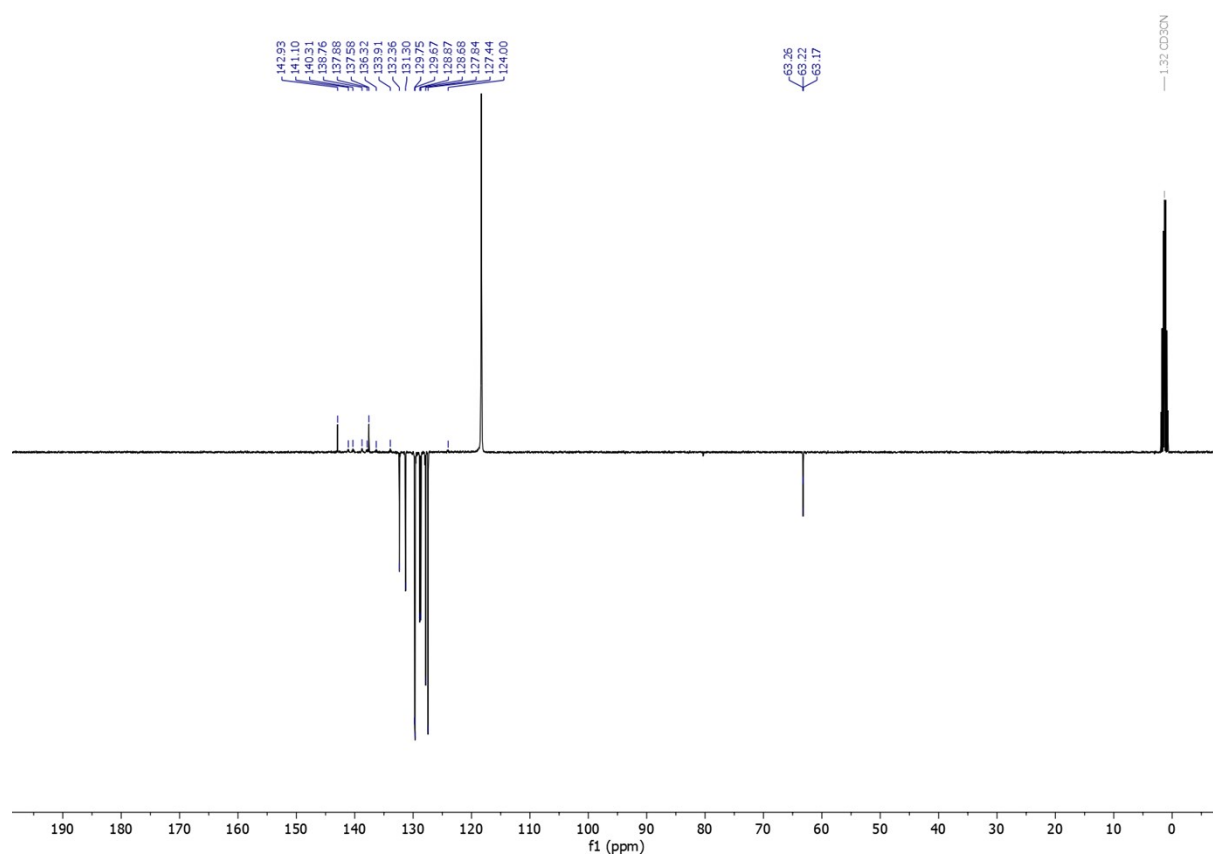


Figure S10. $^{19}\text{F}\{^1\text{H}\}$ NMR (282.4 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-2,3,4,5,6-pentafluoroaniline (**3d**).

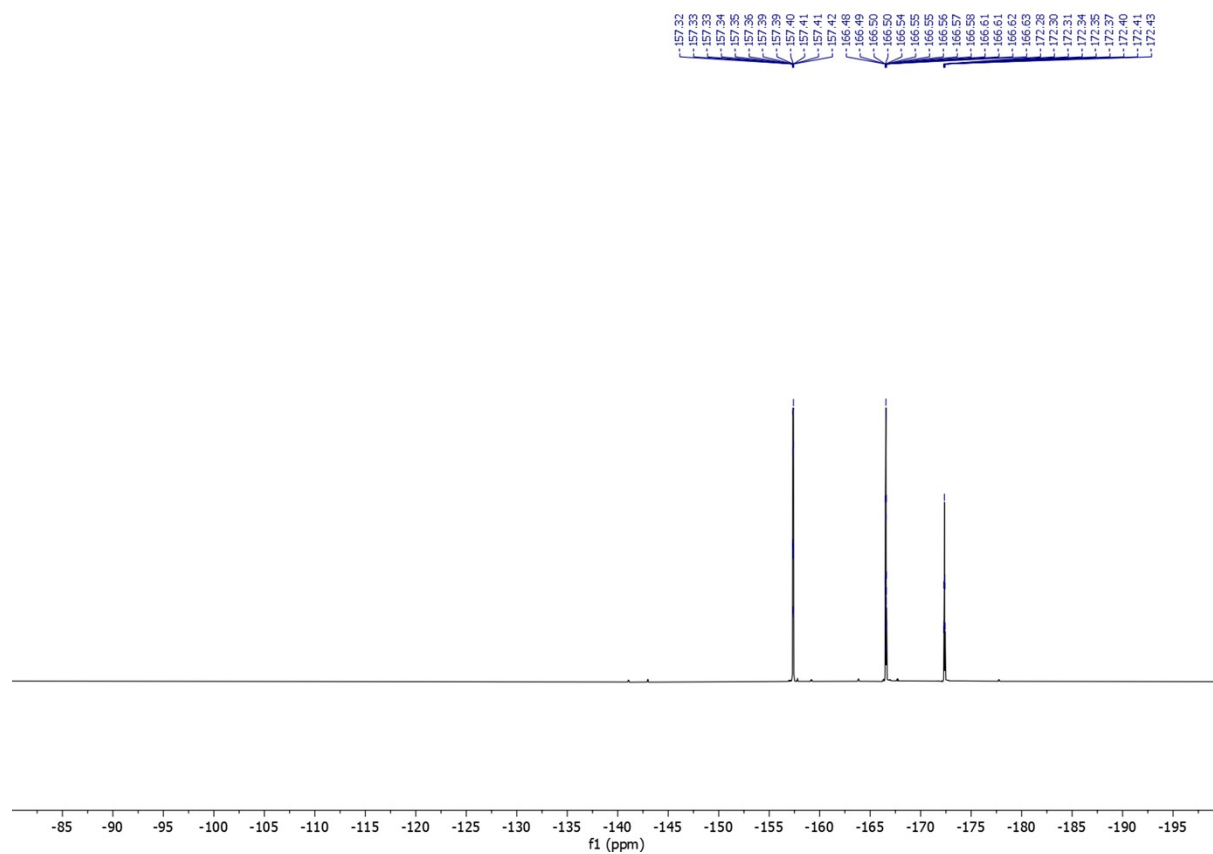


Figure S11. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-3,5-bis(trifluoromethyl)aniline (**3e**).

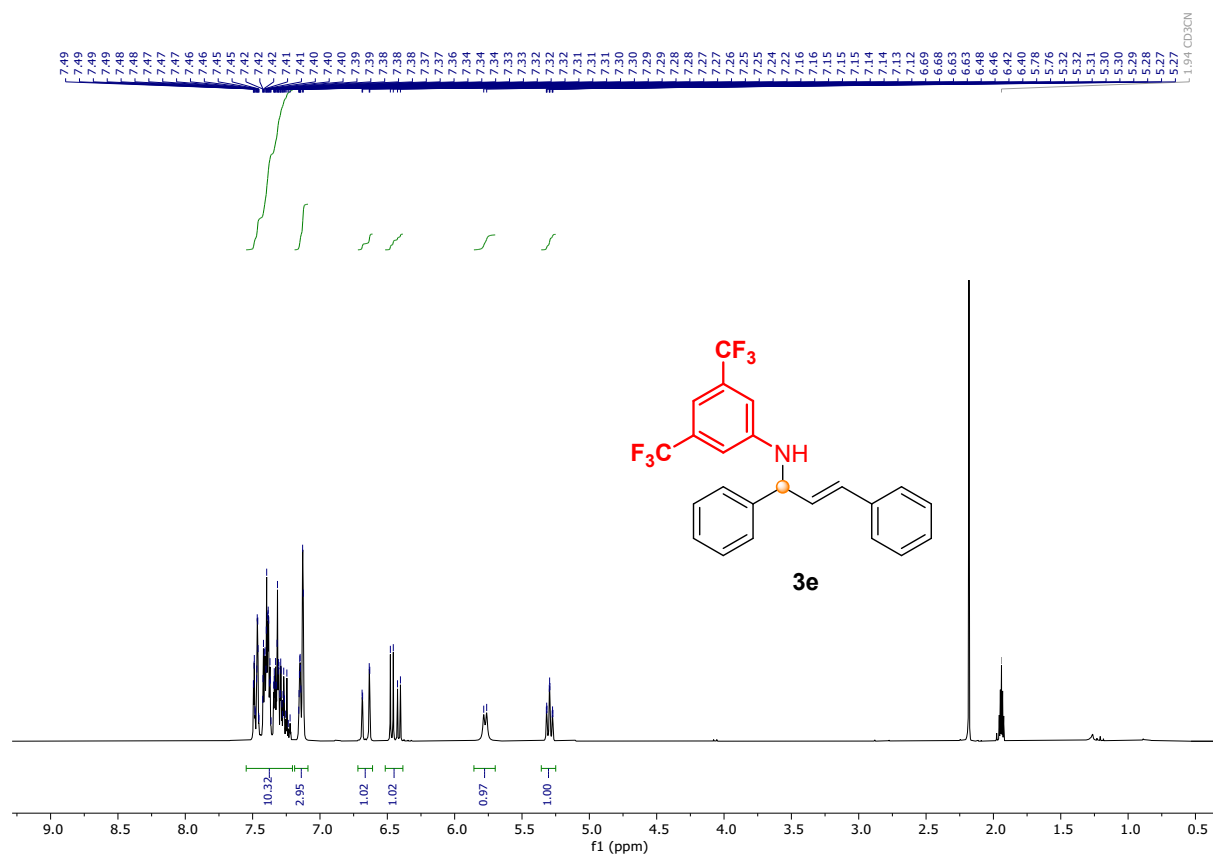


Figure S12. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-4-bromo-*N*-(1,3-diphenylallyl)aniline (**3f**).

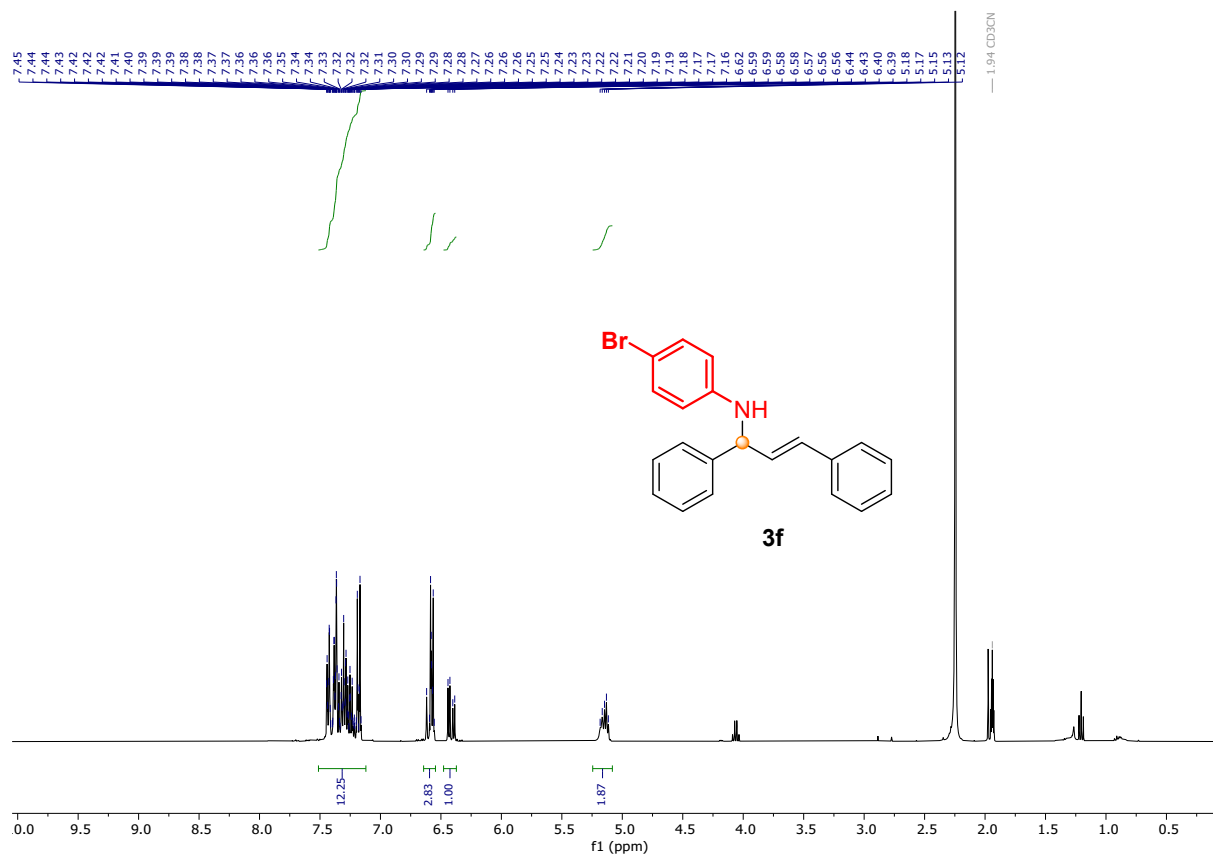


Figure S15. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-4-chloro-*N*-(1,3-diphenylallyl)aniline (**3h**).

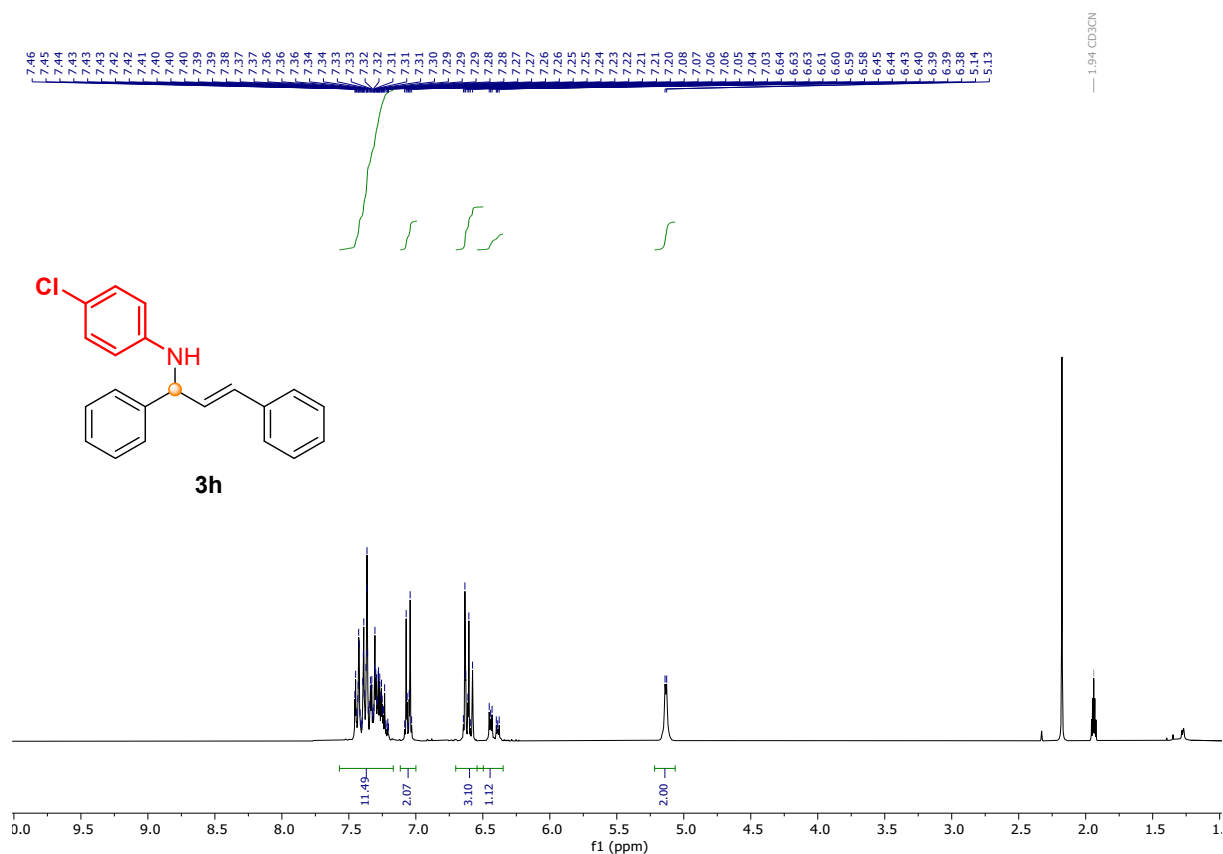


Figure S16. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-bis(4-bromophenyl)allyl)-4-(trifluoromethyl)aniline (**4a**).

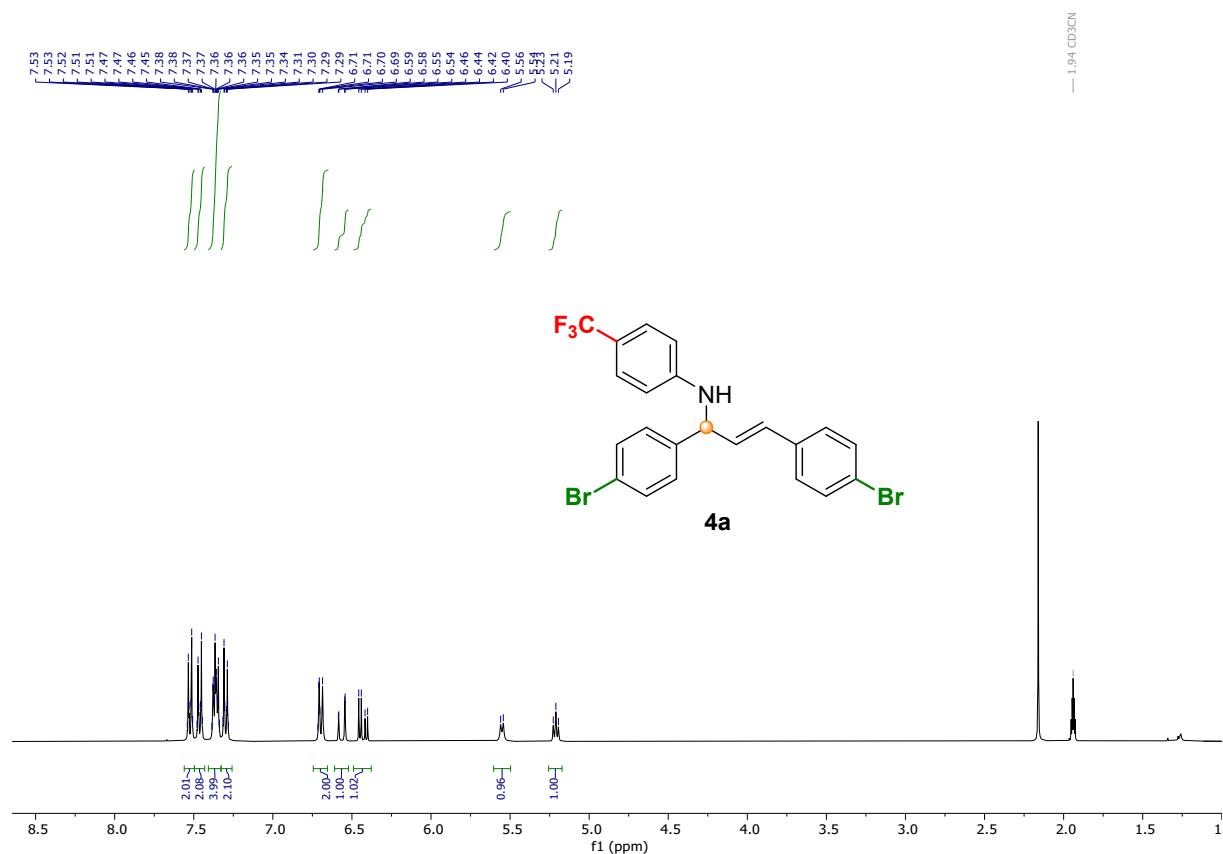


Figure S17. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-bis(4-bromophenyl)allyl)-4-(trifluoromethyl)aniline (**4a**).

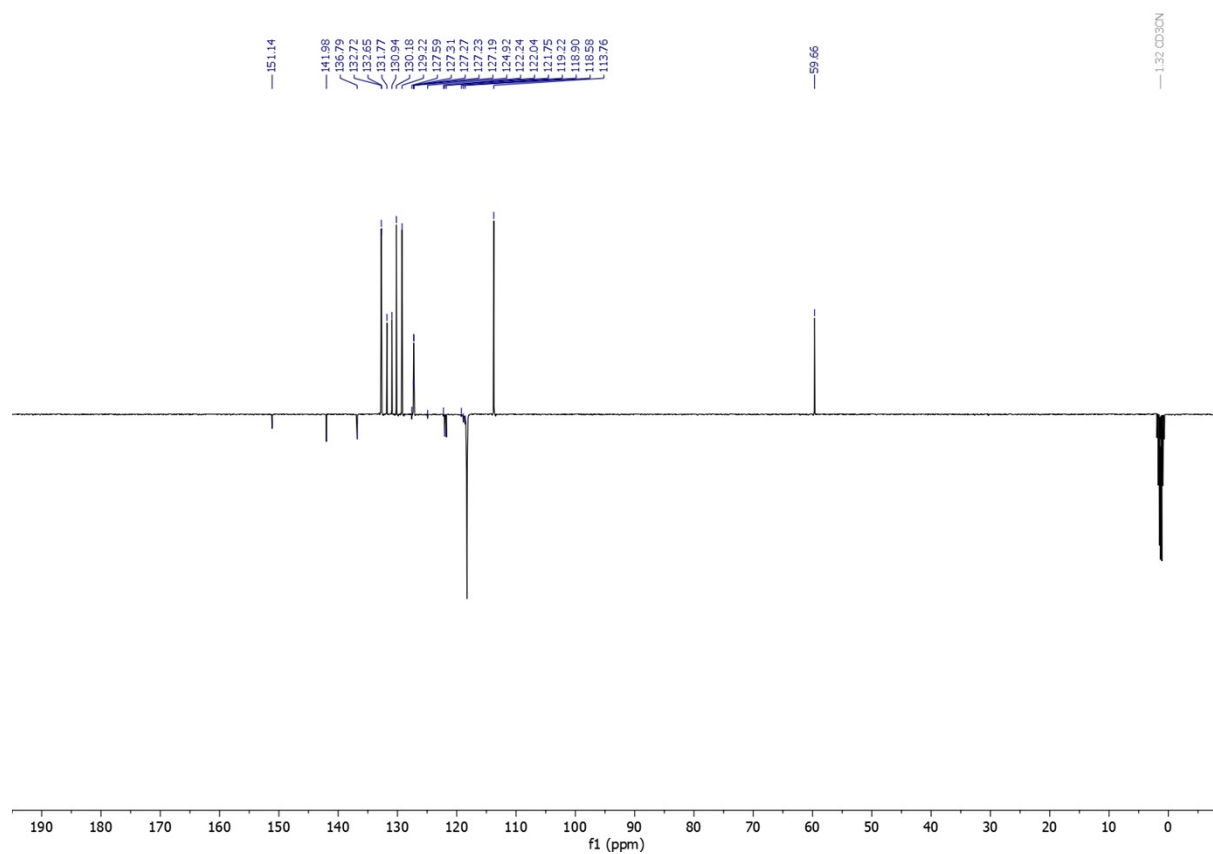


Figure S18. $^{19}\text{F}\{^1\text{H}\}$ NMR (282.4 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-bis(4-bromophenyl)allyl)-4-(trifluoromethyl)aniline (**4a**).

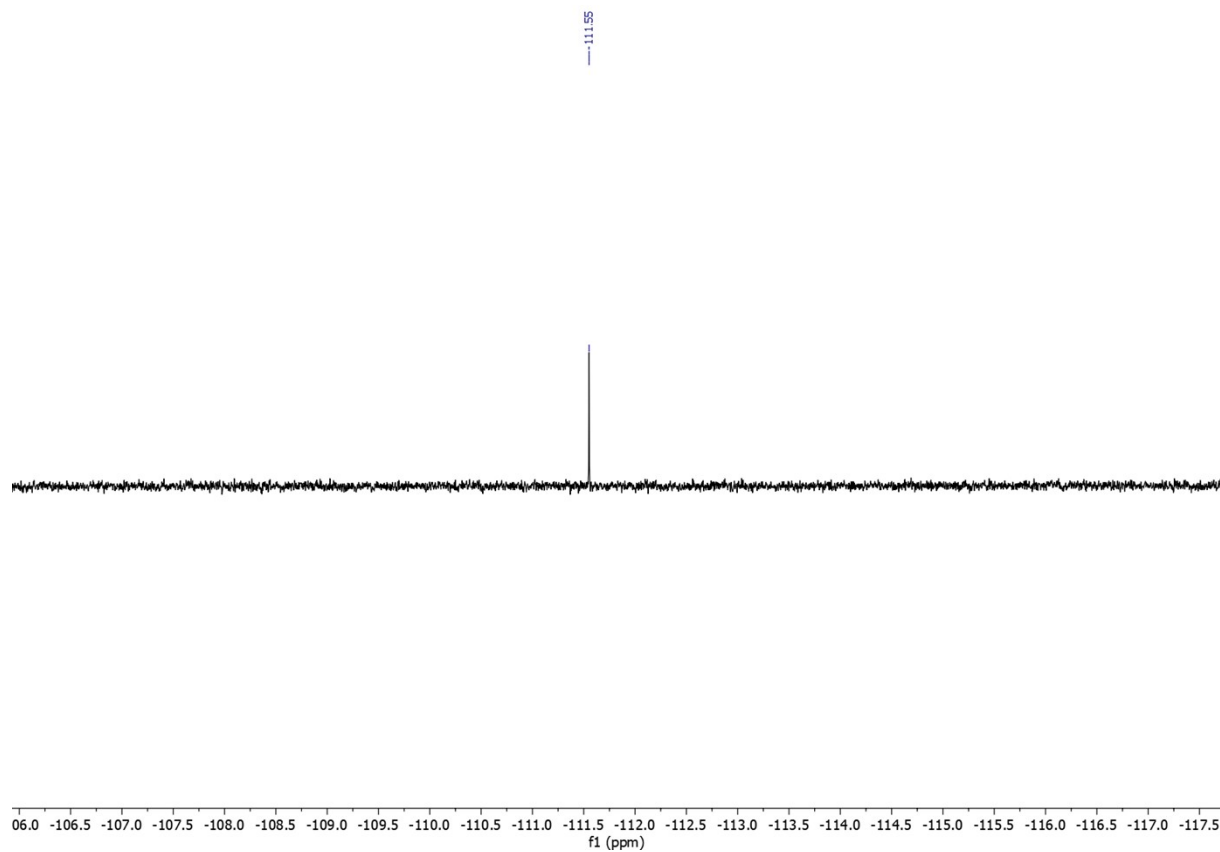


Figure S19. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-di-*p*-tolylallyl)-4-(trifluoromethyl)aniline (**4b**).

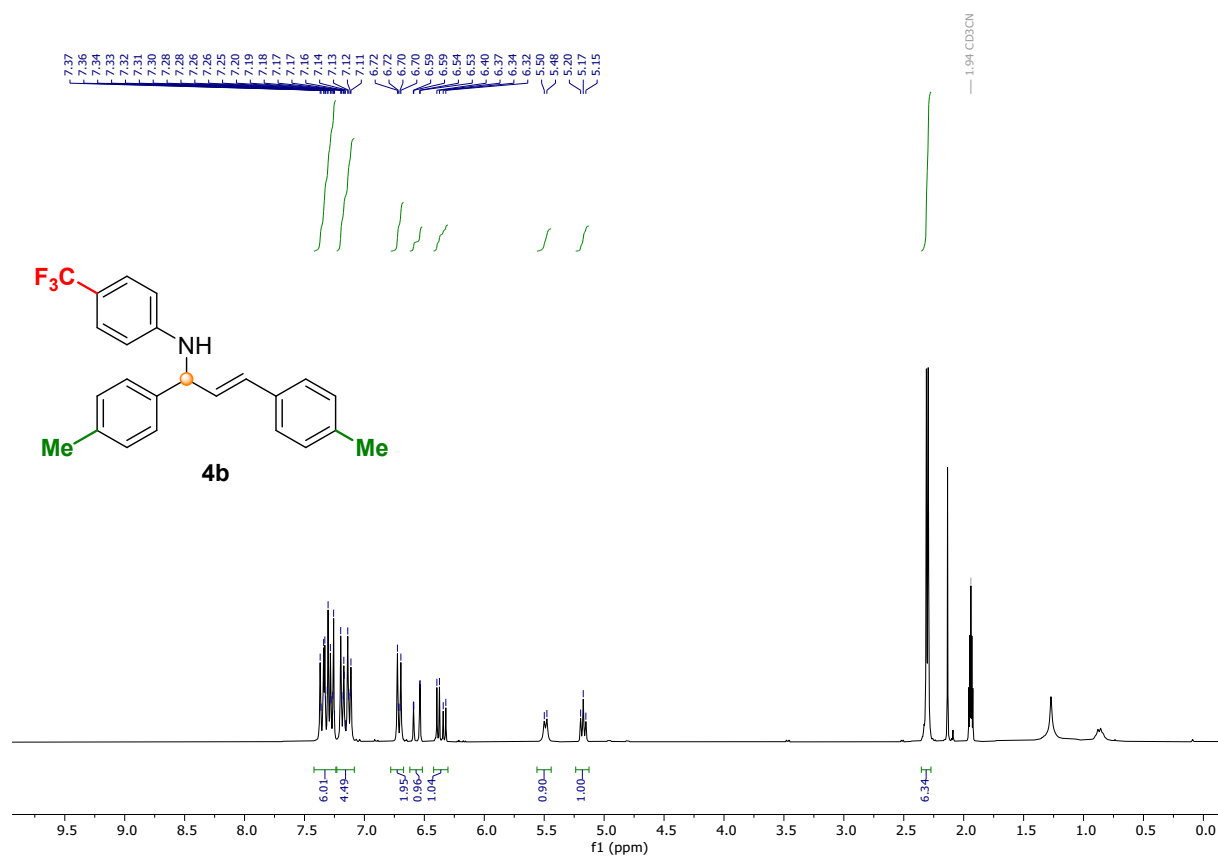


Figure S20. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-di-*p*-tolylallyl)-4-(trifluoromethyl)aniline (**4b**).

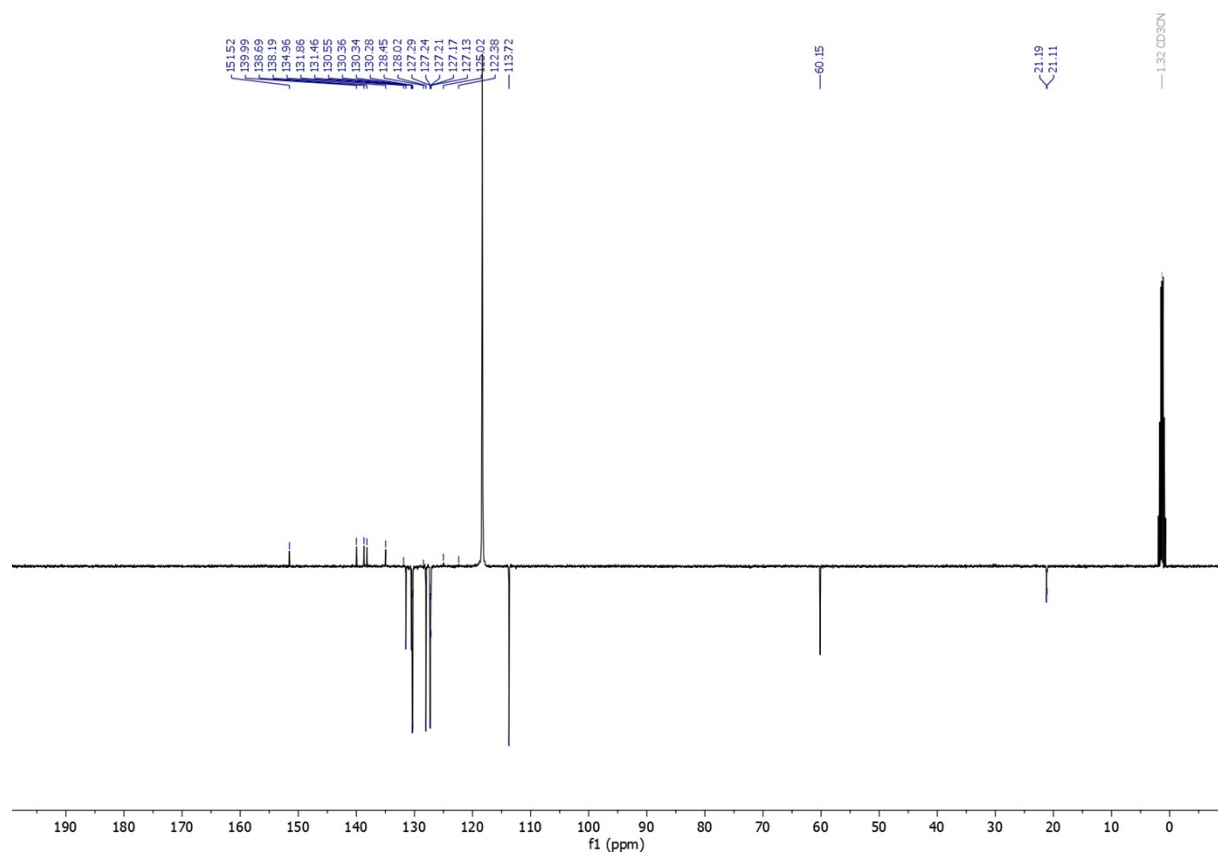


Figure S21. $^{19}\text{F}\{^1\text{H}\}$ NMR (282.4 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-di-*p*-tolylallyl)-4-(trifluoromethyl)aniline (**4b**).

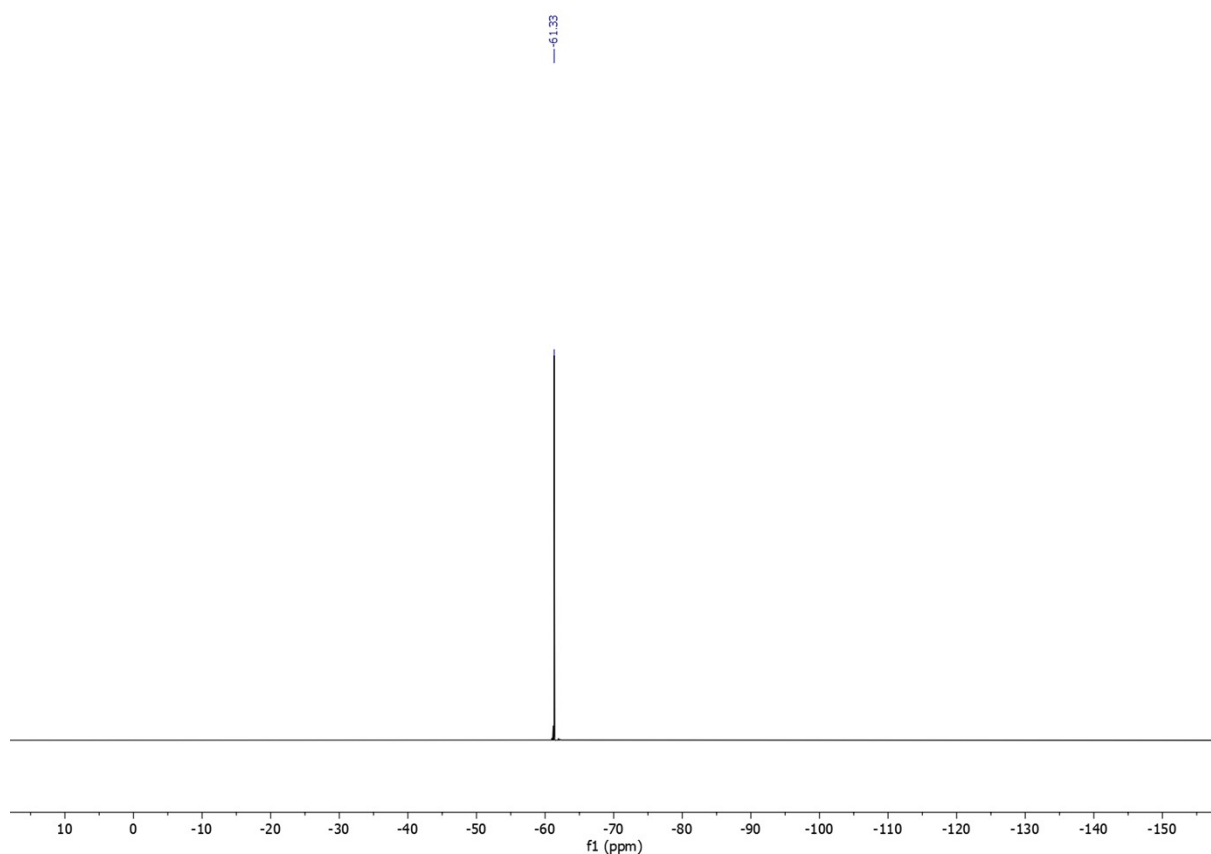


Figure S22. ^1H NMR (400 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-bis(4-bromophenyl)allyl)-3,4-dichloroaniline (**4c**).

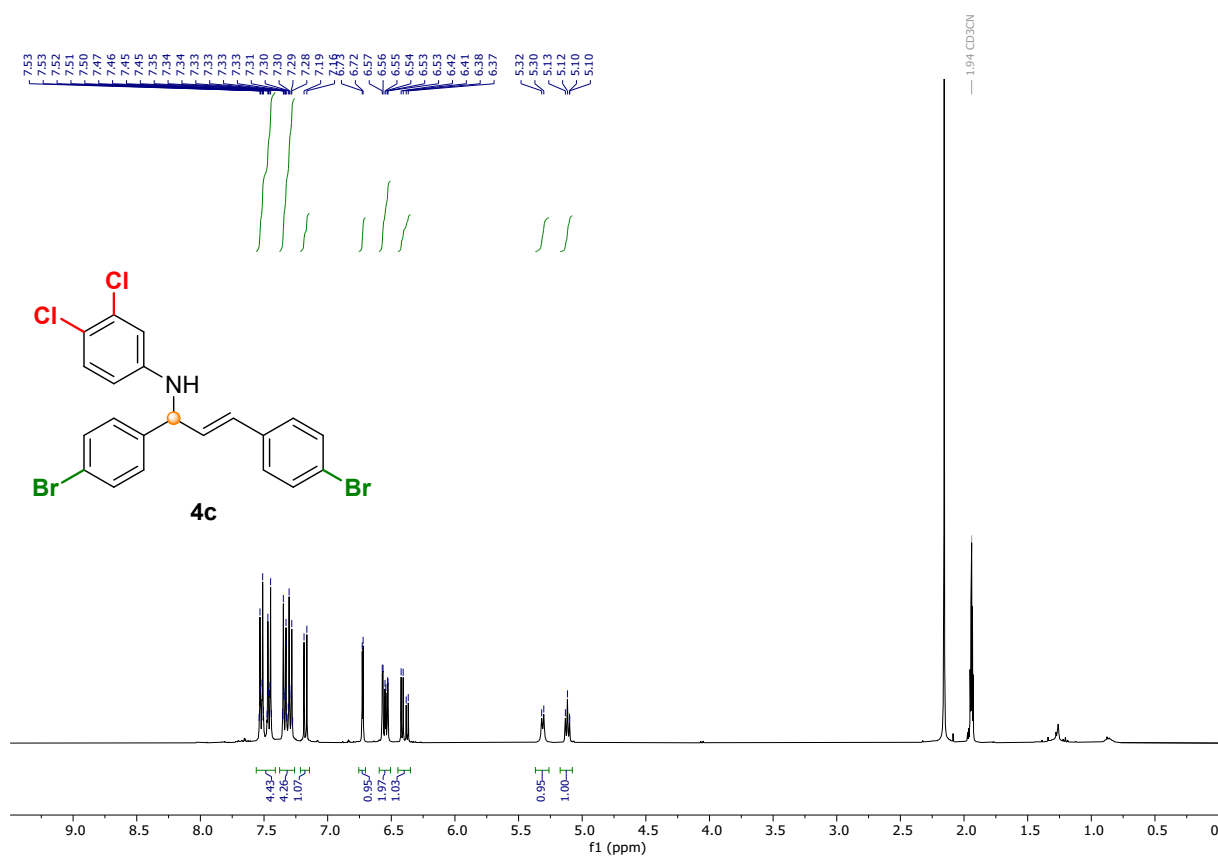


Figure S23. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (101 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-bis(4-bromophenyl)allyl)-3,4-dichloroaniline (**4c**).

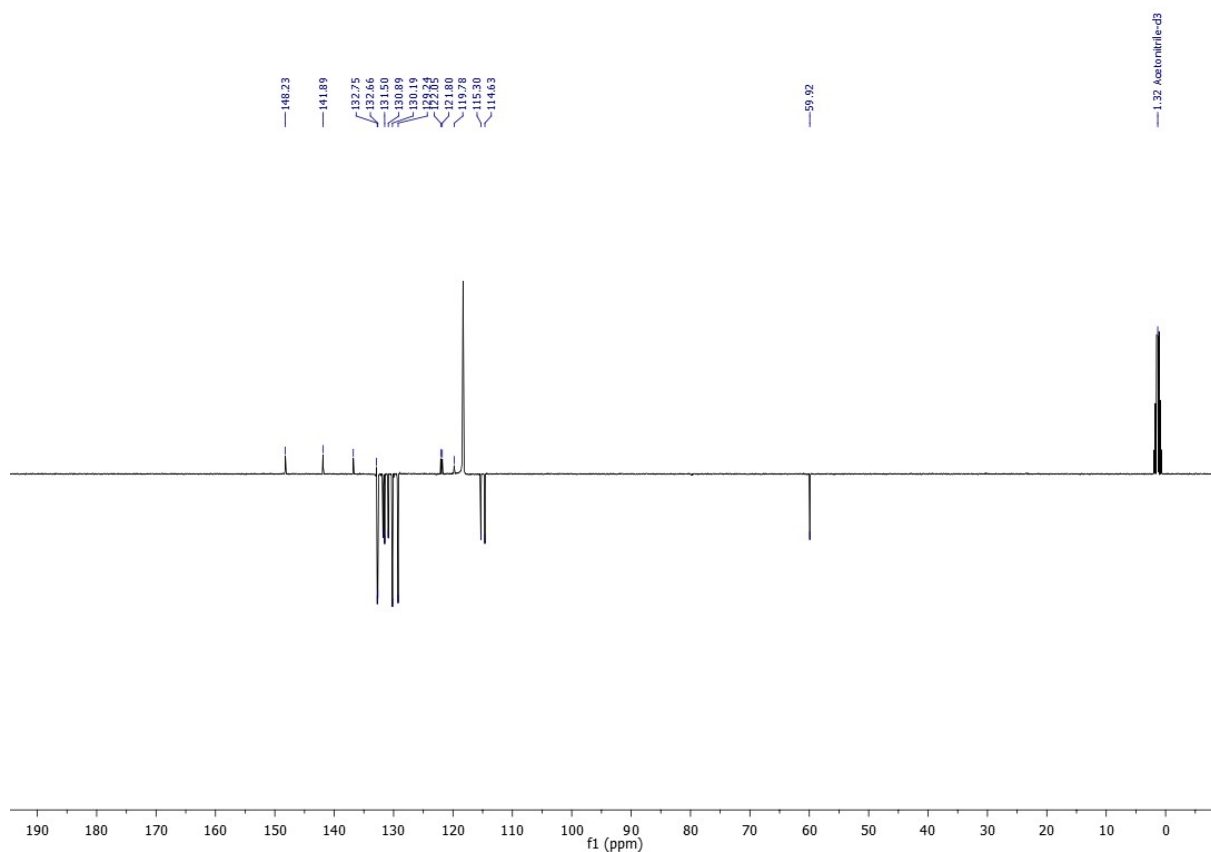


Figure S24. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-bis(4-bromophenyl)allyl)-2-(*tert*-butyl)aniline (**4d**).

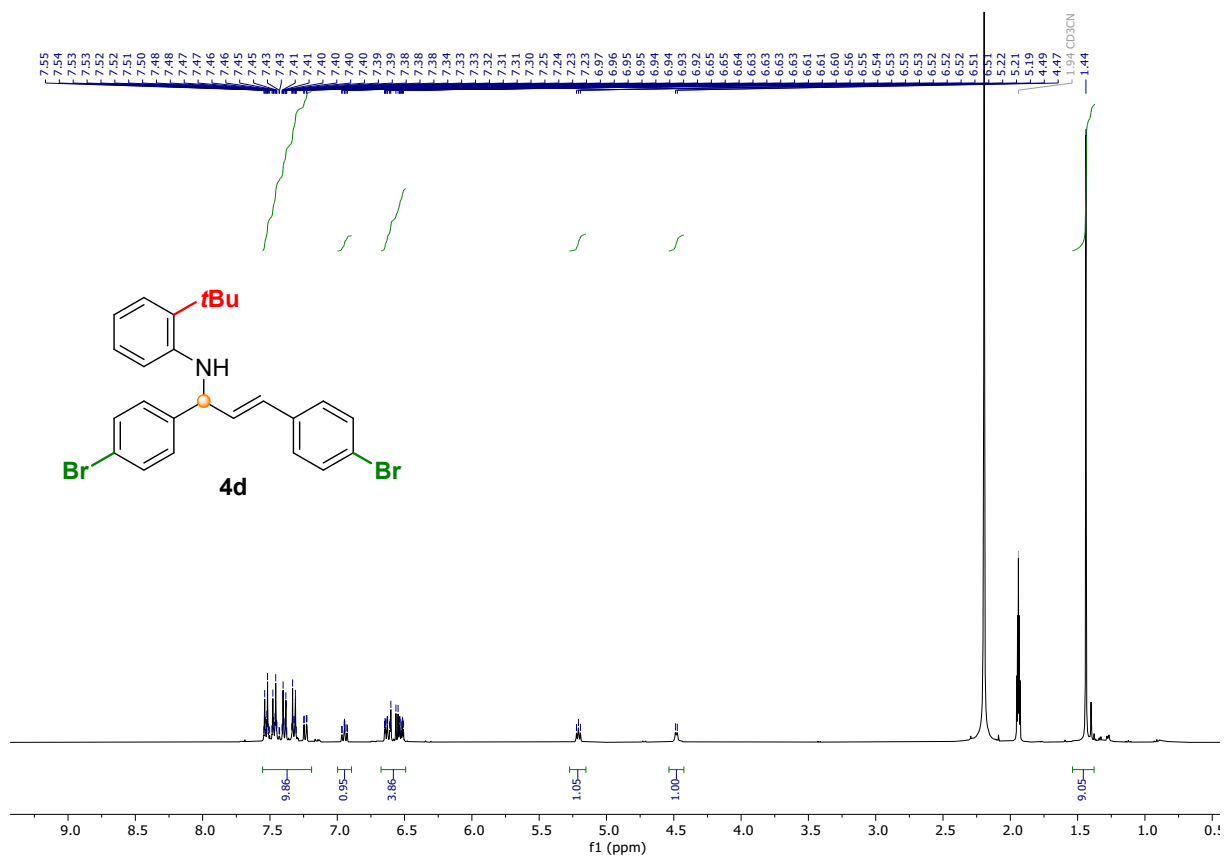


Figure S25. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(1,3-bis(4-chlorophenyl)allyl)-3-(*tert*-butyl)aniline (**4d**).

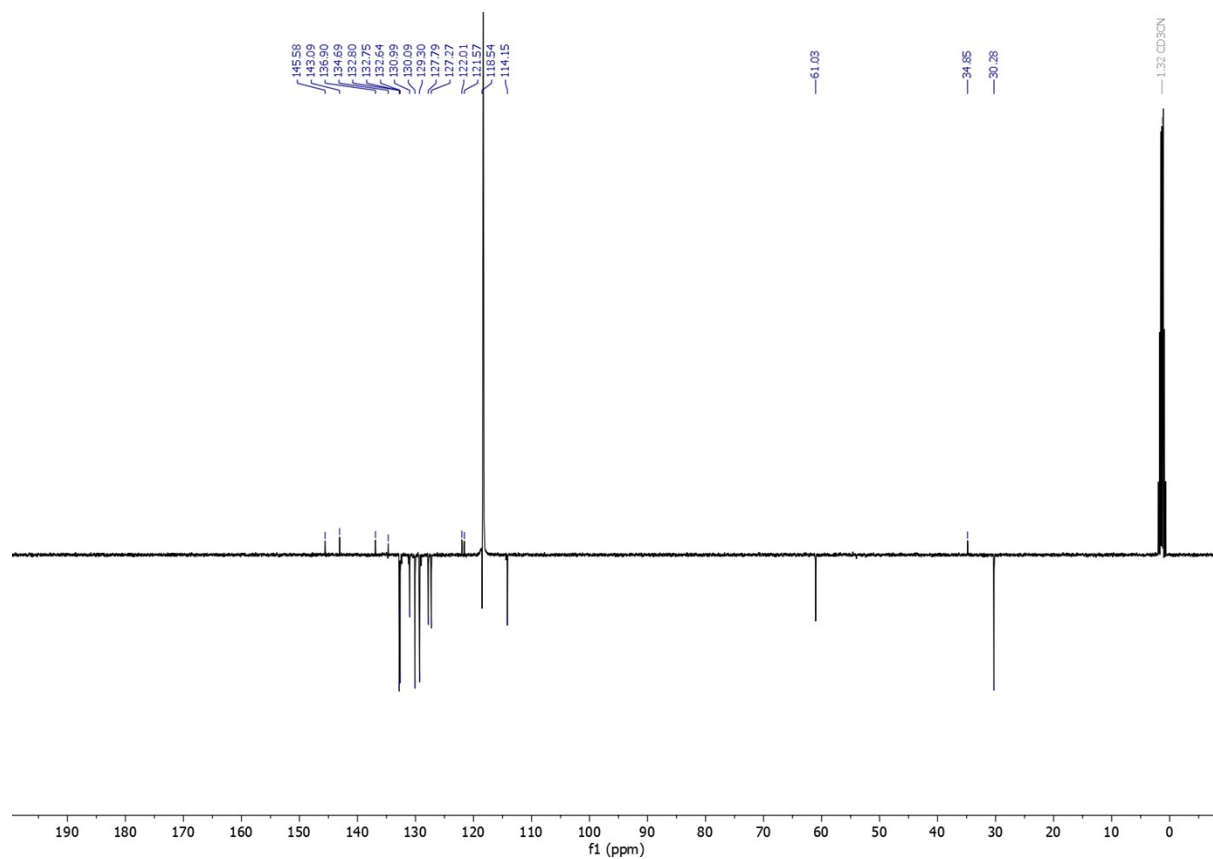


Figure S26. ^1H NMR (400 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(3-phenyl-1-(thiophen-2-yl)allyl)-4-(trifluoromethyl)aniline (**4e**).

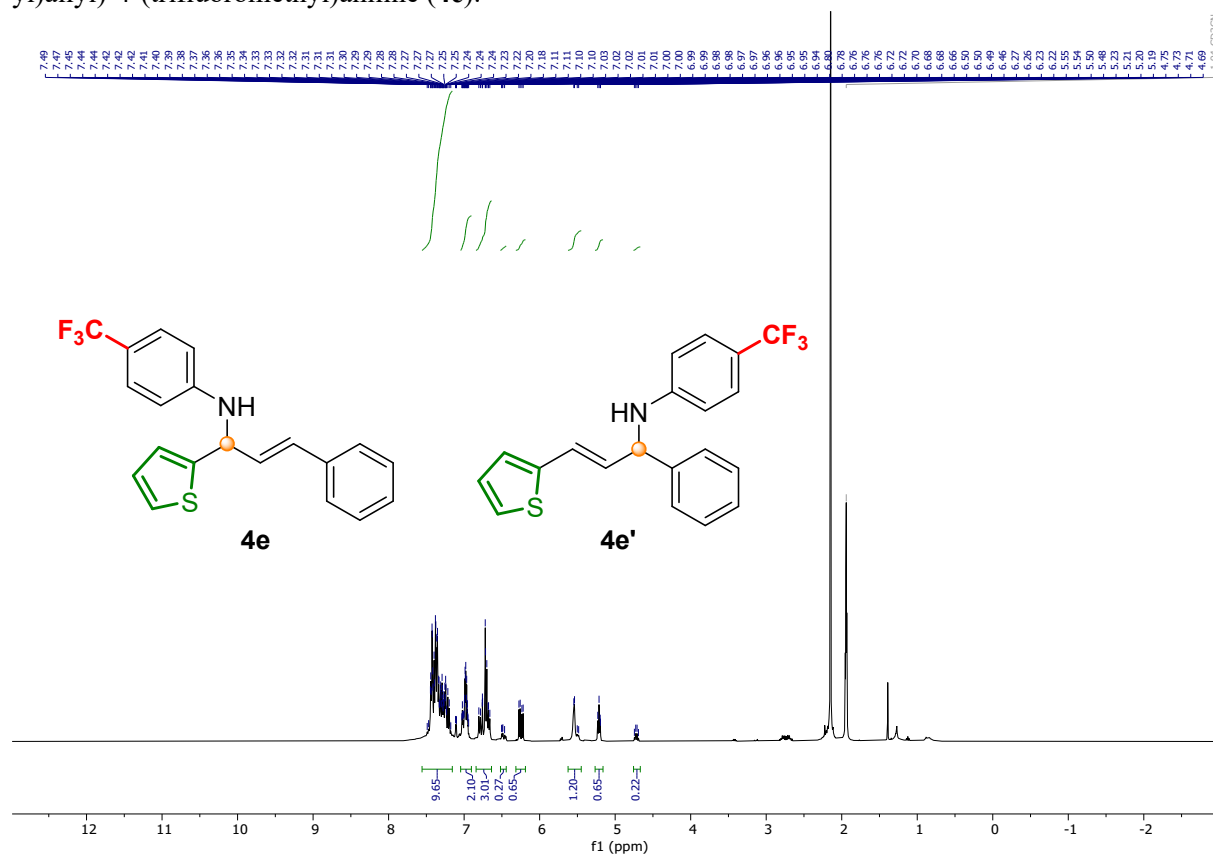


Figure S27. $^{19}\text{F}\{^1\text{H}\}$ NMR (376.5 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(3-phenyl-1-(thiophen-2-yl)allyl)-4-(trifluoromethyl)aniline (**4e**).

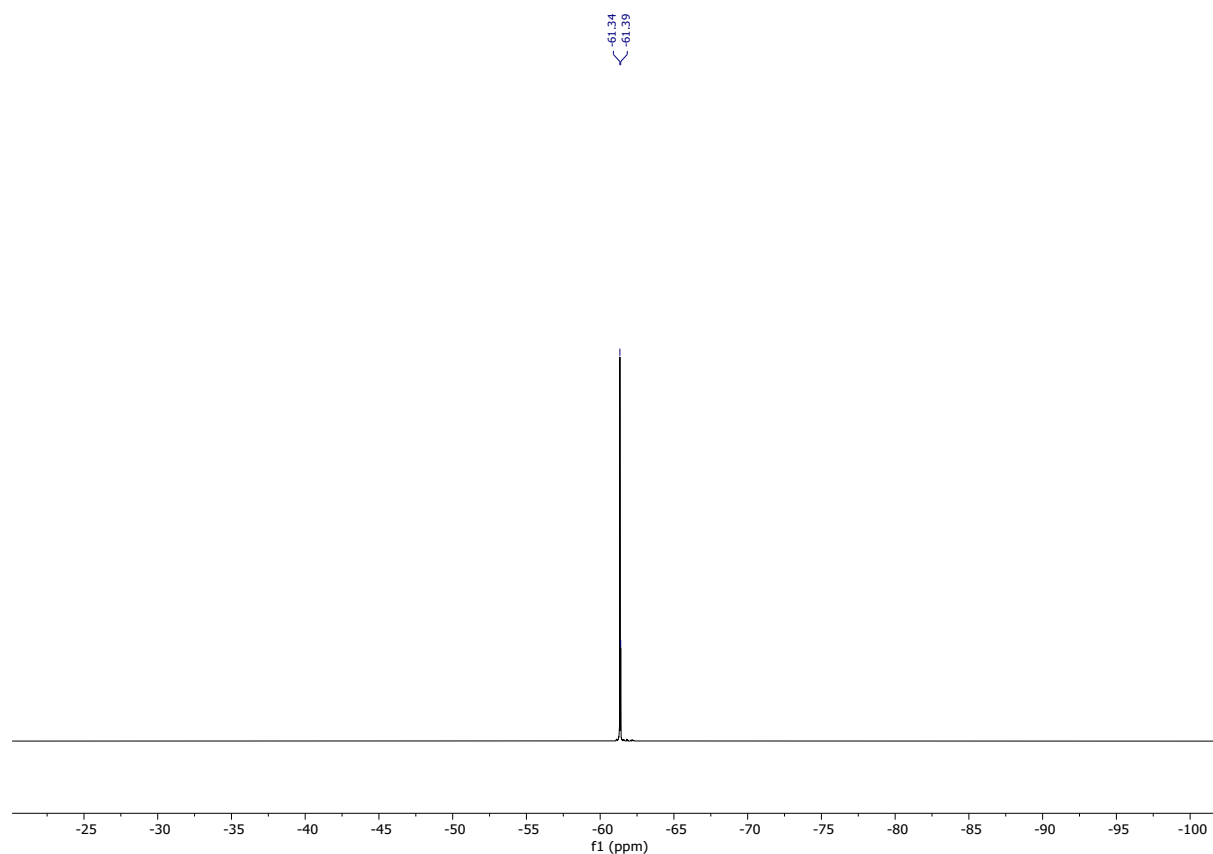


Figure S28. ^1H NMR (300 MHz, CD_3COCD_3) spectrum of compound (*E*)-*N*-(4-phenylbut-3-en-2-yl)-4-(trifluoromethyl)aniline (**4f**).

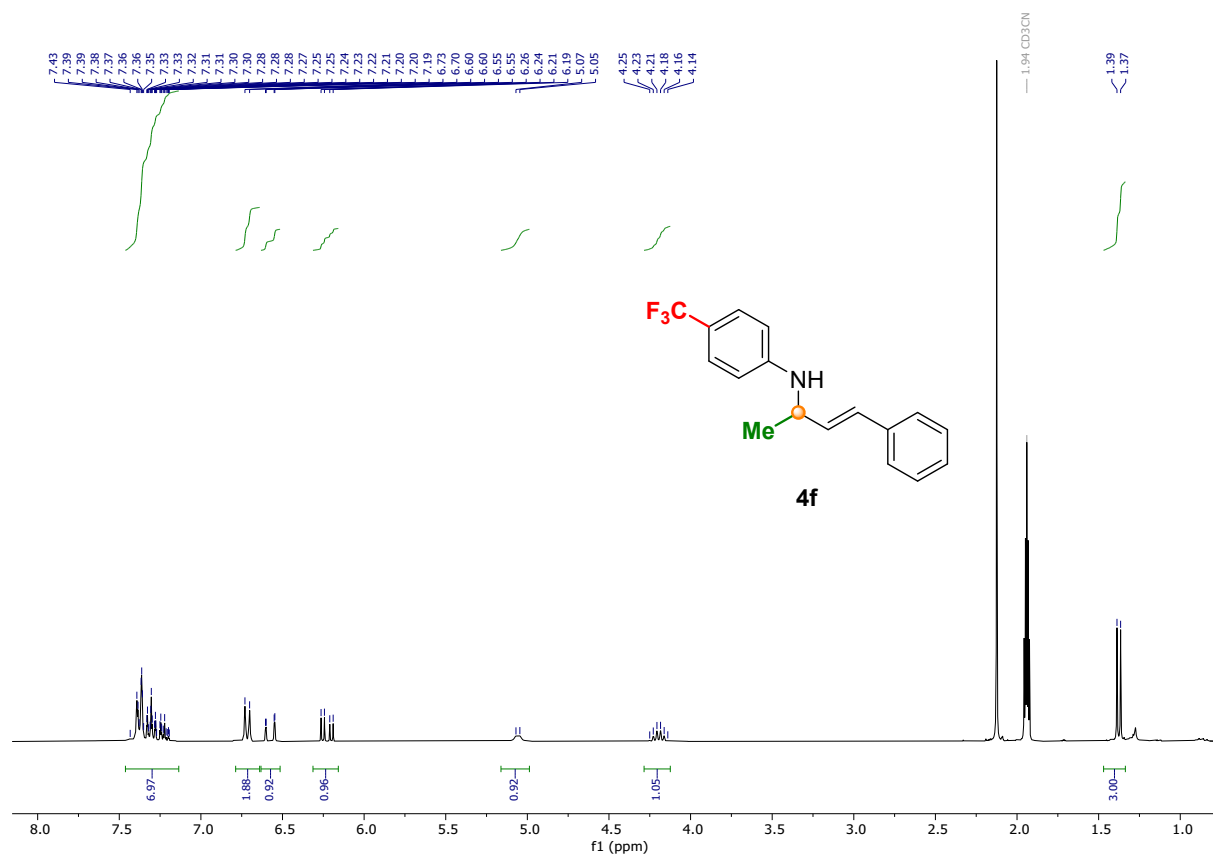


Figure S29. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (101 MHz, CD_3CN) spectrum of compound (*E*)-*N*-(4-phenylbut-3-en-2-yl)-4-(trifluoromethyl)aniline (**4f**).

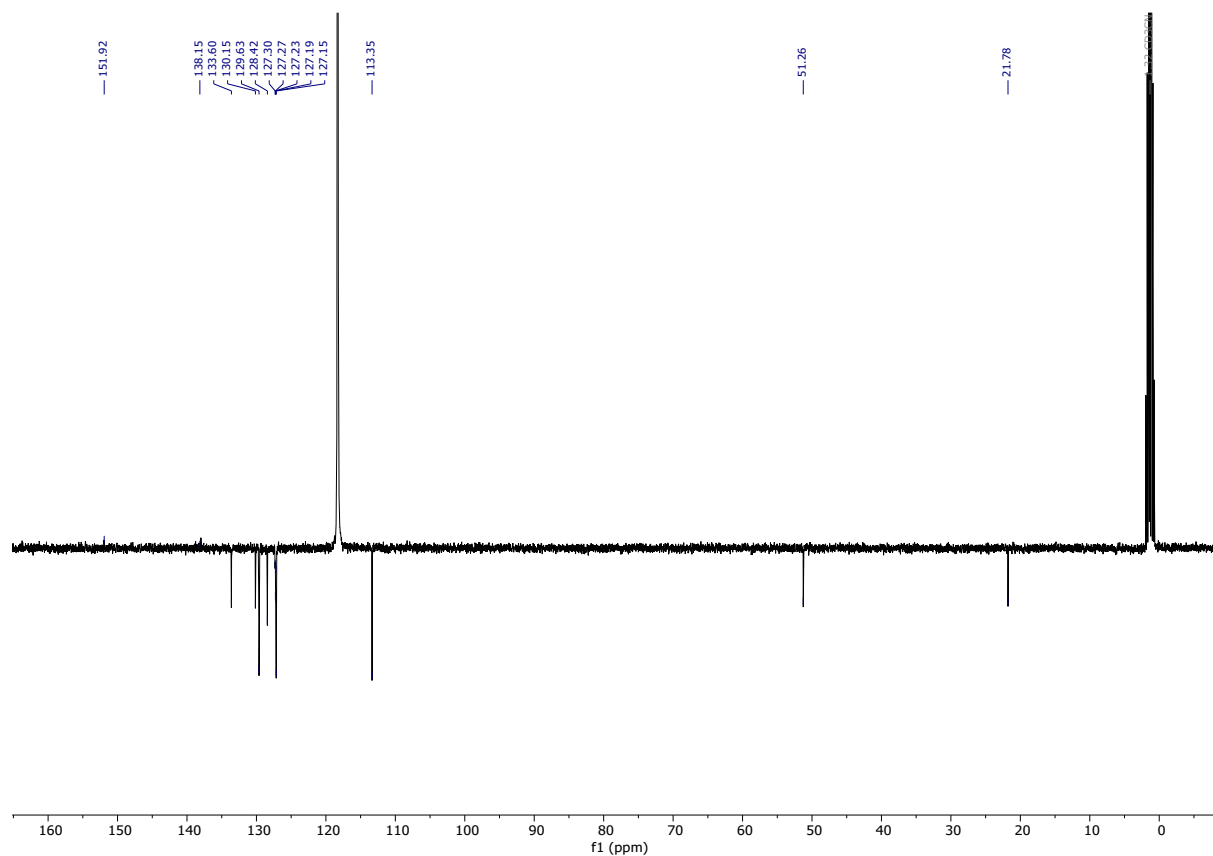


Figure S30. $^{19}\text{F}\{^1\text{H}\}$ NMR (282.4 MHz, CD_3COCD_3) spectrum of compound (*E*)-*N*-(4-phenylbut-3-en-2-yl)-4-(trifluoromethyl)aniline (**4f**).

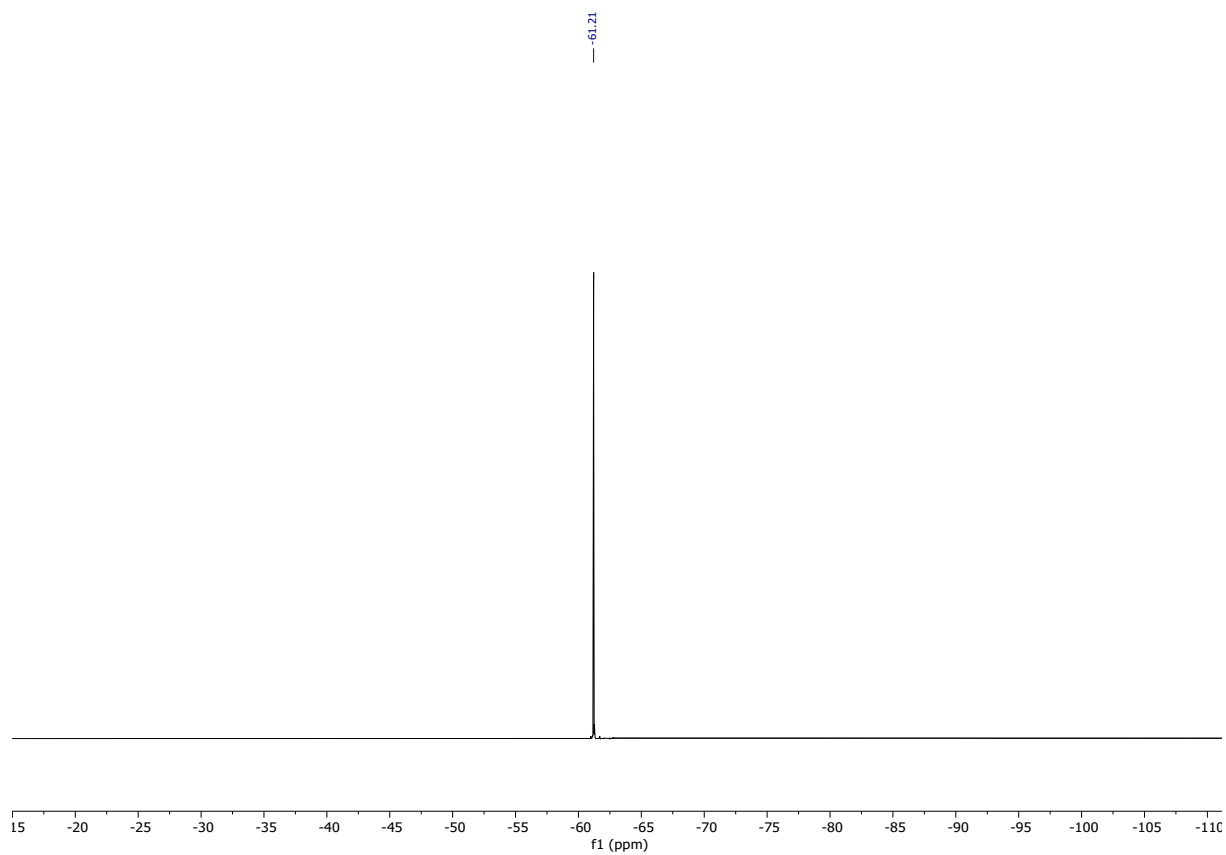


Figure S31. COSY (300 MHz, CD₃COCD₃) spectrum of compound (*E*)-*N*-(4-phenylbut-3-en-2-yl)-4-(trifluoromethyl)aniline (**4f**).

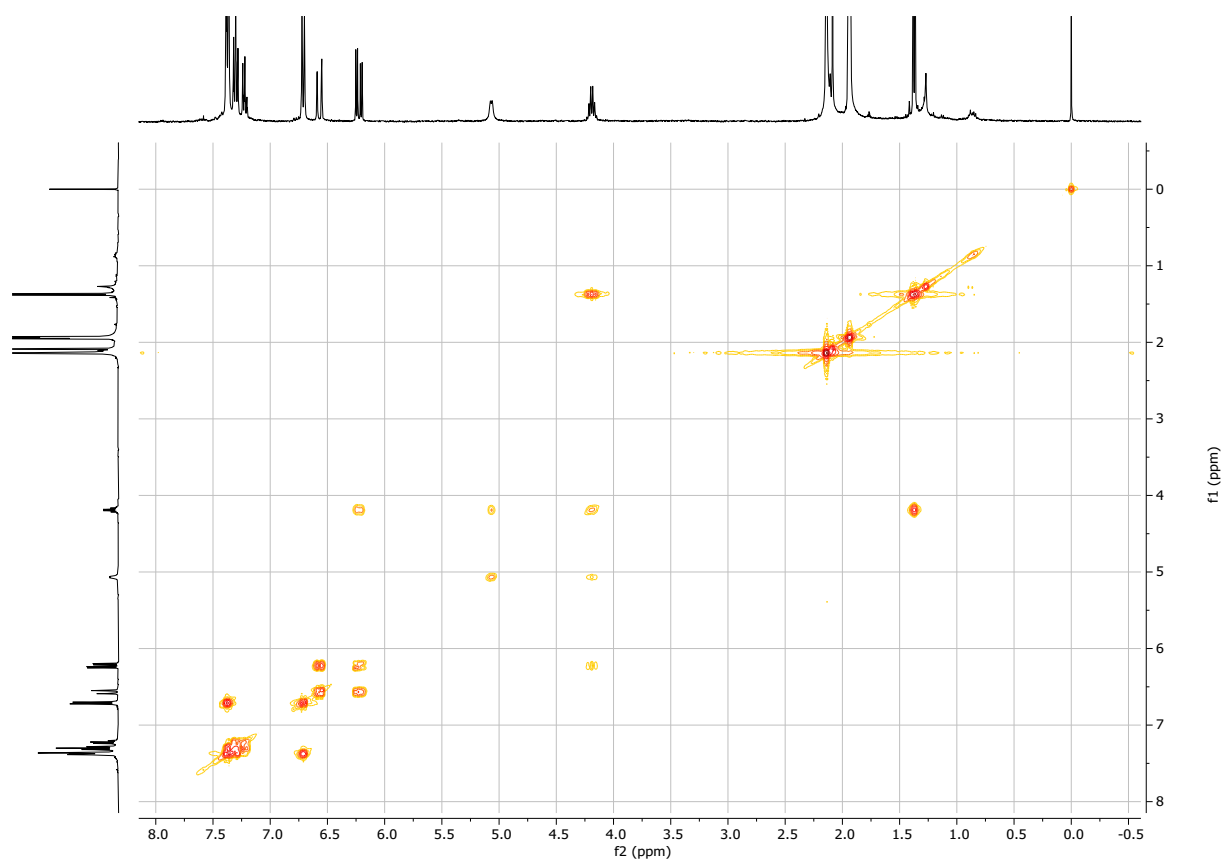


Figure S32. ¹H NMR (300 MHz, CD₃CN) spectrum of compound *N*-(cyclohex-2-en-1-yl)-4-(trifluoromethyl)aniline (**4g**).

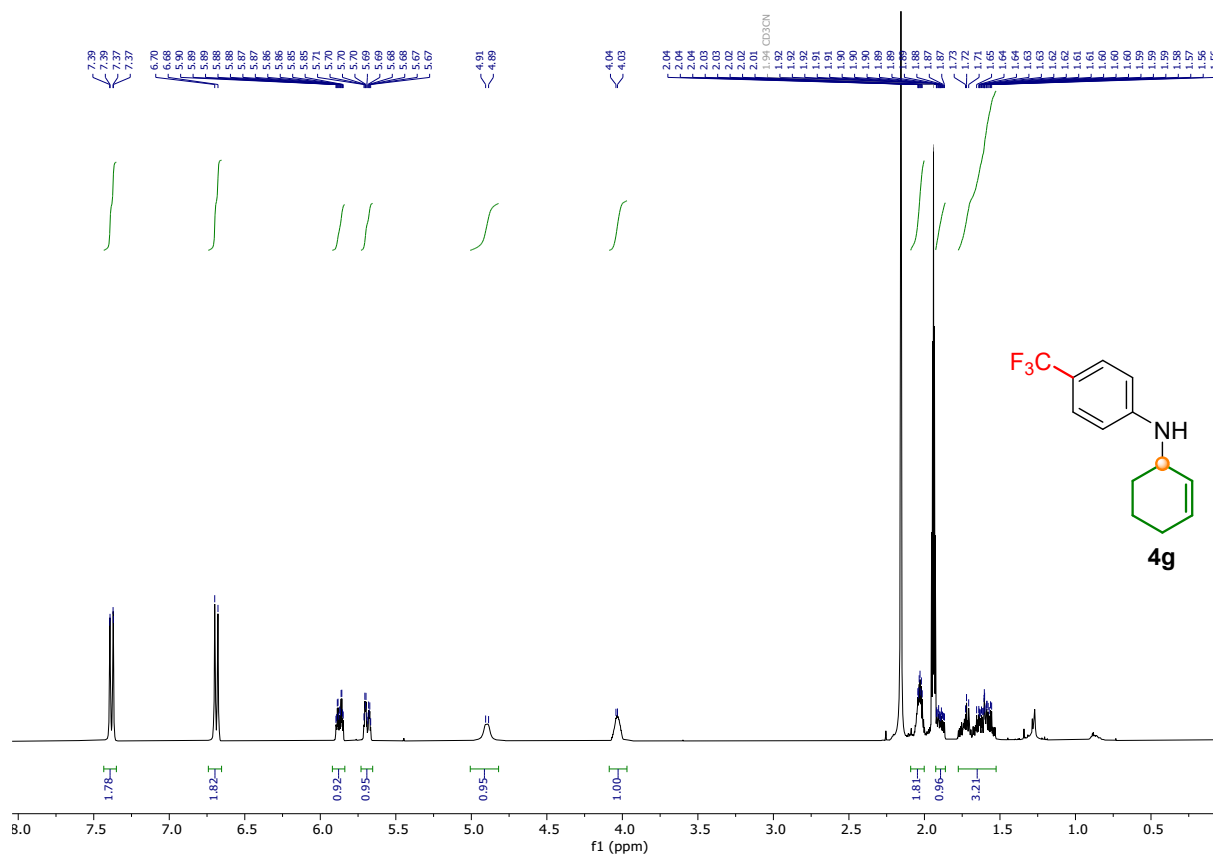


Figure S33. ^1H NMR (300 MHz, CD_3CN) spectrum of compound *N*-(2-ethylidenecyclohexyl)-4-(trifluoromethyl)aniline (**4h**).

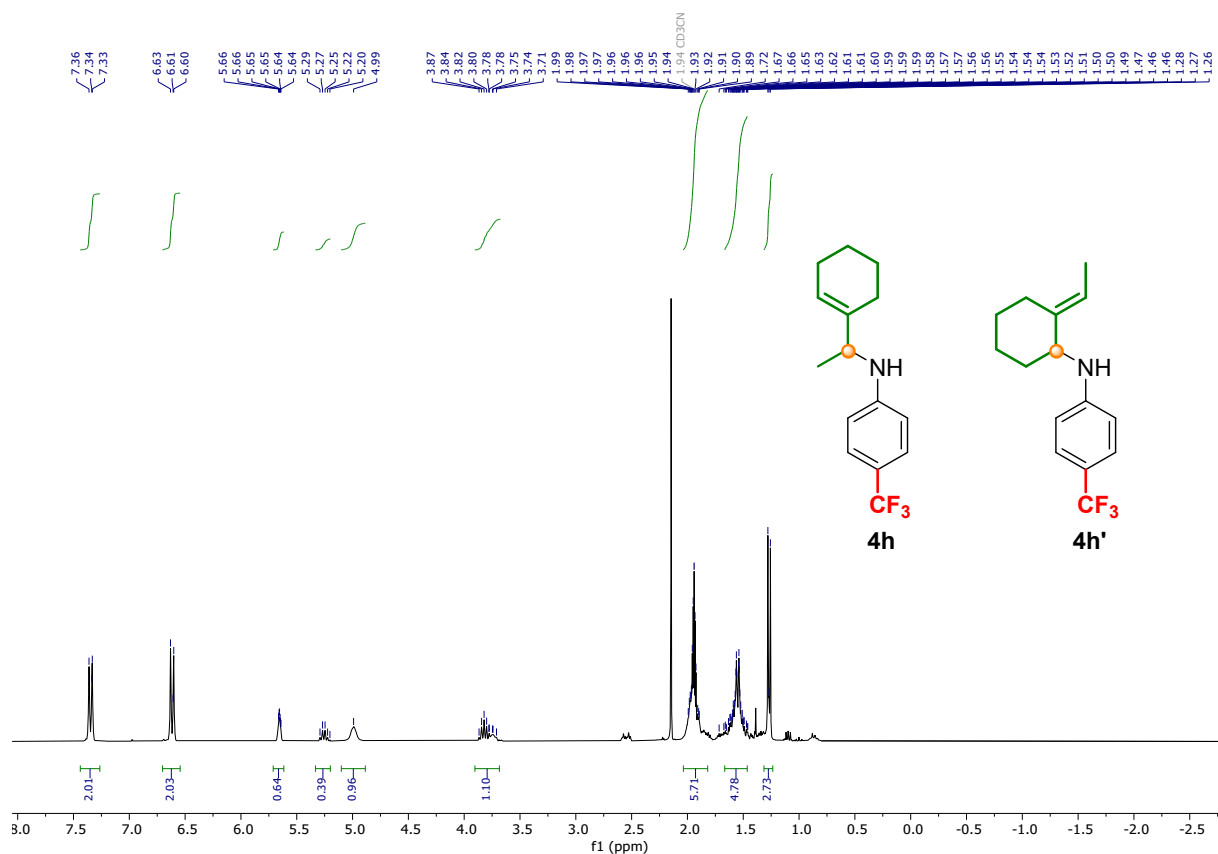


Figure S34. $^{19}\text{F}\{^1\text{H}\}$ NMR (282.4 MHz, CD_3CN) spectrum of compound *N*-(2-ethylidenecyclohexyl)-4-(trifluoromethyl)aniline (**4h**).

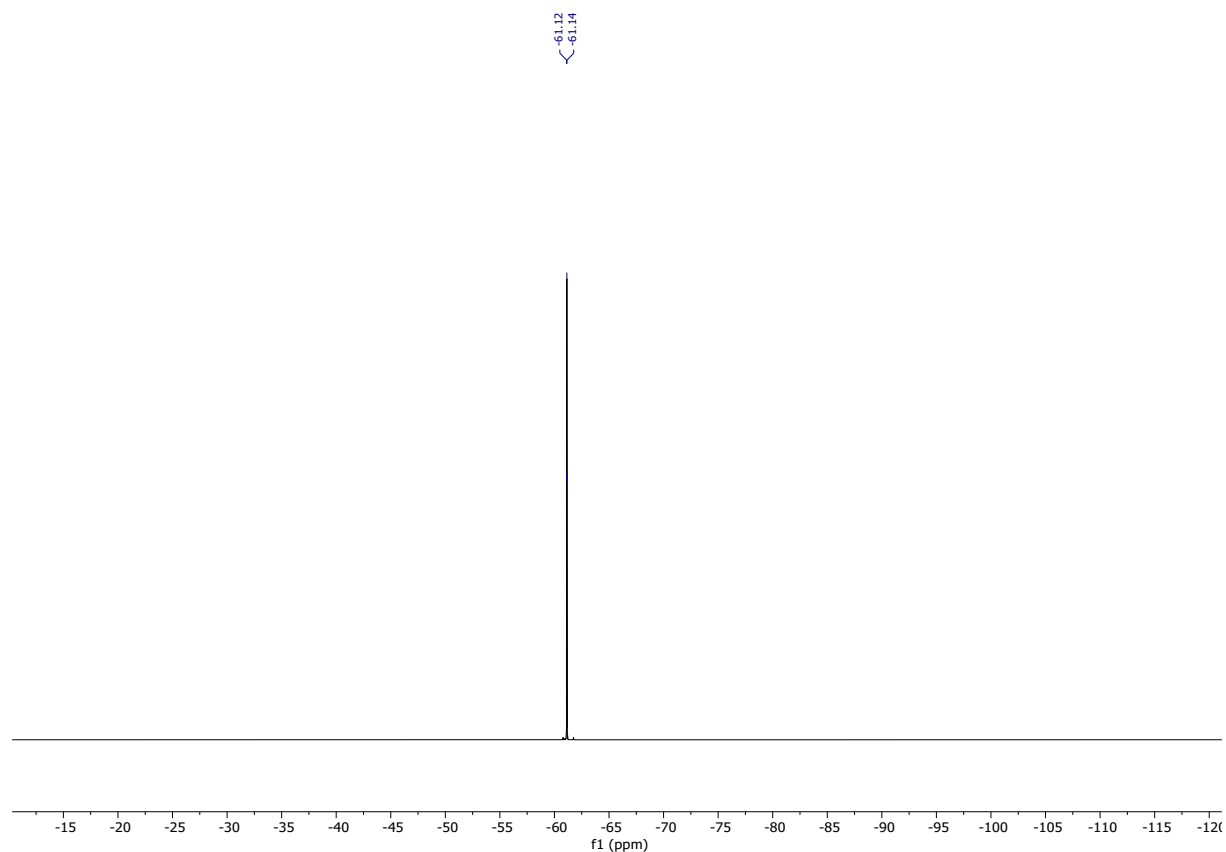


Figure S35. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N'*-(1,3-diphenylallyl)benzohydrazide (**6a**).

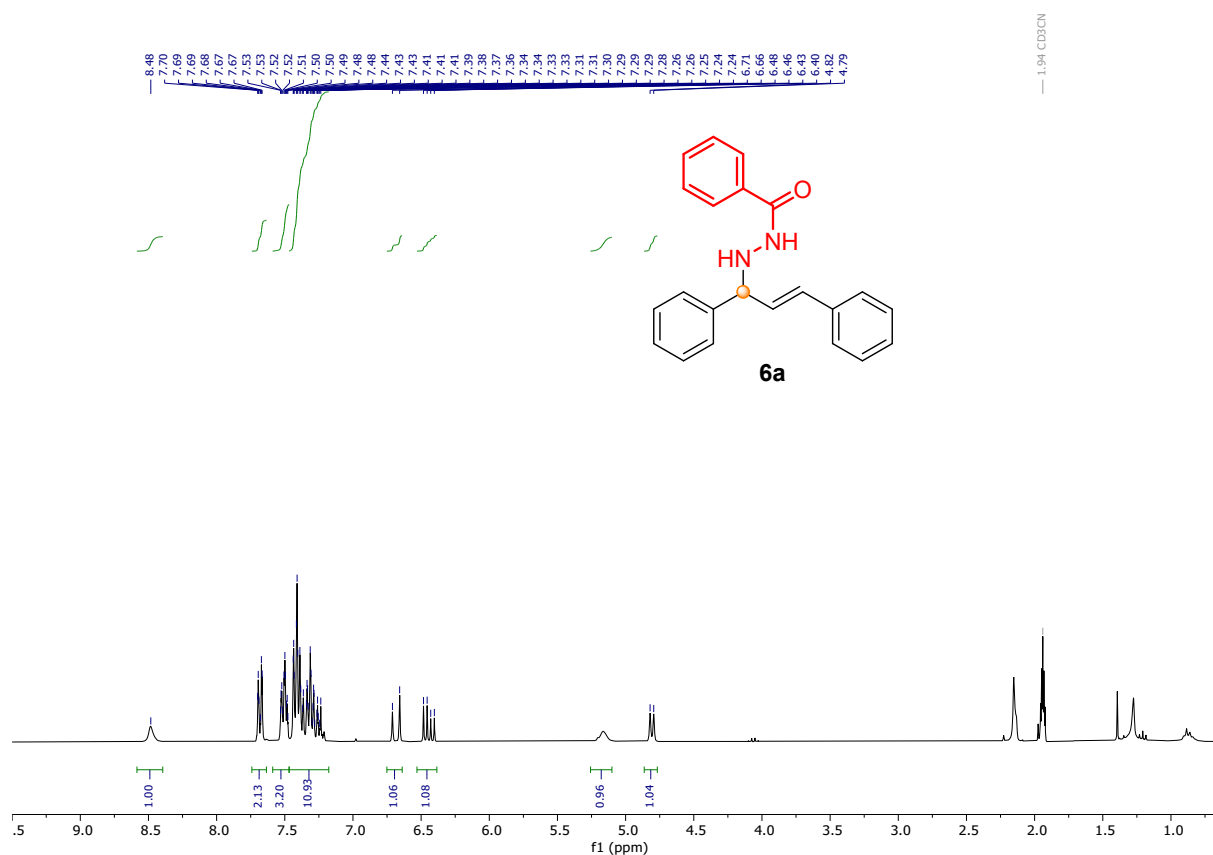


Figure S36. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N'*-(1,3-diphenylallyl)-4-nitrobenzohydrazide (**6b**).

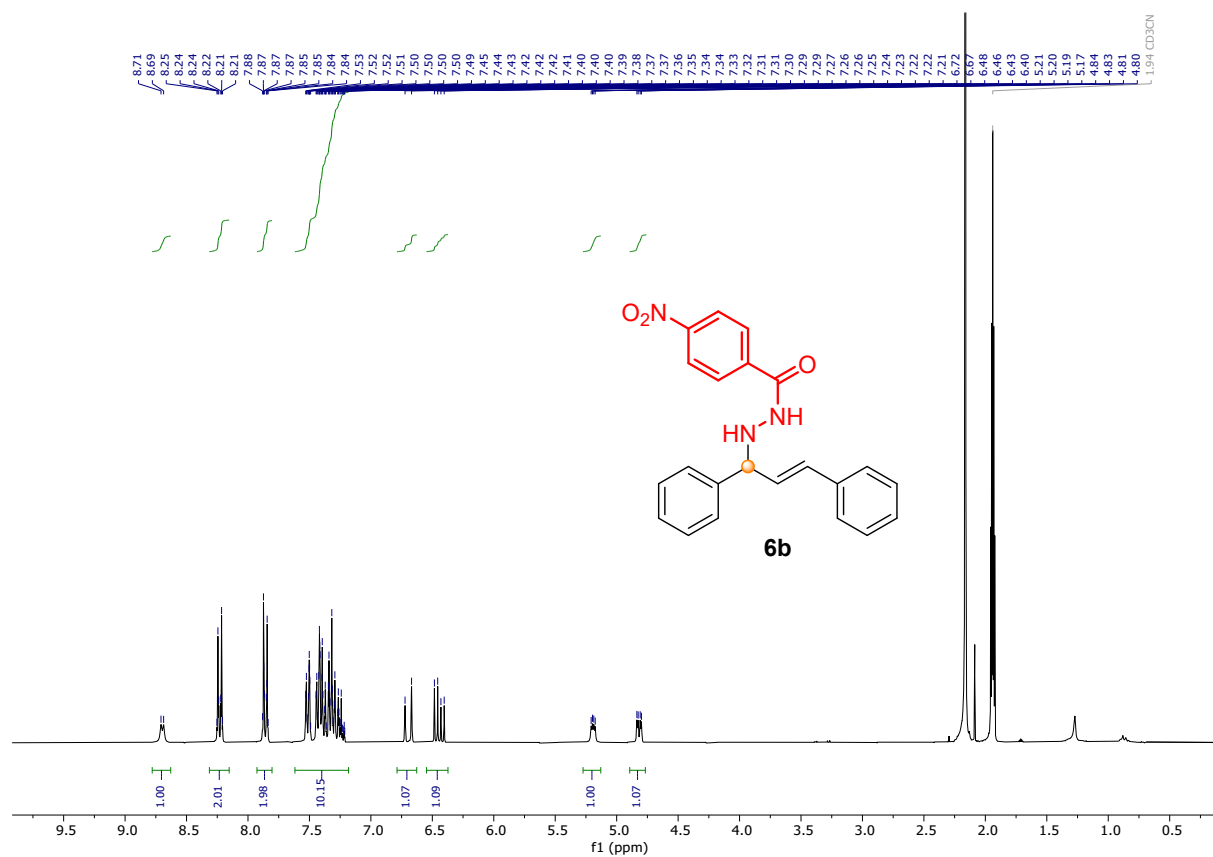


Figure S37. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N'*-(1,3-diphenylallyl)-4-nitrobenzohydrazide (**6b**).

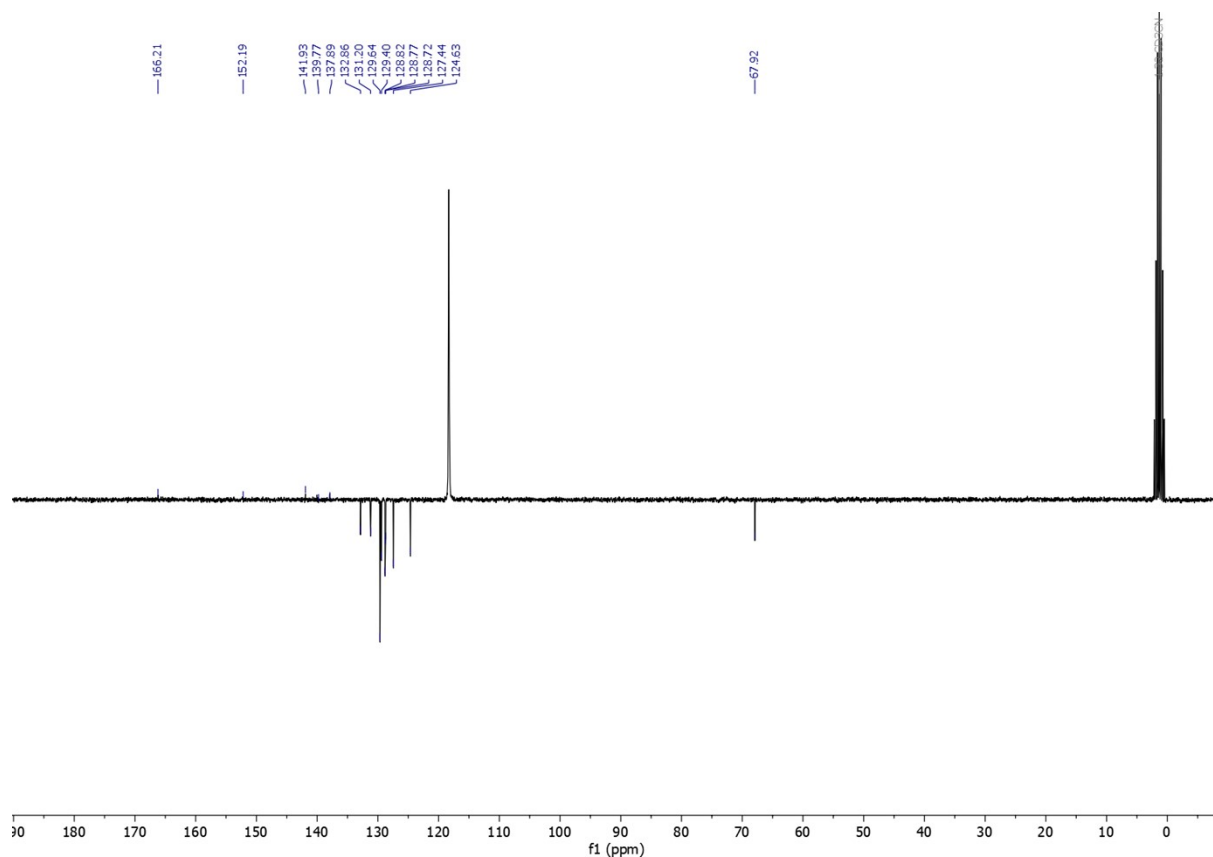


Figure S38. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N'*-(1,3-diphenylallyl)-4-methoxybenzohydrazide (**6c**).

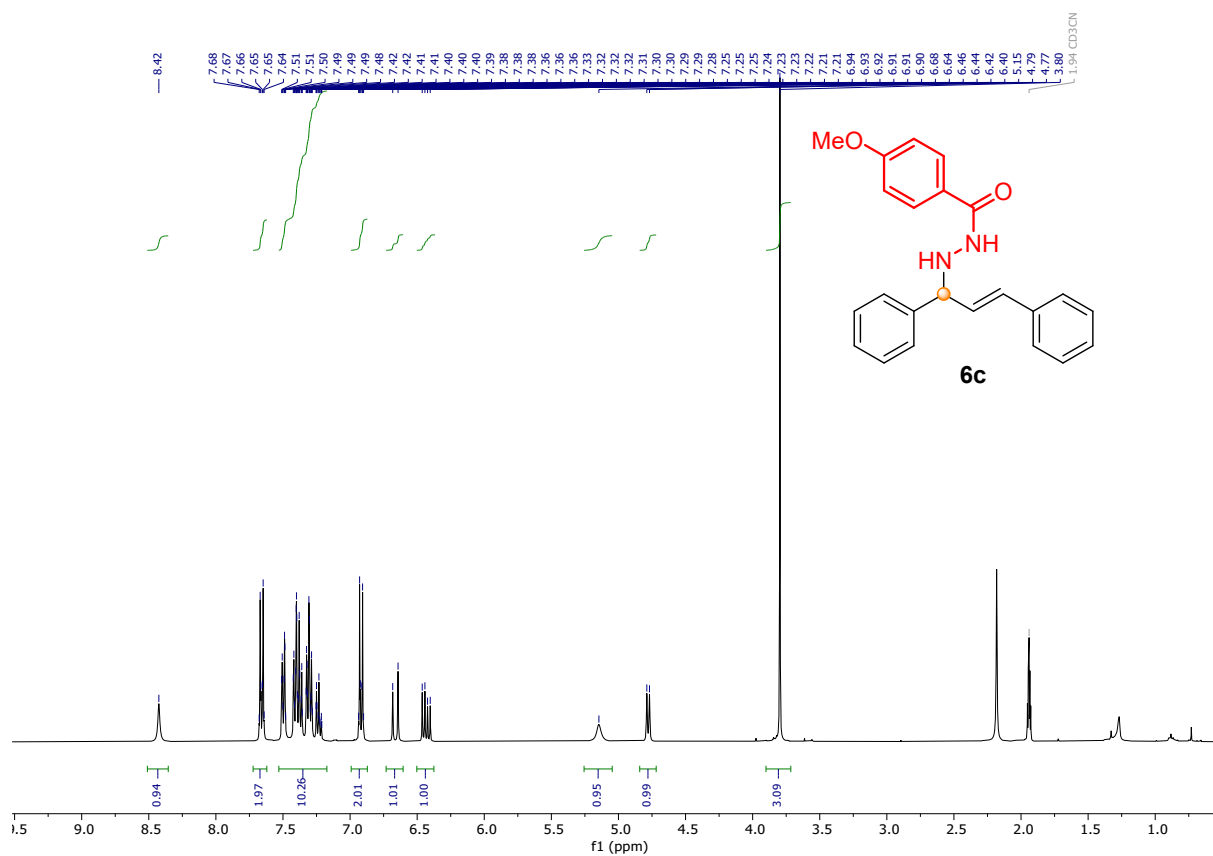


Figure S39. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N'*-(1,3-diphenylallyl)-4-methoxybenzohydrazide (**6c**).

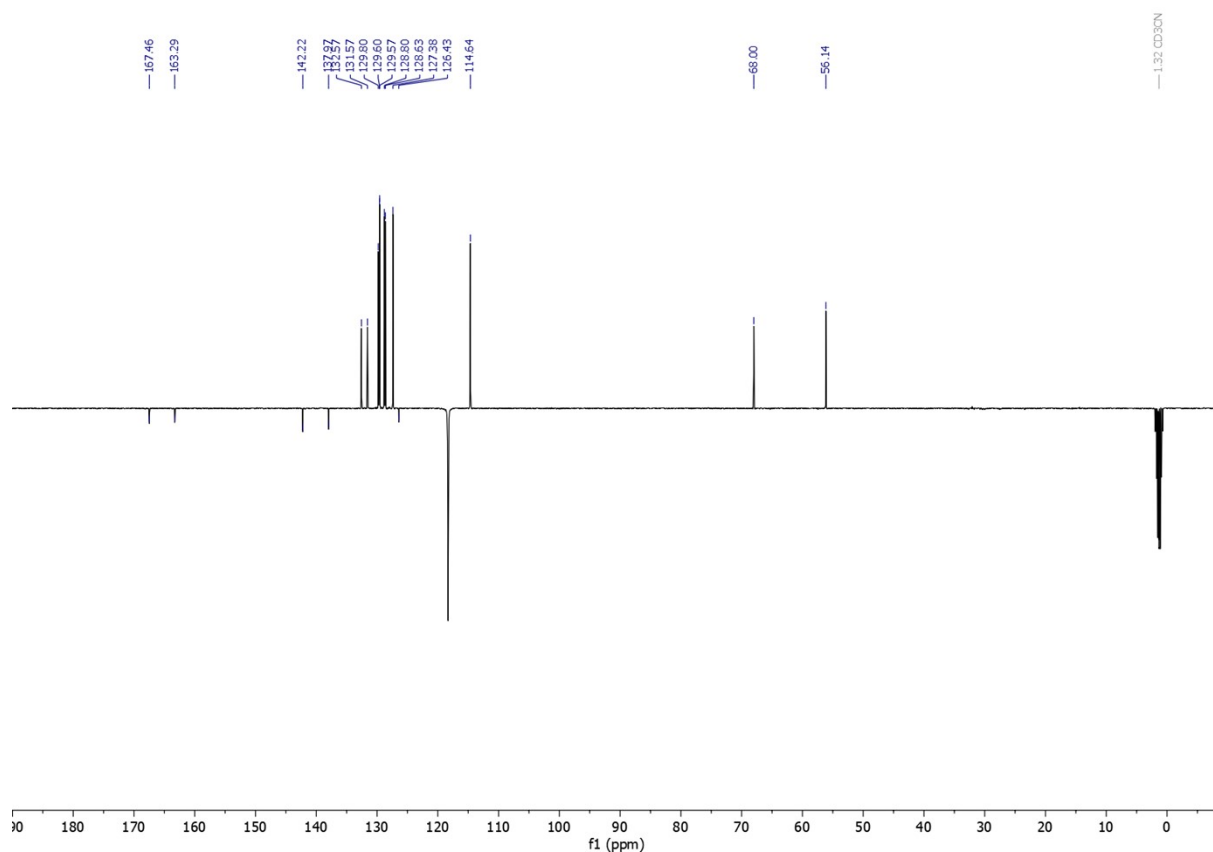


Figure S40. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-*N'*-(1,3-diphenylallyl)octanehydrazide (**6d**).

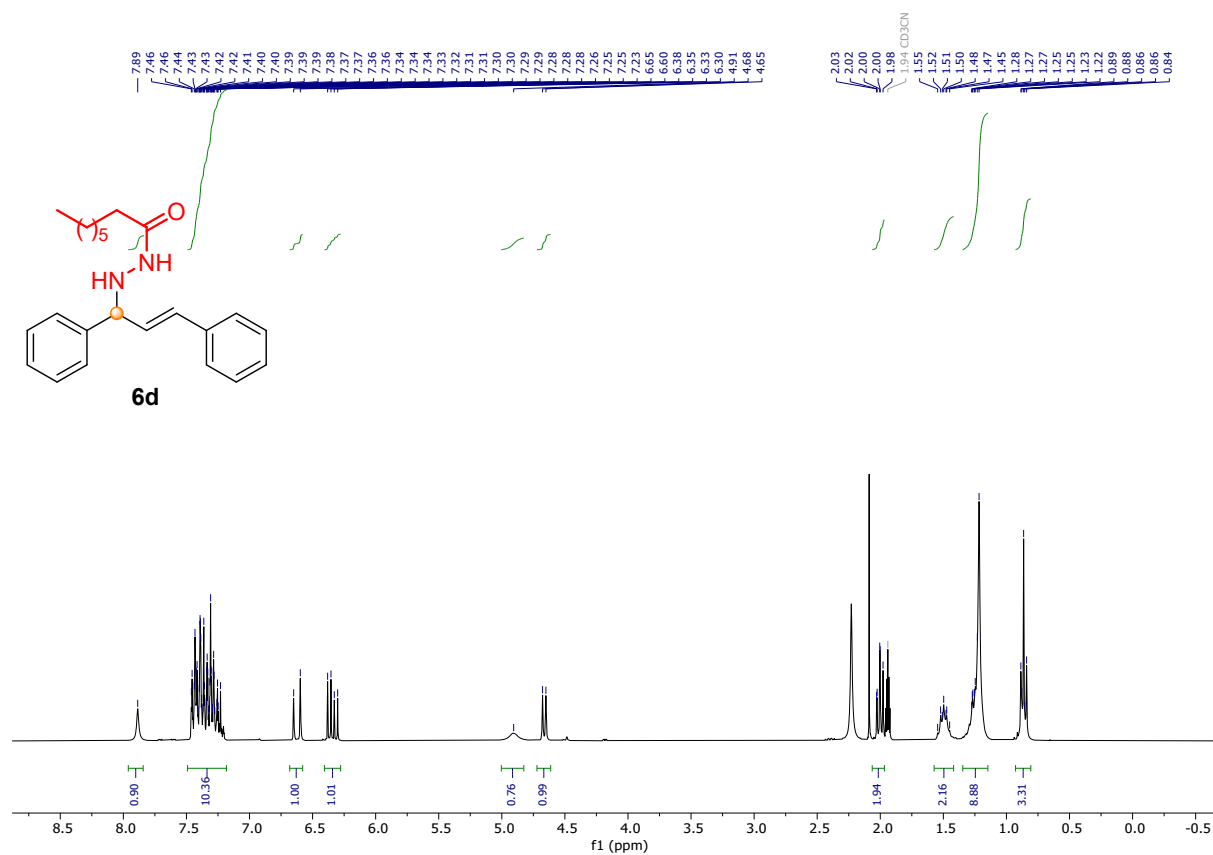


Figure S41. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-*N*'-(1,3-diphenylallyl)octanehydrazide (**6d**).

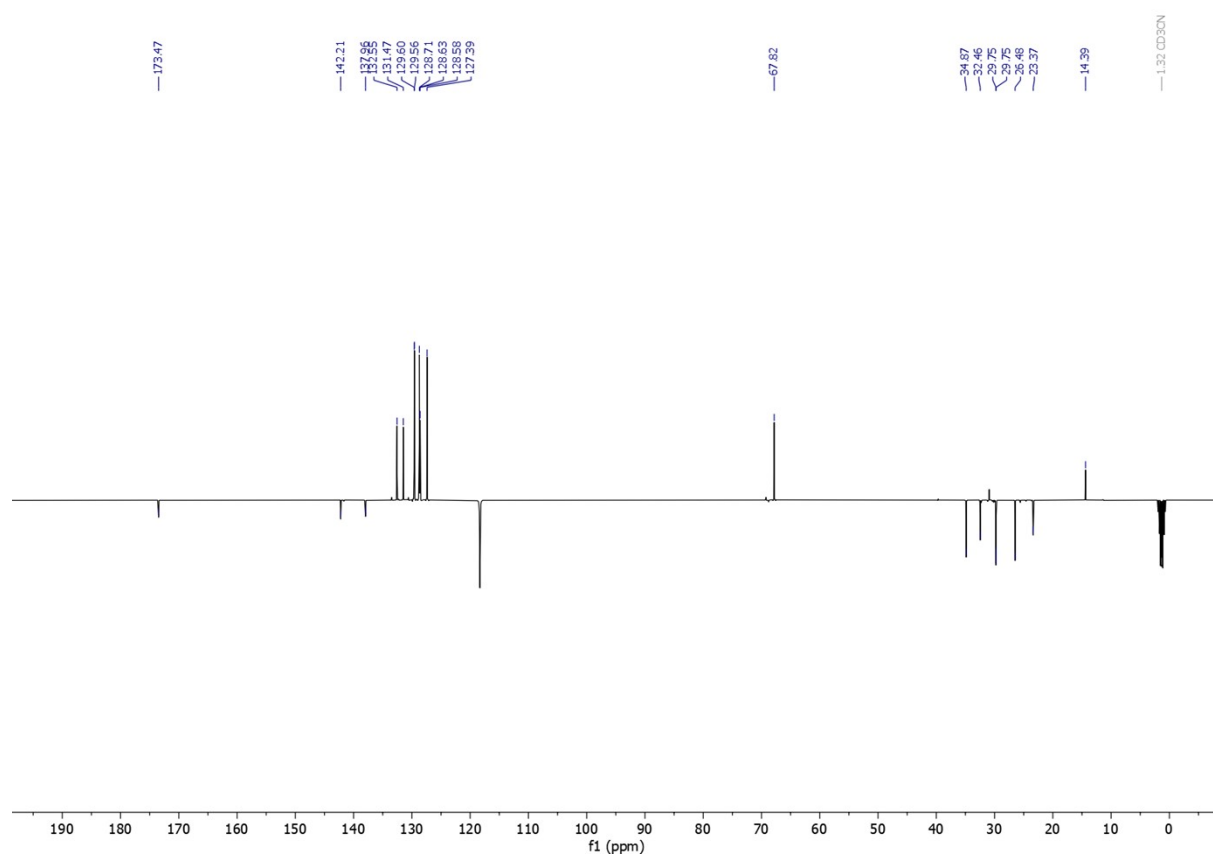


Figure S42. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-diphenylallyl)-1*H*-indole (**8a**).

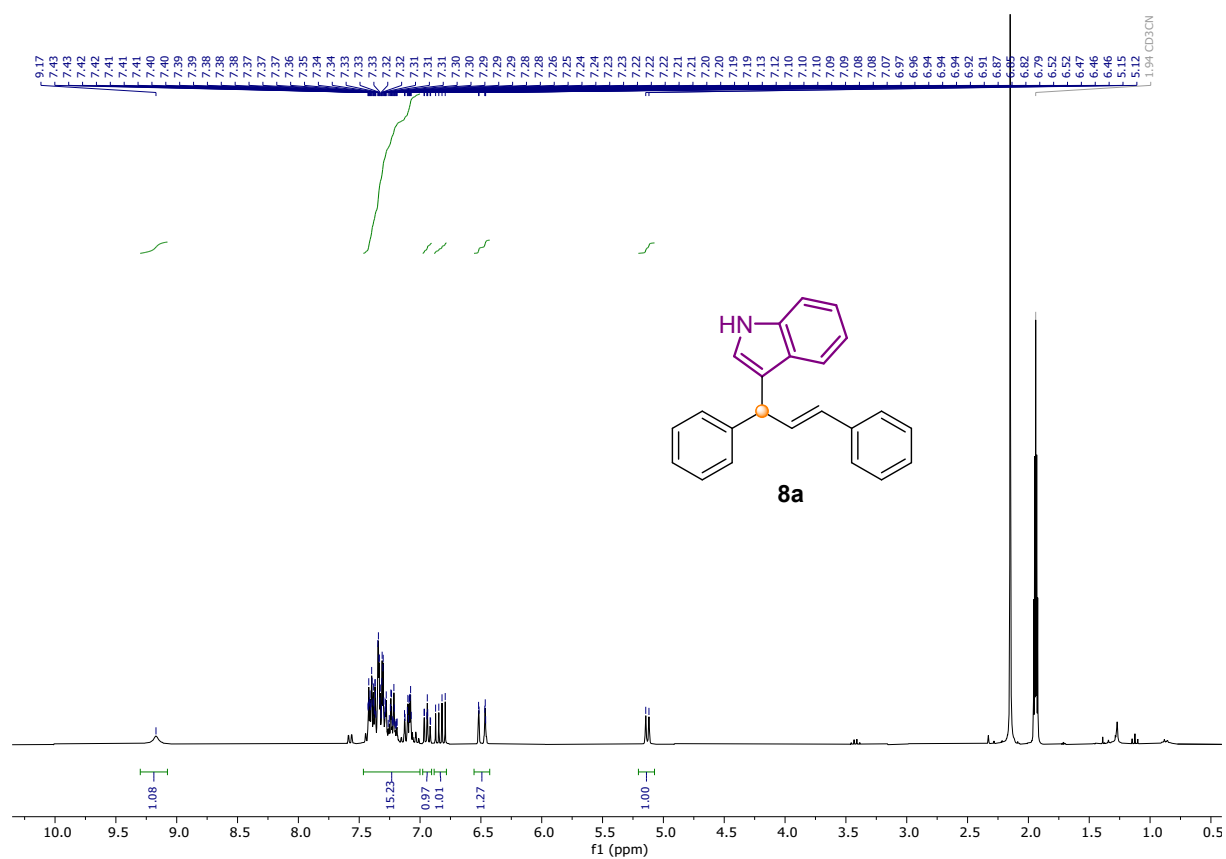


Figure S43. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-diphenylallyl)-2-methyl-1*H*-indole (**8b**).

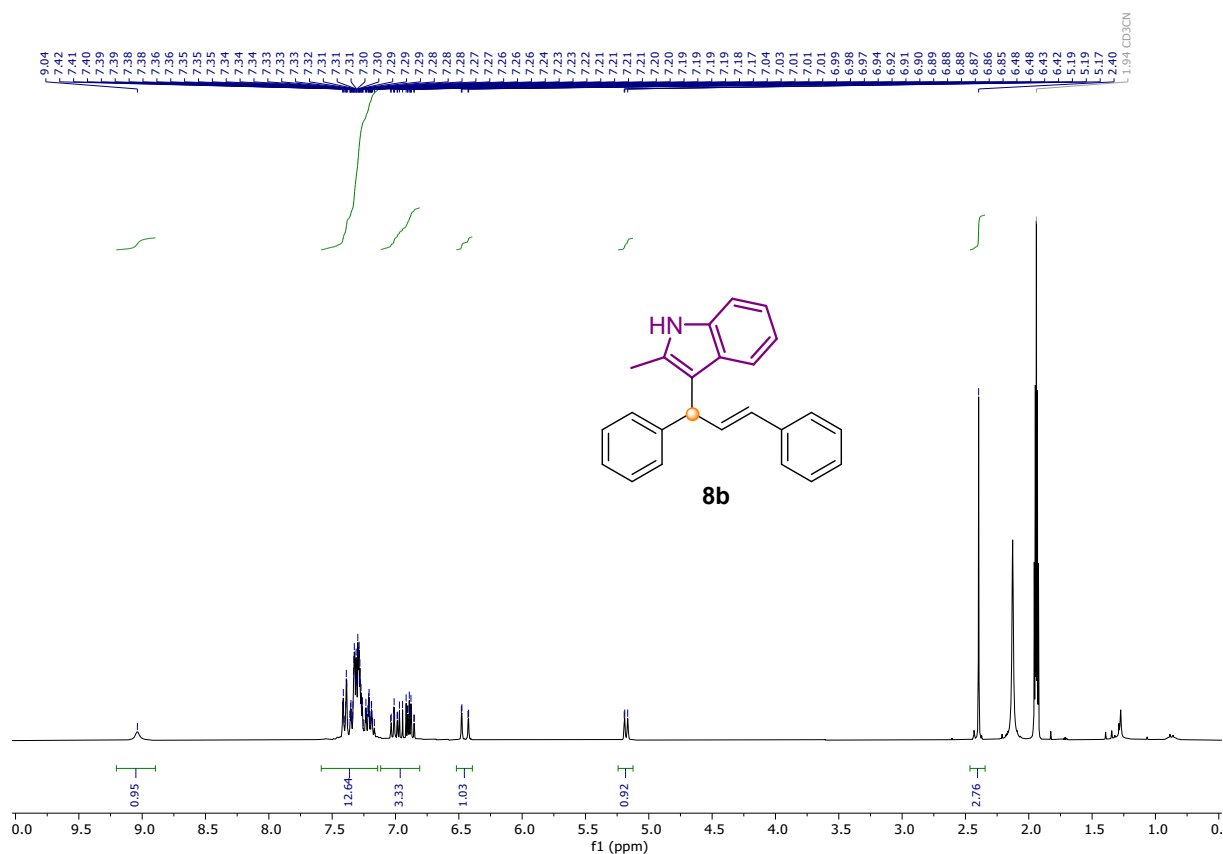


Figure S44. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-diphenylallyl)-1-methyl-1*H*-indole (**8c**).

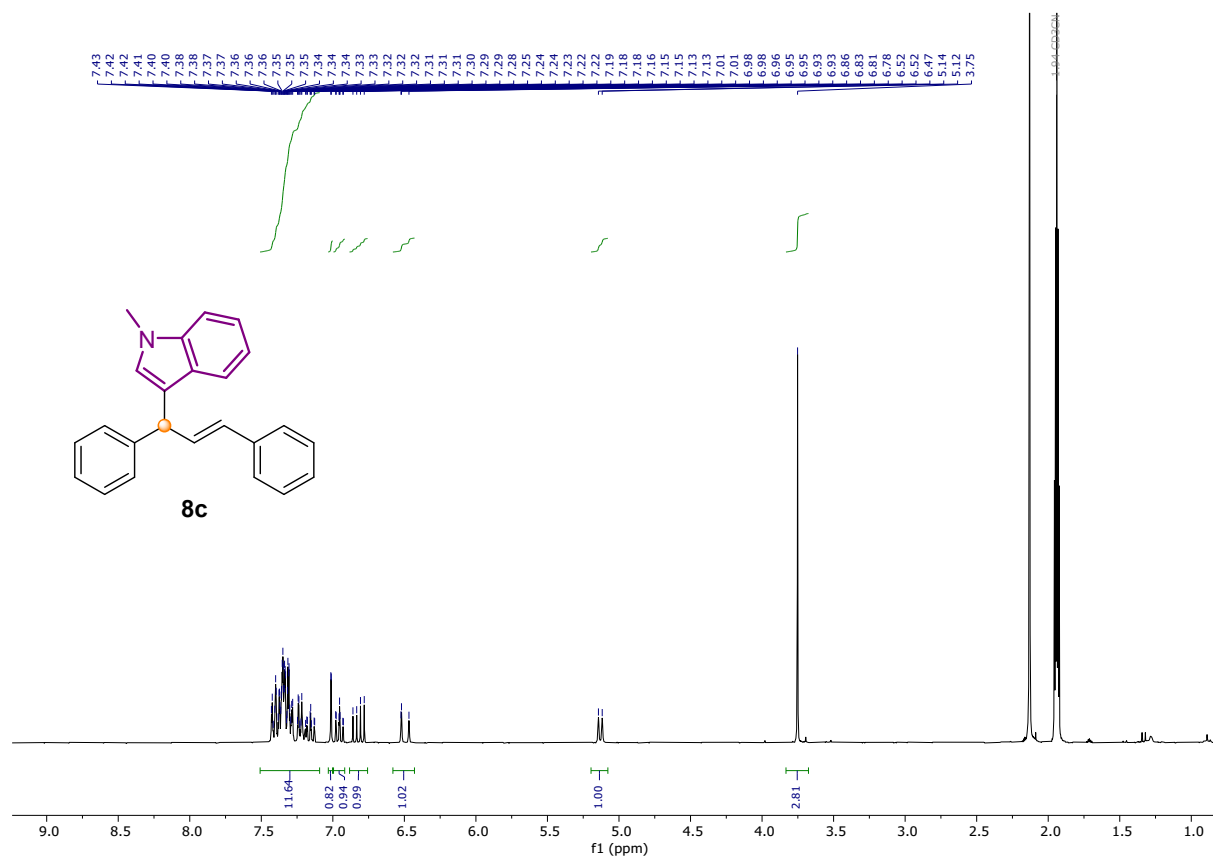


Figure S45. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-5-chloro-3-(1,3-diphenylallyl)-1*H*-indole (**8d**).

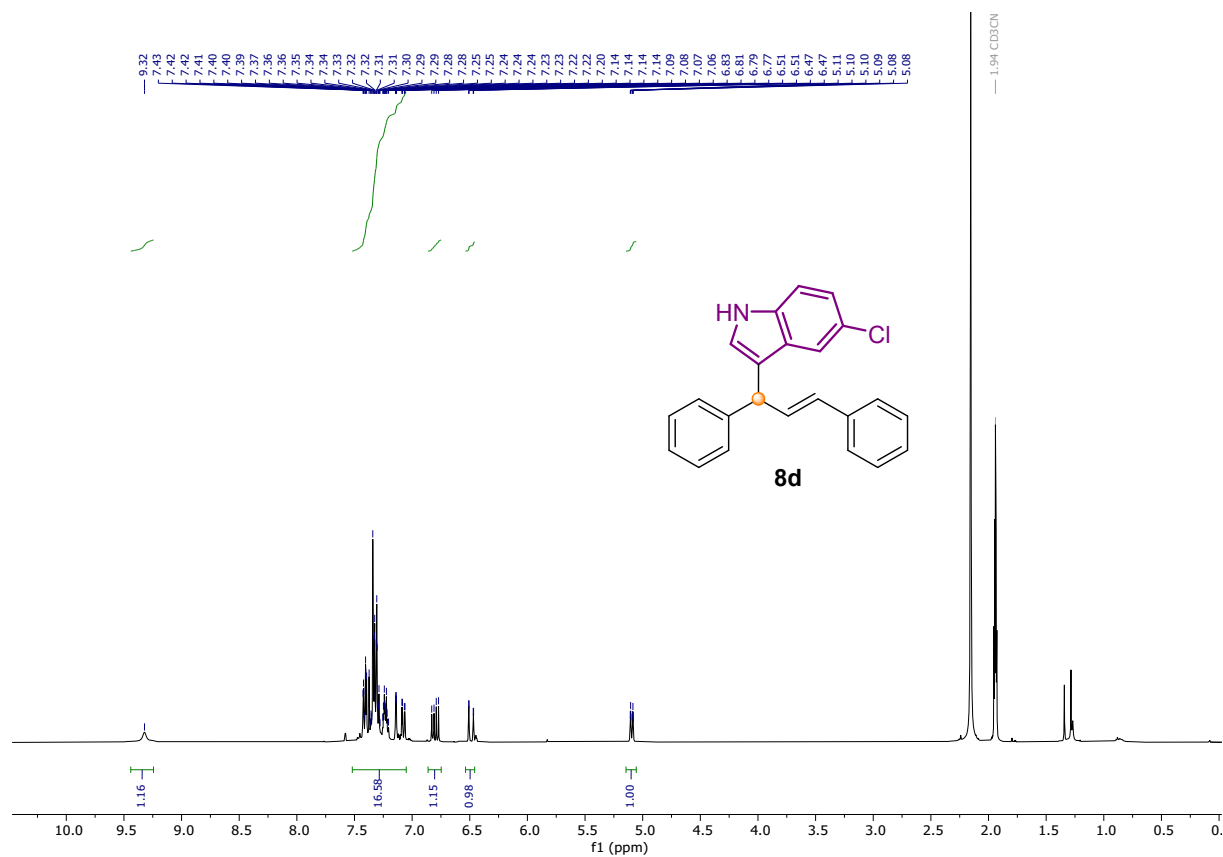


Figure S46. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-diphenylallyl)-5-fluoro-1*H*-indole (**8e**).

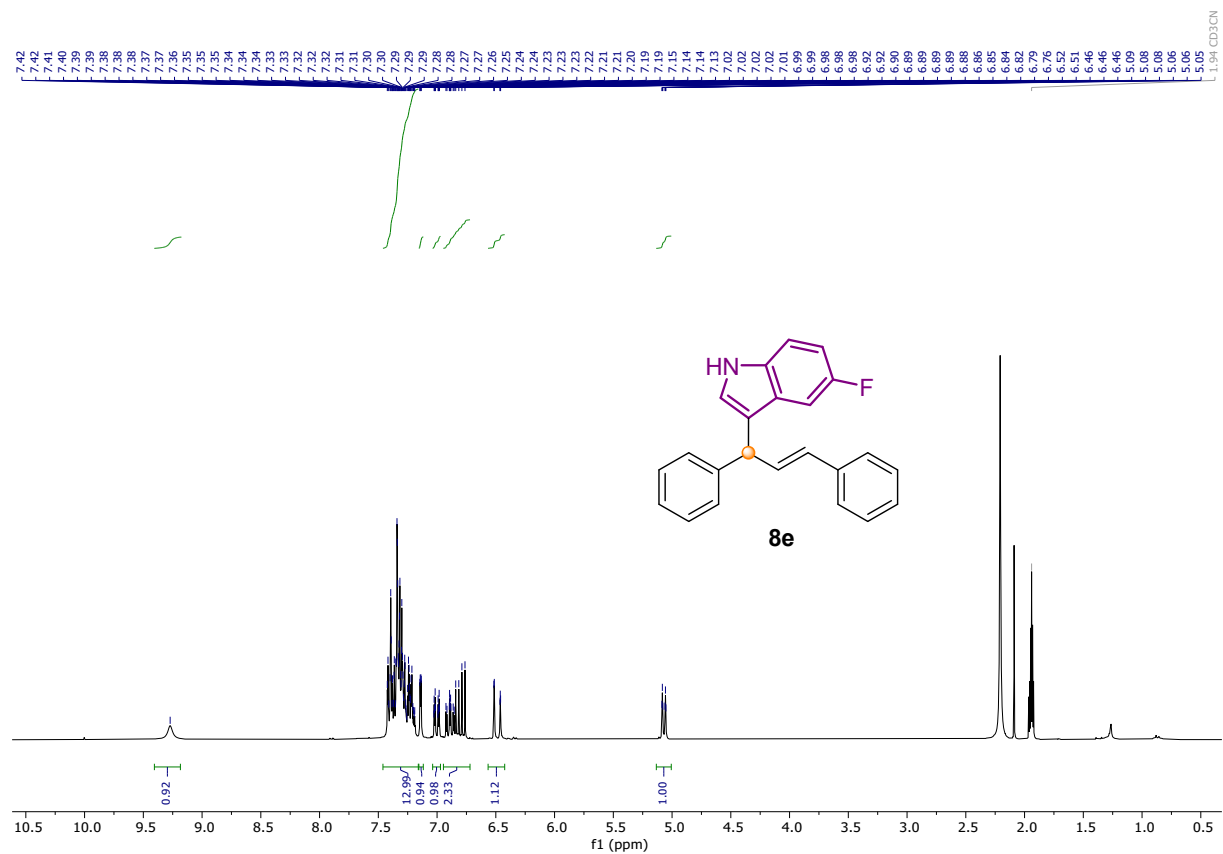


Figure S47. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-diphenylallyl)-1*H*-indole-4-carbonitrile (**8f**).

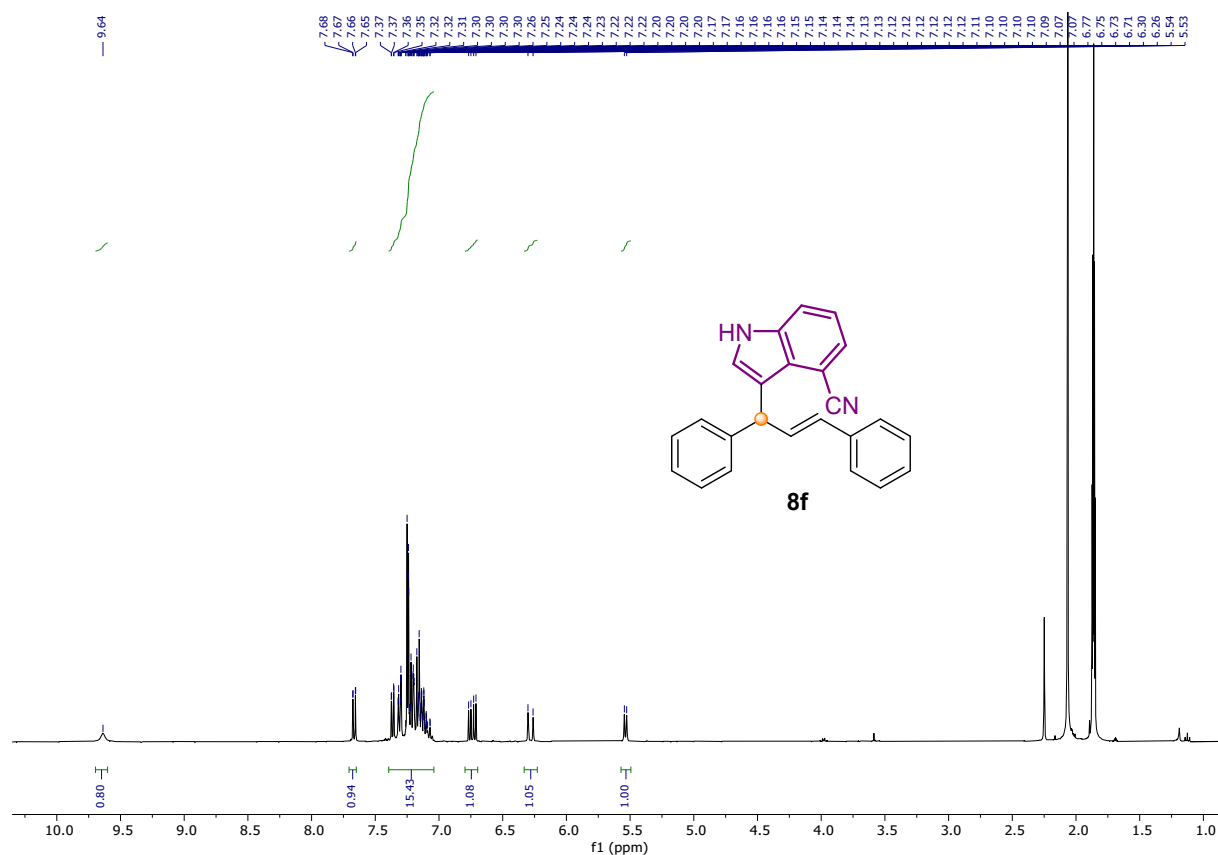


Figure S48. $^{13}\text{C}\{^1\text{H}\}$ APT NMR (75 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-diphenylallyl)-1*H*-indole-4-carbonitrile (**8f**).

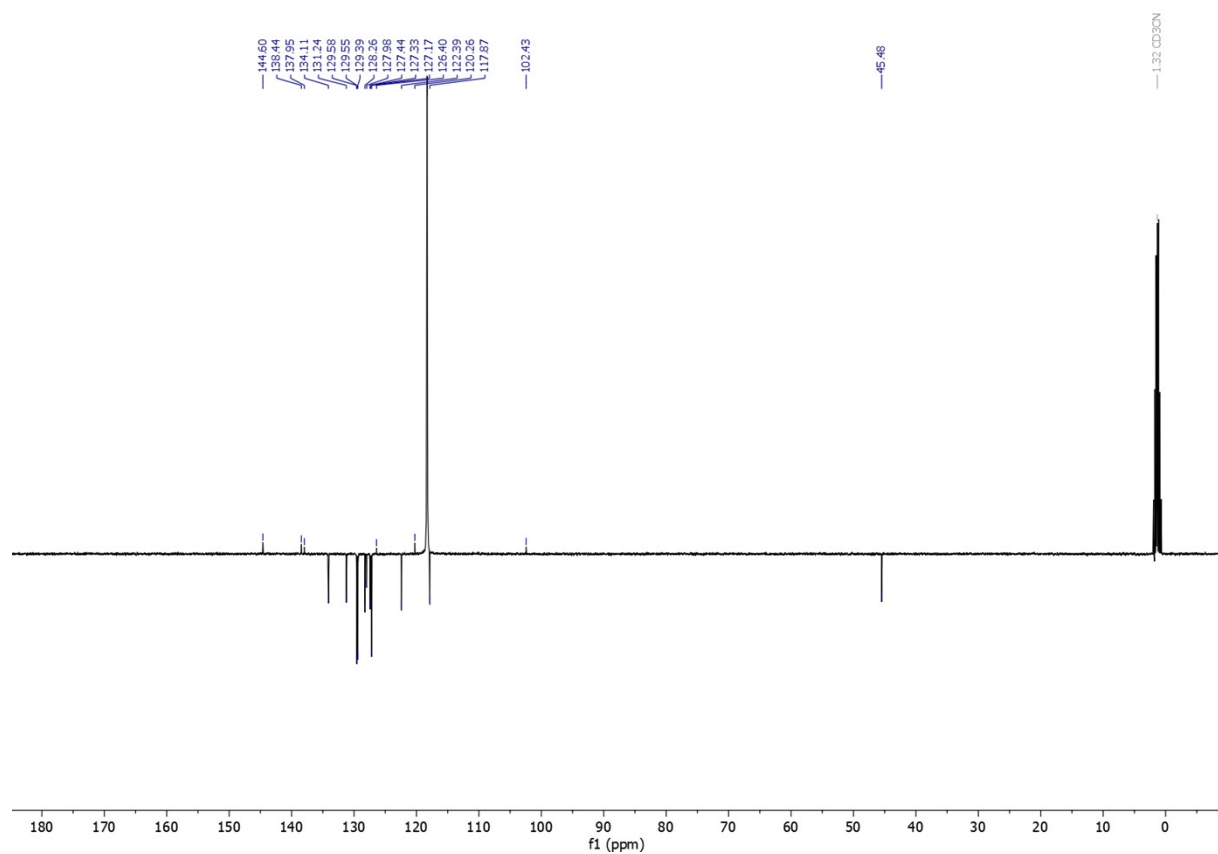


Figure S49. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-bis(4-chlorophenyl)allyl)-1*H*-indole (**8g**).

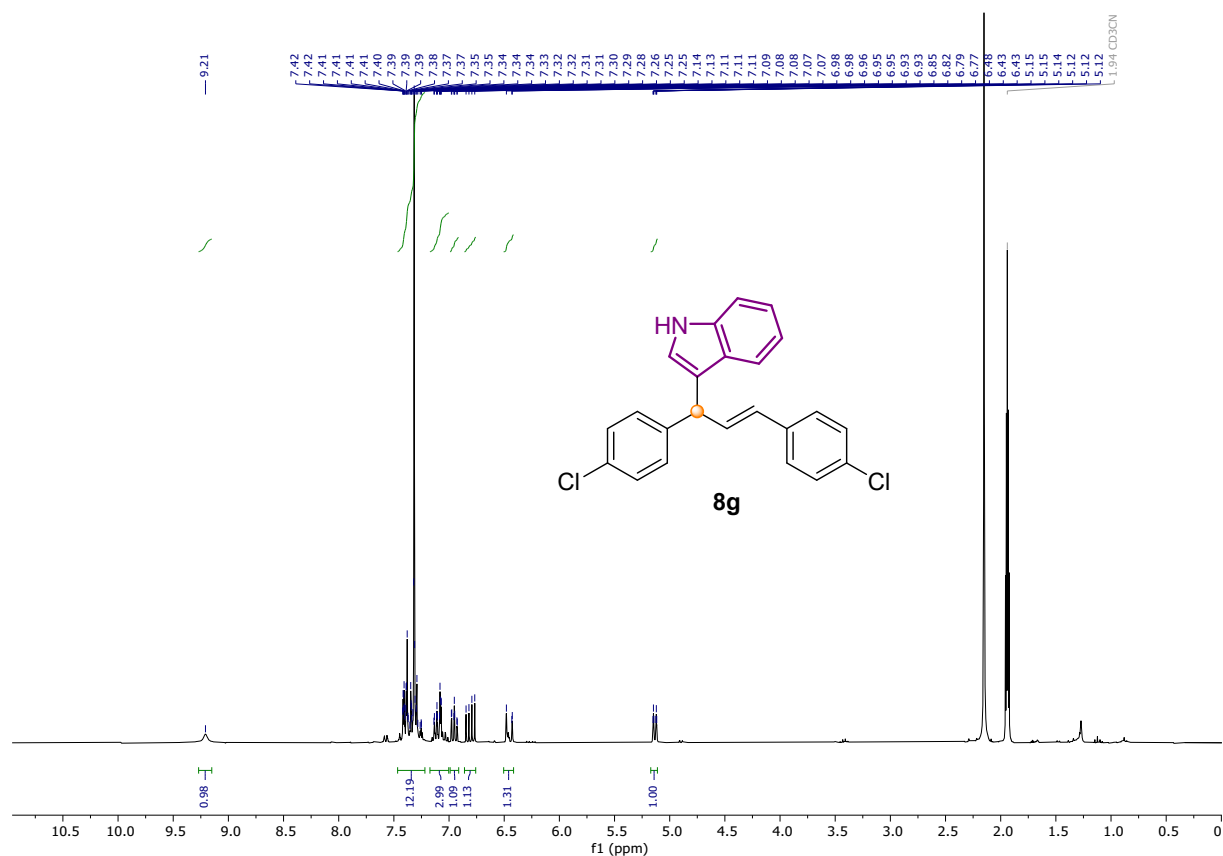


Figure S50. ^1H NMR (300 MHz, CD_3CN) spectrum of compound (*E*)-3-(1,3-bis(4-chlorophenyl)allyl)-1*H*-indole (**8h**).

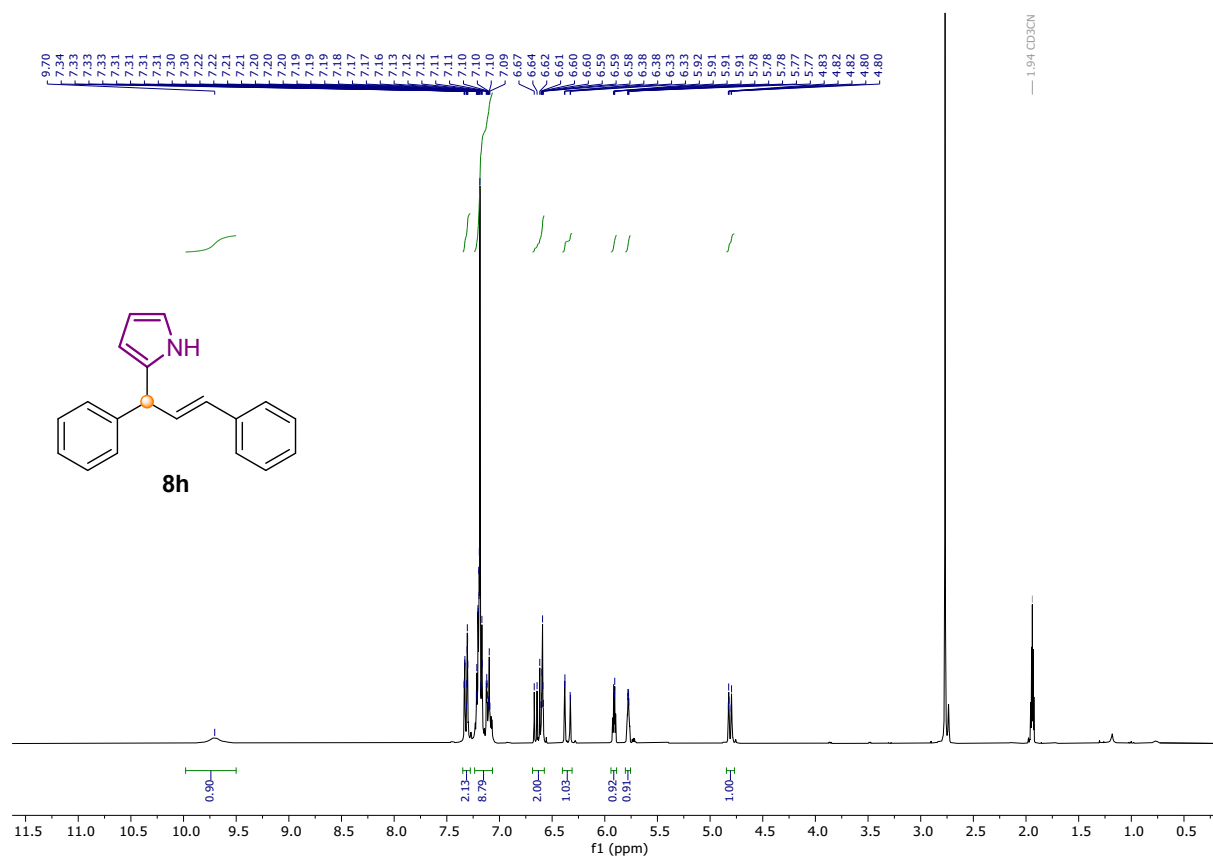


Figure S51. ^1H NMR (300 MHz, CDCl_3) spectrum of compound (*E*)-(3-(benzyloxy)prop-1-ene-1,3-diyl)dibenzene (**10a**).

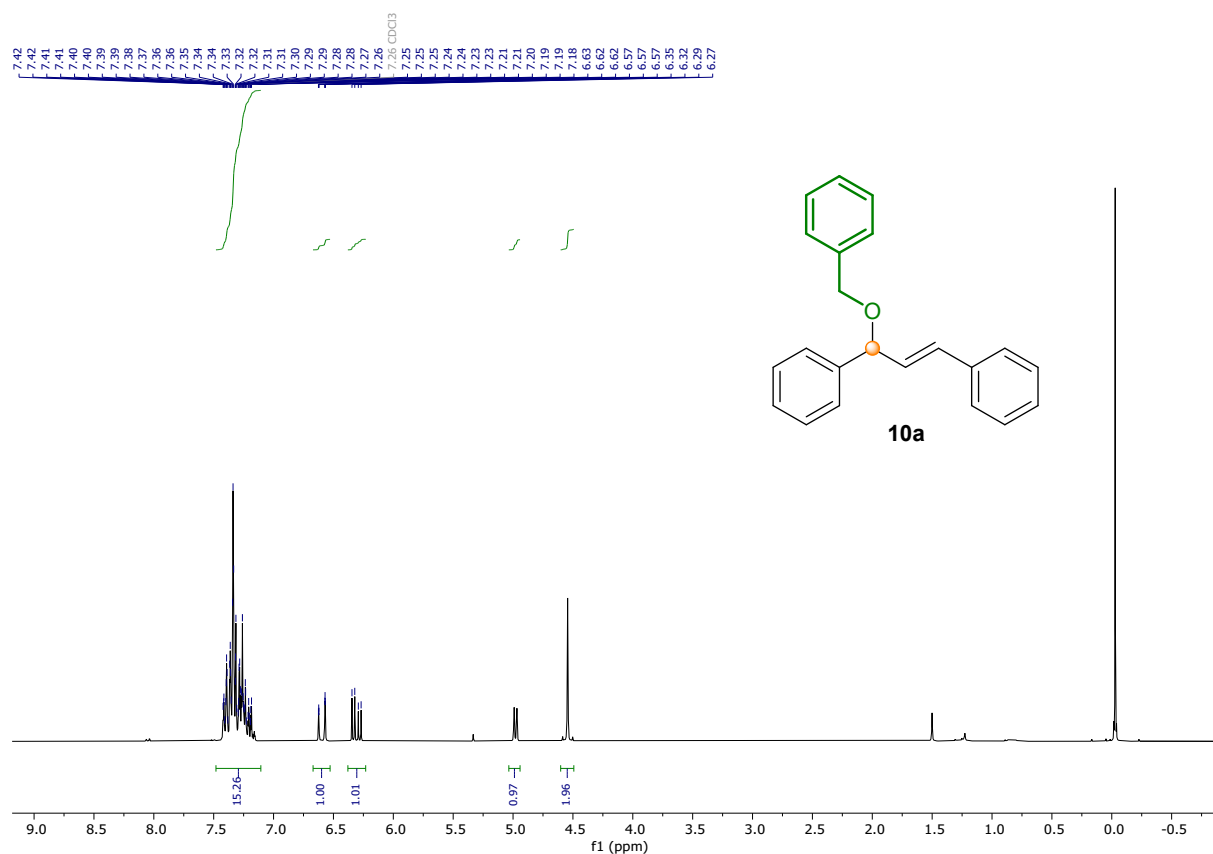


Figure S52. ^1H NMR (400 MHz, CDCl_3) spectrum of compound (*E*)-hexa-1,5-diene-1,3-diyl)dibenzene (**10b**).

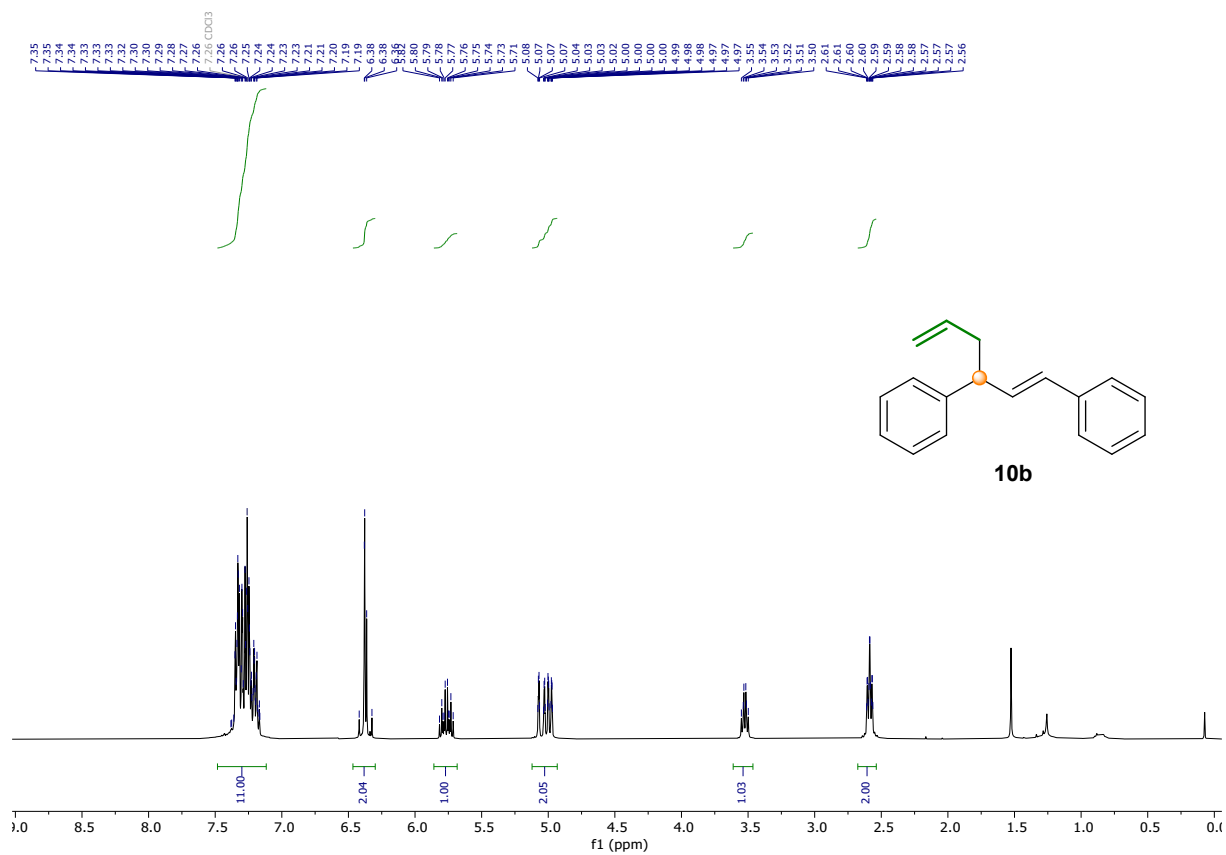


Figure S53. ^1H NMR (300 MHz, CDCl_3) spectrum of compound *tert*-butyl (*E*)-(1,3-diphenylallyl)carbamate (**10c**).

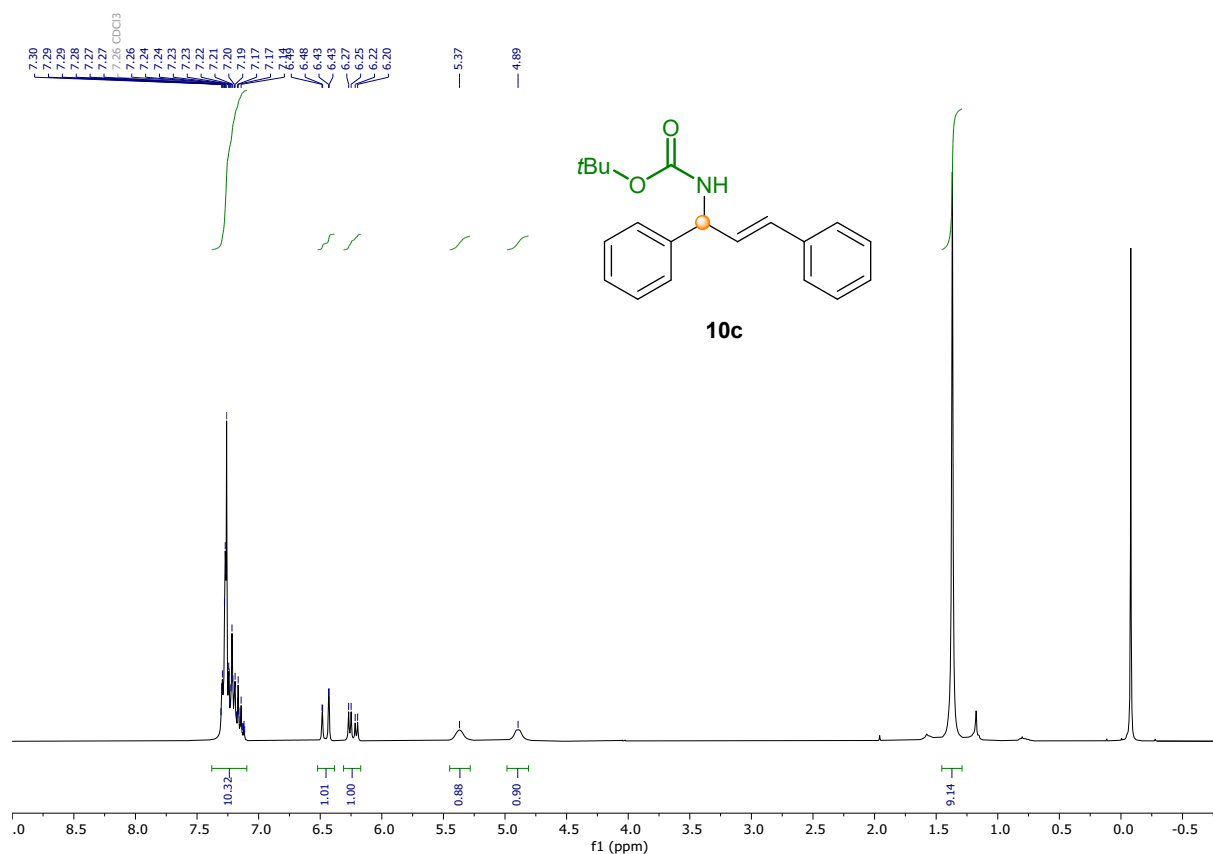


Figure S54. ^1H NMR (400 MHz, CDCl_3) spectrum of compound benzyl (*E*)-(1,3-diphenylallyl)carbamate (**10d**).

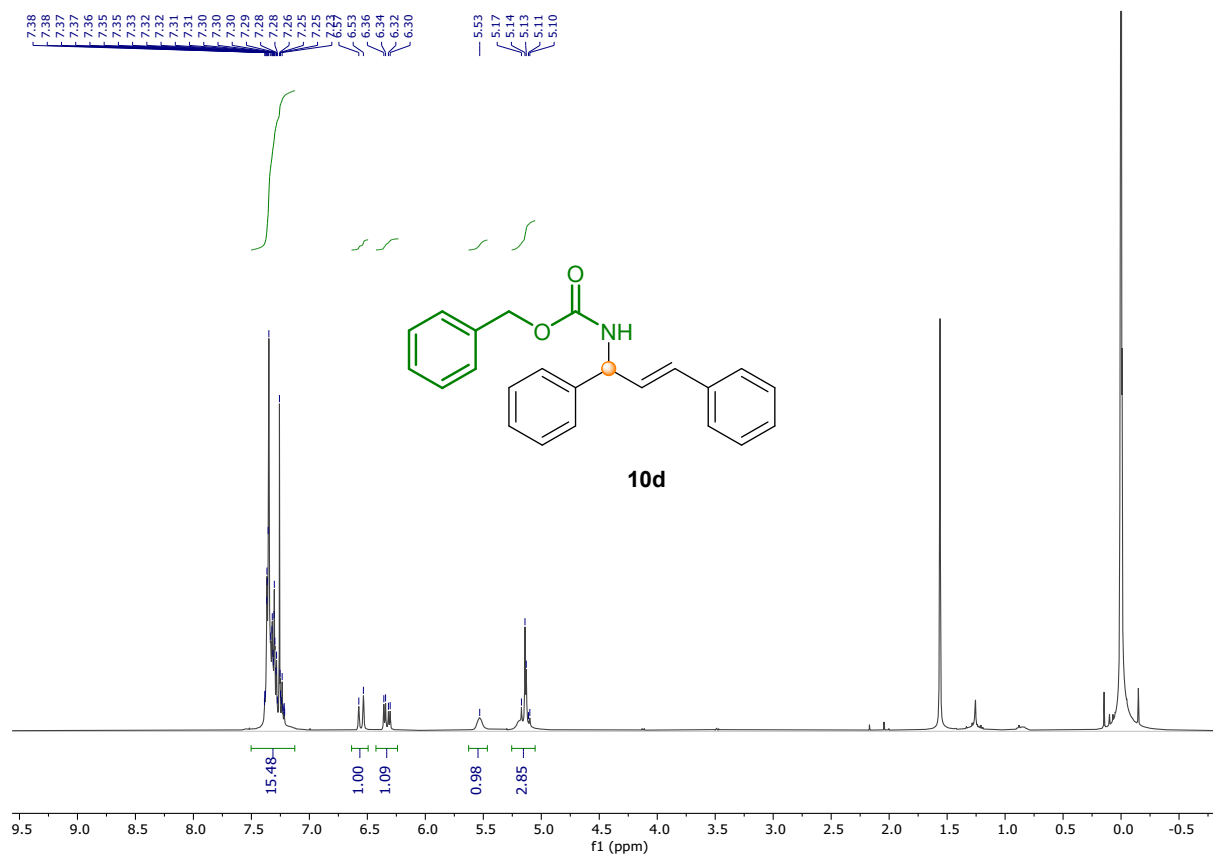


Figure S55. ^1H NMR (300 MHz, CDCl_3) spectrum of compound (*E*)-(3-azidoprop-1-ene-1,3-diyl)dibenzene (**10e**).

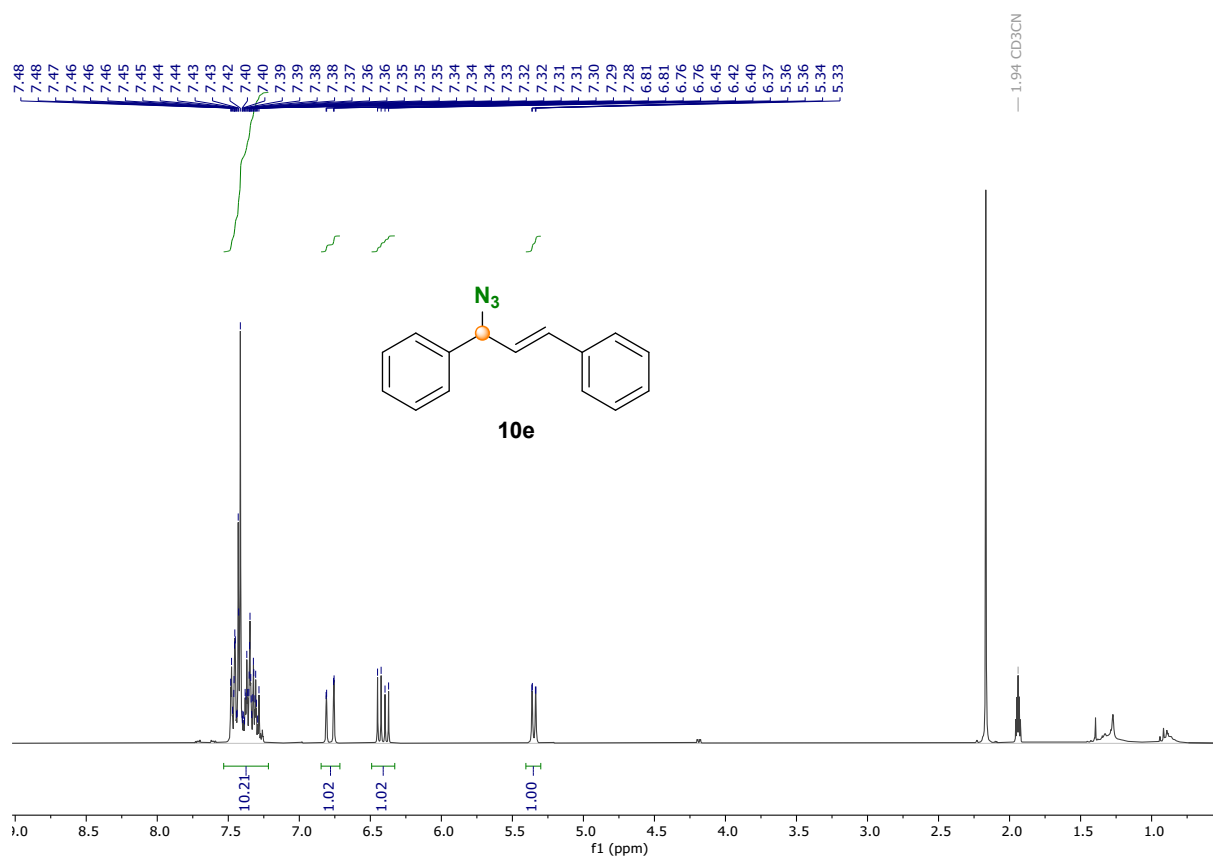


Figure S56. ^1H NMR (300 MHz, CDCl_3) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)benzamide (**10f**).

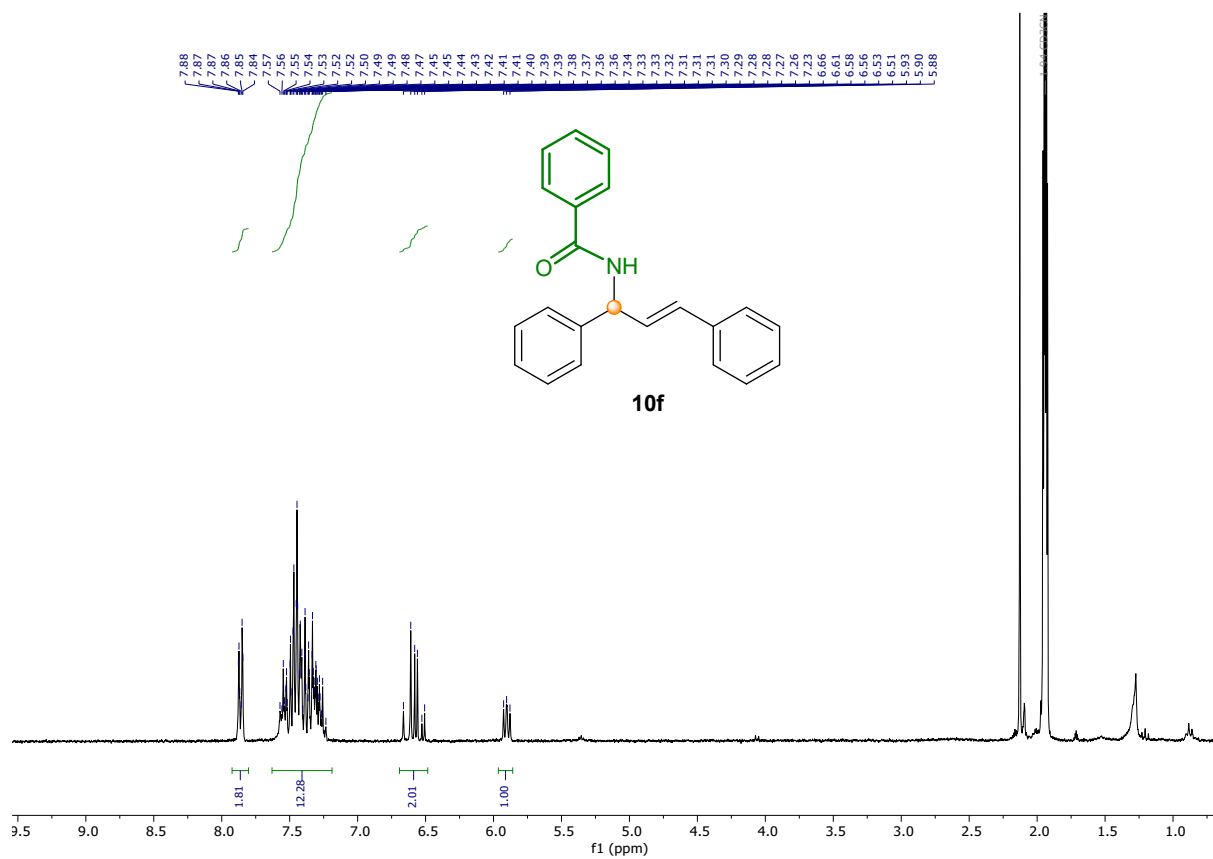


Figure S57. ^1H NMR (300 MHz, CDCl_3) spectrum of compound (*E*)-*N*-(1,3-diphenylallyl)-4-methylbenzenesulfonamide (**10g**).

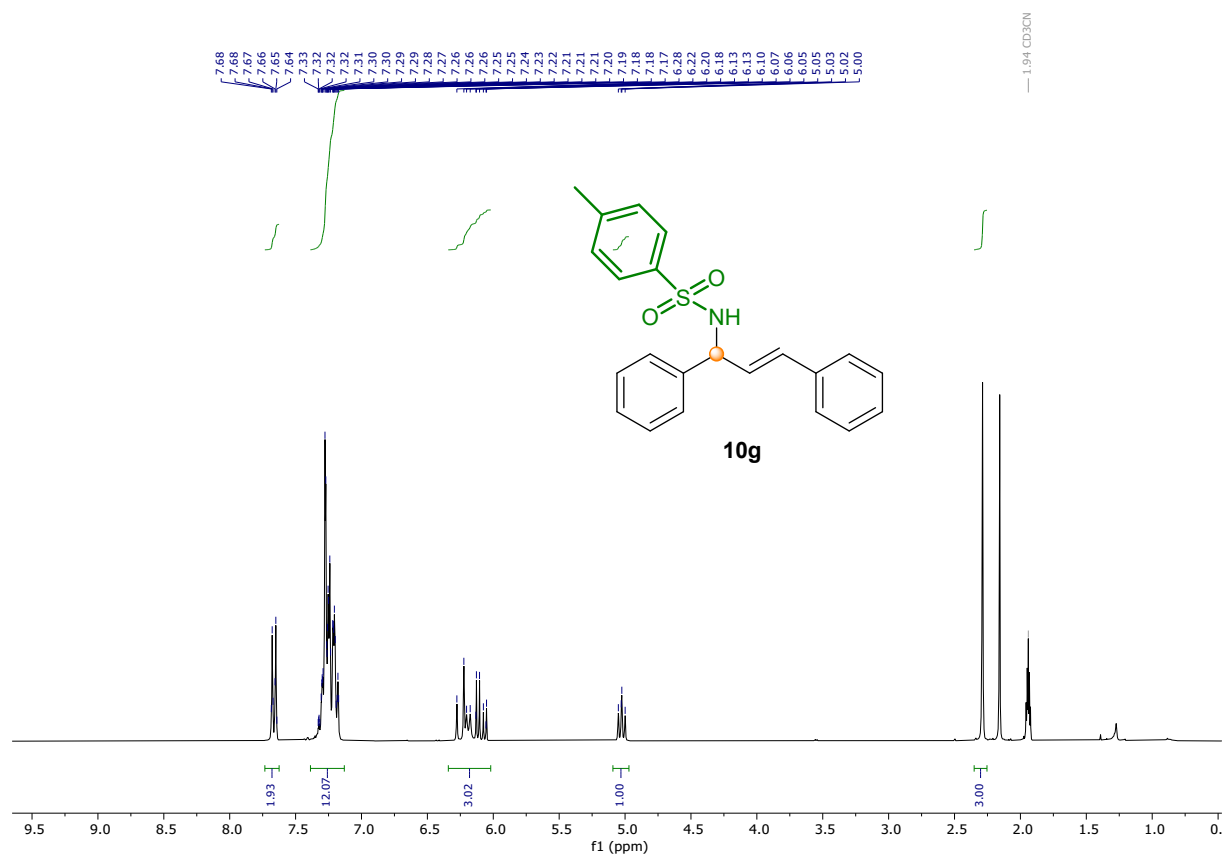
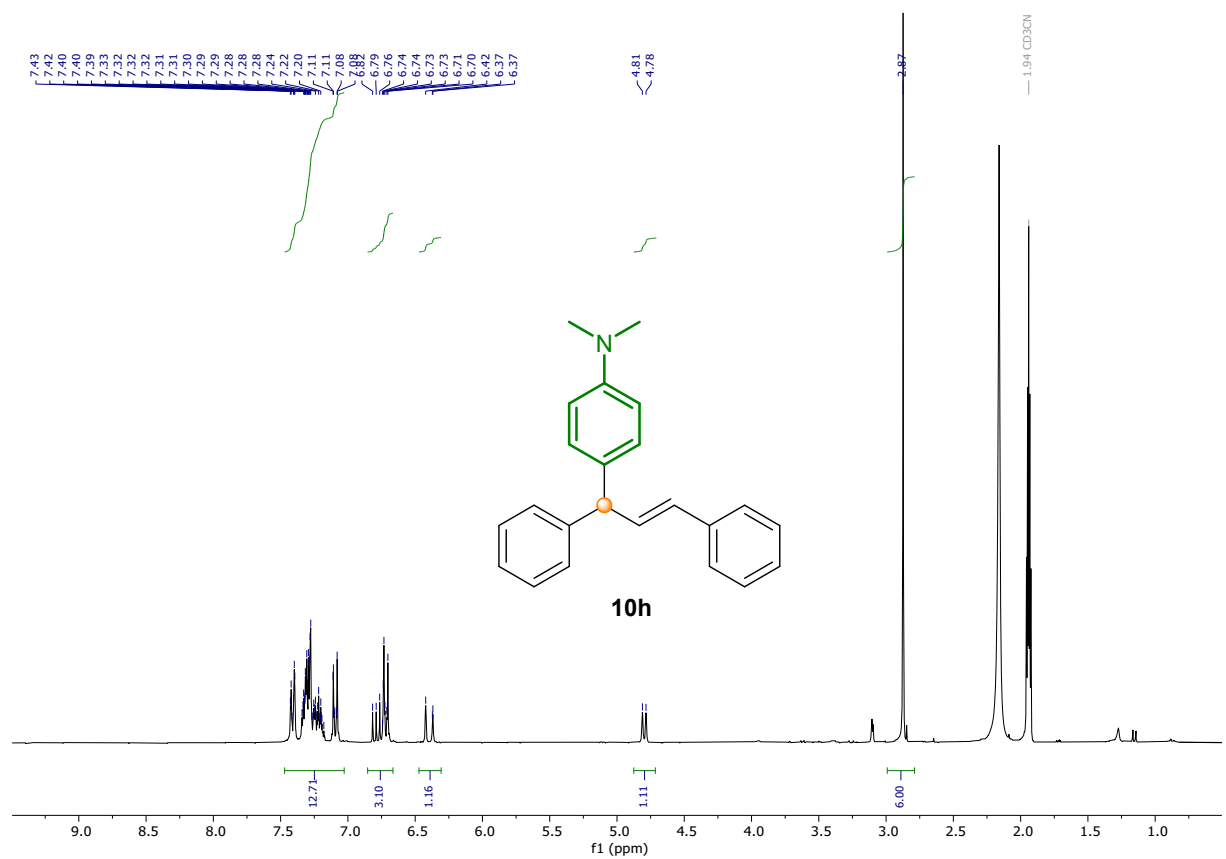


Figure S58. ^1H NMR (300 MHz, CDCl_3) spectrum of compound (*E*)-4-(1,3-diphenylallyl)-*N,N*-dimethylaniline (**10h**).



2. Mechanistic assays

Figure S59. Reaction starting from alcohol **1j**.

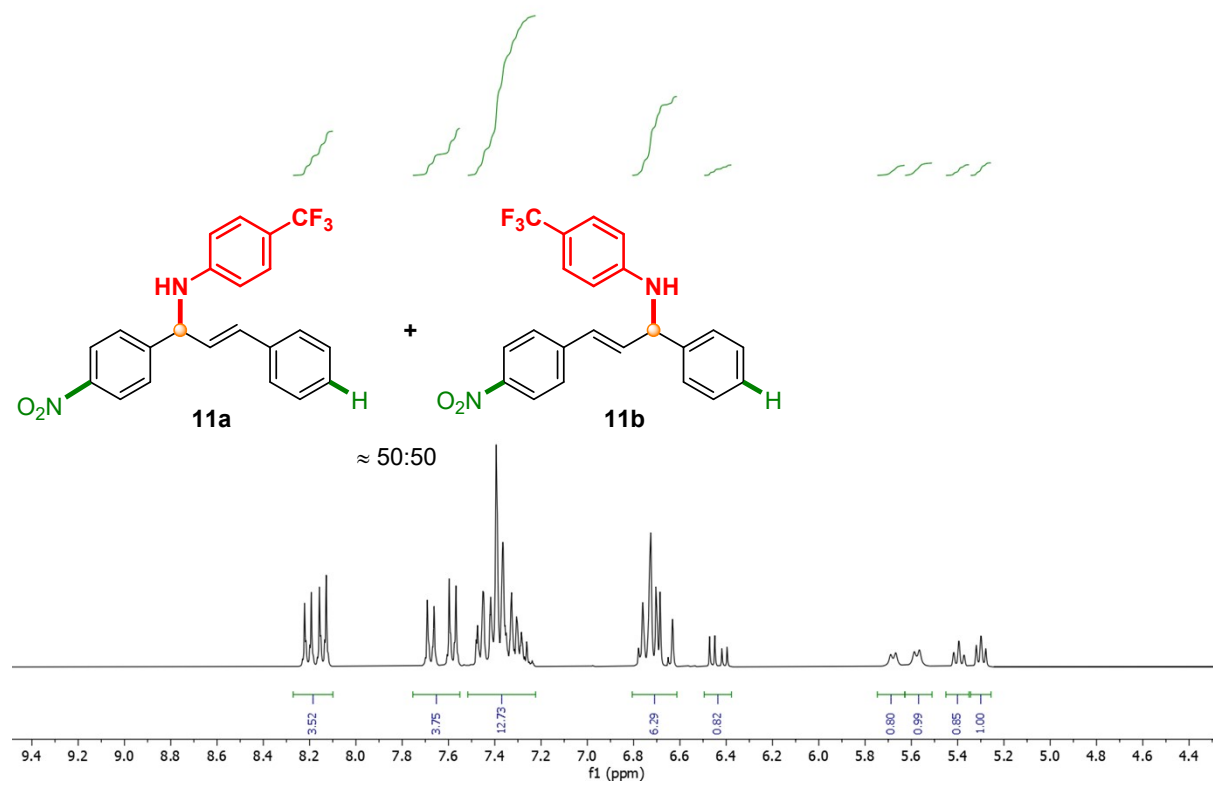


Figure S60. Reaction starting from alcohol **1k**.

