Supporting Information

$Hf(OTf)_4$ as a Highly Potent Catalyst for the Synthesis of Mannich Bases under Solvent-Free Conditions

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The NMR spectra of Mannich bases 11, 15, 16, 20–23, 25 and 27–29

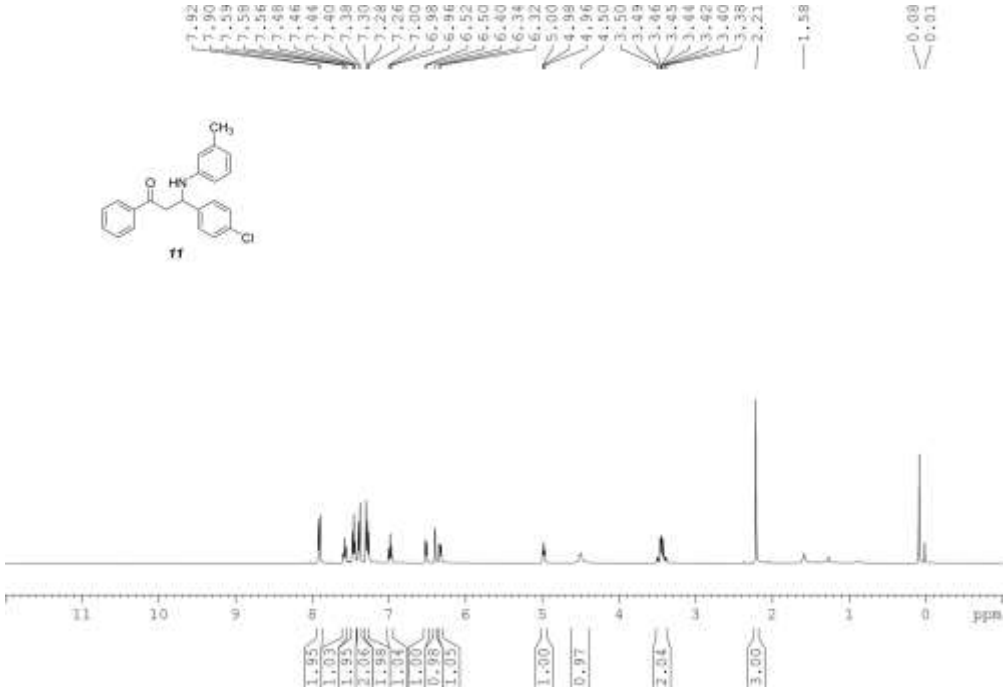

Figure S1. ^{1}H NMR of **11**

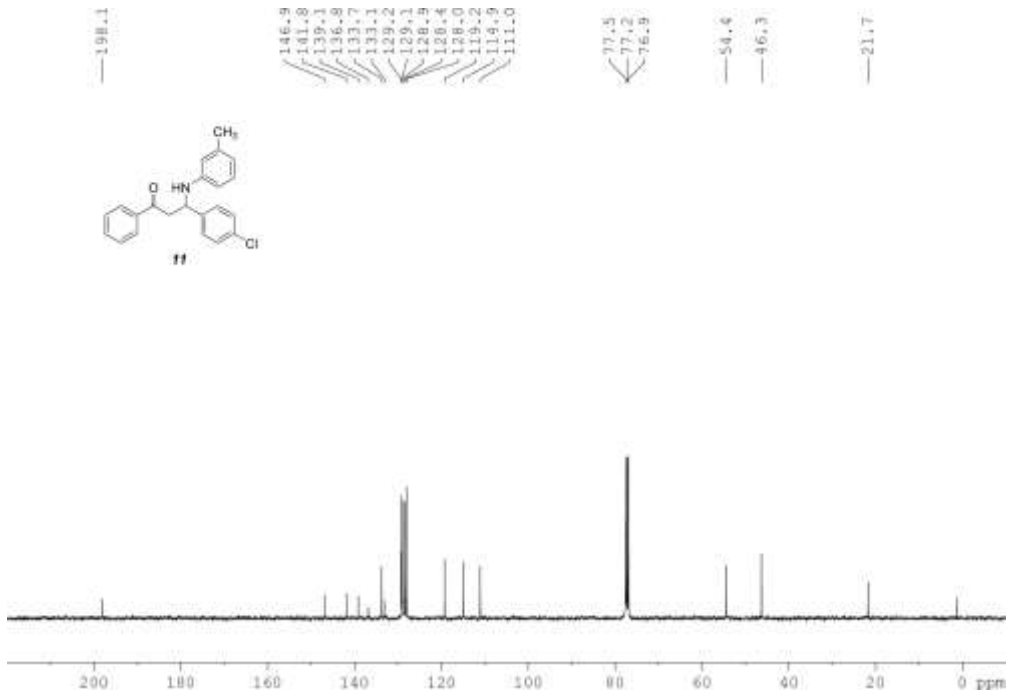

Figure S2. ^{13}C NMR of **11**

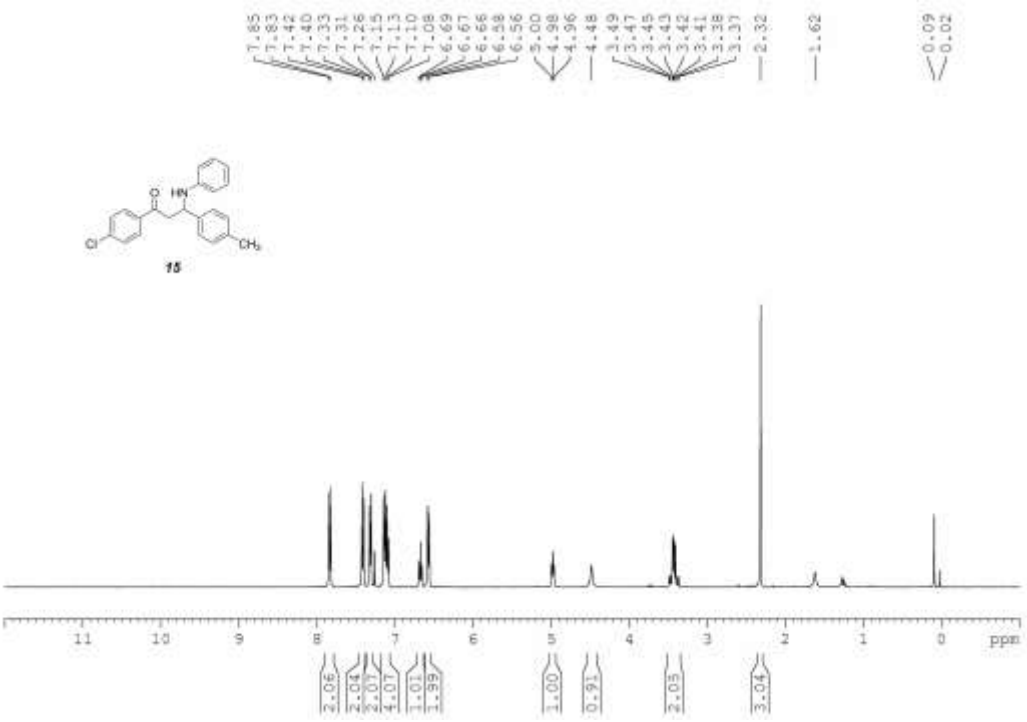

Figure S3. ^{1}H NMR of **15**

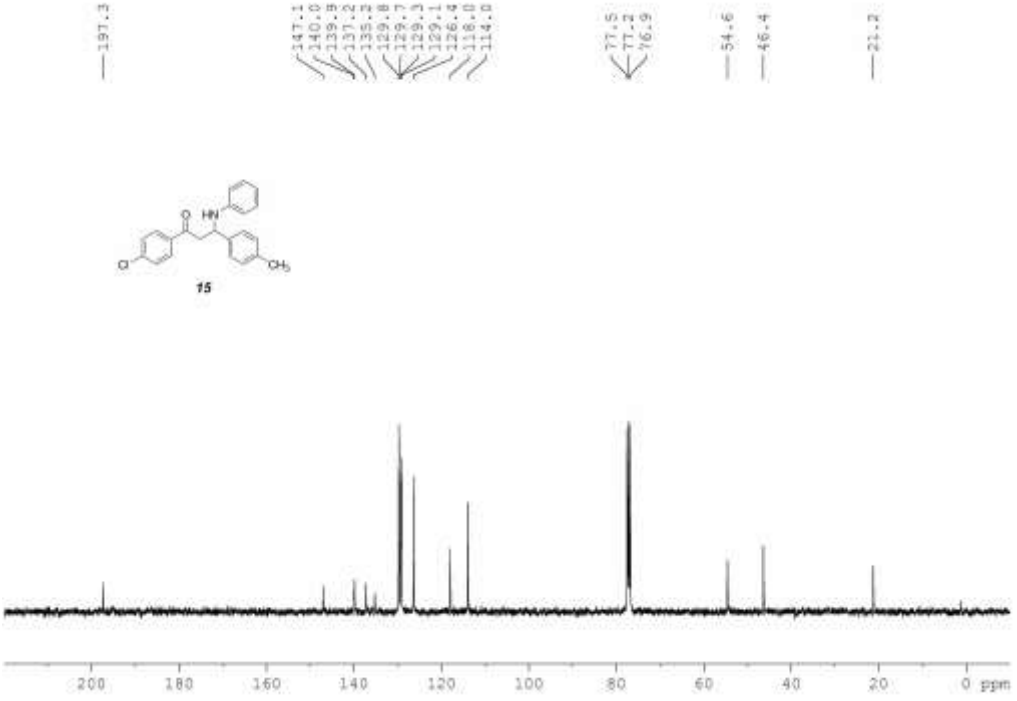

Figure S4. ^{13}C NMR of **15**

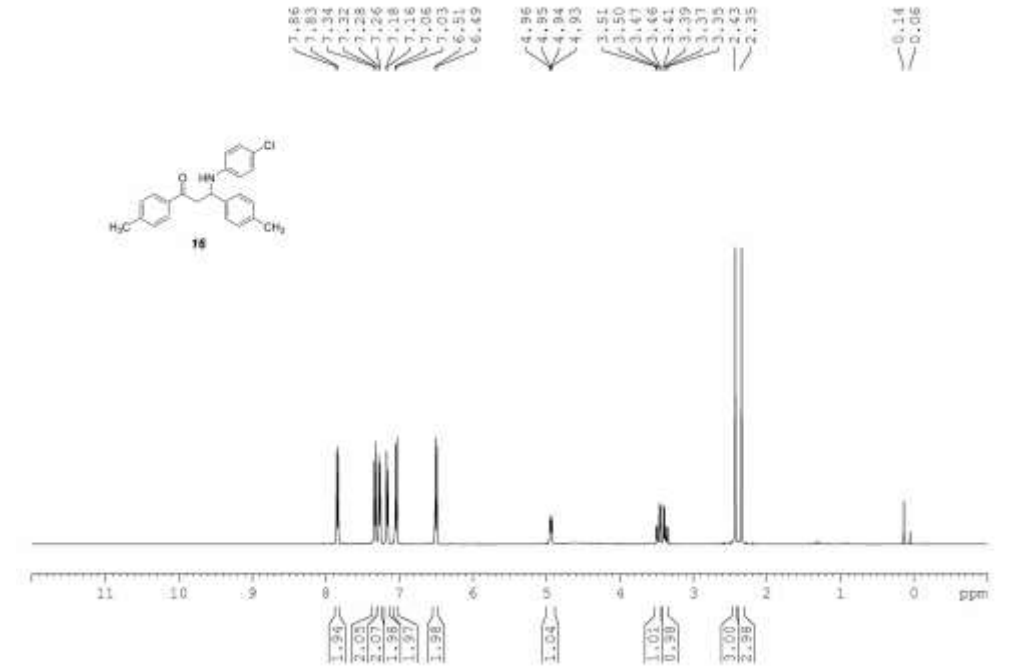

Figure S5. ^{1}H NMR of **16**

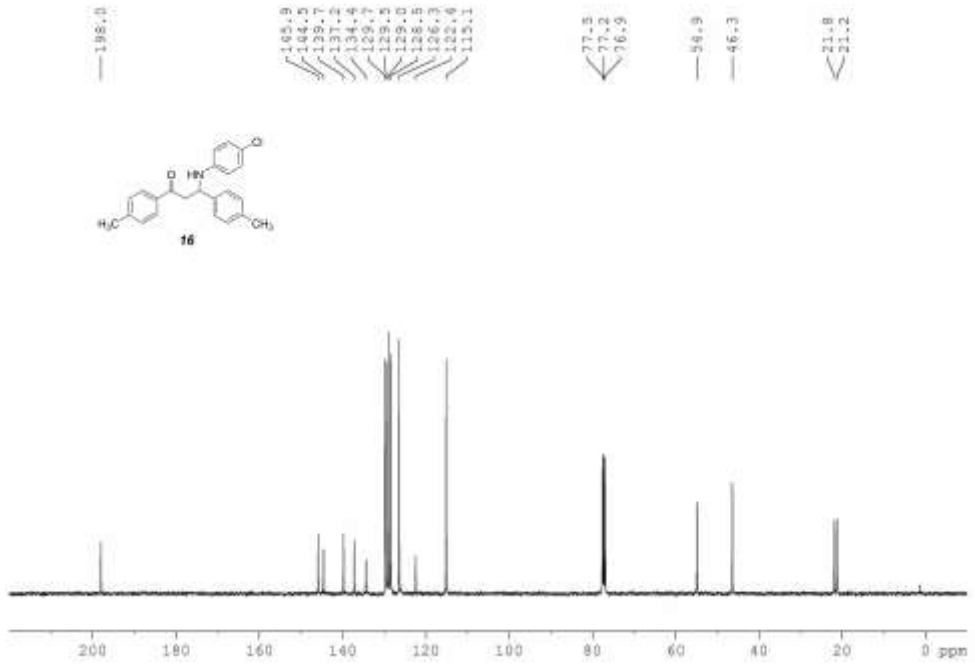

Figure S6. ^{13}C NMR of **16**

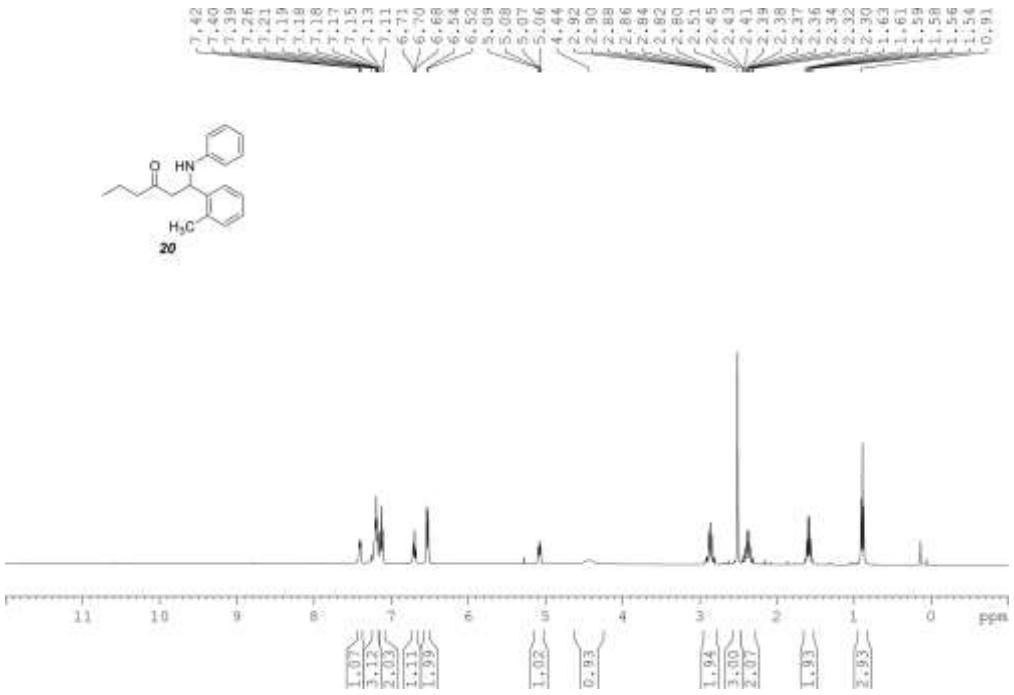

Figure S7. ^{1}H NMR of **20**

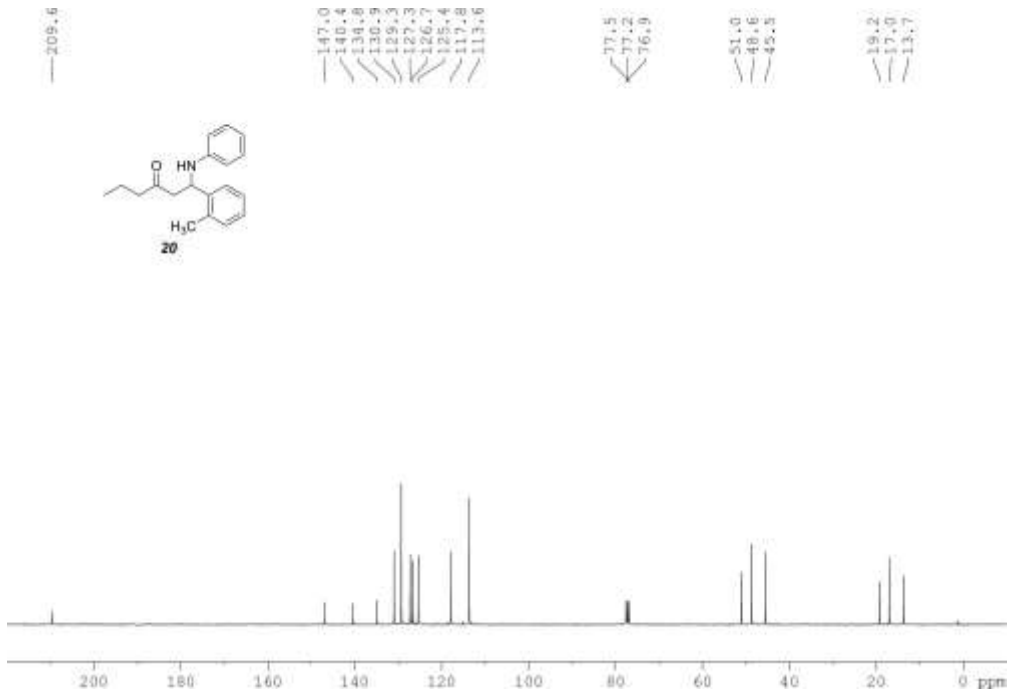

Figure S8. ^{13}C NMR of **20**

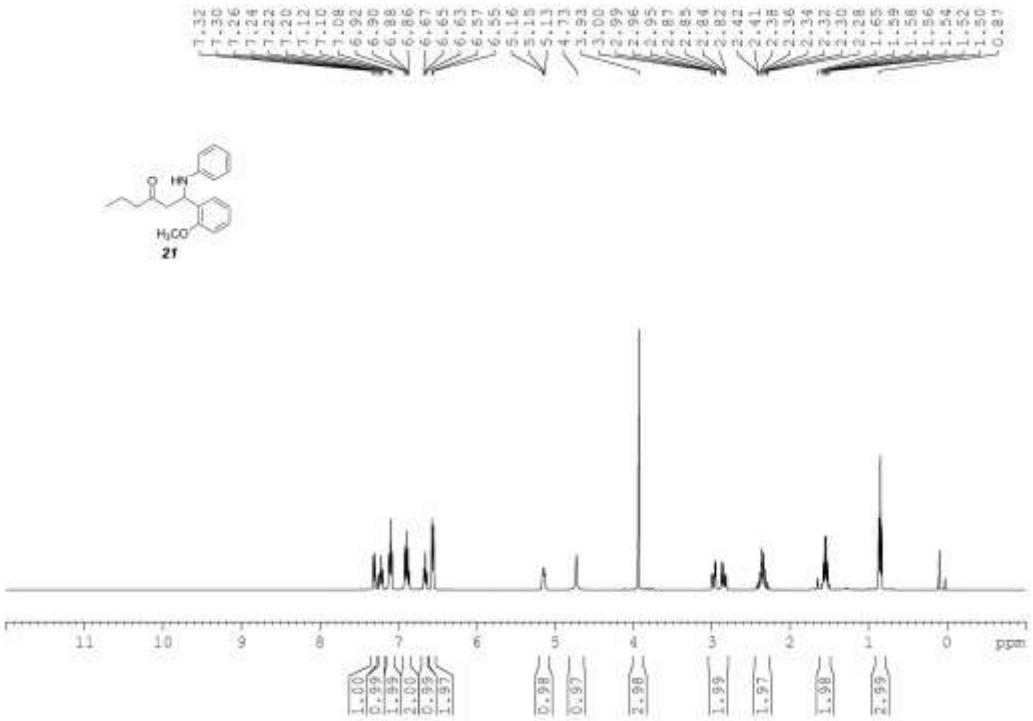

Figure S9. ^{1}H NMR of **21**

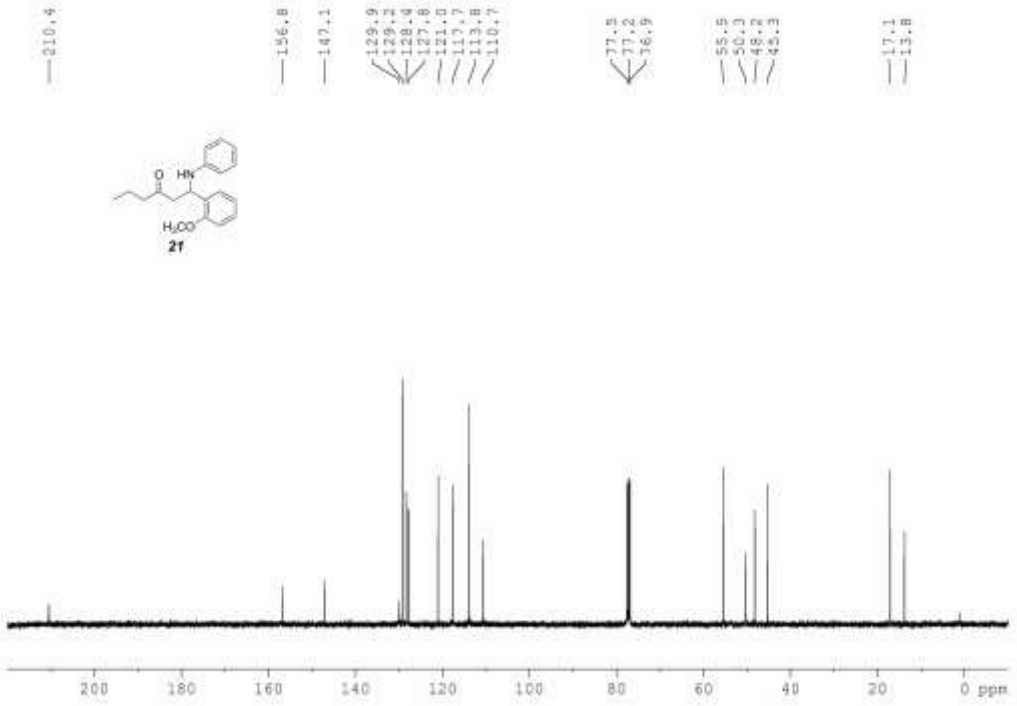

Figure S10. ^{13}C NMR of **21**

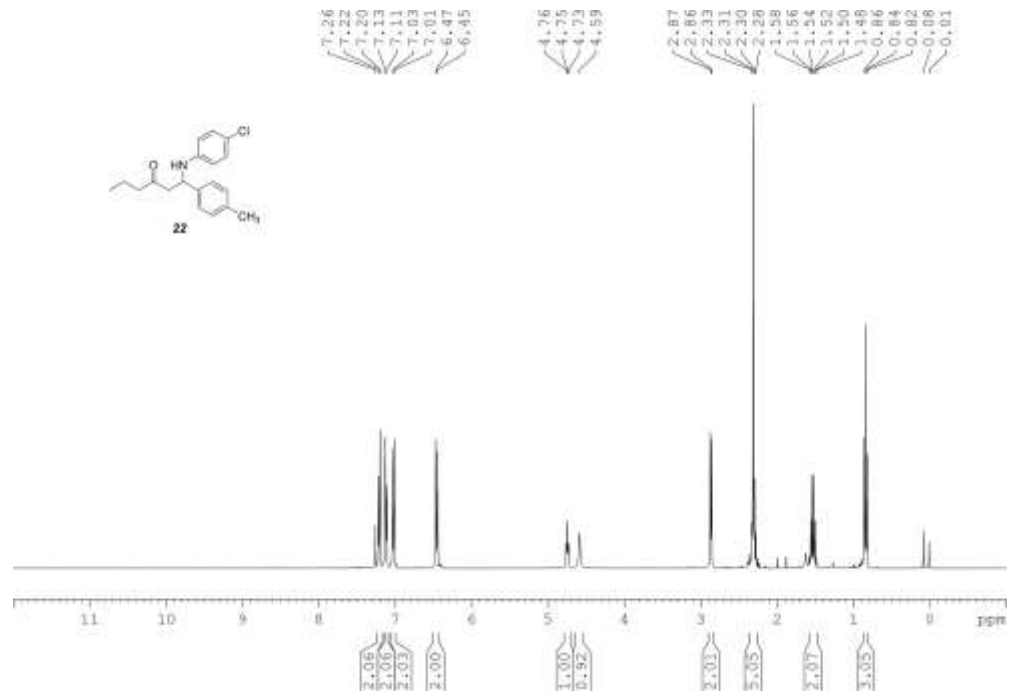

Figure S11. ^{1}H NMR of **22**

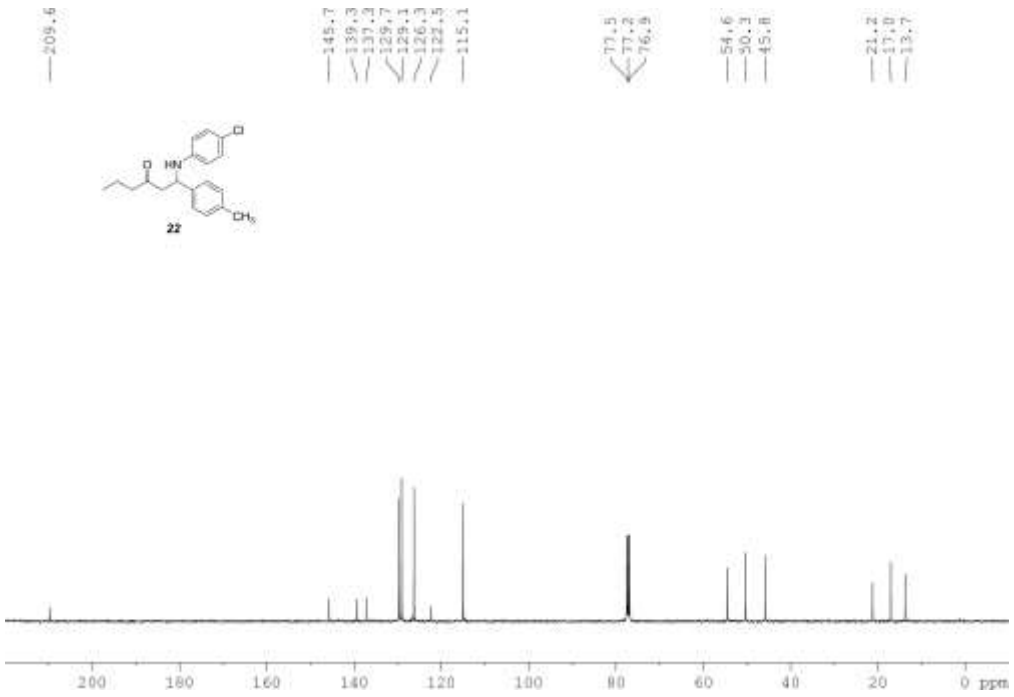

Figure S12. ^{13}C NMR of **22**

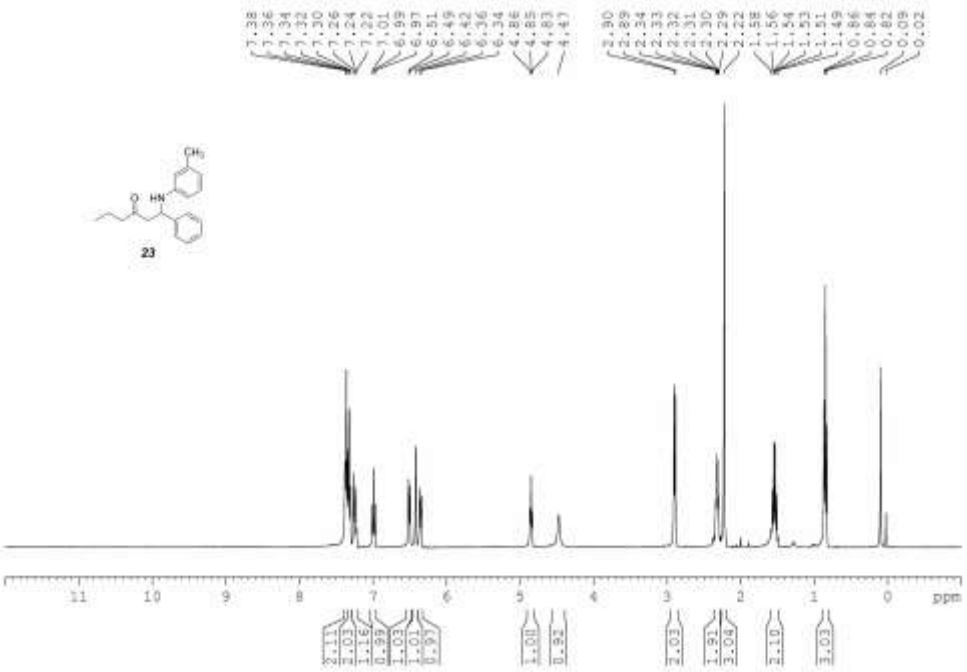

Figure S13. ^{1}H NMR of **23**

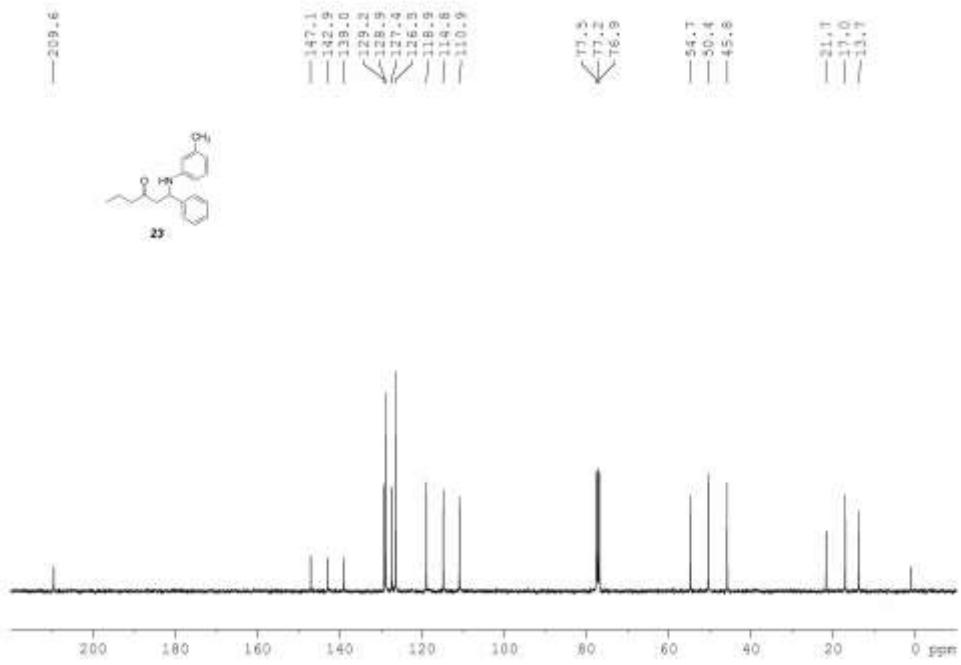

Figure S14. ^{13}C NMR of **23**

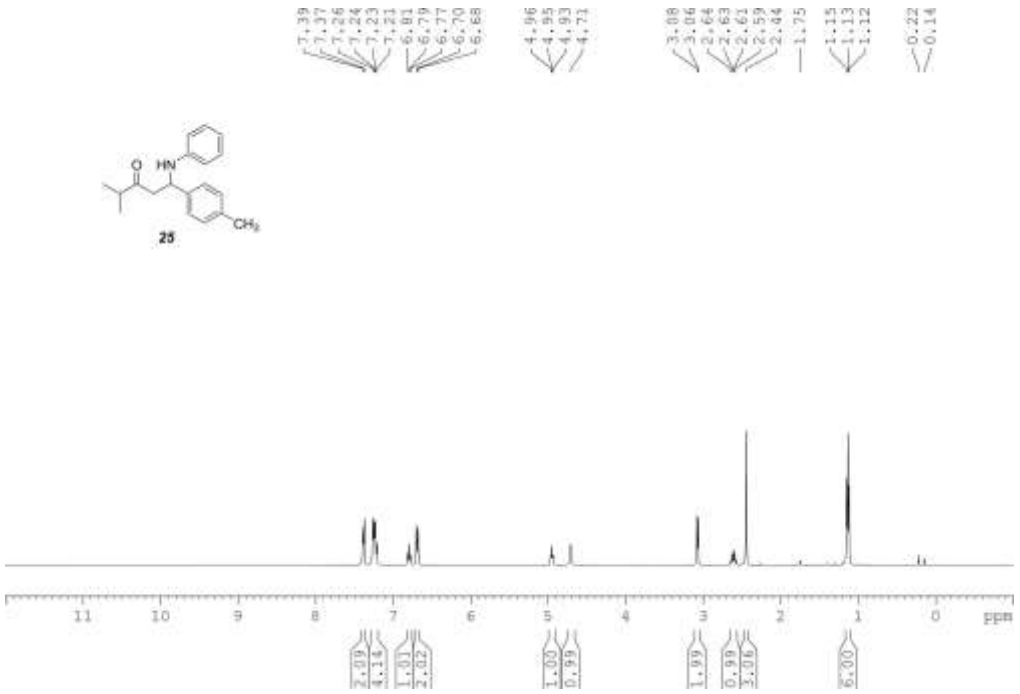

Figure S15. ^{1}H NMR of **25**

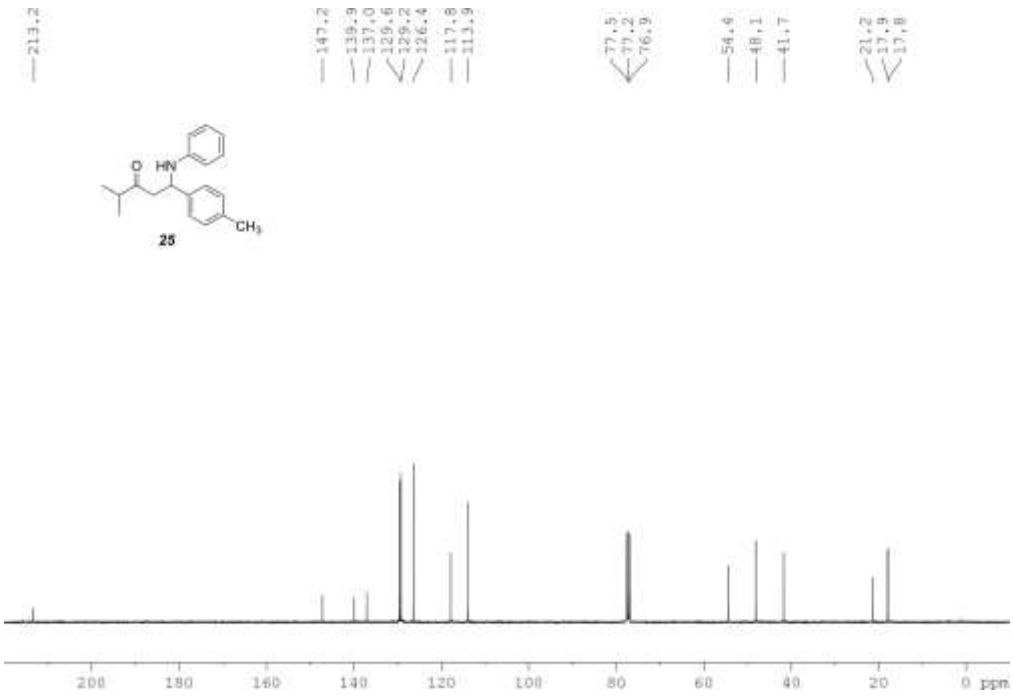

Figure S16. ^{13}C NMR of **25**

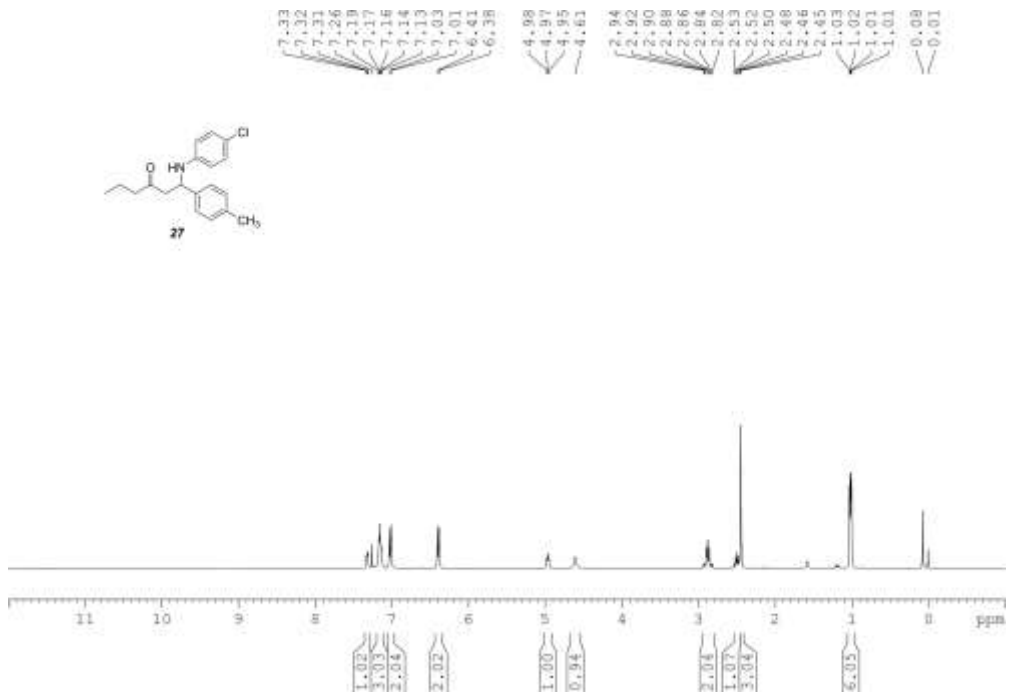

Figure S17. ^{1}H NMR of **27**

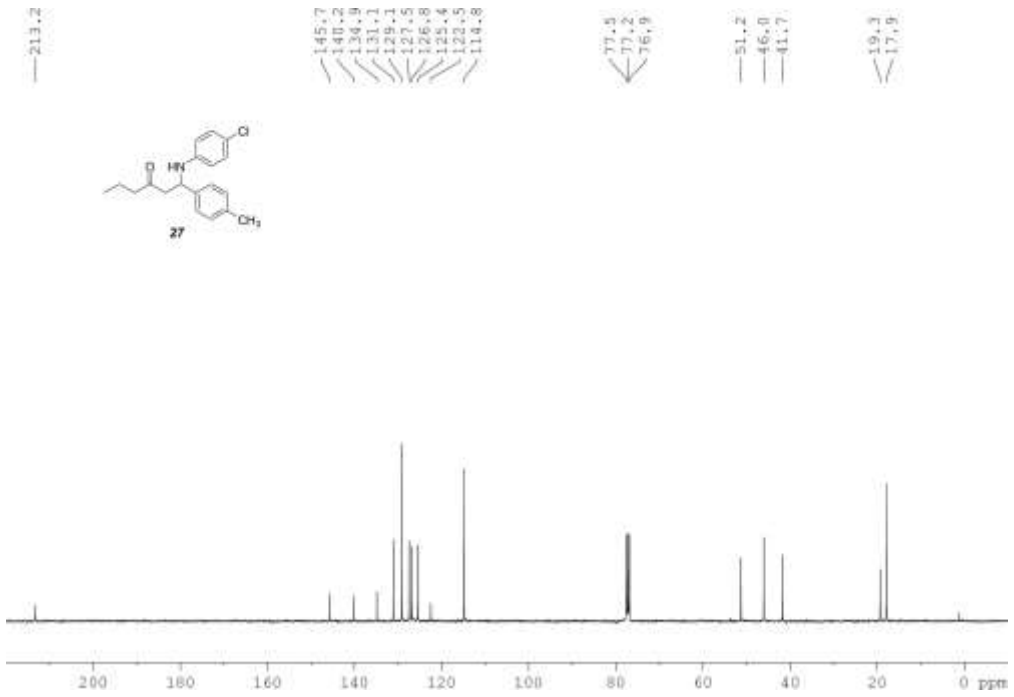

Figure S18. ^{13}C NMR of **27**

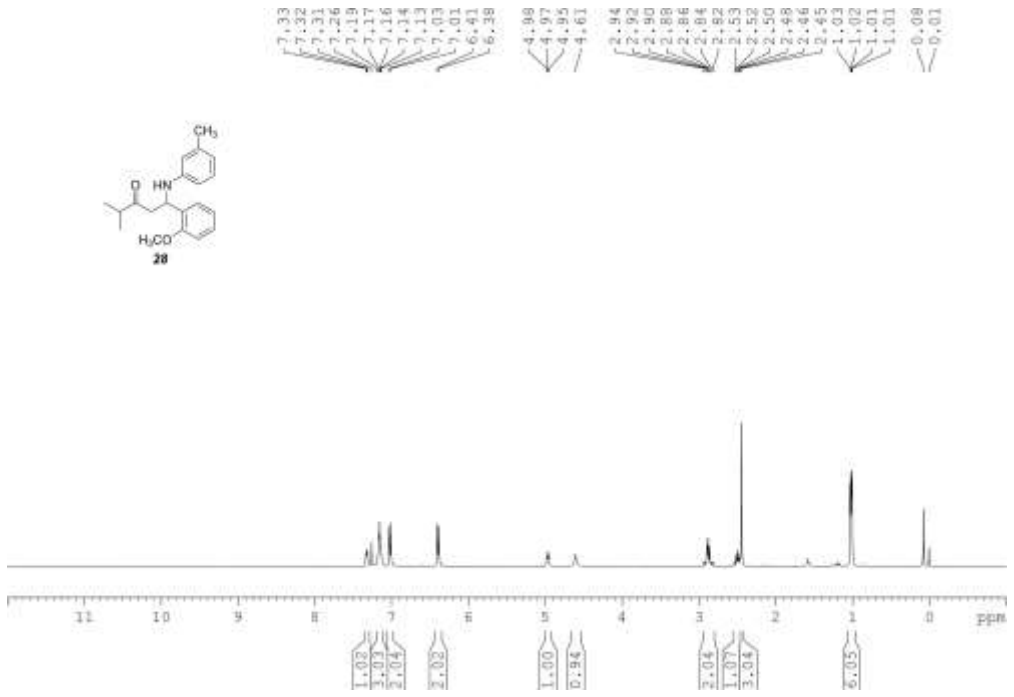

Figure S19. ^{1}H NMR of **28**

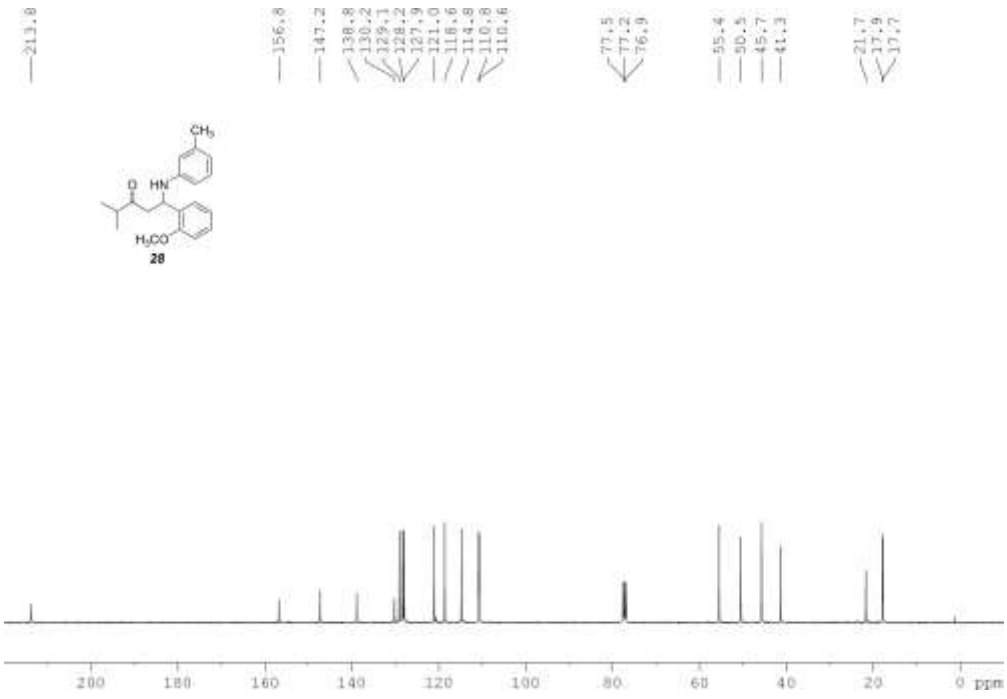

Figure S20. ^{13}C NMR of **28**

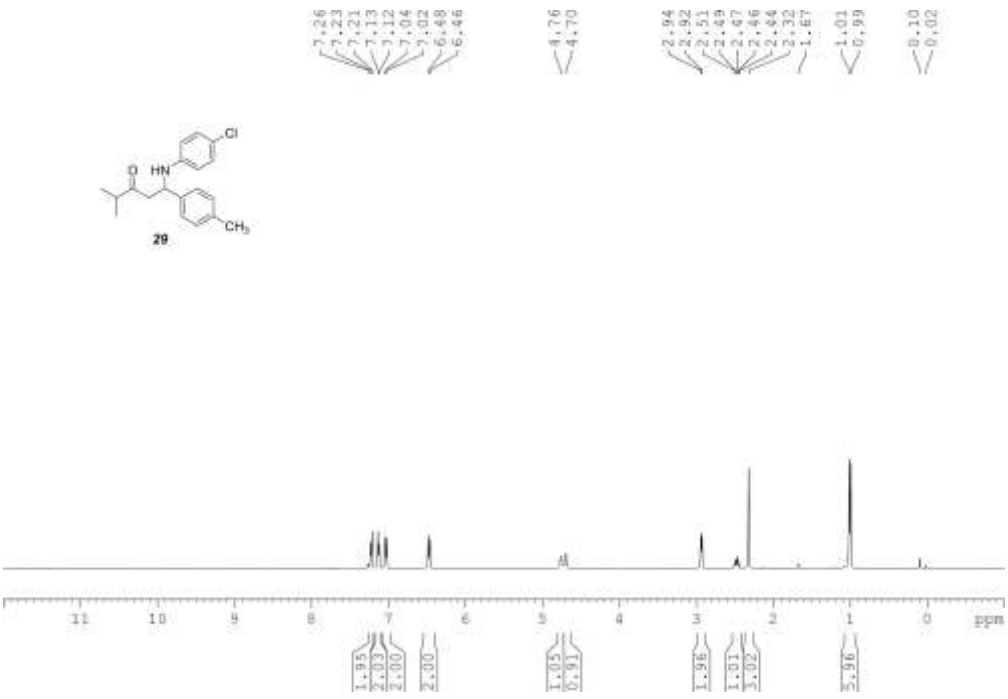

Figure S21. ^{1}H NMR of **29**

Figure S22. ^{13}C NMR of **29**