

Supporting Information for

Synthesis and catalytic activity of well-defined Co(I) complexes based on NHC-phosphane pincer ligands

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1. NMR Spectra of 1

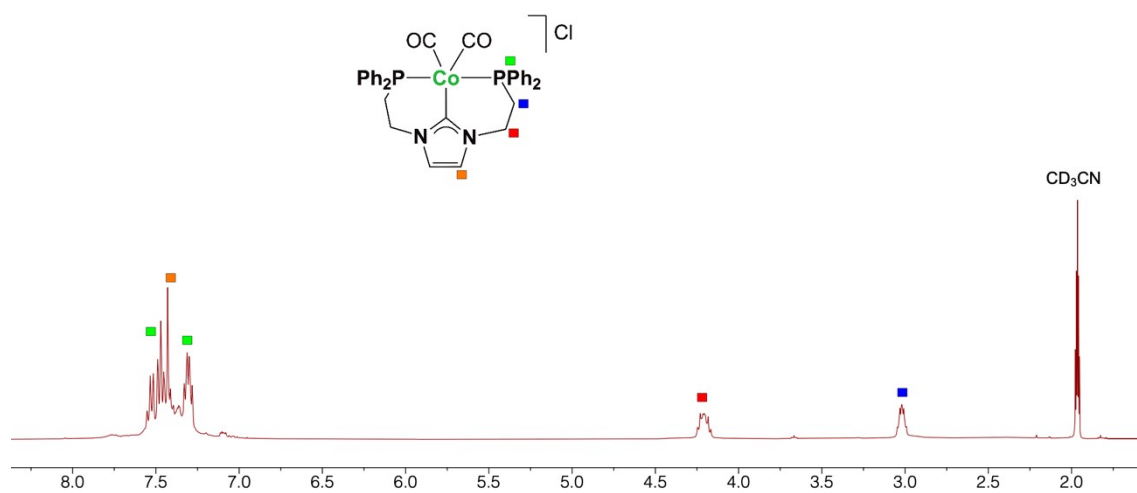


Figure S1. ^1H NMR spectra of 1.

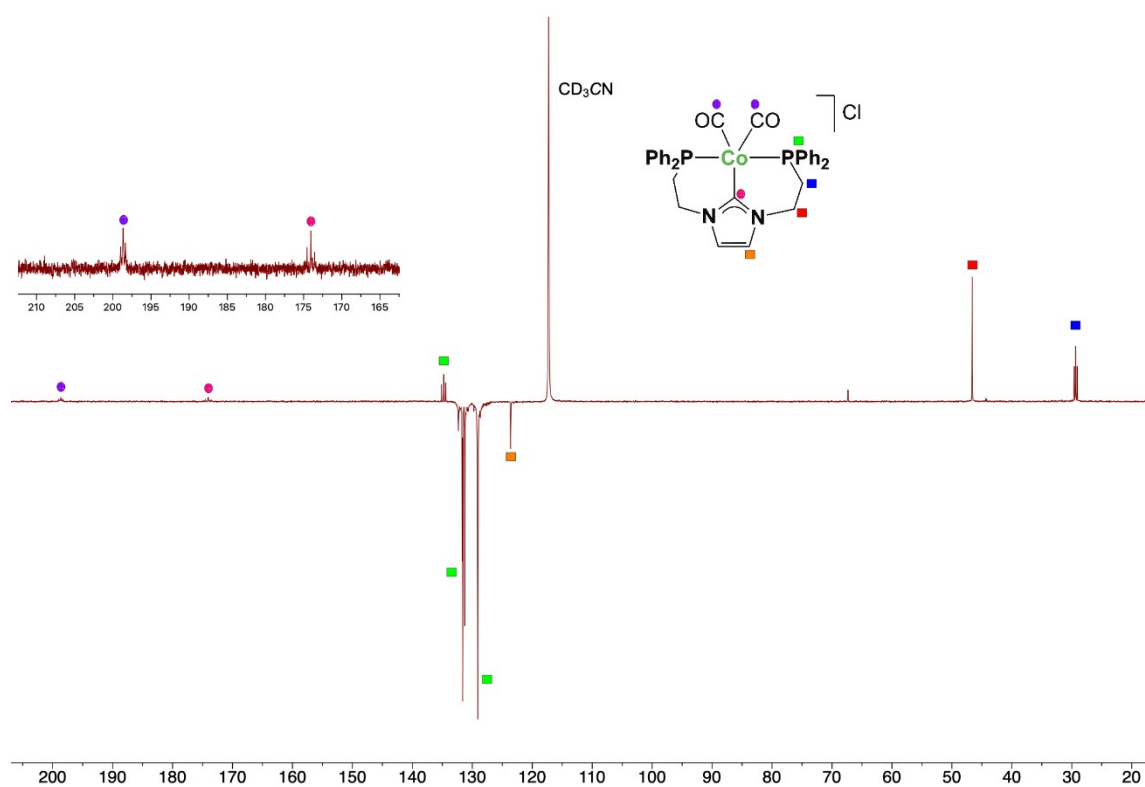


Figure S2. APT $\{^1\text{H}\}$ NMR spectra of 1.

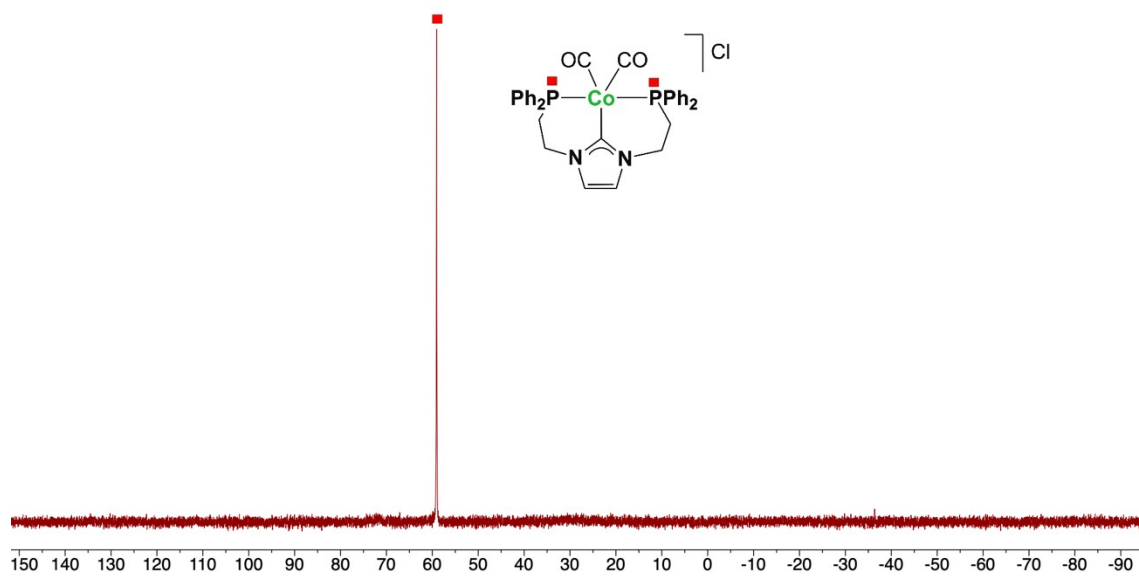


Figure S3. $^{31}\text{P}\{^1\text{H}\}$ NMR spectra of 1.

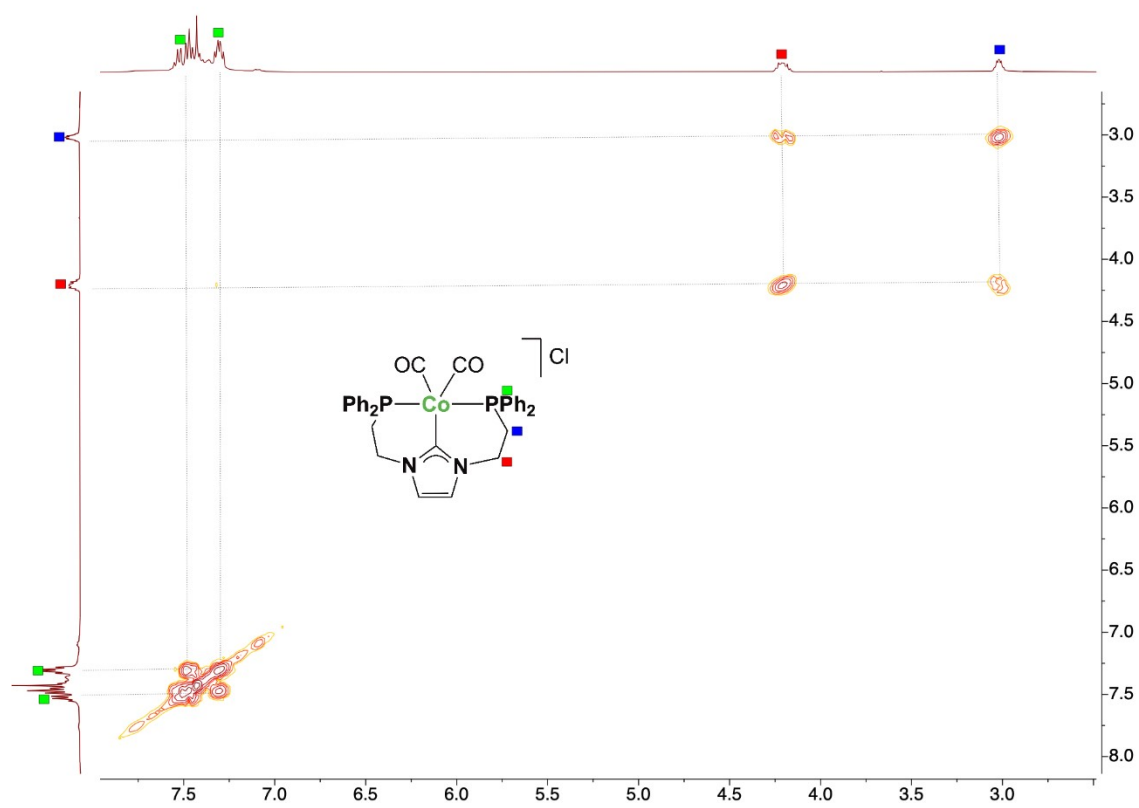


Figure S4. $^1\text{H}\text{-}^1\text{H}$ COSY NMR spectra of 1.

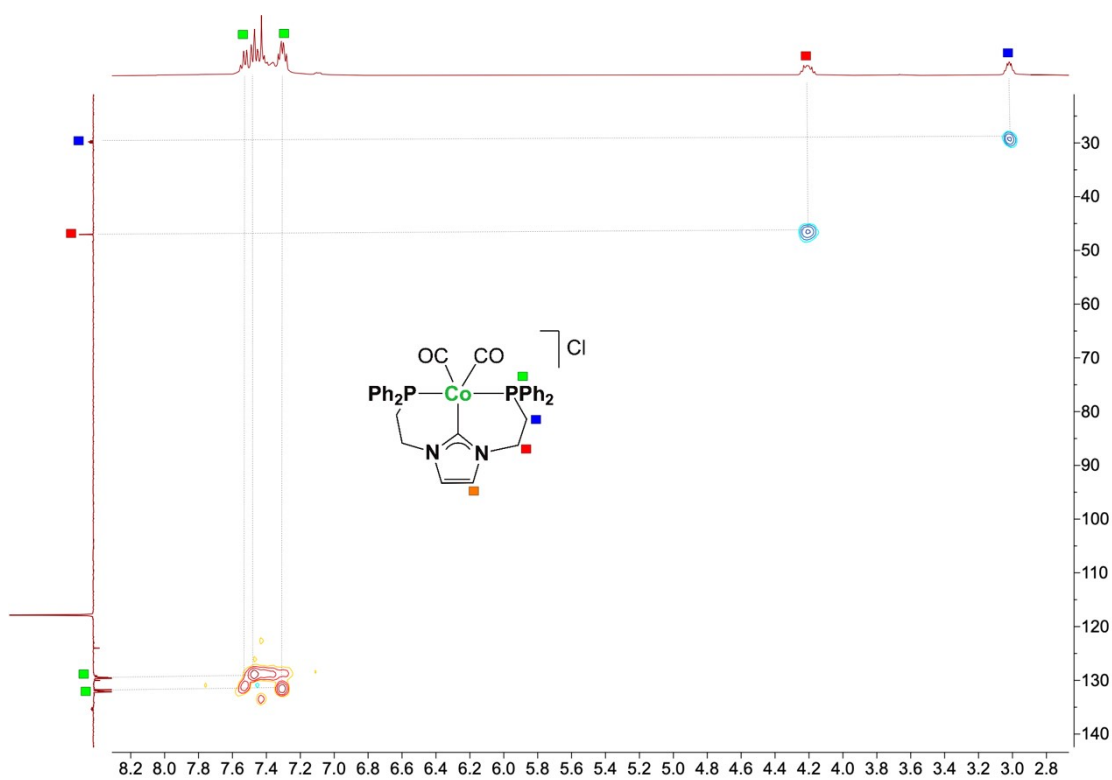


Figure S5. ^1H - ^{13}C HSQC NMR spectra of **1**.

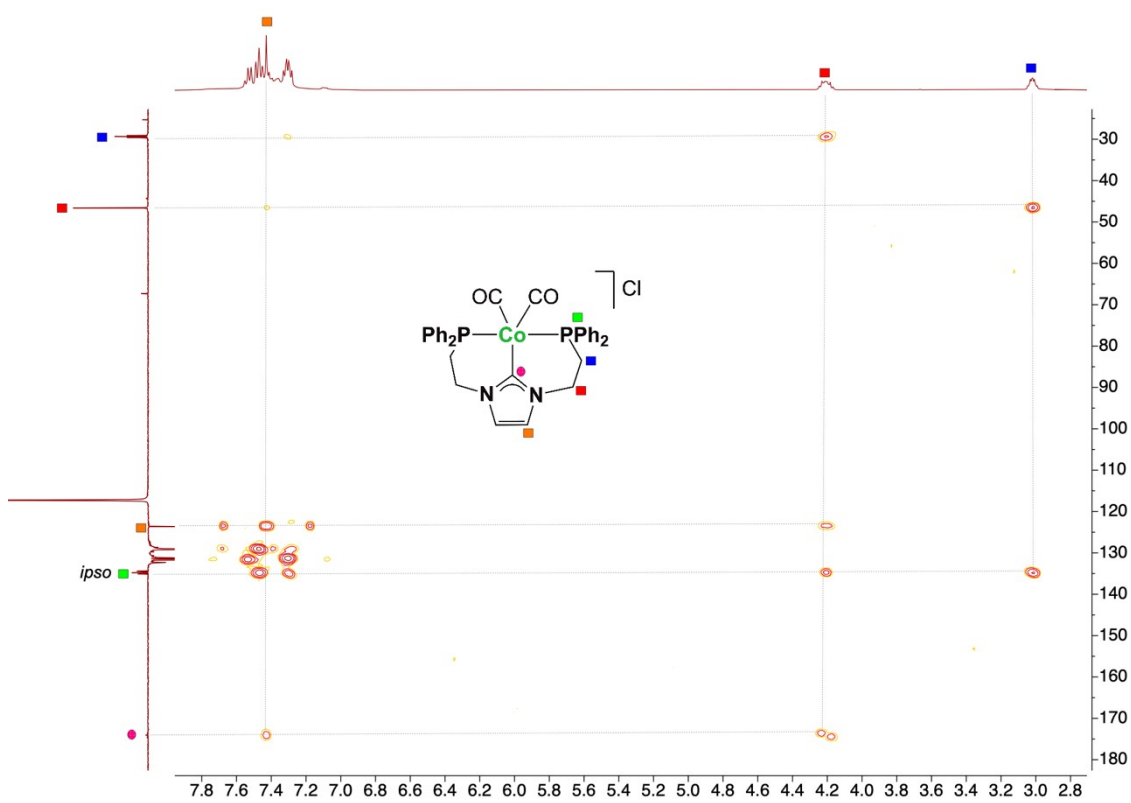


Figure S6. ^1H - ^{13}C HMBC NMR spectra of **1**.

1. NMR Spectra of 2

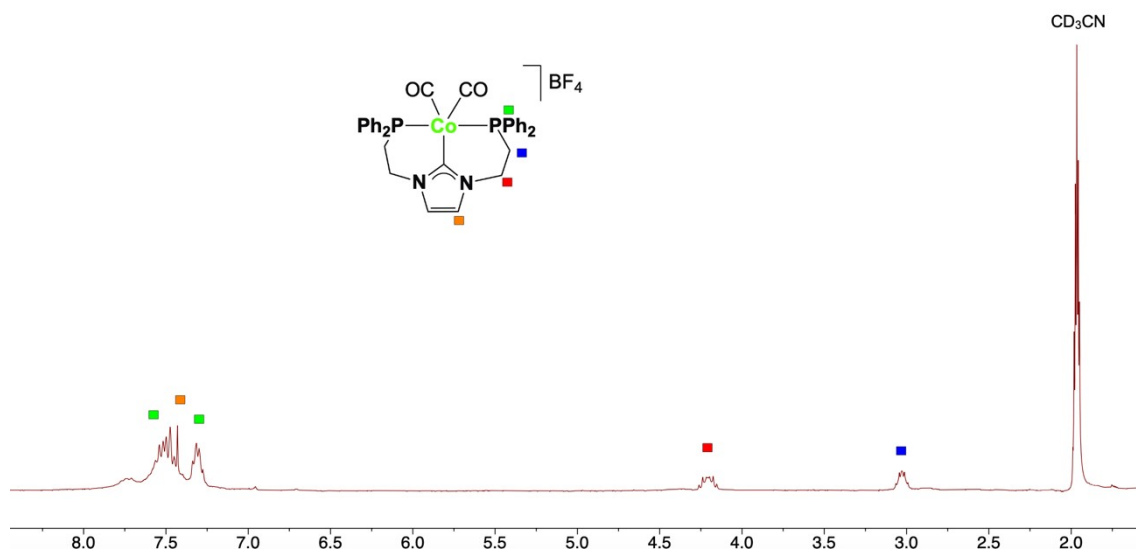


Figure S7. ^1H NMR spectra of 2.

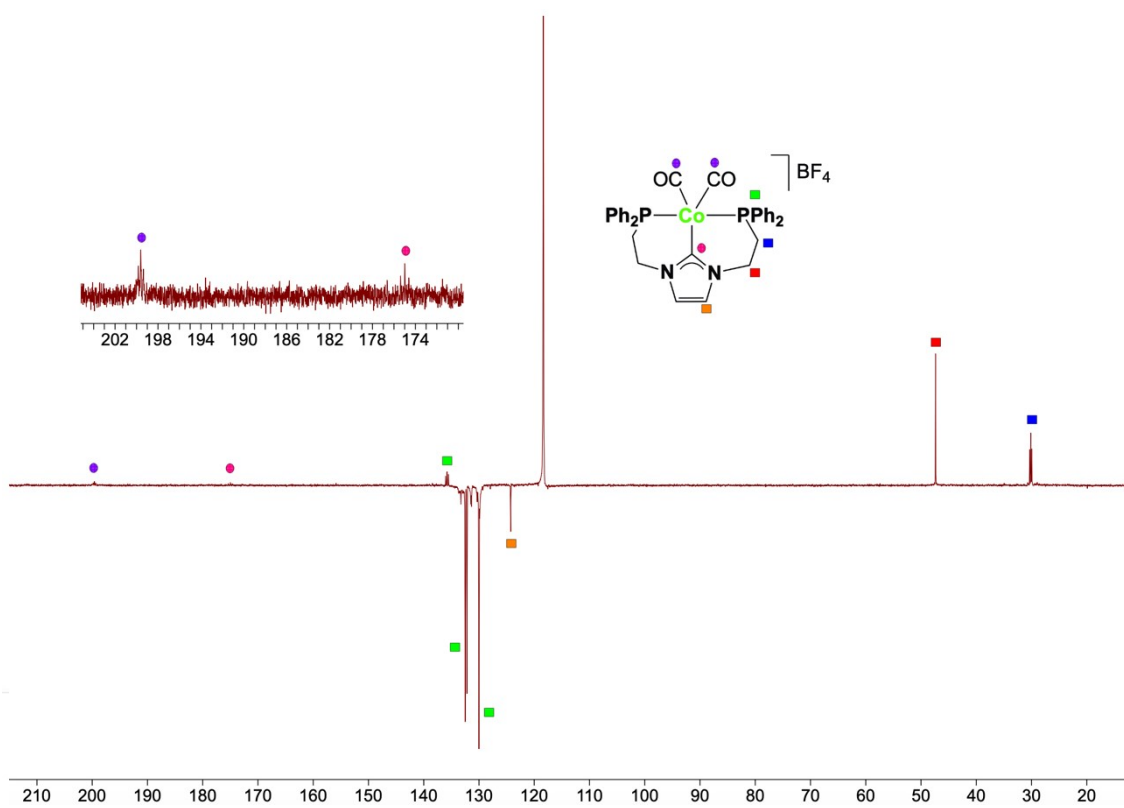


Figure S8. APT $\{^1\text{H}\}$ NMR spectra of 2.

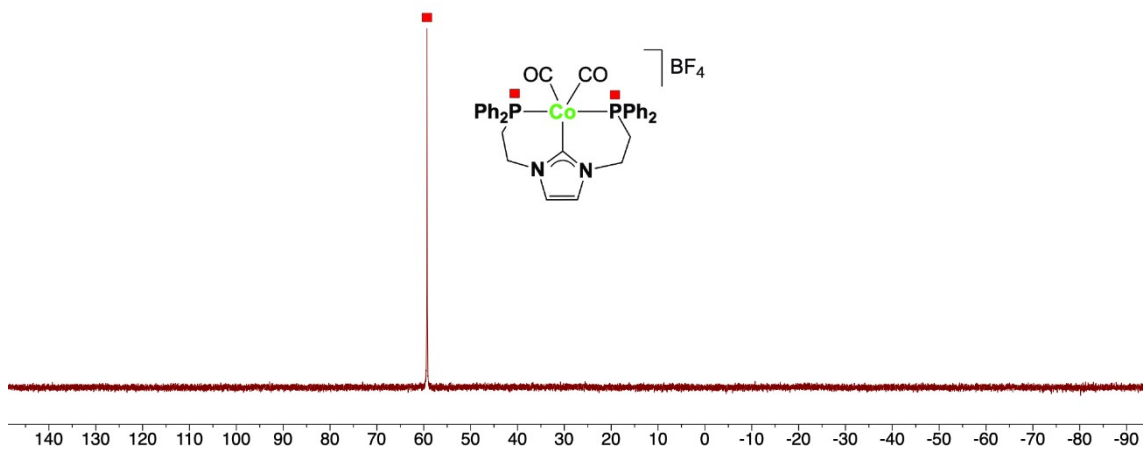


Figure S9. $^{31}\text{P}\{^1\text{H}\}$ NMR spectra of **2**.

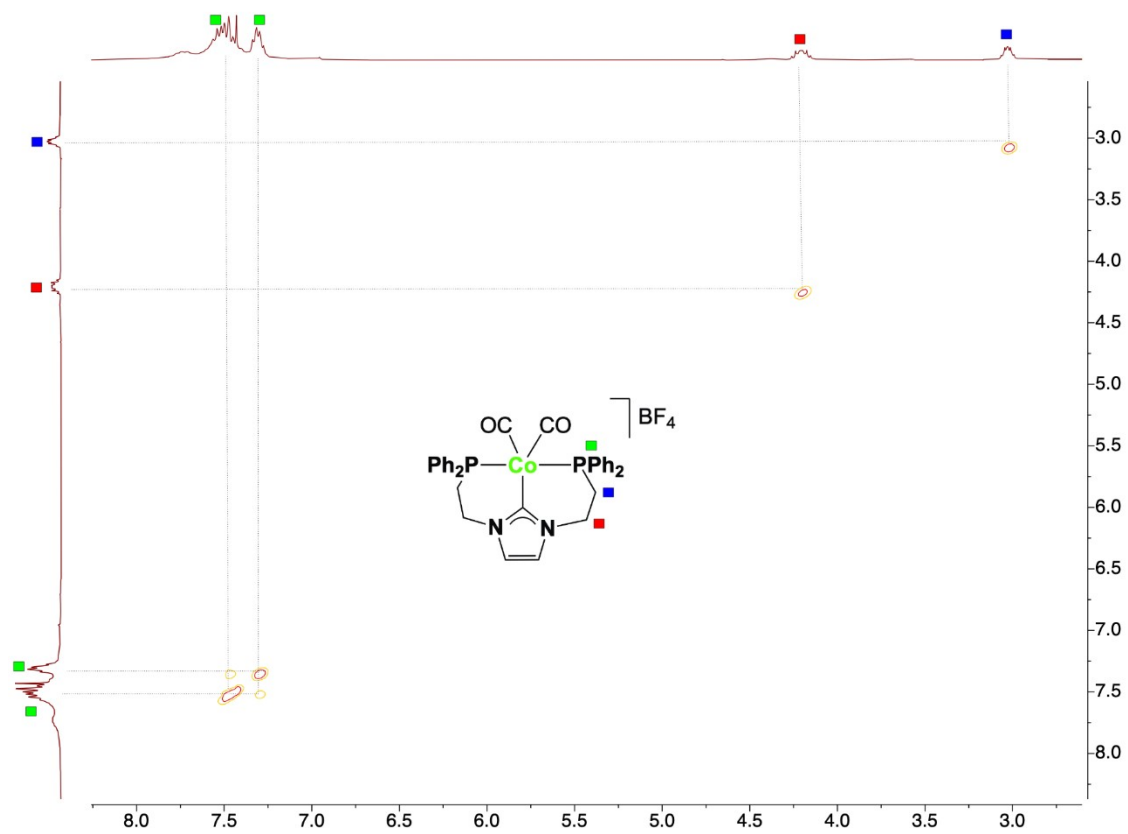


Figure S10. ^1H - ^1H COSY NMR spectra of **2**.

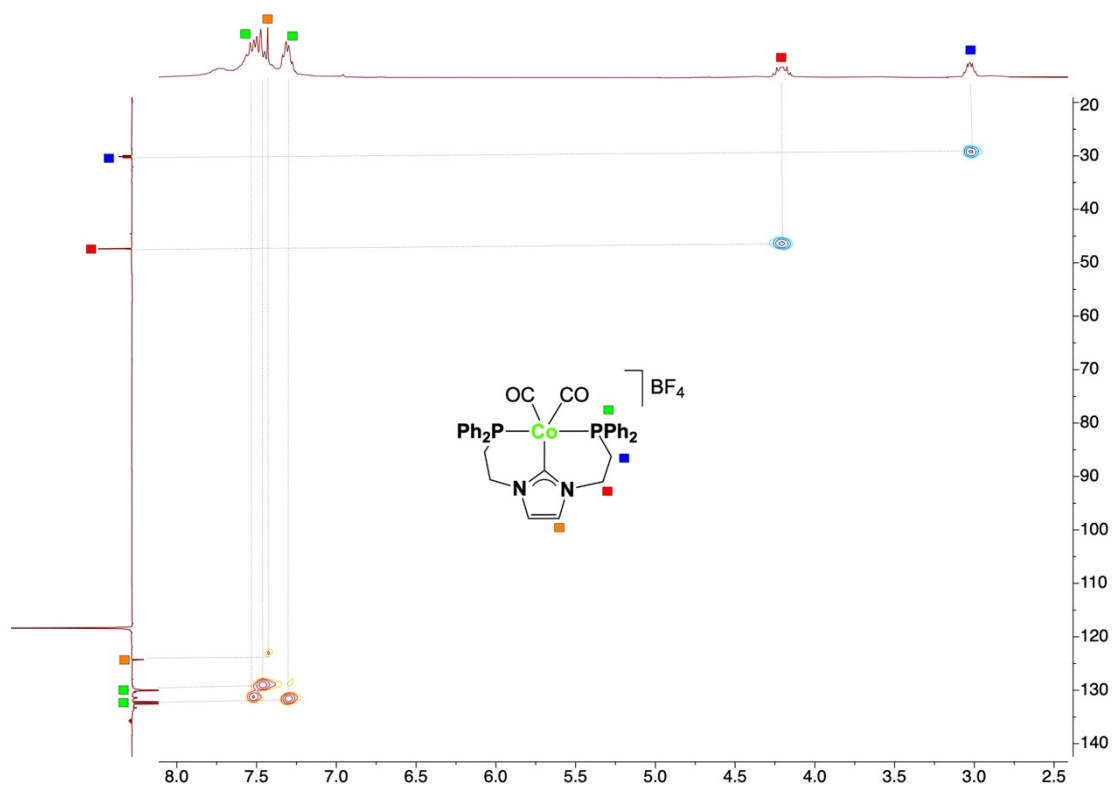


Figure S11. ^1H - ^{13}C HSQC NMR spectra of **2**.

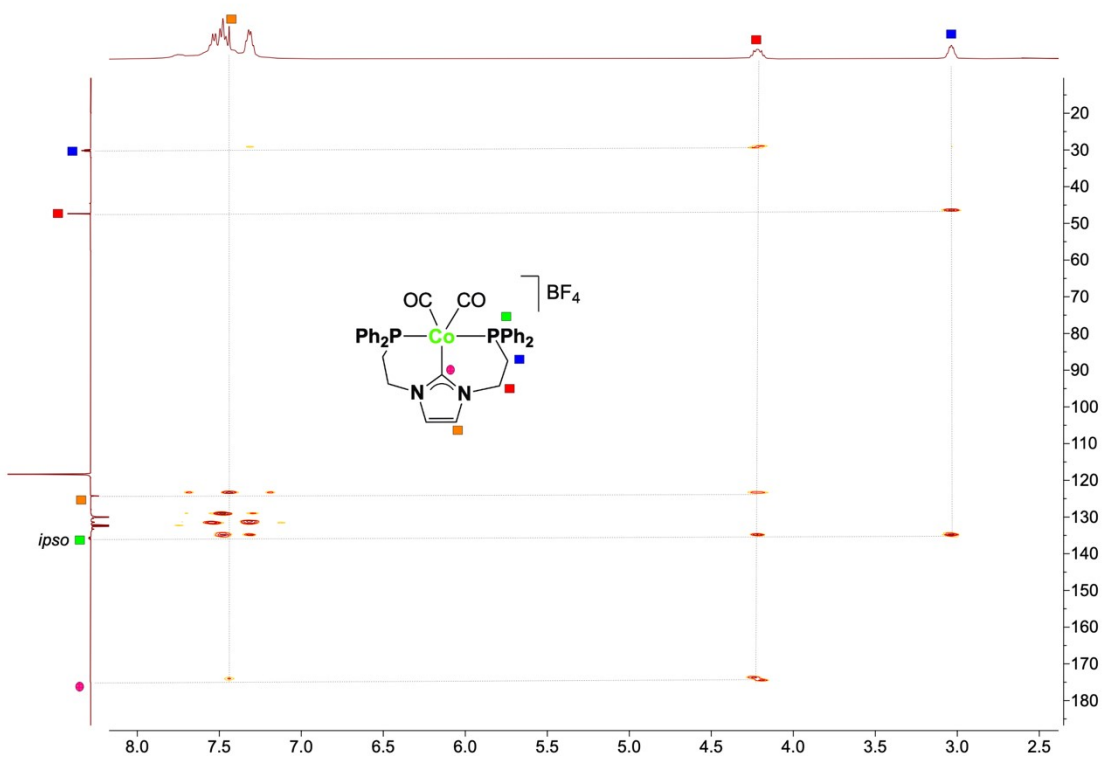


Figure S12. ^1H - ^{13}C HMBC NMR spectra of **2**.

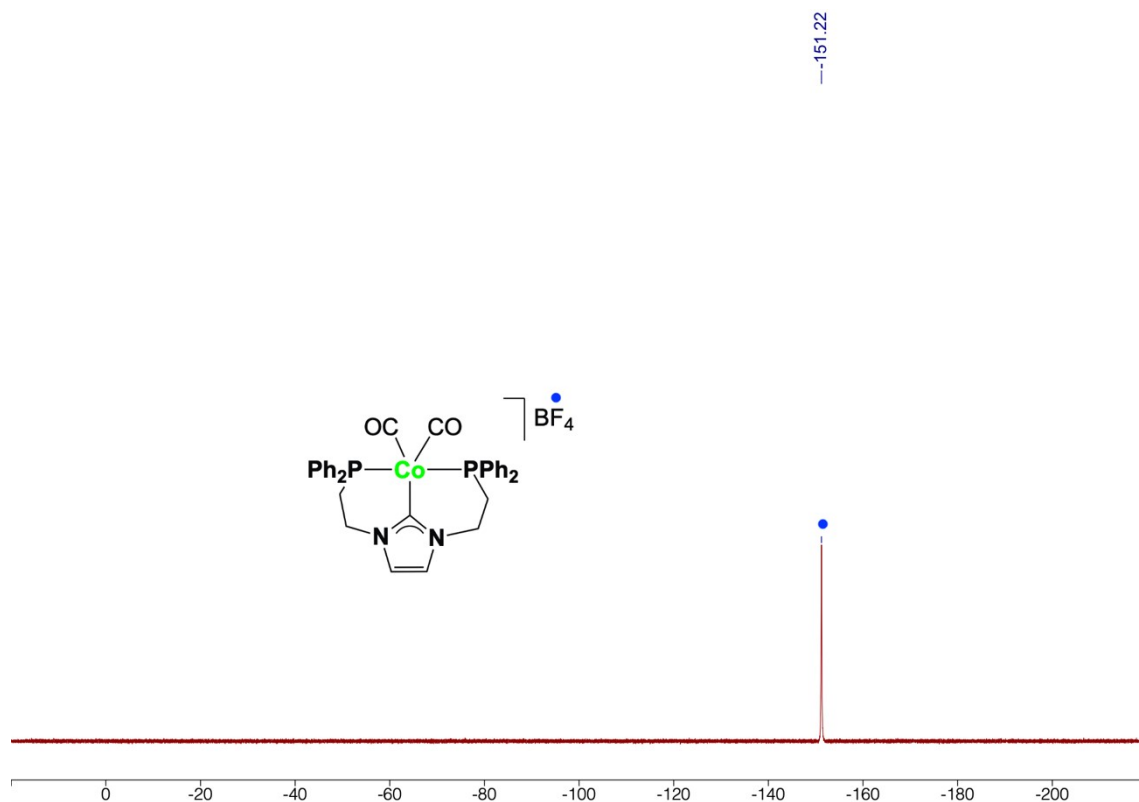


Figure S13. $^{19}\text{F}\{^1\text{H}\}$ NMR spectra of **2**.

2. IR Spectra of 1 and 2

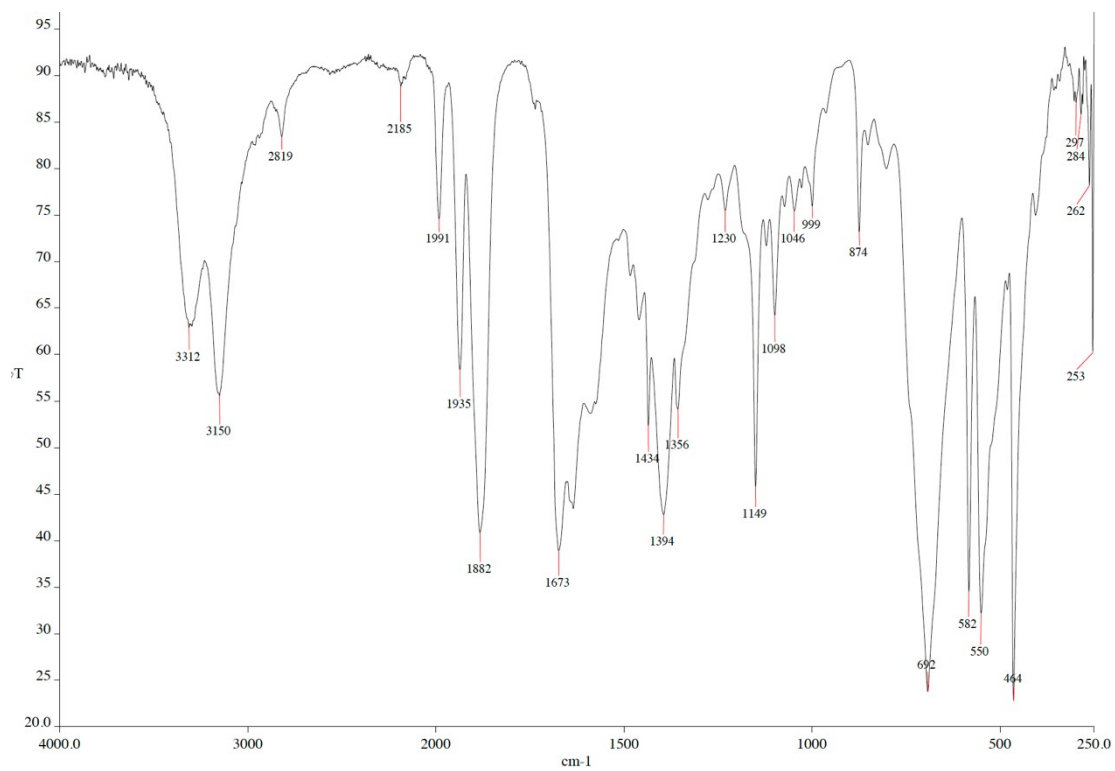


Figure S14. FT-IR spectra of **1**.

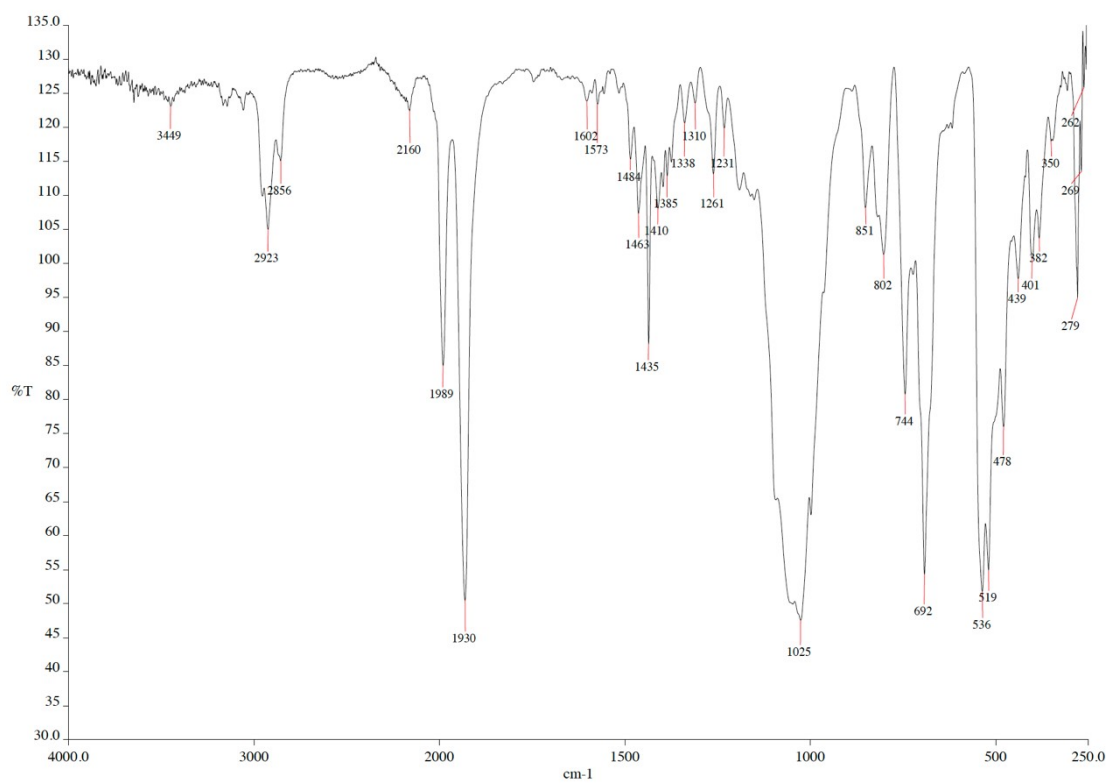
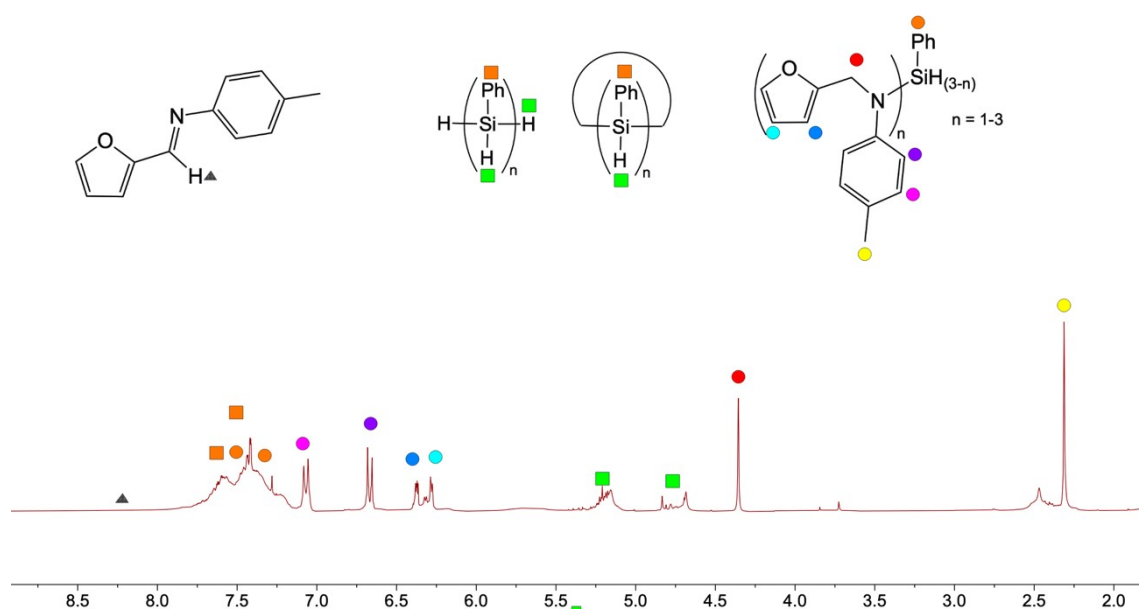
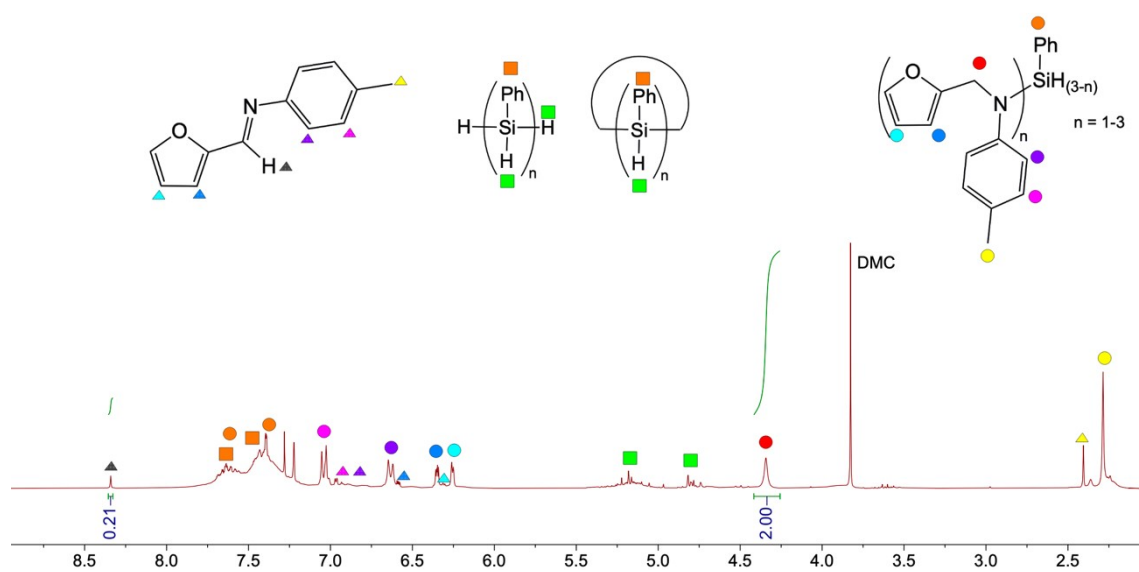


Figure S15. FT-IR spectra of **2**.

3. NMR Spectra of Table 1



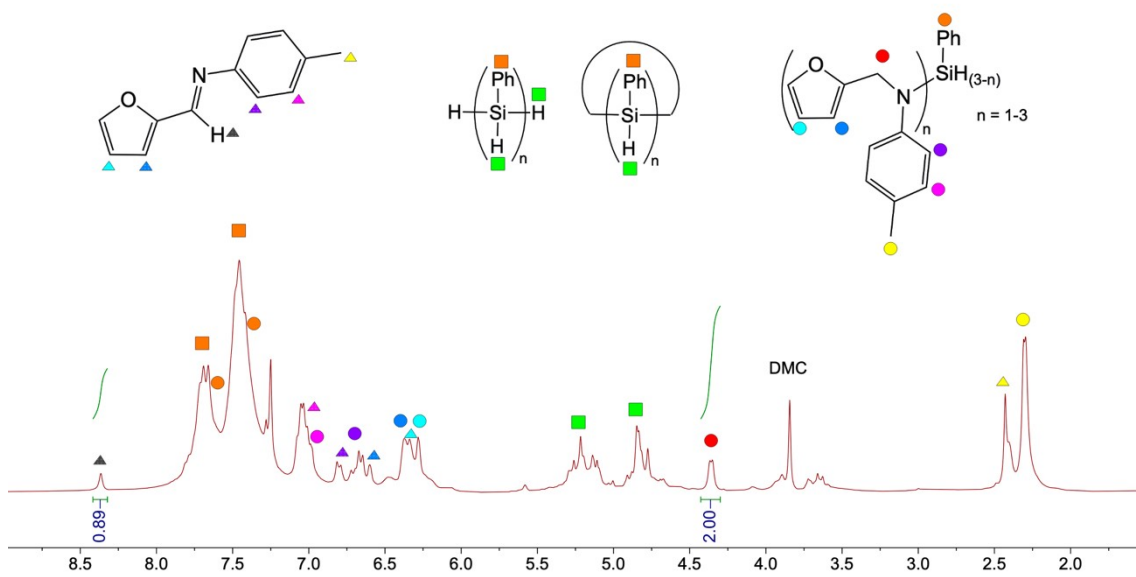


Figure S18. ^1H NMR: Table 1, Entry 3.

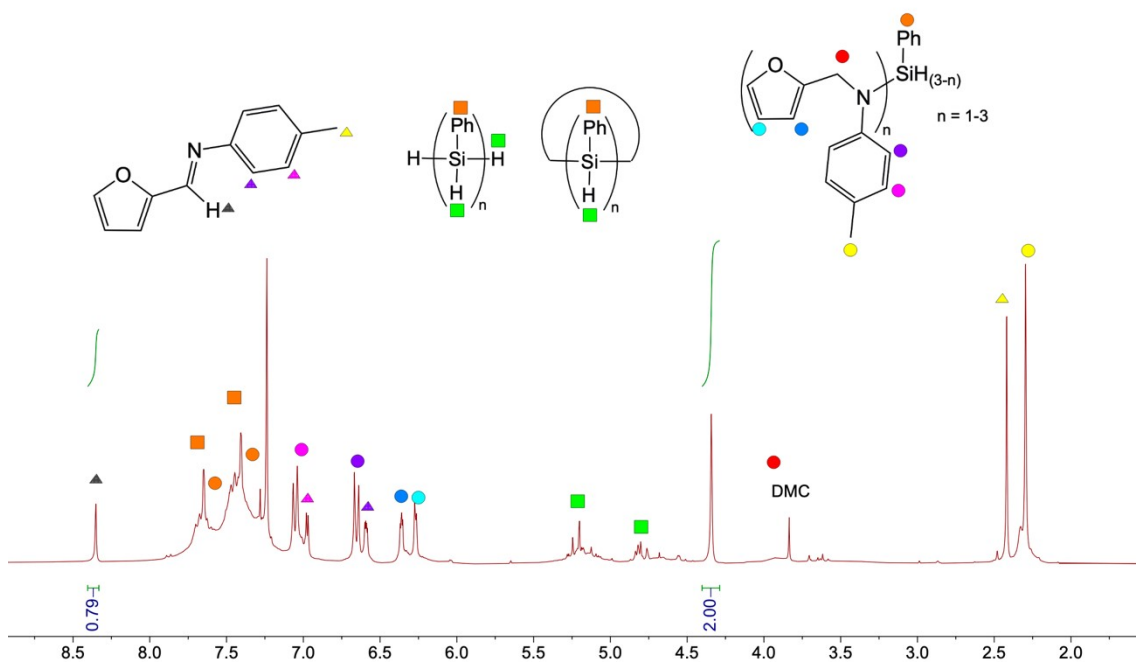


Figure S19. ^1H NMR: Table 1, Entry 4.

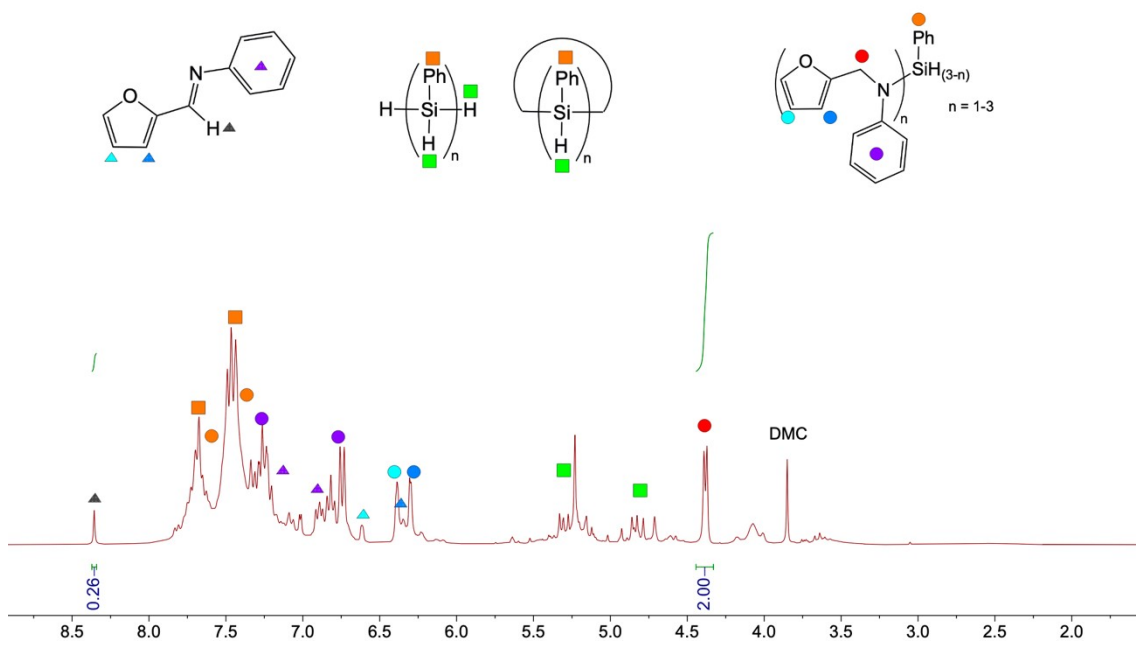


Figure S20. ^1H NMR: Table 1, Entry 5.

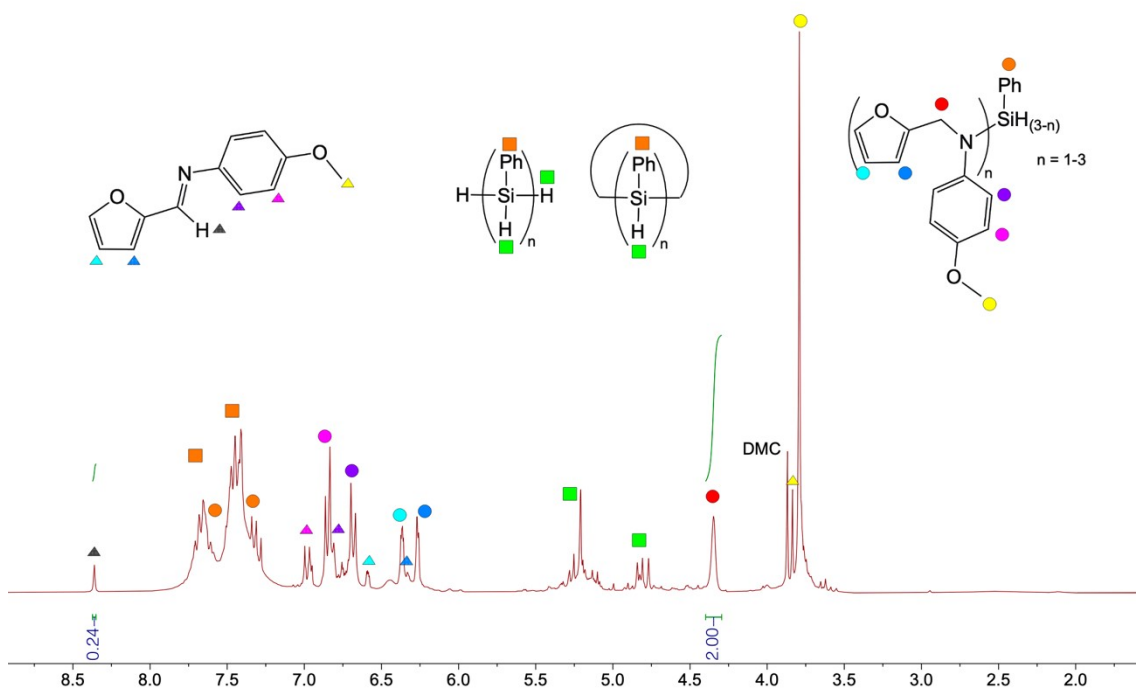
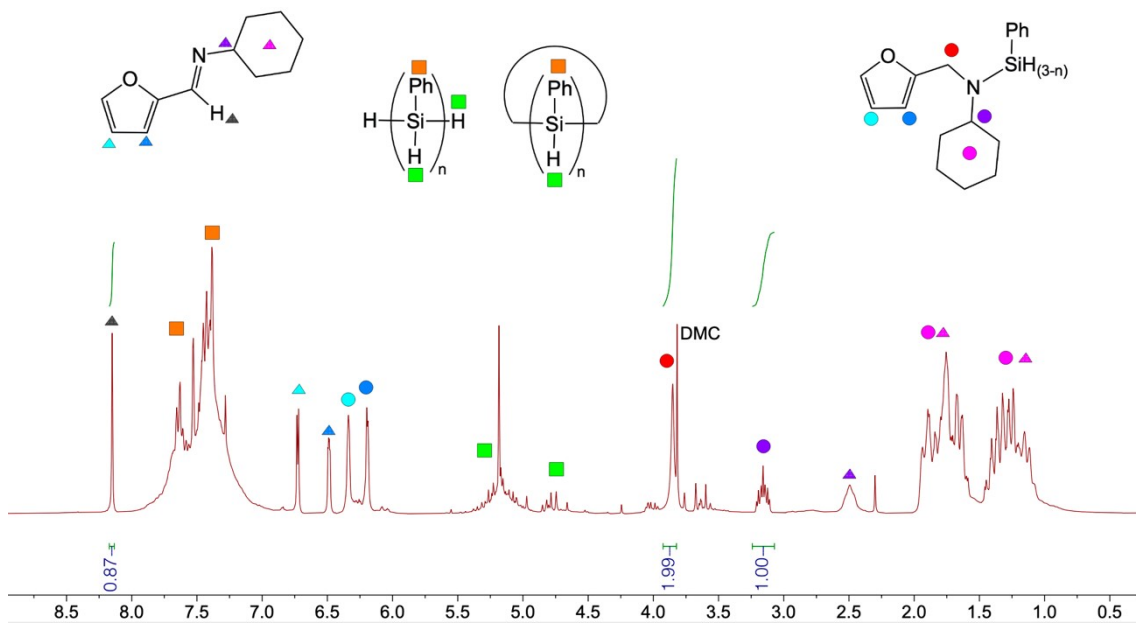
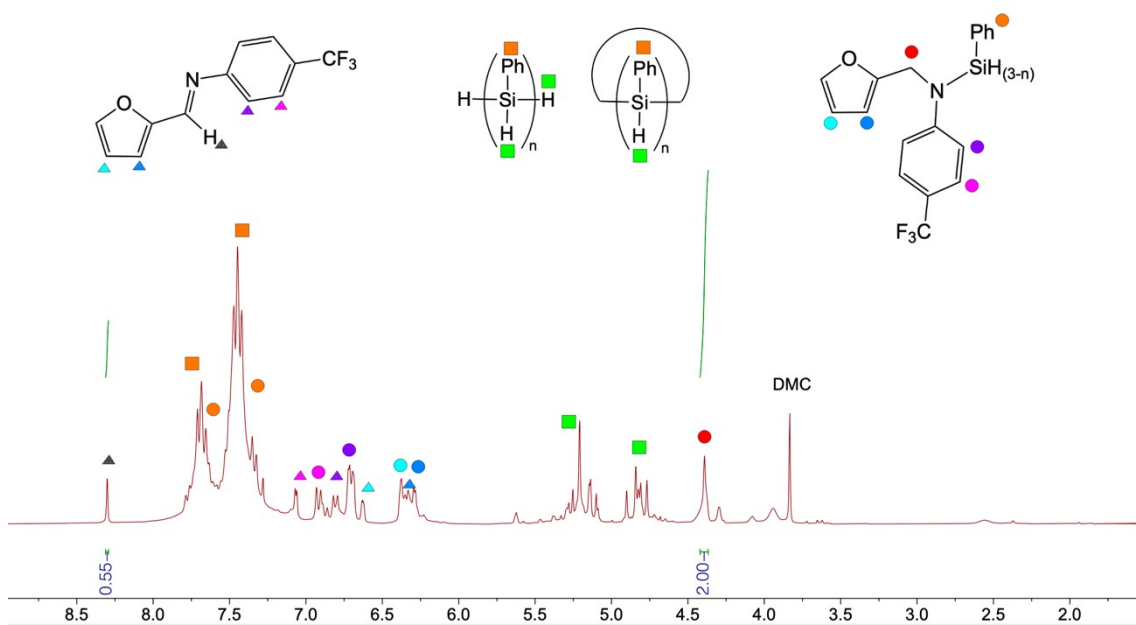


Figure S21. ^1H NMR: Table 1, Entry 6.



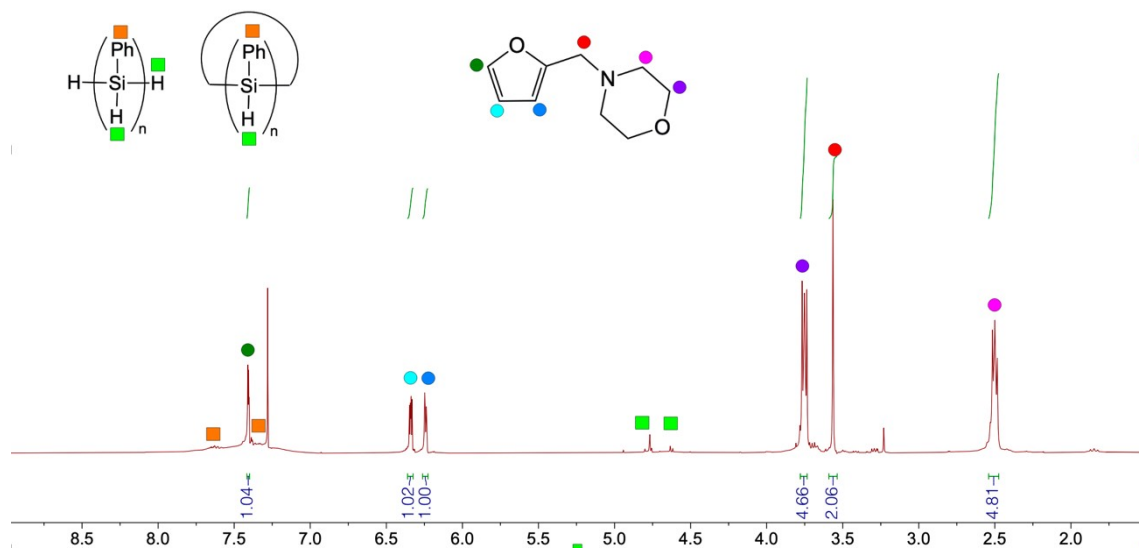


Figure S24. ¹H NMR: Table 1, Entry 9.

4. NMR Spectra of Table 2

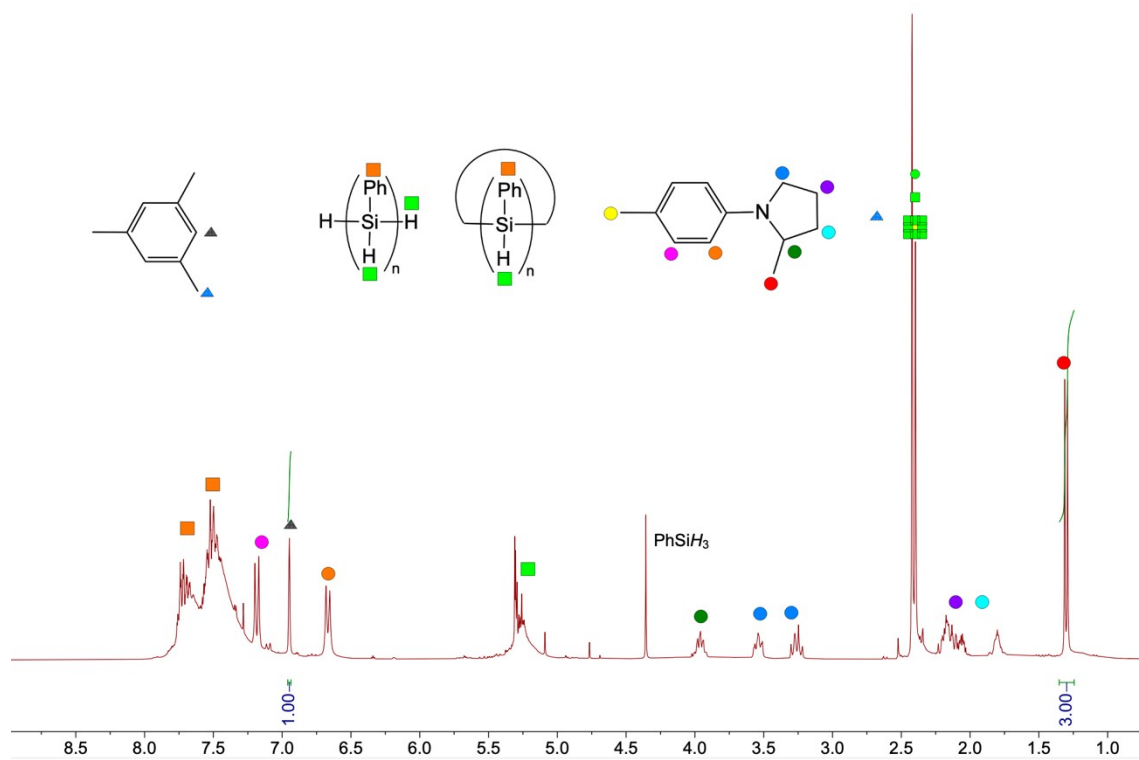


Figure S25. ^1H NMR: Table 2, Entry 1.

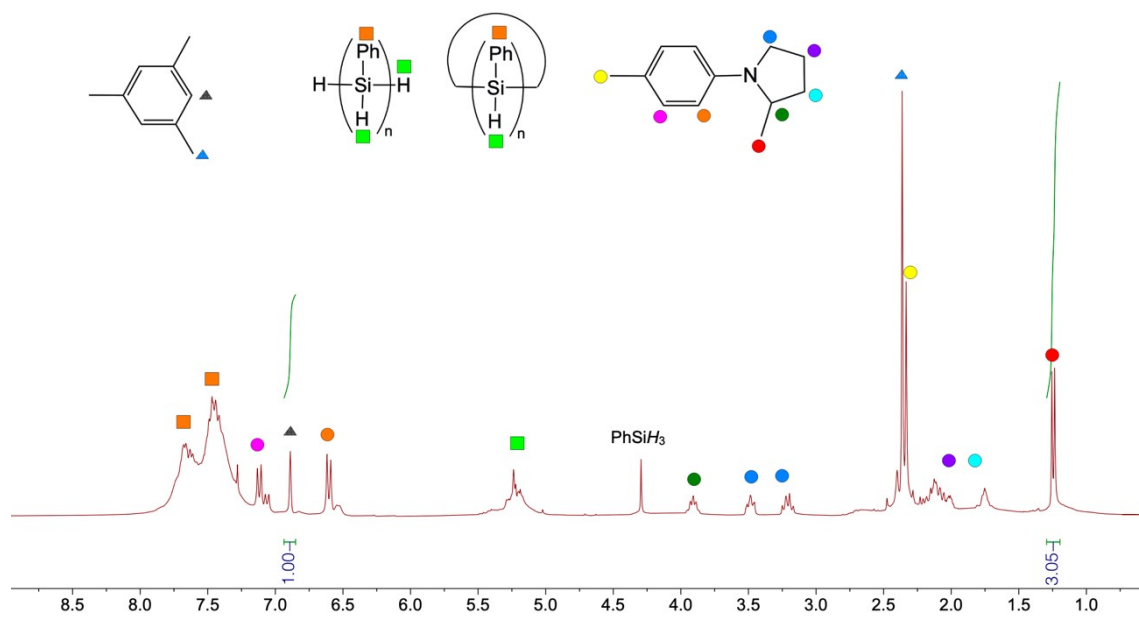
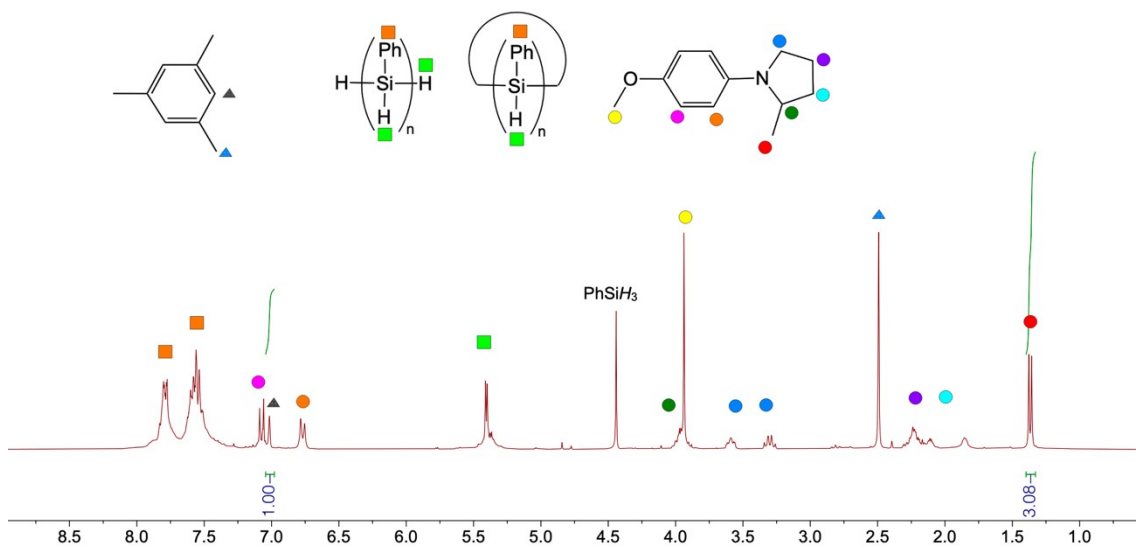
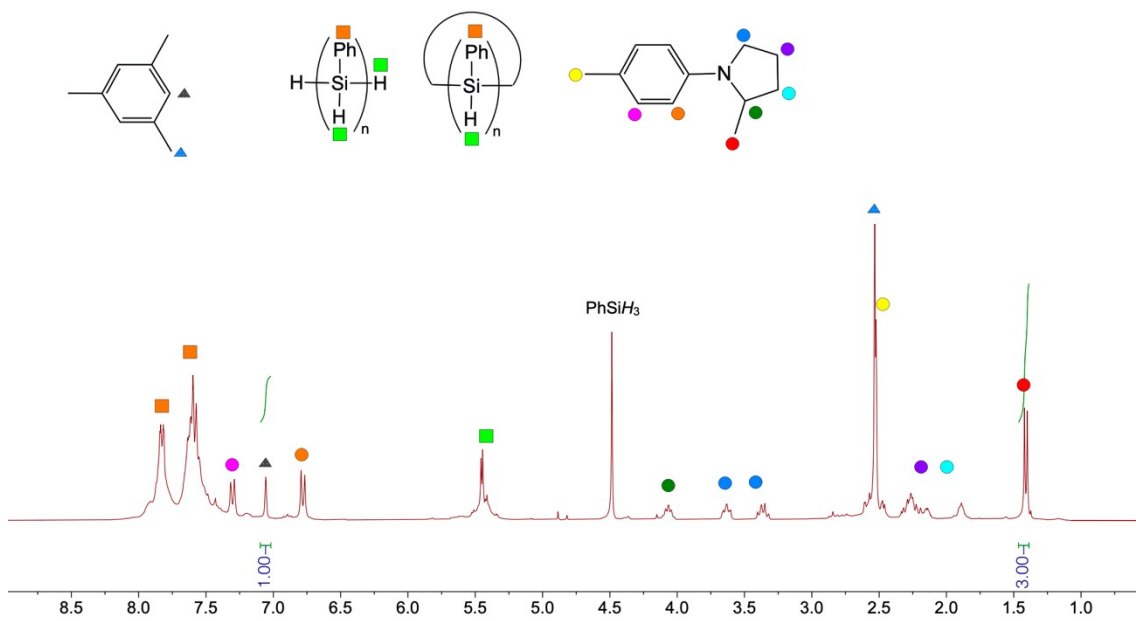


Figure S26. ^1H NMR: Table 2, Entry 2.



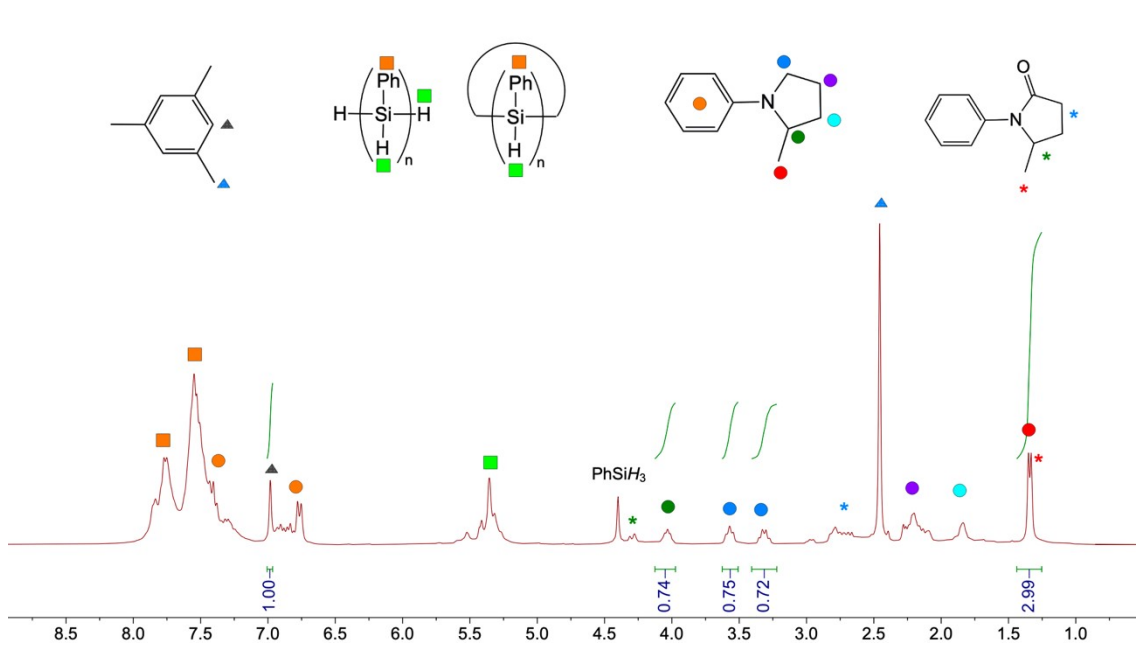


Figure S29. ^1H NMR: Table 2, Entry 5.

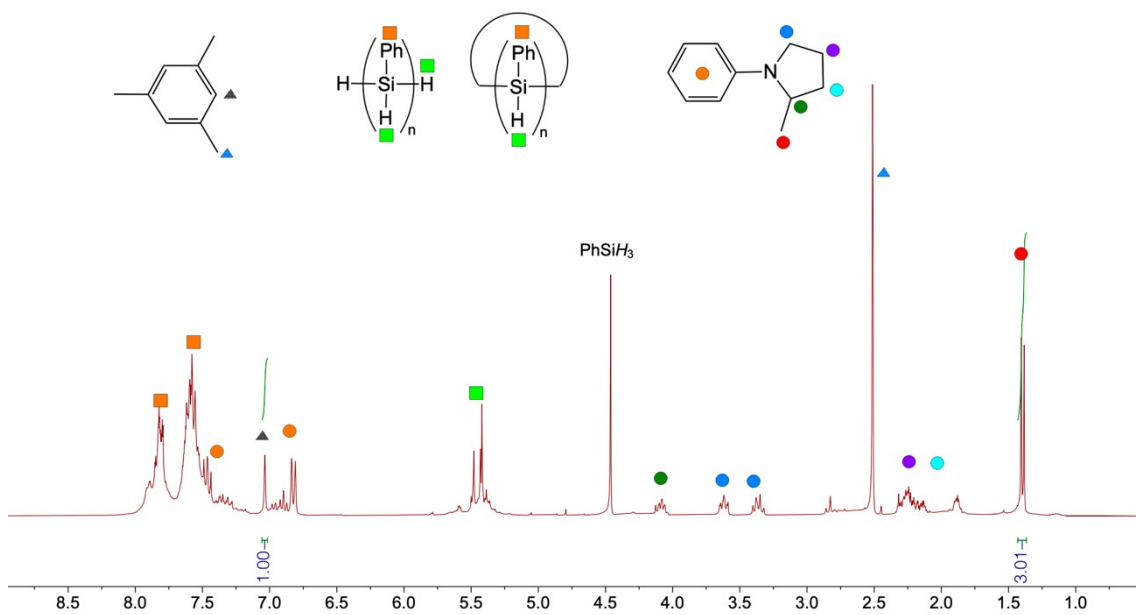


Figure S30. ^1H NMR: Table 2, Entry 6.

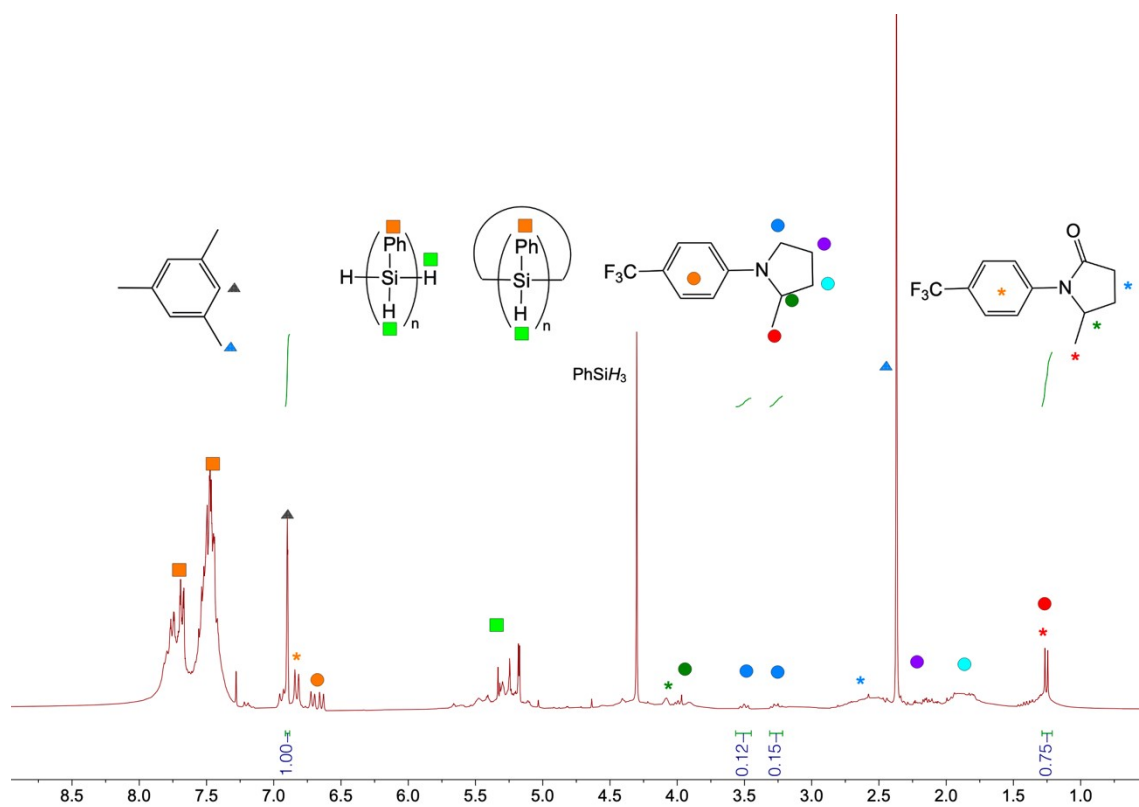


Figure S31. ^1H NMR: Table 2, Entry 7.

5. NMR spectra of stoichiometric experiments

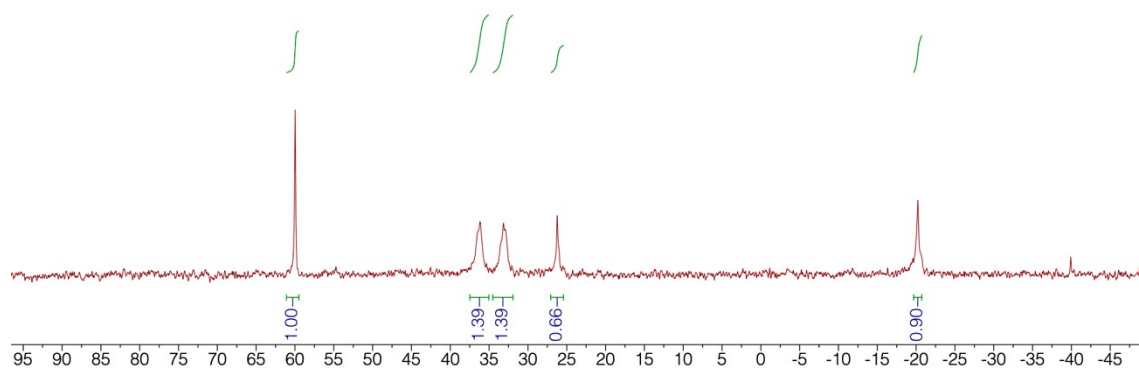


Figure S32. ^{31}P NMR of **1** with 2 equivalents of PhSiH_3 at 60 °C after 24 h in THF-d_8 .

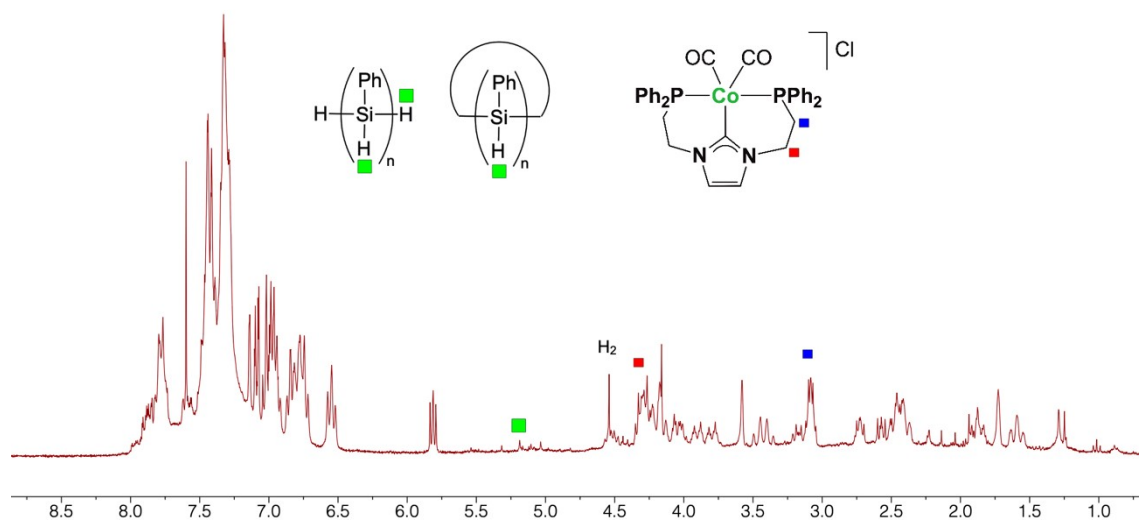


Figure S33. ^1H NMR of **1** with 2 equivalents of PhSiH_3 at 60 °C after 24 h in THF-d_8 .

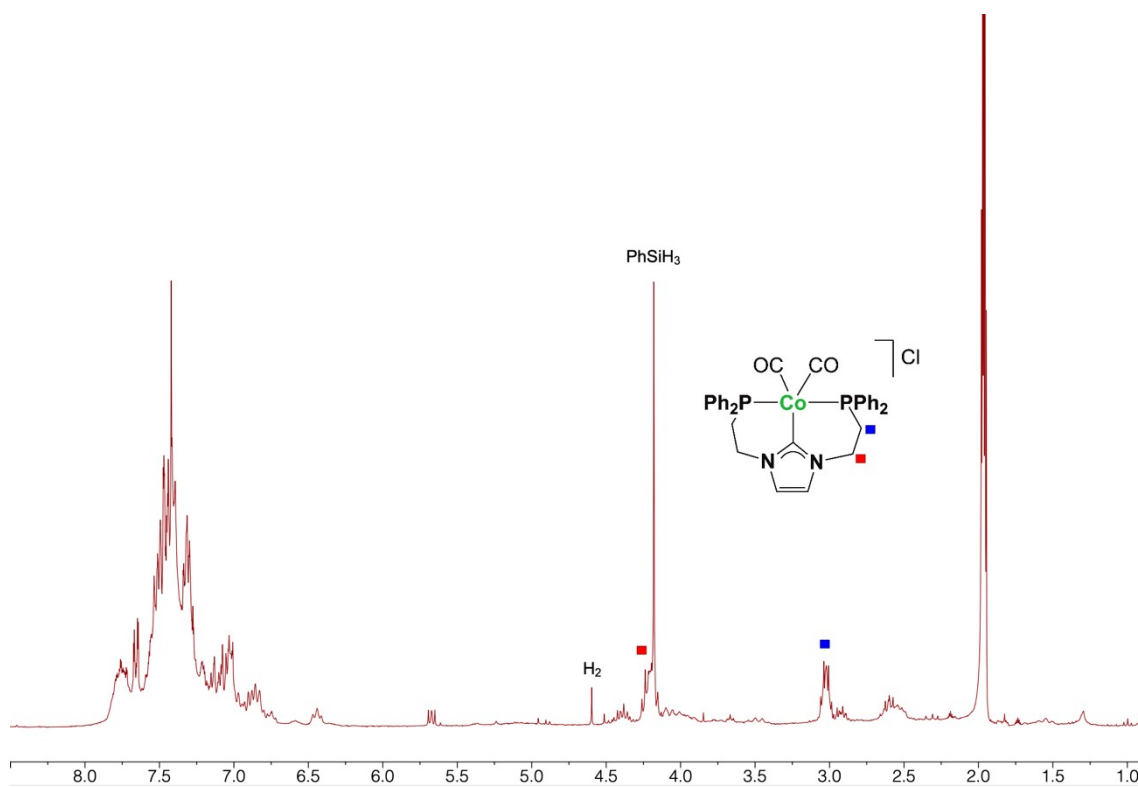


Figure S34. ^1H NMR of **1** with 2 equivalents of PhSiH_3 at $80\text{ }^\circ\text{C}$ after 24 h in CD_3CN .

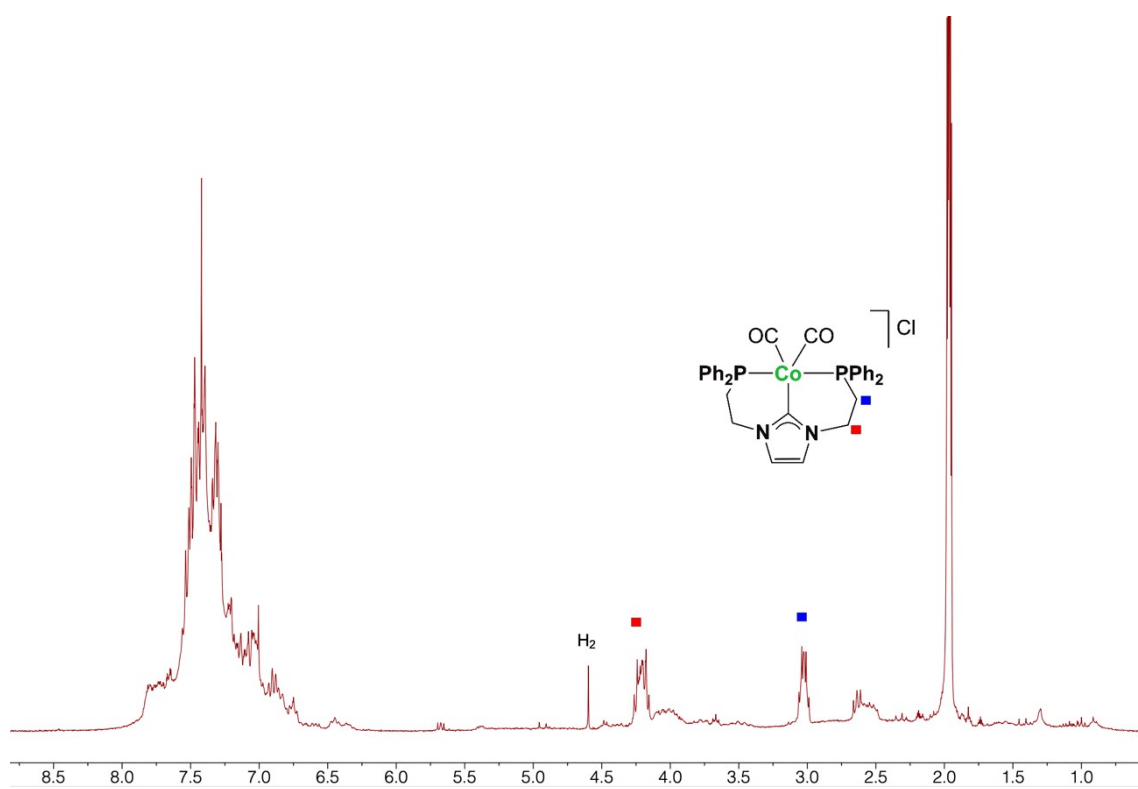


Figure S35. ^1H NMR of **1** with 2 equivalents of PhSiH_3 at $80\text{ }^\circ\text{C}$ after 14 d in CD_3CN .

6. NMR spectra of the dehydrocoupling products

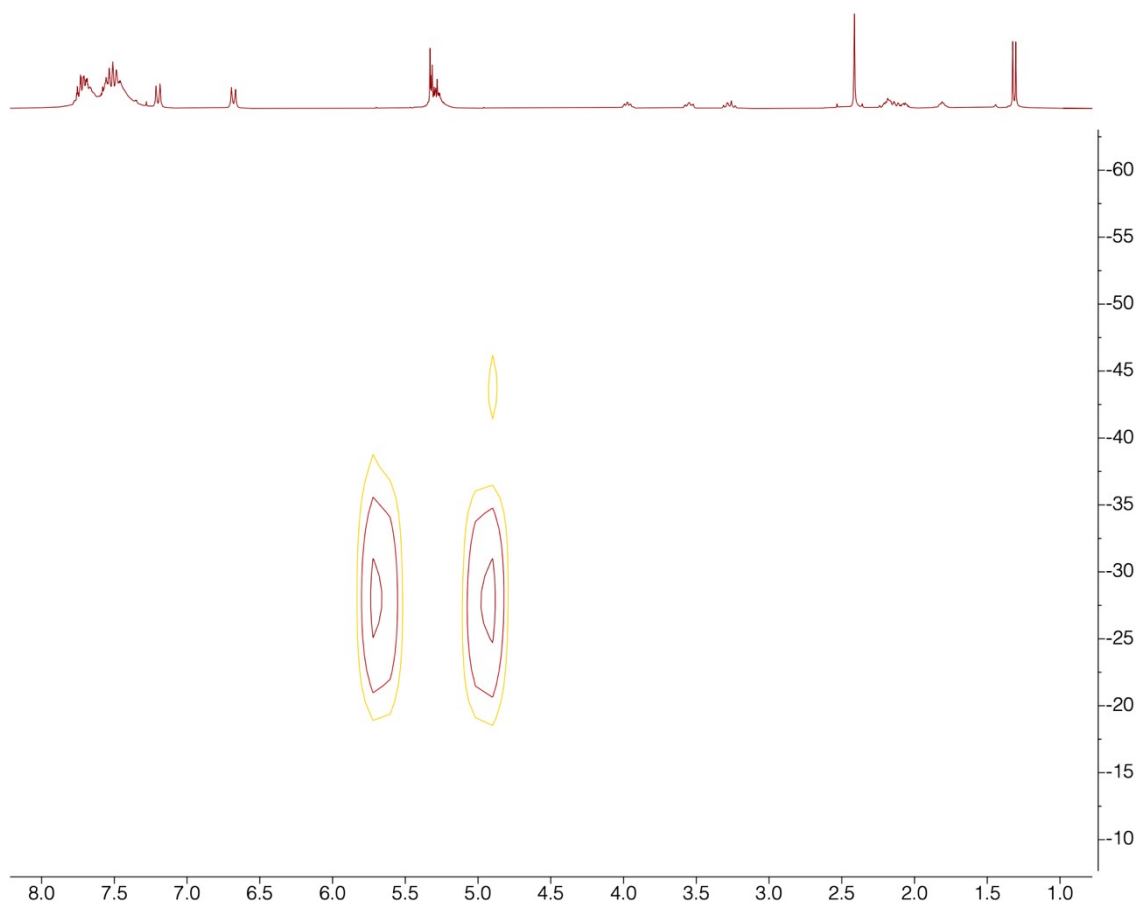


Figure S36. ^{19}Si - ^1H HMBC spectrum of the reductive amination of levulinic acid with *p*-toluidine (Table 2, Entry 3).

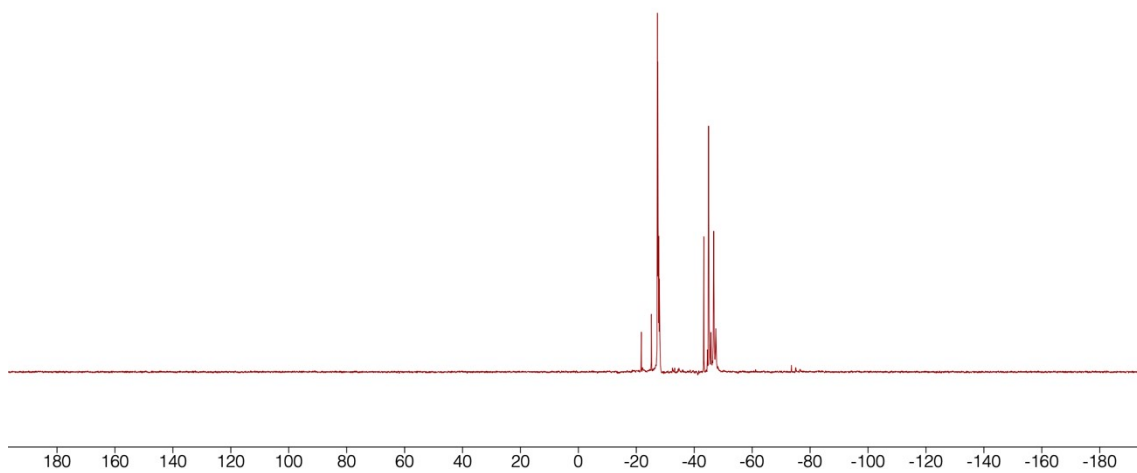


Figure S37. ^{29}Si DEPT of the reductive amination of levulinic acid with *p*-toluidine (Table 2, Entry 3).