Supporting Information

Synthesis, Crystal Structure and Magnetic Properties of a P-Stereogenic Ortho-(4-amino-tempo)Phosphinic Amide Radical and its Cu^{II} Complex

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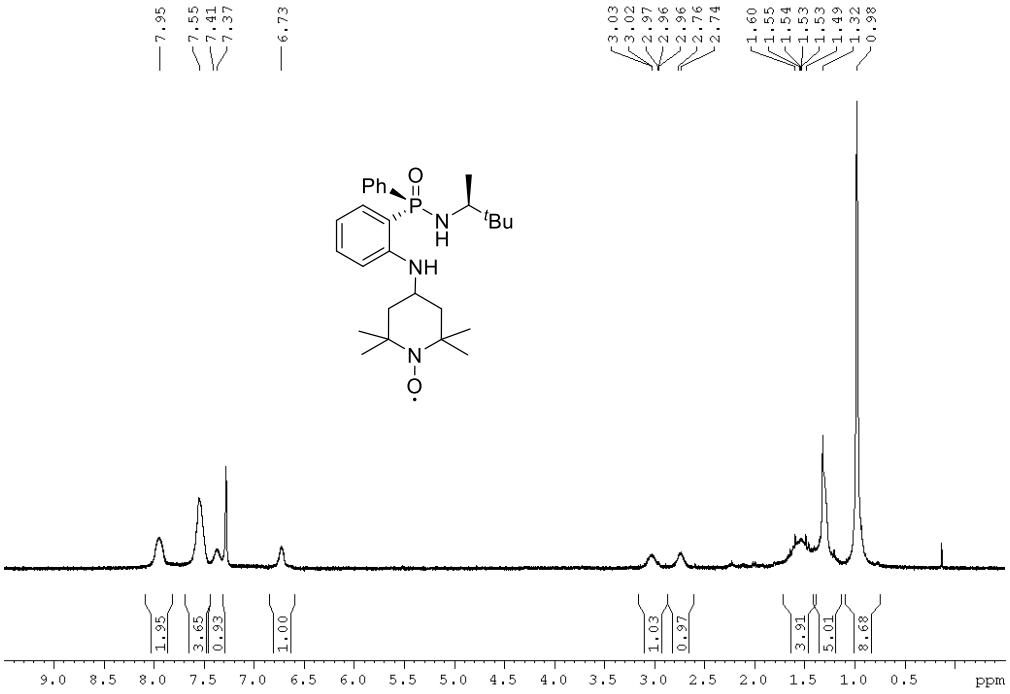

Figure S1. ^{1}H NMR spectrum (300.13 MHz) of compound **10**.

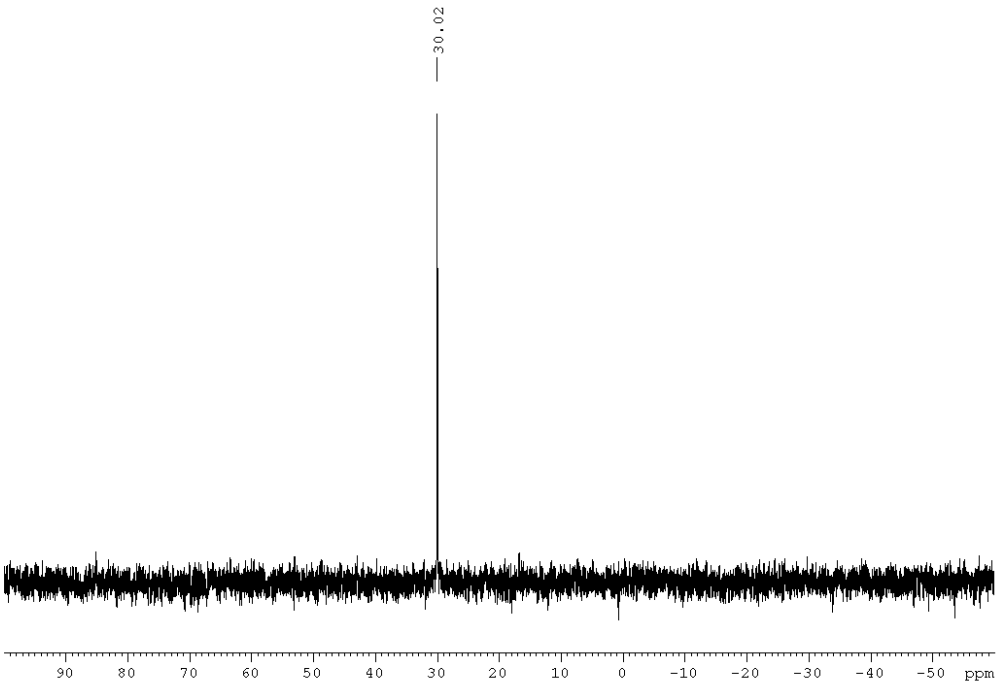

Figure S2. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) of compound **10**.

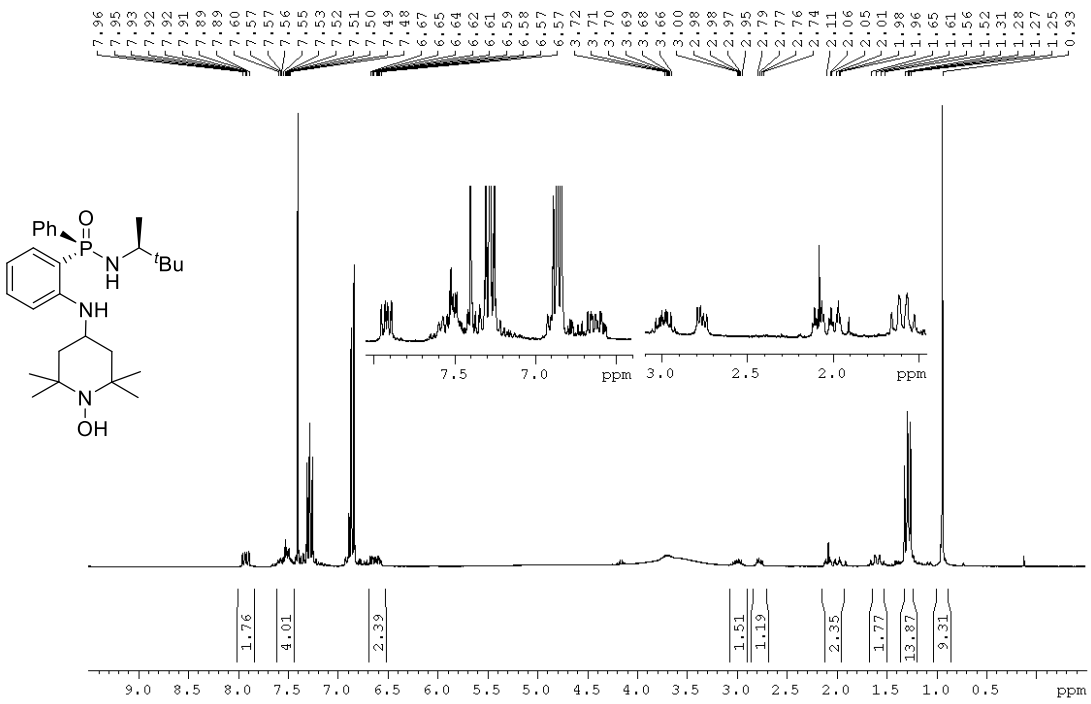

Figure S3. ^{1}H NMR spectrum (300.13 MHz) in the presence of $PhNHNH_2$ of compound **10**.

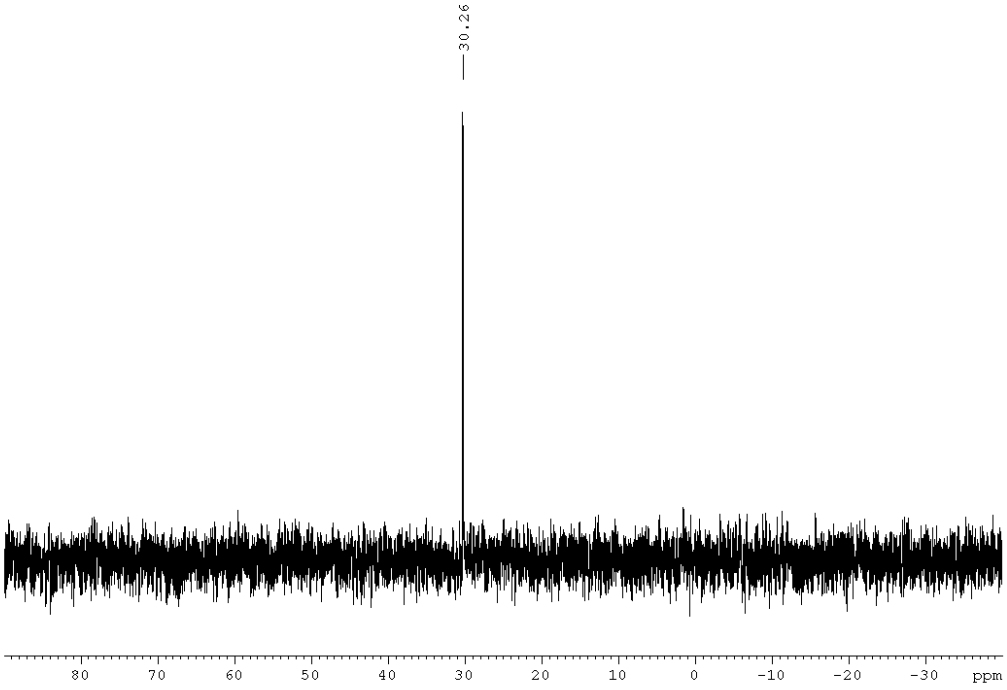

Figure S4. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) in the presence of $PhNHNH_2$ of compound **10**.

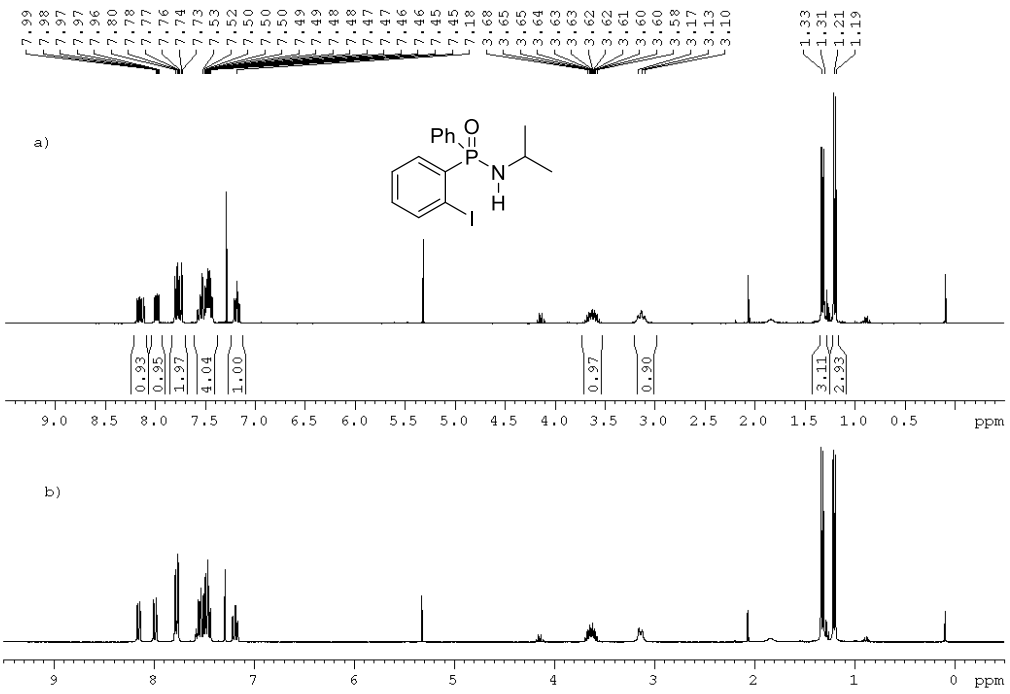

Figure S5. ^{1}H (a) and ^{1}H $\{^{31}P\}$ (b) NMR spectra (300.13 MHz) of compound **11**.

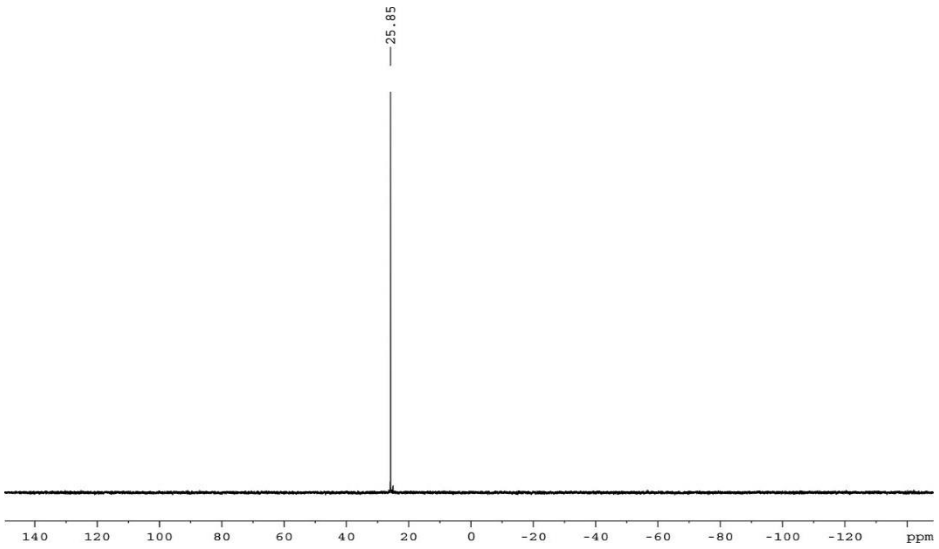

Figure S6. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) of compound **11**.

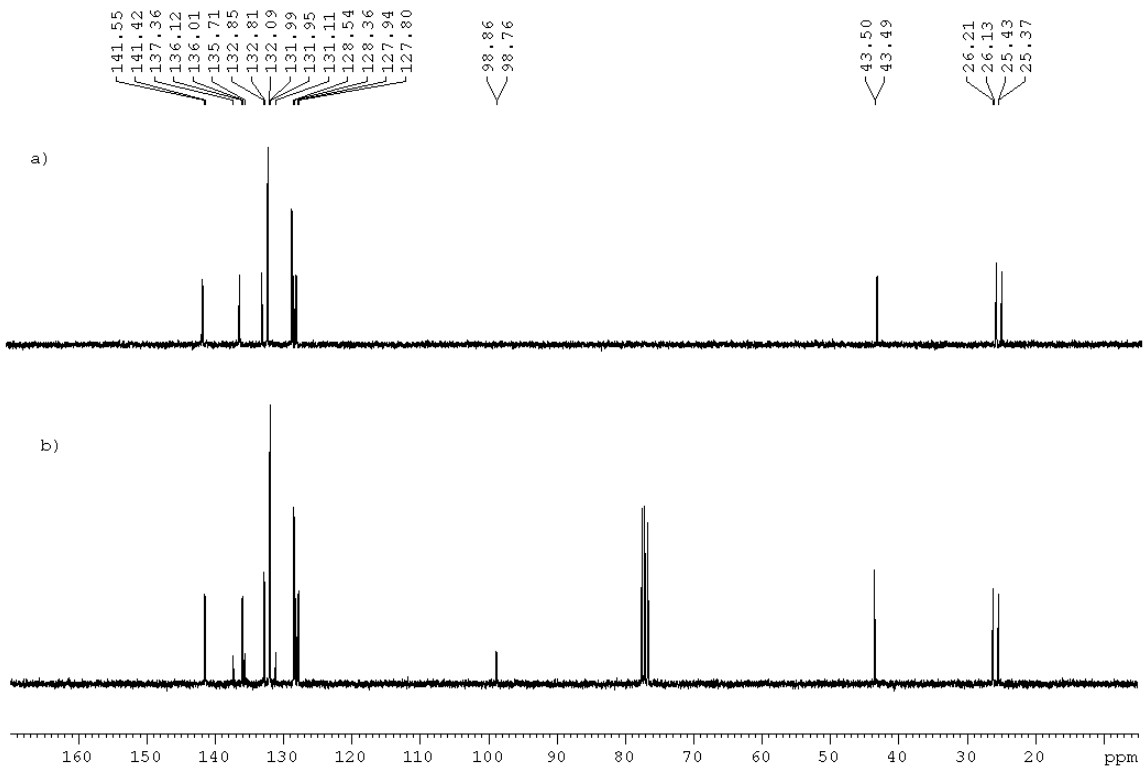

Figure S7. DEPT-135 (a) and $^{13}C\{^{1}H\}$ (b) NMR spectra (75.47 MHz) of compound **11**.

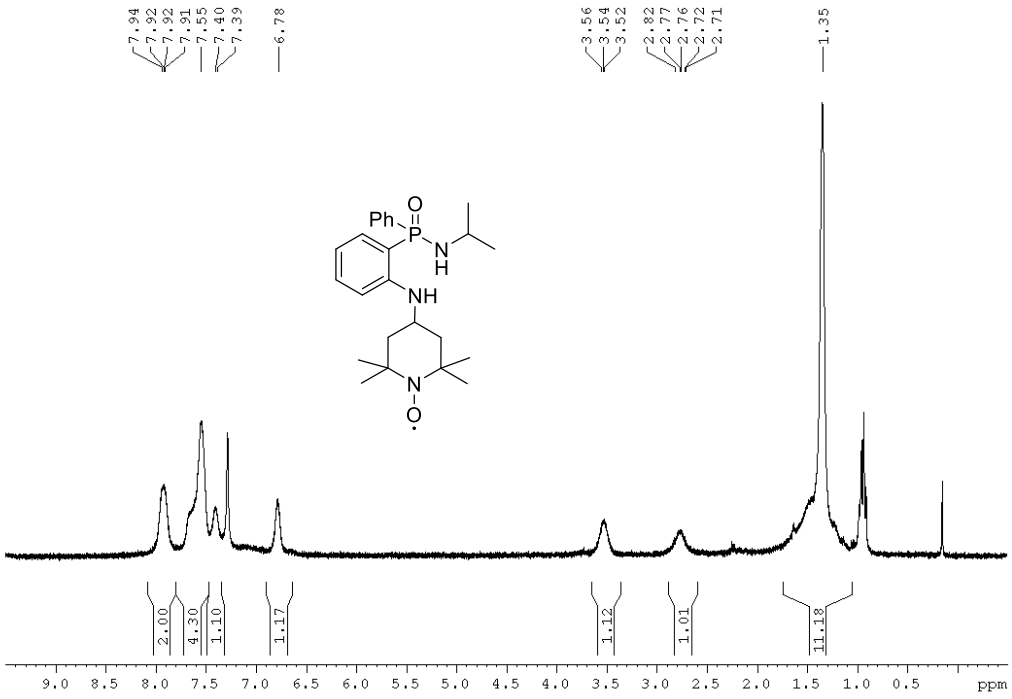

Figure S8. ^{1}H NMR spectrum (300.13 MHz) of compound **13**.

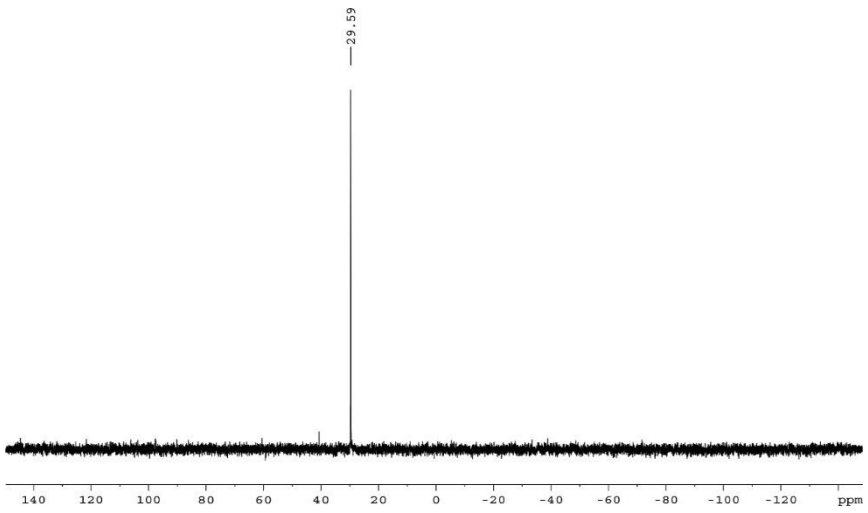

Figure S9. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) of compound **13**.

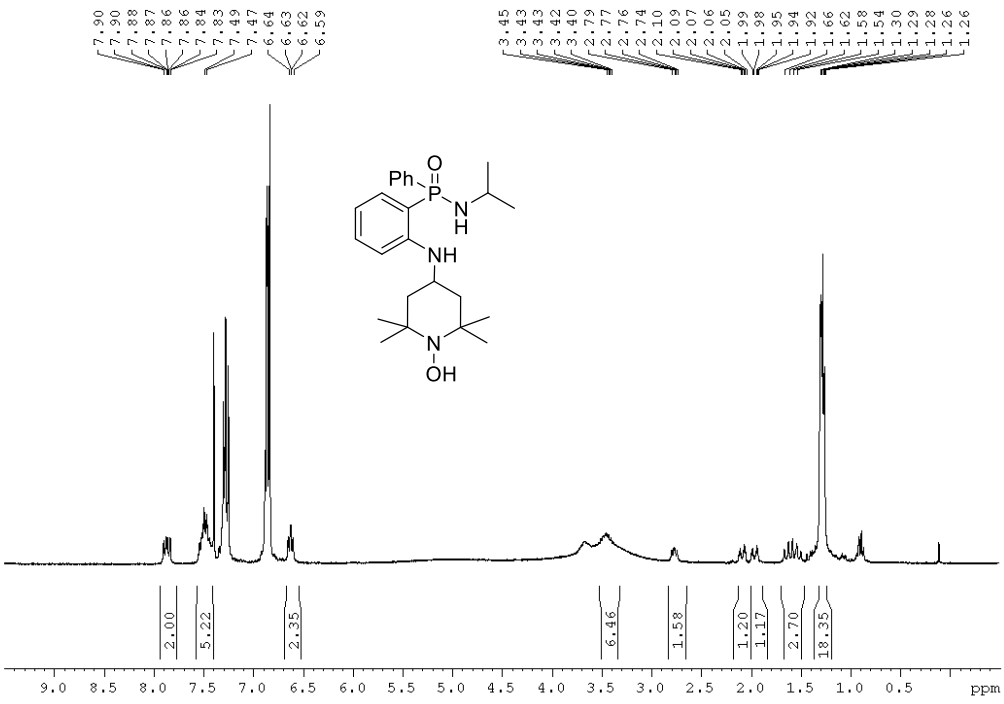

Figure S10. ^{1}H NMR spectrum (300.13 MHz) in the presence of $PhNHNH_2$ of compound **13**.

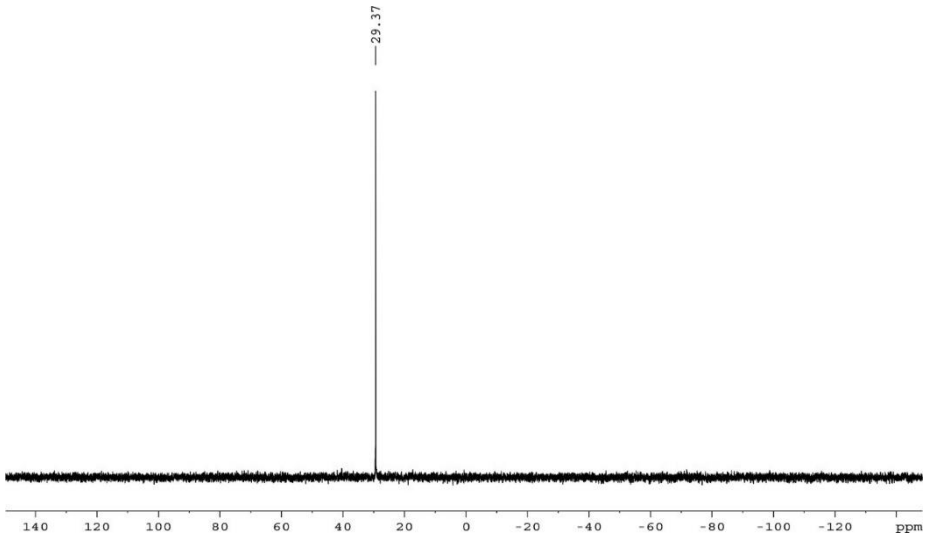

Figure S11. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) in the presence of $PhNHNH_2$ of compound **13**.

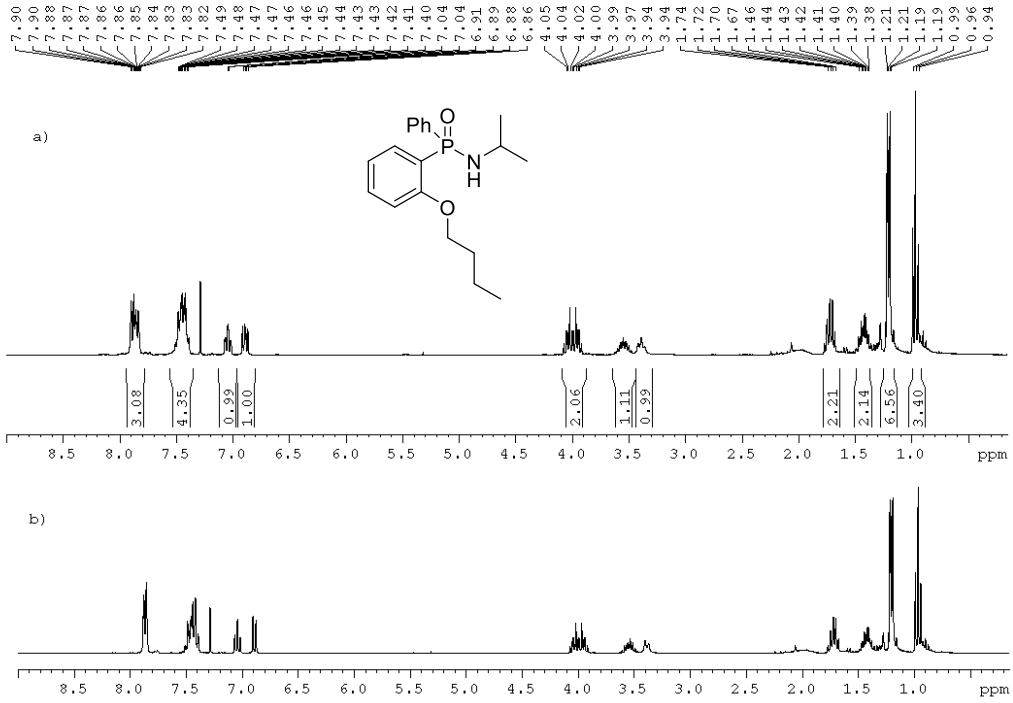

Figure S12. ^{1}H (a) and $^{1}H\{^{31}P\}$ (b) NMR spectra (300.13 MHz) of compound **14**.

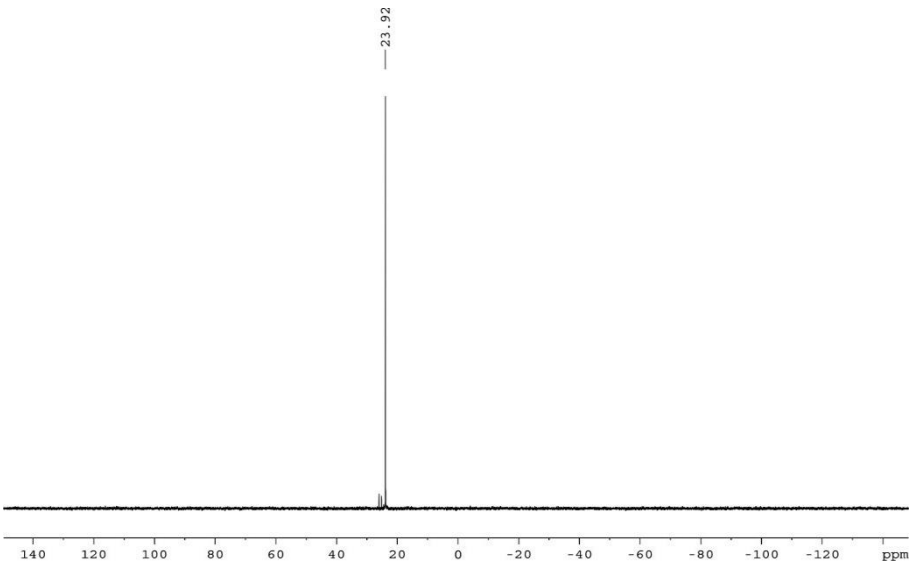

Figure S13. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) of compound **14**.

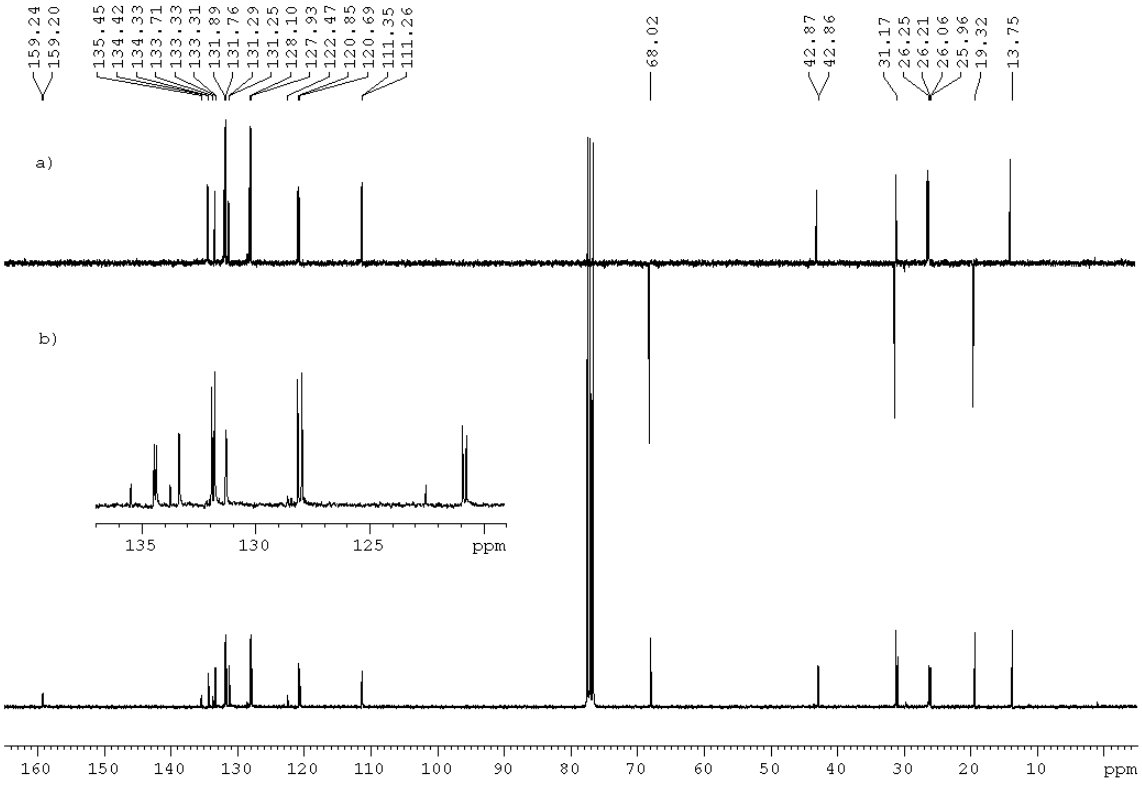

Figure S14. DEPT-135 (a) and $^{13}C\{^{1}H\}$ (b) NMR spectra (75.47 MHz) of compound **14**.

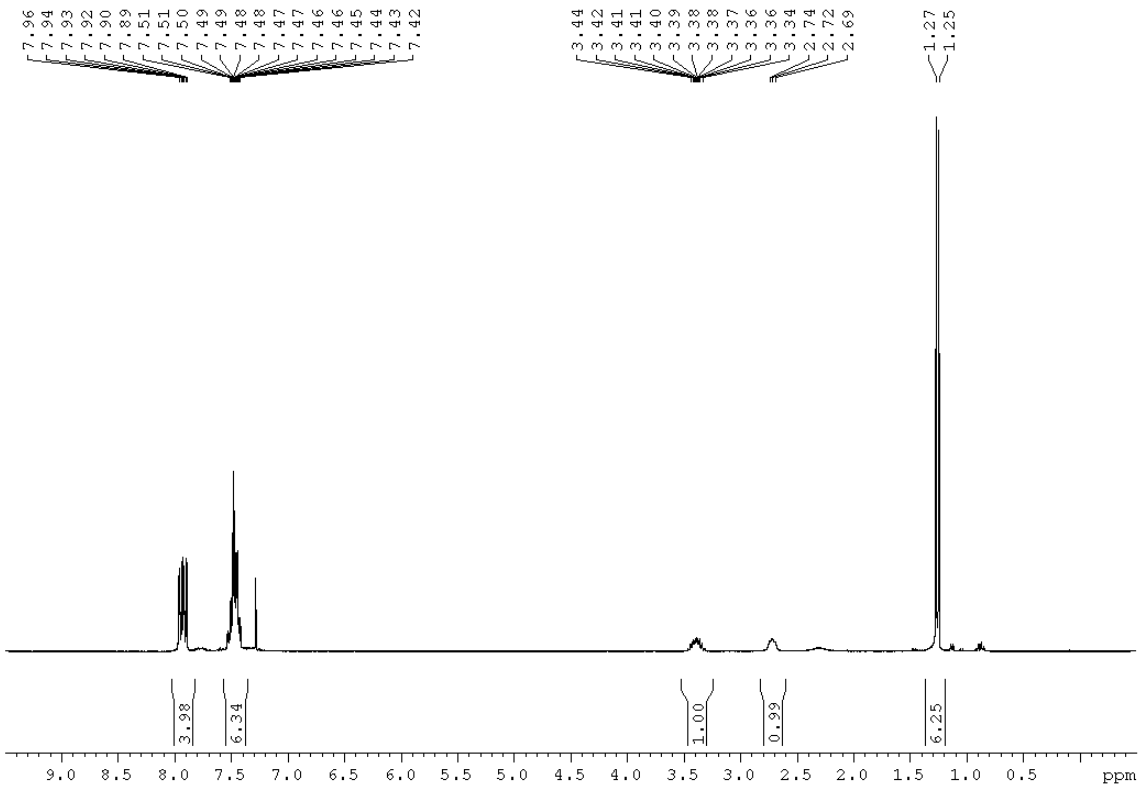

Figure S15. ^{1}H NMR spectrum (300.13 MHz) of compound **15**.

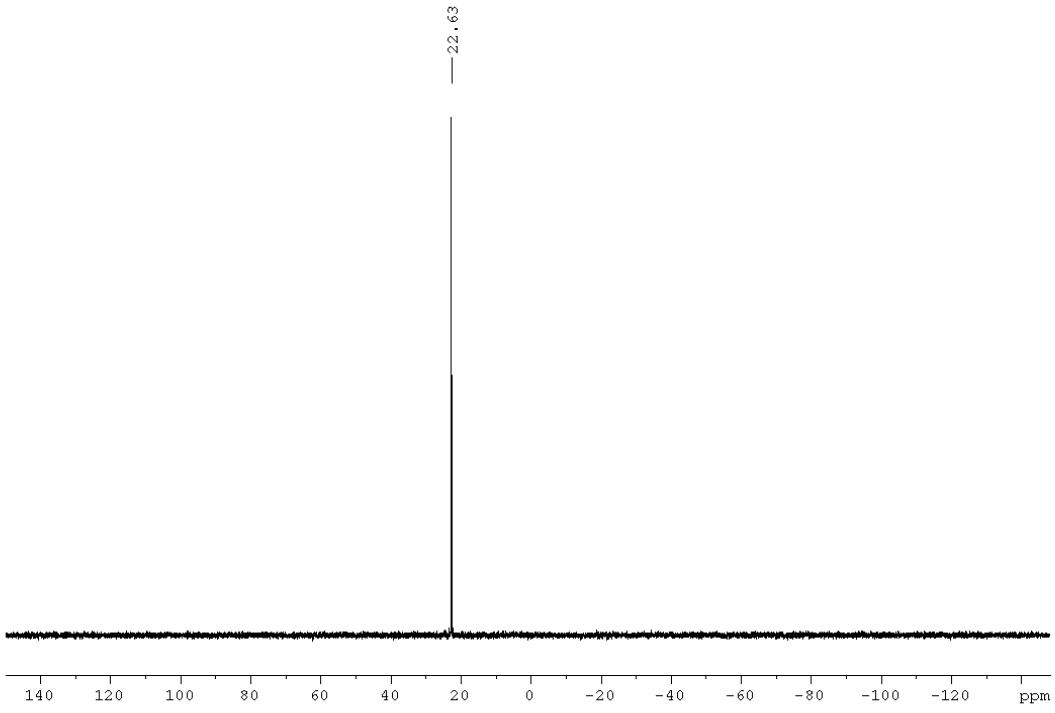

Figure S16. ^{31}P{^{1}H} NMR spectrum (121.50 MHz) of compound **15**.

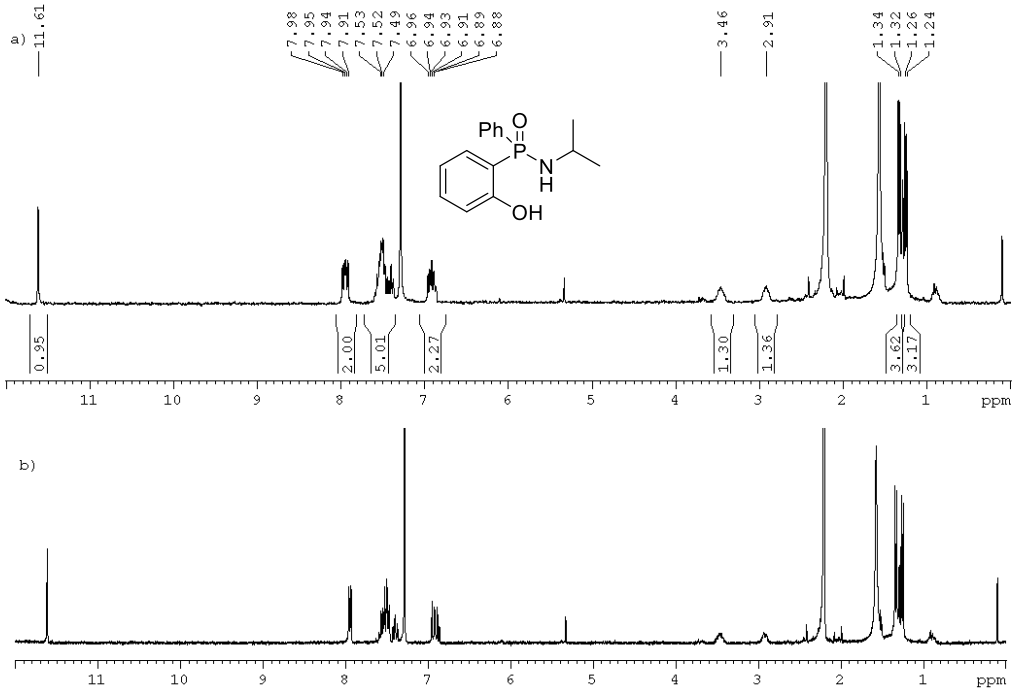

Figure S17. ^{1}H (a) and $^{1}H\{^{31}P\}$ (b) NMR spectra (300.13 MHz) of compound **16**.

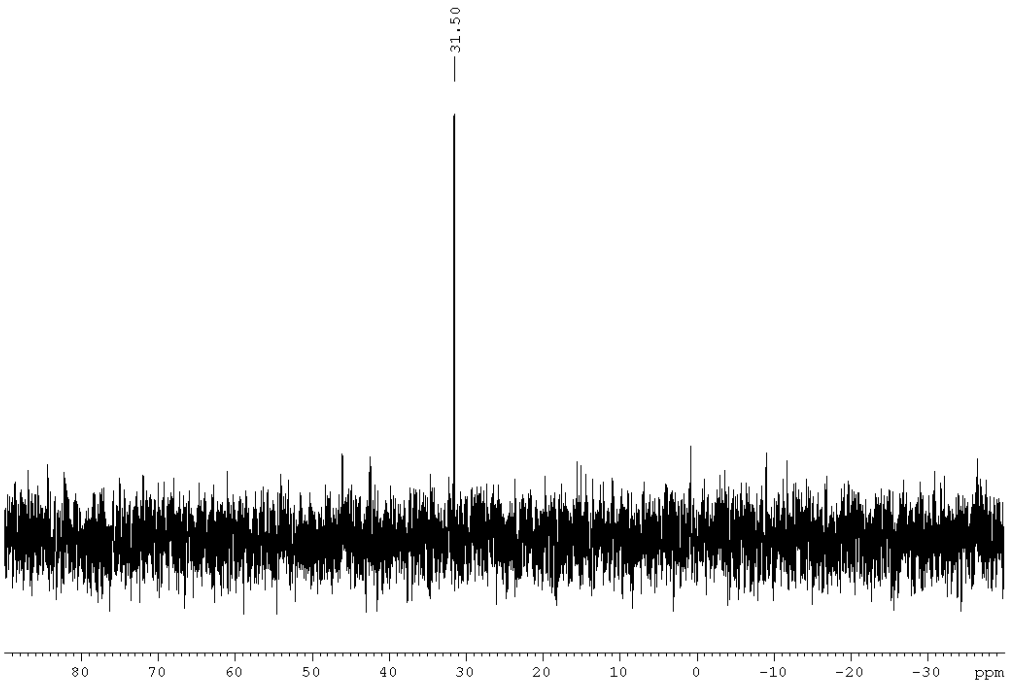

Figure S18. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) of compound **16**.

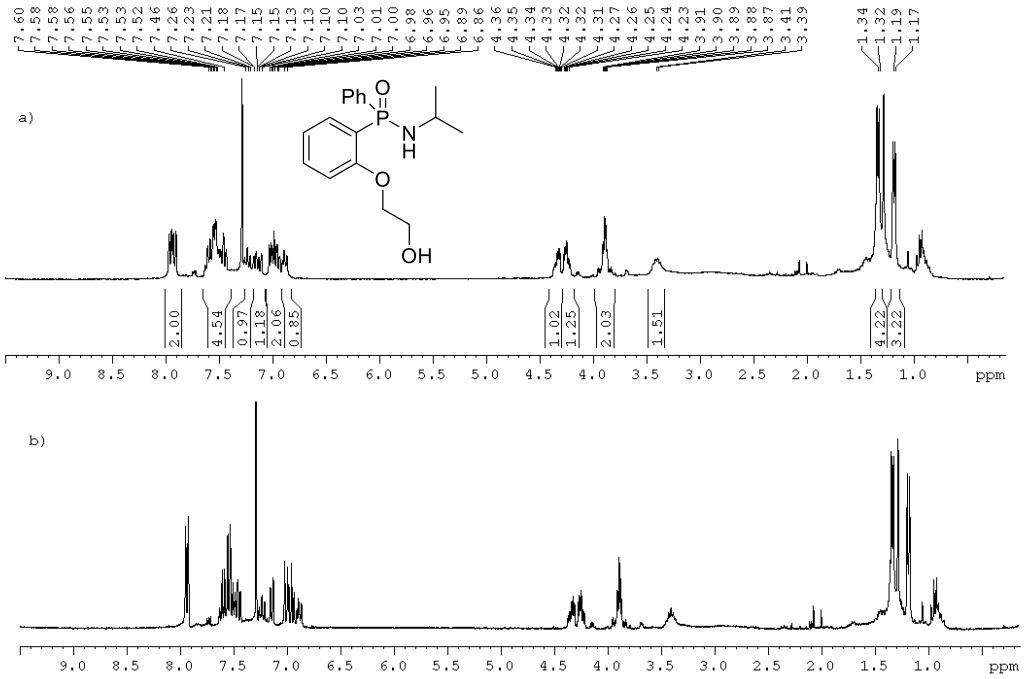

Figure S19. ^{1}H (a) and $^{1}H\{^{31}P\}$ (b) NMR spectra (300.13 MHz) of compound **17**.

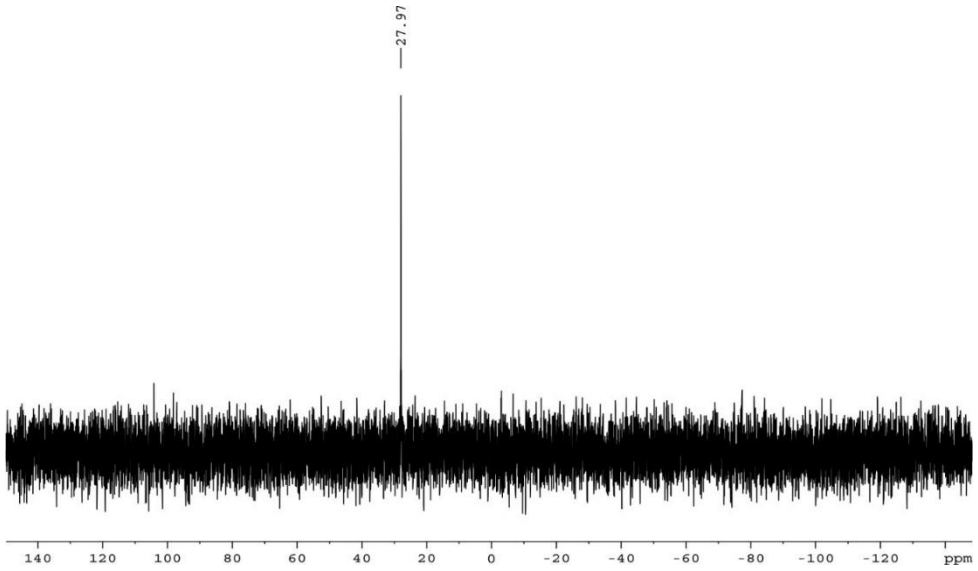

Figure S20. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) of compound **17**.

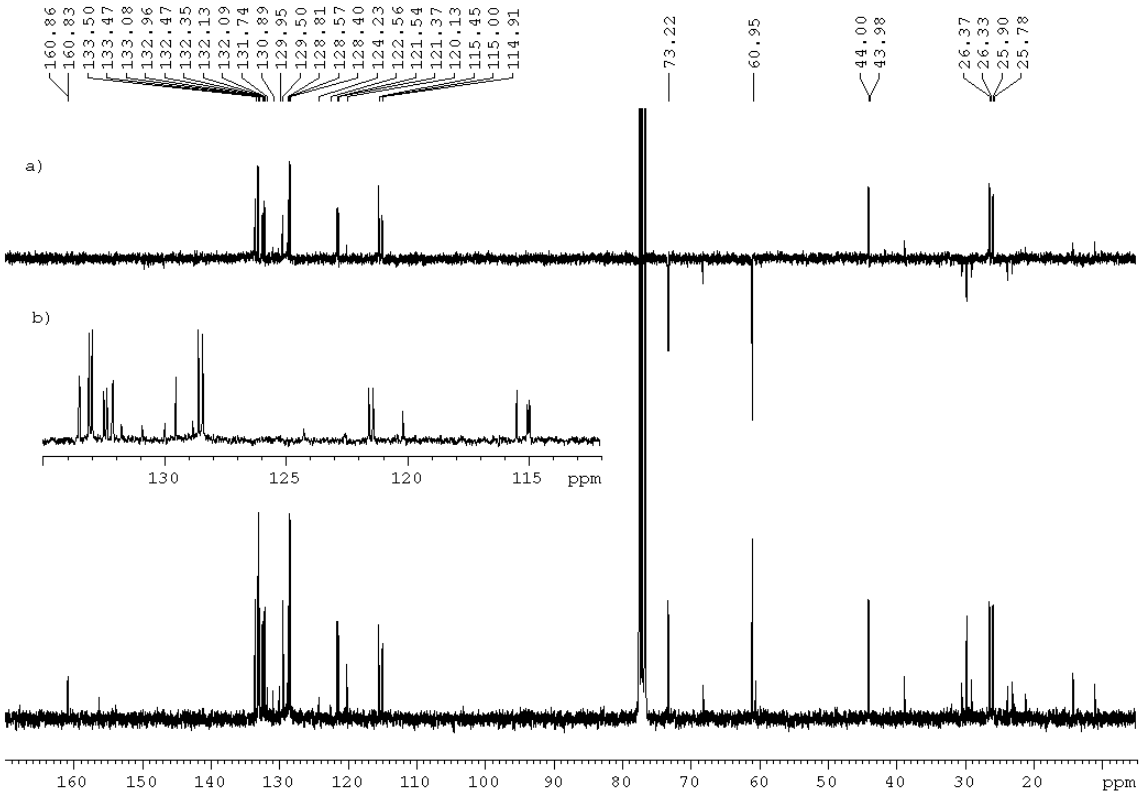

Figure S21. DEPT-135 (a) and $^{13}C\{^{1}H\}$ (b) NMR spectra (75.47 MHz) of compound **17**.

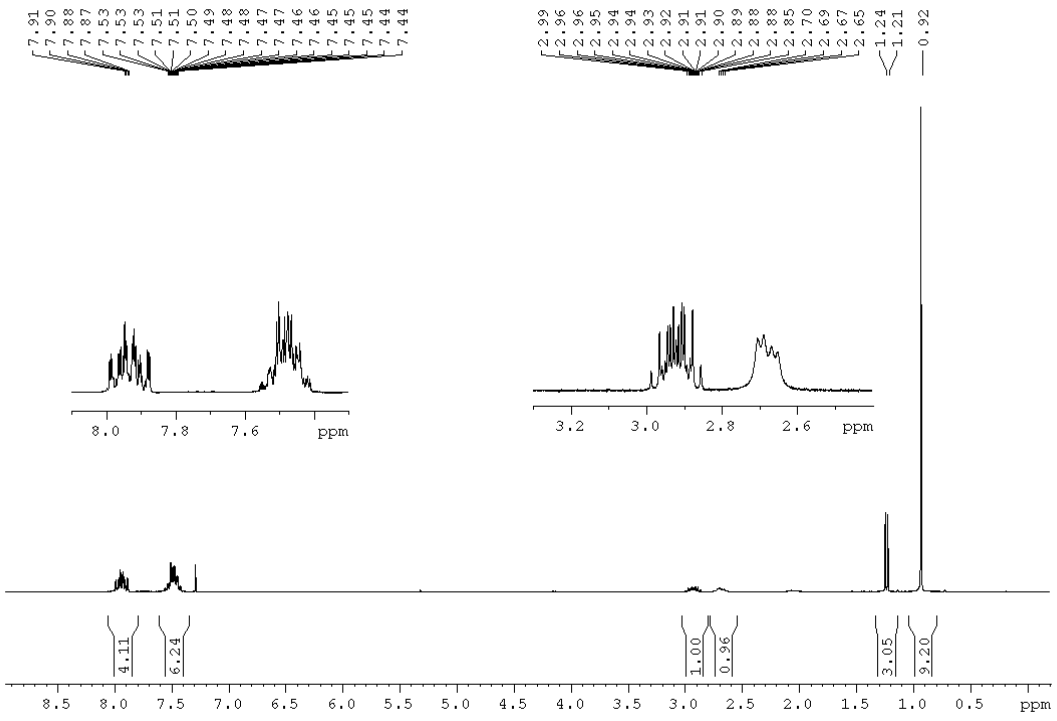

Figure S22. ^{1}H (a) NMR spectrum (300.13 MHz) of compound **18**.

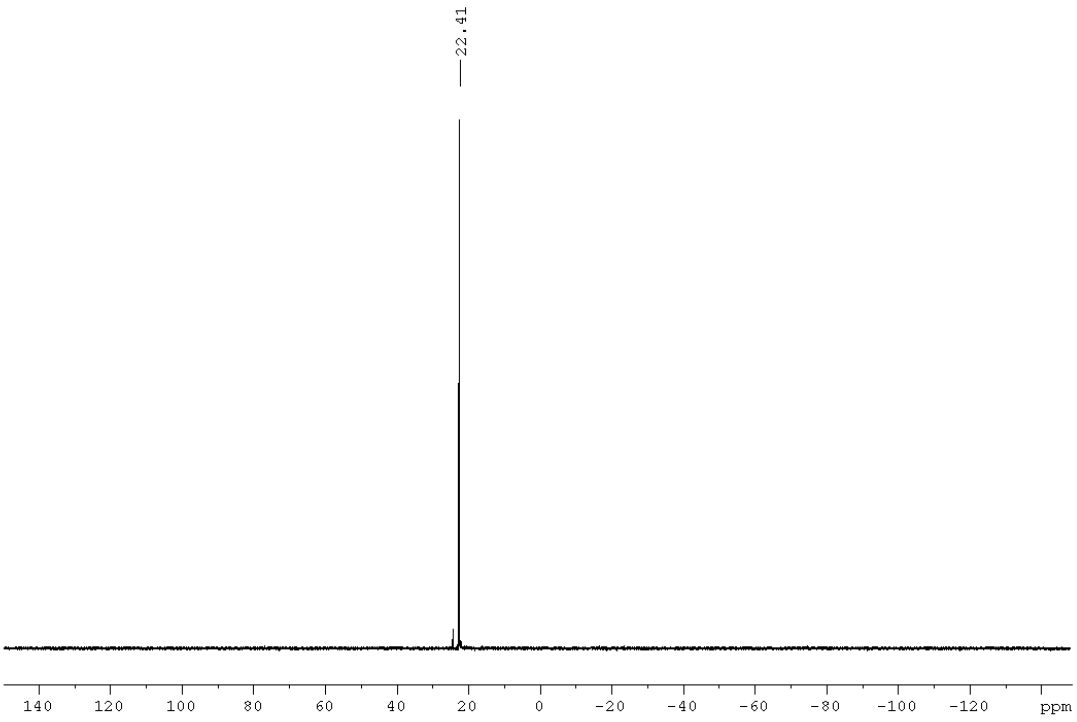

Figure S23. $^{31}P\{^{1}H\}$ NMR spectrum (121.50 MHz) of compound **18**.

Table S1: Summary of the crystal structure, data collection and refinement parameters for **10** and **19**.

Compound reference	**10**	**19**
Chemical formula	$C_{27}H_{41}N_3O_2P$	$C_{44}H_{51}CuF_{12}N_3O_6P$
Formula Mass	470.60	1040.40
Crystal system	Orthorhombic	Orthorhombic
a/Å	8.3792(2) Å	14.6129(3)
b/Å	17.0809(4) Å	15.1415(4)
c/Å	18.6707(4) Å	21.6411(5)
α/°	90	90
β/°	90	90
γ/°	90	90
Unit cell volume/Å^3	2672.23(11)	4788.34(19)
Temperature/K	100(2)	100(2)
Space group	*P* $2_12_12_1$	*P* $2_12_12_1$
No. of formula units per unit cell, *Z*	4	4
Radiation type	CuKα	CuKα
Absorption coefficient, μ/mm^{-1}	1.12	1.81
No. of reflections measured	13459	25077
No. of independent reflections	5437	9753
R_{int}	0.037	0.033
Final R_1 values ($I>2\sigma(I)$)	0.030	0.034
Final $wR(F^2)$ values ($I>2\sigma(I)$)	0.072	0.081
Final R_1 values (all data)	0.035	0.040
Final $wR(F^2)$ values (all data)	0.075	0.084
Goodness of fit on F^2	1.05	1.03
$\Delta\rho_{max}$ and $\Delta\rho_{min}$, eÅ^{-3}	0.21 and -0.32	0.46 and -0.30
Flack parameter	0.024(9)	-0.007(9)
CCDC Deposition	2011812	2011813

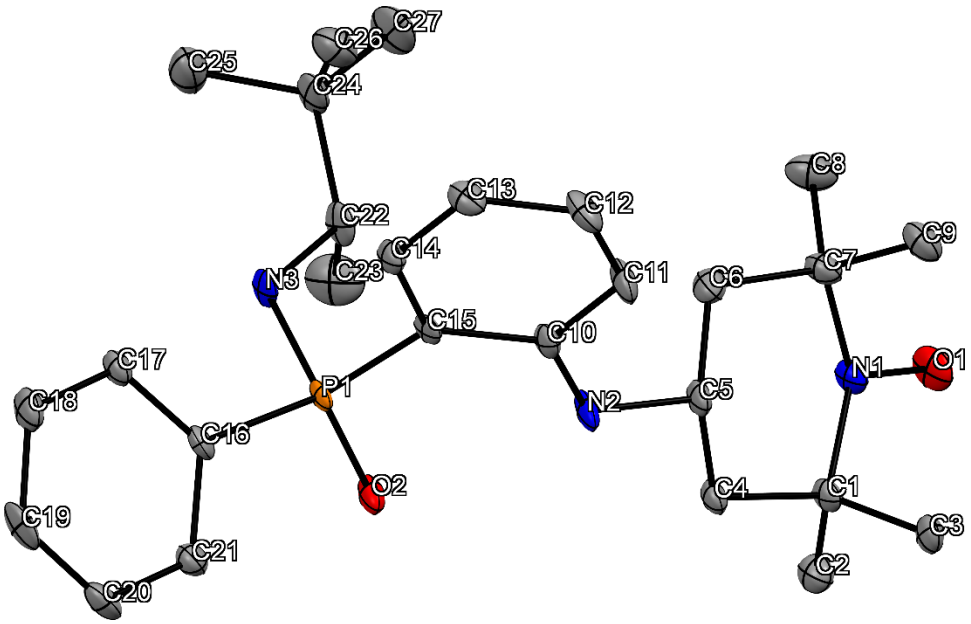

Figure S20: Thermal ellipsoids of the asymmetric unit of compound **10** drawn at 50% of probability level. Hydrogen atoms were omitted for clarity.

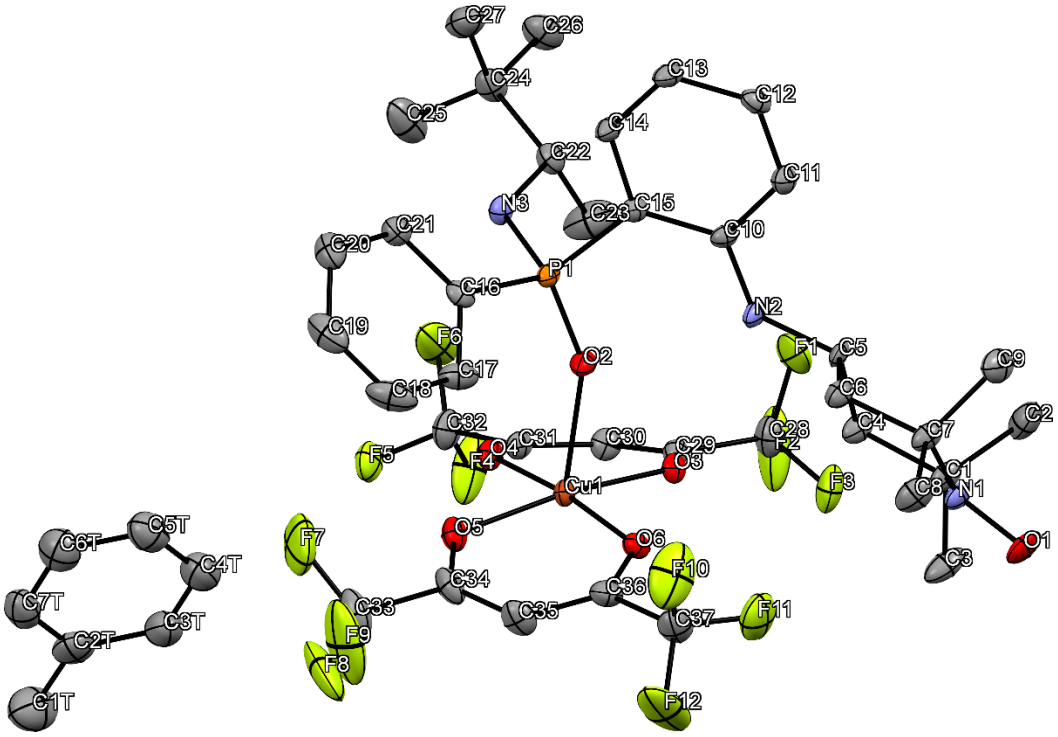

Figure S21: Thermal ellipsoids of the asymmetric unit of compound **19** drawn at 50% of probability level. Hydrogen atoms were omitted for clarity.