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Electronic Supplementary Material

A new amido-phosphane as ligand for copper and silver complexes. Synthesis, characterization and catalytic application for azide-alkyne cycloaddition in glycerol

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1. X-ray data

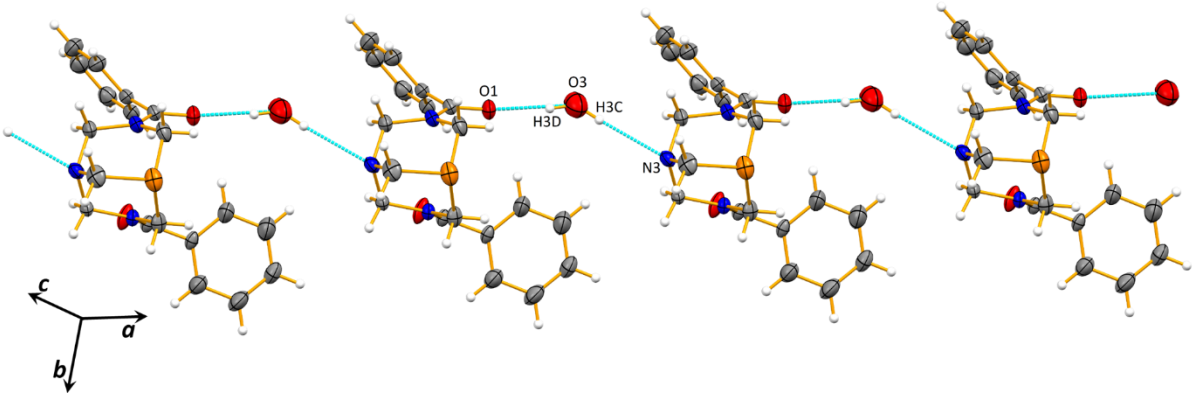


Figure S1. The H-bond 1D chain of compound **1** spreading along the crystallographic *a* axis.

Table S1. Crystallographic data and structure refinement details for **1**.

Empirical formula	$C_{38}H_{42}N_6O_5P$
Formula Weight	724.71
Crystal system	monoclinic
Space group	P 21/n
Temperature/K	298(2)
a/Å	9.5691(5)
b/Å	21.4898(12)
c/Å	10.0298(5)
β/°	116.955(2)
V (Å^3)	1819.0(5)
Z	2
D_{calc} (g cm^{-3})	1.309
*F*000	764
μ(Mo Kα) (mm^{-1})	0.170
Rfls. collected/unique/observed	26254 / 4024 / 2779
R_{int}	0.0533
Final *R*1 [a], *wR*2 [b] ($I \geq 2\sigma$)	0.1226, 0.3516
Goodness-of-fit on F^2	1.209

[a] $R = \Sigma||F_o|-|F_c||/\Sigma|F_o|$; [b] $wR(F^2) = [\Sigma w(|F_o|^2 - |F_c|^2)^2/\Sigma w|F_o|^4]^{½}$.

2. NMR spectra of DBPTA (1) and its complexes 2-12.

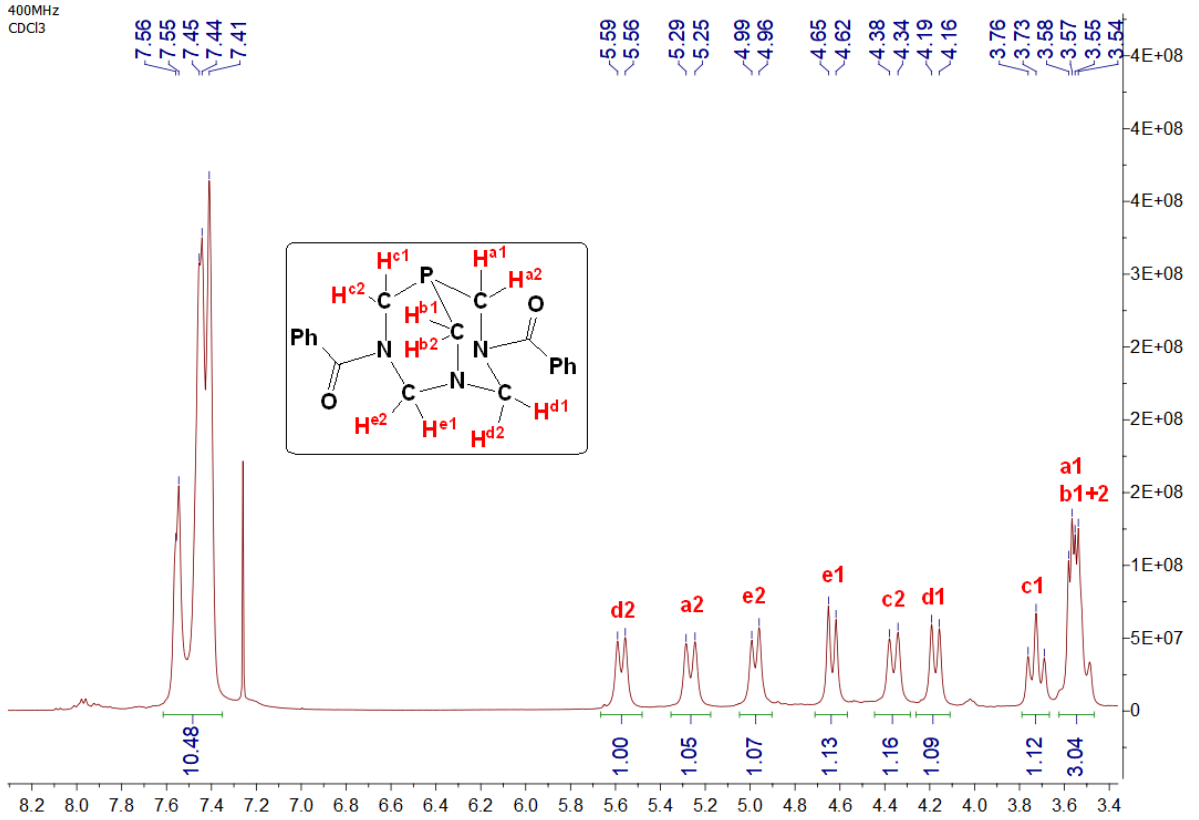


Figure S2. ^{1}H NMR spectrum of DBPTA (**1**) in $CDCl_3$ (400 MHz).

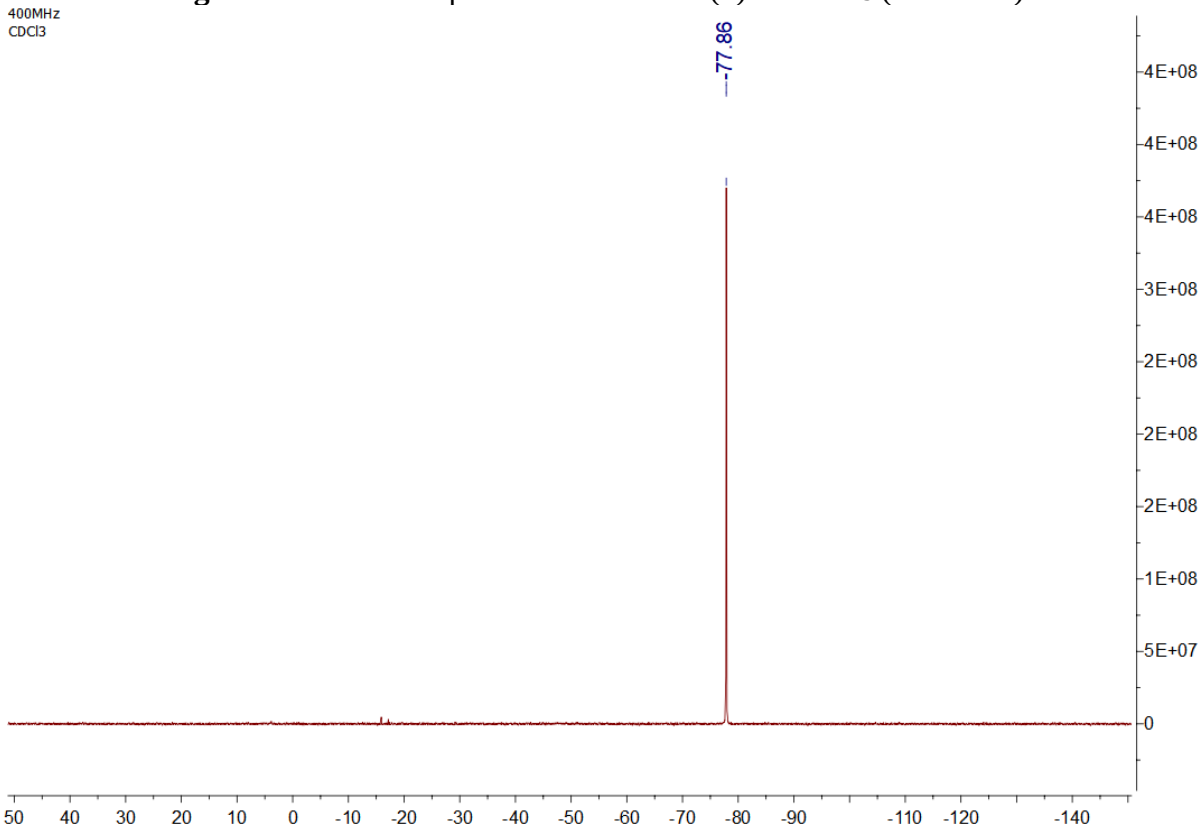


Figure S3. ^{31}P NMR spectrum of DBPTA (**1**) in $CDCl_3$ (400 MHz).

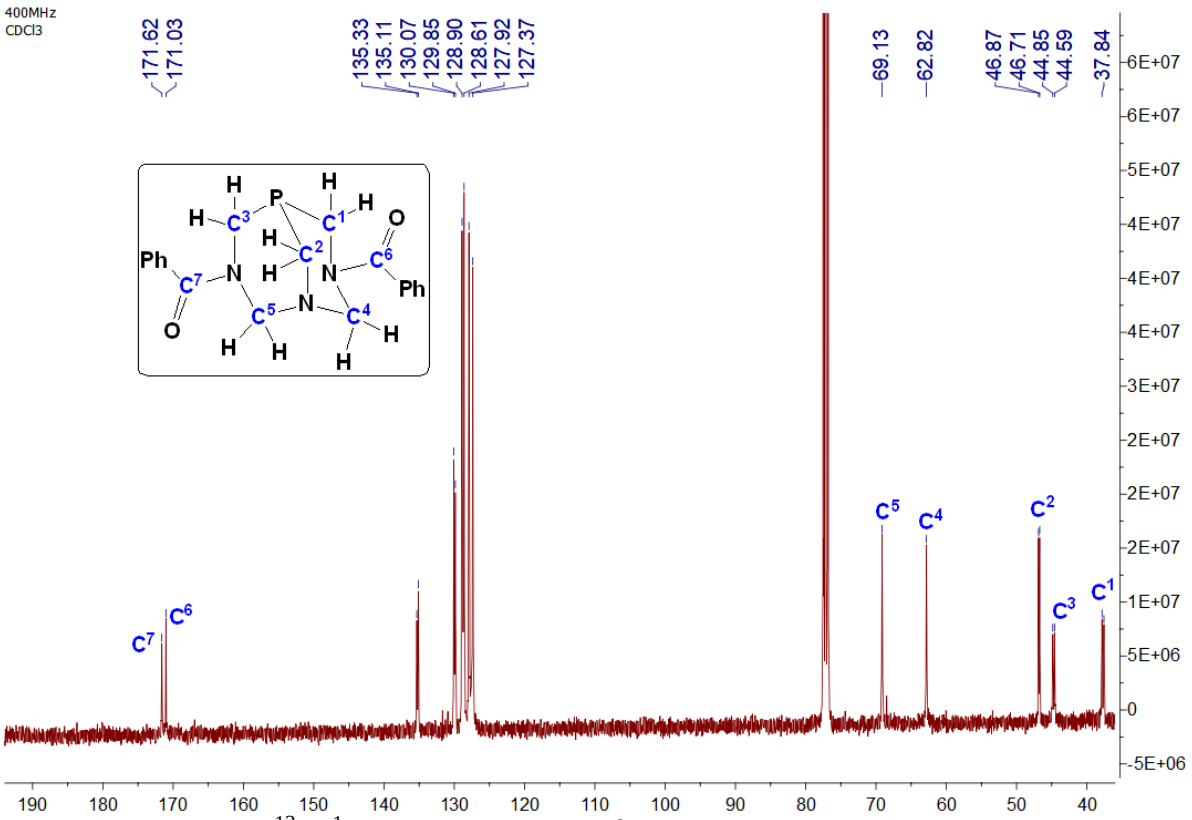


Figure S4. $^{13}C\{^{1}H\}$ NMR spectrum of DBPTA (**1**) in $CDCl_3$ (400 MHz).

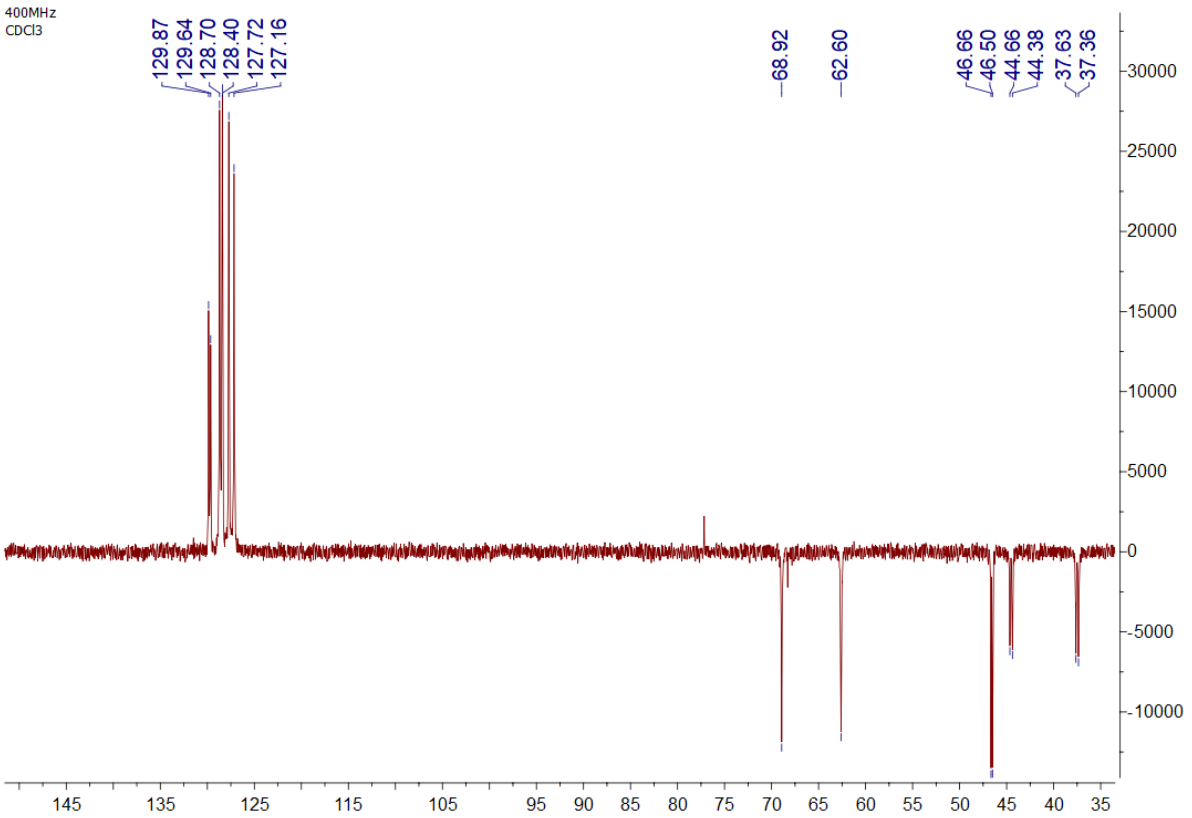


Figure S5. DEPT NMR spectrum of DBPTA (**1**) in $CDCl_3$ (400 MHz).

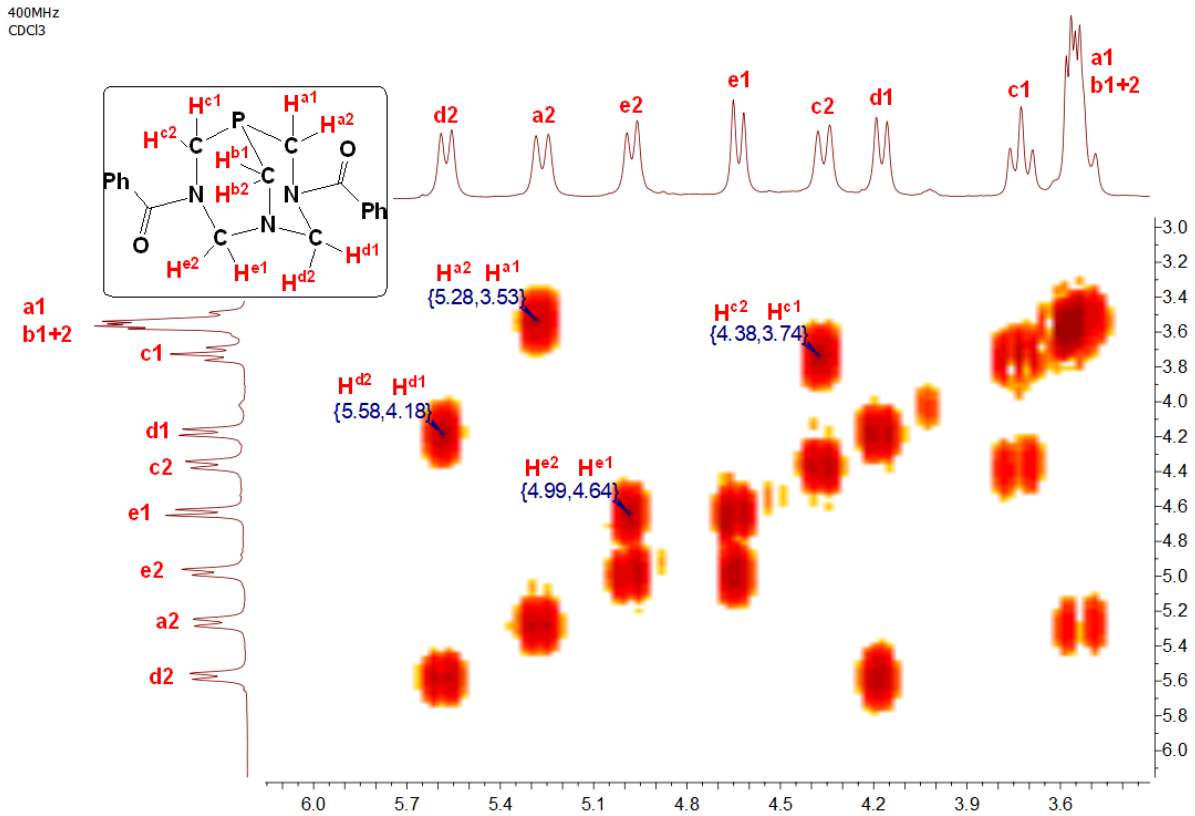


Figure S6. COSY spectrum of DBPTA (**1**) in $CDCl_3$ (400 MHz).

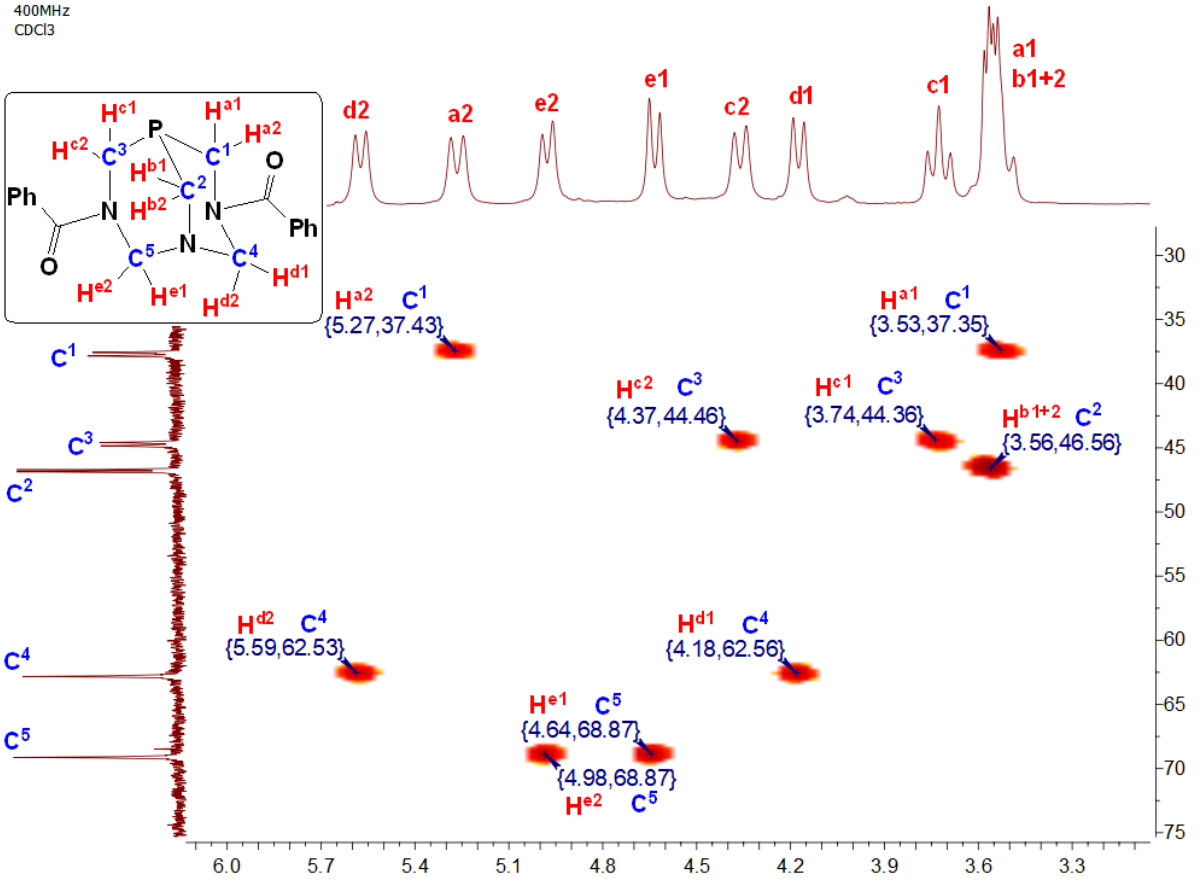


Figure S7. HSQC spectrum of DBPTA (**1**) in $CDCl_3$ (400 MHz).

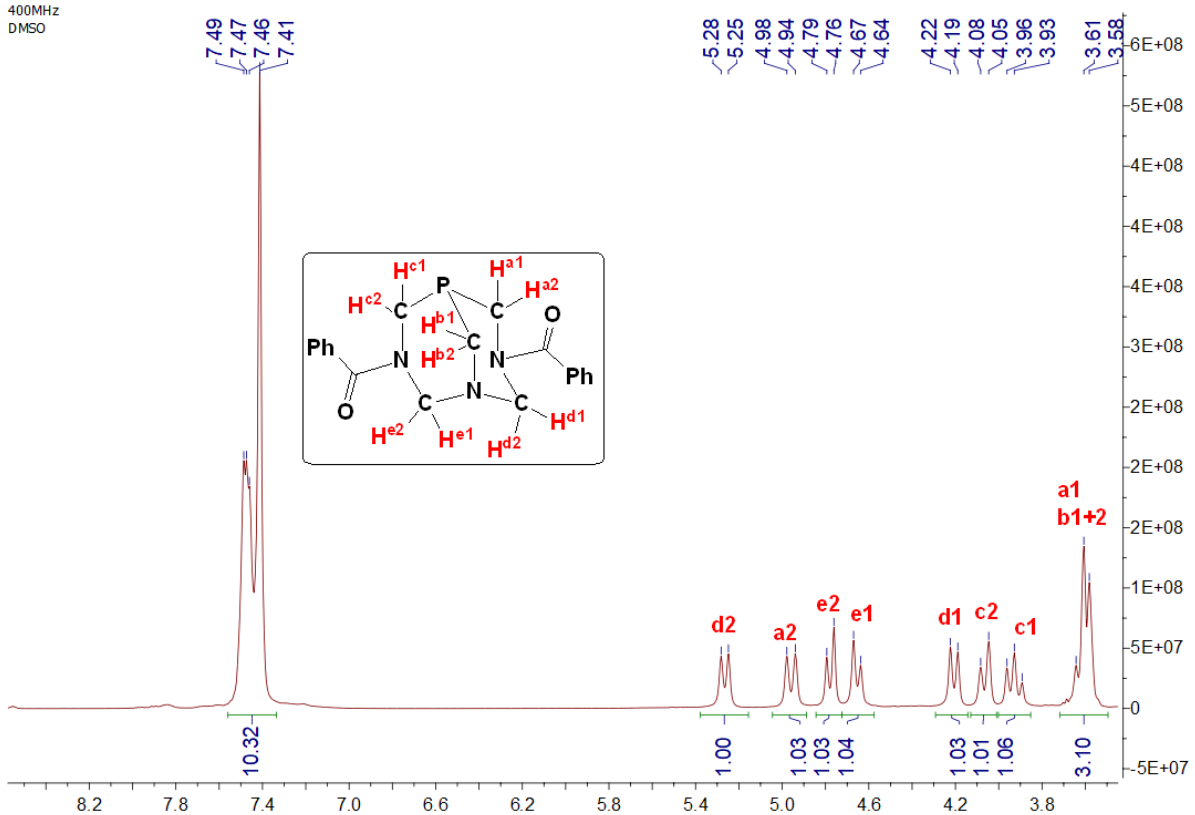


Figure S8. ^{1}H NMR spectrum of DBPTA (**1**) in DMSO-*d*$_6$ (400 MHz).

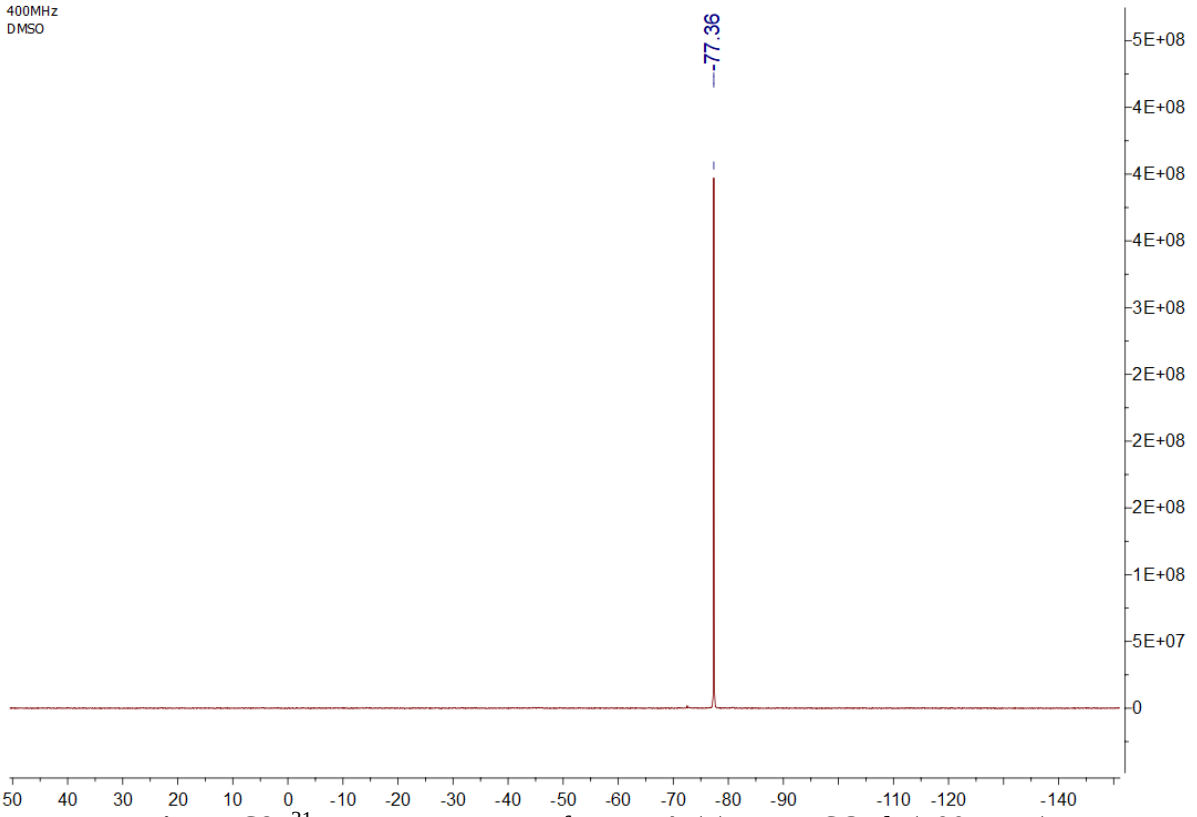


Figure S9. ^{31}P NMR spectrum of DBPTA (**1**) in DMSO-*d*$_6$ (400 MHz).

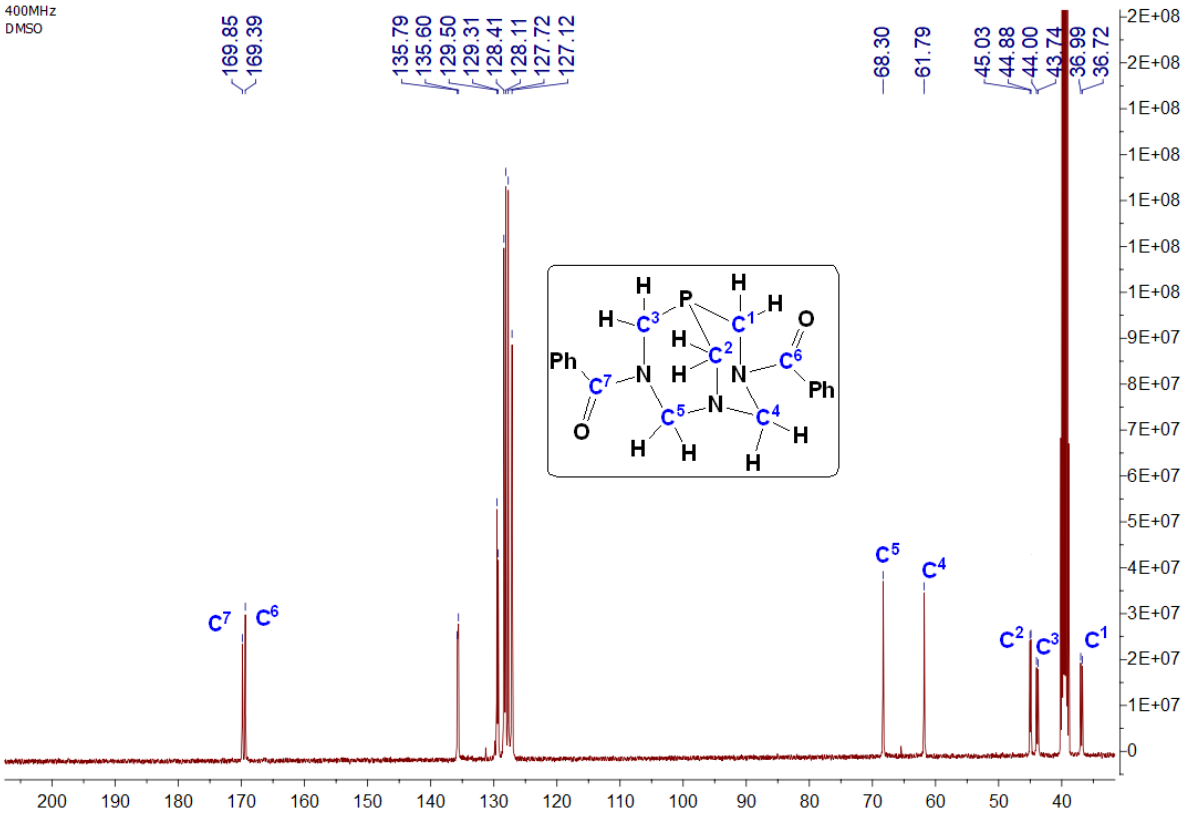


Figure S10. $^{13}C\{^{1}H\}$ NMR spectrum of DBPTA (**1**) in DMSO-d_6 (400 MHz).

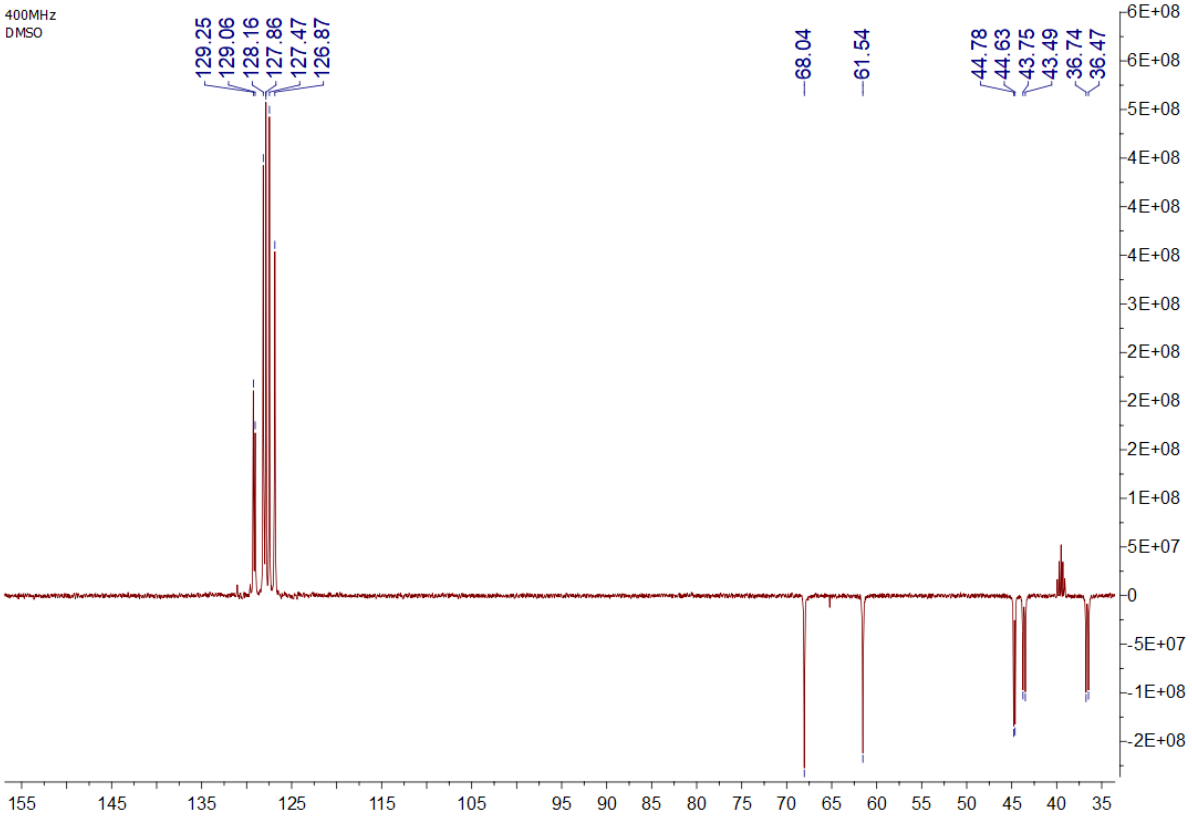


Figure S11. DEPT NMR spectrum of DBPTA (**1**) in DMSO-d_6 (400 MHz).

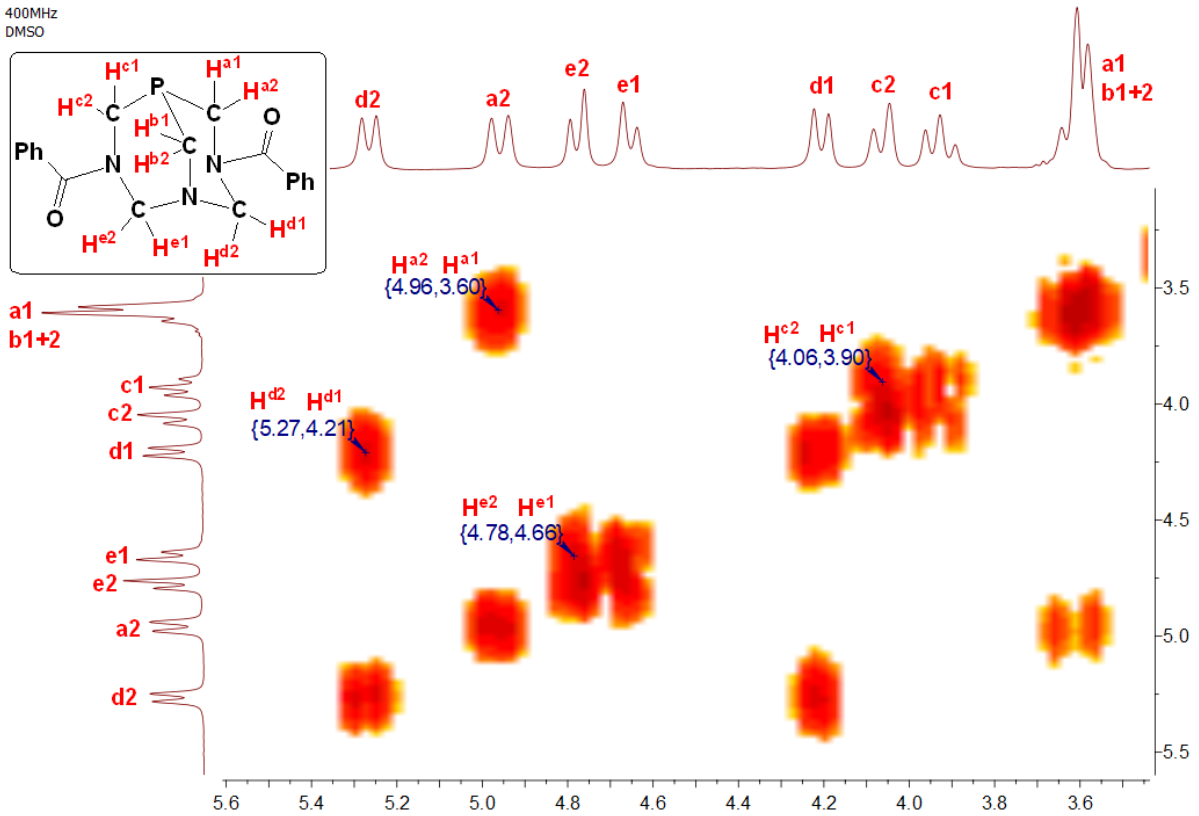


Figure S12. COSY spectrum of DBPTA (**1**) in DMSO-d_6 (400 MHz).

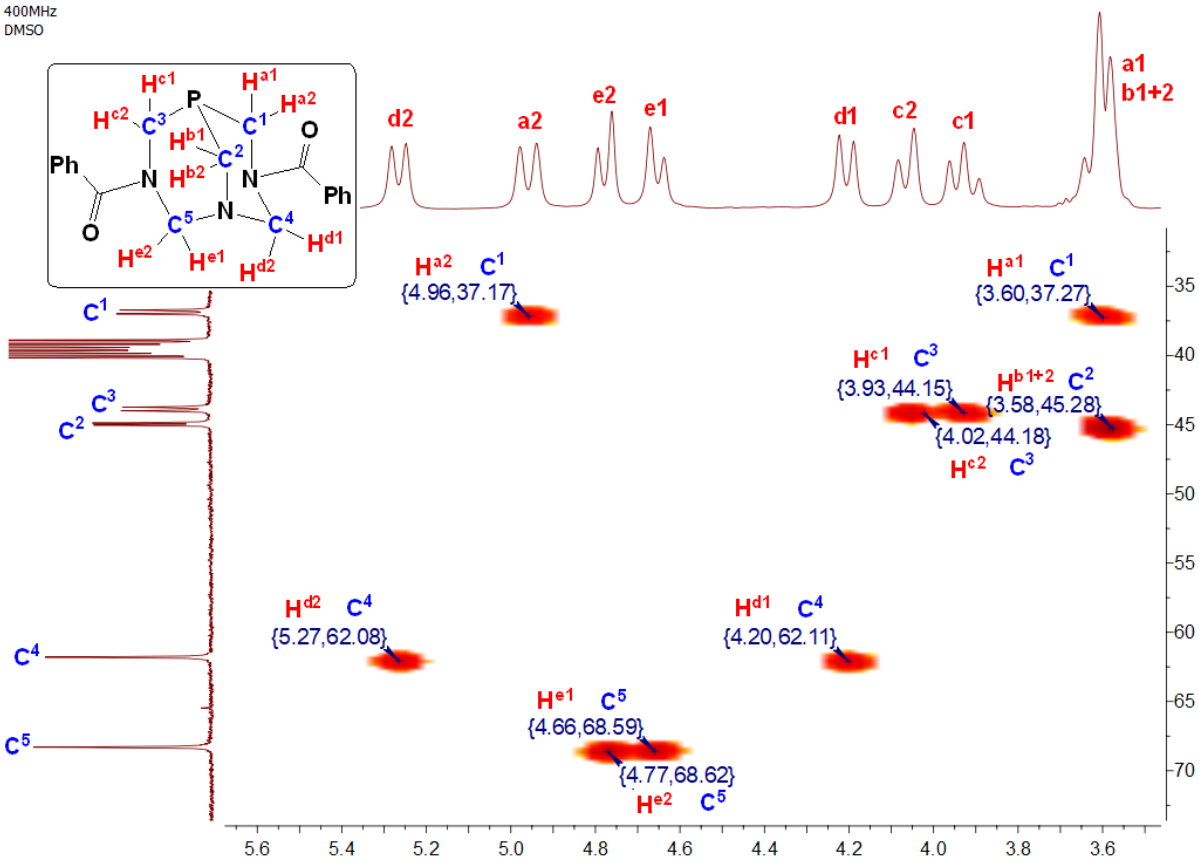


Figure S13. HSQC spectrum of DBPTA (**1**) in DMSO-d_6 (400 MHz).

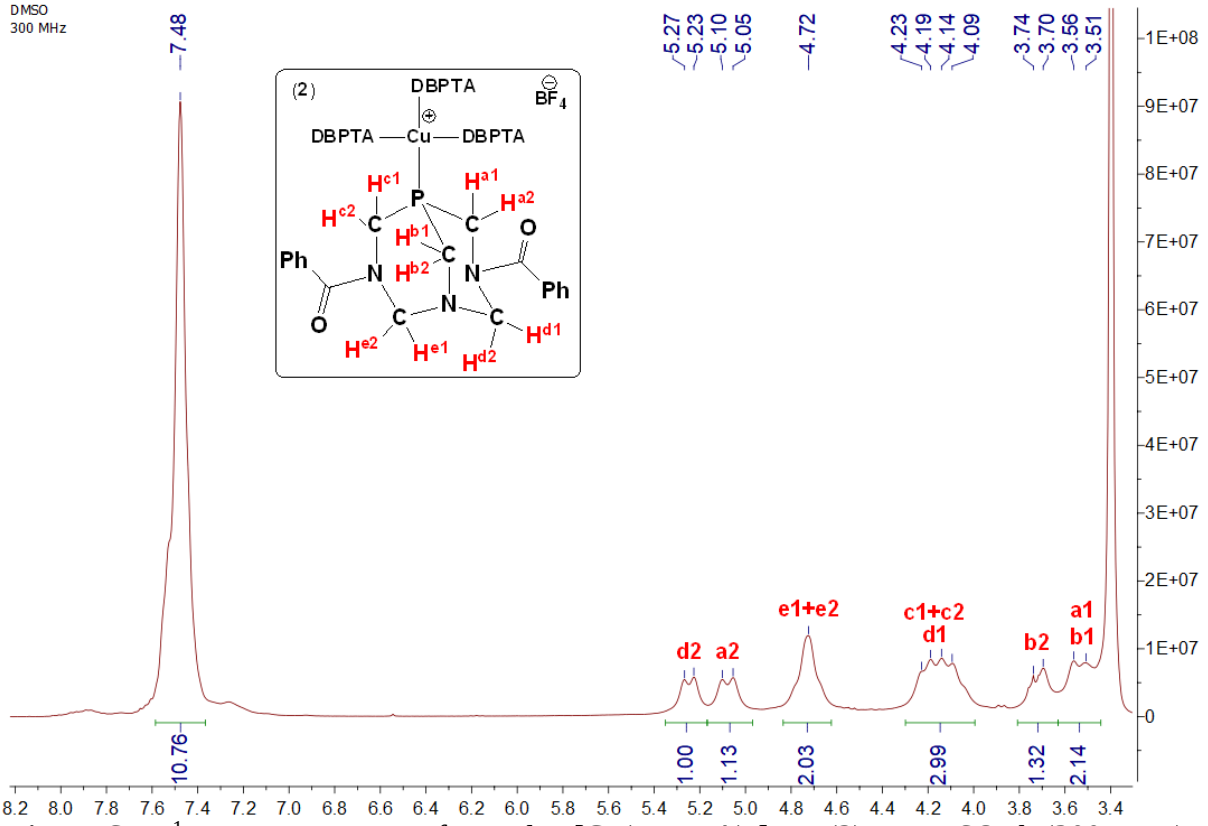


Figure S14. ^{1}H NMR spectrum of complex [Cu(DBPTA)$_4$]BF$_4$ (**2**) in DMSO-*d*$_6$ (300 MHz).

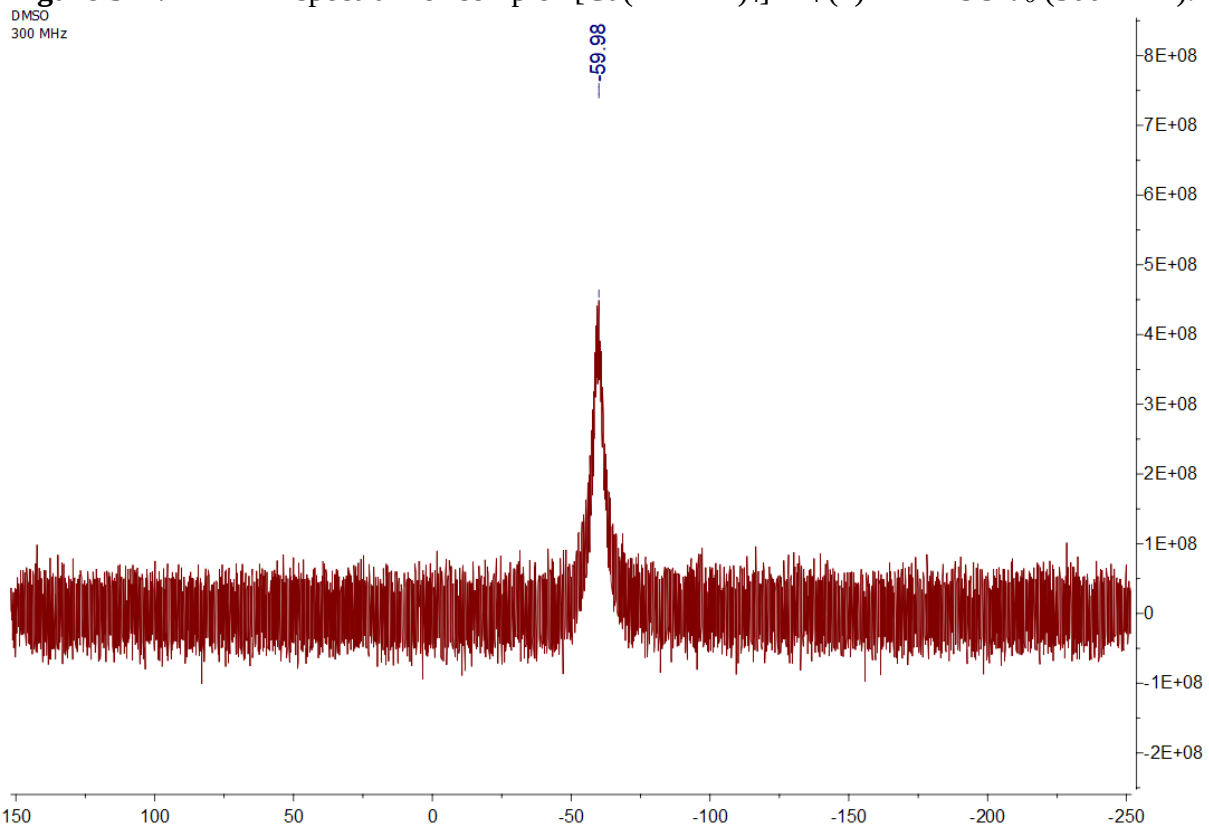


Figure S15. ^{31}P NMR spectrum of complex [Cu(DBPTA)$_4$]BF$_4$ (**2**) in DMSO-*d*$_6$ (300 MHz).

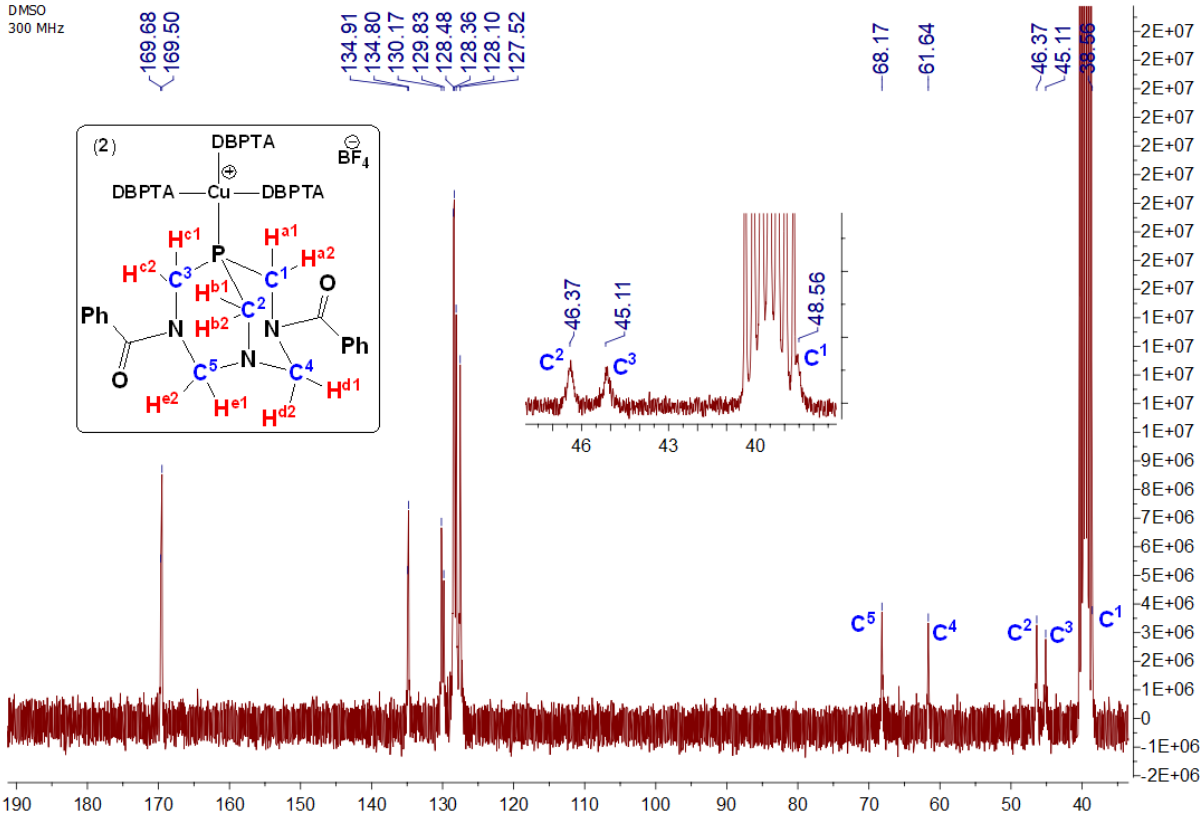


Figure S16. $^{13}C\{^{1}H\}$ NMR spectrum of complex $[Cu(DBPTA)_4]BF_4$ (**2**) in DMSO-d_6 (300 MHz).

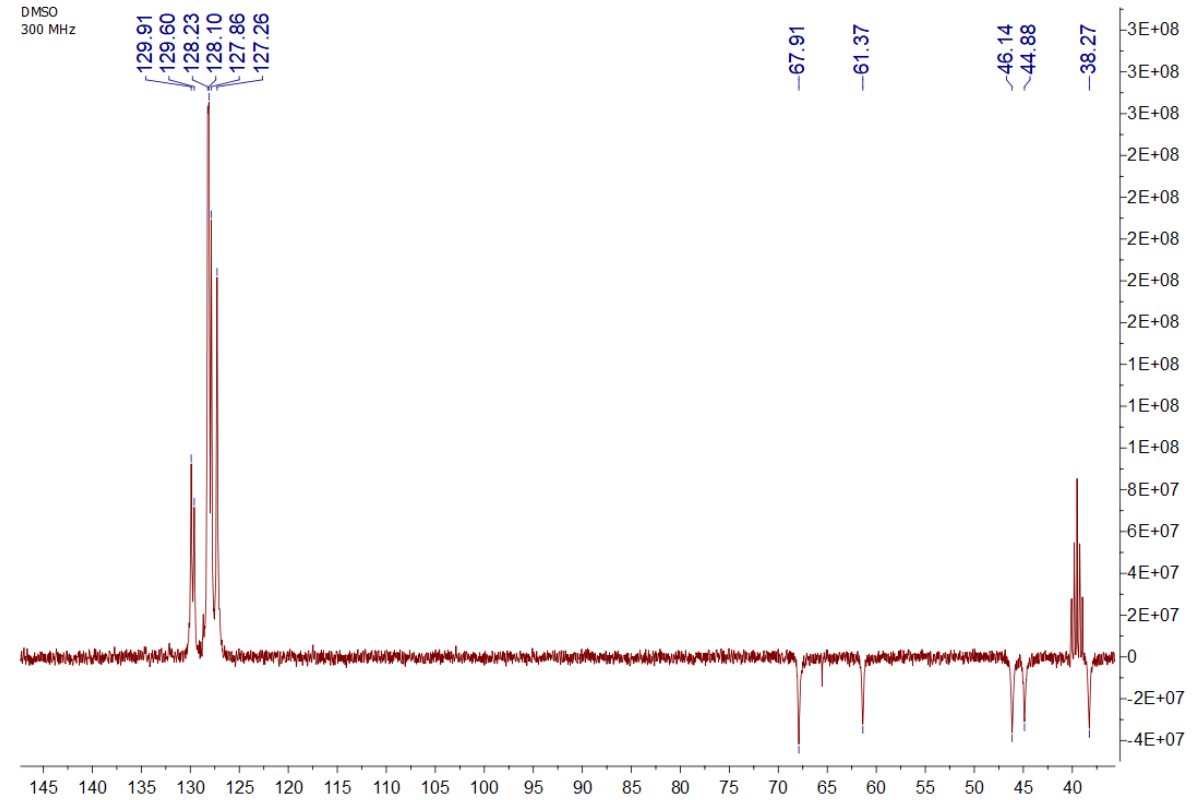


Figure S17. DEPT NMR spectrum of complex $[Cu(DBPTA)_4]BF_4$ (**2**) in DMSO-d_6 (300 MHz).

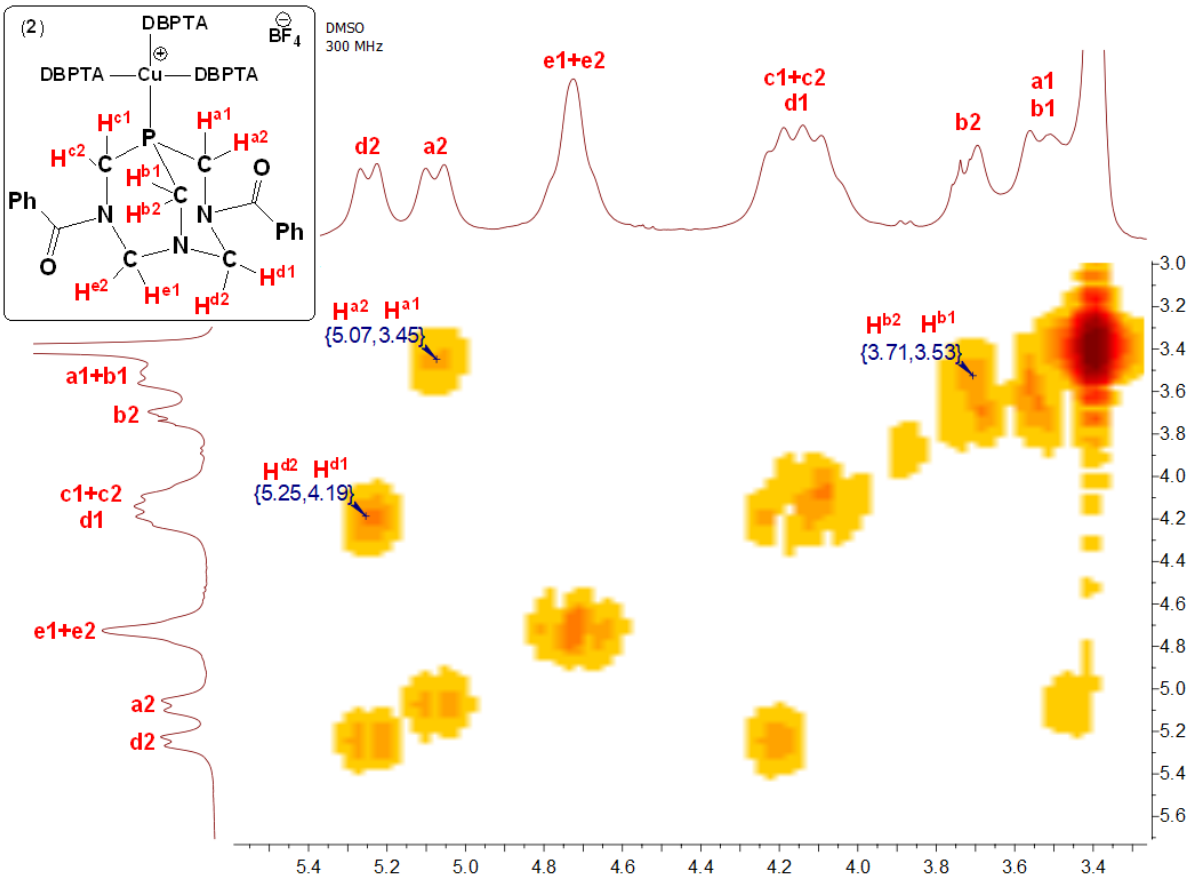


Figure S18. COSY spectrum of complex $[Cu(DBPTA)_4]BF_4$ (**2**) in DMSO-d_6 (300 MHz).

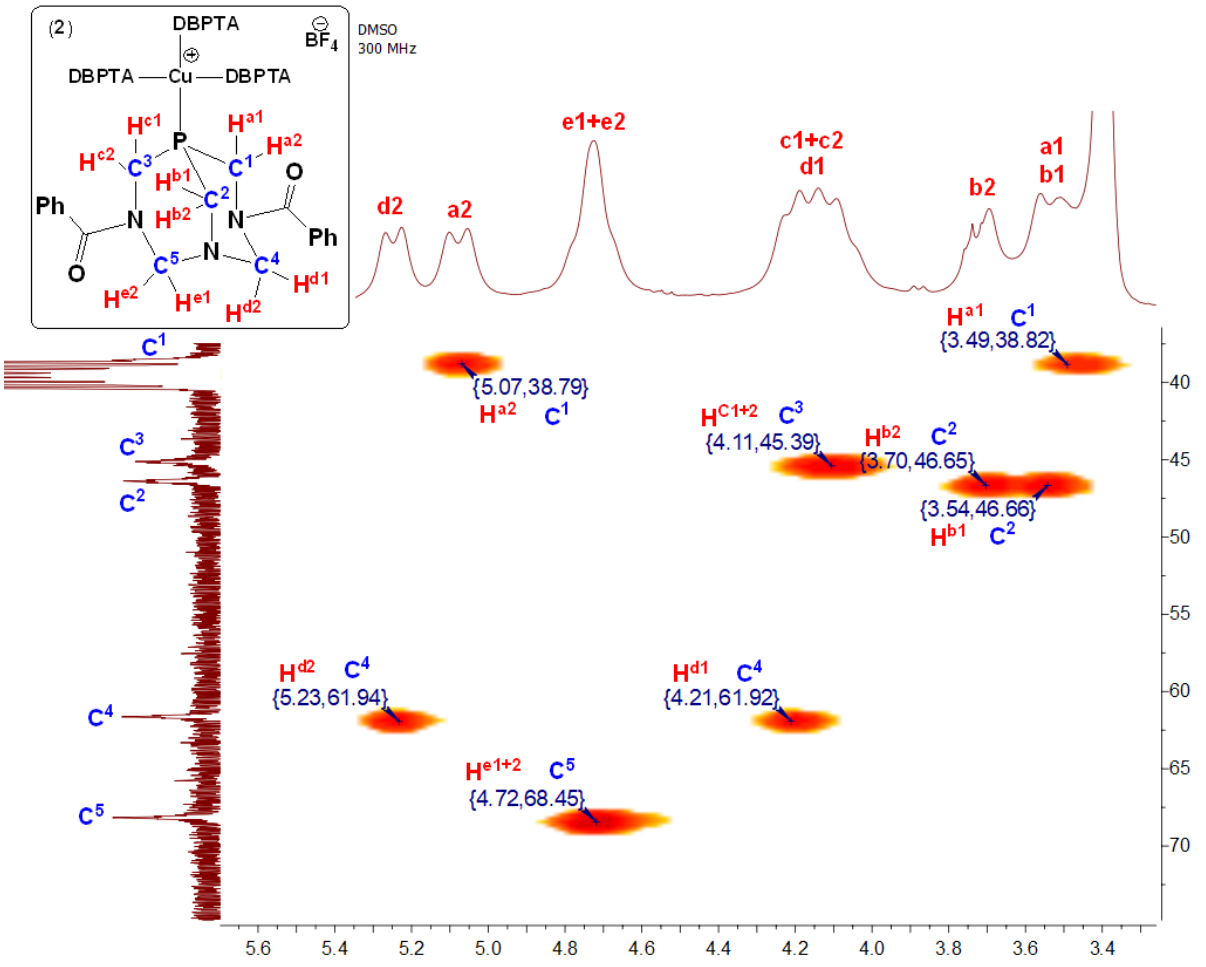


Figure S19. HSQC spectrum of complex $[Cu(DBPTA)_4]BF_4$ (**2**) in DMSO-d_6 (300 MHz).

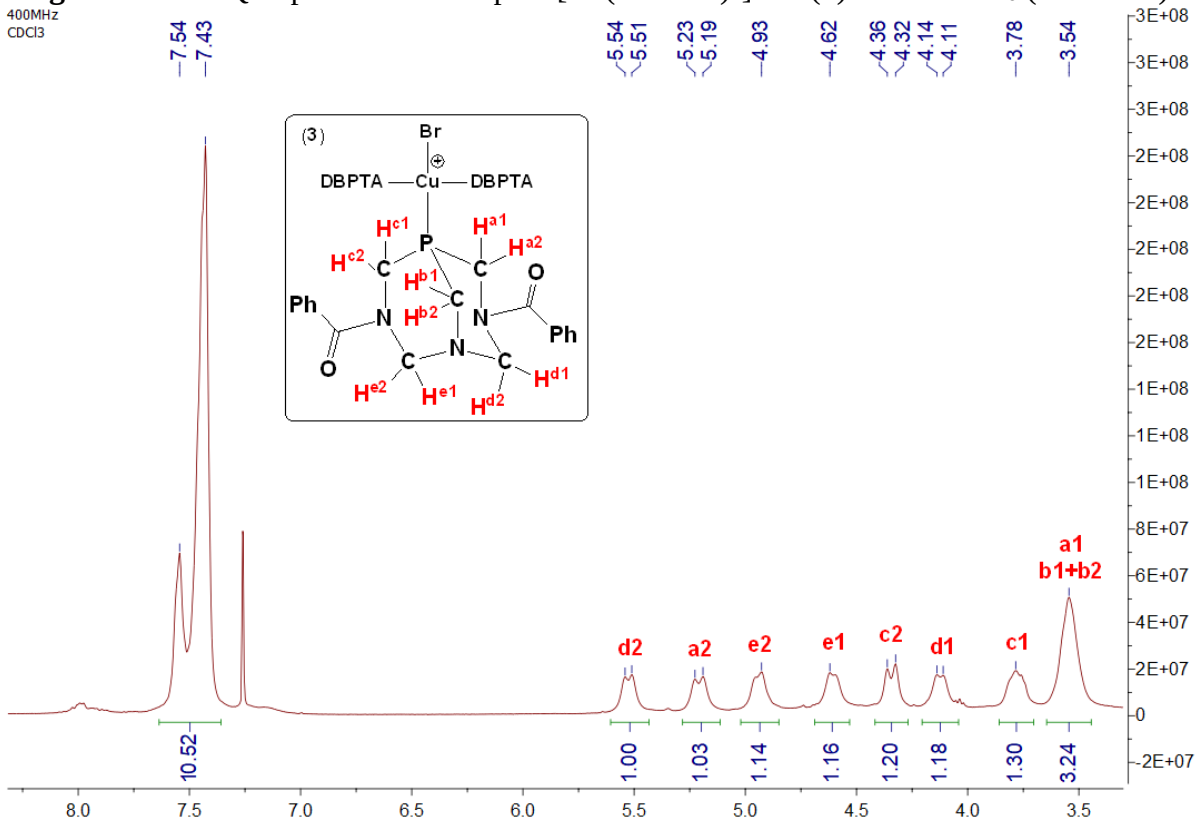


Figure S20. ^{1}H NMR spectrum of complex $[CuBr(DBPTA)_3]$ (**3**) in $CDCl_3$ (400 MHz).

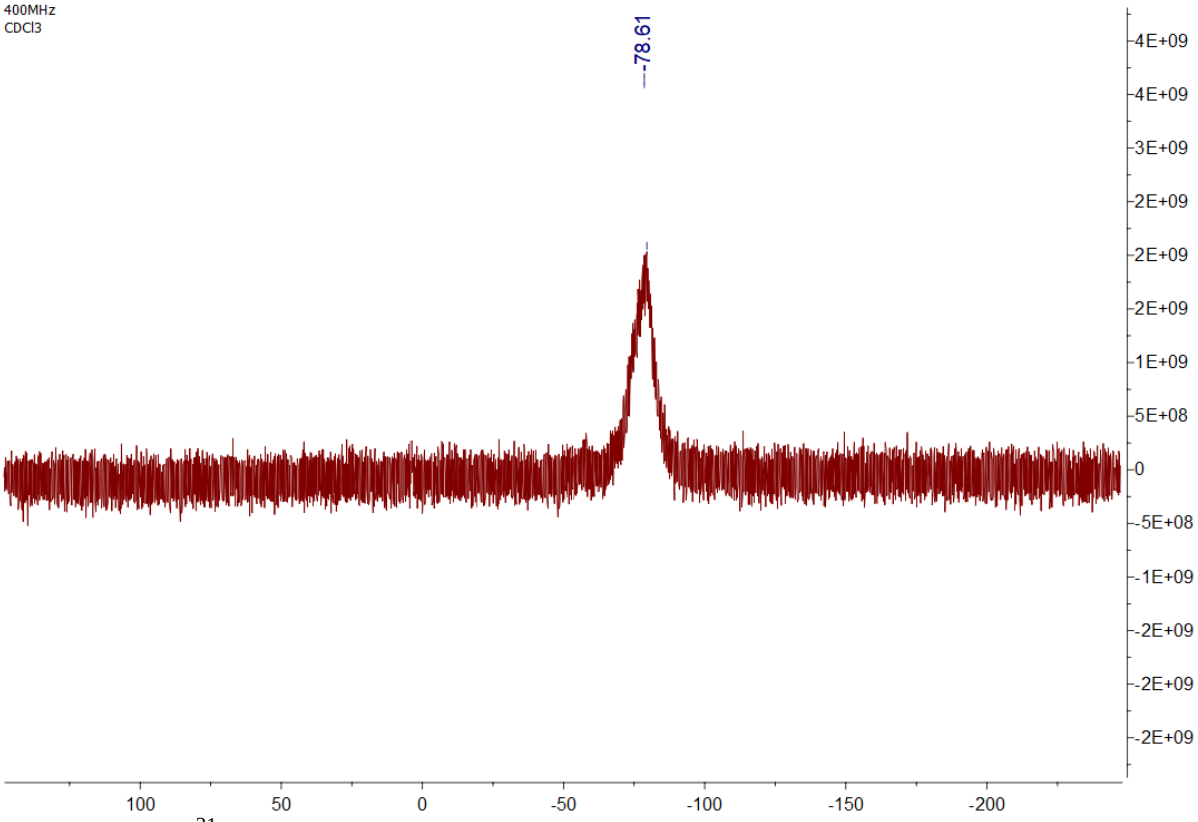


Figure S21. ^{31}P NMR spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in $CDCl_3$ (400 MHz).

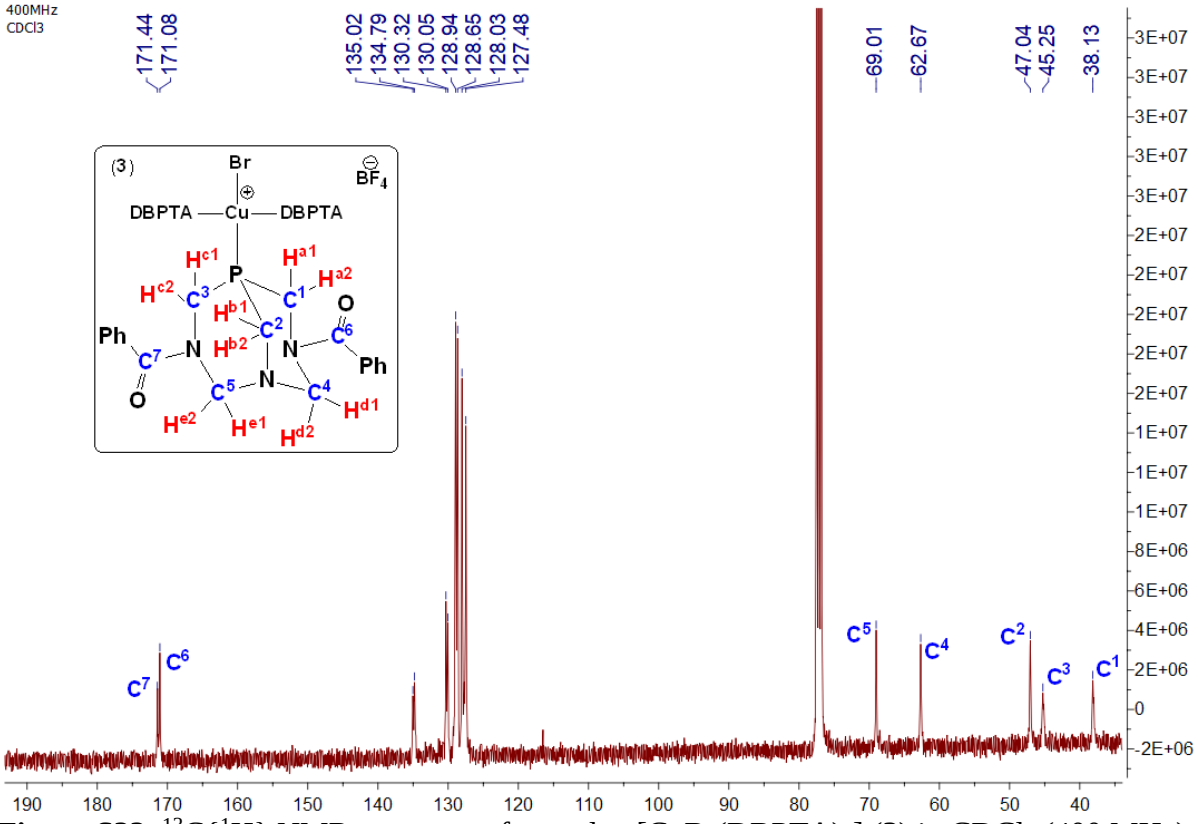


Figure S22. $^{13}C\{^1H\}$ NMR spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in $CDCl_3$ (400 MHz).

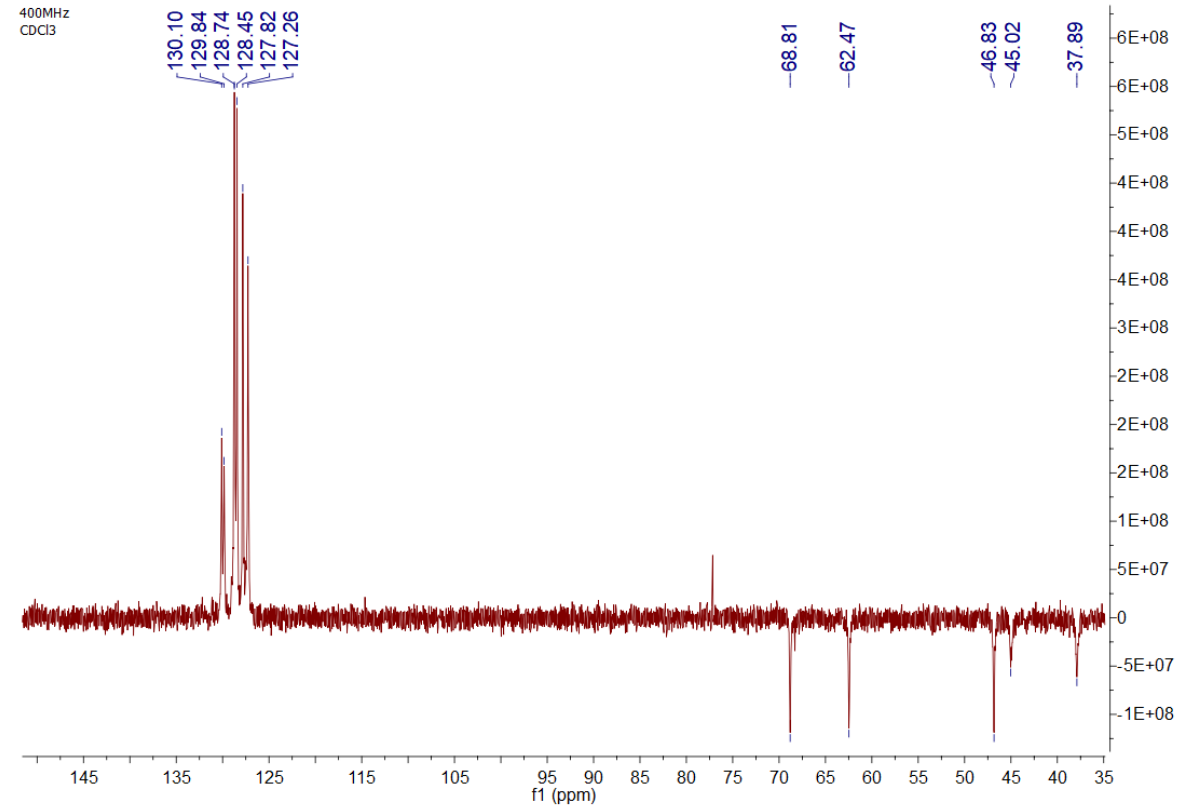


Figure S23. DEPT NMR spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in $CDCl_3$ (400 MHz).

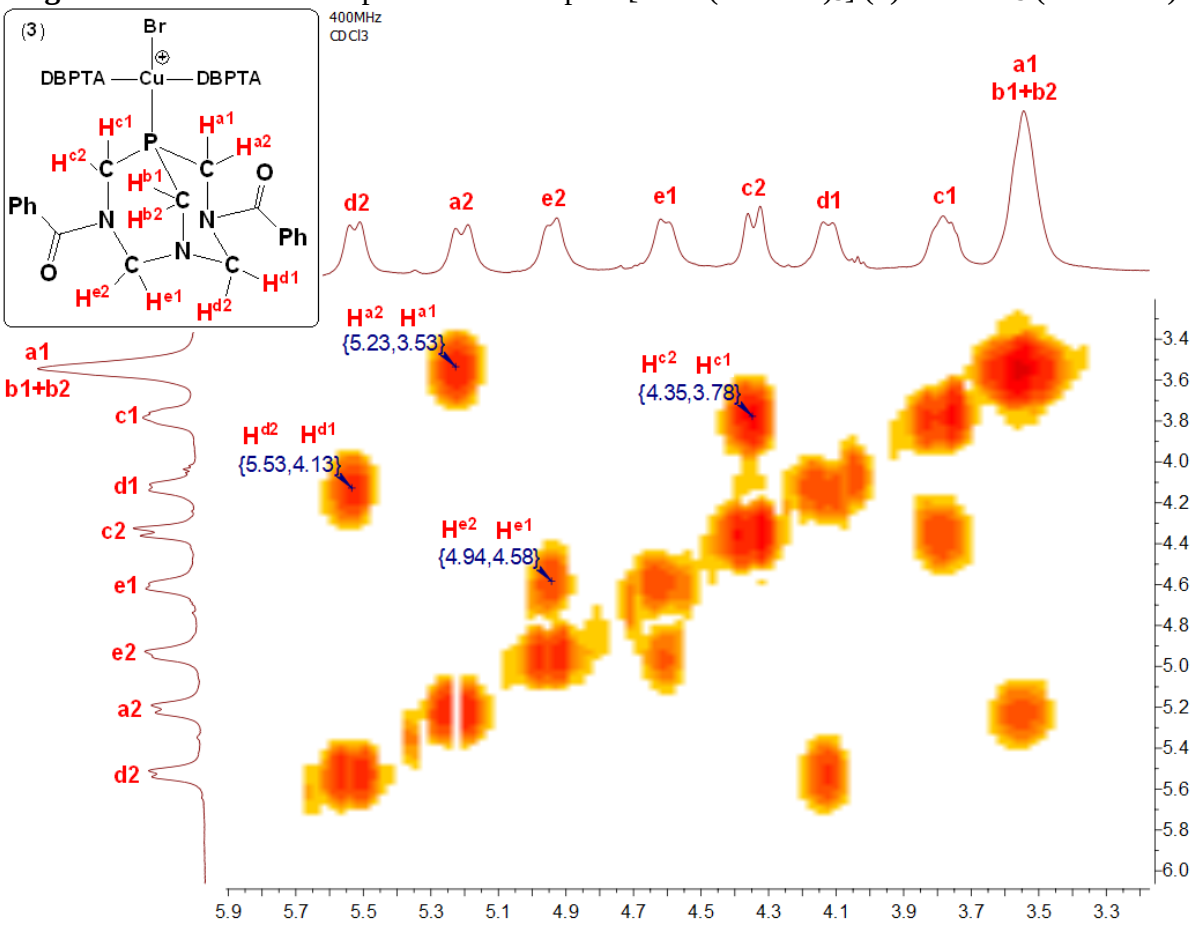


Figure S24. COSY spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in $CDCl_3$ (400 MHz).

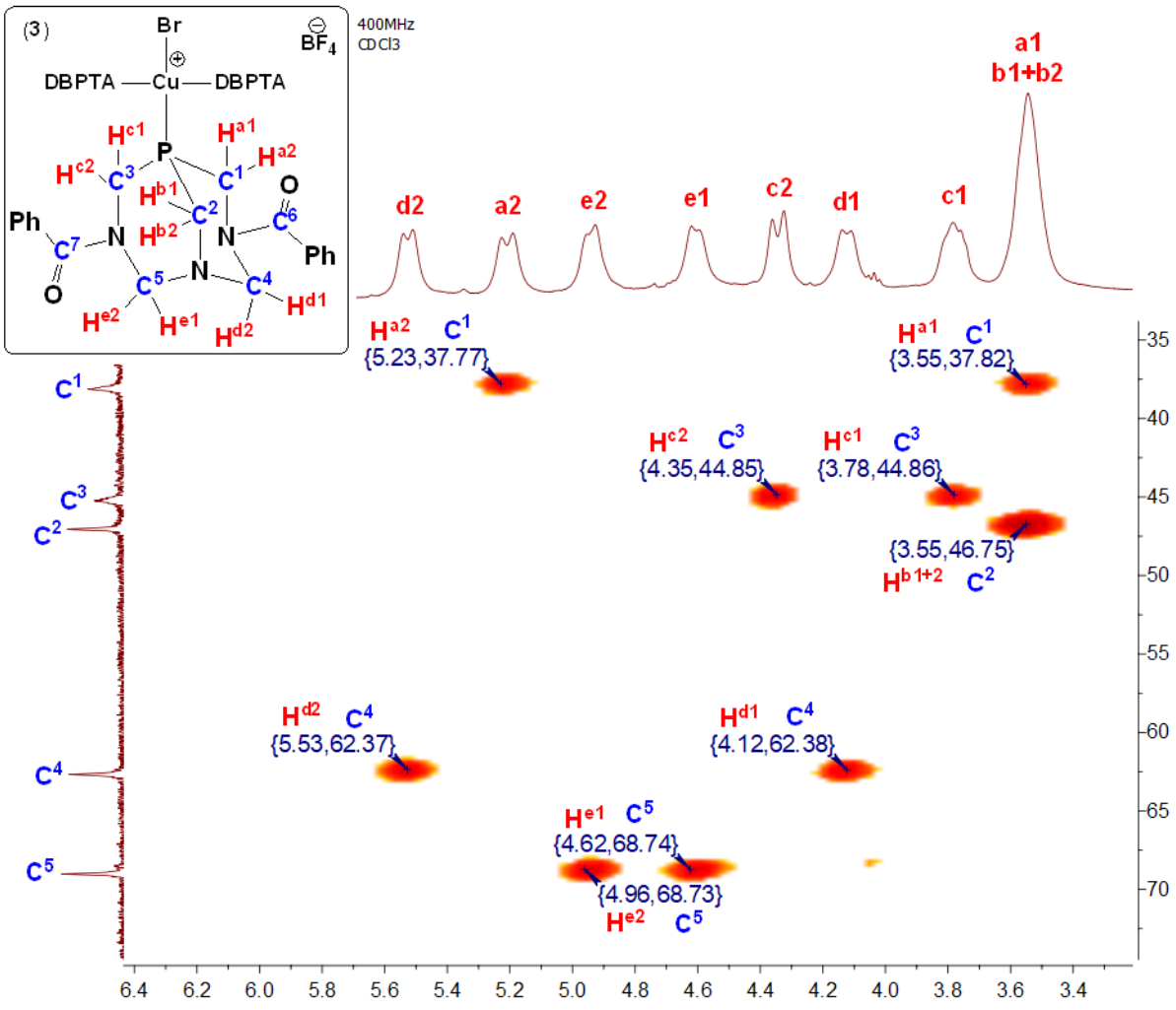


Figure S25. HSQC spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in $CDCl_3$ (400 MHz).

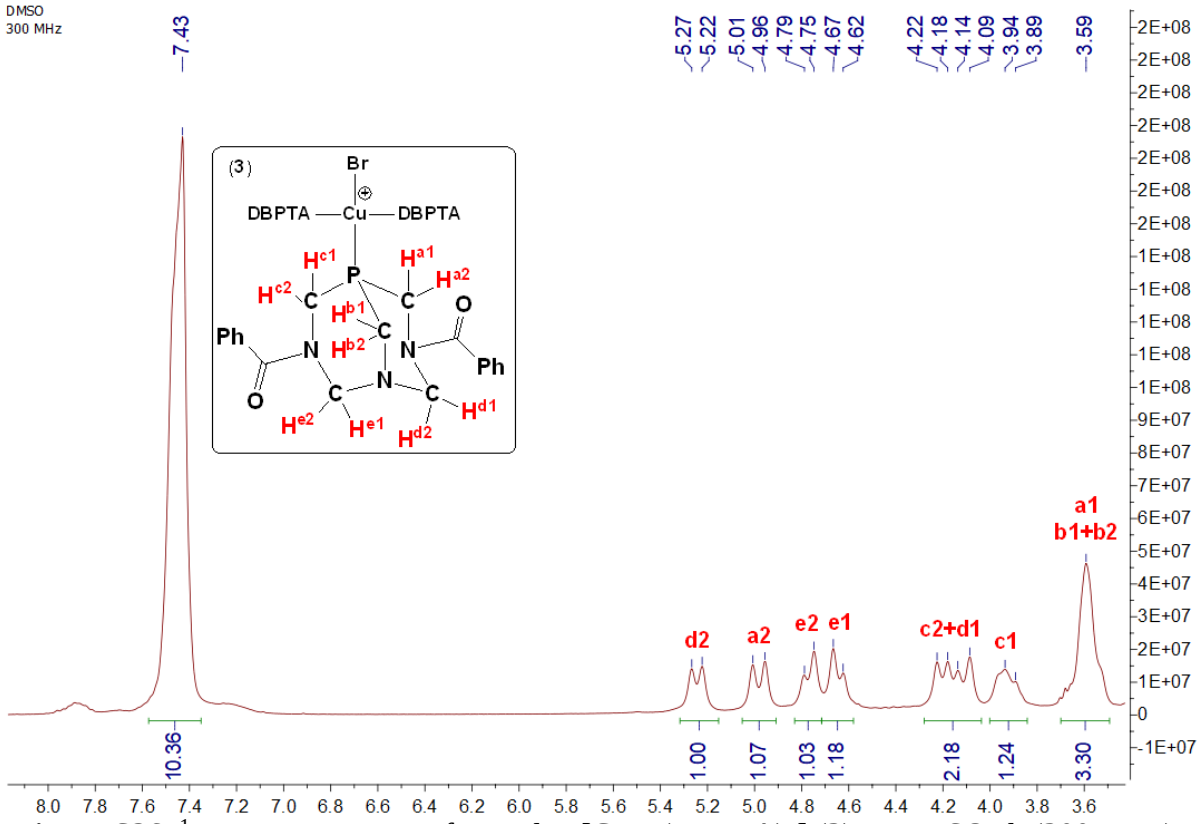


Figure S26. ^{1}H NMR spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in DMSO-d_6 (300 MHz).

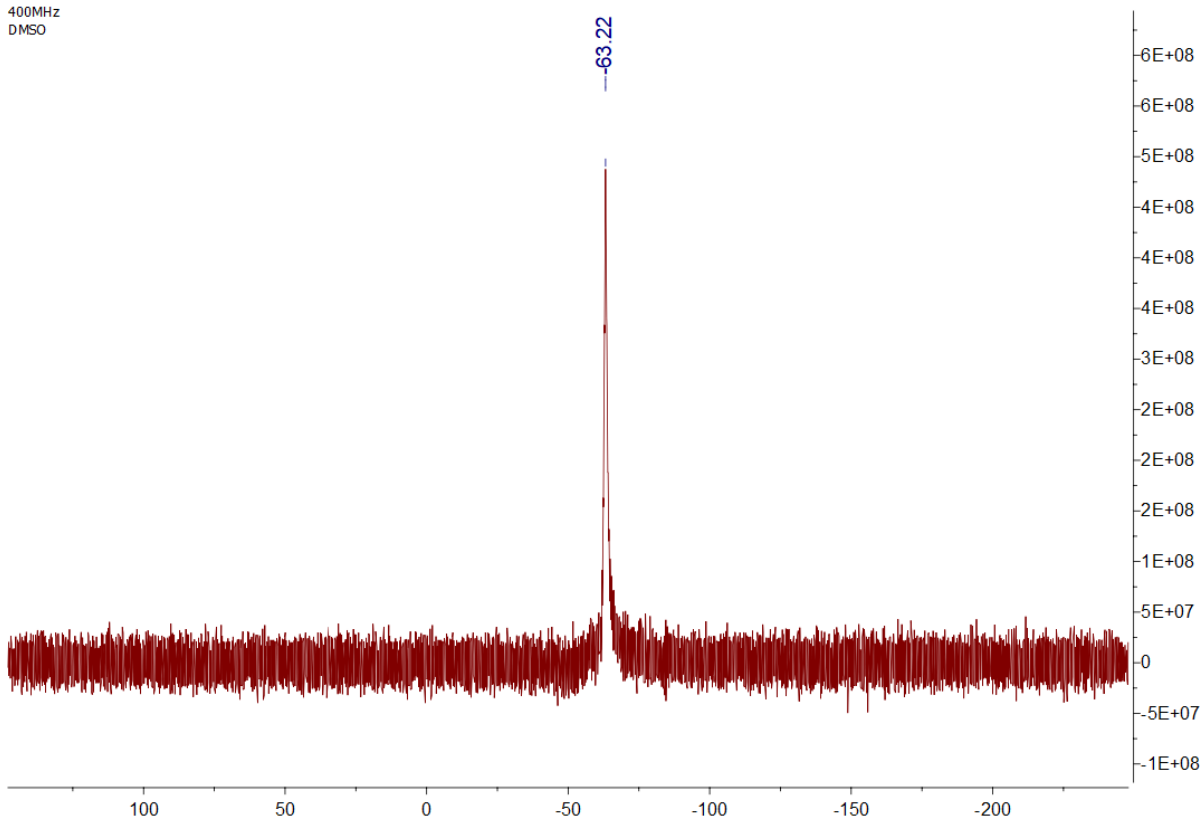


Figure S27. ^{31}P NMR spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in DMSO-d_6 (400 MHz).

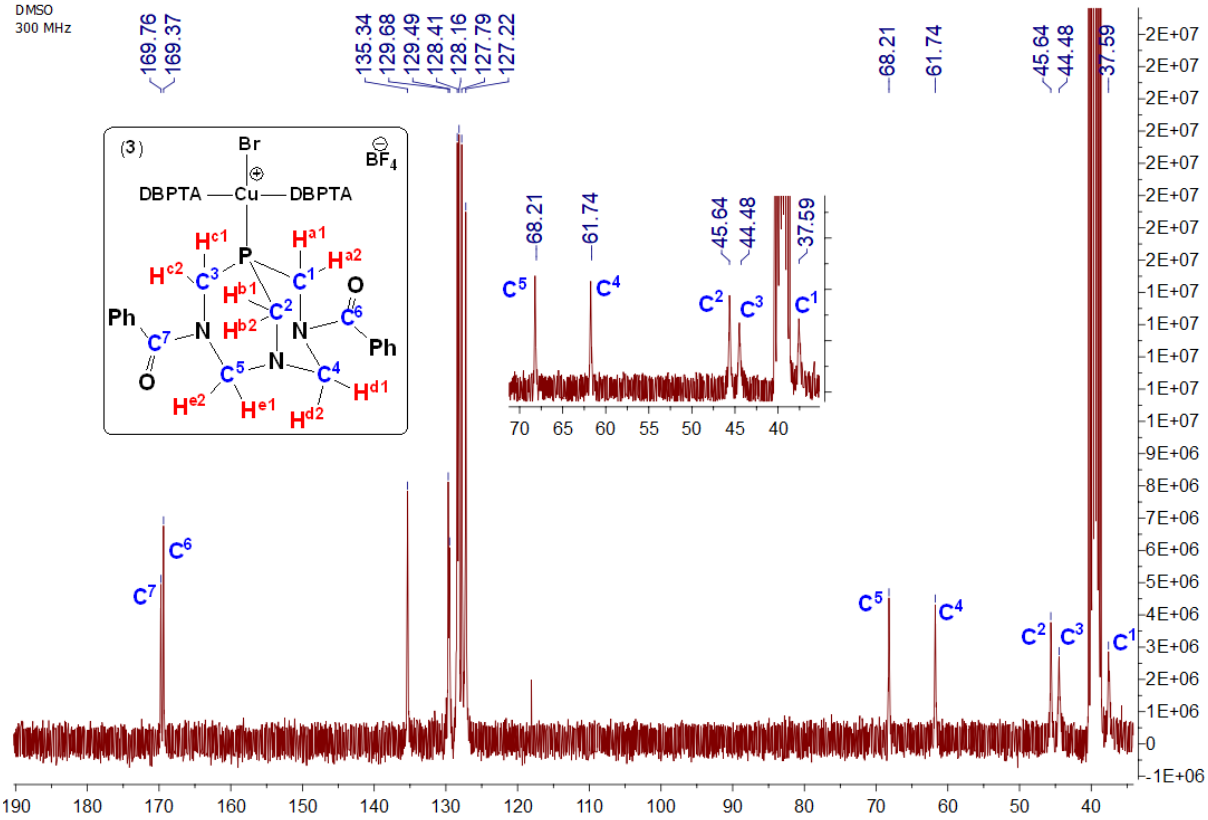


Figure S28. $^{13}C\{^{1}H\}$ NMR spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in DMSO-*d*$_6$ (300 MHz).

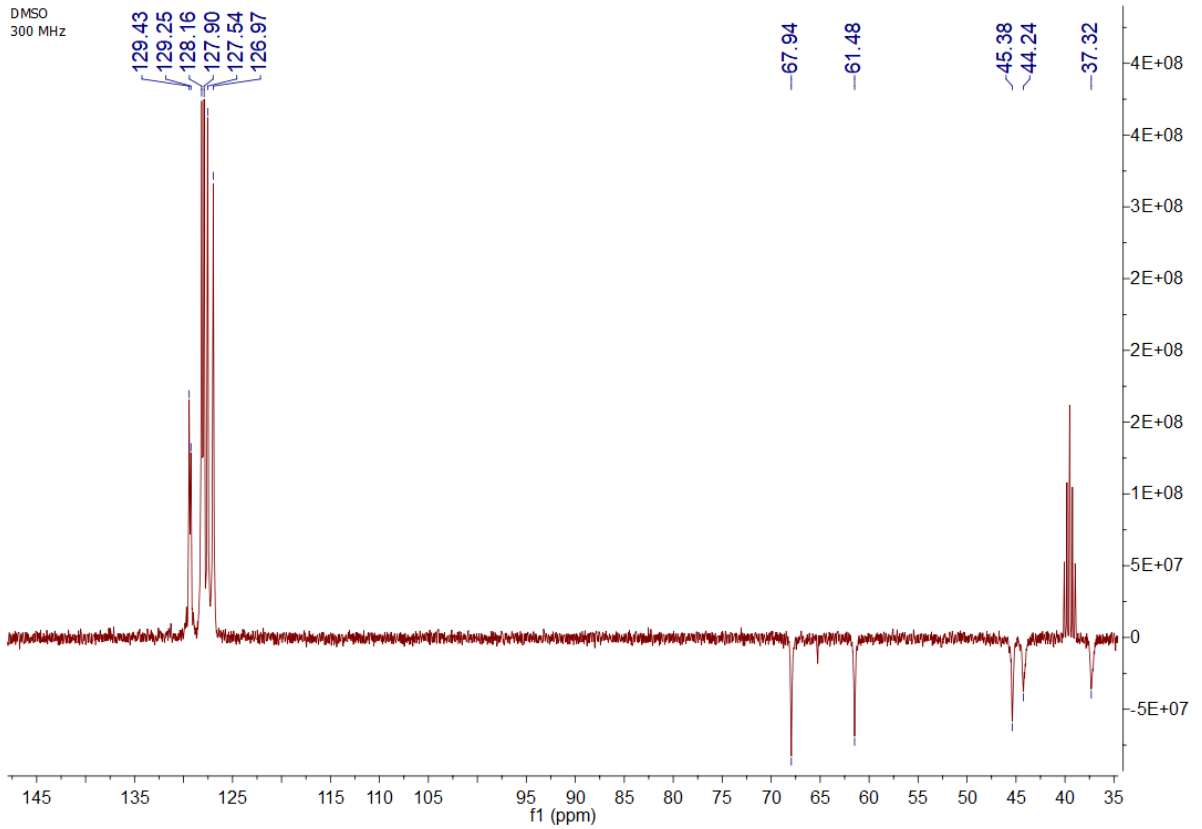


Figure S29. DEPT NMR spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in DMSO-*d*$_6$ (300 MHz).

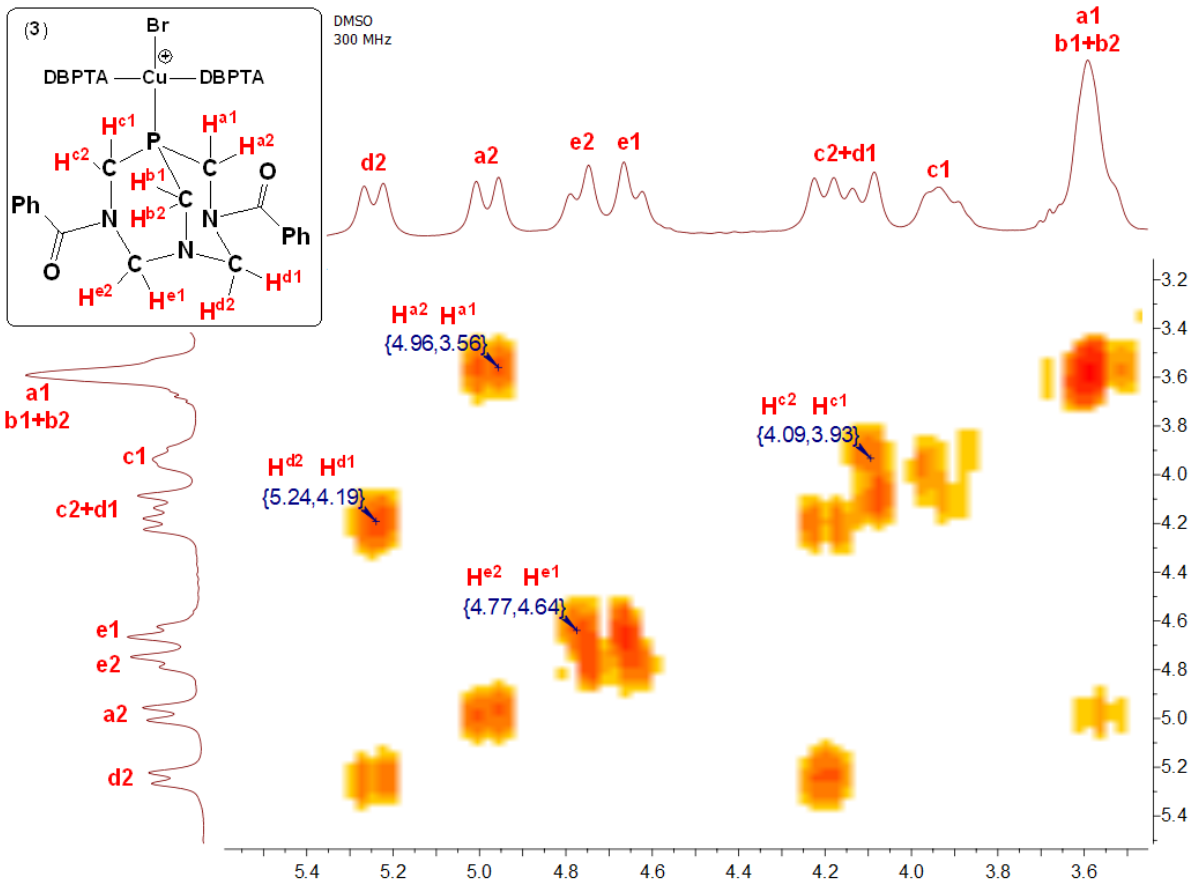


Figure S30. COSY spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in DMSO-d_6 (300 MHz).

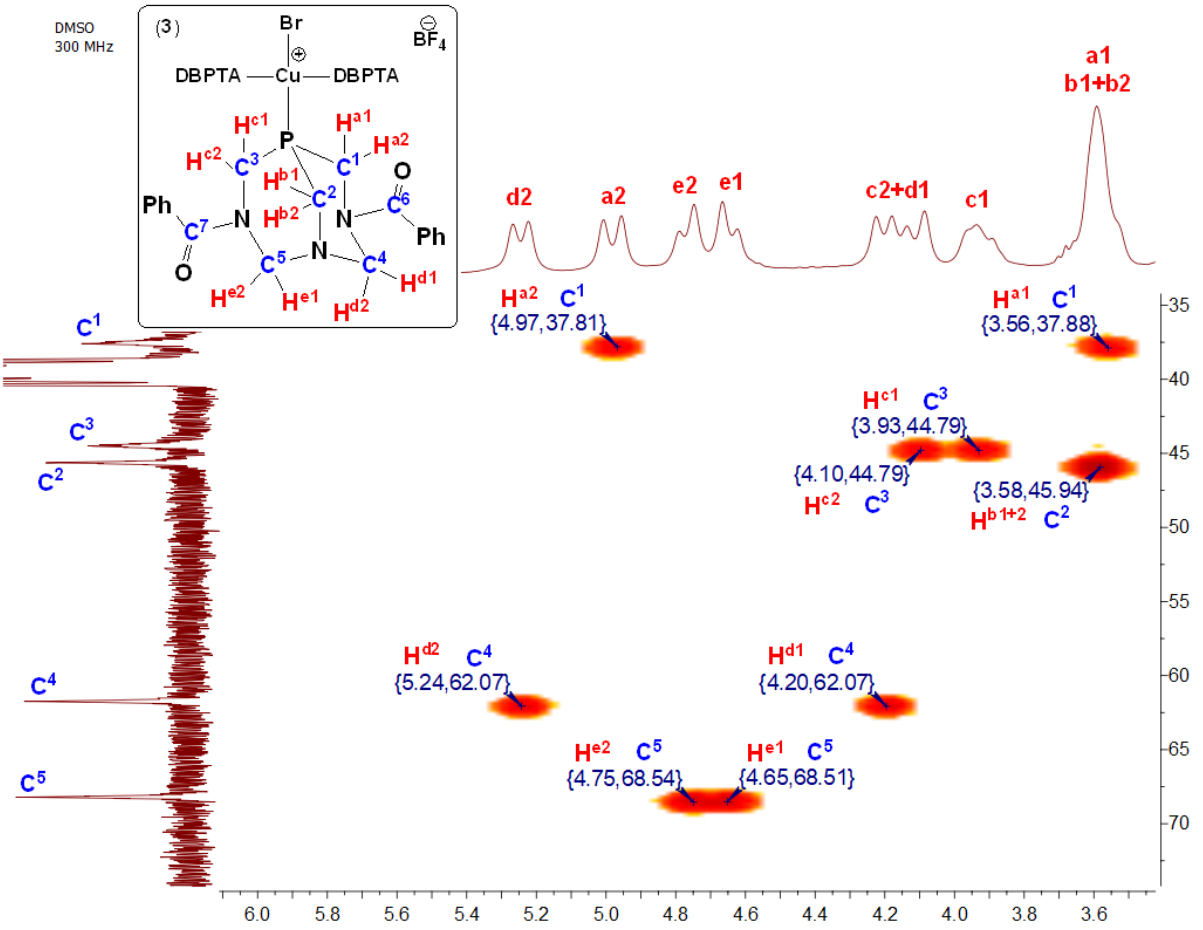


Figure S31. HSQC spectrum of complex [CuBr(DBPTA)$_3$] (**3**) in DMSO-*d*$_6$ (300 MHz).

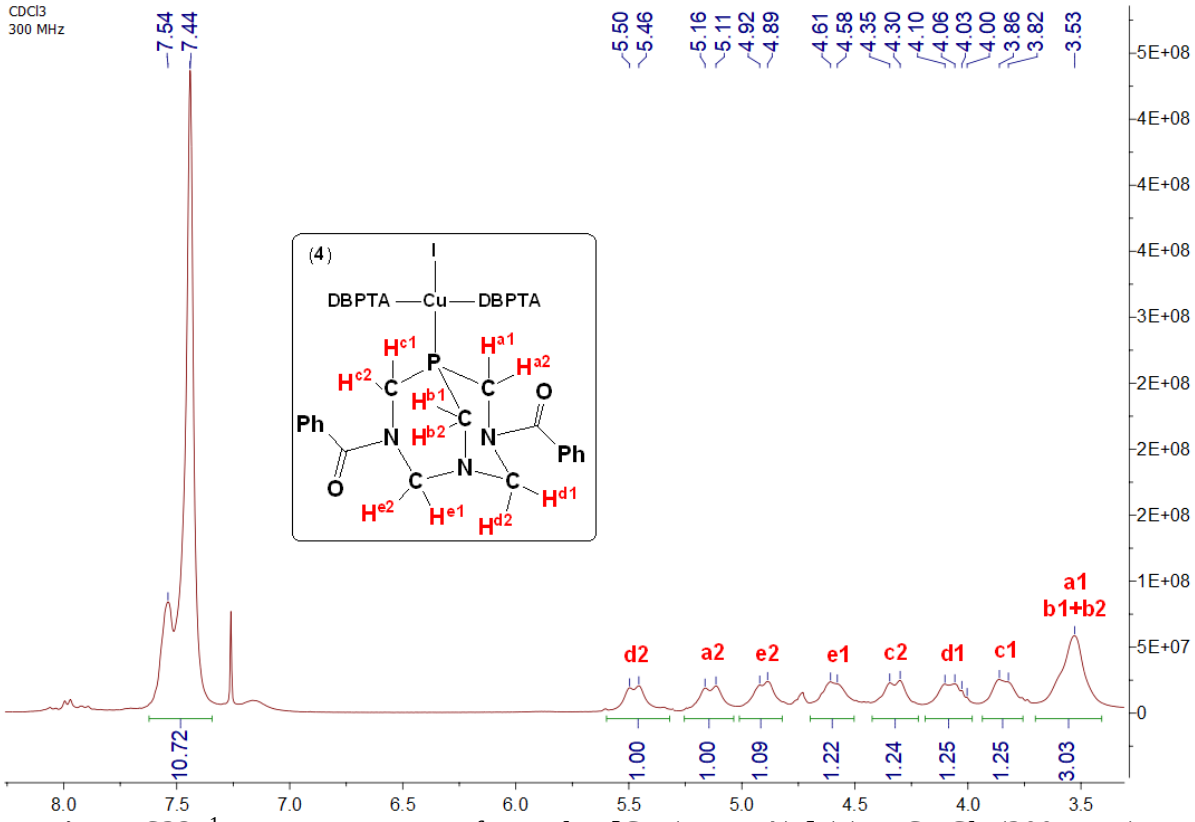


Figure S32. ^{1}H NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in CDCl$_3$ (300 MHz).

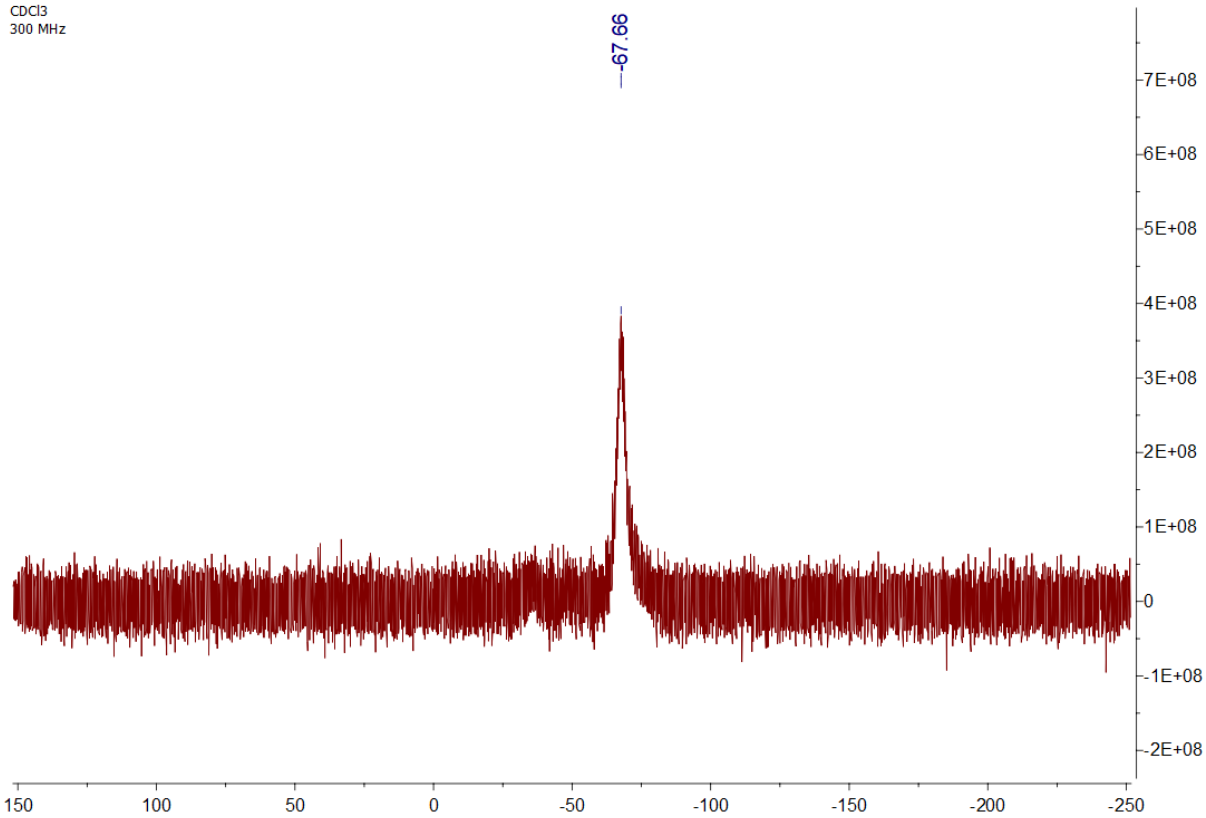


Figure S33. ^{31}P NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in $CDCl_3$ (300 MHz).

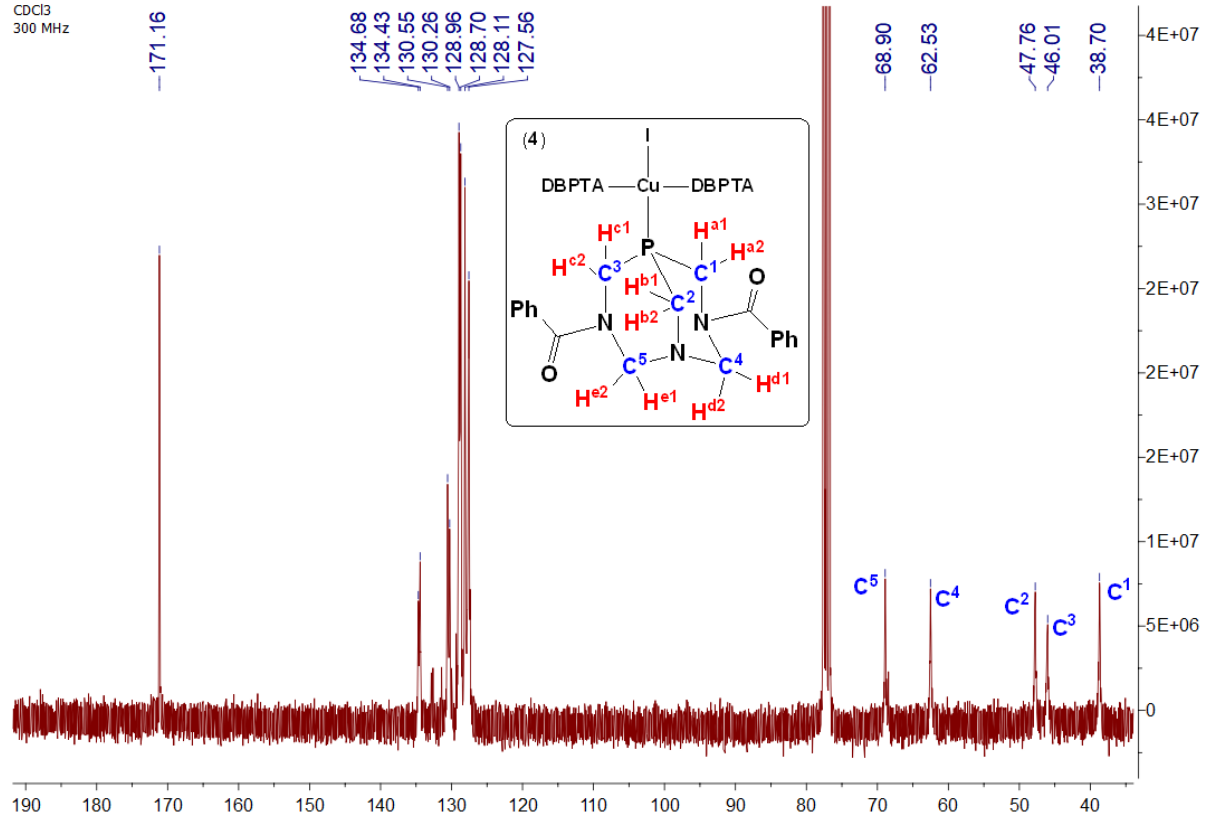


Figure S34. $^{13}C\{^1H\}$ NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in $CDCl_3$ (300 MHz).

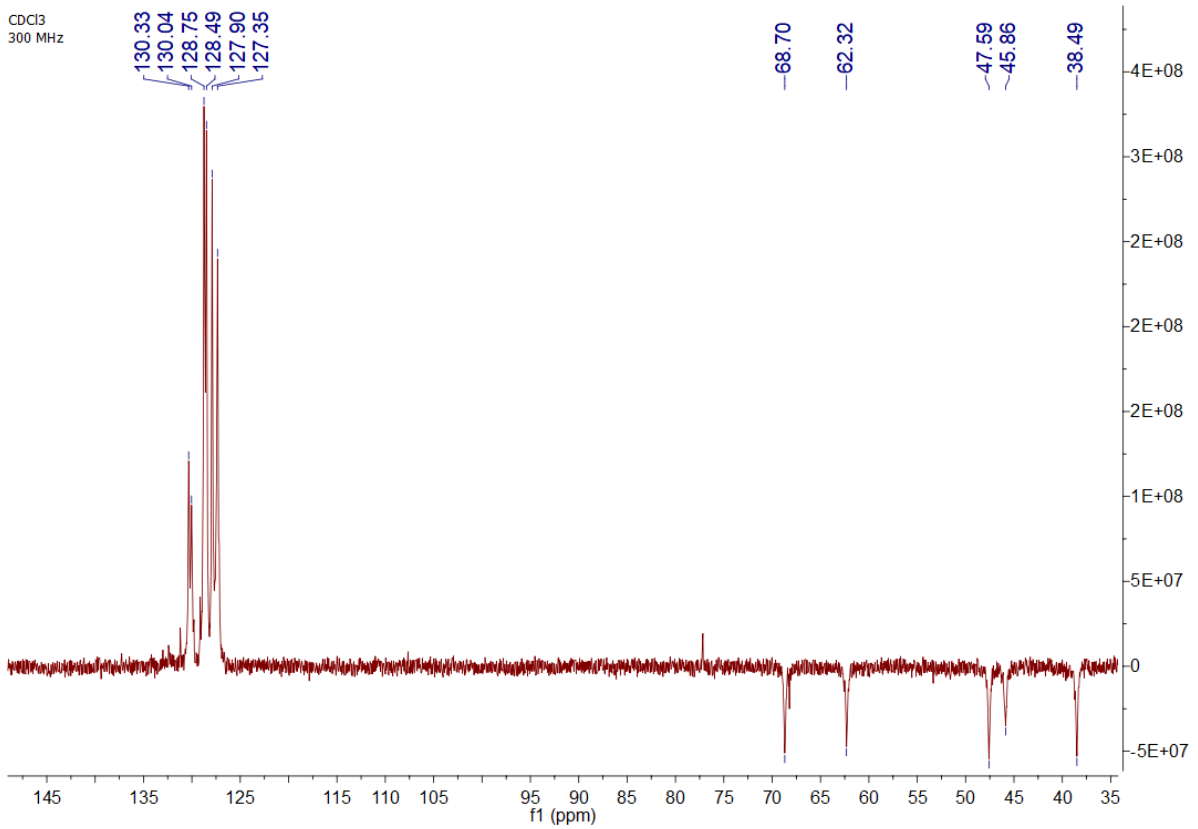


Figure S35. DEPT NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in $CDCl_3$ (300 MHz).

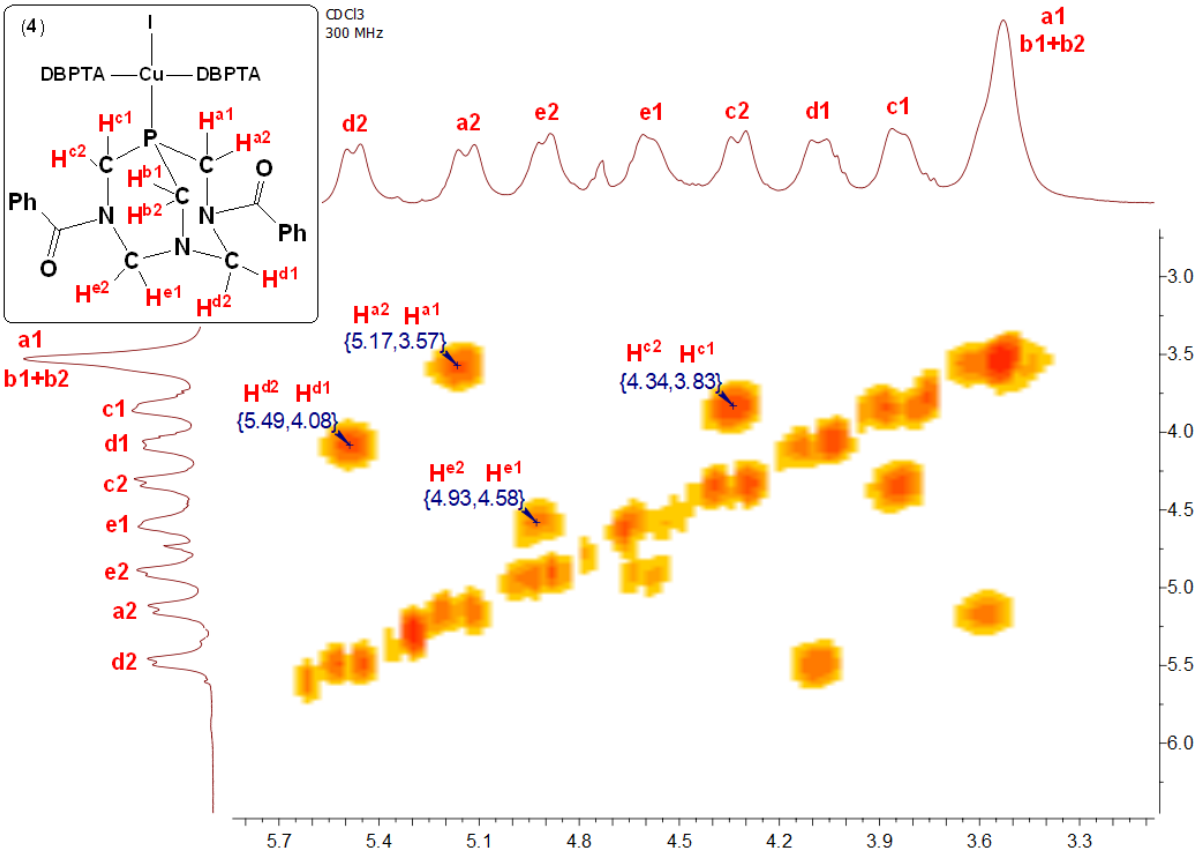


Figure S36. COSY spectrum of complex [CuI(DBPTA)$_3$] (**4**) in $CDCl_3$ (300 MHz).

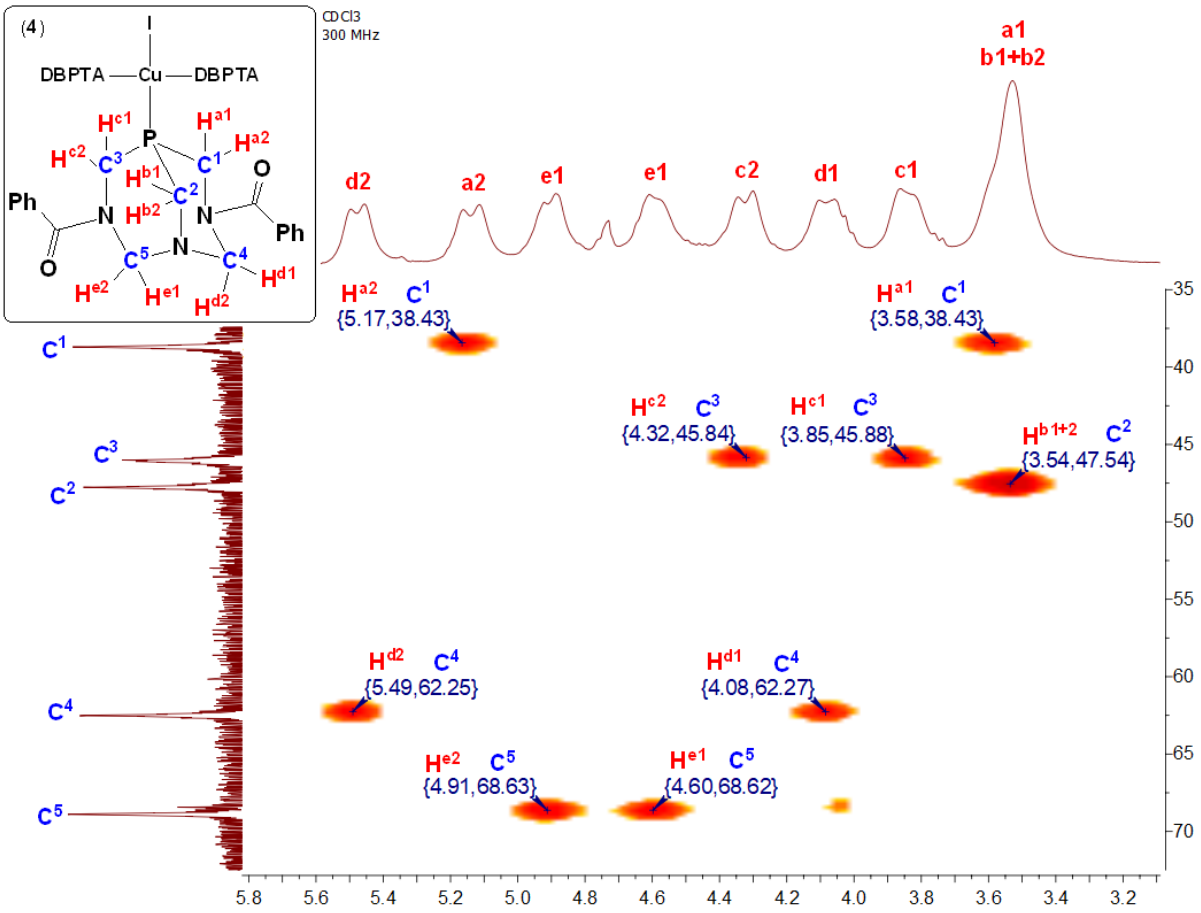


Figure S37. HSQC spectrum of complex [CuI(DBPTA)$_3$] (**4**) in $CDCl_3$ (300 MHz).

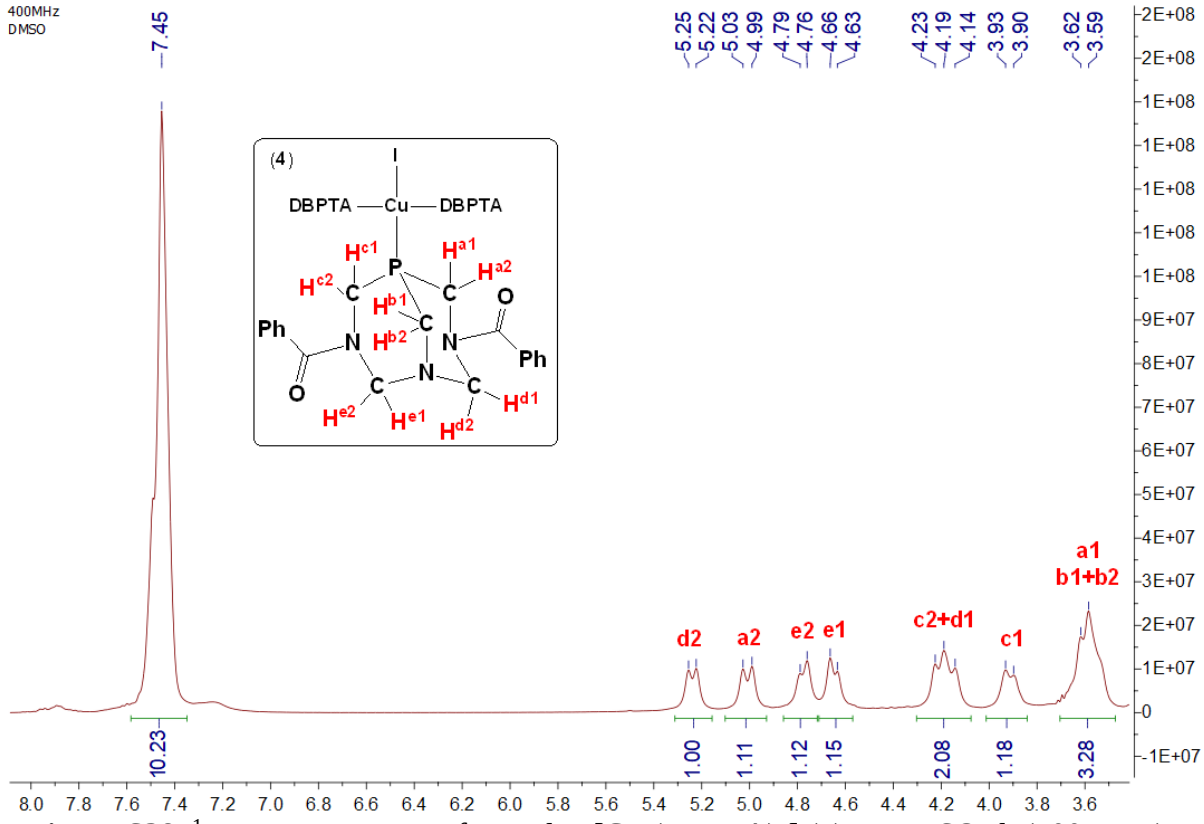


Figure S38. ^{1}H NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in DMSO-d_6 (400 MHz).

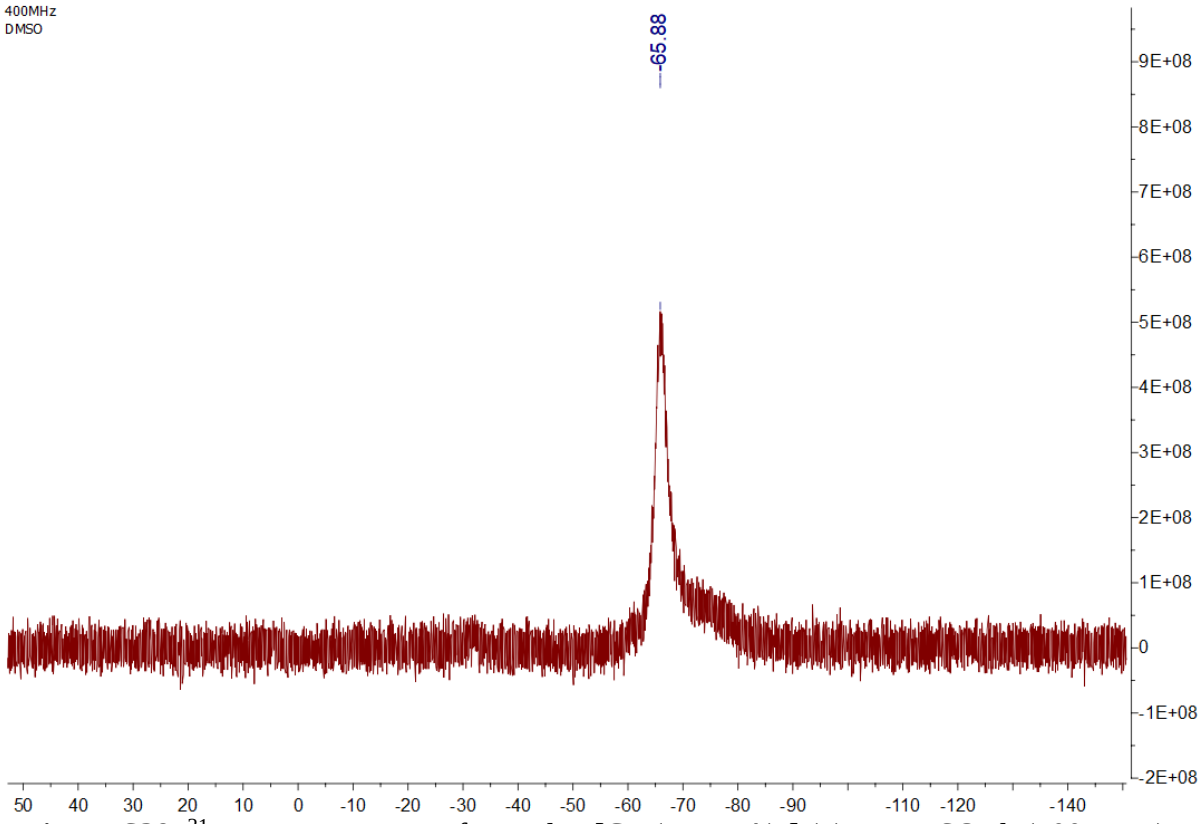


Figure S39. ^{31}P NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in DMSO-*d*$_6$ (400 MHz).

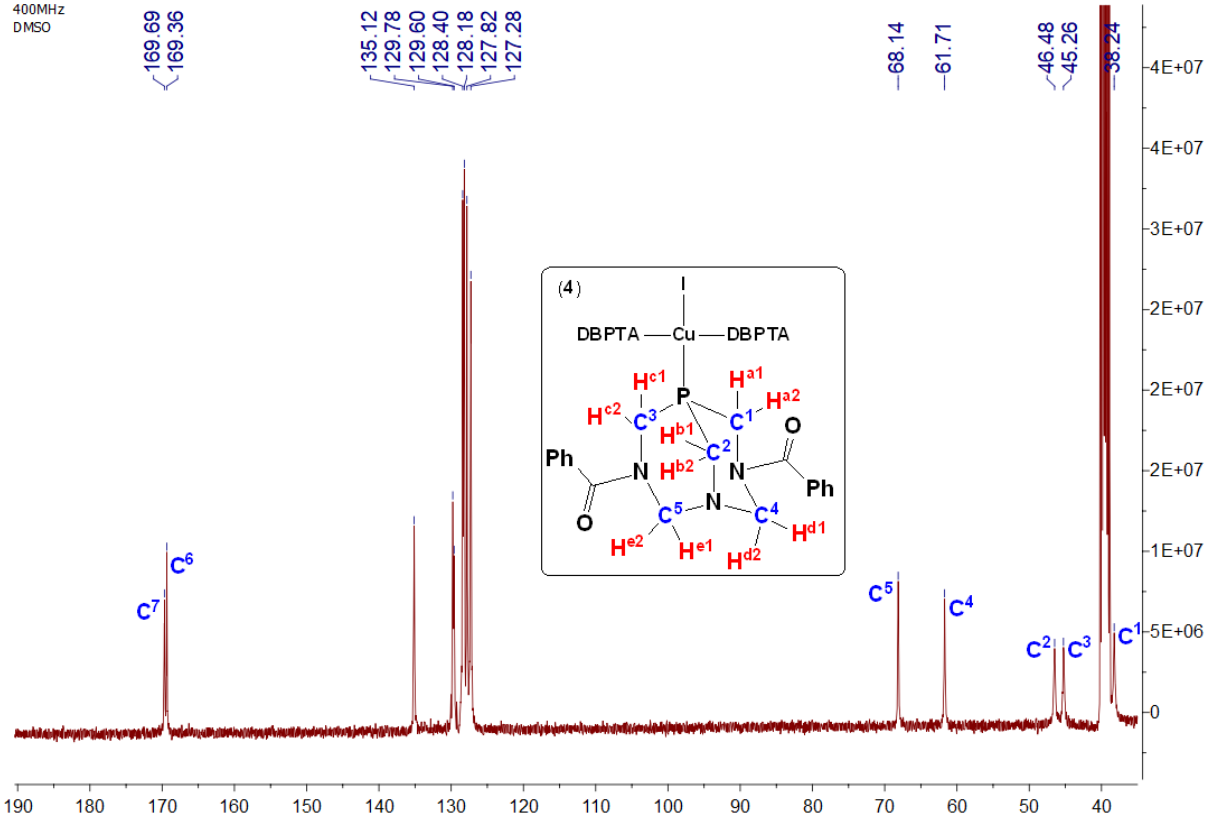


Figure S40. ^{13}C{^{1}H} NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in DMSO-*d*$_6$ (400 MHz).

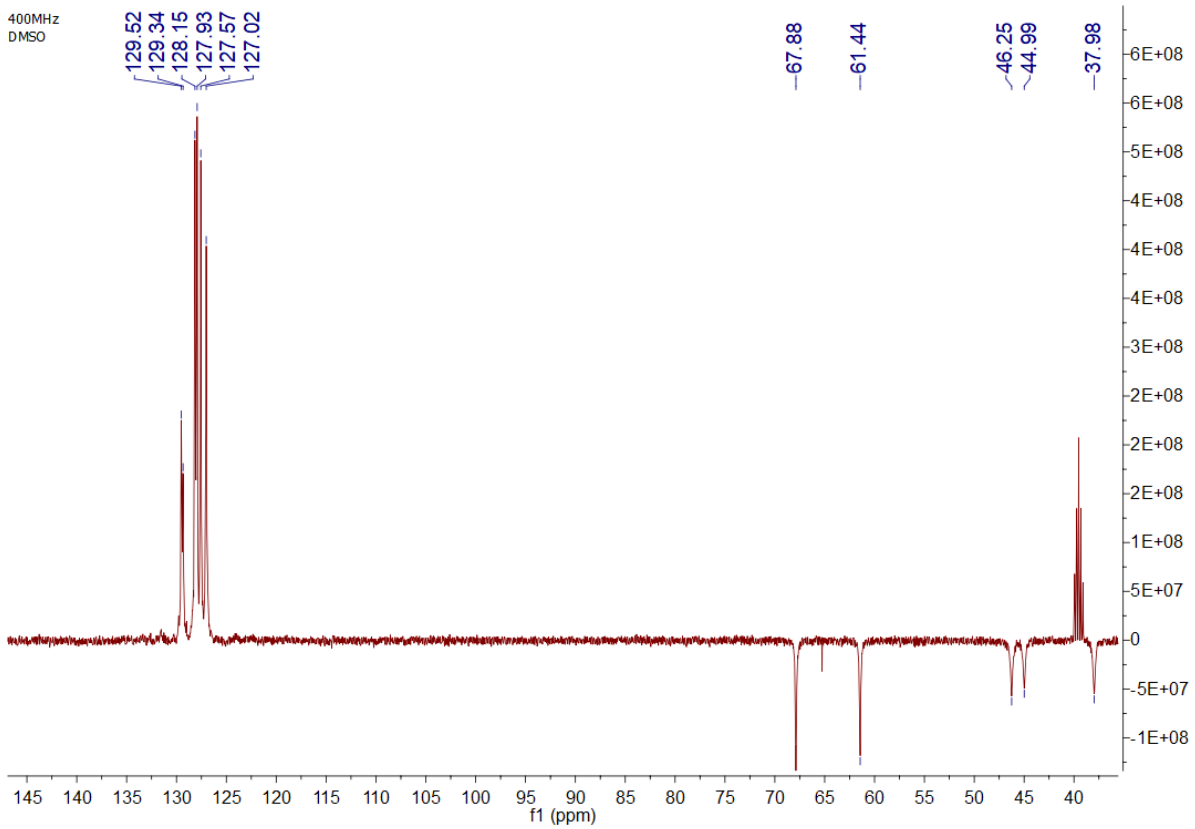


Figure S41. DEPT NMR spectrum of complex [CuI(DBPTA)$_3$] (**4**) in DMSO-d_6 (400 MHz).

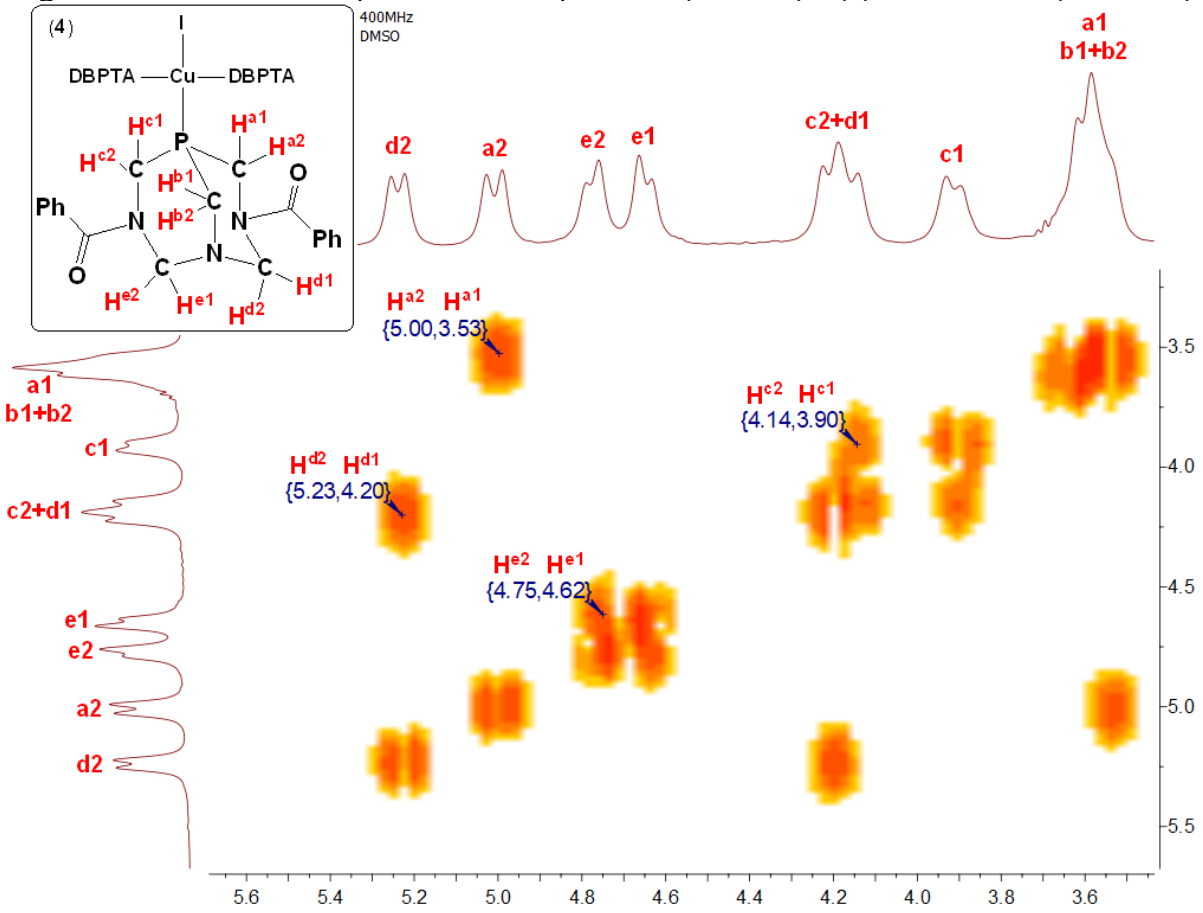


Figure S42. COSY spectrum of complex [CuI(DBPTA)$_3$] (**4**) in DMSO-d_6 (400 MHz).

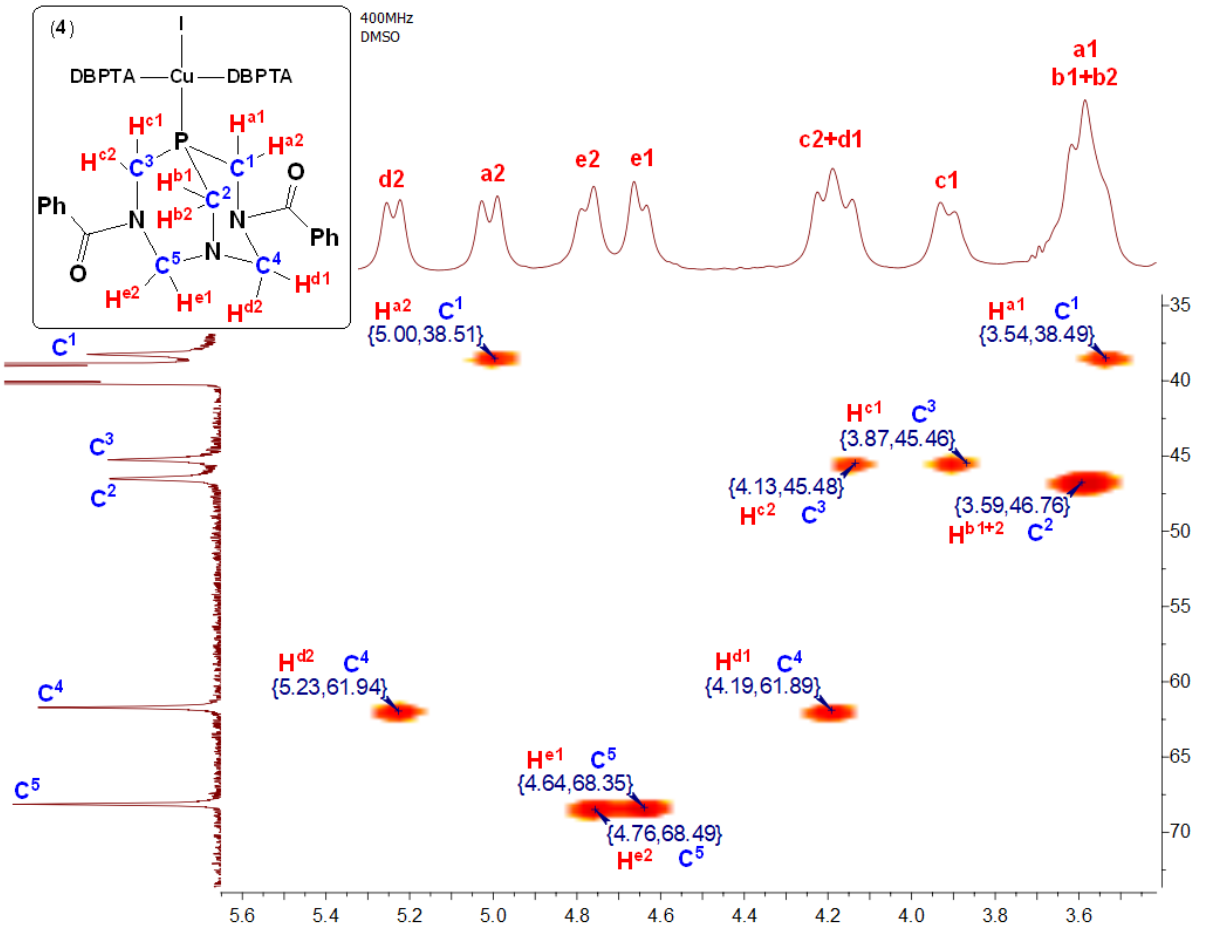


Figure S43. HSQC spectrum of complex [CuI(DBPTA)$_3$] (**4**) in DMSO-d_6 (400 MHz).

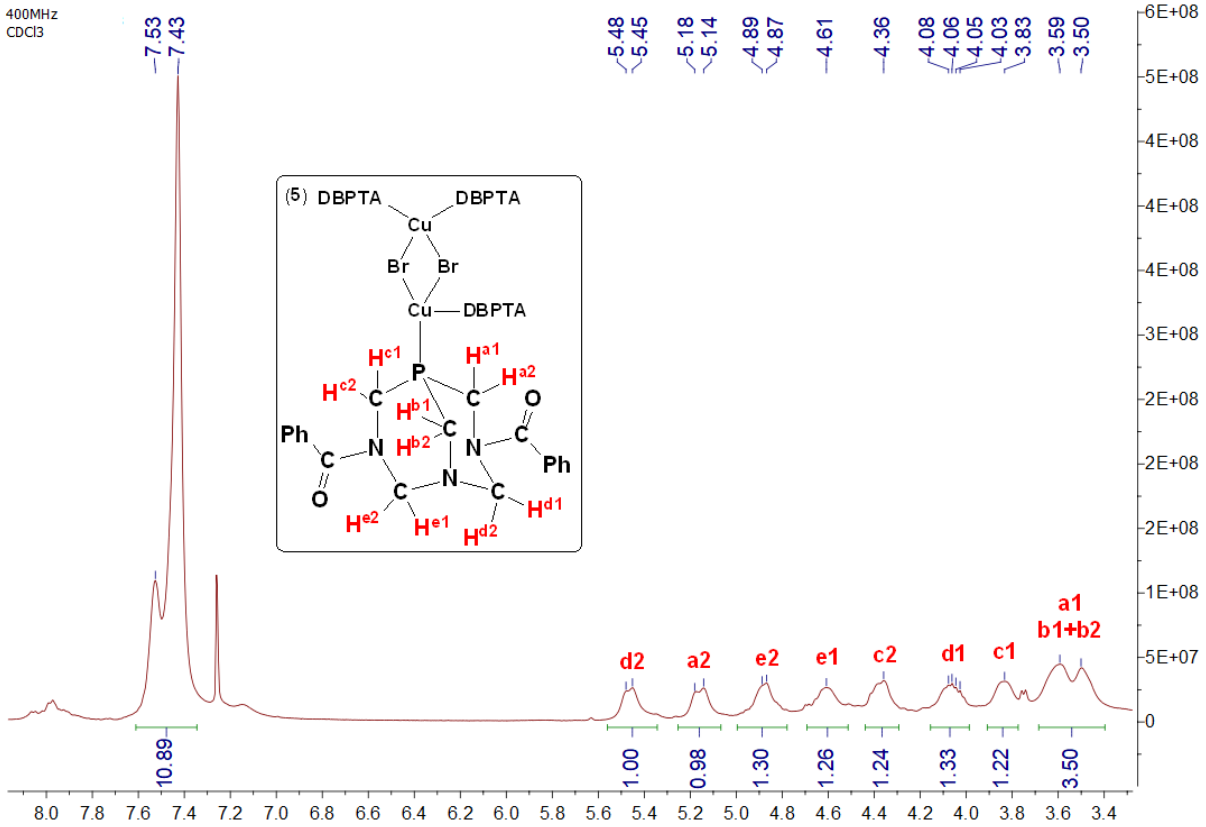


Figure S44. ^{1}H NMR spectrum of complex [Cu(μ-Br)(DBPTA)$_2$]$_2$ (**5**) in CDCl$_3$ (400 MHz).

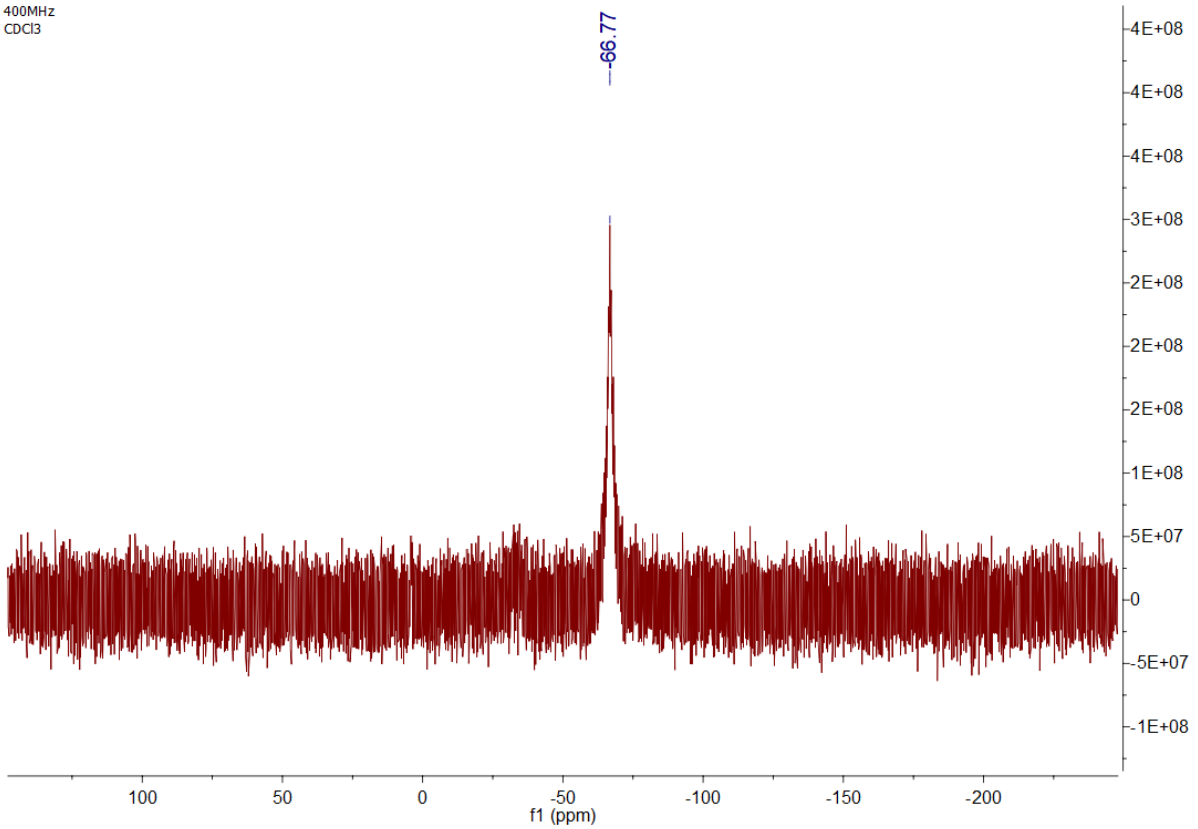


Figure S45. ^{31}P NMR spectrum of complex [Cu(μ-Br)(DBPTA)$_2$]$_2$ (**5**) in $CDCl_3$ (400 MHz).

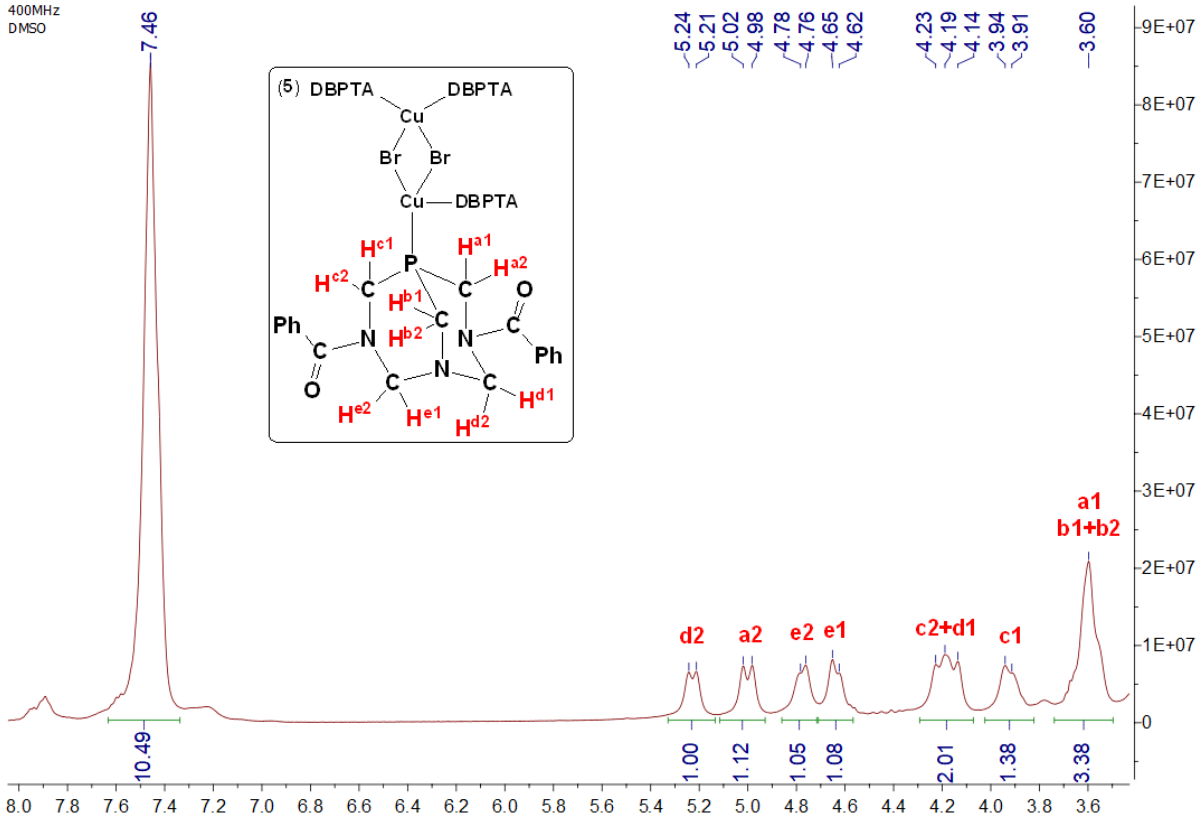


Figure S46. ^{1}H NMR spectrum of complex [Cu(μ-Br)(DBPTA)$_2$]$_2$ (**5**) in DMSO-d_6 (400 MHz).

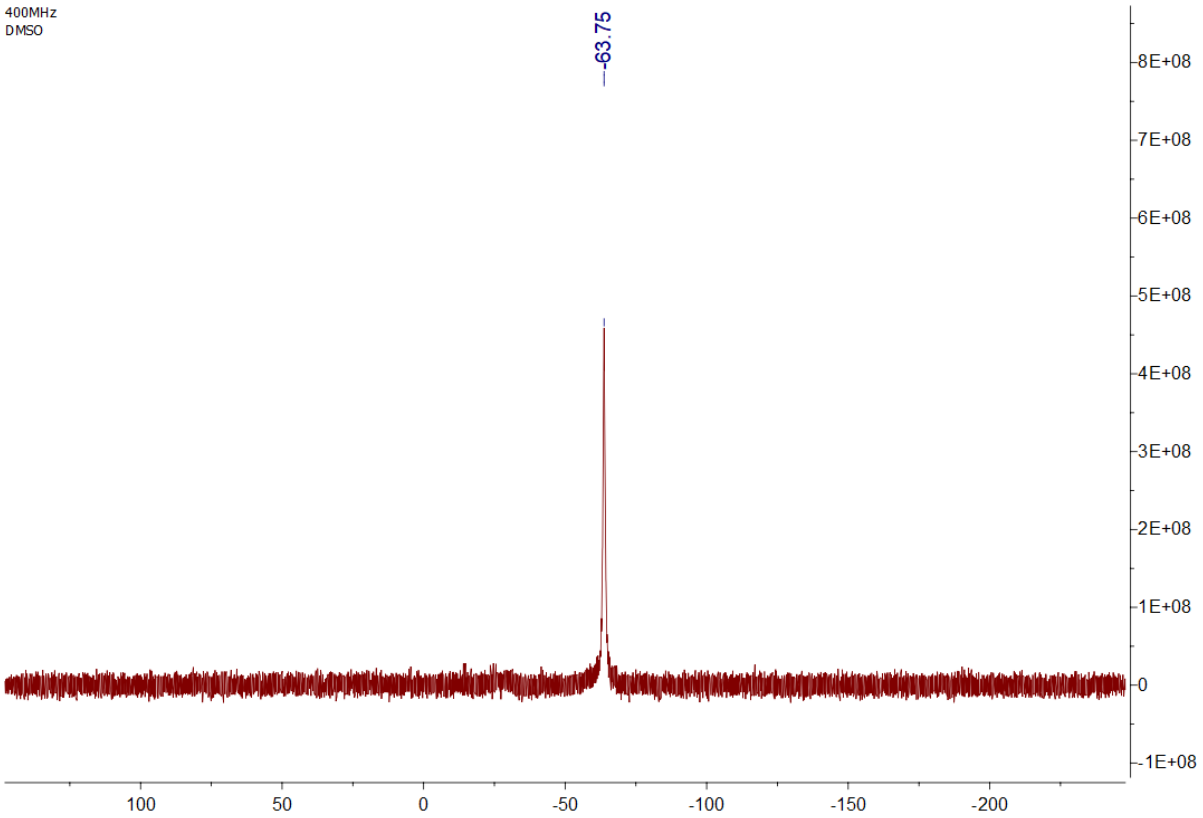


Figure S47. ^{31}P NMR spectrum of complex [Cu(μ-Br)(DBPTA)$_2$]$_2$ (**5**) in DMSO-d_6 (400 MHz).

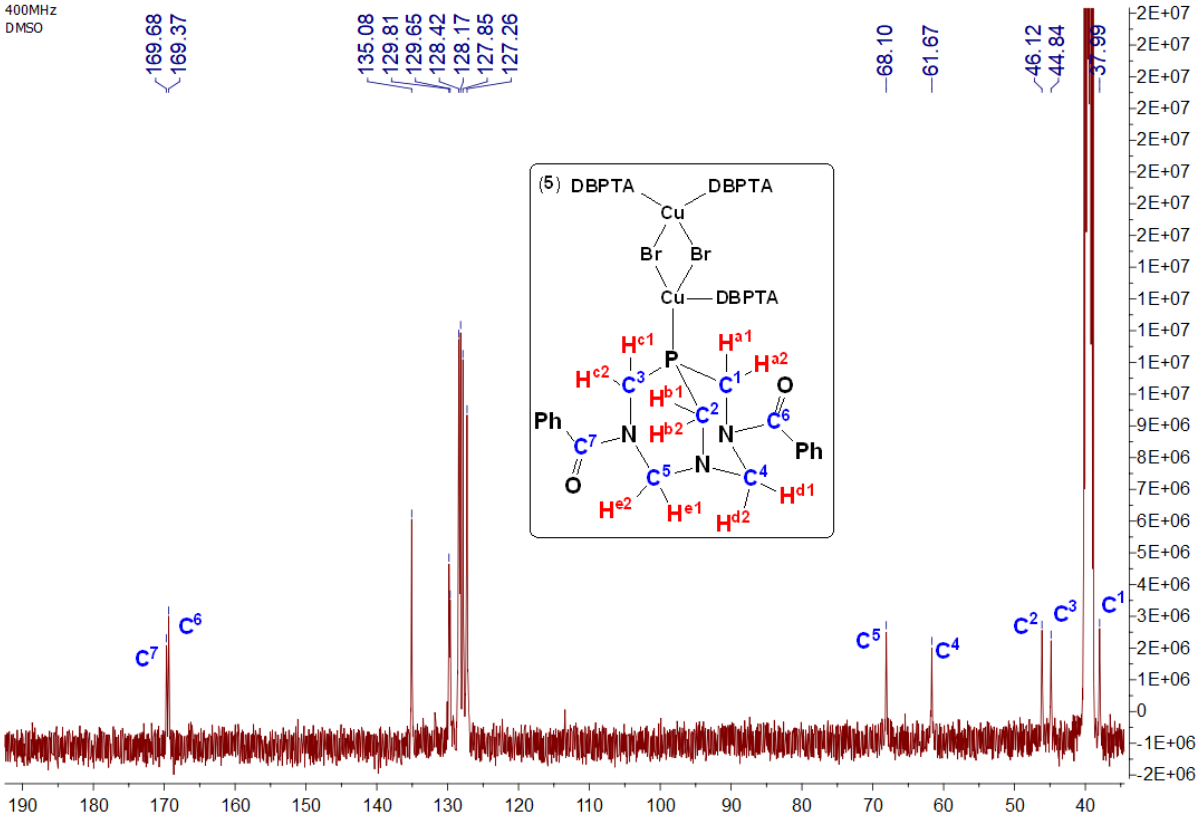


Figure S48. ^{13}C{^{1}H} NMR spectrum of complex [Cu(μ-Br)(DBPTA)$_2$]$_2$ (**5**) in DMSO-d_6 (400 MHz).

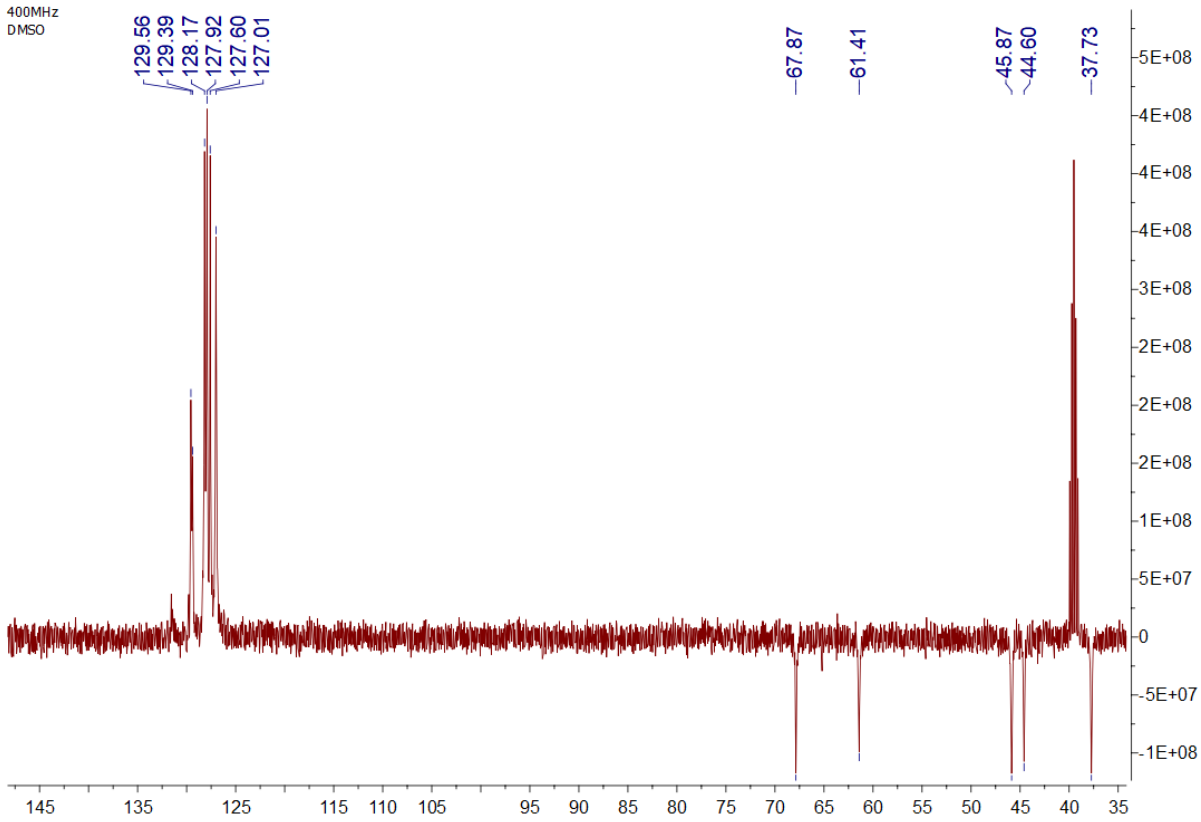


Figure S49. DEPT NMR spectrum of complex $[Cu(\mu\text{-}Br)(DBPTA)_2]_2$ (**5**) in DMSO-d_6 (400 MHz).

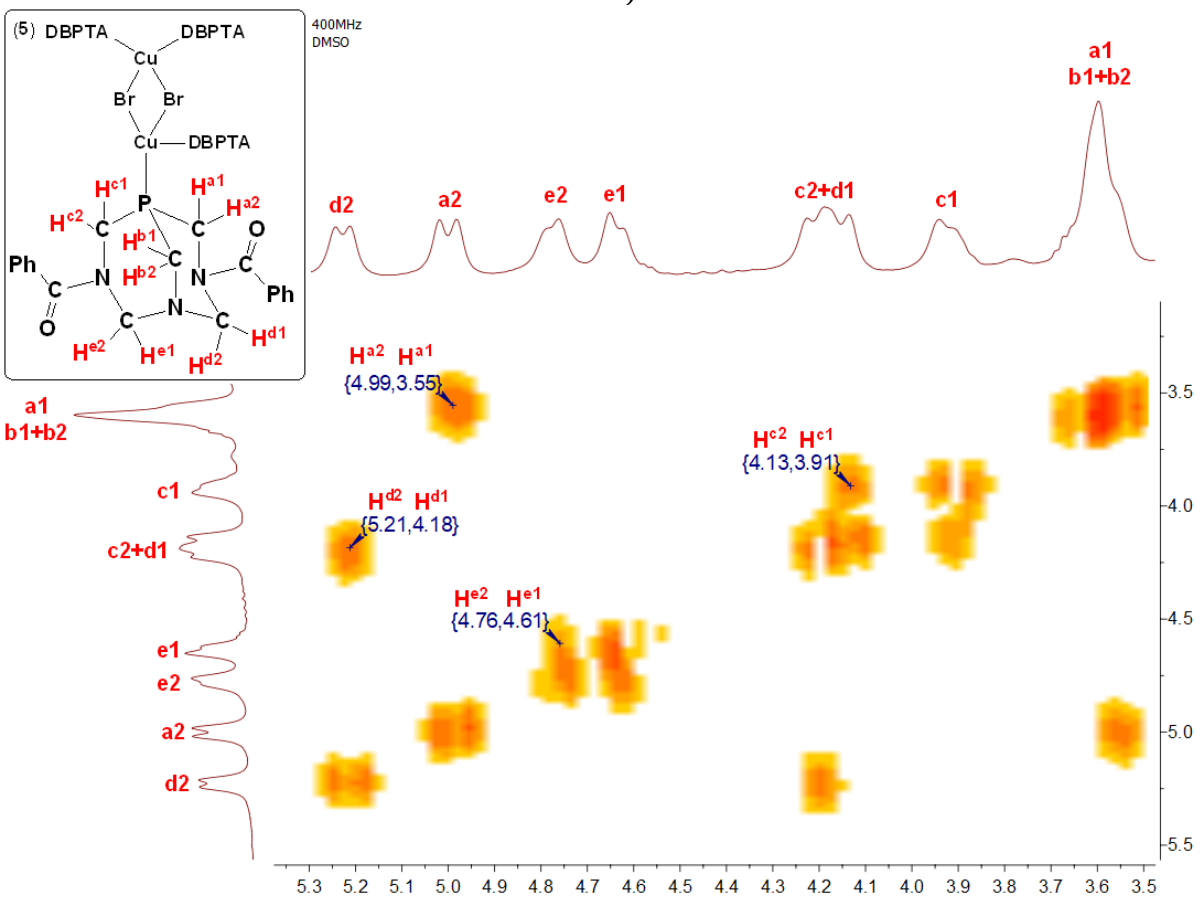


Figure S50. COSY spectrum of complex $[Cu(\mu\text{-}Br)(DBPTA)_2]_2$ (**5**) in DMSO-d_6 (400 MHz).

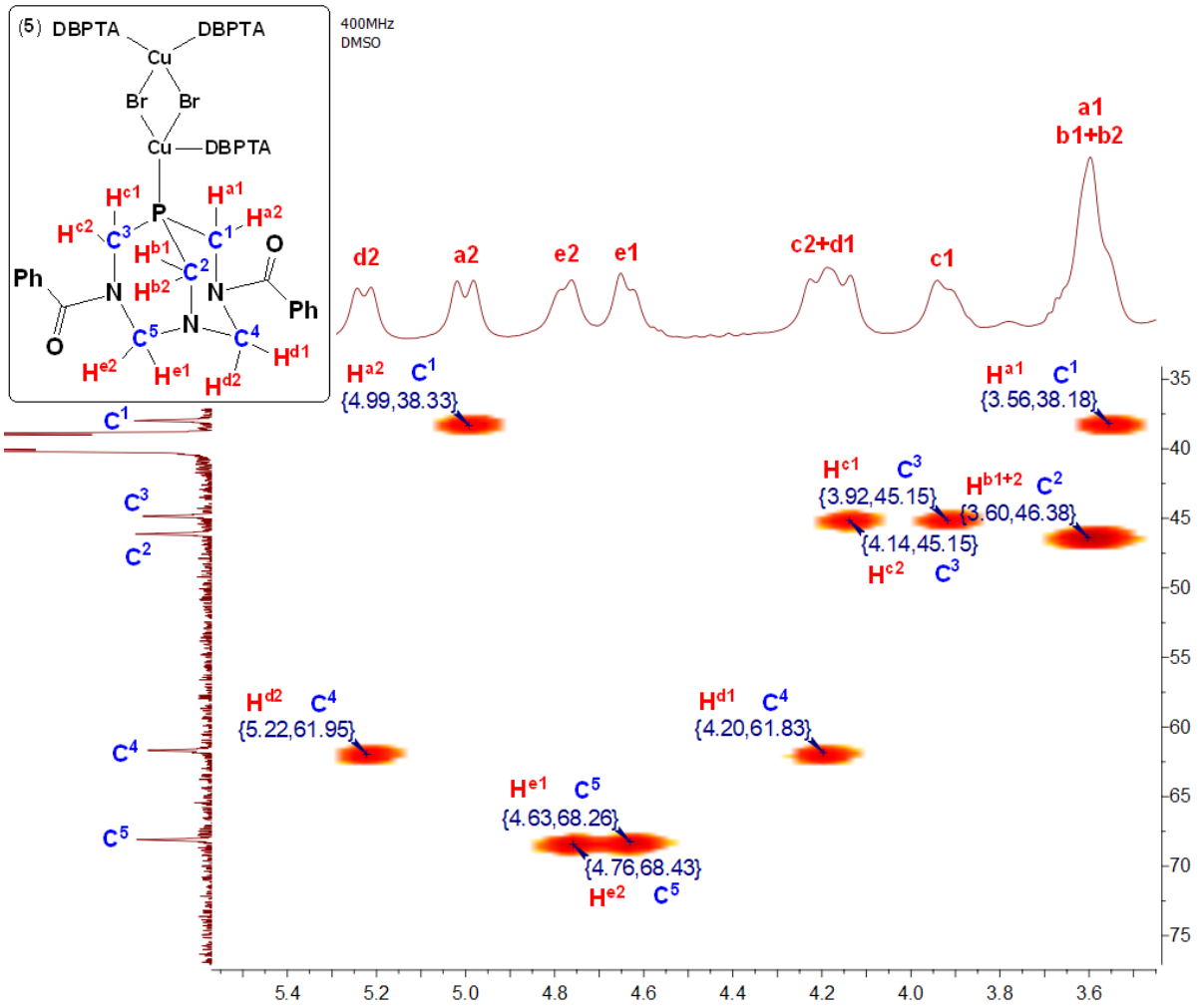


Figure S51. HSQC spectrum of complex [Cu(μ-Br)(DBPTA)$_2$]$_2$ (**5**) in DMSO-d_6 (400 MHz).

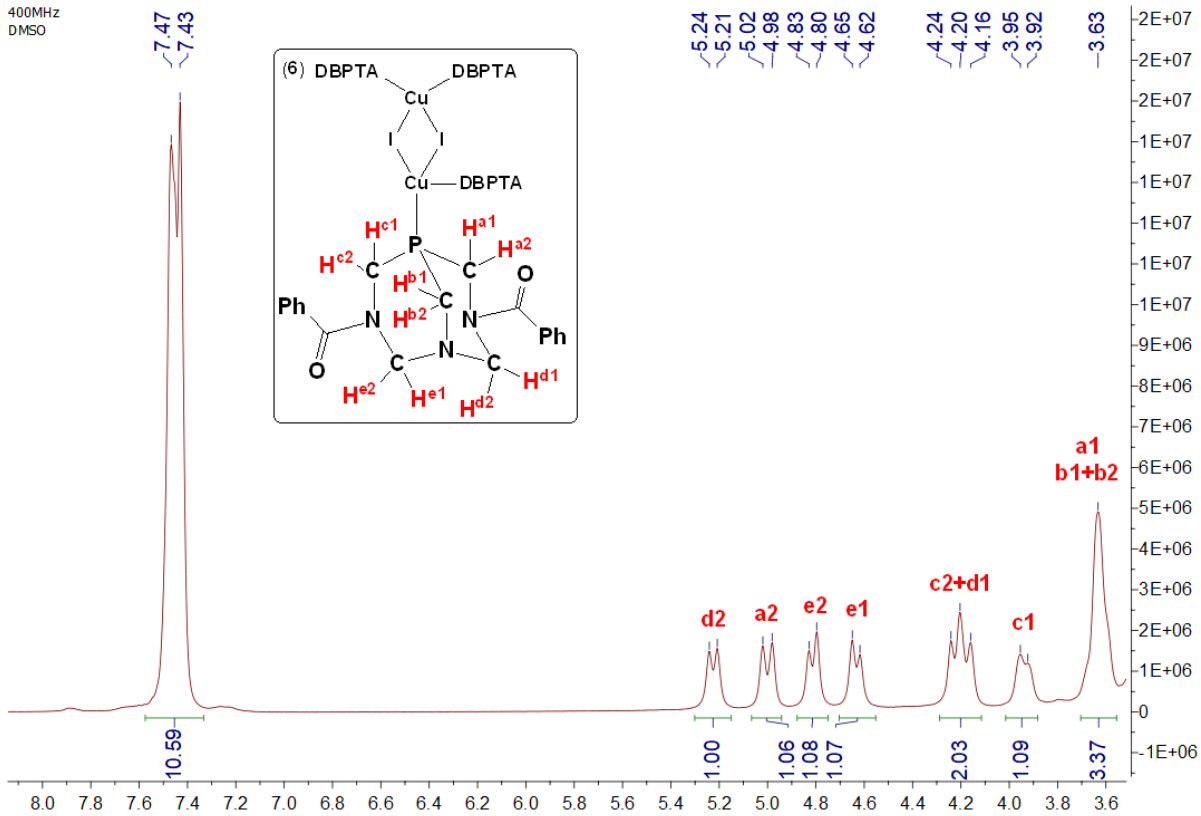


Figure S52. ^{1}H NMR spectrum of complex [Cu(μ-I)(DBPTA)$_2$]$_2$ (**6**) in DMSO-d_6 (400 MHz).

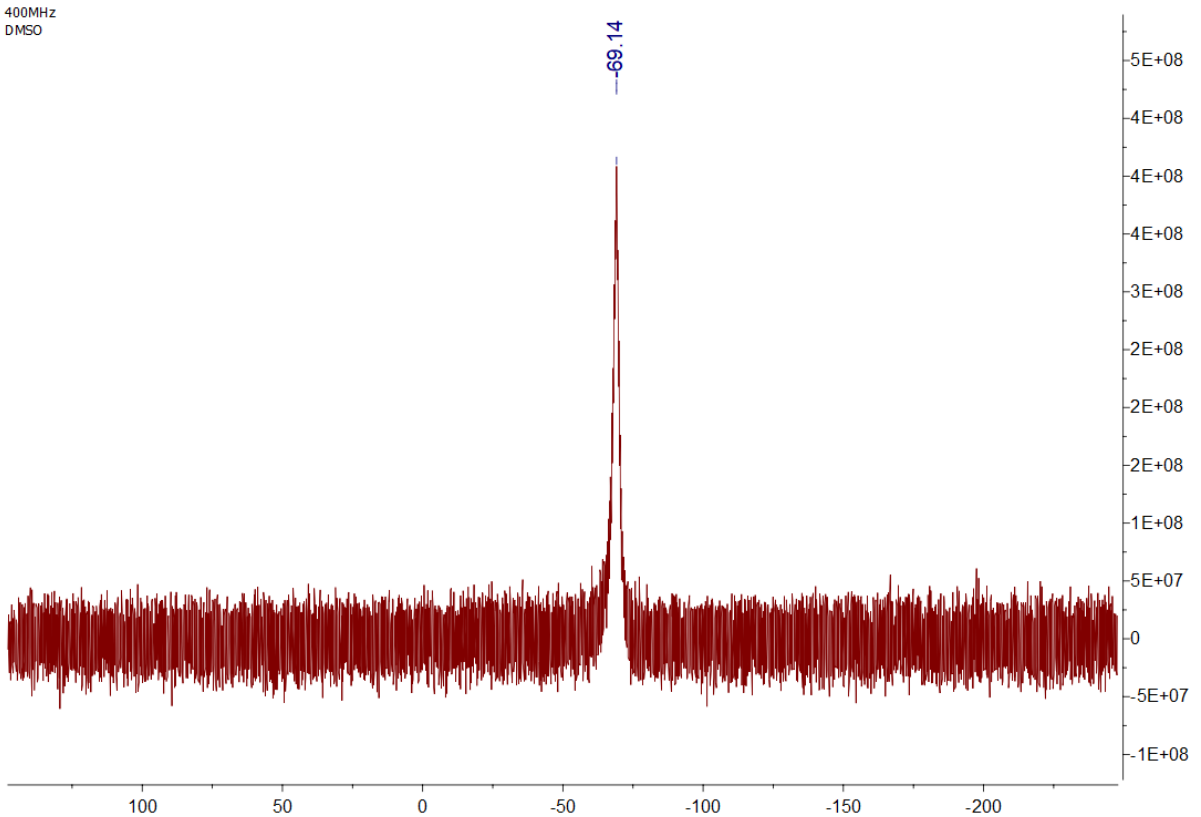


Figure S53. ^{31}P NMR spectrum of complex [Cu(μ-I)(DBPTA)$_2$]$_2$ (**6**) in DMSO-d_6 (400 MHz).

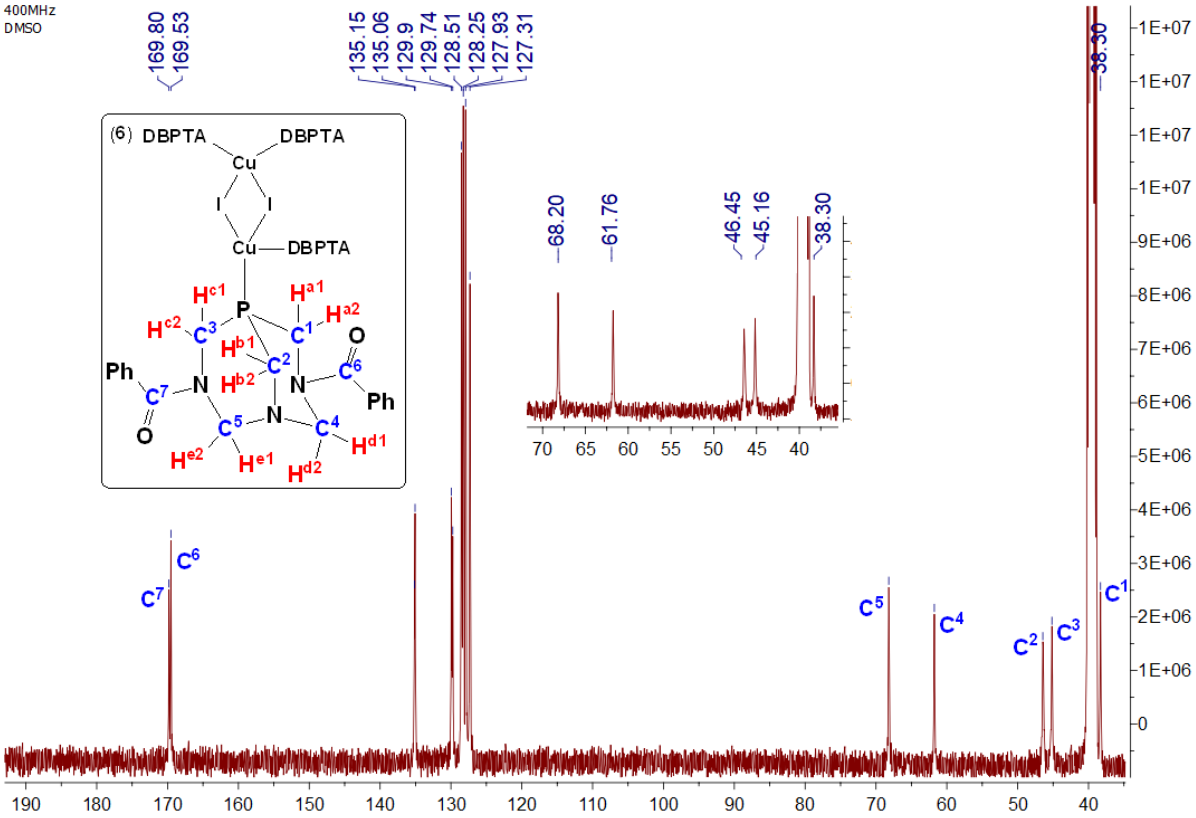


Figure S54. $^{13}C\{^{1}H\}$ NMR spectrum of complex $[Cu(\mu\text{-}I)(DBPTA)_2]_2$ (**6**) in DMSO-d_6 (400 MHz).

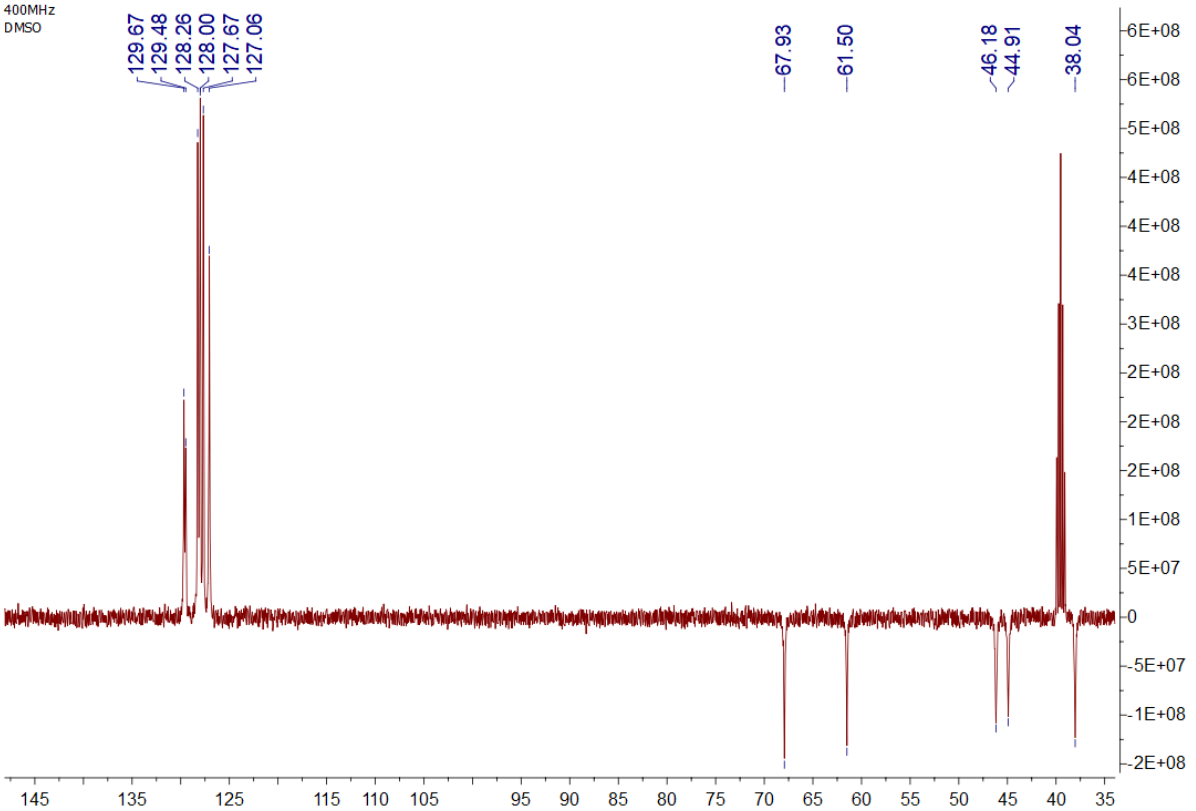


Figure S55. DEPT NMR spectrum of complex $[Cu(\mu\text{-}I)(DBPTA)_2]_2$ (**6**) in DMSO-d_6 (400 MHz).

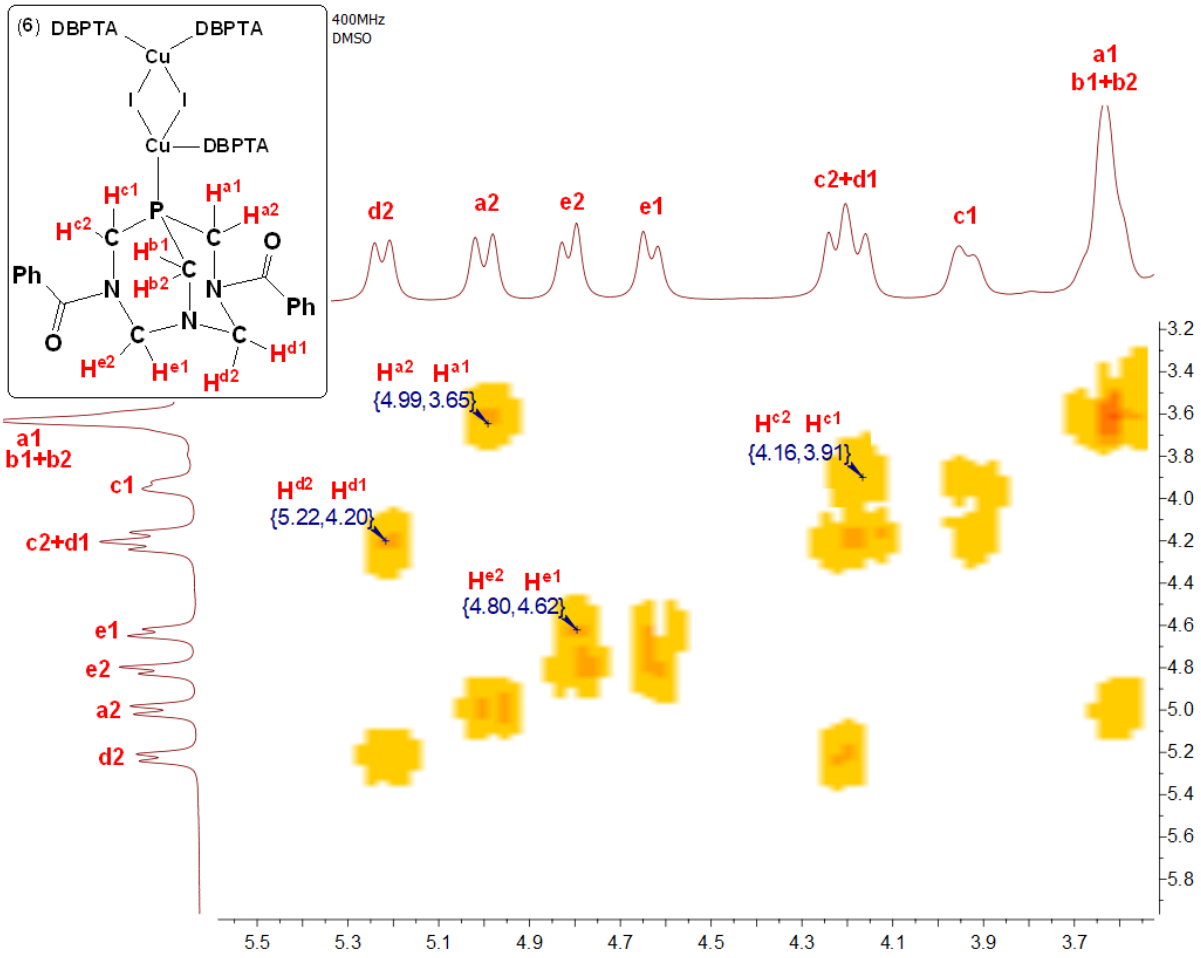


Figure S56. COSY spectrum of complex [Cu(μ-I)(DBPTA)$_2$]$_2$ (**6**) in DMSO-d_6 (400 MHz).

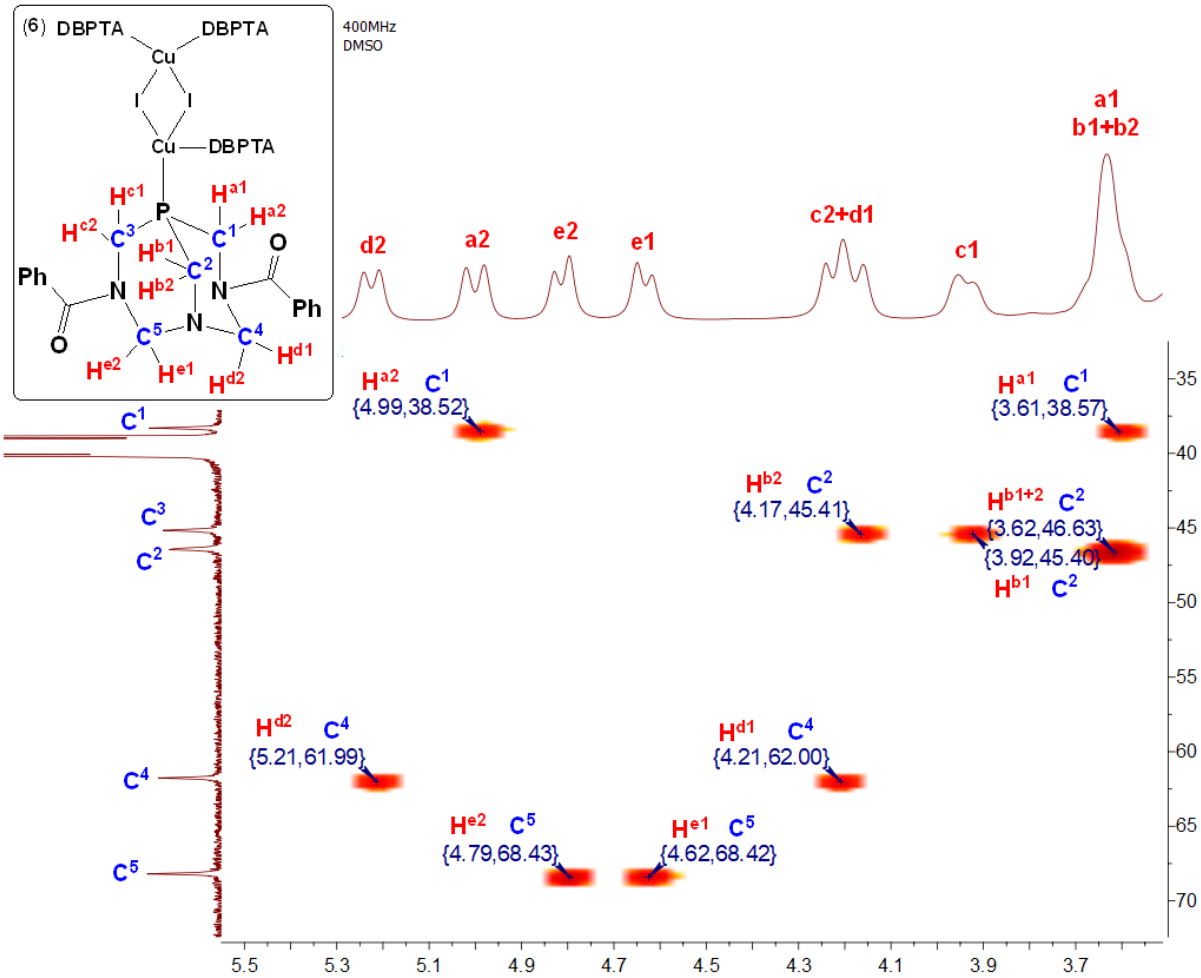


Figure S57. HSQC spectrum of complex [Cu(μ-I)(DBPTA)$_2$]$_2$ (**6**) in DMSO-d_6 (400 MHz).

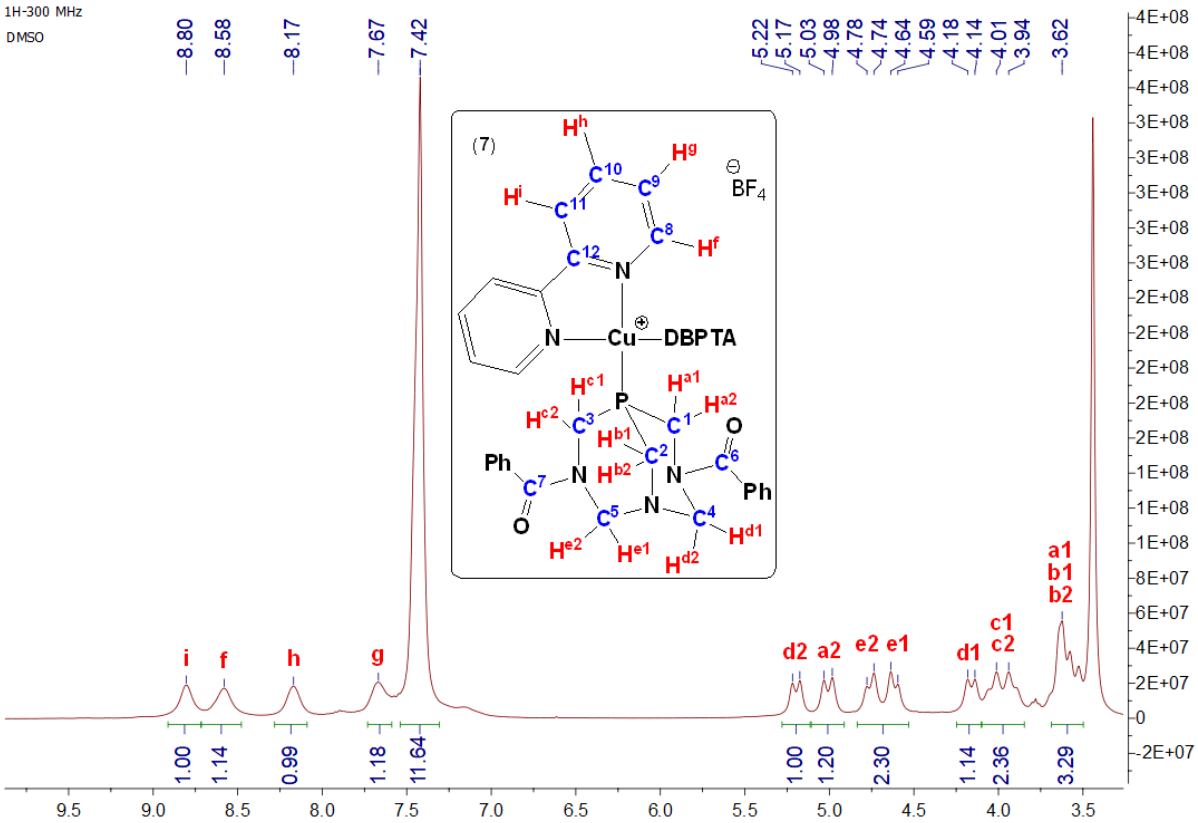


Figure S58. ^{1}H NMR spectrum of complex [Cu(bpy)(DBPTA)$_2$]BF$_4$ (**7**) in DMSO-*d*$_6$ (300 MHz).

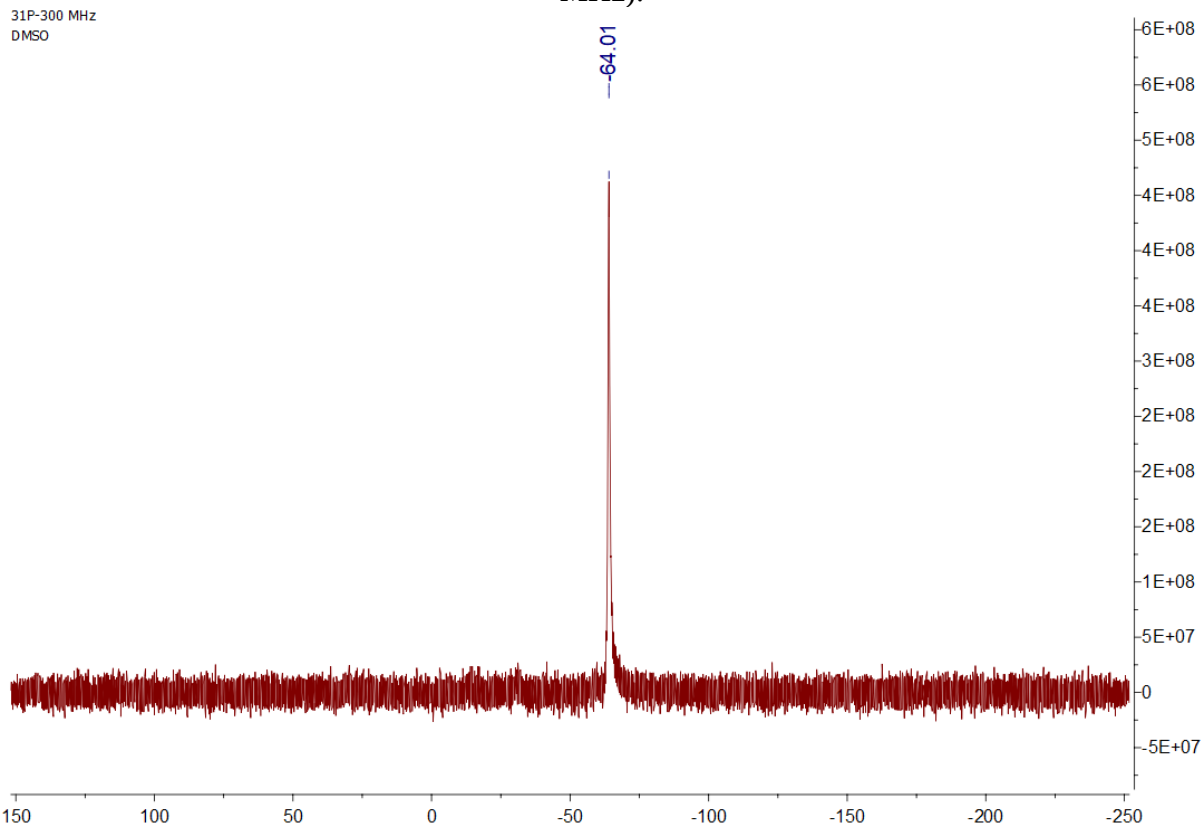


Figure S59. ^{31}P NMR spectrum of complex [Cu(bpy)(DBPTA)$_2$]BF$_4$ (**7**) in DMSO-*d*$_6$ (300 MHz).

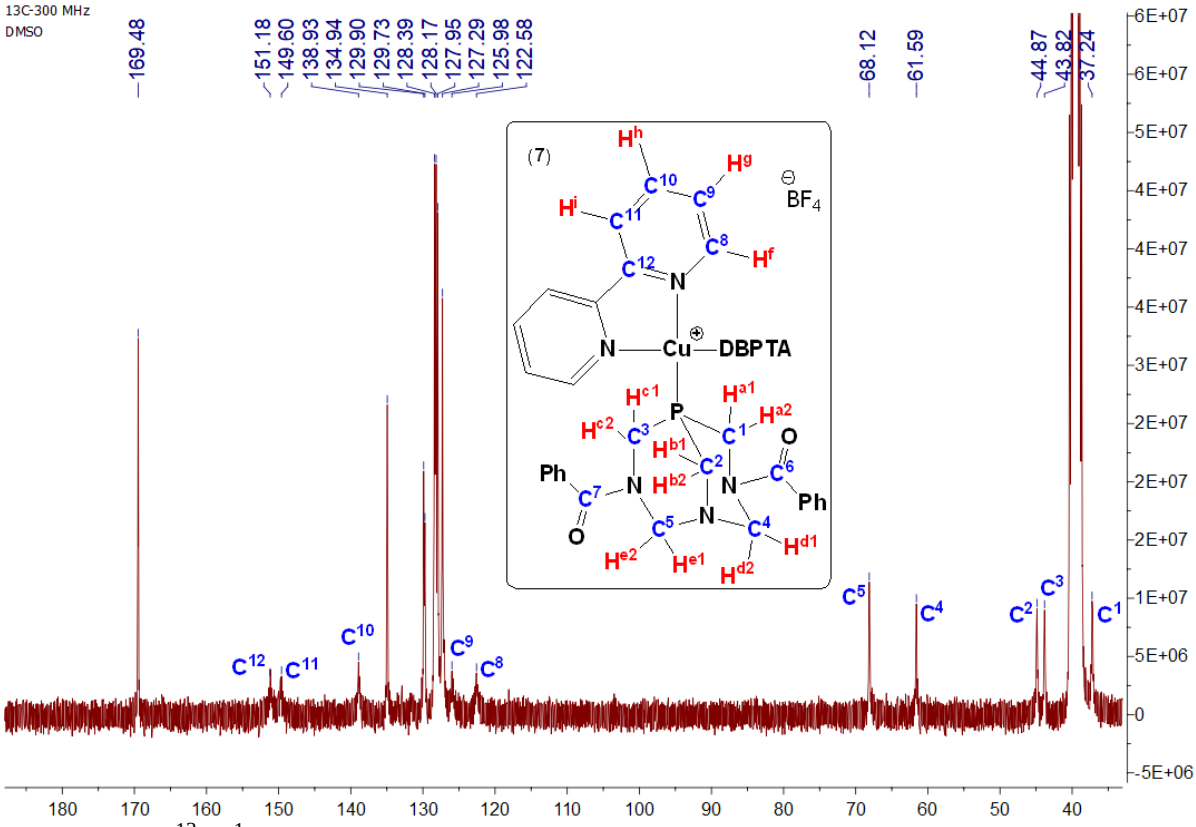


Figure S60. $^{13}C\{^{1}H\}$ NMR spectrum of complex $[Cu(bpy)(DBPTA)_2]BF_4$ (**7**) in DMSO-d_6 (300 MHz).

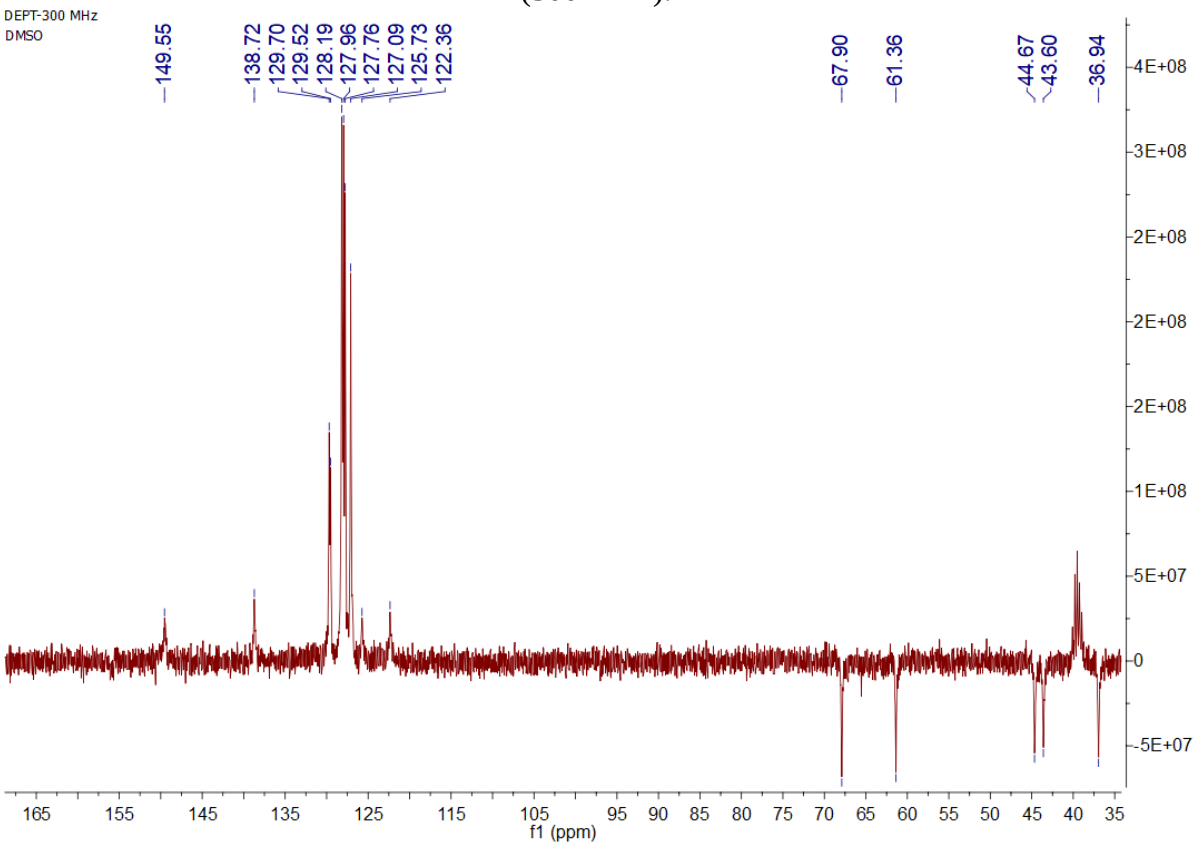


Figure S61. DEPT NMR spectrum of complex $[Cu(bpy)(DBPTA)_2]BF_4$ (**7**) in DMSO-d_6 (300 MHz).

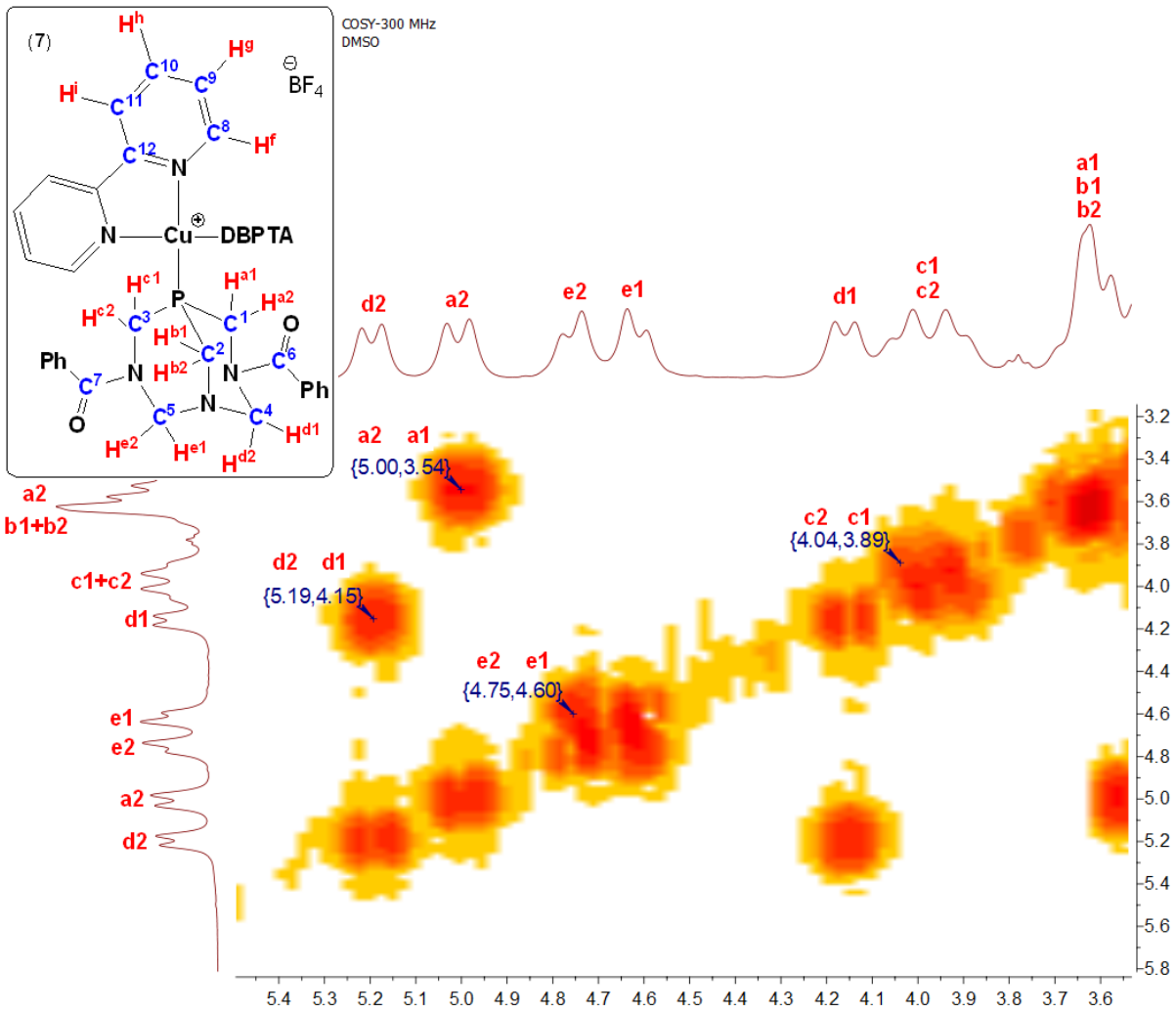


Figure S62. COSY spectrum of complex [Cu(bpy)(DBPTA)$_2$]BF$_4$ (**7**) in DMSO-*d*$_6$ (300 MHz).

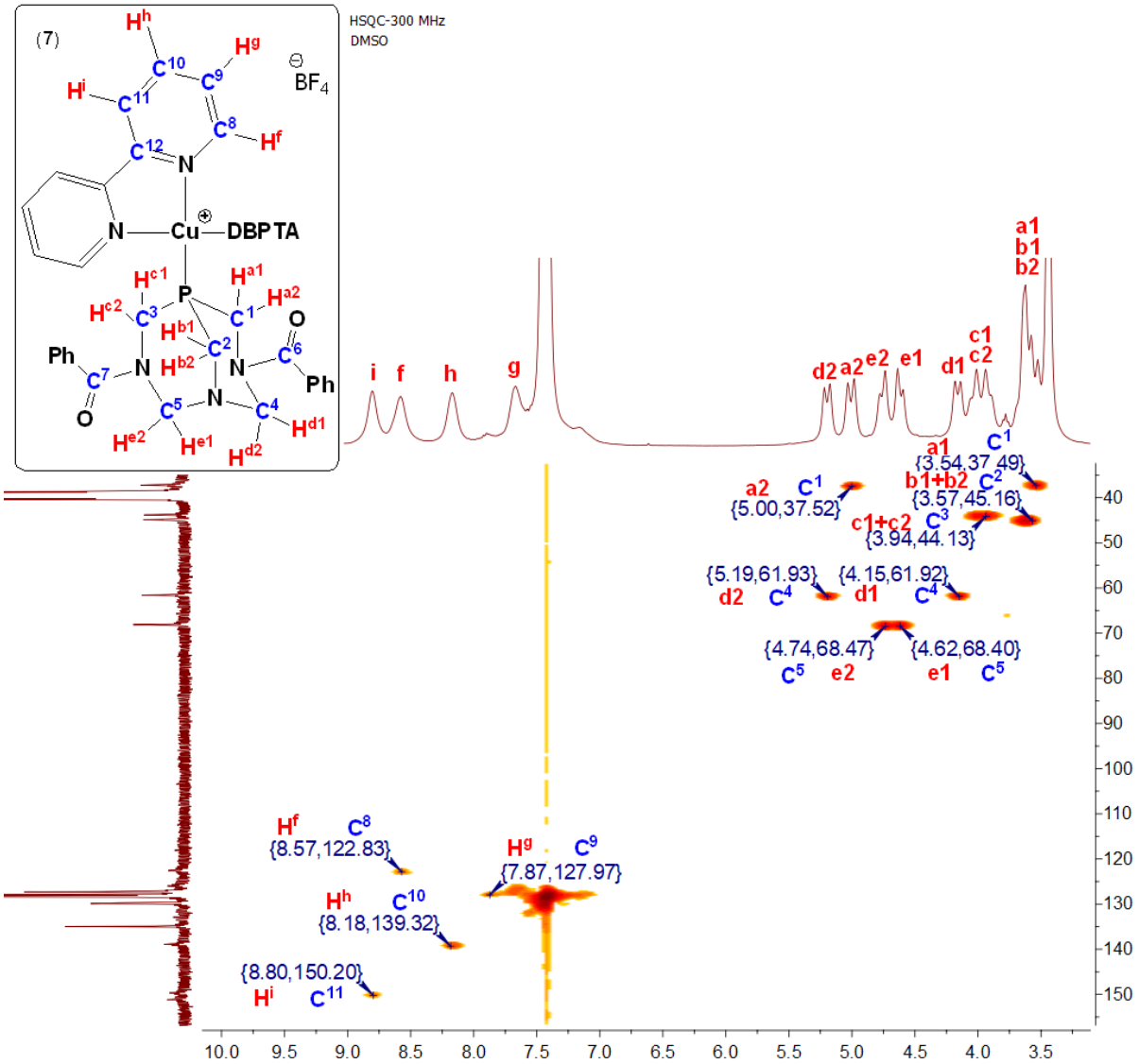


Figure S63. HSQC spectrum of complex $[Cu(bpy)(DBPTA)_2]BF_4$ (**7**) in DMSO-d_6 (300 MHz).

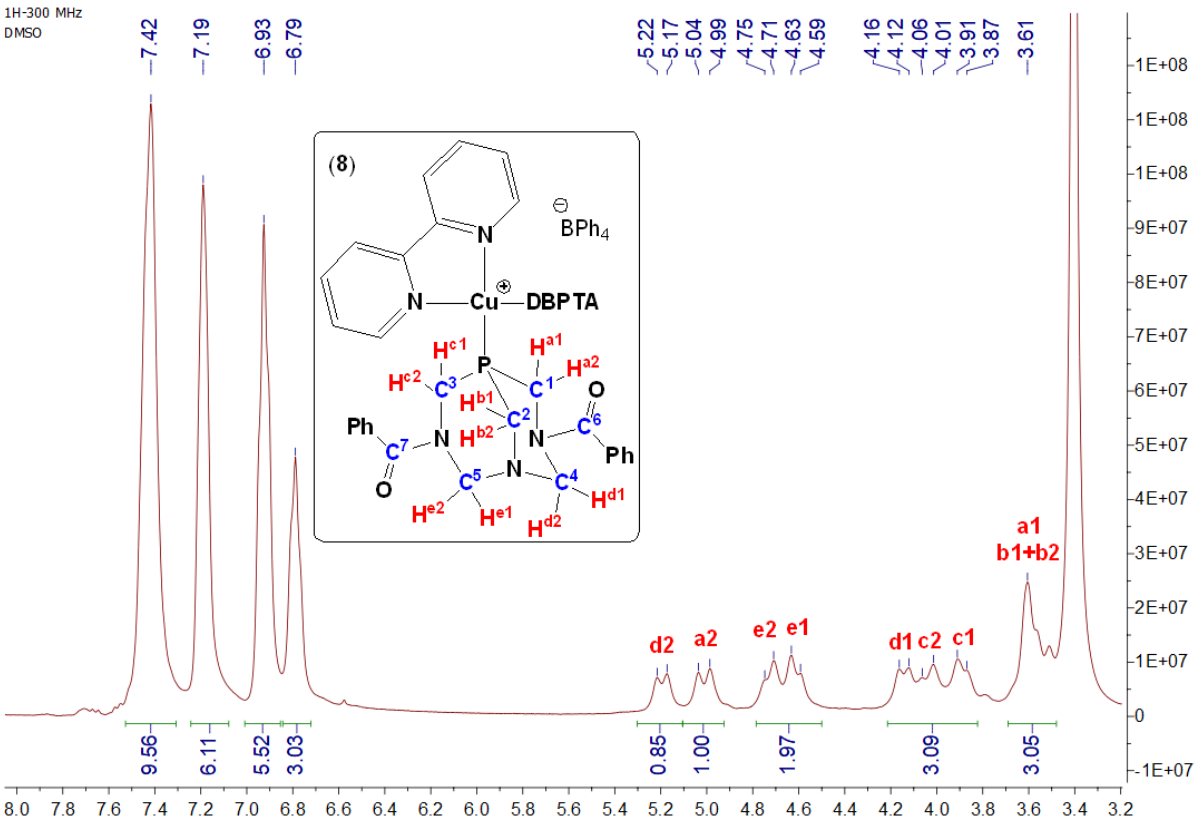


Figure S64. ^{1}H NMR spectrum of complex [Cu(bpy)(DBPTA)$_2$]BPh$_4$ (**8**) in DMSO-*d*$_6$ (300 MHz).

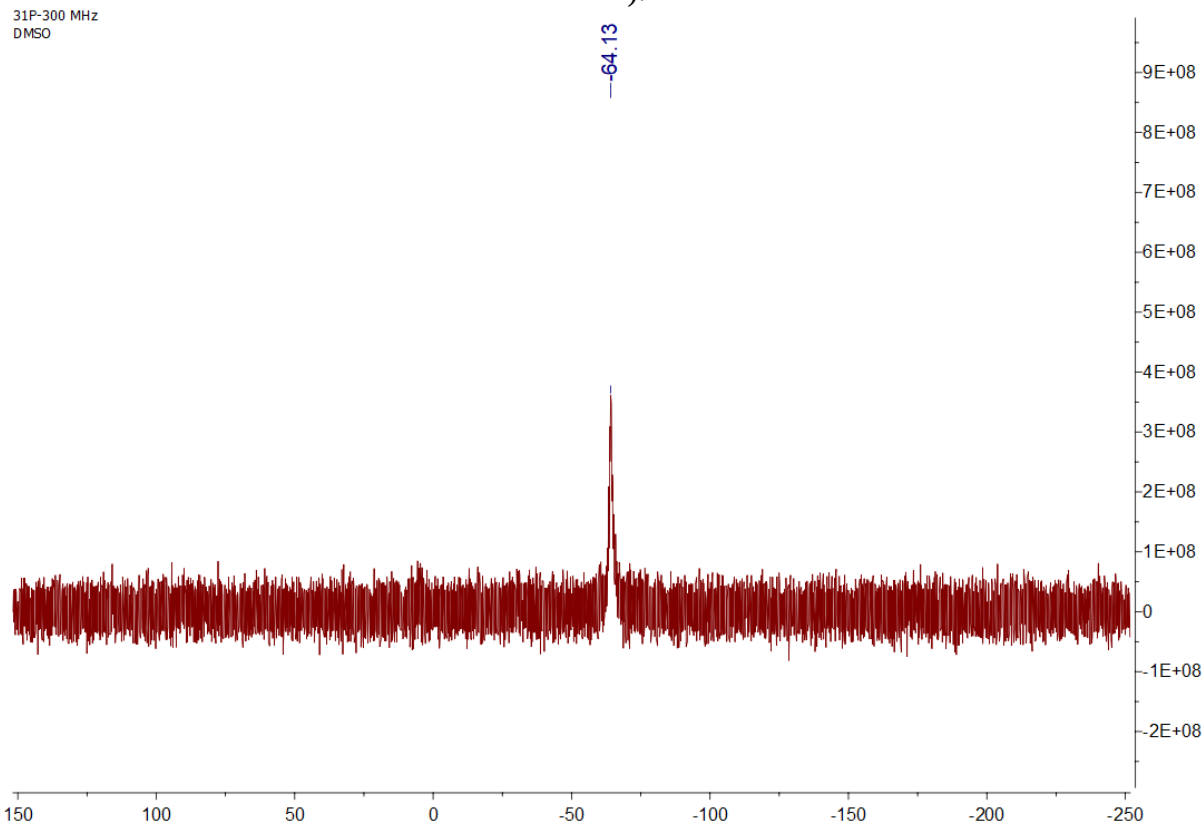


Figure S65. ^{31}P NMR spectrum of complex [Cu(bpy)(DBPTA)$_2$]BPh$_4$ (**8**) in DMSO-*d*$_6$ (300 MHz).

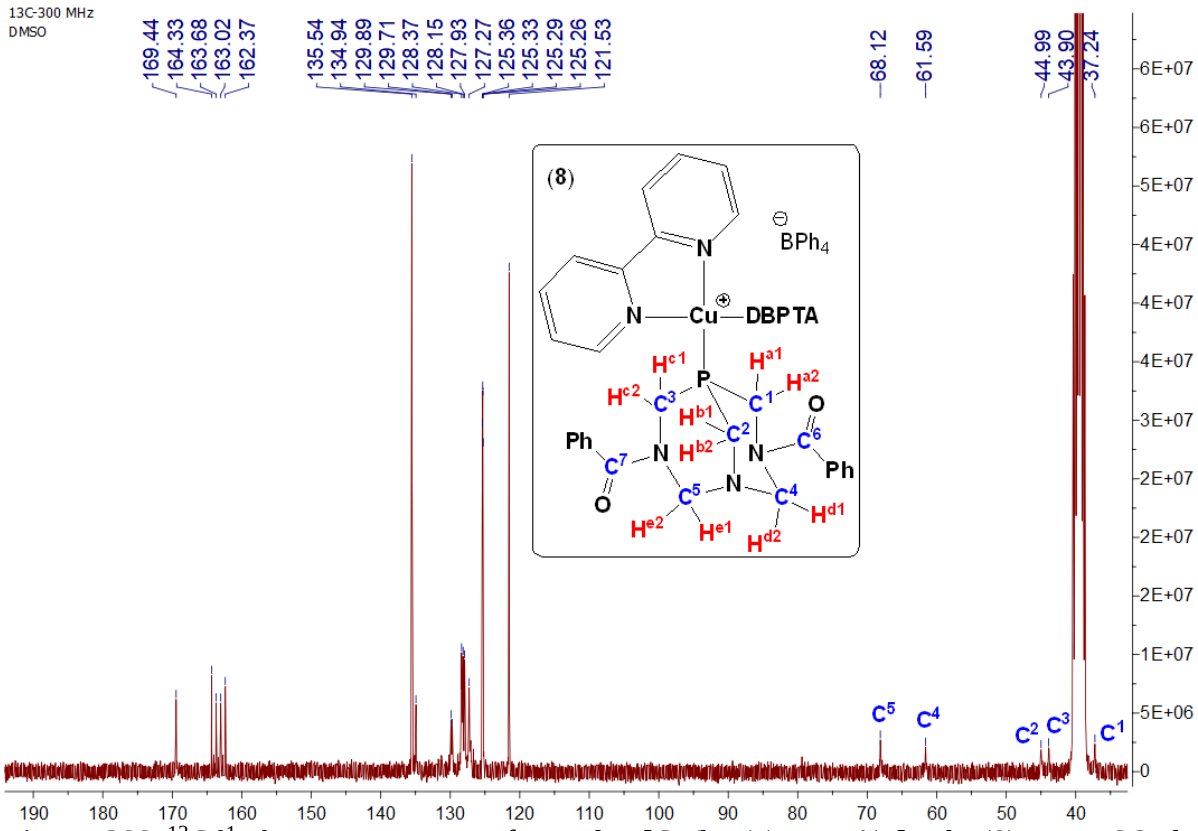


Figure S66. $^{13}C\{^{1}H\}$ NMR spectrum of complex $[Cu(bpy)(DBPTA)_2]BPh_4$ (**8**) in DMSO-d_6 (300 MHz).

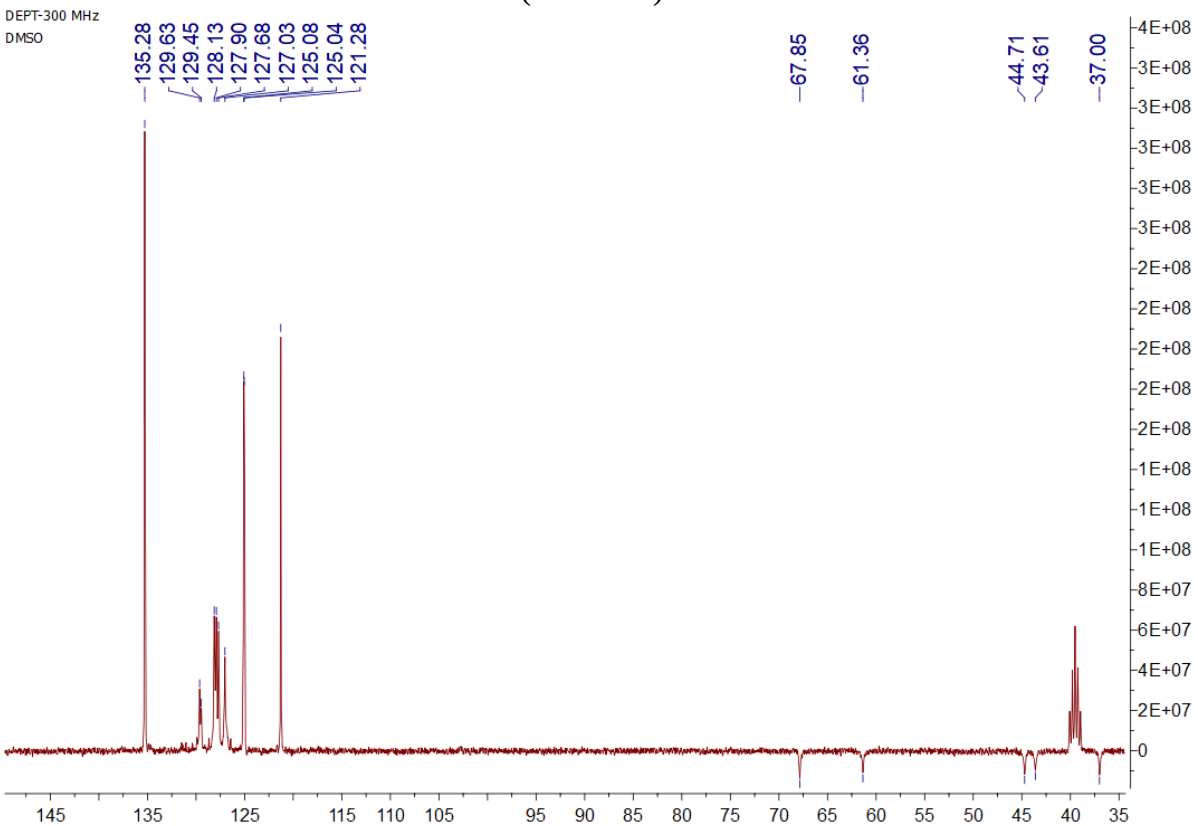


Figure S67. DEPT NMR spectrum of complex $[Cu(bpy)(DBPTA)_2]BPh_4$ (**8**) in DMSO-d_6 (300 MHz).

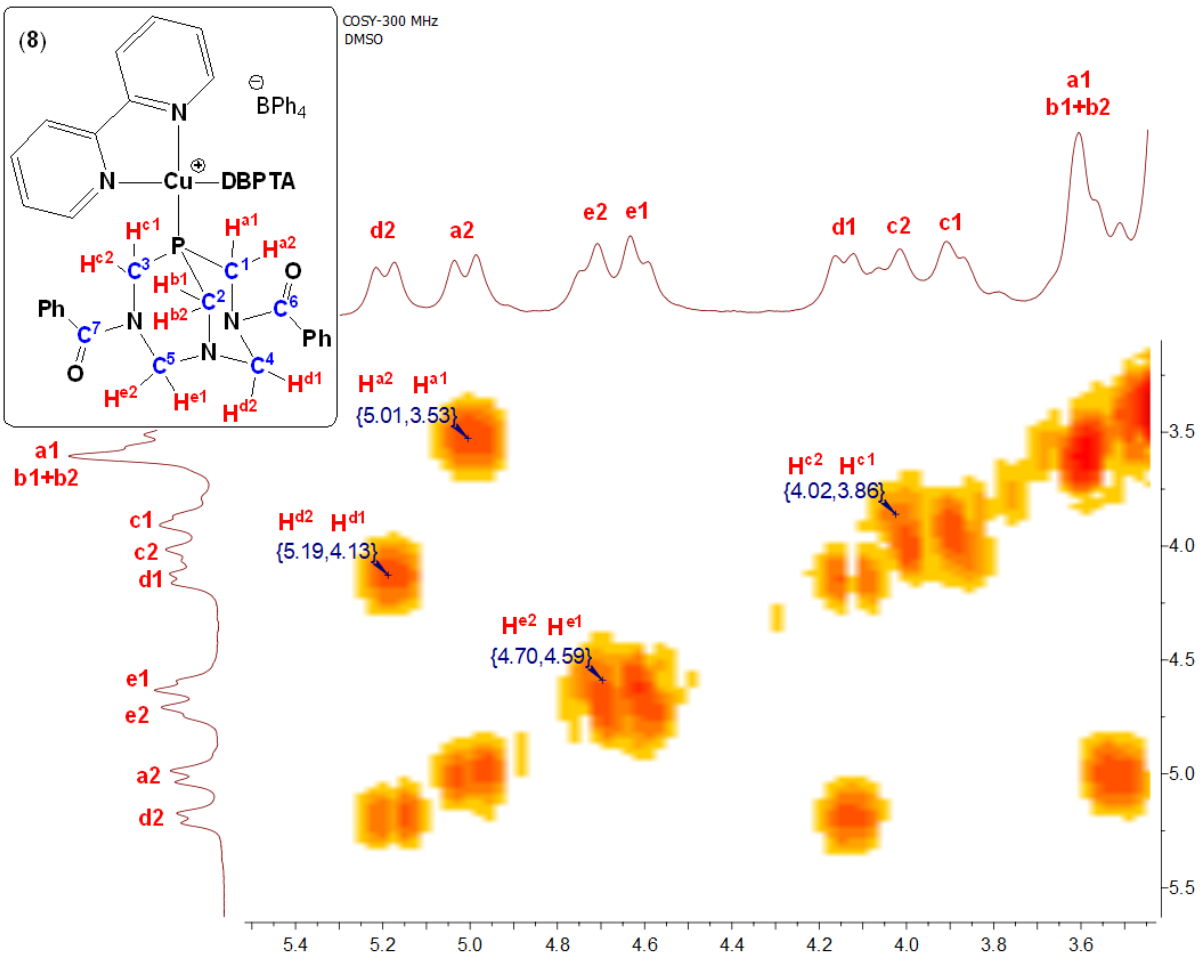


Figure S68. COSY spectrum of complex [Cu(bpy)(DBPTA)$_2$]BPh$_4$ (**8**) in DMSO-d_6 (300 MHz).

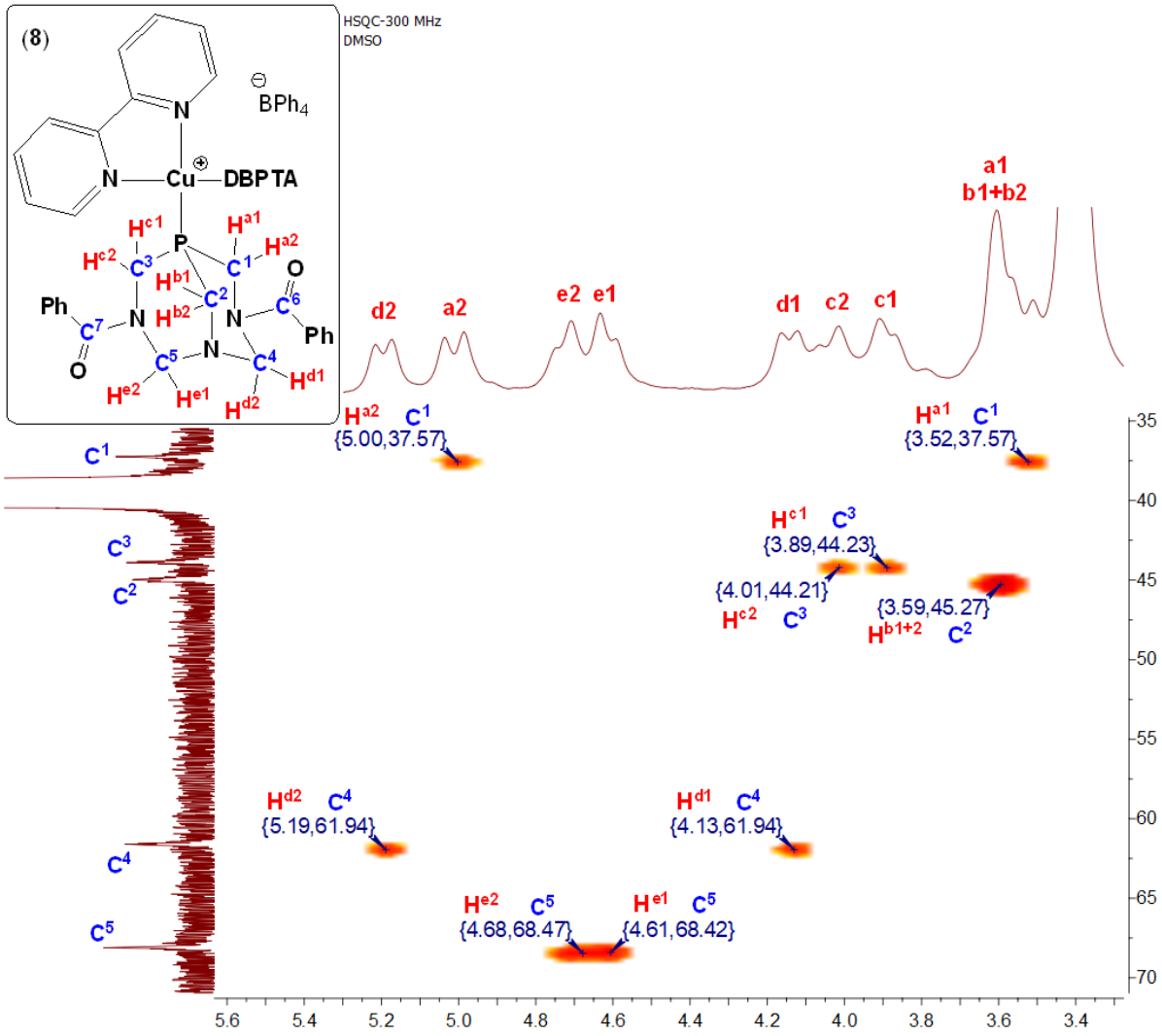


Figure S69. HSQC spectrum of complex [Cu(bpy)(DBPTA)$_2$]BPh$_4$ (**8**) in DMSO-*d*$_6$ (300 MHz).

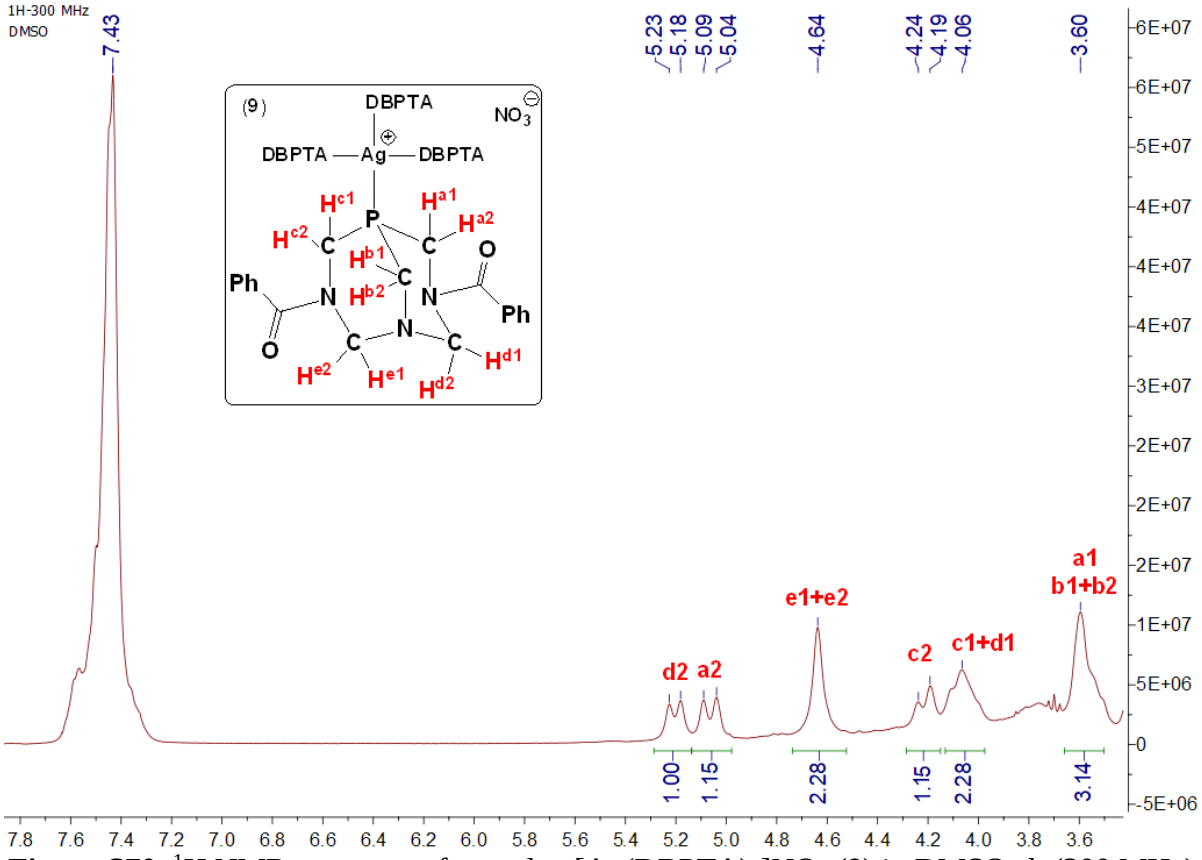


Figure S70. ^{1}H NMR spectrum of complex [Ag(DBPTA)$_4$]NO$_3$ (**9**) in DMSO-*d*$_6$ (300 MHz).

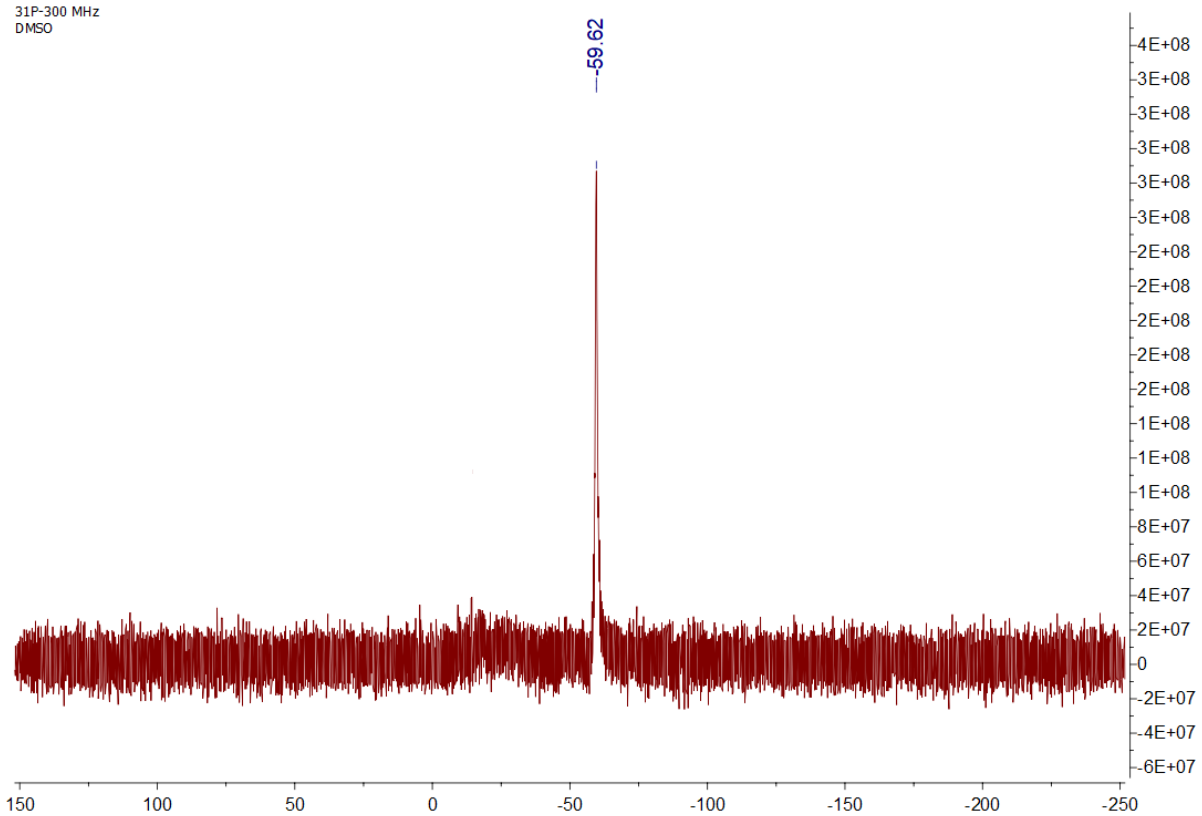


Figure S71. ^{31}P NMR spectrum of complex [Ag(DBPTA)$_4$]NO$_3$ (**9**) in DMSO-*d*$_6$ (300 MHz).

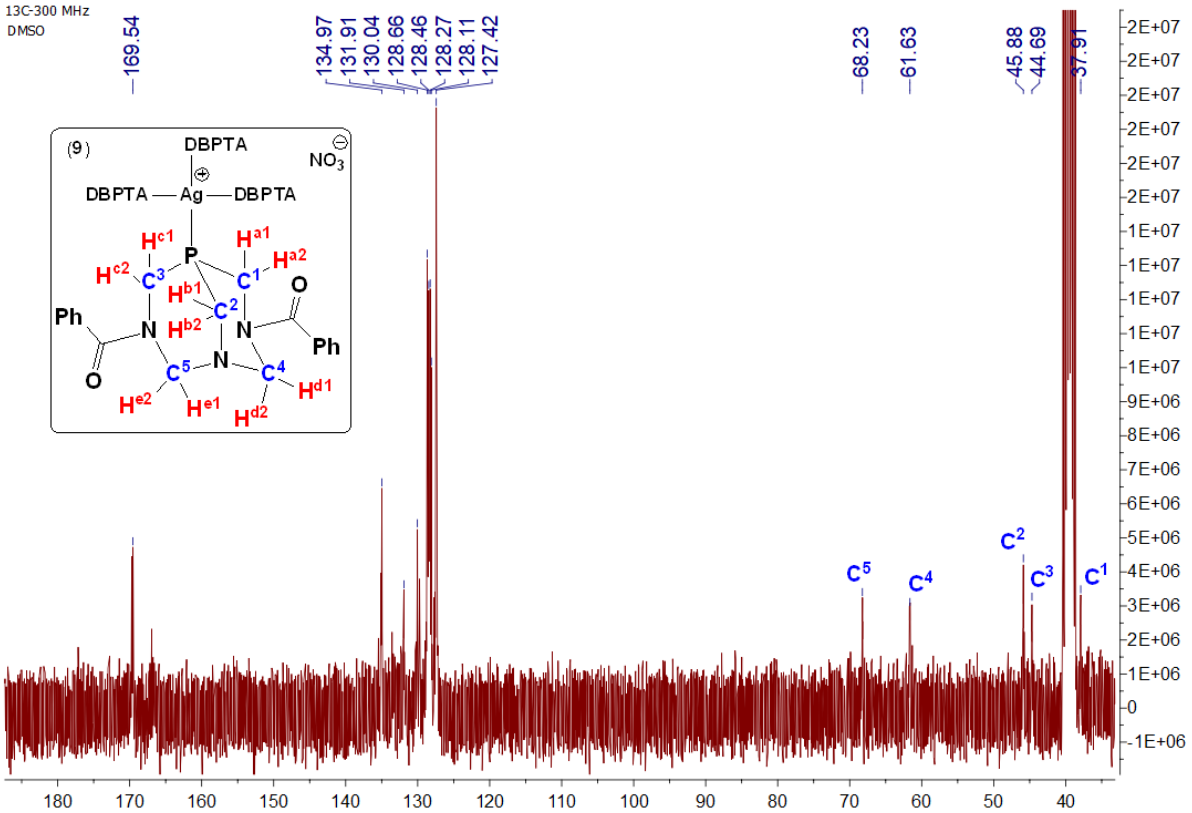


Figure S72. $^{13}C\{^{1}H\}$ NMR spectrum of complex $[Ag(DBPTA)_4]NO_3$ (**9**) in DMSO-d_6 (300 MHz).

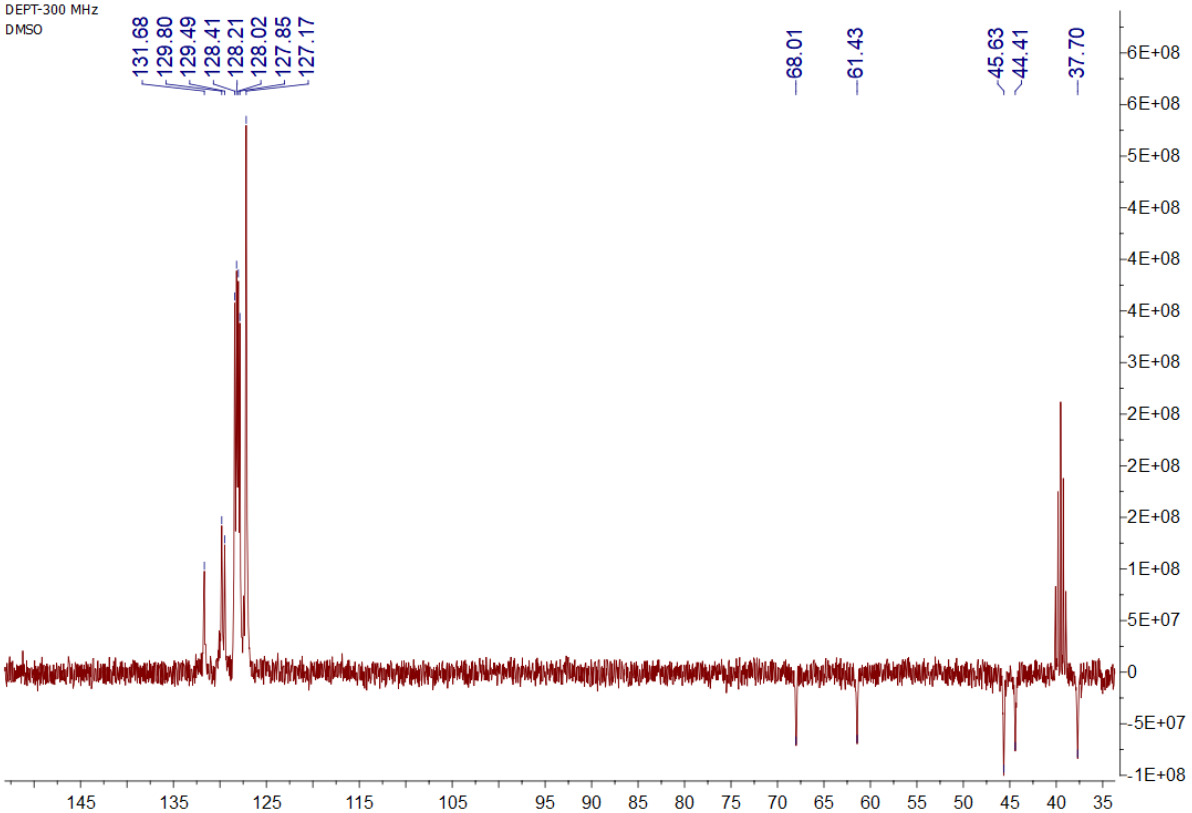


Figure S73. DEPT NMR spectrum of complex $[Ag(DBPTA)_4]NO_3$ (**9**) in DMSO-d_6 (300 MHz).

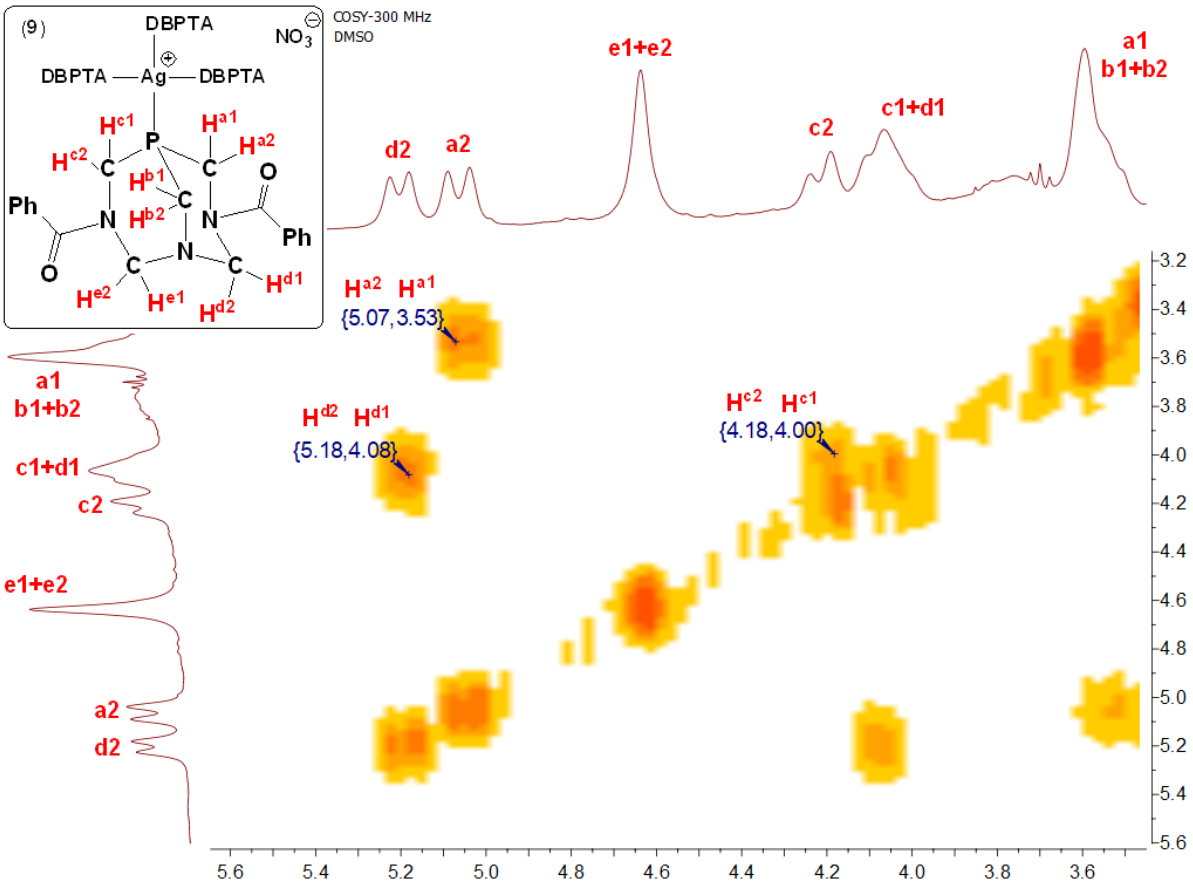


Figure S74. COSY spectrum of complex $[Ag(DBPTA)_4]NO_3$ (**9**) in DMSO-d_6 (300 MHz).

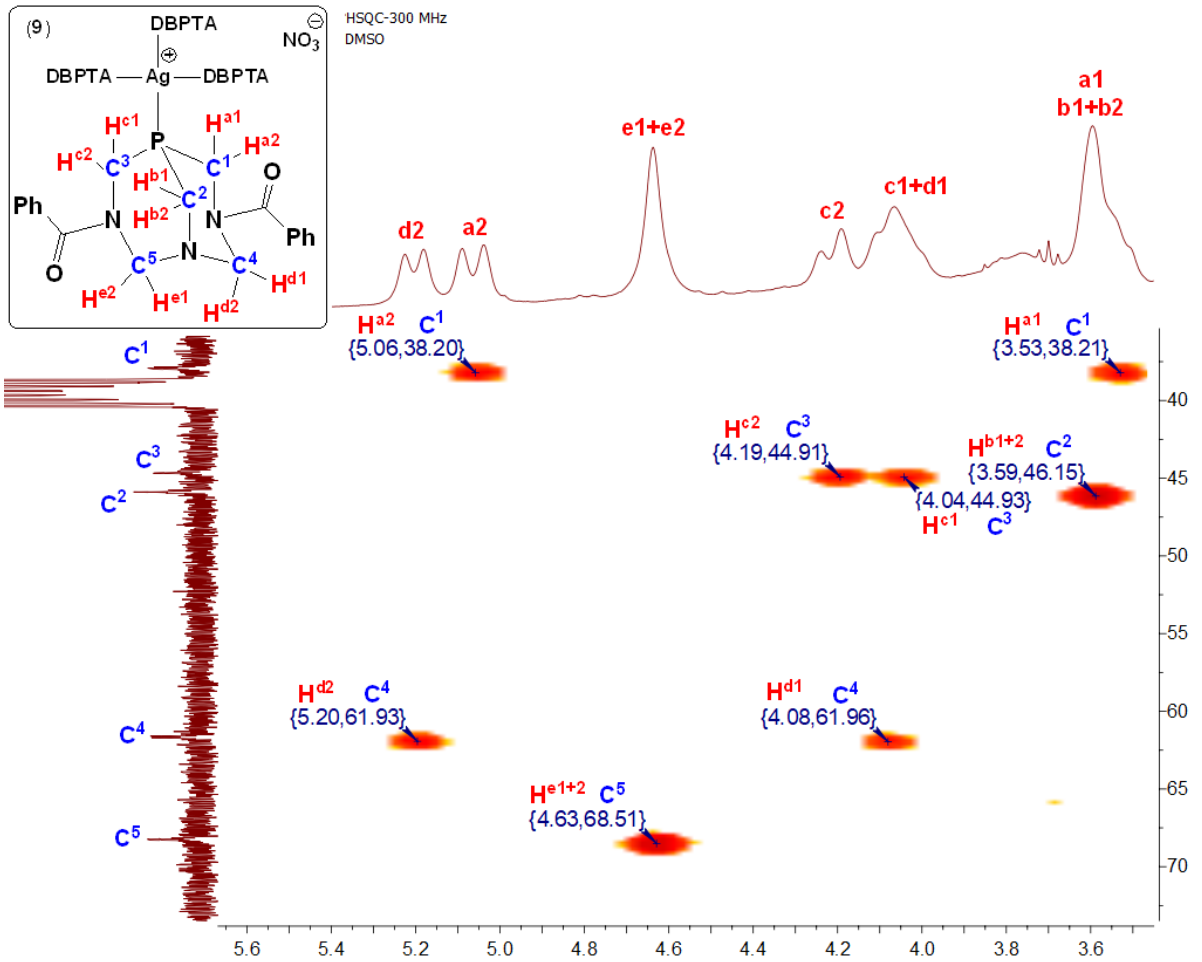


Figure S75. HSQC spectrum of complex [Ag(DBPTA)$_4$]NO$_3$ (**9**) in DMSO-*d*$_6$ (300 MHz).

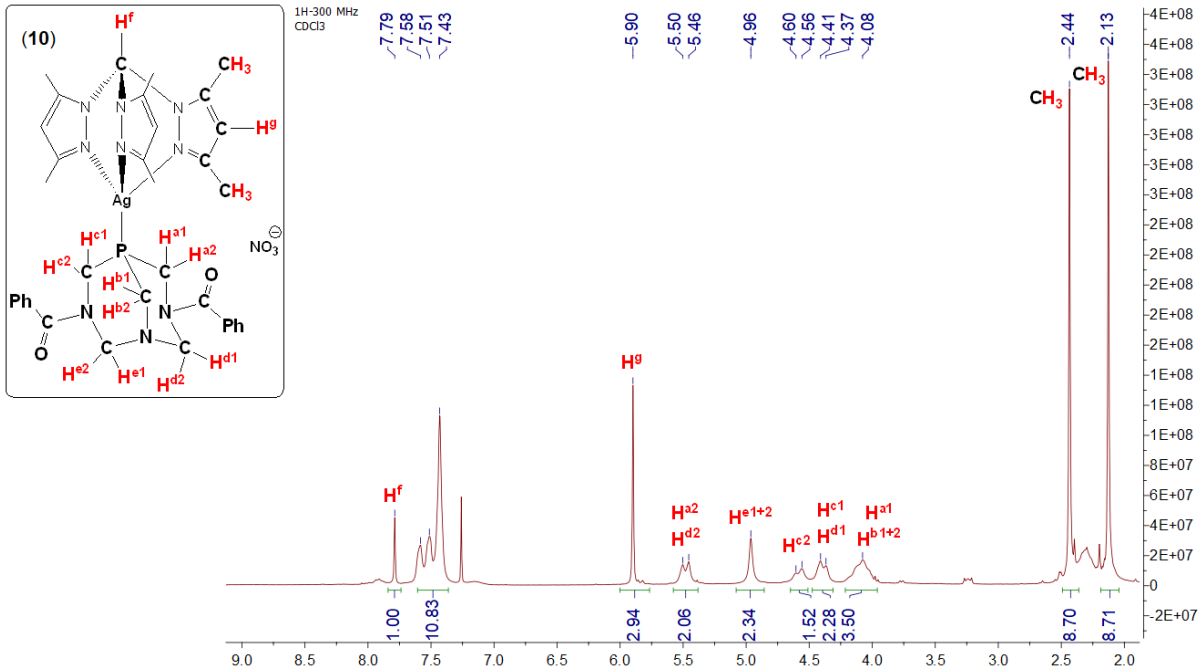


Figure S76. ^{1}H NMR spectrum of complex [Ag(TPM*)(DBPTA)]NO$_3$ (**10**) in CDCl$_3$ (300 MHz).

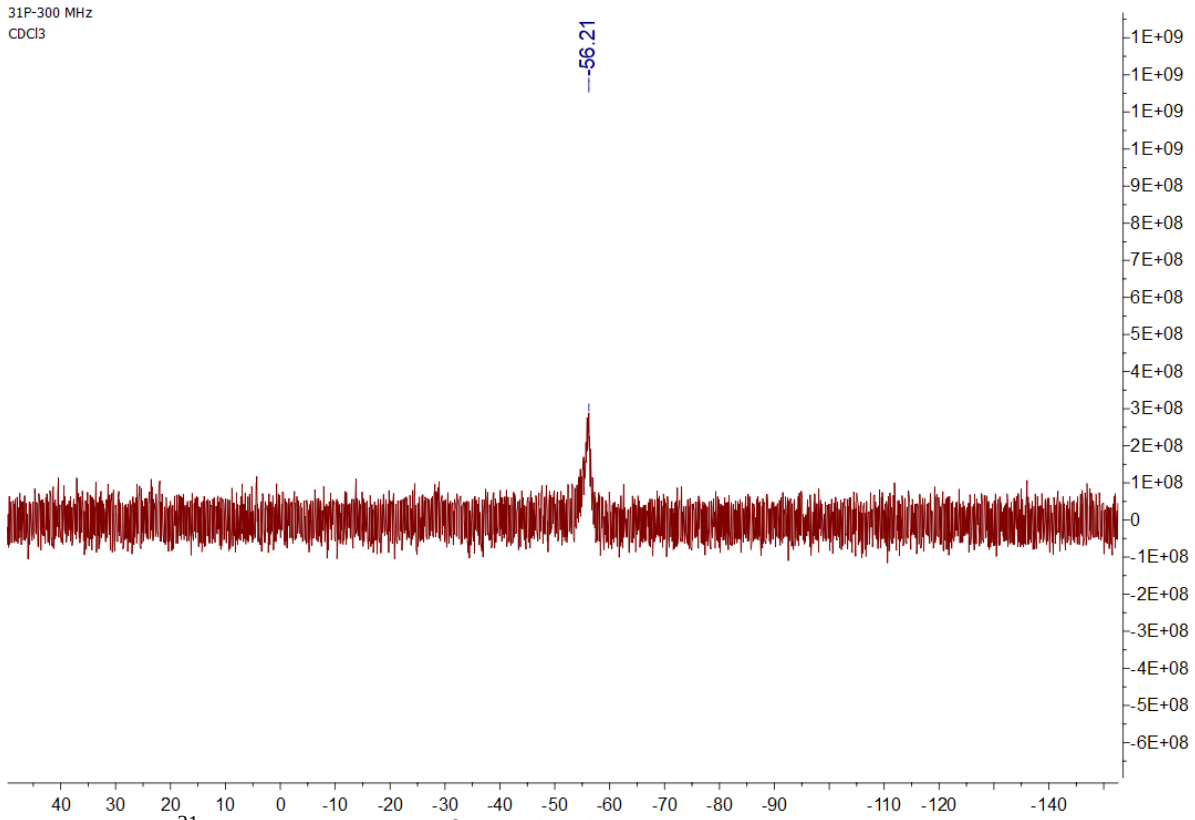


Figure S77. ^{31}P NMR spectrum of complex [Ag(TPM*)(DBPTA)]NO_3 (**10**) in $CDCl_3$ (300 MHz).

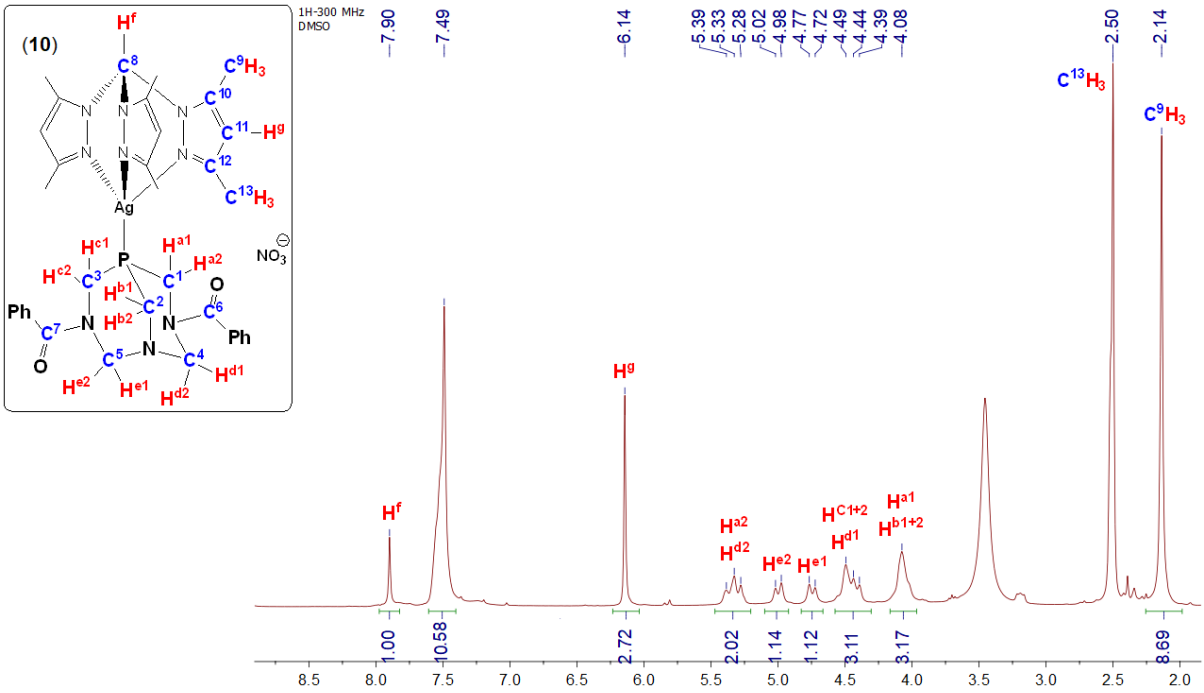


Figure S78. ^{1}H NMR spectrum of complex [Ag(TPM*)(DBPTA)]NO_3 (**10**) in DMSO-*d*$_6$ (300 MHz).

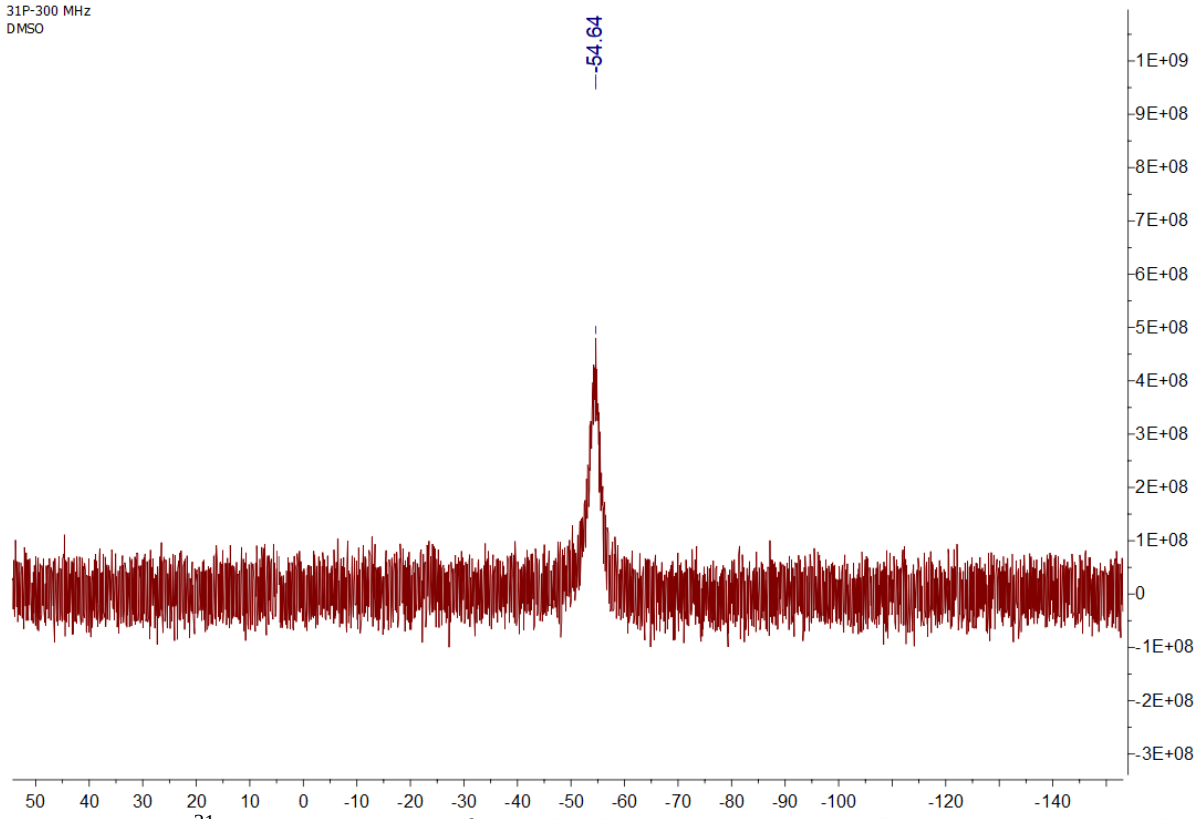


Figure S79. ^{31}P NMR spectrum of complex [Ag(TPM*)(DBPTA)]NO_3 (**10**) in DMSO-d_6 (300 MHz).

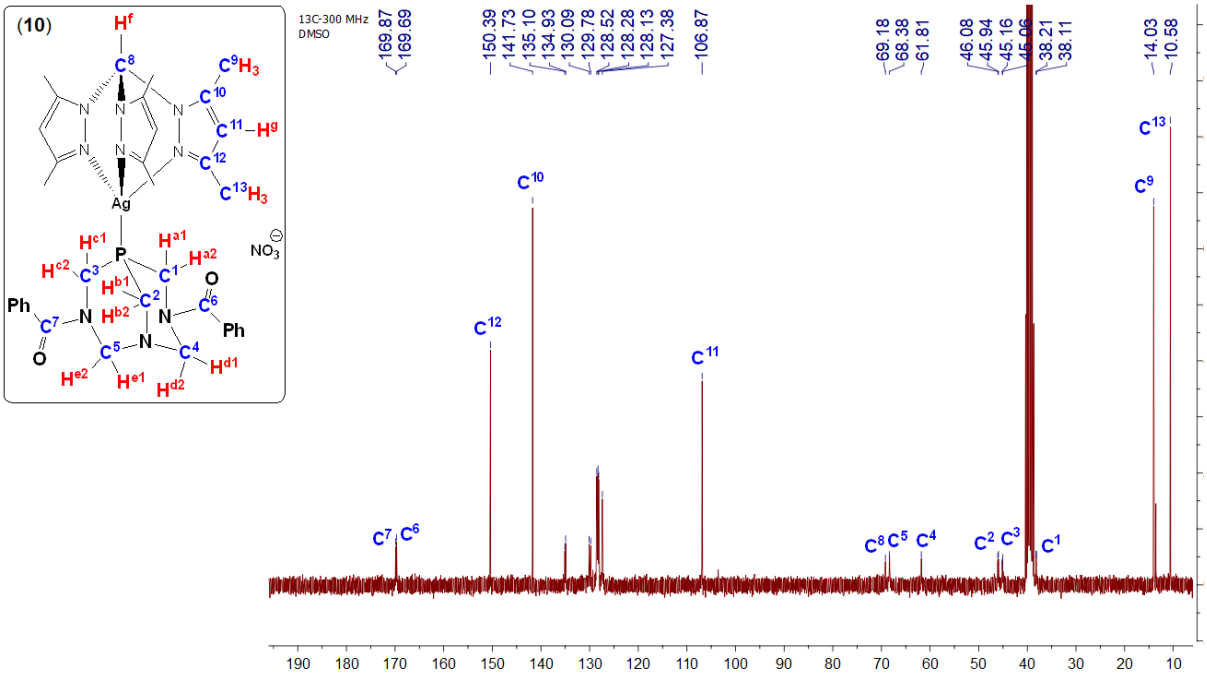


Figure S80. $^{13}C\{^1H\}$ NMR spectrum of complex [Ag(TPM*)(DBPTA)]NO_3 (**10**) in DMSO-d_6 (300 MHz).

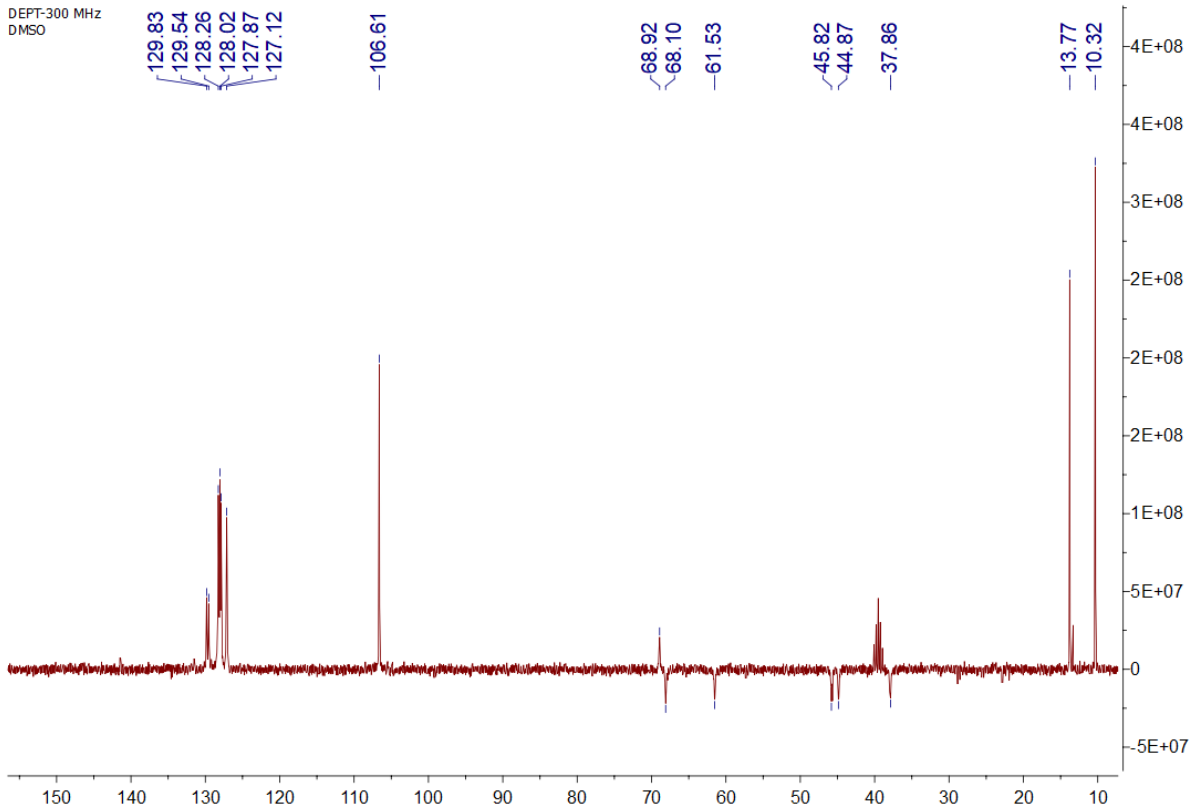


Figure S81. DEPT NMR spectrum of complex [Ag(TPM*)(DBPTA)]NO_3 (**10**) in DMSO-d_6 (300 MHz).

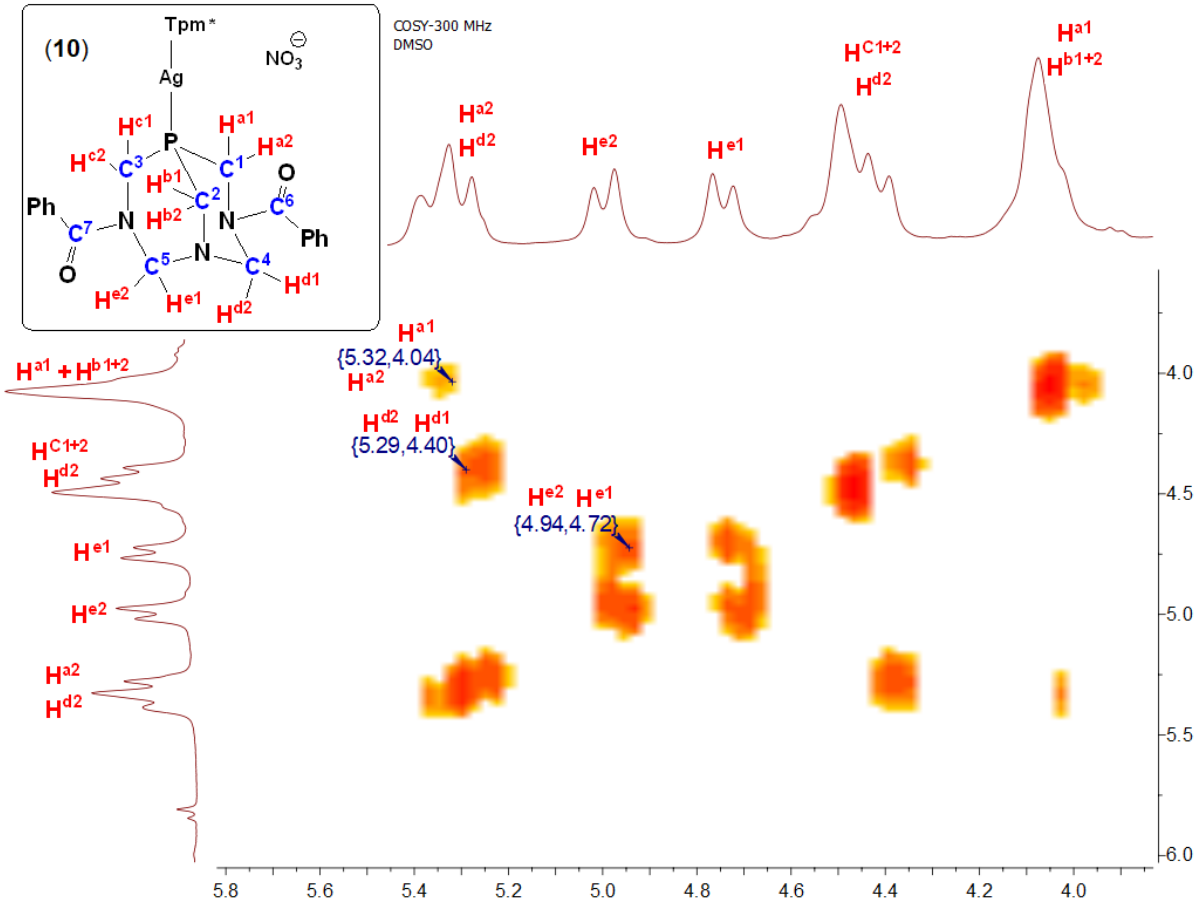


Figure S82. COSY spectrum of complex [Ag(TPM*)(DBPTA)]NO_3 (**10**) in DMSO-d_6 (300 MHz).

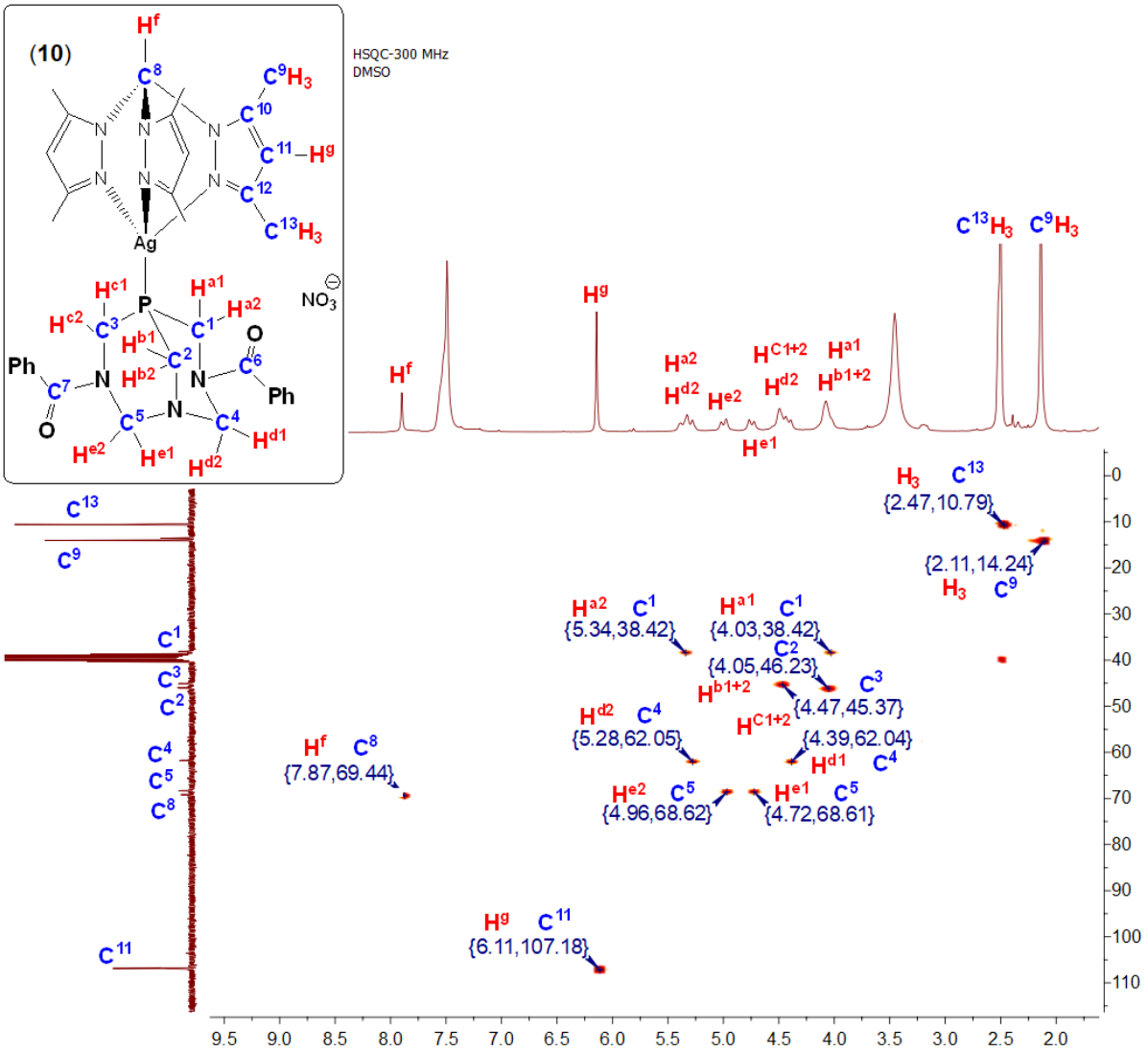


Figure S83. HSQC spectrum of complex [Ag(TPM*)(DBPTA)]NO_3 (**10**) in DMSO-d_6 (300 MHz).

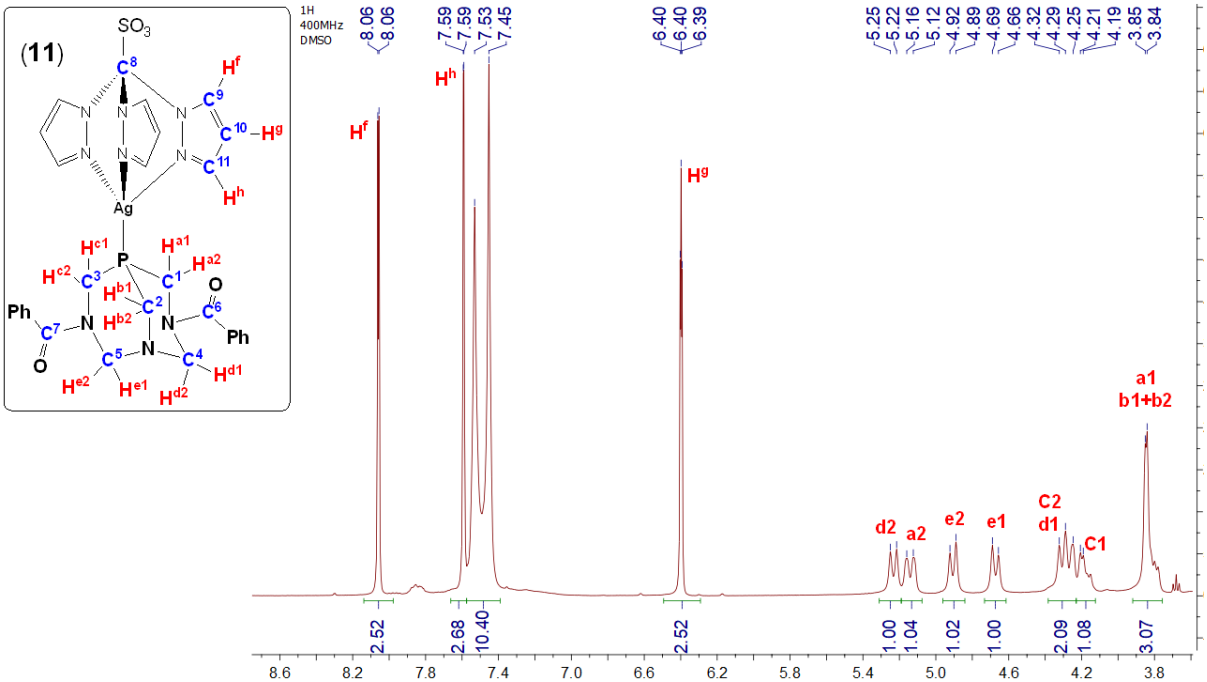


Figure S84. ^{1}H NMR spectrum of complex [Ag(Tpms)(DBPTA)] (**11**) in DMSO-*d*$_6$ (400 MHz).

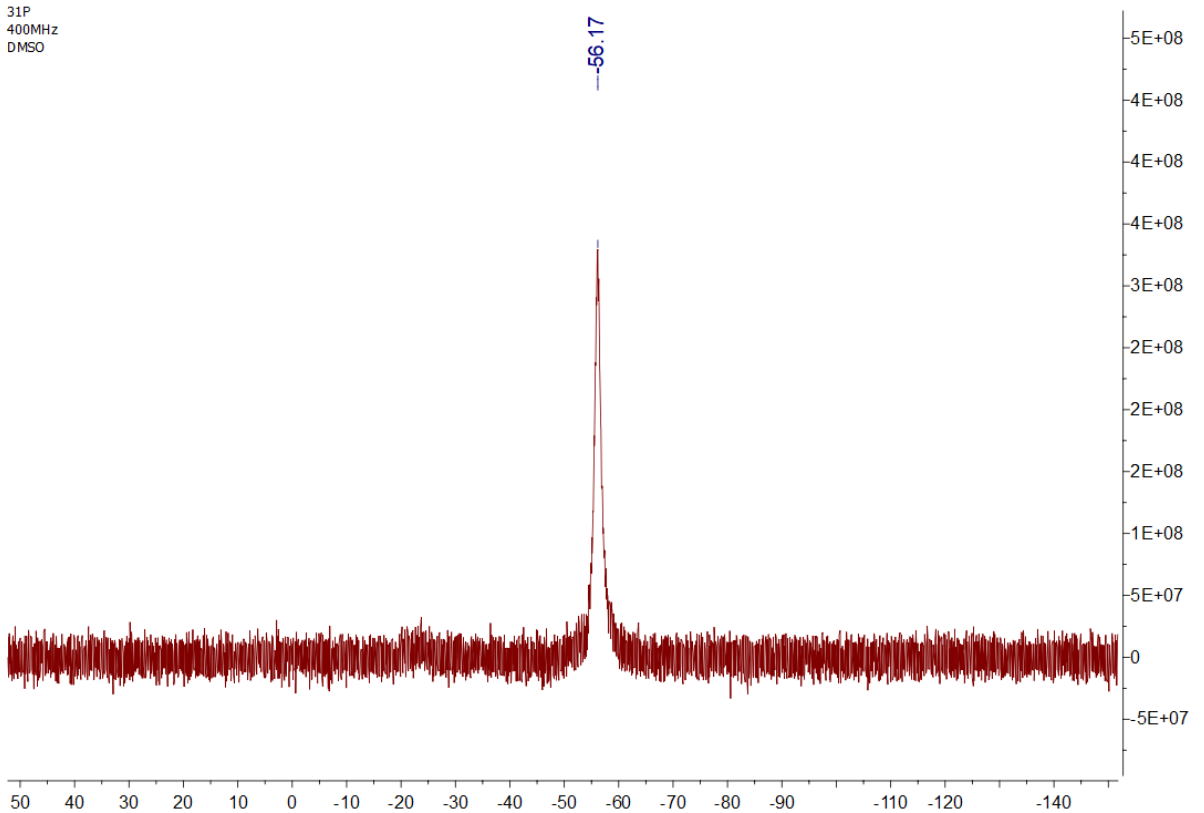


Figure S85. ^{31}P NMR spectrum of complex [Ag(Tpms)(DBPTA)] (**11**) in DMSO-*d*$_6$ (400 MHz).

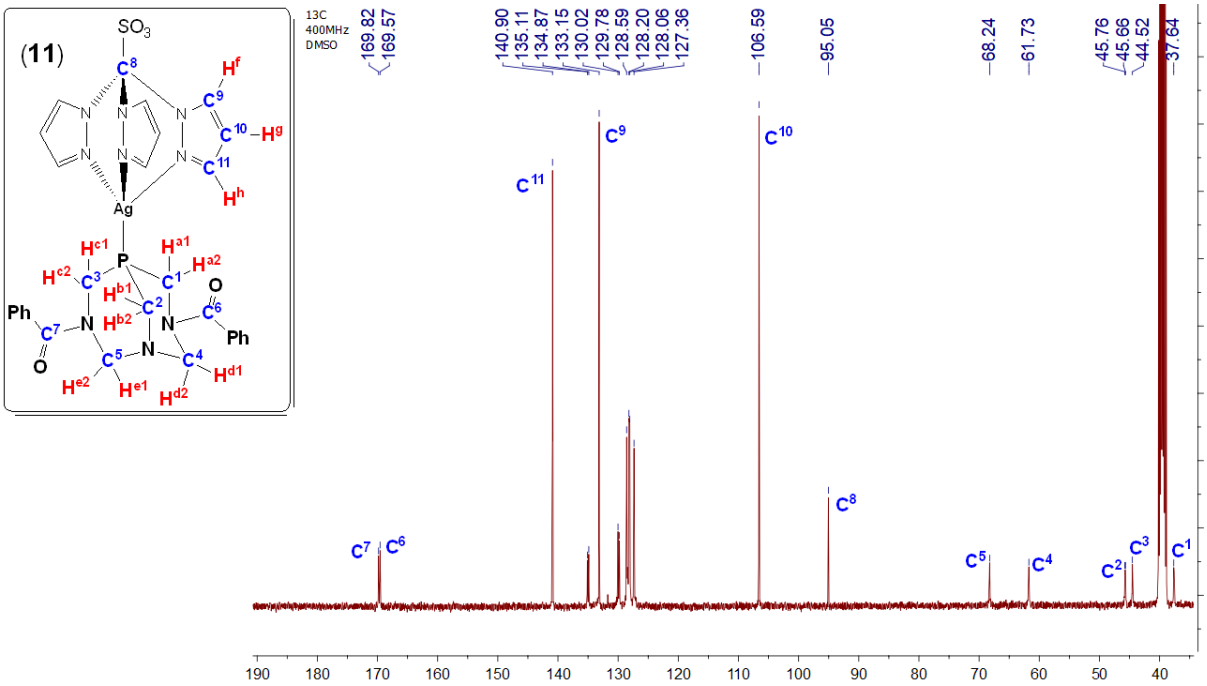


Figure S86. $^{13}C\{^{1}H\}$ NMR spectrum of complex [Ag(Tpms)(DBPTA)] (**11**) in DMSO-d_6 (400 MHz).

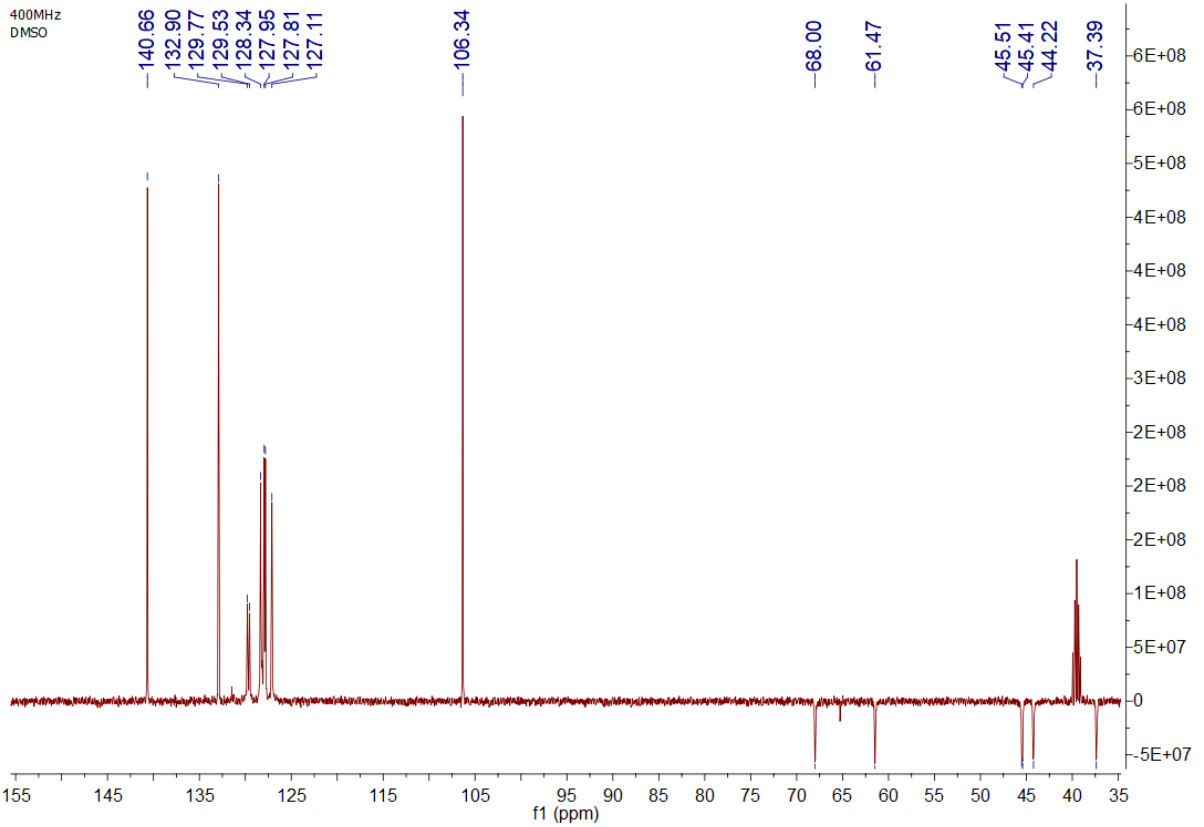


Figure S87. DEPT NMR spectrum of complex [Ag(Tpms)(DBPTA)] (**11**) in DMSO-d_6 (400 MHz).

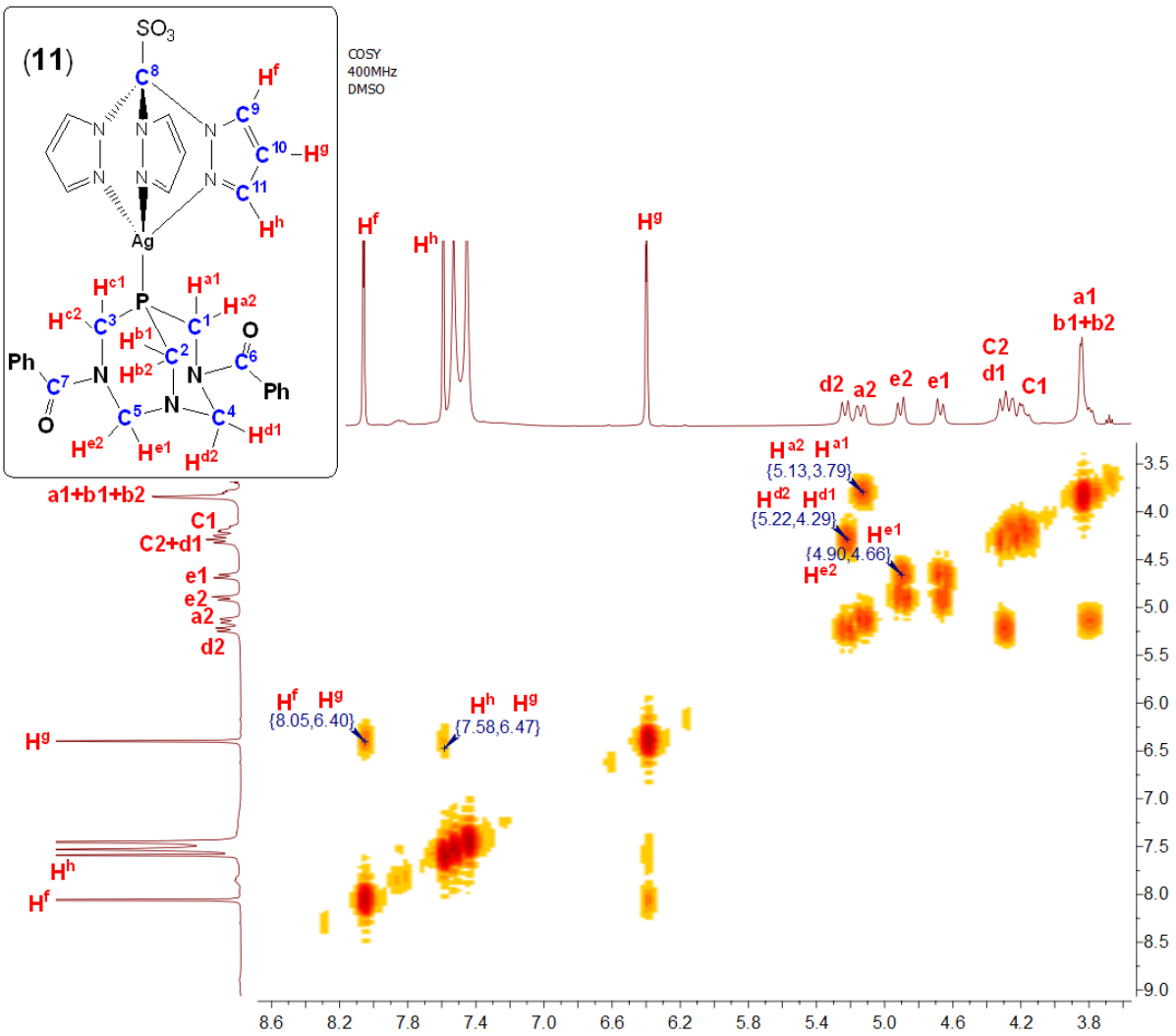


Figure S88. COSY spectrum of complex [Ag(Tpms)(DBPTA)] (**11**) in DMSO-d_6 (400 MHz).

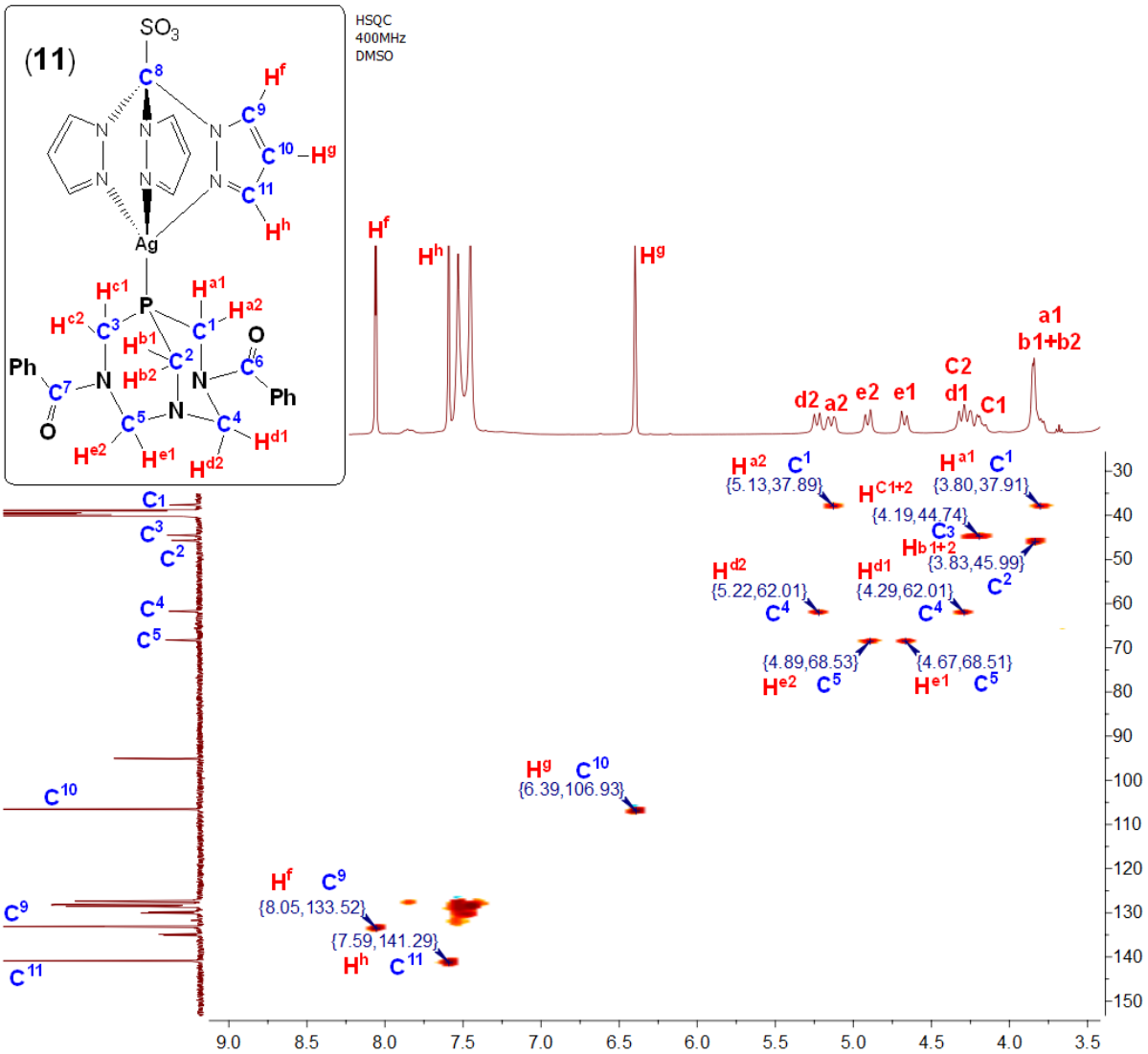


Figure S89. HSQC spectrum of complex [Ag(Tpms)(DBPTA)] (**11**) in DMSO-*d*$_6$ (400 MHz).

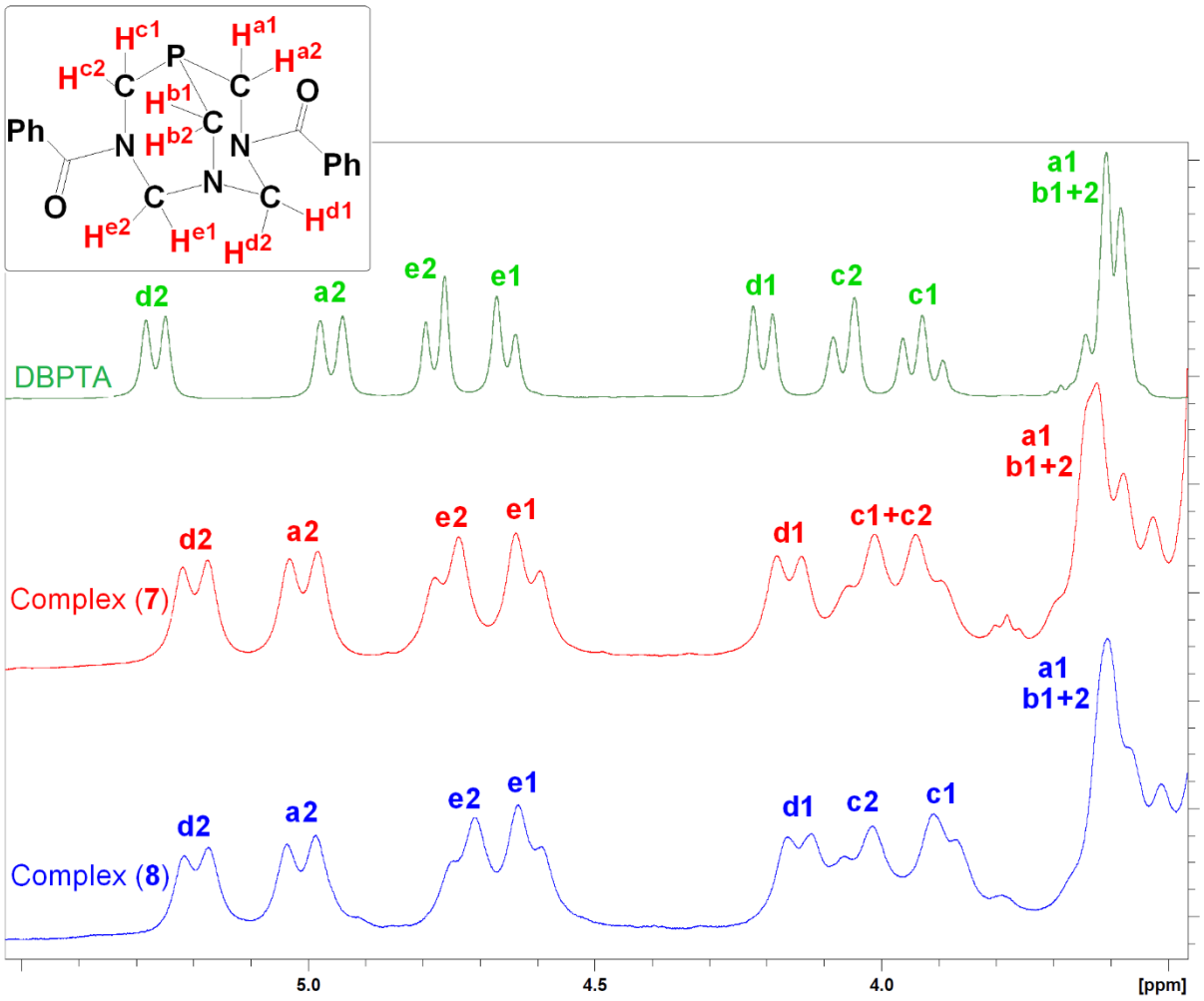


Figure S90. ^{1}H NMR spectra of DBPTA (**1**) and the copper complexes **7** and **8** in DMSO-d_6.

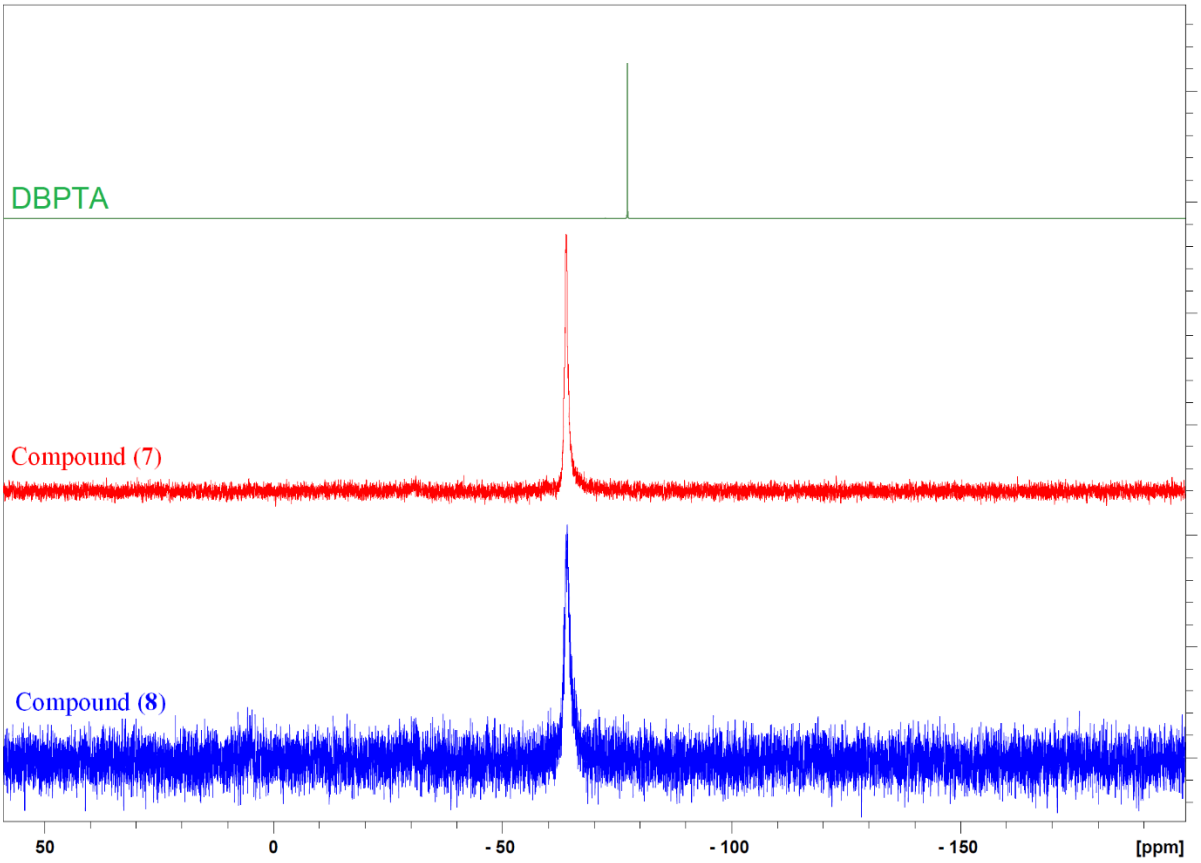


Figure S91. $^{31}P\{^{1}H\}$ NMR spectra of DBPTA (**1**) and the copper complexes **7** and **8** in DMSO-d_6.

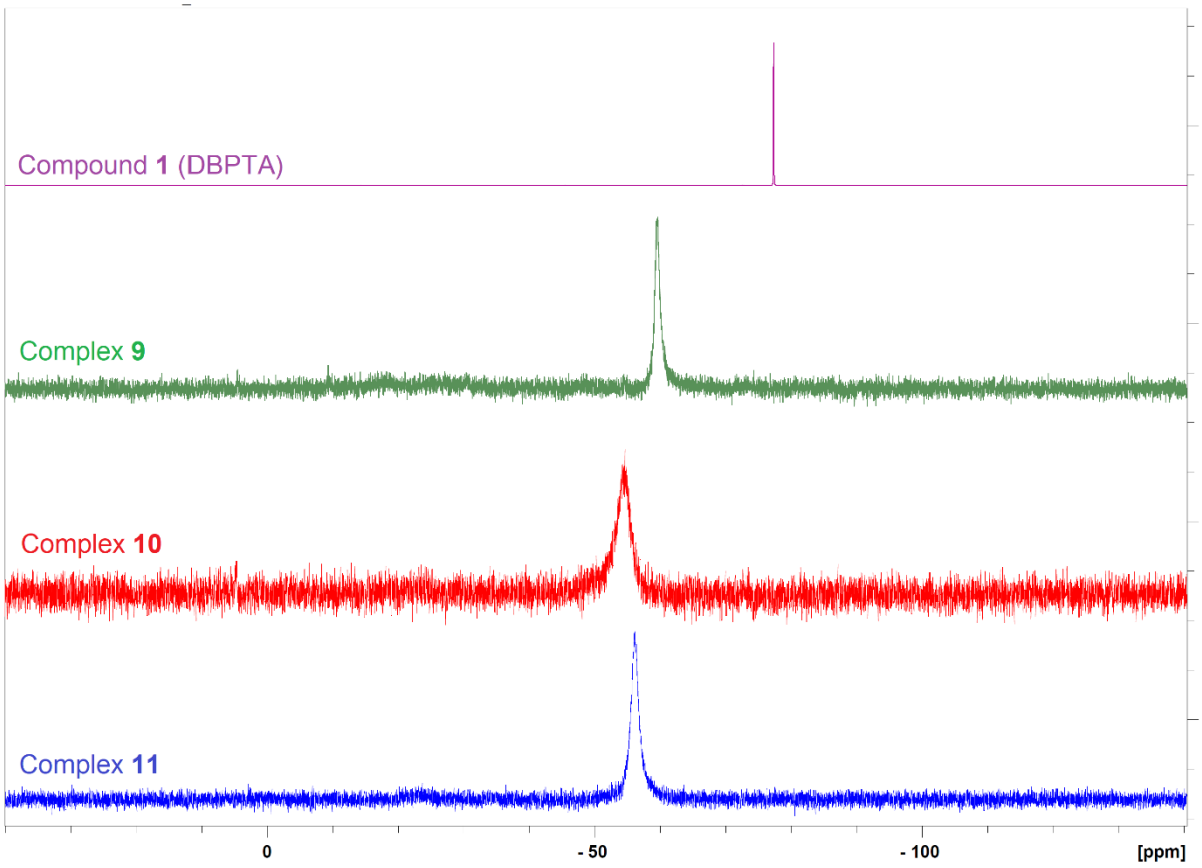


Figure S92. $^{31}P\{^{1}H\}$ NMR spectra of DBPTA (**1**) and the silver complexes **9-11** in DMSO-d_6.

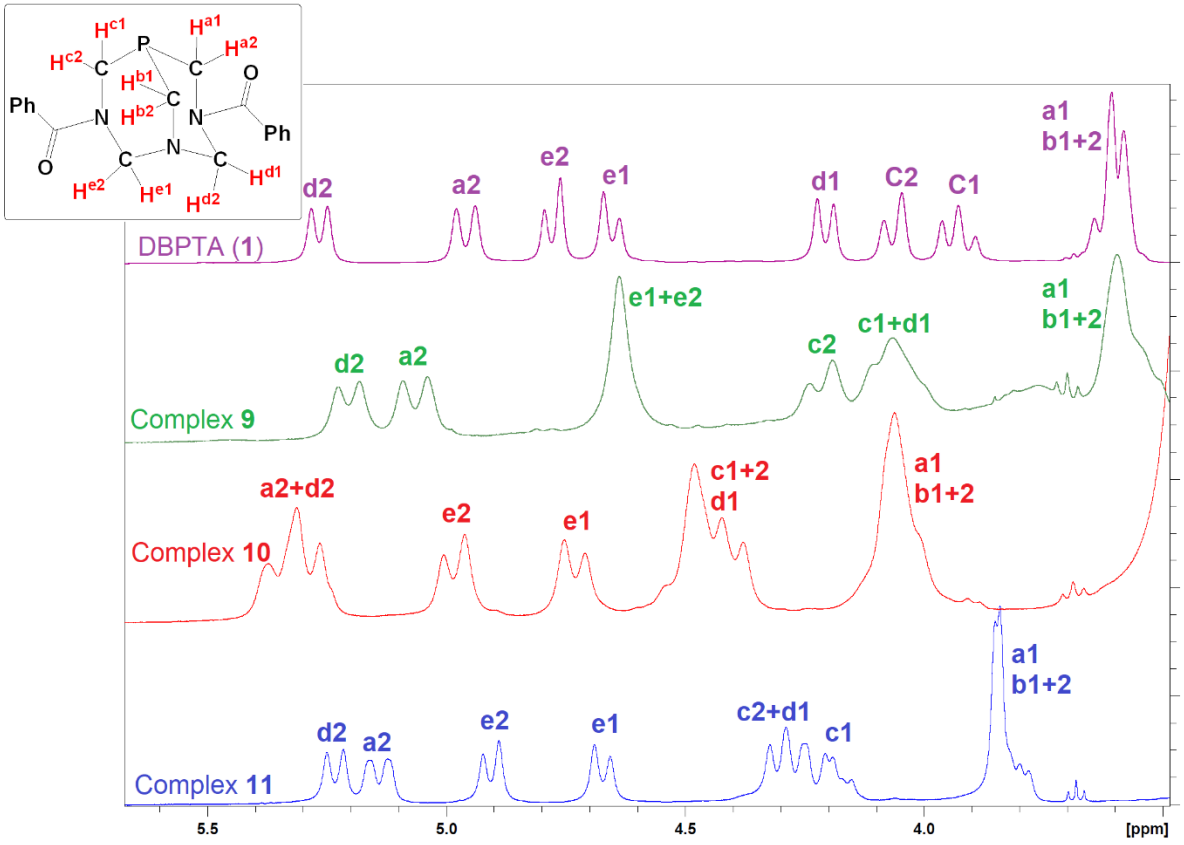


Figure S93. ^{1}H NMR spectra of DBPTA (**1**) and the silver complexes **9-11** in DMSO-d_6.

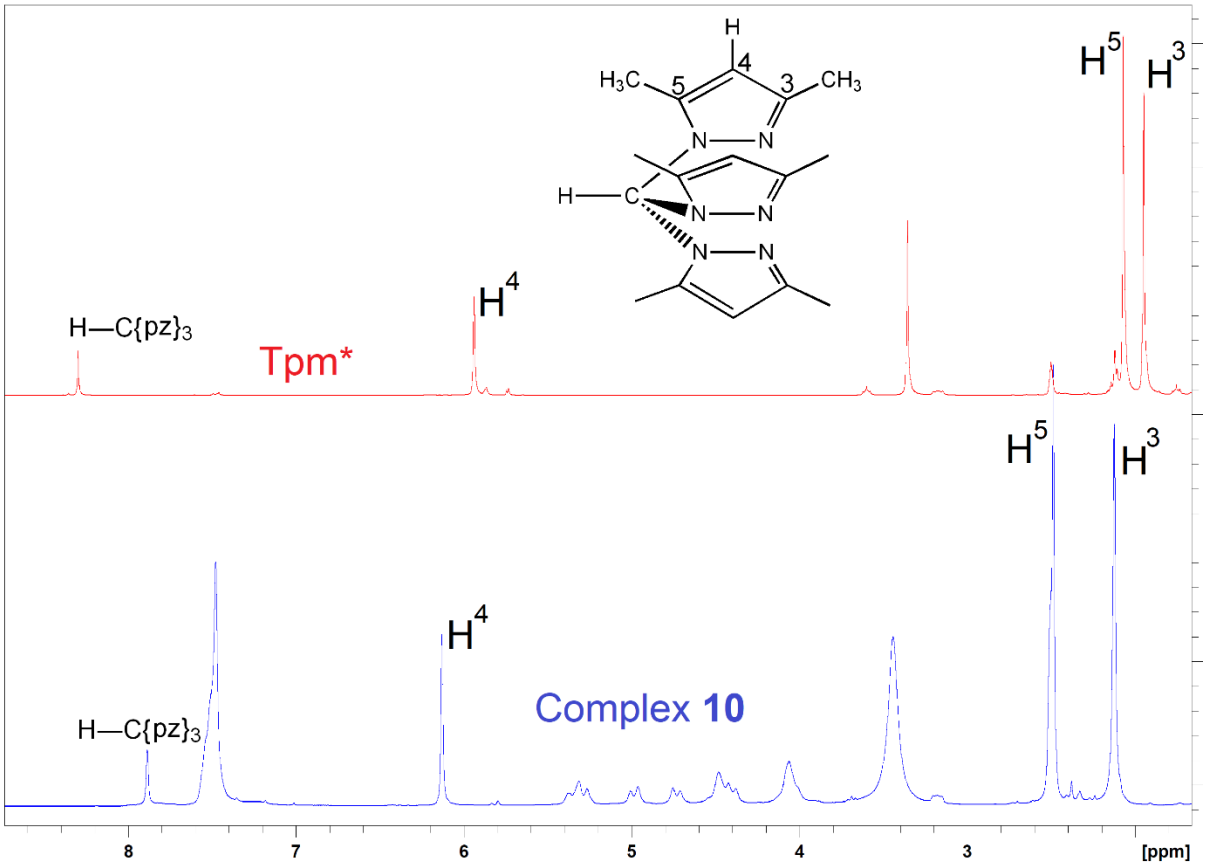


Figure S94. ^{1}H NMR spectra of Tpm* (Top) and the silver complexes **10** (Bottom) in DMSO-d_6.

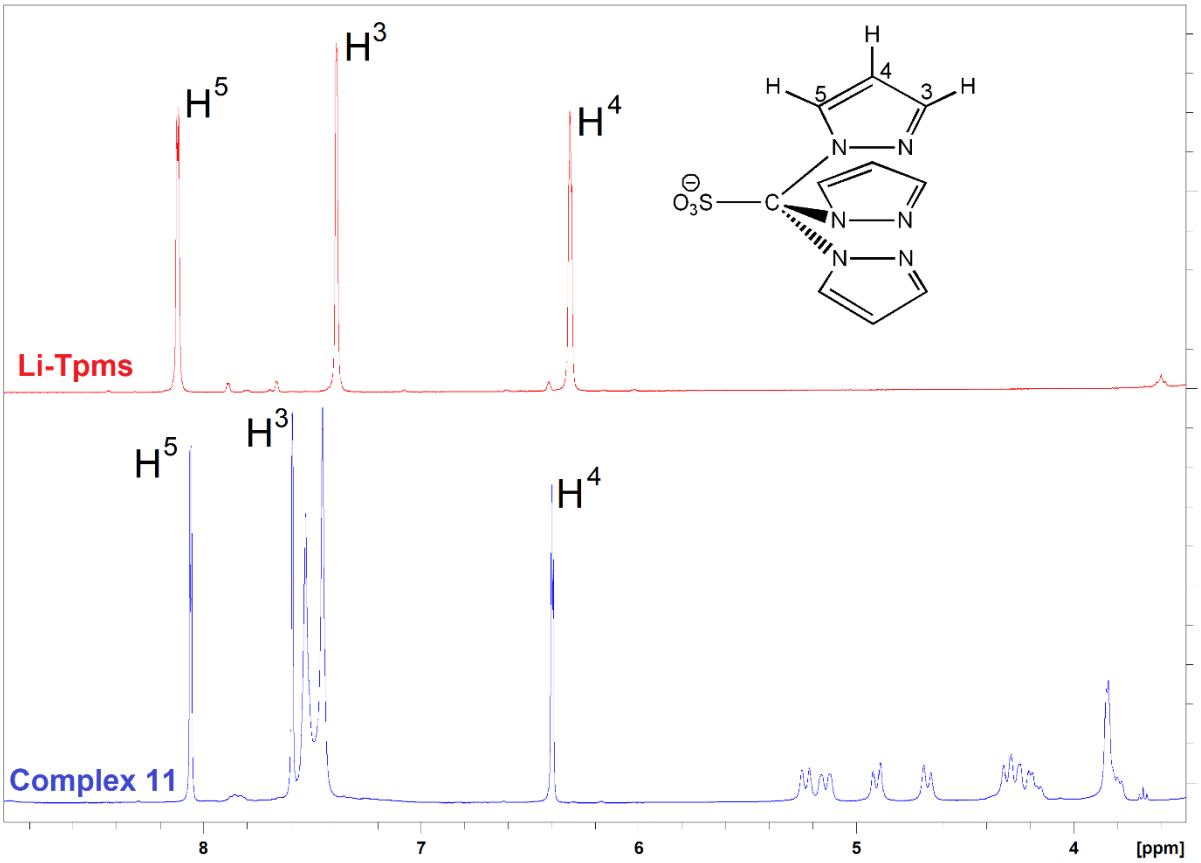
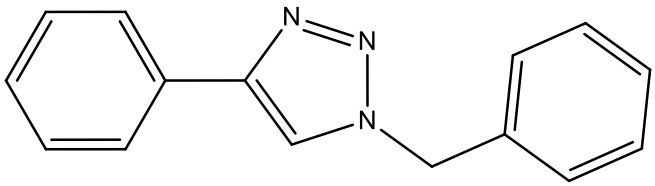
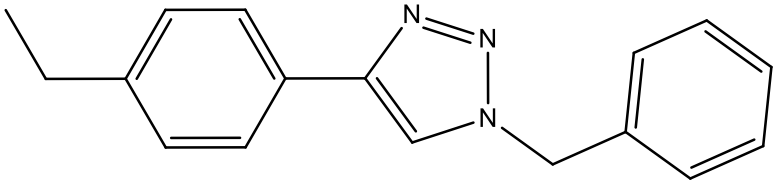


Figure S95. ^{1}H NMR spectra of Li-Tpms (Top) and the silver complexes **11** (Bottom) in DMSO-d_6.

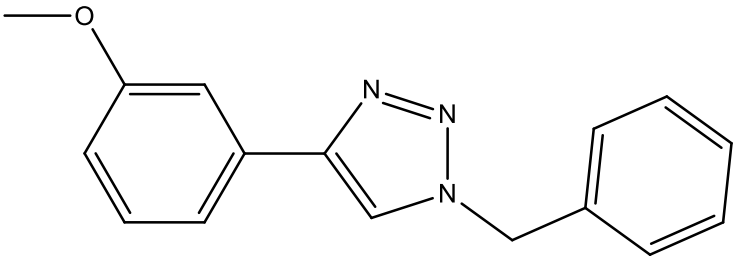
3. Characterization data of triazoles



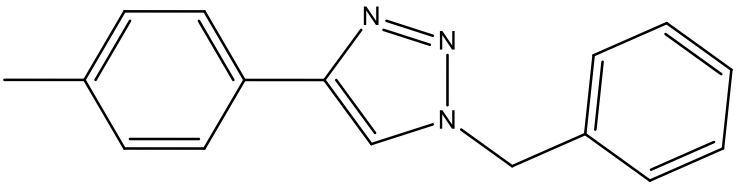
1-benzyl-4-phenyl-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{15}H_{13}N_3$: C 76.57, H 5.57, N 17.86; found: C 76.77, H 5.49, N 17.92. ^{1}H NMR (300 MHz, DMSO-d6, δ): 8.63 (s, 1H), 7.85 (d, *J* = 7.6 Hz, 2H), 7.45-7.32 (m, 8H), 5.65 (s, 2H).



1-benzyl-4-(4-ethylphenyl)-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{17}H_{17}N_3$: C 77.54, H 6.51, N 15.96; found: C 77.35, H 6.42, N 16.05. ^{1}H NMR (300 MHz, $CDCl_3$, *δ*): 7.68 (m, 2H, Ar-H), 7.61 (s, 1H, Ar-H), 7.40–7.34 (m, 3H, Ar-H), 7.31–7.25 (m, 4H, Ar-H), 5.49 (s, 2H, PhC*H*$_2$N), 2.61 (q, *J* = 7.9 Hz, 2H, C*H*$_2$CH$_3$), 1.28 (t, *J* = 7.9 Hz, 3H, CH$_2$C*H*$_3$).

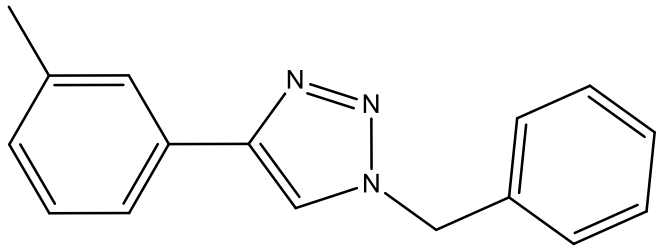


1-benzyl-4-(3-methoxyphenyl)-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{16}H_{15}N_3O$: C 72.43, H 5.70, N 15.84; found: C 72.25, H 5.64, N 15.72. ^{1}H NMR (300 MHz, $CDCl_3$, *δ*): 7.60 (s, 1H, Ar-H), 7.41–7.22 (m, 8H, Ar-H), 7.74 (m, 1H, Ar-H), 5.48 (s, 2H, PhC*H*$_2$N), 3.81 (s, 3H, C*H*$_3$).

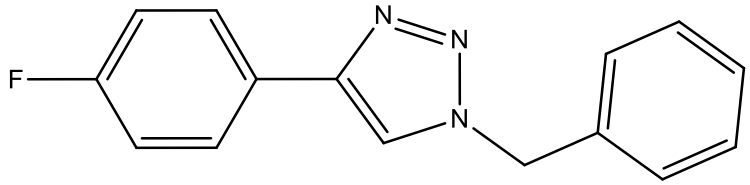


1-benzyl-4-(p-tolyl)-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{16}H_{15}N_3$: C 77.08, H 6.06, N 16.85; found: C 77.13, H 6.11, N 16.77. ^{1}H NMR (300 MHz, $CDCl_3$, *δ*): 7.63 (d, *J* =

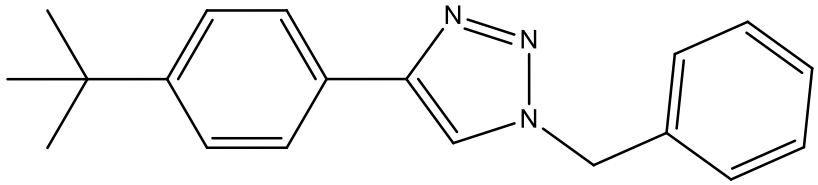
7.9, 2H, Ar-H), 7.54 (s, 1H, Ar-H), 7.30–7.15 (m, 7H, Ar-H), 5.48 (s, 2H, PhC*H*$_2$N), 2.31 (s, 3H, C*H*$_3$).



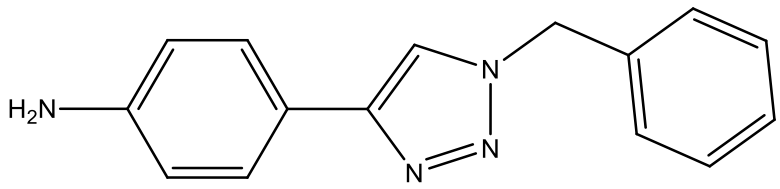
1-benzyl-4-(m-tolyl)-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{16}H_{15}N_3$: C 77.08, H 6.06, N 16.85; found: C 76.91, H 6.01, N 16.67. ^{1}H NMR (300 MHz, $CDCl_3$, δ): 7.61 (br s, 2H, Ar-H), 7.52–7.49 (m, 1H, Ar-H), 7.43–7.27 (m, 6H, Ar-H), 7.14 (m, 1H, Ar-H), 5.49 (s, 2H, PhC*H*$_2$N), 2.34 (s, 3H, C*H*$_3$).



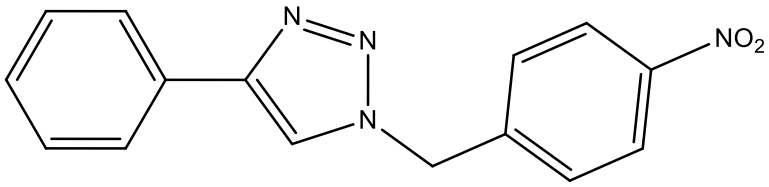
1-benzyl-4-(4-fluorophenyl)-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{15}H_{12}FN_3$: C 71.13, H 4.78, N 16.59; found: C 70.98, H 4.66, N 16.43. ^{1}H NMR (300 MHz, $CDCl_3$, δ): 7.78 – 7.69 (m, 2H, Ar-H), 7.61 (s, 1H, Ar-H), 7.39–7.22 (m, 5H, Ar-H), 7.16–7.07 (m, 2H, Ar-H), 5.43 (s, 2H, PhC*H*$_2$N).



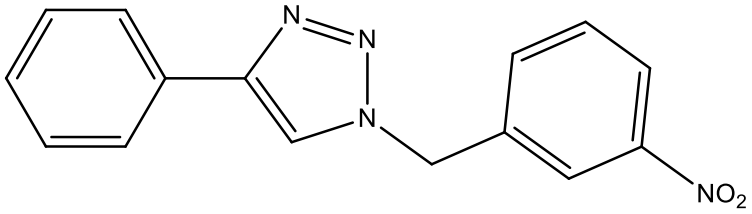
1-benzyl-4-(4-(tert-butyl)phenyl)-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{19}H_{21}N_3$: C 78.32, H 7.26, N 14.42; found: C 78.25, H 7.22, N 14.37. ^{1}H NMR (300 MHz, $CDCl_3$, δ): 7.71 (d, J = 7.9 Hz, 2H, Ar-H), 7.63 (m, 1H, Ar-H), 7.40 (d, J = 7.9 Hz, 2H, Ar-H), 7.34–7.28 (m, 4H, Ar-H), 5.52 (s, 2H, PhC*H*$_2$N), 1.35 (s, 9H, C*H*$_3$).



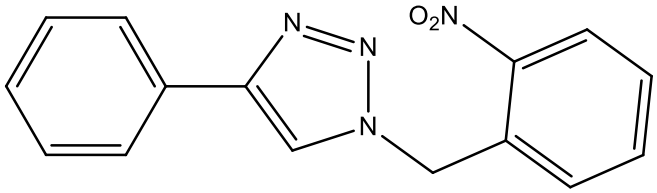
4-(1-benzyl-1*H*-1,2,3-triazol-4-yl)aniline: Elemental analysis calcd (%) for $C_{15}H_{14}N_4$: C 71.98, H 5.64, N 22.38; found: C 72.09, H 5.57, N 22.52. ^{1}H NMR (300 MHz, $CDCl_3$, δ): 7.63–7.55 (m, 3H, Ar-H), 7.39–7.25 (m, 5H, Ar-H), 6.81–6.74 (m, 2H, Ar-H), 5.58 (s, 2H, PhCH_2N), 3.67 (br s, 2H, NH_2).



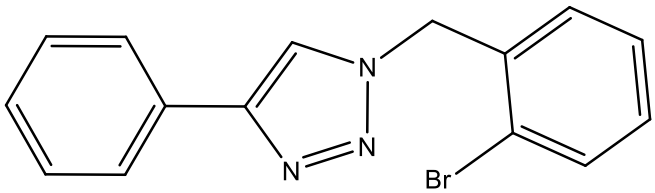
1-(4-nitrobenzyl)-4-phenyl-1*H*-1,2,3-triazole: Elemental analysis calcd (%) for $C_{15}H_{12}N_4O_2$: C 64.28, H 4.32, N 19.99; found: C 64.16, H 4.28, N 20.05. ^{1}H NMR (400 MHz, DMSO-d_6, δ): 8.70 (s, 1H), 8.25 (d, J = 8.4 Hz, 2H), 7.85 (d, J = 7.6 Hz, 2H), 7.57 (d, J = 8.4 Hz, 2H), 7.45 (t, J = 7.6 Hz, 2H), 7.34 (m, 1H), 5.85 (s, 2H).



1-(3-nitrobenzyl)-4-phenyl-1H-1,2,3-triazole: Elemental analysis calcd (%) for $C_{15}H_{12}N_4O_2$: C 64.28, H 4.32, N 19.99; found: C 64.34, H 4.26, N 20.09. ^{1}H NMR (400 MHz, DMSO-d_6, δ): 8.70 (s, 1H), 8.27 (s, 1H), 8.21 (d, J = 8 Hz, 1H), 7.79-7.86 (m, 3H), 7.69 (t, J = 8 Hz, 1H), 7.43 (t, J = 7.6 Hz, 2H), 7.32 (m, 1H), 5.84 (s, 2H).



1-(2-nitrobenzyl)-4-phenyl-1H-1,2,3-triazole: Elemental analysis calcd (%) for $C_{15}H_{12}N_4O_2$: C 64.28, H 4.32, N 19.99; found: C 64.21, H 4.38, N 20.15. ^{1}H NMR (400 MHz, DMSO-d_6, δ): 8.62 (s, 1H), 8.17 (d, J = 8 Hz, 1H), 7.86 (d, J = 7.6 Hz, 2H), 7.77 (t, J = 7.6 Hz, 1H), 7.65 (t, J = 8 Hz, 1H), 7.45 (t, J = 7.6 Hz, 2H), 7.34 (m, 1H), 7.15 (d, J = 7.6 Hz, 1H), 6.02 (s, 2H).



1-(2-bromobenzyl)-4-phenyl-1H-1,2,3-triazole: Elemental analysis calcd (%) for $C_{15}H_{12}BrN_3$: C 57.34, H 3.85, N 13.37; found: C 57.15, H 3.66, N 13.19. ^{1}H NMR (400 MHz, DMSO-d_6, δ): 8.61 (s, 1H), 7.86 (d, J = 7.6 Hz, 2H), 7.70 (d, J = 8 Hz, 1H), 7.46-7.33 (m, 5H), 7.22 (d, J = 7.6 Hz, 1H), 5.73 (s, 2H).