Electronic Supplementary Information

1,2,4-Diazaphospholide Complexes of Yttrium(III), Dysprosium(III), Erbium(III), and Europium(II, III): Synthesis, X-Ray Structural Characterization, and EPR Analysis

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S1 Crystal data and structure refinements for **2**–**8**, and the structural plot of **6**

Table S1-1. Crystal structural analysis data for **2**

Table S1-1-1. Crystal data and structure refinement for **2.**

Identification code	compound2-1d102
Empirical formula	$C_{38}H_{70}N_6O_2P_3Y$
Formula weight	824.82
Temperature/K	293(2)
Crystal system	monoclinic
Space group	C2/c
a/Å	18.6548(8)
b/Å	12.8018(6)
c/Å	20.0600(9)
α/°	90
β/°	102.581(5)
γ/°	90
Volume/Å^3	4675.6(4)
Z	4
ρ_{calc}g/cm^3	1.172
μ/mm^{-1}	1.385
F(000)	1760.0
Crystal size/mm^3	0.187 × 0.156 × 0.112
Radiation	MoKα (λ = 0.71073)
2Θ range for data collection/°	5.328 to 51.998
Index ranges	-21 ≤ h ≤ 22, -15 ≤ k ≤ 15, -24 ≤ l ≤ 15
Reflections collected	9737
Independent reflections	4584 [R_{int} = 0.0391, R_{sigma} = 0.0692]
Data/restraints/parameters	4584/42/298
Goodness-of-fit on F^2	0.972
Final R indexes [I>=2σ (I)]	R_1 = 0.0495, wR_2 = 0.0941
Final R indexes [all data]	R_1 = 0.0788, wR_2 = 0.1009
Largest diff. peak/hole / e Å^{-3}	0.37/-0.28

Table S1-1-2.

Bond Lengths for compound2-ldl02.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Y1	N1[1]	2.357(2)	C2	C7	1.521(4)
Y1	N1	2.357(2)	C3	C4	1.489(8)
Y1	O1	2.3884(19)	C3	C6A	1.501(13)
Y1	O1[1]	2.3885(19)	C3	C5A	1.512(13)
Y1	N5	2.389(2)	C3	C5	1.523(8)
Y1	N5[1]	2.389(2)	C3	C6	1.535(9)
Y1	N2	2.413(2)	C3	C4A	1.553(14)
Y1	N2[1]	2.413(2)	C7	C9	1.525(4)
P1	C1	1.742(3)	C7	C10	1.530(4)
P1	C2	1.760(3)	C7	C8	1.543(4)
P3	C21[1]	1.739(3)	C21	C23	1.518(5)
P3	C21	1.739(3)	C23	C26A	1.308(16)
O1	C34	1.445(4)	C23	C27A	1.326(17)
O1	C31	1.462(3)	C23	C26	1.516(8)
N1	C1	1.338(3)	C23	C27	1.555(10)
N1	N2	1.384(3)	C23	C25	1.673(8)
N2	C2	1.331(3)	C23	C25A	1.725(10)
N5	C21	1.345(3)	C31	C32	1.460(5)
N5	N5[1]	1.379(4)	C32	C33	1.436(5)
C1	C3	1.527(4)	C33	C34	1.464(5)

[1]1-X,+Y,1/2-Z

Table S1-1-3.

Bond Angles for compound2-ldl02.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
N1[1]	Y1	N1	173.29(11)	N1	C1	P1	113.6(2)
N1[1]	Y1	O1	86.47(7)	C3	C1	P1	126.8(2)
N1	Y1	O1	91.82(7)	N2	C2	C7	120.5(2)
N1[1]	Y1	O1[1]	91.82(7)	N2	C2	P1	113.4(2)
N1	Y1	O1[1]	86.47(7)	C7	C2	P1	126.0(2)
O1	Y1	O1[1]	150.53(10)	C6A	C3	C5A	109.6(12)
N1[1]	Y1	N5	92.90(8)	C4	C3	C5	110.5(9)
N1	Y1	N5	93.52(8)	C4	C3	C1	111.2(5)

O1	Y1	N5	87.96(7)	C6A	C3	C1	114.9(15)
O1[1]	Y1	N5	121.51(7)	C5A	C3	C1	114.2(11)
N1[1]	Y1	N5[1]	93.52(8)	C5	C3	C1	105.3(5)
N1	Y1	N5[1]	92.90(8)	C4	C3	C6	109.6(8)
O1	Y1	N5[1]	121.51(7)	C5	C3	C6	111.6(8)
O1[1]	Y1	N5[1]	87.96(7)	C1	C3	C6	108.6(8)
N5	Y1	N5[1]	33.56(11)	C6A	C3	C4A	105.3(12)
N1[1]	Y1	N2	139.62(8)	C5A	C3	C4A	104.3(13)
N1	Y1	N2	33.70(7)	C1	C3	C4A	107.5(13)
O1	Y1	N2	80.21(7)	C2	C7	C9	110.0(3)
O1[1]	Y1	N2	82.24(7)	C2	C7	C10	108.7(3)
N5	Y1	N2	124.21(8)	C9	C7	C10	110.8(3)
N5[1]	Y1	N2	125.89(8)	C2	C7	C8	110.3(3)
N1[1]	Y1	N2[1]	33.71(7)	C9	C7	C8	108.8(3)
N1	Y1	N2[1]	139.62(8)	C10	C7	C8	108.3(3)
O1	Y1	N2[1]	82.24(7)	N5	C21	C23	121.2(3)
O1[1]	Y1	N2[1]	80.21(7)	N5	C21	P3	113.7(2)
N5	Y1	N2[1]	125.89(8)	C23	C21	P3	125.0(2)
N5[1]	Y1	N2[1]	124.20(8)	C26A	C23	C27A	124.7(12)
N2	Y1	N2[1]	106.30(10)	C26A	C23	C21	111.8(8)
C1	P1	C2	87.35(13)	C27A	C23	C21	114.6(8)
C21[1]	P3	C21	87.7(2)	C26	C23	C21	114.7(6)
C34	O1	C31	107.6(3)	C26	C23	C27	115.5(8)
C34	O1	Y1	127.77(18)	C21	C23	C27	112.9(5)
C31	O1	Y1	124.52(19)	C26	C23	C25	101.7(8)
C1	N1	N2	113.0(2)	C21	C23	C25	108.0(4)
C1	N1	Y1	171.21(19)	C27	C23	C25	102.3(6)
N2	N1	Y1	75.37(13)	C26A	C23	C25A	101.2(10)
C2	N2	N1	112.6(2)	C27A	C23	C25A	99.1(10)
C2	N2	Y1	175.3(2)	C21	C23	C25A	99.8(5)
N1	N2	Y1	70.93(13)	C32	C31	O1	106.1(3)
C21	N5	N5[1]	112.49(17)	C33	C32	C31	109.4(3)
C21	N5	Y1	174.3(2)	C32	C33	C34	105.8(3)
N5[1]	N5	Y1	73.22(5)	O1	C34	C33	107.4(3)
N1	C1	C3	119.6(3)				

[1]1-X, +Y, 1/2-Z

Table S1-1-4.

Torsion Angles for compound2-ldl02.

A	B	C	D	Angle/°	A	B	C	D	Angle/°
C1	N1	N2	C2	0.3(3)	P1	C2	C7	C10	-103.4(3)
Y1	N1	N2	C2	-176.7(2)	N2	C2	C7	C8	-167.2(3)
C1	N1	N2	Y1	177.0(2)	P1	C2	C7	C8	15.2(4)
N2	N1	C1	C3	176.1(3)	N5[1]	N5	C21	C23	-178.6(3)
N2	N1	C1	P1	-1.0(3)	N5[1]	N5	C21	P3	-0.5(4)
C2	P1	C1	N1	1.0(2)	C21[1]	P3	C21	N5	0.20(15)
C2	P1	C1	C3	-175.8(3)	C21[1]	P3	C21	C23	178.2(4)
N1	N2	C2	C7	-177.4(2)	N5	C21	C23	C26A	138.8(12)
N1	N2	C2	P1	0.5(3)	P3	C21	C23	C26A	-39.0(13)
C1	P1	C2	N2	-0.8(2)	N5	C21	C23	C27A	-10.2(11)
C1	P1	C2	C7	176.9(3)	P3	C21	C23	C27A	172.0(10)
N1	C1	C3	C4	47.2(9)	N5	C21	C23	C26	-173.9(9)
P1	C1	C3	C4	-136.1(9)	P3	C21	C23	C26	8.3(10)
N1	C1	C3	C6A	-178.4(12)	N5	C21	C23	C27	-38.8(8)
P1	C1	C3	C6A	-1.7(13)	P3	C21	C23	C27	143.4(6)
N1	C1	C3	C5A	-51(2)	N5	C21	C23	C25	73.6(6)
P1	C1	C3	C5A	126(2)	P3	C21	C23	C25	-104.3(6)
N1	C1	C3	C5	-72.5(7)	N5	C21	C23	C25A	-114.9(8)
P1	C1	C3	C5	104.2(7)	P3	C21	C23	C25A	67.3(8)
N1	C1	C3	C6	167.8(8)	C34	O1	C31	C32	-7.9(5)
P1	C1	C3	C6	-15.5(9)	Y1	O1	C31	C32	175.2(3)
N1	C1	C3	C4A	64.7(16)	O1	C31	C32	C33	-4.6(6)
P1	C1	C3	C4A	-118.6(16)	C31	C32	C33	C34	15.1(7)
N2	C2	C7	C9	-47.2(4)	C31	O1	C34	C33	17.3(4)
P1	C2	C7	C9	135.2(3)	Y1	O1	C34	C33	-165.9(3)
N2	C2	C7	C10	74.2(4)	C32	C33	C34	O1	-19.9(6)

[1]1-X,+Y,1/2-Z

Table S1-2. Crystal structural analysis data for **3**

Table S1-2-1.

Crystal data and structure refinement for compound3-exp_44.

Identification code	compound3-exp_44
Empirical formula	$C_{38}H_{70}ErN_6O_2P_3$
Formula weight	903.17
Temperature/K	298(2)
Crystal system	monoclinic
Space group	C2/c
a/Å	18.5513(10)
b/Å	12.7599(5)
c/Å	19.9743(11)
α/°	90.00
β/°	102.571(5)
γ/°	90.00
Volume/Å^3	4614.8(4)
Z	4
ρ_{calc}g/cm^3	1.300
μ/mm^{-1}	1.958
F(000)	1876.0
Crystal size/mm^3	0.24 × 0.06 × 0.04
Radiation	Mo Kα (λ = 0.71073)
2Θ range for data collection/°	6.06 to 52.74
Index ranges	$-23 \leqslant h \leqslant 19$, $-15 \leqslant k \leqslant 15$, $-24 \leqslant l \leqslant 24$
Reflections collected	10471
Independent reflections	4707 [R_{int} = 0.0627, R_{sigma} = 0.0861]
Data/restraints/parameters	4707/64/274
Goodness-of-fit on F^2	1.081
Final R indexes [I>=2σ (I)]	R_1 = 0.0549, wR_2 = 0.1146
Final R indexes [all data]	R_1 = 0.0789, wR_2 = 0.1275
Largest diff. peak/hole / e Å^{-3}	2.33/-1.37

Table S1-2-2.

Bond Lengths for compound3-exp_44.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
C1	N3	1.331(7)	C12	C14	1.529(10)
C1	C2	1.505(10)	C12	C15	1.549(9)
C1	P2	1.741(7)	C19	O1	1.423(8)
C2	C3	1.513(9)	C19	C18	1.476(10)
C2	C5	1.514(9)	C16	O1	1.455(7)
C2	C5'	1.516(10)	C16	C17	1.522(13)
C2	C3'	1.516(10)	C17	C18	1.53(2)
C2	C4'	1.542(10)	Er1	N1[1]	2.337(5)
C2	C4	1.550(9)	Er1	N1	2.337(5)
C7	C6	1.472(10)	Er1	N3	2.354(5)
C7	C9	1.482(9)	Er1	N3[1]	2.354(5)
C7	C8	1.509(9)	Er1	O1	2.369(4)
C7	C10	1.534(9)	Er1	O1[1]	2.369(4)
C10	N1	1.335(7)	Er1	N2[1]	2.398(5)
C10	P1	1.738(6)	Er1	N2	2.398(5)
C11	N2	1.330(7)	N1	N2	1.378(6)
C11	C12	1.517(9)	N3	N3[1]	1.382(9)
C11	P1	1.735(6)	P2	C1[1]	1.741(7)
C12	C13	1.526(10)			

[1]-X,+Y,1/2-Z

Table S1-2-3.

Bond Angles for compound3-exp_44.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
N3	C1	C2	122.1(6)	C16	C17	C18	102.5(10)
N3	C1	P2	114.9(5)	C19	C18	C17	107.7(8)
C2	C1	P2	123.0(5)	N1[1]	Er1	N1	173.5(2)
C1	C2	C3	115.8(8)	N1[1]	Er1	N3	92.93(17)
C1	C2	C5	113.7(11)	N1	Er1	N3	93.24(18)
C3	C2	C5	117.0(13)	N1[1]	Er1	N3[1]	93.24(18)
C1	C2	C5'	112.2(17)	N1	Er1	N3[1]	92.93(17)
C3	C2	C5'	131.6(18)	N3	Er1	N3[1]	34.1(2)

C5	C2	C5’	31.2(12)	N1[1]	Er1	O1	87.31(16)
C1	C2	C3’	108.8(11)	N1	Er1	O1	91.07(16)
C3	C2	C3’	54.9(11)	N3	Er1	O1	87.50(16)
C5	C2	C3’	133.6(16)	N3[1]	Er1	O1	121.63(16)
C5’	C2	C3’	113.9(11)	N1[1]	Er1	O1[1]	91.07(16)
C1	C2	C4’	100.8(11)	N1	Er1	O1[1]	87.31(16)
C3	C2	C4’	56.0(11)	N3	Er1	O1[1]	121.63(16)
C5	C2	C4’	78.7(12)	N3[1]	Er1	O1[1]	87.50(16)
C5’	C2	C4’	109.3(10)	O1	Er1	O1[1]	150.9(2)
C3’	C2	C4’	110.9(10)	N1[1]	Er1	N2[1]	33.82(14)
C1	C2	C4	107.9(8)	N1	Er1	N2[1]	139.74(18)
C3	C2	C4	99.6(12)	N3	Er1	N2[1]	125.71(17)
C5	C2	C4	99.9(12)	N3[1]	Er1	N2[1]	124.44(17)
C5’	C2	C4	70.7(12)	O1	Er1	N2[1]	81.93(15)
C3’	C2	C4	48.4(11)	O1[1]	Er1	N2[1]	80.68(15)
C4’	C2	C4	148.9(12)	N1[1]	Er1	N2	139.74(18)
C6	C7	C9	111.7(8)	N1	Er1	N2	33.82(14)
C6	C7	C8	108.5(9)	N3	Er1	N2	124.44(17)
C9	C7	C8	108.4(8)	N3[1]	Er1	N2	125.71(17)
C6	C7	C10	110.6(7)	O1	Er1	N2	80.68(15)
C9	C7	C10	110.3(7)	O1[1]	Er1	N2	81.93(15)
C8	C7	C10	107.2(6)	N2[1]	Er1	N2	106.1(2)
N1	C10	C7	119.6(5)	C10	N1	N2	112.8(5)
N1	C10	P1	113.3(4)	C10	N1	Er1	171.6(4)
C7	C10	P1	127.1(5)	N2	N1	Er1	75.5(3)
N2	C11	C12	119.5(5)	C11	N2	N1	112.2(5)
N2	C11	P1	114.1(5)	C11	N2	Er1	175.0(4)
C12	C11	P1	126.4(4)	N1	N2	Er1	70.7(3)
C11	C12	C13	110.8(6)	C1	N3	N3[1]	112.0(4)
C11	C12	C14	109.1(6)	C1	N3	Er1	175.1(4)
C13	C12	C14	110.7(7)	N3[1]	N3	Er1	72.93(12)
C11	C12	C15	110.3(6)	C19	O1	C16	107.4(5)
C13	C12	C15	108.7(7)	C19	O1	Er1	128.2(4)
C14	C12	C15	107.1(7)	C16	O1	Er1	124.2(4)
O1	C19	C18	108.9(6)	C11	P1	C10	87.5(3)
O1	C16	C17	107.7(8)	C1[1]	P2	C1	86.1(4)

[1]-X, +Y, 1/2-Z

Table S1-2-4.

Torsion Angles for compound3-exp_44.

A	B	C	D	Angle/°	A	B	C	D	Angle/°
N3	C1	C2	C3	177.6(13)	C10	N1	N2	Er1	-179.4(5)
P2	C1	C2	C3	-3.1(15)	N1^1	Er1	N2	N1	-179.32(6)
N3	C1	C2	C5	37.9(14)	N3	Er1	N2	N1	25.8(4)
P2	C1	C2	C5	-142.8(10)	N3^1	Er1	N2	N1	-16.3(4)
N3	C1	C2	C5'	4.0(14)	O1	Er1	N2	N1	106.2(3)
P2	C1	C2	C5'	-176.7(11)	O1^1	Er1	N2	N1	-97.3(3)
N3	C1	C2	C3'	-123.1(13)	N2^1	Er1	N2	N1	-175.1(4)
P2	C1	C2	C3'	56.2(14)	C2	C1	N3	N3^1	179.6(7)
N3	C1	C2	C4'	120.2(12)	P2	C1	N3	N3^1	0.2(9)
P2	C1	C2	C4'	-60.5(11)	N1	Er1	N3	N3^1	-90.4(4)
N3	C1	C2	C4	-71.9(11)	O1	Er1	N3	N3^1	178.6(4)
P2	C1	C2	C4	107.4(10)	O1^1	Er1	N3	N3^1	-1.6(5)
C6	C7	C10	N1	-49.5(10)	N2^1	Er1	N3	N3^1	100.4(4)
C9	C7	C10	N1	-173.6(7)	N2	Er1	N3	N3^1	-104.5(4)
C8	C7	C10	N1	68.6(9)	C18	C19	O1	C16	-18.2(10)
C6	C7	C10	P1	132.3(8)	C18	C19	O1	Er1	166.3(6)
C9	C7	C10	P1	8.2(10)	C17	C16	O1	C19	25.0(13)
C8	C7	C10	P1	-109.7(7)	C17	C16	O1	Er1	-159.2(10)
N2	C11	C12	C13	47.2(8)	N1^1	Er1	O1	C19	-6.6(6)
P1	C11	C12	C13	-134.5(6)	N1	Er1	O1	C19	167.1(6)
N2	C11	C12	C14	-74.9(8)	N3	Er1	O1	C19	-99.7(6)
P1	C11	C12	C14	103.4(6)	N3^1	Er1	O1	C19	-98.8(6)
N2	C11	C12	C15	167.7(6)	O1^1	Er1	O1	C19	80.7(6)
P1	C11	C12	C15	-14.1(9)	N2^1	Er1	O1	C19	26.9(6)
O1	C16	C17	C18	-21.3(16)	N2	Er1	O1	C19	134.8(6)
O1	C19	C18	C17	4.4(14)	N1^1	Er1	O1	C16	178.5(5)
C16	C17	C18	C19	10.3(17)	N1	Er1	O1	C16	-7.7(5)
C7	C10	N1	N2	-174.4(5)	N3	Er1	O1	C16	85.5(5)
P1	C10	N1	N2	4.1(7)	N3^1	Er1	O1	C16	86.4(5)
N3	Er1	N1	N2	-159.0(3)	O1^1	Er1	O1	C16	-94.1(5)
N3^1	Er1	N1	N2	166.8(3)	N2^1	Er1	O1	C16	-147.9(5)
O1	Er1	N1	N2	-71.4(3)	N2	Er1	O1	C16	-40.0(5)
O1^1	Er1	N1	N2	79.5(3)	N2	C11	P1	C10	0.5(5)

N2[1] Er1 N1 N2	7.3(5)	C12 C11 P1 C10	-177.9(6)
C12 C11 N2 N1	-179.8(5)	N1 C10 P1 C11	-2.6(5)
P1 C11 N2 N1	1.7(6)	C7 C10 P1 C11	175.8(6)
C10 N1 N2 C11	-3.7(7)	N3 C1 P2 C1[1]	-0.1(3)
Er1 N1 N2 C11	175.7(5)	C2 C1 P2 C1[1]	-179.4(9)

[1]-X,+Y,1/2-Z

Table S1-3. Crystal structural analysis data for **4**

Table S1-3-1.

Crystal data and structure refinement for compound4-exp_12.

Identification code	compound4-exp_12
Empirical formula	$C_{38}H_{70}DyN_6O_2P_3$
Formula weight	898.41
Temperature/K	293(2)
Crystal system	monoclinic
Space group	C2/c
a/Å	18.5609(6)
b/Å	12.7972(4)
c/Å	20.0361(6)
α/°	90
β/°	102.531(3)
γ/°	90
Volume/Å^3	4645.8(3)
Z	4
ρ_{calc}g/cm^3	1.284
μ/mm^{-1}	1.747
F(000)	1868.0
Crystal size/mm^3	0.171 × 0.154 × 0.112
Radiation	MoKα (λ = 0.71073)
2Θ range for data collection/°	6.05 to 51.996
Index ranges	-22 ⩽ h ⩽ 22, -9 ⩽ k ⩽ 15, -24 ⩽ l ⩽ 23
Reflections collected	10733
Independent reflections	4560 [R_{int} = 0.0234, R_{sigma} = 0.0367]
Data/restraints/parameters	4560/104/284
Goodness-of-fit on F^2	1.057
Final R indexes [I>=2σ (I)]	R_1 = 0.0293, wR_2 = 0.0667

Final R indexes [all data] R_1 = 0.0349, wR_2 = 0.0688

Largest diff. peak/hole / e Å^{-3} 0.41/-0.45

Table S1-3-2.

Bond Lengths for compound4-exp_12.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
Dy1	O1	2.405(2)	C2	C3	1.525(4)
Dy1	O1[1]	2.405(2)	C3	C4	1.533(5)
Dy1	N1	2.362(2)	C3	C5	1.533(5)
Dy1	N1[1]	2.362(2)	C3	C6	1.521(5)
Dy1	N2	2.411(2)	C7	C8	1.484(6)
Dy1	N2[1]	2.410(2)	C7	C9	1.520(6)
Dy1	N3[1]	2.389(2)	C7	C10	1.498(5)
Dy1	N3	2.389(2)	C11	C12	1.510(5)
P1	C1	1.734(3)	C12	C13	1.676(9)
P1	C2	1.746(3)	C12	C14	1.468(8)
P2	C11	1.728(4)	C12	C15	1.472(10)
P2	C11[1]	1.728(4)	C12	C13’	1.455(12)
O1	C16	1.448(4)	C12	C14’	1.708(11)
O1	C19	1.438(4)	C12	C15’	1.444(16)
N1	N2	1.375(3)	C16	C17	1.595(9)
N1	C1	1.331(4)	C16	C17’	1.449(9)
N2	C2	1.329(4)	C17	C18	1.554(12)
N3	N3[1]	1.385(5)	C18	C19	1.419(11)
N3	C11	1.339(4)	C17’	C18’	1.472(15)
C1	C7	1.523(4)	C18’	C19	1.619(14)

[1]1-X,+Y,1/2-Z

Table S1-3-3.

Bond Angles for compound4-exp_12.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
O1	Dy1	O1[1]	150.36(12)	N1	C1	P1	113.8(2)
O1[1]	Dy1	N2[1]	80.09(8)	N1	C1	C7	119.2(3)
O1	Dy1	N2[1]	82.35(8)	C7	C1	P1	126.9(2)
O1	Dy1	N2	80.09(8)	N2	C2	P1	113.9(2)
O1[1]	Dy1	N2	82.34(8)	N2	C2	C3	120.2(3)

N1[1]	Dy1	O1[1]	91.56(8)	C3	C2	P1	125.9(2)
N1	Dy1	O1	91.56(8)	C2	C3	C4	108.7(3)
N1[1]	Dy1	O1	86.72(8)	C2	C3	C5	110.9(3)
N1	Dy1	O1[1]	86.72(8)	C5	C3	C4	108.0(3)
N1	Dy1	N1[1]	173.29(12)	C6	C3	C2	109.9(3)
N1	Dy1	N2	33.48(7)	C6	C3	C4	110.9(4)
N1[1]	Dy1	N2[1]	33.48(7)	C6	C3	C5	108.4(3)
N1	Dy1	N2[1]	139.84(9)	C8	C7	C1	111.1(3)
N1[1]	Dy1	N2	139.84(9)	C8	C7	C9	108.7(5)
N1	Dy1	N3	92.89(9)	C8	C7	C10	109.6(4)
N1[1]	Dy1	N3[1]	92.89(9)	C9	C7	C1	107.5(3)
N1[1]	Dy1	N3	93.53(9)	C10	C7	C1	110.8(3)
N1	Dy1	N3[1]	93.53(9)	C10	C7	C9	109.1(4)
N2[1]	Dy1	N2	106.73(11)	N3	C11	P2	115.0(2)
N3	Dy1	O1	121.67(8)	N3	C11	C12	121.2(3)
N3	Dy1	O1[1]	87.97(8)	C12	C11	P2	123.8(3)
N3[1]	Dy1	O1	87.97(8)	C11	C12	C13	107.8(4)
N3[1]	Dy1	O1[1]	121.67(8)	C11	C12	C14’	100.9(5)
N3	Dy1	N2[1]	124.03(9)	C14	C12	C11	116.4(5)
N3	Dy1	N2	125.64(9)	C14	C12	C13	99.2(7)
N3[1]	Dy1	N2[1]	125.64(9)	C14	C12	C15	115.1(7)
N3[1]	Dy1	N2	124.03(9)	C15	C12	C11	114.5(6)
N3	Dy1	N3[1]	33.71(12)	C15	C12	C13	101.0(7)
C1	P1	C2	87.10(15)	C13’	C12	C11	109.1(6)
C11	P2	C11[1]	86.8(2)	C13’	C12	C14’	106.9(9)
C16	O1	Dy1	124.1(2)	C15’	C12	C11	113.4(9)
C19	O1	Dy1	127.0(2)	C15’	C12	C13’	122.7(11)
C19	O1	C16	108.9(3)	C15’	C12	C14’	101.0(10)
N2	N1	Dy1	75.19(14)	O1	C16	C17	101.2(4)
C1	N1	Dy1	171.3(2)	O1	C16	C17’	109.0(5)
C1	N1	N2	113.0(2)	C18	C17	C16	100.7(6)
N1	N2	Dy1	71.33(15)	C19	C18	C17	97.7(8)
C2	N2	Dy1	175.1(2)	C16	C17’	C18’	104.7(9)
C2	N2	N1	112.2(2)	C17’	C18’	C19	104.8(10)
N3[1]	N3	Dy1	73.15(6)	O1	C19	C18’	104.0(6)
C11	N3	Dy1	175.2(2)	C18	C19	O1	108.6(5)
C11	N3	N3[1]	111.64(18)				

[1]1-X, +Y, 1/2-Z

Table S1-3-4.

Torsion Angles for compound4-exp_12.

A	B	C	D	Angle/°	A	B	C	D	Angle/°
Dy1	O1	C16	C17	-170.2(4)	N3[1]	N3	C11	P2	-0.6(5)
Dy1	O1	C16	C17'	158.5(5)	N3[1]	N3	C11	C12	-179.4(4)
Dy1	O1	C19	C18	-158.6(5)	N3	C11	C12	C13	74.4(6)
Dy1	O1	C19	C18'	-175.6(7)	N3	C11	C12	C14	-175.3(7)
Dy1	N1	N2	C2	-176.4(2)	N3	C11	C12	C15	-37.0(8)
P1	C1	C7	C8	-130.8(4)	N3	C11	C12	C13'	131.9(9)
P1	C1	C7	C9	110.4(4)	N3	C11	C12	C14'	-115.9(6)
P1	C1	C7	C10	-8.8(5)	N3	C11	C12	C15'	-8.7(11)
P1	C2	C3	C4	-103.8(3)	C1	P1	C2	N2	-0.6(2)
P1	C2	C3	C5	14.7(4)	C1	P1	C2	C3	177.0(3)
P1	C2	C3	C6	134.6(3)	C1	N1	N2	Dy1	177.0(3)
P2	C11	C12	C13	-104.3(5)	C1	N1	N2	C2	0.6(4)
P2	C11	C12	C14	6.0(8)	C2	P1	C1	N1	0.9(2)
P2	C11	C12	C15	144.2(6)	C2	P1	C1	C7	-176.2(3)
P2	C11	C12	C13'	-46.9(10)	C11[1]	P2	C11	N3	0.21(17)
P2	C11	C12	C14'	65.4(6)	C11[1]	P2	C11	C12	179.0(4)
P2	C11	C12	C15'	172.5(10)	C16	O1	C19	C18	23.8(6)
O1	C16	C17	C18	-32.7(8)	C16	O1	C19	C18'	6.7(8)
O1	C16	C17'	C18'	30.8(11)	C16	C17	C18	C19	45.6(8)
N1	N2	C2	P1	0.2(3)	C16	C17'	C18'	C19	-25.1(14)
N1	N2	C2	C3	-177.6(3)	C17	C16	C17'	C18'	-49.3(10)
N1	C1	C7	C8	52.2(5)	C17	C18	C19	O1	-43.5(8)
N1	C1	C7	C9	-66.6(5)	C17	C18	C19	C18'	33(3)
N1	C1	C7	C10	174.3(4)	C17'	C16	C17	C18	75.6(13)
N2	N1	C1	P1	-1.1(3)	C17'	C18'	C19	O1	11.6(13)
N2	N1	C1	C7	176.3(3)	C17'	C18'	C19	C18	-96(3)
N2	C2	C3	C4	73.7(4)	C19	O1	C16	C17	7.6(6)
N2	C2	C3	C5	-167.8(3)	C19	O1	C16	C17'	-23.7(6)
N2	C2	C3	C6	-47.9(4)					

[1]1-X,+Y,1/2-Z

Table S1-4. Crystal structural analysis data for **5**

Table S1-4-1.
Crystal data and structure refinement for compound5-20140709.

Identification code	compound5-20140709
Empirical formula	$C_{64}H_{120}KN_8O_6P_4Y$
Formula weight	1349.56
Temperature/K	293(2)
Crystal system	monoclinic
Space group	$P2_1/c$
a/Å	15.7119(14)
b/Å	19.192(2)
c/Å	27.436(2)
α/°	90
β/°	92.394(7)
γ/°	90
Volume/Å^3	8265.8(14)
Z	4
ρ_{calc}g/cm^3	1.084
μ/mm^{-1}	0.878
F(000)	2904.0
Crystal size/mm^3	0.211 × 0.156 × 0.123
Radiation	MoKα (λ = 0.71073)
2Θ range for data collection/°	5.856 to 50.1
Index ranges	$-18 \leqslant h \leqslant 18$, $-22 \leqslant k \leqslant 22$, $-32 \leqslant l \leqslant 23$
Reflections collected	44716
Independent reflections	14614 [R_{int} = 0.0762, R_{sigma} = 0.1197]
Data/restraints/parameters	14614/496/1142
Goodness-of-fit on F^2	0.985
Final R indexes [I>=2σ (I)]	R_1 = 0.0835, wR_2 = 0.2032
Final R indexes [all data]	R_1 = 0.1801, wR_2 = 0.2395
Largest diff. peak/hole / e Å^{-3}	0.57/-0.72

Table S1-4-2.

Bond Lengths for compound5-20140709.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
K1	O1	2.654(18)	C27	C30	1.527(9)
K1	O5	2.676(7)	C27	C28	1.540(9)
K1	O4'	2.682(10)	C31	C37	1.511(8)
K1	O2'	2.68(2)	C32	C33	1.513(8)
K1	O6	2.711(8)	C33	C35	1.512(9)
K1	O3	2.721(8)	C33	C34	1.524(9)
K1	O2	2.759(17)	C33	C36	1.549(9)
K1	O1'	2.94(5)	C37	C38	1.493(9)
K1	O4	2.96(4)	C37	C40	1.501(10)
Y1	N7	2.352(5)	C37	C39	1.531(10)
Y1	N6	2.357(4)	O3	C49'	1.315(15)
Y1	N3	2.370(5)	O3	C52	1.346(16)
Y1	N4	2.374(5)	O3	C49	1.378(17)
Y1	N1	2.377(4)	O3	C52'	1.420(15)
Y1	N2	2.381(5)	O5	C60'	1.335(15)
Y1	N5	2.385(4)	O5	C57	1.345(15)
Y1	N8	2.393(5)	O5	C60	1.379(16)
N1	C2	1.331(6)	O5	C57'	1.416(14)
N1	N2	1.380(6)	O6	C61'	1.329(18)
N2	C1	1.339(6)	O6	C61	1.343(16)
N3	C11	1.329(7)	O6	C64	1.417(16)
N3	N4	1.381(6)	O6	C64'	1.422(17)
N4	C12	1.314(6)	O1	C44	1.376(16)
N5	C21	1.341(6)	O1	C41	1.384(17)
N5	N6	1.364(5)	O2	C45	1.359(17)
N6	C22	1.333(6)	O2	C48	1.420(16)
N7	C31	1.313(7)	O4	C56	1.347(18)
N7	N8	1.365(6)	O4	C53	1.385(19)
N8	C32	1.314(6)	C41	C42	1.480(15)
P1	C1	1.728(6)	C42	C43	1.531(15)
P1	C2	1.764(6)	C43	C44	1.496(15)
P2	C11	1.743(6)	C45	C46	1.500(16)
P2	C12	1.753(7)	C46	C47	1.502(17)
P3	C21	1.732(6)	C47	C48	1.502(17)
P3	C22	1.733(6)	C49	C50	1.522(19)
P4	C32	1.741(6)	C50	C51	1.482(19)

P4	C31	1.753(7)	C51	C52	1.531(18)
C1	C7	1.498(8)	C53	C54	1.498(19)
C2	C3	1.498(8)	C54	C55	1.541(19)
C3	C5	1.544(10)	C56	C55	1.529(19)
C3	C6	1.547(9)	C57	C58	1.539(19)
C3	C4	1.556(8)	C58	C59	1.495(19)
C7	C8’	1.515(18)	C59	C60	1.514(18)
C7	C9	1.518(10)	C61	C62	1.538(18)
C7	C9’	1.524(17)	C62	C63	1.492(17)
C7	C10	1.527(10)	C63	C64	1.495(18)
C7	C10’	1.550(18)	O1’	C44’	1.38(2)
C7	C8	1.567(10)	O1’	C41’	1.39(2)
C11	C17	1.513(9)	O2’	C45’	1.335(16)
C12	C13	1.508(9)	O2’	C48’	1.403(17)
C13	C16	1.517(10)	O4’	C53’	1.361(15)
C13	C15’	1.518(18)	O4’	C56’	1.383(15)
C13	C14	1.532(10)	C41’	C42’	1.536(19)
C13	C14’	1.536(18)	C42’	C43’	1.54(2)
C13	C15	1.539(11)	C43’	C44’	1.495(19)
C13	C16’	1.582(18)	C45’	C46’	1.475(15)
C17	C19’	1.462(12)	C46’	C47’	1.509(17)
C17	C18	1.486(16)	C47’	C48’	1.493(16)
C17	C18’	1.519(12)	C49’	C50’	1.442(16)
C17	C20	1.530(15)	C50’	C51’	1.435(17)
C17	C20’	1.574(13)	C51’	C52’	1.517(16)
C17	C19	1.595(16)	C53’	C54’	1.497(17)
C21	C27	1.520(8)	C54’	C55’	1.512(16)
C22	C23	1.525(8)	C56’	C55’	1.508(16)
C23	C25	1.496(10)	C57’	C58’	1.537(17)
C23	C26	1.504(9)	C58’	C59’	1.498(17)
C23	C24	1.530(10)	C59’	C60’	1.509(19)
C23	C24’	1.552(18)	C61’	C62’	1.515(19)
C23	C25’	1.580(17)	C62’	C63’	1.54(2)
C23	C26’	1.586(16)	C63’	C64’	1.543(18)
C27	C29	1.502(10)			

Table S1-4-3.

Bond Angles for compound5-20140709.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
O1	K1	O5	91.6(4)	C11	C17	C20'	108.9(9)
O5	K1	O4'	176.2(3)	C18'	C17	C20'	97.7(9)
O5	K1	O2'	88.4(5)	C18	C17	C19	109.8(12)
O4'	K1	O2'	93.5(6)	C11	C17	C19	105.7(10)
O1	K1	O6	92.8(5)	C20	C17	C19	107.2(10)
O5	K1	O6	93.7(3)	N5	C21	C27	119.2(5)
O4'	K1	O6	84.4(4)	N5	C21	P3	114.3(4)
O2'	K1	O6	177.4(5)	C27	C21	P3	126.4(4)
O1	K1	O3	177.3(5)	N6	C22	C23	118.4(5)
O5	K1	O3	85.9(3)	N6	C22	P3	113.9(4)
O4'	K1	O3	97.3(3)	C23	C22	P3	127.7(4)
O2'	K1	O3	93.3(5)	C25	C23	C26	108.7(8)
O6	K1	O3	88.5(3)	C25	C23	C22	109.7(6)
O1	K1	O2	92.5(7)	C26	C23	C22	111.8(7)
O5	K1	O2	88.8(5)	C25	C23	C24	107.8(9)
O6	K1	O2	174.1(6)	C26	C23	C24	109.3(9)
O3	K1	O2	86.4(6)	C22	C23	C24	109.5(6)
O5	K1	O1'	96.9(9)	C22	C23	C24'	112.5(14)
O4'	K1	O1'	79.9(9)	C22	C23	C25'	104.6(12)
O2'	K1	O1'	89.8(11)	C24'	C23	C25'	107(2)
O6	K1	O1'	88.3(11)	C22	C23	C26'	106.4(12)
O3	K1	O1'	175.9(11)	C24'	C23	C26'	119(2)
O1	K1	O4	99.3(6)	C25'	C23	C26'	106.3(18)
O5	K1	O4	168.3(6)	C29	C27	C21	109.2(6)
O6	K1	O4	81.8(7)	C29	C27	C30	110.5(7)
O3	K1	O4	83.2(5)	C21	C27	C30	112.3(5)
O2	K1	O4	94.8(8)	C29	C27	C28	107.3(7)
N7	Y1	N6	81.49(14)	C21	C27	C28	108.5(6)
N7	Y1	N3	148.16(16)	C30	C27	C28	108.9(7)
N6	Y1	N3	88.44(15)	N7	C31	C37	118.6(6)
N7	Y1	N4	130.31(16)	N7	C31	P4	113.2(5)
N6	Y1	N4	117.21(15)	C37	C31	P4	128.0(5)
N3	Y1	N4	33.85(14)	N8	C32	C33	120.1(6)
N7	Y1	N1	87.37(16)	N8	C32	P4	113.5(5)
N6	Y1	N1	148.01(15)	C33	C32	P4	126.4(5)
N3	Y1	N1	115.16(16)	C35	C33	C32	110.7(6)

N4	Y1	N1	92.78(15)	C35	C33	C34	110.6(7)
N7	Y1	N2	117.55(16)	C32	C33	C34	109.2(6)
N6	Y1	N2	132.92(15)	C35	C33	C36	106.1(7)
N3	Y1	N2	91.31(16)	C32	C33	C36	111.1(5)
N4	Y1	N2	84.19(15)	C34	C33	C36	109.0(6)
N1	Y1	N2	33.72(14)	C38	C37	C40	108.7(8)
N7	Y1	N5	90.86(15)	C38	C37	C31	111.9(6)
N6	Y1	N5	33.42(13)	C40	C37	C31	109.7(6)
N3	Y1	N5	97.18(15)	C38	C37	C39	107.2(7)
N4	Y1	N5	131.00(15)	C40	C37	C39	108.9(7)
N1	Y1	N5	117.75(15)	C31	C37	C39	110.3(7)
N2	Y1	N5	100.33(14)	C52	O3	C49	109.0(18)
N7	Y1	N8	33.43(13)	C49’	O3	C52’	112.4(14)
N6	Y1	N8	89.19(14)	C49’	O3	K1	120.8(12)
N3	Y1	N8	117.00(17)	C52	O3	K1	119.7(11)
N4	Y1	N8	97.95(16)	C49	O3	K1	130.7(13)
N1	Y1	N8	97.83(16)	C52’	O3	K1	126.6(10)
N2	Y1	N8	131.29(15)	C57	O5	C60	109.2(14)
N5	Y1	N8	113.18(14)	C60’	O5	C57’	105.1(12)
C2	N1	N2	113.4(5)	C60’	O5	K1	133.7(11)
C2	N1	Y1	168.9(4)	C57	O5	K1	125.3(12)
N2	N1	Y1	73.3(3)	C60	O5	K1	124.9(11)
C1	N2	N1	112.8(5)	C57’	O5	K1	120.9(10)
C1	N2	Y1	169.0(4)	C61	O6	C64	116.1(17)
N1	N2	Y1	73.0(3)	C61’	O6	C64’	107(2)
C11	N3	N4	113.0(5)	C61’	O6	K1	129.4(14)
C11	N3	Y1	171.4(4)	C61	O6	K1	120.3(13)
N4	N3	Y1	73.3(3)	C64	O6	K1	123.6(12)
C12	N4	N3	112.9(5)	C64’	O6	K1	118.5(13)
C12	N4	Y1	170.4(4)	C44	O1	C41	105.4(16)
N3	N4	Y1	72.9(3)	C44	O1	K1	132.5(13)
C21	N5	N6	111.8(4)	C41	O1	K1	121.6(15)
C21	N5	Y1	172.2(4)	C45	O2	C48	111.0(15)
N6	N5	Y1	72.2(2)	C45	O2	K1	118.1(11)
C22	N6	N5	113.0(4)	C48	O2	K1	130.9(14)
C22	N6	Y1	170.9(4)	C56	O4	C53	111.8(19)
N5	N6	Y1	74.4(2)	C56	O4	K1	99(3)
C31	N7	N8	113.2(5)	C53	O4	K1	120(3)
C31	N7	Y1	171.4(4)	O1	C41	C42	110.3(16)
N8	N7	Y1	74.9(3)	C41	C42	C43	104.1(14)

C32	N8	N7	113.3(5)	C44	C43	C42	97.0(14)
C32	N8	Y1	174.5(4)	O1	C44	C43	112.5(14)
N7	N8	Y1	71.6(3)	O2	C45	C46	104.1(13)
C1	P1	C2	88.0(3)	C45	C46	C47	110.1(15)
C11	P2	C12	87.2(3)	C46	C47	C48	97.0(13)
C21	P3	C22	86.9(3)	O2	C48	C47	108.0(15)
C32	P4	C31	86.9(3)	O3	C49	C50	108(2)
N2	C1	C7	118.3(5)	C51	C50	C49	90(2)
N2	C1	P1	113.5(5)	C50	C51	C52	99(3)
C7	C1	P1	128.0(4)	O3	C52	C51	95.1(19)
N1	C2	C3	122.2(5)	O4	C53	C54	93(2)
N1	C2	P1	112.3(5)	C53	C54	C55	108(3)
C3	C2	P1	125.4(4)	O4	C56	C55	110(3)
C2	C3	C5	109.0(6)	C56	C55	C54	93(3)
C2	C3	C6	111.3(5)	O5	C57	C58	87.1(16)
C5	C3	C6	109.2(7)	C59	C58	C57	94(2)
C2	C3	C4	109.3(6)	C58	C59	C60	95(2)
C5	C3	C4	109.8(7)	O5	C60	C59	101.4(16)
C6	C3	C4	108.4(6)	O6	C61	C62	96.1(18)
C1	C7	C8’	109.1(15)	C63	C62	C61	112(2)
C1	C7	C9	109.9(6)	C62	C63	C64	98(2)
C1	C7	C9’	115.9(15)	O6	C64	C63	108.0(18)
C8’	C7	C9’	95.6(13)	C44’	O1’	C41’	121(4)
C1	C7	C10	110.5(7)	C44’	O1’	K1	113(2)
C9	C7	C10	110.5(7)	C41’	O1’	K1	123(3)
C1	C7	C10’	105.5(18)	C45’	O2’	C48’	106.1(16)
C8’	C7	C10’	113(2)	C45’	O2’	K1	122.2(14)
C9’	C7	C10’	118(2)	C48’	O2’	K1	126.9(15)
C1	C7	C8	110.1(6)	C53’	O4’	C56’	112.2(12)
C9	C7	C8	109.3(8)	C53’	O4’	K1	116.2(11)
C10	C7	C8	106.5(8)	C56’	O4’	K1	131.3(9)
N3	C11	C17	120.0(6)	O1’	C41’	C42’	91(3)
N3	C11	P2	113.3(4)	C41’	C42’	C43’	95(3)
C17	C11	P2	126.7(5)	C44’	C43’	C42’	90(3)
N4	C12	C13	121.0(6)	O1’	C44’	C43’	86(3)
N4	C12	P2	113.7(4)	O2’	C45’	C46’	111.6(16)
C13	C12	P2	125.3(5)	C45’	C46’	C47’	105.9(16)
C12	C13	C16	110.8(7)	C48’	C47’	C46’	98.8(17)
C12	C13	C15’	110.6(14)	O2’	C48’	C47’	111.4(17)
C12	C13	C14	112.7(7)	O3	C49’	C50’	102.2(17)

C16	C13	C14	108.3(8)	C51'	C50'	C49'	116(2)
C12	C13	C14'	107.4(16)	C50'	C51'	C52'	94.7(18)
C15'	C13	C14'	94.0(13)	O3	C52'	C51'	109.7(15)
C12	C13	C15	110.5(7)	O4'	C53'	C54'	102.3(12)
C16	C13	C15	108.8(9)	C53'	C54'	C55'	108.5(13)
C14	C13	C15	105.6(9)	O4'	C56'	C55'	104.5(13)
C12	C13	C16'	106.3(14)	C56'	C55'	C54'	96.0(12)
C15'	C13	C16'	131(2)	O5	C57'	C58'	106.1(15)
C14'	C13	C16'	105(2)	C59'	C58'	C57'	100.6(19)
C19'	C17	C11	114.1(9)	C58'	C59'	C60'	94(2)
C18	C17	C11	111.4(14)	O5	C60'	C59'	110.8(18)
C19'	C17	C18'	111.6(11)	O6	C61'	C62'	104.3(19)
C11	C17	C18'	112.6(7)	C61'	C62'	C63'	93.4(15)
C18	C17	C20	114.5(11)	C62'	C63'	C64'	87(2)
C11	C17	C20	107.8(10)	O6	C64'	C63'	94.9(17)
C19'	C17	C20'	110.8(12)				

Table S1-4-4.

Torsion Angles for compound5-20140709.

A	B	C	D	Angle/°	A	B	C	D	Angle/°
C2	N1	N2	C1	-0.5(6)	N7	C31	C37	C38	43.7(9)
Y1	N1	N2	C1	170.0(4)	P4	C31	C37	C38	-141.3(7)
C2	N1	N2	Y1	-170.5(4)	N7	C31	C37	C40	-77.1(8)
C11	N3	N4	C12	-1.8(7)	P4	C31	C37	C40	97.9(8)
Y1	N3	N4	C12	171.9(4)	N7	C31	C37	C39	163.0(6)
C11	N3	N4	Y1	-173.6(5)	P4	C31	C37	C39	-22.0(9)
C21	N5	N6	C22	-1.5(6)	C44	O1	C41	C42	0(2)
Y1	N5	N6	C22	-174.4(4)	K1	O1	C41	C42	172.9(12)
C21	N5	N6	Y1	172.9(4)	O1	C41	C42	C43	-20(2)
C31	N7	N8	C32	0.2(6)	C41	C42	C43	C44	28.7(18)
Y1	N7	N8	C32	177.4(4)	C41	O1	C44	C43	22(2)
C31	N7	N8	Y1	-177.2(4)	K1	O1	C44	C43	-150.5(15)
N1	N2	C1	C7	-175.4(5)	C42	C43	C44	O1	-32(2)
Y1	N2	C1	C7	-56(2)	C48	O2	C45	C46	10(3)
N1	N2	C1	P1	-0.3(6)	K1	O2	C45	C46	-171.5(16)
Y1	N2	C1	P1	120(2)	O2	C45	C46	C47	11(4)
C2	P1	C1	N2	0.7(4)	C45	C46	C47	C48	-25(3)
C2	P1	C1	C7	175.2(6)	C45	O2	C48	C47	-27(3)

N2	N1	C2	C3	178.9(5)	K1	O2	C48	C47	153.9(18)
Y1	N1	C2	C3	54(2)	C46	C47	C48	O2	31(3)
N2	N1	C2	P1	1.0(6)	C49’	O3	C49	C50	79(3)
Y1	N1	C2	P1	-124(2)	C52	O3	C49	C50	2(3)
C1	P1	C2	N1	-0.9(5)	C52’	O3	C49	C50	-50(3)
C1	P1	C2	C3	-178.7(6)	K1	O3	C49	C50	172.9(16)
N1	C2	C3	C5	104.0(7)	O3	C49	C50	C51	34(3)
P1	C2	C3	C5	-78.4(7)	C49	C50	C51	C52	-54(3)
N1	C2	C3	C6	-16.5(9)	C49’	O3	C52	C51	-78(2)
P1	C2	C3	C6	161.1(5)	C49	O3	C52	C51	-36(3)
N1	C2	C3	C4	-136.1(7)	C52’	O3	C52	C51	36.0(18)
P1	C2	C3	C4	41.5(9)	K1	O3	C52	C51	152.2(19)
N2	C1	C7	C8’	-95.1(19)	C50	C51	C52	O3	60(3)
P1	C1	C7	C8’	90.6(19)	C56	O4	C53	C54	-44(5)
N2	C1	C7	C9	78.2(8)	K1	O4	C53	C54	-159.7(19)
P1	C1	C7	C9	-96.1(8)	O4	C53	C54	C55	47(4)
N2	C1	C7	C9’	11(2)	C53	O4	C56	C55	26(6)
P1	C1	C7	C9’	-162.9(18)	K1	O4	C56	C55	154(3)
N2	C1	C7	C10	-159.6(7)	O4	C56	C55	C54	6(4)
P1	C1	C7	C10	26.0(10)	C53	C54	C55	C56	-33(4)
N2	C1	C7	C10’	143(2)	C60’	O5	C57	C58	-95.3(19)
P1	C1	C7	C10’	-31(2)	C60	O5	C57	C58	-58(2)
N2	C1	C7	C8	-42.2(10)	C57’	O5	C57	C58	18.1(16)
P1	C1	C7	C8	143.4(8)	K1	O5	C57	C58	130.3(16)
N4	N3	C11	C17	-179.9(6)	O5	C57	C58	C59	69(2)
N4	N3	C11	P2	0.9(7)	C57	C58	C59	C60	-55(3)
C12	P2	C11	N3	0.1(5)	C60’	O5	C60	C59	76(3)
C12	P2	C11	C17	-179.1(7)	C57	O5	C60	C59	25(3)
N3	N4	C12	C13	-177.5(6)	C57’	O5	C60	C59	-38(3)
N3	N4	C12	P2	1.8(6)	K1	O5	C60	C59	-163.2(19)
C11	P2	C12	N4	-1.1(5)	C58	C59	C60	O5	22(3)
C11	P2	C12	C13	178.2(6)	C61’	O6	C61	C62	-87(2)
N4	C12	C13	C16	-92.2(9)	C64	O6	C61	C62	-29(3)
P2	C12	C13	C16	88.5(8)	C64’	O6	C61	C62	39.7(19)
N4	C12	C13	C15’	-19.6(19)	K1	O6	C61	C62	154.2(15)
P2	C12	C13	C15’	161.2(18)	O6	C61	C62	C63	32(3)
N4	C12	C13	C14	146.2(9)	C61	C62	C63	C64	-22(4)
P2	C12	C13	C14	-33.0(11)	C61’	O6	C64	C63	60(3)
N4	C12	C13	C14’	81.7(19)	C61	O6	C64	C63	17(3)
P2	C12	C13	C14’	-97.5(18)	C64’	O6	C64	C63	-49(3)

N4	C12	C13	C15	28.4(11)	K1	O6	C64 C63 -166(2)
P2	C12	C13	C15	-150.9(8)	C62	C63	C64 O6 5(4)
N4	C12	C13	C16'	-166.8(16)	C44'	O1'	C41' C42' -4(6)
P2	C12	C13	C16'	14.0(18)	K1	O1'	C41' C42' -164(3)
N3	C11	C17	C19'	114.2(13)	O1'	C41'	C42' C43' -39(4)
P2	C11	C17	C19'	-66.6(14)	C41'	C42'	C43' C44' 69(4)
N3	C11	C17	C18	-53.3(16)	C41'	O1'	C44' C43' 46(6)
P2	C11	C17	C18	125.8(15)	K1	O1'	C44' C43' -152(3)
N3	C11	C17	C18'	-14.2(11)	C42'	C43'	C44' O1' -63(4)
P2	C11	C17	C18'	164.9(8)	C48'	O2'	C45' C46' 10(3)
N3	C11	C17	C20	-179.8(13)	K1	O2'	C45' C46' 167.1(17)
P2	C11	C17	C20	-0.6(15)	O2'	C45'	C46' C47' 6(4)
N3	C11	C17	C20'	-121.4(11)	C45'	C46'	C47' C48' -18(3)
P2	C11	C17	C20'	57.7(12)	C45'	O2'	C48' C47' -23(3)
N3	C11	C17	C19	65.9(14)	K1	O2'	C48' C47' -178.9(16)
P2	C11	C17	C19	-115.0(13)	C46'	C47'	C48' O2' 26(3)
N6	N5	C21	C27	178.7(5)	C52	O3	C49' C50' 47(2)
N6	N5	C21	P3	2.5(6)	C49	O3	C49' C50' -65(3)
C22	P3	C21	N5	-2.2(4)	C52'	O3	C49' C50' -8(3)
C22	P3	C21	C27	-178.0(6)	K1	O3	C49' C50' 176.5(15)
N5	N6	C22	C23	178.3(5)	O3	C49'	C50' C51' 20(3)
N5	N6	C22	P3	-0.2(6)	C49'	C50'	C51' C52' -22(3)
C21	P3	C22	N6	1.3(4)	C49'	O3	C52' C51' -5(3)
C21	P3	C22	C23	-177.0(6)	C52	O3	C52' C51' -86(3)
N6	C22	C23	C25	-65.6(9)	C49	O3	C52' C51' 30(3)
P3	C22	C23	C25	112.6(8)	K1	O3	C52' C51' 170.1(15)
N6	C22	C23	C26	173.7(8)	C50'	C51'	C52' O3 15(3)
P3	C22	C23	C26	-8.1(11)	C56'	O4'	C53' C54' 16(3)
N6	C22	C23	C24	52.5(10)	K1	O4'	C53' C54' -169.4(15)
P3	C22	C23	C24	-129.3(8)	O4'	C53'	C54' C55' 12(3)
N6	C22	C23	C24'	-5(2)	C53'	O4'	C56' C55' -37(3)
P3	C22	C23	C24'	173(2)	K1	O4'	C56' C55' 149.0(15)
N6	C22	C23	C25'	-120.9(17)	O4'	C56'	C55' C54' 39(2)
P3	C22	C23	C25'	57.3(18)	C53'	C54'	C55' C56' -30(3)
N6	C22	C23	C26'	126.9(13)	C60'	O5	C57' C58' 4(3)
P3	C22	C23	C26'	-54.9(14)	C57	O5	C57' C58' -64(2)
N5	C21	C27	C29	-87.1(7)	C60	O5	C57' C58' 49(3)
P3	C21	C27	C29	88.6(7)	K1	O5	C57' C58' 178.1(18)
N5	C21	C27	C30	35.8(8)	O5	C57'	C58' C59' -32(3)
P3	C21	C27	C30	-148.5(6)	C57'	C58'	C59' C60' 43(3)

N5	C21	C27	C28	156.2(6)	C57	O5	C60' C59' 88(2)
P3	C21	C27	C28	-28.1(8)	C60	O5	C60' C59' -43(2)
N8	N7	C31	C37	175.7(5)	C57'	O5	C60' C59' 27(3)
N8	N7	C31	P4	0.0(6)	K1	O5	C60' C59' -146.0(15)
C32	P4	C31	N7	-0.1(4)	C58'	C59'	C60' O5 -46(3)
C32	P4	C31	C37	-175.3(6)	C61	O6	C61' C62' 55(3)
N7	N8	C32	C33	179.7(5)	C64	O6	C61' C62' -74(3)
N7	N8	C32	P4	-0.3(6)	C64'	O6	C61' C62' 2(3)
C31	P4	C32	N8	0.2(4)	K1	O6	C61' C62' 155.7(15)
C31	P4	C32	C33	-179.7(6)	O6	C61'	C62' C63' 41(3)
N8	C32	C33	C35	148.9(6)	C61'	C62'	C63' C64' -62(3)
P4	C32	C33	C35	-31.1(9)	C61'	O6	C64' C63' -44(3)
N8	C32	C33	C34	-89.0(7)	C61	O6	C64' C63' -85(3)
P4	C32	C33	C34	90.9(7)	C64	O6	C64' C63' 37(3)
N8	C32	C33	C36	31.3(8)	K1	O6	C64' C63' 158.9(19)
P4	C32	C33	C36	-148.8(5)	C62'	C63'	C64' O6 65(3)

S1-5 The plot of complex **6.**

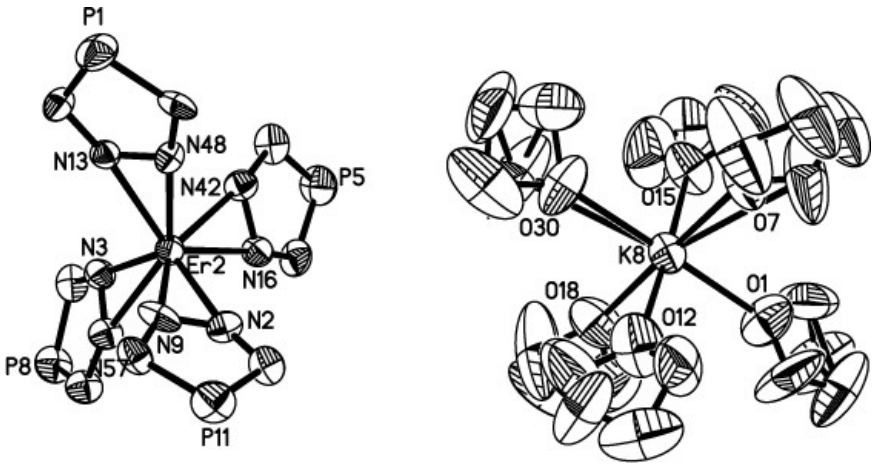

Figure S1-5. Molecular structure of **6** with thermal ellipsoids at the 30% probability level. The *t*Bu groups are not shown for clarity.

Table S1-6. Crystal structural analysis data for **7**

Table S1-6-1.

Crystal data and structure refinement for compound7-exp_141.

Identification code	compound7-exp_141
Empirical formula	$C_{40}H_{72}EuK_2N_8P_4$
Formula weight	1019.10
Temperature/K	298(2)
Crystal system	monoclinic
Space group	$P2_1/c$
a/Å	20.6930(5)
b/Å	12.1401(3)
c/Å	21.7951(5)
α/°	90.00
β/°	101.795(2)
γ/°	90.00
Volume/Å^3	5359.7(2)
Z	4
ρ_{calc}g/cm^3	1.263
μ/mm^{-1}	1.478
F(000)	2116.0
Crystal size/mm^3	0.21 × 0.14 × 0.08
Radiation	Mo Kα (λ = 0.71073)
2Θ range for data collection/°	5.74 to 52.68
Index ranges	$-23 \leqslant h \leqslant 25$, $-15 \leqslant k \leqslant 10$, $-27 \leqslant l \leqslant 21$
Reflections collected	23727
Independent reflections	10926 [R_{int} = 0.0370, R_{sigma} = 0.0765]
Data/restraints/parameters	10926/138/612
Goodness-of-fit on F^2	1.018
Final R indexes [I>=2σ (I)]	R_1 = 0.0420, wR_2 = 0.0832
Final R indexes [all data]	R_1 = 0.0721, wR_2 = 0.0949
Largest diff. peak/hole / e Å^{-3}	0.88/-0.53

Table S1-6-2.

Bond Lengths for compound7-exp_141.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
C2	C4'	1.48(2)	C31	C34	1.526(8)
C2	C3	1.490(11)	C32	C34	1.512(7)
C2	C5	1.525(6)	C32	K2[1]	3.457(7)
C2	C1	1.525(10)	C33	C34	1.511(8)
C2	C1'	1.562(19)	C34	C35	1.536(7)
C2	C4	1.578(12)	C35	N3	1.331(5)
C2	C3'	1.601(16)	C35	P2	1.747(5)
C5	N5	1.323(5)	C35	K2	3.489(5)
C5	P1	1.749(5)	C36	N4	1.327(5)
C6	N6	1.335(5)	C36	C37	1.531(6)
C6	C7	1.512(6)	C36	P2	1.749(5)
C6	P1	1.744(5)	C36	K2	3.297(5)
C6	K1	3.379(5)	C37	C38'	1.47(4)
C7	C8	1.495(8)	C37	C39	1.523(9)
C7	C10	1.525(7)	C37	C40	1.528(8)
C7	C9	1.541(8)	C37	C40'	1.54(3)
C11	C14	1.512(18)	C37	C38	1.542(9)
C12	C14	1.47(2)	C37	C39'	1.64(4)
C13	C14	1.587(17)	Eu1	N2	2.570(4)
C14	C12'	1.496(16)	Eu1	N5	2.601(4)
C14	C15	1.507(7)	Eu1	N4	2.604(4)
C14	C11'	1.532(17)	Eu1	N6	2.608(4)
C14	C13'	1.598(15)	Eu1	N7	2.624(4)
C15	N1	1.332(6)	Eu1	N8	2.643(4)
C15	P3	1.748(5)	Eu1	N1	2.659(4)
C15	K2	3.398(5)	Eu1	N3	2.678(4)
C16	N2	1.325(5)	Eu1	K1	3.9199(13)
C16	C17	1.523(7)	Eu1	K2	3.9727(13)
C16	P3	1.747(5)	K1	N6	2.881(4)
C16	K2	3.153(5)	K1	N7	2.904(4)
C17	C20	1.498(7)	K1	N8	2.969(4)
C17	C18	1.527(7)	K1	N5	2.992(4)
C17	C19	1.529(7)	K1	P4[2]	3.3728(18)
C21	C23	1.483(9)	K2	N2	2.810(4)
C22	C23	1.507(8)	K2	N4	2.888(4)
C23	C25	1.510(7)	K2	N1	2.978(4)

C23	C24	1.518(7)	K2	N3	3.026(4)
C25	N7	1.334(5)	K2	P2[1]	3.3966(19)
C25	P4	1.740(5)	K2	C32[1]	3.457(7)
C25	K1	3.519(5)	K2	P3	3.713(2)
C26	N8	1.321(5)	N1	N2	1.382(5)
C26	C27	1.520(7)	N3	N4	1.379(5)
C26	P4	1.740(5)	N5	N6	1.372(5)
C27	C29	1.466(8)	N7	N8	1.374(5)
C27	C30	1.507(8)	P2	K2[1]	3.3966(19)
C27	C28	1.510(9)	P4	K1[3]	3.3728(18)

1- X,1-Y,1-Z; [2]1-X,-1/2+Y,3/2-Z; [3]1-X,1/2+Y,3/2-Z

Table S1-6-3.

Bond Angles for compound7-exp_141.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
C4'	C2	C3	137.0(10)	N6	Eu1	K1	47.30(9)
C4'	C2	C5	109.2(9)	N7	Eu1	K1	47.81(8)
C3	C2	C5	108.4(6)	N8	Eu1	K1	49.21(8)
C4'	C2	C1	76.0(10)	N1	Eu1	K1	127.24(9)
C3	C2	C1	108.6(7)	N3	Eu1	K1	134.64(9)
C5	C2	C1	111.4(5)	N2	Eu1	K2	44.79(8)
C4'	C2	C1'	117.6(12)	N5	Eu1	K2	133.21(9)
C3	C2	C1'	66.0(9)	N4	Eu1	K2	46.58(8)
C5	C2	C1'	110.5(8)	N6	Eu1	K2	132.87(9)
C1	C2	C1'	45.4(8)	N7	Eu1	K2	129.41(8)
C4'	C2	C4	33.4(9)	N8	Eu1	K2	130.73(8)
C3	C2	C4	112.7(7)	N1	Eu1	K2	48.56(9)
C5	C2	C4	109.2(5)	N3	Eu1	K2	49.57(9)
C1	C2	C4	106.6(7)	K1	Eu1	K2	175.77(3)
C1'	C2	C4	138.1(9)	N6	K1	N7	78.93(11)
C4'	C2	C3'	109.6(11)	N6	K1	N8	83.98(11)
C3	C2	C3'	36.3(6)	N7	K1	N8	27.02(9)
C5	C2	C3'	109.7(6)	N6	K1	N5	26.93(9)
C1	C2	C3'	133.5(7)	N7	K1	N5	83.47(11)
C1'	C2	C3'	99.7(10)	N8	K1	N5	75.92(10)
C4	C2	C3'	78.8(7)	N6	K1	P4[2]	109.71(9)
N5	C5	C2	119.5(4)	N7	K1	P4[2]	145.34(9)

N5	C5	P1	113.8(3)	N8	K1	$P4^2$	164.23(9)
C2	C5	P1	126.6(4)	N5	K1	$P4^2$	119.83(8)
N6	C6	C7	119.5(4)	N6	K1	C6	22.90(10)
N6	C6	P1	113.9(3)	N7	K1	C6	99.08(12)
C7	C6	P1	126.5(4)	N8	K1	C6	106.87(12)
N6	C6	K1	57.1(2)	N5	K1	C6	40.79(10)
C7	C6	K1	112.8(3)	$P4^2$	K1	C6	86.93(9)
P1	C6	K1	98.76(19)	N6	K1	C25	97.67(11)
C8	C7	C6	109.3(5)	N7	K1	C25	21.34(10)
C8	C7	C10	110.5(5)	N8	K1	C25	39.47(10)
C6	C7	C10	110.8(4)	N5	K1	C25	104.79(11)
C8	C7	C9	108.4(5)	$P4^2$	K1	C25	127.80(9)
C6	C7	C9	110.7(5)	C6	K1	C25	115.00(12)
C10	C7	C9	107.1(5)	N6	K1	Eu1	41.70(7)
C12	C14	C12’	133.9(10)	N7	K1	Eu1	42.02(7)
C12	C14	C15	114.1(8)	N8	K1	Eu1	42.38(7)
C12’	C14	C15	111.3(7)	N5	K1	Eu1	41.56(7)
C12	C14	C11	112.4(11)	$P4^2$	K1	Eu1	149.93(5)
C12’	C14	C11	57.0(9)	C6	K1	Eu1	64.53(9)
C15	C14	C11	109.7(8)	C25	K1	Eu1	63.28(8)
C12	C14	C11’	43.4(8)	N2	K2	N4	81.03(11)
C12’	C14	C11’	114.6(11)	N2	K2	N1	27.42(10)
C15	C14	C11’	106.9(7)	N4	K2	N1	76.12(10)
C11	C14	C11’	142.8(10)	N2	K2	N3	76.48(11)
C12	C14	C13	104.4(11)	N4	K2	N3	26.83(9)
C12’	C14	C13	50.0(8)	N1	K2	N3	84.35(11)
C15	C14	C13	111.2(7)	N2	K2	C16	24.83(11)
C11	C14	C13	104.6(11)	N4	K2	C16	105.50(12)
C11’	C14	C13	67.6(9)	N1	K2	C16	43.02(11)
C12	C14	C13’	63.5(9)	N3	K2	C16	96.60(12)
C12’	C14	C13’	106.8(9)	N2	K2	C36	104.27(12)
C15	C14	C13’	111.0(7)	N4	K2	C36	23.62(10)
C11	C14	C13’	53.7(8)	N1	K2	C36	95.03(11)
C11’	C14	C13’	106.1(9)	N3	K2	C36	41.54(11)
C13	C14	C13’	137.2(8)	C16	K2	C36	128.96(13)
N1	C15	C14	120.6(5)	N2	K2	$P2^1$	138.03(9)
N1	C15	P3	114.6(4)	N4	K2	$P2^1$	132.01(9)
C14	C15	P3	124.8(4)	N1	K2	$P2^1$	151.82(9)
N1	C15	K2	60.6(3)	N3	K2	$P2^1$	119.87(9)
C14	C15	K2	122.9(4)	C16	K2	$P2^1$	114.64(9)

P3	C15	K2	86.07(18)	C36	K2	$P2^1$	112.58(9)
N2	C16	C17	118.8(4)	N2	K2	C15	41.12(11)
N2	C16	P3	114.4(3)	N4	K2	C15	96.43(12)
C17	C16	P3	126.7(4)	N1	K2	C15	22.92(11)
N2	C16	K2	62.9(2)	N3	K2	C15	107.25(12)
C17	C16	K2	108.0(3)	C16	K2	C15	42.59(12)
P3	C16	K2	94.13(19)	C36	K2	C15	111.51(12)
C20	C17	C16	111.1(5)	$P2^1$	K2	C15	130.90(10)
C20	C17	C18	108.8(5)	N2	K2	$C32^1$	141.96(14)
C16	C17	C18	109.8(5)	N4	K2	$C32^1$	116.65(16)
C20	C17	C19	110.7(6)	N1	K2	$C32^1$	119.95(13)
C16	C17	C19	109.5(5)	N3	K2	$C32^1$	134.38(16)
C18	C17	C19	106.8(5)	C16	K2	$C32^1$	127.98(17)
C21	C23	C22	110.5(6)	C36	K2	$C32^1$	95.02(17)
C21	C23	C25	111.4(5)	$P2^1$	K2	$C32^1$	54.55(11)
C22	C23	C25	110.3(5)	C15	K2	$C32^1$	101.33(14)
C21	C23	C24	108.3(6)	N2	K2	C35	96.25(12)
C22	C23	C24	104.9(5)	N4	K2	C35	39.91(10)
C25	C23	C24	111.3(5)	N1	K2	C35	106.49(12)
N7	C25	C23	119.0(4)	N3	K2	C35	22.14(10)
N7	C25	P4	113.6(3)	C16	K2	C35	112.63(13)
C23	C25	P4	127.2(4)	C36	K2	C35	41.28(11)
N7	C25	K1	52.4(2)	$P2^1$	K2	C35	98.34(9)
C23	C25	K1	113.3(3)	C15	K2	C35	129.39(13)
P4	C25	K1	100.6(2)	$C32^1$	K2	C35	119.17(15)
N8	C26	C27	119.0(4)	N2	K2	P3	44.21(8)
N8	C26	P4	113.9(3)	N4	K2	P3	119.87(8)
C27	C26	P4	127.1(4)	N1	K2	P3	44.08(8)
C29	C27	C30	107.9(6)	N3	K2	P3	120.68(8)
C29	C27	C28	111.7(6)	C16	K2	P3	27.99(9)
C30	C27	C28	104.3(6)	C36	K2	P3	138.63(9)
C29	C27	C26	111.4(5)	$P2^1$	K2	P3	107.79(5)
C30	C27	C26	112.3(5)	C15	K2	P3	28.01(8)
C28	C27	C26	109.0(5)	$C32^1$	K2	P3	101.09(13)
C34	C32	$K2^1$	122.7(4)	C35	K2	P3	139.64(9)
C33	C34	C32	108.5(6)	N2	K2	Eu1	40.12(8)
C33	C34	C31	108.4(6)	N4	K2	Eu1	40.91(7)
C32	C34	C31	109.2(6)	N1	K2	Eu1	42.01(8)
C33	C34	C35	111.4(5)	N3	K2	Eu1	42.35(7)
C32	C34	C35	110.3(5)	C16	K2	Eu1	64.68(9)

C31	C34	C35	108.9(5)	C36	K2	Eu1	64.29(8)
N3	C35	C34	119.3(4)	P2[1]	K2	Eu1	158.11(5)
N3	C35	P2	114.3(3)	C15	K2	Eu1	64.93(9)
C34	C35	P2	126.1(4)	C32[1]	K2	Eu1	144.78(12)
N3	C35	K2	59.0(3)	C35	K2	Eu1	64.48(8)
C34	C35	K2	122.2(3)	P3	K2	Eu1	81.43(4)
P2	C35	K2	89.31(19)	C15	N1	N2	111.9(4)
N4	C36	C37	118.5(4)	C15	N1	Eu1	174.0(3)
N4	C36	P2	113.9(3)	N2	N1	Eu1	71.1(2)
C37	C36	P2	127.4(4)	C15	N1	K2	96.5(3)
N4	C36	K2	60.7(2)	N2	N1	K2	69.5(2)
C37	C36	K2	112.8(3)	Eu1	N1	K2	89.43(11)
P2	C36	K2	95.72(18)	C16	N2	N1	112.7(4)
C38’	C37	C39	43.5(18)	C16	N2	Eu1	167.5(3)
C38’	C37	C40	71.3(19)	N1	N2	Eu1	78.3(2)
C39	C37	C40	109.0(6)	C16	N2	K2	92.2(3)
C38’	C37	C36	106.5(16)	N1	N2	K2	83.1(2)
C39	C37	C36	110.9(4)	Eu1	N2	K2	95.10(11)
C40	C37	C36	111.7(5)	C35	N3	N4	112.1(4)
C38’	C37	C40’	110(2)	C35	N3	Eu1	172.8(4)
C39	C37	C40’	68.7(14)	N4	N3	Eu1	71.9(2)
C40	C37	C40’	134.9(12)	C35	N3	K2	98.9(3)
C36	C37	C40’	110.6(12)	N4	N3	K2	71.0(2)
C38’	C37	C38	142.7(17)	Eu1	N3	K2	88.08(11)
C39	C37	C38	109.0(6)	C36	N4	N3	113.0(4)
C40	C37	C38	108.4(5)	C36	N4	Eu1	167.2(3)
C36	C37	C38	107.8(5)	N3	N4	Eu1	77.9(2)
C40’	C37	C38	42.5(13)	C36	N4	K2	95.7(3)
C38’	C37	C39’	118(2)	N3	N4	K2	82.1(2)
C39	C37	C39’	140.1(16)	Eu1	N4	K2	92.50(11)
C40	C37	C39’	49.1(18)	C5	N5	N6	113.1(4)
C36	C37	C39’	108.6(16)	C5	N5	Eu1	166.1(3)
C40’	C37	C39’	102(2)	N6	N5	Eu1	75.0(2)
C38	C37	C39’	62.8(18)	C5	N5	K1	104.5(3)
N2	Eu1	N5	171.42(12)	N6	N5	K1	72.1(2)
N2	Eu1	N4	91.37(11)	Eu1	N5	K1	88.71(11)
N5	Eu1	N4	87.19(12)	C6	N6	N5	112.4(4)
N2	Eu1	N6	141.92(11)	C6	N6	Eu1	167.8(3)
N5	Eu1	N6	30.54(10)	N5	N6	Eu1	74.5(2)
N4	Eu1	N6	98.60(11)	C6	N6	K1	100.0(3)

N2	Eu1	N7	85.28(12)	N5	N6	K1	81.0(2)
N5	Eu1	N7	97.38(12)	Eu1	N6	K1	91.00(11)
N4	Eu1	N7	170.74(11)	C25	N7	N8	112.5(4)
N6	Eu1	N7	89.30(11)	C25	N7	Eu1	162.6(3)
N2	Eu1	N8	97.52(12)	N8	N7	Eu1	75.7(2)
N5	Eu1	N8	88.69(12)	C25	N7	K1	106.3(3)
N4	Eu1	N8	142.67(11)	N8	N7	K1	79.1(2)
N6	Eu1	N8	96.38(12)	Eu1	N7	K1	90.17(11)
N7	Eu1	N8	30.23(10)	C26	N8	N7	112.9(4)
N2	Eu1	N1	30.58(10)	C26	N8	Eu1	162.6(3)
N5	Eu1	N1	140.84(12)	N7	N8	Eu1	74.1(2)
N4	Eu1	N1	86.83(12)	C26	N8	K1	108.8(3)
N6	Eu1	N1	113.07(11)	N7	N8	K1	73.9(2)
N7	Eu1	N1	94.54(12)	Eu1	N8	K1	88.41(11)
N8	Eu1	N1	117.96(11)	C6	P1	C5	86.8(2)
N2	Eu1	N3	87.08(11)	C35	P2	C36	86.7(2)
N5	Eu1	N3	95.83(12)	C35	P2	K2[1]	106.36(16)
N4	Eu1	N3	30.21(10)	C36	P2	K2[1]	135.72(18)
N6	Eu1	N3	118.78(11)	C16	P3	C15	86.3(2)
N7	Eu1	N3	140.72(11)	C16	P3	K2	57.87(16)
N8	Eu1	N3	113.91(11)	C15	P3	K2	65.92(17)
N1	Eu1	N3	98.11(12)	C25	P4	C26	87.1(2)
N2	Eu1	K1	131.73(8)	C25	P4	K1[3]	124.09(16)
N5	Eu1	K1	49.73(9)	C26	P4	K1[3]	144.01(18)
N4	Eu1	K1	136.77(8)				

[1]-X,1-Y,1-Z; [2]1-X,-1/2+Y,3/2-Z; [3]1-X,1/2+Y,3/2-Z

Table S1-6-4.

Torsion Angles for compound7-exp_141.

A	B	C	D	Angle/°	A	B	C	D	Angle/°
C4'	C2	C5	N5	87.3(12)	C17	C16	N2	N1	180.0(4)
C3	C2	C5	N5	-71.3(8)	P3	C16	N2	N1	-1.7(5)
C1	C2	C5	N5	169.3(7)	K2	C16	N2	N1	-83.5(3)
C1'	C2	C5	N5	-141.8(11)	C17	C16	N2	Eu1	29.3(17)
C4	C2	C5	N5	51.9(8)	P3	C16	N2	Eu1	-152.3(12)
C3'	C2	C5	N5	-32.8(10)	K2	C16	N2	Eu1	125.9(15)
C4'	C2	C5	P1	-94.1(12)	C17	C16	N2	K2	-96.6(4)

C3	C2	C5	P1	107.3(8)	P3	C16	N2	K2	81.8(3)
C1	C2	C5	P1	-12.1(9)	C15	N1	N2	C16	0.7(6)
C1’	C2	C5	P1	36.8(12)	Eu1	N1	N2	C16	-173.8(4)
C4	C2	C5	P1	-129.5(7)	K2	N1	N2	C16	89.5(3)
C3’	C2	C5	P1	145.8(8)	C15	N1	N2	Eu1	174.4(4)
N6	C6	C7	C8	83.7(6)	K2	N1	N2	Eu1	-96.69(9)
P1	C6	C7	C8	-91.3(6)	C15	N1	N2	K2	-88.9(4)
K1	C6	C7	C8	147.7(4)	Eu1	N1	N2	K2	96.69(9)
N6	C6	C7	C10	-38.3(7)	N5	Eu1	N2	C16	153.7(13)
P1	C6	C7	C10	146.7(4)	N4	Eu1	N2	C16	-126.1(14)
K1	C6	C7	C10	25.6(6)	N6	Eu1	N2	C16	128.1(14)
N6	C6	C7	C9	-157.0(5)	N7	Eu1	N2	C16	45.3(14)
P1	C6	C7	C9	28.0(7)	N8	Eu1	N2	C16	17.6(15)
K1	C6	C7	C9	-93.1(5)	N1	Eu1	N2	C16	152.5(16)
C12	C14	C15	N1	-55.0(13)	N3	Eu1	N2	C16	-96.2(14)
C12’	C14	C15	N1	133.2(10)	K1	Eu1	N2	C16	57.6(15)
C11	C14	C15	N1	72.0(11)	K2	Eu1	N2	C16	-125.7(15)
C11’	C14	C15	N1	-100.9(10)	N5	Eu1	N2	N1	1.2(9)
C13	C14	C15	N1	-172.8(10)	N4	Eu1	N2	N1	81.4(2)
C13’	C14	C15	N1	14.4(11)	N6	Eu1	N2	N1	-24.4(3)
C12	C14	C15	P3	128.0(11)	N7	Eu1	N2	N1	-107.2(2)
C12’	C14	C15	P3	-43.7(11)	N8	Eu1	N2	N1	-134.9(2)
C11	C14	C15	P3	-105.0(11)	N3	Eu1	N2	N1	111.3(2)
C11’	C14	C15	P3	82.2(10)	K1	Eu1	N2	N1	-94.8(2)
C13	C14	C15	P3	10.2(12)	K2	Eu1	N2	N1	81.9(2)
C13’	C14	C15	P3	-162.5(8)	N5	Eu1	N2	K2	-80.6(8)
C12	C14	C15	K2	17.6(12)	N4	Eu1	N2	K2	-0.42(12)
C12’	C14	C15	K2	-154.1(9)	N6	Eu1	N2	K2	-106.26(18)
C11	C14	C15	K2	144.6(10)	N7	Eu1	N2	K2	170.93(12)
C11’	C14	C15	K2	-28.3(10)	N8	Eu1	N2	K2	143.24(11)
C13	C14	C15	K2	-100.2(10)	N1	Eu1	N2	K2	-81.9(2)
C13’	C14	C15	K2	87.0(9)	N3	Eu1	N2	K2	29.50(12)
N2	C16	C17	C20	-36.2(7)	K1	Eu1	N2	K2	-176.69(4)
P3	C16	C17	C20	145.7(5)	N4	K2	N2	C16	170.2(3)
K2	C16	C17	C20	-104.7(5)	N1	K2	N2	C16	-112.6(4)
N2	C16	C17	C18	-156.7(5)	N3	K2	N2	C16	143.3(3)
P3	C16	C17	C18	25.2(7)	C36	K2	N2	C16	174.4(3)
K2	C16	C17	C18	134.9(4)	P2[1]	K2	N2	C16	23.4(3)
N2	C16	C17	C19	86.3(6)	C15	K2	N2	C16	-79.1(3)
P3	C16	C17	C19	-91.8(6)	C32	K2	N2	C16	-67.4(4)

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K2	C16	C17	C19	17.8(5)	C35	K2	N2	C16	133.2(3)
C21	C23	C25	N7	-58.5(7)	P3	K2	N2	C16	-37.5(2)
C22	C23	C25	N7	64.7(7)	Eu1	K2	N2	C16	169.9(3)
C24	C23	C25	N7	-179.4(5)	N4	K2	N2	N1	-77.1(2)
C21	C23	C25	P4	117.6(6)	N3	K2	N2	N1	-104.1(2)
C22	C23	C25	P4	-119.3(5)	C16	K2	N2	N1	112.6(4)
C24	C23	C25	P4	-3.4(8)	C36	K2	N2	N1	-72.9(2)
C21	C23	C25	K1	-117.1(6)	P2^{1}	K2	N2	N1	136.0(2)
C22	C23	C25	K1	6.0(6)	C15	K2	N2	N1	33.6(2)
C24	C23	C25	K1	121.9(5)	C32$_{1}$	K2	N2	N1	45.2(4)
N8	C26	C27	C29	-54.6(8)	C35	K2	N2	N1	-114.1(2)
P4	C26	C27	C29	126.8(6)	P3	K2	N2	N1	75.2(2)
N8	C26	C27	C30	-175.8(5)	Eu1	K2	N2	N1	-77.5(2)
P4	C26	C27	C30	5.7(8)	N4	K2	N2	Eu1	0.38(11)
N8	C26	C27	C28	69.1(7)	N1	K2	N2	Eu1	77.5(2)
P4	C26	C27	C28	-109.4(6)	N3	K2	N2	Eu1	-26.59(11)
K2^{1}	C32	C34	C33	-103.5(5)	C16	K2	N2	Eu1	-169.9(3)
K2^{1}	C32	C34	C31	138.5(5)	C36	K2	N2	Eu1	4.59(14)
K2^{1}	C32	C34	C35	18.9(7)	P2^{1}	K2	N2	Eu1	-146.50(9)
C33	C34	C35	N3	-42.7(7)	C15	K2	N2	Eu1	111.08(19)
C32	C34	C35	N3	-163.3(5)	C32$_{1}$	K2	N2	Eu1	122.7(2)
C31	C34	C35	N3	76.9(7)	C35	K2	N2	Eu1	-36.63(12)
C33	C34	C35	P2	143.4(5)	P3	K2	N2	Eu1	152.69(16)
C32	C34	C35	P2	22.8(7)	C34	C35	N3	N4	-174.9(4)
C31	C34	C35	P2	-97.1(6)	P2	C35	N3	N4	-0.3(5)
C33	C34	C35	K2	27.2(6)	K2	C35	N3	N4	73.0(3)
C32	C34	C35	K2	-93.5(5)	C34	C35	N3	Eu1	-52(3)
C31	C34	C35	K2	146.7(4)	P2	C35	N3	Eu1	123(2)
N4	C36	C37	C38’	94(2)	K2	C35	N3	Eu1	-164(3)
P2	C36	C37	C38’	-91(2)	C34	C35	N3	K2	112.1(4)
K2	C36	C37	C38’	26(2)	P2	C35	N3	K2	-73.3(3)
N4	C36	C37	C39	48.2(7)	N2	Eu1	N3	C35	137(2)
P2	C36	C37	C39	-136.9(5)	N5	Eu1	N3	C35	-51(2)
K2	C36	C37	C39	-19.7(6)	N4	Eu1	N3	C35	-125(3)
N4	C36	C37	C40	170.0(5)	N6	Eu1	N3	C35	-72(2)
P2	C36	C37	C40	-15.1(8)	N7	Eu1	N3	C35	58(3)
K2	C36	C37	C40	102.1(5)	N8	Eu1	N3	C35	40(3)

N4	C36	C37	C40’	-26.0(16)	N1	Eu1	N3	C35	166(2)
P2	C36	C37	C40’	148.9(15)	K1	Eu1	N3	C35	-15(3)
K2	C36	C37	C40’	-93.9(15)	K2	Eu1	N3	C35	164(3)
N4	C36	C37	C38	-71.1(7)	N2	Eu1	N3	N4	-97.8(2)
P2	C36	C37	C38	103.8(6)	N5	Eu1	N3	N4	74.1(2)
K2	C36	C37	C38	-138.9(5)	N6	Eu1	N3	N4	52.8(3)
N4	C36	C37	C39’	-138(2)	N7	Eu1	N3	N4	-176.7(2)
P2	C36	C37	C39’	37(2)	N8	Eu1	N3	N4	165.3(2)
K2	C36	C37	C39’	155(2)	N1	Eu1	N3	N4	-69.2(2)
C7	C6	K1	N6	-111.3(5)	K1	Eu1	N3	N4	109.8(2)
P1	C6	K1	N6	112.9(3)	K2	Eu1	N3	N4	-70.7(2)
N6	C6	K1	N7	28.6(3)	N2	Eu1	N3	K2	-27.11(11)
C7	C6	K1	N7	-82.8(3)	N5	Eu1	N3	K2	144.80(11)
P1	C6	K1	N7	141.43(19)	N4	Eu1	N3	K2	70.7(2)
N6	C6	K1	N8	2.0(3)	N6	Eu1	N3	K2	123.49(11)
C7	C6	K1	N8	-109.3(3)	N7	Eu1	N3	K2	-106.00(17)
P1	C6	K1	N8	114.84(19)	N8	Eu1	N3	K2	-124.05(11)
N6	C6	K1	N5	-40.2(2)	N1	Eu1	N3	K2	1.49(11)
C7	C6	K1	N5	-151.6(4)	K1	Eu1	N3	K2	-179.53(4)
P1	C6	K1	N5	72.6(2)	N2	K2	N3	C35	-152.6(3)
N6	C6	K1	$P4^2$	174.2(3)	N4	K2	N3	C35	110.5(4)
C7	C6	K1	$P4^2$	62.9(3)	N1	K2	N3	C35	-179.3(3)
P1	C6	K1	$P4^2$	-72.92(18)	C16	K2	N3	C35	-138.0(3)
N6	C6	K1	C25	43.5(3)	C36	K2	N3	C35	76.5(3)
C7	C6	K1	C25	-67.8(4)	$P2^1$	K2	N3	C35	-14.6(3)
P1	C6	K1	C25	156.37(17)	C15	K2	N3	C35	179.7(3)
N6	C6	K1	Eu1	4.0(2)	$C32_1$	K2	N3	C35	53.5(3)
C7	C6	K1	Eu1	-107.3(3)	P3	K2	N3	C35	-153.2(2)
P1	C6	K1	Eu1	116.9(2)	Eu1	K2	N3	C35	-178.0(3)
N7	C25	K1	N6	-28.7(3)	N2	K2	N3	N4	96.9(2)
C23	C25	K1	N6	80.9(4)	N1	K2	N3	N4	70.2(2)
P4	C25	K1	N6	-140.44(18)	C16	K2	N3	N4	111.5(2)
C23	C25	K1	N7	109.6(5)	C36	K2	N3	N4	-33.9(2)
P4	C25	K1	N7	-111.8(4)	$P2^1$	K2	N3	N4	-125.1(2)
N7	C25	K1	N8	42.0(3)	C15	K2	N3	N4	69.3(2)
C23	C25	K1	N8	151.6(4)	$C32_1$	K2	N3	N4	-57.0(3)
P4	C25	K1	N8	-69.7(2)	C35	K2	N3	N4	-110.5(4)
N7	C25	K1	N5	-2.2(3)	P3	K2	N3	N4	96.3(2)

C23	C25	K1	N5	107.4(4)	Eu1	K2	N3	N4	71.5(2)
P4	C25	K1	N5	-113.93(19)	N2	K2	N3	Eu1	25.35(10)
N7	C25	K1	$P4^2$	-151.0(3)	N4	K2	N3	Eu1	-71.5(2)
C23	C25	K1	$P4^2$	-41.4(4)	N1	K2	N3	Eu1	-1.32(10)
P4	C25	K1	$P4^2$	97.20(18)	C16	K2	N3	Eu1	39.99(12)
N7	C25	K1	C6	-44.4(3)	C36	K2	N3	Eu1	-105.49(17)
C23	C25	K1	C6	65.2(4)	$P2^1$	K2	N3	Eu1	163.40(6)
P4	C25	K1	C6	-156.12(17)	C15	K2	N3	Eu1	-2.27(13)
N7	C25	K1	Eu1	-4.4(3)	$C32_1$	K2	N3	Eu1	-128.55(16)
C23	C25	K1	Eu1	105.2(4)	C35	K2	N3	Eu1	178.0(3)
P4	C25	K1	Eu1	-116.11(19)	P3	K2	N3	Eu1	24.76(12)
N2	Eu1	K1	N6	127.75(15)	C37	C36	N4	N3	174.6(4)
N5	Eu1	K1	N6	-41.04(14)	P2	C36	N4	N3	-1.0(5)
N4	Eu1	K1	N6	-46.81(16)	K2	C36	N4	N3	-83.9(3)
N7	Eu1	K1	N6	144.50(15)	C37	C36	N4	Eu1	28.1(18)
N8	Eu1	K1	N6	-174.80(15)	P2	C36	N4	Eu1	-147.5(13)
N1	Eu1	K1	N6	88.20(15)	K2	C36	N4	Eu1	129.6(15)
N3	Eu1	K1	N6	-90.53(15)	C37	C36	N4	K2	-101.6(4)
K2	Eu1	K1	N6	94.3(4)	P2	C36	N4	K2	82.9(3)
N2	Eu1	K1	N7	-16.75(15)	C35	N3	N4	C36	0.8(6)
N5	Eu1	K1	N7	174.46(15)	Eu1	N3	N4	C36	-172.8(4)
N4	Eu1	K1	N7	168.69(16)	K2	N3	N4	C36	92.9(4)
N6	Eu1	K1	N7	-144.50(15)	C35	N3	N4	Eu1	173.6(4)
N8	Eu1	K1	N7	40.70(13)	K2	N3	N4	Eu1	-94.29(8)
N1	Eu1	K1	N7	-56.30(15)	C35	N3	N4	K2	-92.1(4)
N3	Eu1	K1	N7	124.97(15)	Eu1	N3	N4	K2	94.29(8)
K2	Eu1	K1	N7	-50.2(4)	N2	Eu1	N4	C36	-129.5(15)
N2	Eu1	K1	N8	-57.45(15)	N5	Eu1	N4	C36	42.0(15)
N5	Eu1	K1	N8	133.76(15)	N6	Eu1	N4	C36	13.6(15)
N4	Eu1	K1	N8	127.99(15)	N7	Eu1	N4	C36	161.9(13)
N6	Eu1	K1	N8	174.80(15)	N8	Eu1	N4	C36	126.2(14)
N7	Eu1	K1	N8	-40.70(13)	N1	Eu1	N4	C36	-99.3(15)
N1	Eu1	K1	N8	-97.00(14)	N3	Eu1	N4	C36	148.7(16)
N3	Eu1	K1	N8	84.27(15)	K1	Eu1	N4	C36	46.4(15)
K2	Eu1	K1	N8	-90.9(4)	K2	Eu1	N4	C36	-129.9(15)
N2	Eu1	K1	N5	168.79(15)	N2	Eu1	N4	N3	81.8(2)
N4	Eu1	K1	N5	-5.77(16)	N5	Eu1	N4	N3	-106.6(2)
N6	Eu1	K1	N5	41.04(14)	N6	Eu1	N4	N3	-135.1(2)
N7	Eu1	K1	N5	-174.46(15)	N7	Eu1	N4	N3	13.2(8)

N8	Eu1	K1	N5	-133.76(15)	N8	Eu1	N4	N3	-22.5(3)
N1	Eu1	K1	N5	129.23(15)	N1	Eu1	N4	N3	112.1(2)
N3	Eu1	K1	N5	-49.50(15)	K1	Eu1	N4	N3	-102.2(2)
K2	Eu1	K1	N5	135.3(4)	K2	Eu1	N4	N3	81.4(2)
N2	Eu1	K1	$P4^2$	105.63(15)	N2	Eu1	N4	K2	0.41(11)
N5	Eu1	K1	$P4^2$	-63.16(14)	N5	Eu1	N4	K2	171.94(11)
N4	Eu1	K1	$P4^2$	-68.93(16)	N6	Eu1	N4	K2	143.53(11)
N6	Eu1	K1	$P4^2$	-22.12(13)	N7	Eu1	N4	K2	-68.2(7)
N7	Eu1	K1	$P4^2$	122.38(15)	N8	Eu1	N4	K2	-103.91(18)
N8	Eu1	K1	$P4^2$	163.08(15)	N1	Eu1	N4	K2	30.66(11)
N1	Eu1	K1	$P4^2$	66.07(14)	N3	Eu1	N4	K2	-81.4(2)
N3	Eu1	K1	$P4^2$	-112.66(14)	K1	Eu1	N4	K2	176.35(4)
K2	Eu1	K1	$P4^2$	72.2(4)	N2	K2	N4	C36	169.8(3)
N2	Eu1	K1	C6	125.41(14)	N1	K2	N4	C36	142.2(3)
N5	Eu1	K1	C6	-43.38(14)	N3	K2	N4	C36	-112.5(4)
N4	Eu1	K1	C6	-49.15(15)	C16	K2	N4	C36	174.0(3)
N6	Eu1	K1	C6	-2.34(14)	$P2^1$	K2	N4	C36	-39.7(3)
N7	Eu1	K1	C6	142.16(14)	C15	K2	N4	C36	131.5(3)
N8	Eu1	K1	C6	-177.14(14)	$C32_1$	K2	N4	C36	25.4(3)
N1	Eu1	K1	C6	85.86(13)	C35	K2	N4	C36	-79.1(3)
N3	Eu1	K1	C6	-92.87(14)	P3	K2	N4	C36	147.8(2)
K2	Eu1	K1	C6	92.0(4)	Eu1	K2	N4	C36	170.2(3)
N2	Eu1	K1	C25	-14.39(14)	N2	K2	N4	N3	-77.7(2)
N5	Eu1	K1	C25	176.82(14)	N1	K2	N4	N3	-105.3(2)
N4	Eu1	K1	C25	171.05(14)	C16	K2	N4	N3	-73.5(2)
N6	Eu1	K1	C25	-142.14(14)	C36	K2	N4	N3	112.5(4)
N7	Eu1	K1	C25	2.36(14)	$P2^1$	K2	N4	N3	72.8(3)
N8	Eu1	K1	C25	43.06(13)	C15	K2	N4	N3	-116.0(2)
N1	Eu1	K1	C25	-53.94(13)	$C32_1$	K2	N4	N3	137.9(2)
N3	Eu1	K1	C25	127.33(14)	C35	K2	N4	N3	33.4(2)
K2	Eu1	K1	C25	-47.8(4)	P3	K2	N4	N3	-99.7(2)
C17	C16	K2	N2	113.8(5)	Eu1	K2	N4	N3	-77.4(2)
P3	C16	K2	N2	-115.4(3)	N2	K2	N4	Eu1	-0.38(10)
N2	C16	K2	N4	-10.0(3)	N1	K2	N4	Eu1	-27.92(10)
C17	C16	K2	N4	103.8(3)	N3	K2	N4	Eu1	77.4(2)
P3	C16	K2	N4	-125.41(18)	C16	K2	N4	Eu1	3.86(14)
N2	C16	K2	N1	38.5(2)	C36	K2	N4	Eu1	-170.2(3)
C17	C16	K2	N1	152.3(4)	$P2^1$	K2	N4	Eu1	150.17(7)

P3	C16	K2	N1	-76.9(2)	C15	K2	N4	Eu1	-38.62(12)
N2	C16	K2	N3	-35.8(3)	$C32_1$	K2	N4	Eu1	-144.75(13)
C17	C16	K2	N3	77.9(3)	C35	K2	N4	Eu1	110.76(19)
P3	C16	K2	N3	-151.23(18)	P3	K2	N4	Eu1	-22.32(13)
N2	C16	K2	C36	-6.9(3)	C2	C5	N5	N6	177.3(4)
C17	C16	K2	C36	106.8(3)	P1	C5	N5	N6	-1.4(6)
P3	C16	K2	C36	-122.33(19)	C2	C5	N5	Eu1	54.1(16)
N2	C16	K2	$P2^1$	-163.0(2)	P1	C5	N5	Eu1	-124.7(12)
C17	C16	K2	$P2^1$	-49.3(3)	C2	C5	N5	K1	-106.3(4)
P3	C16	K2	$P2^1$	81.56(18)	P1	C5	N5	K1	74.9(3)
N2	C16	K2	C15	72.5(3)	N2	Eu1	N5	C5	95.5(15)
C17	C16	K2	C15	-173.7(4)	N4	Eu1	N5	C5	15.0(14)
P3	C16	K2	C15	-42.86(18)	N6	Eu1	N5	C5	127.2(15)
N2	C16	K2	$C32^1$	133.8(3)	N7	Eu1	N5	C5	-156.9(14)
C17	C16	K2	$C32^1$	-112.4(3)	N8	Eu1	N5	C5	-127.9(14)
P3	C16	K2	$C32^1$	18.4(3)	N1	Eu1	N5	C5	96.5(14)
N2	C16	K2	C35	-51.7(3)	N3	Eu1	N5	C5	-14.0(14)
C17	C16	K2	C35	62.1(3)	K1	Eu1	N5	C5	-161.1(14)
P3	C16	K2	C35	-167.09(16)	K2	Eu1	N5	C5	23.0(14)
N2	C16	K2	P3	115.4(3)	N2	Eu1	N5	N6	-31.7(9)
C17	C16	K2	P3	-130.8(4)	N4	Eu1	N5	N6	-112.2(2)
N2	C16	K2	Eu1	-7.2(2)	N7	Eu1	N5	N6	75.9(2)
C17	C16	K2	Eu1	106.6(3)	N8	Eu1	N5	N6	104.9(2)
P3	C16	K2	Eu1	-122.61(19)	N1	Eu1	N5	N6	-30.7(3)
N4	C36	K2	N2	-10.4(3)	N3	Eu1	N5	N6	-141.2(2)
C37	C36	K2	N2	100.5(3)	K1	Eu1	N5	N6	71.8(2)
P2	C36	K2	N2	-124.68(18)	K2	Eu1	N5	N6	-104.2(2)
C37	C36	K2	N4	111.0(4)	N2	Eu1	N5	K1	-103.4(8)
P2	C36	K2	N4	-114.3(3)	N4	Eu1	N5	K1	176.05(11)
N4	C36	K2	N1	-36.6(3)	N6	Eu1	N5	K1	-71.8(2)
C37	C36	K2	N1	74.3(3)	N7	Eu1	N5	K1	4.14(11)
P2	C36	K2	N1	-150.91(18)	N8	Eu1	N5	K1	33.16(11)
N4	C36	K2	N3	39.0(2)	N1	Eu1	N5	K1	-102.45(18)
C37	C36	K2	N3	149.9(4)	N3	Eu1	N5	K1	147.06(11)
P2	C36	K2	N3	-75.3(2)	K2	Eu1	N5	K1	-175.92(4)
N4	C36	K2	C16	-7.4(3)	N6	K1	N5	C5	-110.0(4)
C37	C36	K2	C16	103.5(3)	N7	K1	N5	C5	171.6(3)
P2	C36	K2	C16	-121.69(19)	N8	K1	N5	C5	145.2(3)
N4	C36	K2	$P2^1$	149.1(2)	$P4^2$	K1	N5	C5	-35.7(3)

C37	C36	K2	P2^{1}	-100.0(3)	C6	K1	N5	C5	-76.3(3)
P2	C36	K2	P2^{1}	34.8(2)	C25	K1	N5	C5	172.4(3)
N4	C36	K2	C15	-53.1(3)	Eu1	K1	N5	C5	175.4(3)
C37	C36	K2	C15	57.9(4)	N7	K1	N5	N6	-78.4(2)
P2	C36	K2	C15	-167.35(17)	N8	K1	N5	N6	-104.8(2)
N4	C36	K2	C32^{1}	-157.4(3)	P4^{2}	K1	N5	N6	74.3(2)
C37	C36	K2	C32^{1}	-46.4(3)	C6	K1	N5	N6	33.7(2)
P2	C36	K2	C32^{1}	88.37(19)	C25	K1	N5	N6	-77.6(2)
N4	C36	K2	C35	72.7(3)	Eu1	K1	N5	N6	-74.6(2)
C37	C36	K2	C35	-176.3(4)	N6	K1	N5	Eu1	74.6(2)
P2	C36	K2	C35	-41.55(17)	N7	K1	N5	Eu1	-3.73(10)
N4	C36	K2	P3	-44.3(3)	N8	K1	N5	Eu1	-30.13(10)
C37	C36	K2	P3	66.7(4)	P4^{2}	K1	N5	Eu1	148.98(7)
P2	C36	K2	P3	-158.56(12)	C6	K1	N5	Eu1	108.35(19)
N4	C36	K2	Eu1	-7.1(2)	C25	K1	N5	Eu1	-2.93(13)
C37	C36	K2	Eu1	103.8(3)	C7	C6	N6	N5	-176.2(4)
P2	C36	K2	Eu1	-121.40(19)	P1	C6	N6	N5	-0.6(5)
N1	C15	K2	N2	-40.8(3)	K1	C6	N6	N5	84.3(3)
C14	C15	K2	N2	-150.2(5)	C7	C6	N6	Eu1	-54.0(16)
P3	C15	K2	N2	80.4(2)	P1	C6	N6	Eu1	121.6(13)
N1	C15	K2	N4	27.6(3)	K1	C6	N6	Eu1	-153.4(15)
C14	C15	K2	N4	-81.7(4)	C7	C6	N6	K1	99.5(4)
P3	C15	K2	N4	148.78(18)	P1	C6	N6	K1	-85.0(3)
C14	C15	K2	N1	-109.3(5)	C5	N5	N6	C6	1.3(6)
P3	C15	K2	N1	121.2(4)	Eu1	N5	N6	C6	169.3(4)
N1	C15	K2	N3	2.4(3)	K1	N5	N6	C6	-97.1(4)
C14	C15	K2	N3	-106.9(4)	C5	N5	N6	Eu1	-168.0(4)
P3	C15	K2	N3	123.64(18)	K1	N5	N6	Eu1	93.57(8)
N1	C15	K2	C16	-78.4(3)	C5	N5	N6	K1	98.5(4)
C14	C15	K2	C16	172.3(5)	Eu1	N5	N6	K1	-93.57(8)
P3	C15	K2	C16	42.84(18)	N2	Eu1	N6	C6	46.9(15)
N1	C15	K2	C36	46.4(3)	N5	Eu1	N6	C6	-125.8(15)
C14	C15	K2	C36	-62.9(5)	N4	Eu1	N6	C6	-56.5(14)
P3	C15	K2	C36	167.59(17)	N7	Eu1	N6	C6	128.4(14)
N1	C15	K2	P2^{1}	-161.1(2)	N8	Eu1	N6	C6	157.8(14)
C14	C15	K2	P2^{1}	89.6(4)	N1	Eu1	N6	C6	33.7(14)
P3	C15	K2	P2^{1}	-39.9(2)	N3	Eu1	N6	C6	-80.4(14)
N1	C15	K2	C32^{1}	146.4(3)	K1	Eu1	N6	C6	153.9(15)
C14	C15	K2	C32^{1}	37.1(5)	K2	Eu1	N6	C6	-20.4(15)
P3	C15	K2	C32^{1}	-92.3(2)	N2	Eu1	N6	N5	172.7(2)

N1	C15	K2	C35	2.6(3)	N4	Eu1	N6	N5	69.3(2)
C14	C15	K2	C35	-106.7(4)	N7	Eu1	N6	N5	-105.9(2)
P3	C15	K2	C35	123.77(18)	N8	Eu1	N6	N5	-76.4(2)
N1	C15	K2	P3	-121.2(4)	N1	Eu1	N6	N5	159.5(2)
C14	C15	K2	P3	129.5(5)	N3	Eu1	N6	N5	45.4(3)
N1	C15	K2	Eu1	0.7(2)	K1	Eu1	N6	N5	-80.4(2)
C14	C15	K2	Eu1	-108.6(4)	K2	Eu1	N6	N5	105.4(2)
P3	C15	K2	Eu1	121.95(19)	N2	Eu1	N6	K1	-106.91(18)
N3	C35	K2	N2	26.7(3)	N5	Eu1	N6	K1	80.4(2)
C34	C35	K2	N2	-80.5(4)	N4	Eu1	N6	K1	149.66(11)
P2	C35	K2	N2	145.90(17)	N7	Eu1	N6	K1	-25.48(11)
N3	C35	K2	N4	-41.2(3)	N8	Eu1	N6	K1	3.96(11)
C34	C35	K2	N4	-148.5(5)	N1	Eu1	N6	K1	-120.12(11)
P2	C35	K2	N4	77.96(19)	N3	Eu1	N6	K1	125.74(12)
N3	C35	K2	N1	0.7(3)	K2	Eu1	N6	K1	-174.24(4)
C34	C35	K2	N1	-106.5(4)	N7	K1	N6	C6	-151.2(3)
P2	C35	K2	N1	119.90(17)	N8	K1	N6	C6	-178.1(3)
C34	C35	K2	N3	-107.3(5)	N5	K1	N6	C6	111.3(4)
P2	C35	K2	N3	119.2(3)	P4^{2}	K1	N6	C6	-6.1(3)
N3	C35	K2	C16	46.1(3)	C25	K1	N6	C6	-141.0(3)
C34	C35	K2	C16	-61.2(4)	Eu1	K1	N6	C6	-174.6(3)
P2	C35	K2	C16	165.26(16)	N7	K1	N6	N5	97.4(2)
N3	C35	K2	C36	-77.8(3)	N8	K1	N6	N5	70.6(2)
C34	C35	K2	C36	174.9(5)	P4^{2}	K1	N6	N5	-117.5(2)
P2	C35	K2	C36	41.35(16)	C6	K1	N6	N5	-111.3(4)
N3	C35	K2	P2^{1}	167.2(3)	C25	K1	N6	N5	107.7(2)
C34	C35	K2	P2^{1}	60.0(4)	Eu1	K1	N6	N5	74.1(2)
P2	C35	K2	P2^{1}	-73.57(16)	N7	K1	N6	Eu1	23.34(10)
N3	C35	K2	C15	-0.3(3)	N8	K1	N6	Eu1	-3.52(10)
C34	C35	K2	C15	-107.6(4)	N5	K1	N6	Eu1	-74.1(2)
P2	C35	K2	C15	118.86(18)	P4^{2}	K1	N6	Eu1	168.44(7)
N3	C35	K2	C32^{1}	-138.9(3)	C6	K1	N6	Eu1	174.6(3)
C34	C35	K2	C32^{1}	113.9(4)	C25	K1	N6	Eu1	33.59(12)
P2	C35	K2	C32^{1}	-19.7(2)	C23	C25	N7	N8	177.0(4)
N3	C35	K2	P3	36.7(3)	P4	C25	N7	N8	0.5(5)
C34	C35	K2	P3	-70.5(4)	K1	C25	N7	N8	-84.7(3)
P2	C35	K2	P3	155.94(11)	C23	C25	N7	Eu1	61.9(12)
N3	C35	K2	Eu1	1.5(2)	P4	C25	N7	Eu1	-114.6(10)
C34	C35	K2	Eu1	-105.8(4)	K1	C25	N7	Eu1	160.2(11)
P2	C35	K2	Eu1	120.69(17)	C23	C25	N7	K1	-98.3(5)

N5	Eu1	K2	N2	168.35(16)	P4	C25	N7	K1	85.2(3)
N4	Eu1	K2	N2	179.42(16)	N2	Eu1	N7	C25	6.5(10)
N6	Eu1	K2	N2	126.11(16)	N5	Eu1	N7	C25	-165.3(10)
N7	Eu1	K2	N2	-11.73(16)	N4	Eu1	N7	C25	75.5(13)
N8	Eu1	K2	N2	-51.53(16)	N6	Eu1	N7	C25	-135.8(10)
N1	Eu1	K2	N2	42.21(14)	N8	Eu1	N7	C25	120.3(11)
N3	Eu1	K2	N2	-139.76(16)	N1	Eu1	N7	C25	-22.7(10)
K1	Eu1	K2	N2	35.7(4)	N3	Eu1	N7	C25	86.0(10)
N2	Eu1	K2	N4	-179.42(16)	K1	Eu1	N7	C25	-161.0(11)
N5	Eu1	K2	N4	-11.07(16)	K2	Eu1	N7	C25	14.8(11)
N6	Eu1	K2	N4	-53.31(15)	N2	Eu1	N7	N8	-113.8(2)
N7	Eu1	K2	N4	168.85(15)	N5	Eu1	N7	N8	74.4(2)
N8	Eu1	K2	N4	129.05(15)	N4	Eu1	N7	N8	-44.7(8)
N1	Eu1	K2	N4	-137.21(15)	N6	Eu1	N7	N8	104.0(2)
N3	Eu1	K2	N4	40.82(13)	N1	Eu1	N7	N8	-142.9(2)
K1	Eu1	K2	N4	-143.7(4)	N3	Eu1	N7	N8	-34.2(3)
N2	Eu1	K2	N1	-42.21(14)	K1	Eu1	N7	N8	78.7(2)
N5	Eu1	K2	N1	126.14(15)	K2	Eu1	N7	N8	-105.5(2)
N4	Eu1	K2	N1	137.21(15)	N2	Eu1	N7	K1	167.54(11)
N6	Eu1	K2	N1	83.90(15)	N5	Eu1	N7	K1	-4.26(12)
N7	Eu1	K2	N1	-53.94(15)	N4	Eu1	N7	K1	-123.4(7)
N8	Eu1	K2	N1	-93.74(15)	N6	Eu1	N7	K1	25.27(11)
N3	Eu1	K2	N1	178.03(15)	N8	Eu1	N7	K1	-78.7(2)
K1	Eu1	K2	N1	-6.5(4)	N1	Eu1	N7	K1	138.36(11)
N2	Eu1	K2	N3	139.76(16)	N3	Eu1	N7	K1	-112.94(17)
N5	Eu1	K2	N3	-51.89(15)	K2	Eu1	N7	K1	175.80(4)
N4	Eu1	K2	N3	-40.82(13)	N6	K1	N7	C25	151.0(3)
N6	Eu1	K2	N3	-94.13(15)	N8	K1	N7	C25	-110.5(4)
N7	Eu1	K2	N3	128.03(14)	N5	K1	N7	C25	177.9(3)
N8	Eu1	K2	N3	88.23(15)	P4^2	K1	N7	C25	42.3(4)
N1	Eu1	K2	N3	-178.03(15)	C6	K1	N7	C25	140.1(3)
K1	Eu1	K2	N3	175.5(4)	Eu1	K1	N7	C25	174.2(3)
N2	Eu1	K2	C16	4.69(15)	N6	K1	N7	N8	-98.5(2)
N5	Eu1	K2	C16	173.04(15)	N5	K1	N7	N8	-71.7(2)
N4	Eu1	K2	C16	-175.89(15)	P4^2	K1	N7	N8	152.7(2)
N6	Eu1	K2	C16	130.80(14)	C6	K1	N7	N8	-109.5(2)
N7	Eu1	K2	C16	-7.04(14)	C25	K1	N7	N8	110.5(4)
N8	Eu1	K2	C16	-46.84(14)	Eu1	K1	N7	N8	-75.4(2)
N1	Eu1	K2	C16	46.90(14)	N6	K1	N7	Eu1	-23.18(10)
N3	Eu1	K2	C16	-135.07(14)	N8	K1	N7	Eu1	75.4(2)

K1	Eu1	K2	C16	40.4(4)	N5	K1	N7	Eu1	3.70(10)
N2	Eu1	K2	C36	-175.07(15)	P4[2]	K1	N7	Eu1	-131.92(12)
N5	Eu1	K2	C36	-6.72(14)	C6	K1	N7	Eu1	-34.12(12)
N4	Eu1	K2	C36	4.36(14)	C25	K1	N7	Eu1	-174.2(3)
N6	Eu1	K2	C36	-48.95(14)	C27	C26	N8	N7	-178.0(5)
N7	Eu1	K2	C36	173.21(13)	P4	C26	N8	N7	0.7(5)
N8	Eu1	K2	C36	133.41(13)	C27	C26	N8	Eu1	-67.4(12)
N1	Eu1	K2	C36	-132.86(14)	P4	C26	N8	Eu1	111.3(10)
N3	Eu1	K2	C36	45.18(13)	C27	C26	N8	K1	102.0(5)
K1	Eu1	K2	C36	-139.3(4)	P4	C26	N8	K1	-79.3(3)
N2	Eu1	K2	P2[1]	98.10(16)	C25	N7	N8	C26	-0.7(6)
N5	Eu1	K2	P2[1]	-93.55(16)	Eu1	N7	N8	C26	163.0(4)
N4	Eu1	K2	P2[1]	-82.47(16)	K1	N7	N8	C26	-104.0(4)
N6	Eu1	K2	P2[1]	-135.78(15)	C25	N7	N8	Eu1	-163.8(4)
N7	Eu1	K2	P2[1]	86.38(16)	K1	N7	N8	Eu1	93.00(8)
N8	Eu1	K2	P2[1]	46.57(16)	C25	N7	N8	K1	103.2(3)
N1	Eu1	K2	P2[1]	140.31(16)	Eu1	N7	N8	K1	-93.00(8)
N3	Eu1	K2	P2[1]	-41.65(15)	N2	Eu1	N8	C26	-49.4(11)
K1	Eu1	K2	P2[1]	133.8(3)	N5	Eu1	N8	C26	136.6(11)
N2	Eu1	K2	C15	-42.64(14)	N4	Eu1	N8	C26	52.9(11)
N5	Eu1	K2	C15	125.71(14)	N6	Eu1	N8	C26	166.2(10)
N4	Eu1	K2	C15	136.78(14)	N7	Eu1	N8	C26	-116.3(11)
N6	Eu1	K2	C15	83.47(14)	N1	Eu1	N8	C26	-73.5(11)
N7	Eu1	K2	C15	-54.37(14)	N3	Eu1	N8	C26	40.8(11)
N8	Eu1	K2	C15	-94.17(14)	K1	Eu1	N8	C26	170.0(11)
N1	Eu1	K2	C15	-0.43(14)	K2	Eu1	N8	C26	-15.6(11)
N3	Eu1	K2	C15	177.60(14)	N2	Eu1	N8	N7	66.9(2)
K1	Eu1	K2	C15	-6.9(4)	N5	Eu1	N8	N7	-107.1(2)
N2	Eu1	K2	C32[1]	-116.0(3)	N4	Eu1	N8	N7	169.2(2)
N5	Eu1	K2	C32[1]	52.4(3)	N6	Eu1	N8	N7	-77.5(2)
N4	Eu1	K2	C32[1]	63.4(2)	N1	Eu1	N8	N7	42.9(3)
N6	Eu1	K2	C32[1]	10.1(3)	N3	Eu1	N8	N7	157.1(2)
N7	Eu1	K2	C32[1]	-127.7(2)	K1	Eu1	N8	N7	-73.7(2)
N8	Eu1	K2	C32[1]	-167.5(2)	K2	Eu1	N8	N7	100.7(2)
N1	Eu1	K2	C32[1]	-73.8(2)	N2	Eu1	N8	K1	140.62(10)
N3	Eu1	K2	C32[1]	104.3(2)	N5	Eu1	N8	K1	-33.45(11)
K1	Eu1	K2	C32[1]	-80.3(4)	N4	Eu1	N8	K1	-117.09(16)
N2	Eu1	K2	C35	138.92(14)	N6	Eu1	N8	K1	-3.84(11)
N5	Eu1	K2	C35	-52.73(14)	N7	Eu1	N8	K1	73.7(2)
N4	Eu1	K2	C35	-41.66(13)	N1	Eu1	N8	K1	116.54(11)

N6	Eu1	K2	C35	-94.97(13)	N3	Eu1	N8	K1	-129.25(11)
N7	Eu1	K2	C35	127.19(13)	K2	Eu1	N8	K1	174.42(4)
N8	Eu1	K2	C35	87.39(13)	N6	K1	N8	C26	-173.4(3)
N1	Eu1	K2	C35	-178.87(13)	N7	K1	N8	C26	109.2(4)
N3	Eu1	K2	C35	-0.84(14)	N5	K1	N8	C26	-147.2(3)
K1	Eu1	K2	C35	174.6(4)	P4^{2}	K1	N8	C26	35.6(5)
N2	Eu1	K2	P3	-18.88(12)	C6	K1	N8	C26	-174.2(3)
N5	Eu1	K2	P3	149.47(11)	C25	K1	N8	C26	76.8(3)
N4	Eu1	K2	P3	160.54(12)	Eu1	K1	N8	C26	-176.9(3)
N6	Eu1	K2	P3	107.24(11)	N6	K1	N8	N7	77.4(2)
N7	Eu1	K2	P3	-30.61(11)	N5	K1	N8	N7	103.5(2)
N8	Eu1	K2	P3	-70.41(11)	P4^{2}	K1	N8	N7	-73.6(4)
N1	Eu1	K2	P3	23.33(11)	C6	K1	N8	N7	76.6(2)
N3	Eu1	K2	P3	-158.64(11)	C25	K1	N8	N7	-32.4(2)
K1	Eu1	K2	P3	16.8(4)	Eu1	K1	N8	N7	73.9(2)
C14	C15	N1	N2	-176.6(5)	N6	K1	N8	Eu1	3.48(10)
P3	C15	N1	N2	0.7(5)	N7	K1	N8	Eu1	-73.9(2)
K2	C15	N1	N2	70.5(3)	N5	K1	N8	Eu1	29.60(10)
C14	C15	N1	Eu1	-57(3)	P4^{2}	K1	N8	Eu1	-147.5(3)
P3	C15	N1	Eu1	120(3)	C6	K1	N8	Eu1	2.70(13)
K2	C15	N1	Eu1	-170(3)	C25	K1	N8	Eu1	-106.36(18)
C14	C15	N1	K2	113.0(5)	N6	C6	P1	C5	-0.1(4)
P3	C15	N1	K2	-69.8(3)	C7	C6	P1	C5	175.1(5)
N2	Eu1	N1	C15	-121(3)	K1	C6	P1	C5	-58.0(2)
N5	Eu1	N1	C15	59(3)	N5	C5	P1	C6	0.9(4)
N4	Eu1	N1	C15	141(3)	C2	C5	P1	C6	-177.8(5)
N6	Eu1	N1	C15	43(3)	N3	C35	P2	C36	-0.2(4)
N7	Eu1	N1	C15	-48(3)	C34	C35	P2	C36	174.0(5)
N8	Eu1	N1	C15	-68(3)	K2	C35	P2	C36	-55.40(18)
N3	Eu1	N1	C15	169(3)	N3	C35	P2	K2^{1}	136.7(3)
K1	Eu1	N1	C15	-10(3)	C34	C35	P2	K2^{1}	-49.1(5)
K2	Eu1	N1	C15	170(3)	K2	C35	P2	K2^{1}	81.51(10)
N5	Eu1	N1	N2	-179.7(2)	N4	C36	P2	C35	0.7(4)
N4	Eu1	N1	N2	-98.1(2)	C37	C36	P2	C35	-174.4(5)
N6	Eu1	N1	N2	163.9(2)	K2	C36	P2	C35	61.08(19)
N7	Eu1	N1	N2	72.7(2)	N4	C36	P2	K2^{1}	-109.4(4)
N8	Eu1	N1	N2	52.6(3)	C37	C36	P2	K2^{1}	75.5(5)
N3	Eu1	N1	N2	-70.0(2)	K2	C36	P2	K2^{1}	-49.0(2)
K1	Eu1	N1	N2	110.9(2)	N2	C16	P3	C15	1.7(4)
K2	Eu1	N1	N2	-68.5(2)	C17	C16	P3	C15	179.9(5)

N2	Eu1	N1	K2	68.5(2)	K2	C16	P3	C15	63.8(2)
N5	Eu1	N1	K2	-111.24(17)	N2	C16	P3	K2	-62.1(3)
N4	Eu1	N1	K2	-29.61(10)	C17	C16	P3	K2	116.1(5)
N6	Eu1	N1	K2	-127.62(11)	N1	C15	P3	C16	-1.3(4)
N7	Eu1	N1	K2	141.20(10)	C14	C15	P3	C16	175.8(5)
N8	Eu1	N1	K2	121.11(11)	K2	C15	P3	C16	-56.31(18)
N3	Eu1	N1	K2	-1.51(11)	N1	C15	P3	K2	55.0(3)
K1	Eu1	N1	K2	179.40(3)	C14	C15	P3	K2	-127.9(5)
N2	K2	N1	C15	111.0(4)	N2	K2	P3	C16	33.0(2)
N4	K2	N1	C15	-151.7(3)	N4	K2	P3	C16	64.9(2)
N3	K2	N1	C15	-177.7(3)	N1	K2	P3	C16	72.8(2)
C16	K2	N1	C15	76.3(3)	N3	K2	P3	C16	33.8(2)
C36	K2	N1	C15	-137.5(3)	C36	K2	P3	C16	83.7(2)
P2^{1}	K2	N1	C15	31.3(4)	P2^{1}	K2	P3	C16	-109.23(19)
C32^{1}	K2	N1	C15	-38.7(3)	C15	K2	P3	C16	101.4(3)
C35	K2	N1	C15	-177.9(3)	C32$_{1}$	K2	P3	C16	-165.3(2)
P3	K2	N1	C15	35.3(2)	C35	K2	P3	C16	18.6(2)
Eu1	K2	N1	C15	-179.0(3)	Eu1	K2	P3	C16	50.35(19)
N4	K2	N1	N2	97.3(2)	N2	K2	P3	C15	-68.4(2)
N3	K2	N1	N2	71.4(2)	N4	K2	P3	C15	-36.4(2)
C16	K2	N1	N2	-34.6(2)	N1	K2	P3	C15	-28.6(2)
C36	K2	N1	N2	111.6(2)	N3	K2	P3	C15	-67.6(2)
P2^{1}	K2	N1	N2	-79.7(3)	C16	K2	P3	C15	-101.4(3)
C15	K2	N1	N2	-111.0(4)	C36	K2	P3	C15	-17.6(2)
C32^{1}	K2	N1	N2	-149.7(3)	P2^{1}	K2	P3	C15	149.4(2)
C35	K2	N1	N2	71.1(2)	C32$_{1}$	K2	P3	C15	93.3(2)
P3	K2	N1	N2	-75.7(2)	C35	K2	P3	C15	-82.8(2)
Eu1	K2	N1	N2	70.0(2)	Eu1	K2	P3	C15	-51.01(19)
N2	K2	N1	Eu1	-70.0(2)	N7	C25	P4	C26	-0.1(4)
N4	K2	N1	Eu1	27.27(10)	C23	C25	P4	C26	-176.3(5)
N3	K2	N1	Eu1	1.33(10)	K1	C25	P4	C26	53.34(19)
C16	K2	N1	Eu1	-104.66(19)	N7	C25	P4	K1^{3}	-160.8(3)
C36	K2	N1	Eu1	41.53(12)	C23	C25	P4	K1^{3}	23.0(6)
P2^{1}	K2	N1	Eu1	-149.73(14)	K1	C25	P4	K1^{3}	-107.37(14)
C15	K2	N1	Eu1	179.0(3)	N8	C26	P4	C25	-0.3(4)
C32^{1}	K2	N1	Eu1	140.28(17)	C27	C26	P4	C25	178.2(5)
C35	K2	N1	Eu1	1.06(13)	N8	C26	P4	K1^{3}	151.9(3)
P3	K2	N1	Eu1	-145.74(15)	C27	C26	P4	K1^{3}	-29.5(7)

[1]-X,1-Y,1-Z; [2]1-X,-1/2+Y,3/2-Z; [3]1-X,1/2+Y,3/2-Z

Table S1-7. Crystal structural analysis data for **8**

Table S1-7-1.

Crystal data and structure refinement for compound8-exp_227.

Identification code	compound8-exp_227
Empirical formula	$C_{77}H_{58}EuK_2N_{10}P_5$
Formula weight	1508.34
Temperature/K	293(2)
Crystal system	Orthorhombic
Space group	$P2_12_12_1$
a/Å	17.4510(8)
b/Å	21.6779(9)
c/Å	22.1731(7)
α/°	90.00
β/°	90.00
γ/°	90.00
Volume/Å^3	8388.1(6)
Z	4
ρ_{calc}g/cm^3	1.194
μ/mm^{-1}	0.986
F(000)	3064.0
Crystal size/mm^3	0.25 × 0.14 × 0.05
Radiation	Mo Kα (λ = 0.71073)
2Θ range for data collection/°	5.76 to 52.74
Index ranges	-21 ≤ h ≤ 21, -23 ≤ k ≤ 27, -26 ≤ l ≤ 27
Reflections collected	46049
Independent reflections	17091 [R_{int} = 0.0785, R_{sigma} = 0.1321]
Data/restraints/parameters	17091/114/845
Goodness-of-fit on F^2	0.979
Final R indexes [I>=2σ (I)]	R_1 = 0.0724, wR_2 = 0.1539
Final R indexes [all data]	R_1 = 0.1198, wR_2 = 0.1793
Largest diff. peak/hole / e Å^{-3}	2.38/-0.71
Flack parameter	-0.007(13)

Table S1-7-2.

Bond Lengths for compound8-exp_227.

Atom	Atom	Length/Å	Atom	Atom	Length/Å
C1	C6	1.364(12)	C50	K2	3.081(10)
C1	C2	1.369(15)	C51	C52	1.328(16)
C2	C3	1.375(18)	C51	C56	1.348(15)
C3	C4	1.366(17)	C51	K2	3.483(12)
C4	C5	1.405(13)	C52	C53	1.48(3)
C5	C6	1.365(14)	C53	C54	1.29(3)
C6	C7	1.480(12)	C54	C55	1.26(2)
C7	N5	1.361(11)	C55	C56	1.444(16)
C7	P1	1.737(10)	C57	C58	1.3900
C7	K1[1]	3.464(9)	C57	C62	1.3900
C8	N6	1.385(11)	C58	C59	1.3900
C8	C9	1.470(12)	C59	C60	1.3900
C8	P1	1.723(8)	C60	C61	1.3900
C8	K1[1]	3.173(9)	C61	C62	1.3900
C9	C14	1.412(12)	C62	C63	1.488(13)
C9	C10	1.426(12)	C63	N9	1.320(11)
C10	C11	1.383(13)	C63	P5	1.776(12)
C11	C12	1.387(15)	C64	N10	1.354(9)
C12	C13	1.472(18)	C64	C65	1.510(15)
C13	C14	1.315(14)	C64	P5	1.759(12)
C13	K2[2]	3.374(13)	C64	K2	3.181(9)
C14	K2[2]	3.490(11)	C65	C70	1.357(16)
C15	C16	1.391(17)	C65	C66	1.386(14)
C15	C20	1.432(13)	C66	C67	1.40(2)
C15	K2[2]	3.445(13)	C67	C68	1.34(2)
C16	C17	1.306(17)	C68	C69	1.32(2)
C16	K2[2]	3.328(13)	C69	C70	1.361(16)
C17	C18	1.412(17)	C71	C72	1.35(2)
C17	K2[2]	3.357(16)	C71	C76	1.45(2)
C18	C19	1.384(15)	C71	K1	3.285(16)
C18	K2[2]	3.369(14)	C72	C73	1.32(2)
C19	C20	1.393(14)	C72	K1	3.242(16)
C19	K2[2]	3.475(11)	C73	C74	1.39(2)
C20	C21	1.444(13)	C73	K1	3.273(15)
C21	N7	1.302(10)	C74	C75	1.43(2)
C21	P3	1.776(10)	C74	K1	3.191(15)

C22	N8	1.356(11)	C75	C76	1.39(2)
C22	C23	1.470(13)	C75	K1	3.187(14)
C22	P3	1.757(10)	C76	C77	1.49(2)
C23	C28	1.387(13)	C76	K1	3.225(17)
C23	C24	1.404(12)	Eu1	N8	2.431(6)
C24	C25	1.378(15)	Eu1	N1	2.482(6)
C24	K1	3.482(10)	Eu1	N4	2.484(7)
C25	C26	1.449(17)	Eu1	N3	2.497(7)
C25	K1	3.303(12)	Eu1	N7	2.499(6)
C26	C27	1.374(16)	Eu1	N6	2.506(8)
C27	C28	1.328(14)	Eu1	N10	2.508(7)
C29	C34	1.348(18)	Eu1	N2	2.509(8)
C29	C30	1.449(18)	Eu1	N9	2.566(7)
C30	C31	1.30(2)	Eu1	N5	2.645(8)
C31	C32	1.307(19)	Eu1	K1[1]	4.356(2)
C32	C33	1.404(17)	Eu1	K2	4.665(3)
C33	C34	1.354(19)	K1	N6[3]	2.976(7)
C34	C35	1.465(15)	K1	N1[3]	3.011(8)
C35	N2	1.377(11)	K1	C36[3]	3.112(10)
C35	P2	1.757(10)	K1	N5[3]	3.148(7)
C35	K1[1]	3.516(10)	K1	C8[3]	3.173(9)
C36	N1	1.344(9)	K1	N2[3]	3.280(8)
C36	C37	1.484(12)	K2	N10	3.069(8)
C36	P2	1.751(9)	K2	N4	3.200(8)
C36	K1[1]	3.112(10)	K2	C16[4]	3.328(13)
C37	C38	1.380(13)	K2	N9	3.335(8)
C37	C42	1.390(12)	K2	C17[4]	3.357(16)
C38	C39	1.399(14)	K2	C18[4]	3.369(14)
C39	C40	1.287(15)	K2	C13[4]	3.374(13)
C40	C41	1.396(18)	K2	C15[4]	3.444(13)
C41	C42	1.326(14)	K2	C19[4]	3.475(11)
C43	C48	1.423(17)	N1	N2	1.345(9)
C43	C44	1.443(19)	N1	K1[1]	3.011(8)
C44	C45	1.44(2)	N2	K1[1]	3.280(8)
C45	C46	1.354(18)	N3	N4	1.339(9)
C46	C47	1.387(18)	N5	N6	1.351(9)
C47	C48	1.373(18)	N5	K1[1]	3.148(7)
C48	C49	1.491(16)	N6	K1[1]	2.976(7)
C49	N3	1.321(11)	N7	N8	1.355(9)
C49	P4	1.788(11)	N9	N10	1.384(10)

C50	N4	1.377(11)	P1	K1[1]	3.657(4)
C50	C51	1.441(15)	P2	K1[1]	3.583(4)
C50	P4	1.749(12)			

[1]1/2-X,-Y,-1/2+Z; [2]-X,-1/2+Y,1/2-Z; [3]1/2-X,-Y,1/2+Z; [4]-X,1/2+Y,1/2-Z

Table S1-7-3.

Bond Angles for compound8-exp_227.

Atom	Atom	Atom	Angle/°	Atom	Atom	Atom	Angle/°
C6	C1	C2	122.0(12)	N1	Eu1	K1[1]	42.00(17)
C1	C2	C3	120.5(12)	N4	Eu1	K1[1]	108.95(16)
C4	C3	C2	118.6(12)	N3	Eu1	K1[1]	119.06(15)
C3	C4	C5	120.0(13)	N7	Eu1	K1[1]	106.67(17)
C6	C5	C4	120.9(11)	N6	Eu1	K1[1]	41.30(15)
C1	C6	C5	117.9(10)	N10	Eu1	K1[1]	157.3(2)
C1	C6	C7	118.8(10)	N2	Eu1	K1[1]	48.40(17)
C5	C6	C7	123.3(9)	N9	Eu1	K1[1]	126.67(18)
N5	C7	C6	119.0(8)	N5	Eu1	K1[1]	45.81(14)
N5	C7	P1	112.1(6)	N8	Eu1	K2	108.10(18)
C6	C7	P1	128.9(7)	N1	Eu1	K2	106.09(18)
N5	C7	K1[1]	65.3(4)	N4	Eu1	K2	40.25(17)
C6	C7	K1[1]	121.3(5)	N3	Eu1	K2	50.01(18)
P1	C7	K1[1]	82.2(3)	N7	Eu1	K2	110.48(17)
N6	C8	C9	117.7(7)	N6	Eu1	K2	151.66(15)
N6	C8	P1	113.4(7)	N10	Eu1	K2	37.22(17)
C9	C8	P1	128.8(7)	N2	Eu1	K2	118.51(19)
N6	C8	K1[1]	69.1(4)	N9	Eu1	K2	43.99(18)
C9	C8	K1[1]	107.2(5)	N5	Eu1	K2	124.05(15)
P1	C8	K1[1]	91.8(3)	K1[1]	Eu1	K2	142.45(5)
C14	C9	C10	116.0(9)	N6[3]	K1	N1[3]	67.17(19)
C14	C9	C8	119.5(9)	N6[3]	K1	C36[3]	91.7(2)
C10	C9	C8	124.3(8)	N1[3]	K1	C36[3]	25.28(17)
C11	C10	C9	120.3(10)	N6[3]	K1	N5[3]	25.30(16)
C10	C11	C12	120.8(10)	N1[3]	K1	N5[3]	63.4(2)
C11	C12	C13	119.2(11)	C36[3]	K1	N5[3]	82.9(2)

C14	C13	C12	117.0(14)	N6^{3}	K1	C8^{3}	25.8(2)
C14	C13	K2^{2}	83.9(8)	N1^{3}	K1	C8^{3}	92.7(2)
C12	C13	K2^{2}	96.3(8)	C36^{3}	K1	C8^{3}	117.5(2)
C13	C14	C9	126.1(12)	N5^{3}	K1	C8^{3}	41.8(2)
C13	C14	K2^{2}	74.0(7)	N6^{3}	K1	C75	140.6(4)
C9	C14	K2^{2}	102.6(6)	N1^{3}	K1	C75	147.6(4)
C16	C15	C20	121.3(11)	C36^{3}	K1	C75	126.1(4)
C16	C15	K2^{2}	73.5(8)	N5^{3}	K1	C75	149.0(4)
C20	C15	K2^{2}	82.9(6)	C8^{3}	K1	C75	115.4(4)
C17	C16	C15	121.9(12)	N6^{3}	K1	C74	147.6(3)
C17	C16	K2^{2}	80.0(10)	N1^{3}	K1	C74	122.4(4)
C15	C16	K2^{2}	82.9(8)	C36^{3}	K1	C74	104.7(4)
C16	C17	C18	119.2(13)	N5^{3}	K1	C74	171.2(4)
C16	C17	K2^{2}	77.5(10)	C8^{3}	K1	C74	129.4(4)
C18	C17	K2^{2}	78.4(9)	C75	K1	C74	26.0(4)
C19	C18	C17	120.4(12)	N6^{3}	K1	C76	115.6(4)
C19	C18	K2^{2}	82.7(7)	N1^{3}	K1	C76	159.1(4)
C17	C18	K2^{2}	77.4(9)	C36^{3}	K1	C76	148.4(4)
C18	C19	C20	121.6(11)	N5^{3}	K1	C76	128.5(4)
C18	C19	K2^{2}	74.1(7)	C8^{3}	K1	C76	90.6(4)
C20	C19	K2^{2}	82.2(6)	C75	K1	C76	25.0(4)
C19	C20	C15	115.4(10)	C74	K1	C76	43.7(5)
C19	C20	C21	121.7(9)	N6^{3}	K1	C72	106.5(4)
C15	C20	C21	122.9(10)	N1^{3}	K1	C72	115.7(4)
N7	C21	C20	120.4(8)	C36^{3}	K1	C72	116.0(4)
N7	C21	P3	115.2(7)	N5^{3}	K1	C72	131.6(4)
C20	C21	P3	124.4(7)	C8^{3}	K1	C72	93.1(4)
N8	C22	C23	118.6(8)	C75	K1	C72	50.7(4)
N8	C22	P3	113.2(7)	C74	K1	C72	41.1(4)
C23	C22	P3	128.2(7)	C76	K1	C72	43.5(5)
C28	C23	C24	118.2(10)	N6^{3}	K1	C73	126.0(3)
C28	C23	C22	121.9(8)	N1^{3}	K1	C73	108.5(3)
C24	C23	C22	119.7(10)	C36^{3}	K1	C73	99.6(4)
C25	C24	C23	117.9(11)	N5^{3}	K1	C73	150.9(3)
C25	C24	K1	71.1(6)	C8^{3}	K1	C73	116.2(4)
C23	C24	K1	126.5(7)	C75	K1	C73	45.7(4)
C24	C25	C26	123.2(10)	C74	K1	C73	24.7(3)
C24	C25	K1	85.7(7)	C76	K1	C73	52.0(5)
C26	C25	K1	117.5(9)	C72	K1	C73	23.4(4)
C27	C26	C25	114.7(11)	N6^{3}	K1	N2^{3}	64.26(19)

C28	C27	C26	122.8(11)	N1[3]	K1	N2[3]	24.21(17)				
C27	C28	C23	123.1(10)	C36[3]	K1	N2[3]	41.9(2)				
C34	C29	C30	119.2(15)	N5[3]	K1	N2[3]	71.8(2)				
C31	C30	C29	121.8(16)	C8[3]	K1	N2[3]	86.2(2)				
C30	C31	C32	118.3(17)	C75	K1	N2[3]	136.0(4)				
C31	C32	C33	122.7(17)	C74	K1	N2[3]	110.8(4)				
C34	C33	C32	120.2(15)	C76	K1	N2[3]	136.0(4)				
C29	C34	C33	117.6(13)	C72	K1	N2[3]	92.8(4)				
C29	C34	C35	120.6(14)	C73	K1	N2[3]	90.7(3)				
C33	C34	C35	121.7(12)	N6[3]	K1	C71	100.6(3)				
N2	C35	C34	120.0(9)	N1[3]	K1	C71	135.6(4)				
N2	C35	P2	114.1(7)	C36[3]	K1	C71	139.8(4)				
C34	C35	P2	125.9(8)	N5[3]	K1	C71	121.7(4)				
N2	C35	K1[1]	68.8(5)	C8[3]	K1	C71	79.9(4)				
C34	C35	K1[1]	123.1(8)	C75	K1	C71	44.4(4)				
P2	C35	K1[1]	77.8(3)	C74	K1	C71	49.5(5)				
N1	C36	C37	120.4(7)	C76	K1	C71	25.7(4)				
N1	C36	P2	112.0(7)	C72	K1	C71	23.9(4)				
C37	C36	P2	127.5(6)	C73	K1	C71	43.0(4)				
N1	C36	K1[1]	73.1(5)	N2[3]	K1	C71	111.4(4)				
C37	C36	K1[1]	101.0(5)	N10	K2	C50	84.7(2)				
P2	C36	K1[1]	90.4(4)	N10	K2	C64	24.93(18)				
C38	C37	C42	119.3(9)	C50	K2	C64	109.3(2)				
C38	C37	C36	120.5(8)	N10	K2	N4	59.61(18)				
C42	C37	C36	120.1(8)	C50	K2	N4	25.2(2)				
C37	C38	C39	118.2(9)	C64	K2	N4	84.1(2)				
C40	C39	C38	122.0(12)	N10	K2	C16[4]	120.0(3)				
C39	C40	C41	119.2(13)	C50	K2	C16[4]	94.7(3)				
C42	C41	C40	121.5(12)	C64	K2	C16[4]	119.8(4)				
C41	C42	C37	119.3(10)	N4	K2	C16[4]	108.6(3)				
C48	C43	C44	116.4(15)	N10	K2	N9	24.52(18)				
C45	C44	C43	118.0(15)	C50	K2	N9	79.3(2)				
C46	C45	C44	122.1(16)	C64	K2	N9	40.9(2)				
C45	C46	C47	119.2(15)	N4	K2	N9	57.90(19)				
C48	C47	C46	121.0(13)	C16[4]	K2	N9	96.3(3)				
C47	C48	C43	121.1(13)	N10	K2	C17[4]	106.7(3)				
C47	C48	C49	121.4(11)	C50	K2	C17[4]	112.9(4)				
C43	C48	C49	116.5(13)	C64	K2	C17[4]	99.8(3)				
N3	C49	C48	121.3(10)	N4	K2	C17[4]	119.7(3)				
N3	C49	P4	113.0(8)	C16[4]	K2	C17[4]	22.5(3)				

C48	C49	P4	125.6(9)	N9	K2	$C17^4$	86.7(3)
N4	C50	C51	120.1(10)	N10	K2	$C18^4$	112.0(3)
N4	C50	P4	111.3(8)	C50	K2	$C18^4$	135.6(3)
C51	C50	P4	128.6(8)	C64	K2	$C18^4$	95.6(3)
N4	C50	K2	82.3(5)	N4	K2	$C18^4$	143.5(3)
C51	C50	K2	93.7(7)	$C16^4$	K2	$C18^4$	41.0(3)
P4	C50	K2	93.3(4)	N9	K2	$C18^4$	99.1(3)
C52	C51	C56	118.6(14)	$C17^4$	K2	$C18^4$	24.2(3)
C52	C51	C50	120.1(13)	N10	K2	$C13^4$	93.9(3)
C56	C51	C50	121.2(11)	C50	K2	$C13^4$	107.0(3)
C52	C51	K2	119.0(9)	C64	K2	$C13^4$	82.9(4)
C56	C51	K2	92.0(7)	N4	K2	$C13^4$	104.0(3)
C50	C51	K2	62.0(6)	$C16^4$	K2	$C13^4$	141.5(3)
C51	C52	C53	118.1(17)	N9	K2	$C13^4$	118.4(3)
C54	C53	C52	121(2)	$C17^4$	K2	$C13^4$	136.3(3)
C55	C54	C53	122(2)	$C18^4$	K2	$C13^4$	112.2(3)
C54	C55	C56	120.2(17)	N10	K2	$C15^4$	143.6(3)
C51	C56	C55	120.5(13)	C50	K2	$C15^4$	94.6(3)
C58	C57	C62	120.0	C64	K2	$C15^4$	140.1(3)
C57	C58	C59	120.0	N4	K2	$C15^4$	115.9(2)
C60	C59	C58	120.0	$C16^4$	K2	$C15^4$	23.6(3)
C59	C60	C61	120.0	N9	K2	$C15^4$	119.6(2)
C62	C61	C60	120.0	$C17^4$	K2	$C15^4$	40.5(3)
C61	C62	C57	120.0	$C18^4$	K2	$C15^4$	47.3(3)
C61	C62	C63	120.3(8)	$C13^4$	K2	$C15^4$	120.7(3)
C57	C62	C63	119.6(8)	N10	K2	$C19^4$	132.5(2)
N9	C63	C62	119.7(9)	C50	K2	$C19^4$	134.6(3)
N9	C63	P5	115.2(8)	C64	K2	$C19^4$	111.6(3)
C62	C63	P5	125.2(7)	N4	K2	$C19^4$	155.6(2)
N10	C64	C65	118.8(10)	$C16^4$	K2	$C19^4$	47.7(3)
N10	C64	P5	113.8(8)	N9	K2	$C19^4$	122.3(3)
C65	C64	P5	127.3(7)	$C17^4$	K2	$C19^4$	41.6(3)
N10	C64	K2	72.9(4)	$C18^4$	K2	$C19^4$	23.3(3)
C65	C64	K2	107.5(6)	$C13^4$	K2	$C19^4$	96.6(3)
P5	C64	K2	90.1(4)	$C15^4$	K2	$C19^4$	40.4(3)
C70	C65	C66	120.0(12)	N10	K2	C51	94.9(2)
C70	C65	C64	122.0(9)	C50	K2	C51	24.4(3)
C66	C65	C64	118.0(12)	C64	K2	C51	119.2(3)
C65	C66	C67	114.2(14)	N4	K2	C51	42.6(2)
C68	C67	C66	126.7(16)	$C16^4$	K2	C51	70.4(3)

C69	C68	C67	114.9(16)	N9	K2	C51	80.4(2)
C68	C69	C70	123.6(17)	C17^{4}	K2	C51	88.7(3)
C65	C70	C69	120.5(12)	C18^{4}	K2	C51	111.2(3)
C72	C71	C76	118(2)	C13^{4}	K2	C51	128.2(3)
C72	C71	K1	76.3(11)	C15^{4}	K2	C51	73.4(3)
C76	C71	K1	74.8(9)	C19^{4}	K2	C51	113.6(3)
C73	C72	C71	128(2)	C36	N1	N2	116.7(7)
C73	C72	K1	79.6(10)	C36	N1	Eu1	166.8(6)
C71	C72	K1	79.9(11)	N2	N1	Eu1	75.5(4)
C72	C73	C74	113(2)	C36	N1	K1^{1}	81.6(5)
C72	C73	K1	77.0(10)	N2	N1	K1^{1}	89.2(5)
C74	C73	K1	74.3(9)	Eu1	N1	K1^{1}	104.5(2)
C73	C74	C75	126.0(18)	N1	N2	C35	109.9(7)
C73	C74	K1	81.0(9)	N1	N2	Eu1	73.3(4)
C75	C74	K1	76.9(9)	C35	N2	Eu1	175.0(6)
C76	C75	C74	115.6(18)	N1	N2	K1^{1}	66.6(4)
C76	C75	K1	79.0(9)	C35	N2	K1^{1}	88.2(5)
C74	C75	K1	77.2(9)	Eu1	N2	K1^{1}	96.7(2)
C75	C76	C71	119(2)	C49	N3	N4	113.5(7)
C75	C76	C77	111.1(18)	C49	N3	Eu1	170.8(7)
C71	C76	C77	130(2)	N4	N3	Eu1	73.9(4)
C75	C76	K1	76.0(10)	N3	N4	C50	114.7(8)
C71	C76	K1	79.5(10)	N3	N4	Eu1	75.0(4)
C77	C76	K1	112.2(11)	C50	N4	Eu1	170.1(7)
N8	Eu1	N1	118.8(2)	N3	N4	K2	96.6(5)
N8	Eu1	N4	144.6(2)	C50	N4	K2	72.5(5)
N1	Eu1	N4	90.7(2)	Eu1	N4	K2	109.6(2)
N8	Eu1	N3	122.7(2)	N6	N5	C7	114.6(7)
N1	Eu1	N3	118.3(2)	N6	N5	Eu1	69.2(4)
N4	Eu1	N3	31.2(2)	C7	N5	Eu1	171.3(6)
N8	Eu1	N7	31.9(2)	N6	N5	K1^{1}	70.2(4)
N1	Eu1	N7	139.5(2)	C7	N5	K1^{1}	91.6(5)
N4	Eu1	N7	128.9(3)	Eu1	N5	K1^{1}	97.1(2)
N3	Eu1	N7	98.7(2)	N5	N6	C8	111.2(7)
N8	Eu1	N6	89.4(2)	N5	N6	Eu1	80.6(5)
N1	Eu1	N6	83.2(2)	C8	N6	Eu1	165.6(5)
N4	Eu1	N6	114.8(2)	N5	N6	K1^{1}	84.5(4)
N3	Eu1	N6	101.8(2)	C8	N6	K1^{1}	85.1(5)
N7	Eu1	N6	72.9(2)	Eu1	N6	K1^{1}	104.9(2)
N8	Eu1	N10	71.8(2)	C21	N7	N8	112.8(7)

N1	Eu1	N10	118.1(3)	C21	N7	Eu1	175.7(6)
N4	Eu1	N10	77.3(2)	N8	N7	Eu1	71.3(4)
N3	Eu1	N10	77.9(2)	N7	N8	C22	113.3(7)
N7	Eu1	N10	83.7(2)	N7	N8	Eu1	76.8(4)
N6	Eu1	N10	156.3(2)	C22	N8	Eu1	169.7(7)
N8	Eu1	N2	87.6(2)	C63	N9	N10	112.1(8)
N1	Eu1	N2	31.3(2)	C63	N9	Eu1	167.0(7)
N4	Eu1	N2	119.1(2)	N10	N9	Eu1	71.9(4)
N3	Eu1	N2	149.0(2)	C63	N9	K2	89.1(6)
N7	Eu1	N2	111.9(2)	N10	N9	K2	66.9(4)
N6	Eu1	N2	83.4(2)	Eu1	N9	K2	103.7(3)
N10	Eu1	N2	109.1(3)	C64	N10	N9	113.0(8)
N8	Eu1	N9	84.7(2)	C64	N10	Eu1	162.8(6)
N1	Eu1	N9	86.5(2)	N9	N10	Eu1	76.5(4)
N4	Eu1	N9	77.6(2)	C64	N10	K2	82.2(5)
N3	Eu1	N9	94.0(2)	N9	N10	K2	88.6(4)
N7	Eu1	N9	108.1(2)	Eu1	N10	K2	113.2(2)
N6	Eu1	N9	163.8(2)	C8	P1	C7	88.7(4)
N10	Eu1	N9	31.6(2)	C8	P1	K1[1]	60.1(3)
N2	Eu1	N9	81.3(3)	C7	P1	K1[1]	69.8(3)
N8	Eu1	N5	118.1(2)	C36	P2	C35	87.3(4)
N1	Eu1	N5	78.3(2)	C36	P2	K1[1]	60.3(3)
N4	Eu1	N5	84.9(2)	C35	P2	K1[1]	73.6(3)
N3	Eu1	N5	78.2(2)	C22	P3	C21	85.4(4)
N7	Eu1	N5	95.0(2)	C50	P4	C49	87.3(5)
N6	Eu1	N5	30.3(2)	C50	P4	K2	58.0(3)
N10	Eu1	N5	155.6(2)	C49	P4	K2	83.4(3)
N2	Eu1	N5	94.1(2)	C64	P5	C63	85.9(4)
N9	Eu1	N5	156.6(2)	C64	P5	K2	61.0(3)
N8	Eu1	K1[1]	106.19(18)	C63	P5	K2	73.5(4)

[1]1/2-X,-Y,-1/2+Z; [2]-X,-1/2+Y,1/2-Z; [3]1/2-X,-Y,1/2+Z; [4]-X,1/2+Y,1/2-Z

Table S1-7-4.

Torsion Angles for compound8-exp_227.

A	B	C	D	Angle/°	A	B	C	D	Angle/°
C6	C1	C2	C3	1(2)	N1	Eu1	N2	K1[1]	-63.1(4)
C1	C2	C3	C4	-4(2)	N4	Eu1	N2	K1[1]	-90.2(3)

C2	C3	C4	C5	5(2)	N3	Eu1	N2	K1[1]	-77.5(5)
C3	C4	C5	C6	-3.6(18)	N7	Eu1	N2	K1[1]	93.2(2)
C2	C1	C6	C5	0.2(16)	N6	Eu1	N2	K1[1]	24.6(2)
C2	C1	C6	C7	179.5(10)	N10	Eu1	N2	K1[1]	-175.99(19)
C4	C5	C6	C1	0.9(15)	N9	Eu1	N2	K1[1]	-160.7(2)
C4	C5	C6	C7	-178.4(9)	N5	Eu1	N2	K1[1]	-3.8(2)
C1	C6	C7	N5	160.4(8)	K2	Eu1	N2	K1[1]	-136.41(13)
C5	C6	C7	N5	-20.3(13)	C48	C49	N3	N4	176.8(9)
C1	C6	C7	P1	-23.3(13)	P4	C49	N3	N4	-4.2(9)
C5	C6	C7	P1	156.0(8)	C48	C49	N3	Eu1	35(4)
C1	C6	C7	K1[1]	83.2(10)	P4	C49	N3	Eu1	-146(3)
C5	C6	C7	K1[1]	-97.4(10)	N8	Eu1	N3	C49	-72(4)
N6	C8	C9	C14	174.8(8)	N1	Eu1	N3	C49	114(4)
P1	C8	C9	C14	-3.3(13)	N4	Eu1	N3	C49	144(4)
K1[1]	C8	C9	C14	-110.2(8)	N7	Eu1	N3	C49	-49(4)
N6	C8	C9	C10	-9.7(12)	N6	Eu1	N3	C49	25(4)
P1	C8	C9	C10	172.2(7)	N10	Eu1	N3	C49	-131(4)
K1[1]	C8	C9	C10	65.3(9)	N2	Eu1	N3	C49	122(4)
C14	C9	C10	C11	-6.4(14)	N9	Eu1	N3	C49	-158(4)
C8	C9	C10	C11	177.9(9)	N5	Eu1	N3	C49	44(4)
C9	C10	C11	C12	9.8(18)	K1[1]	Eu1	N3	C49	65(4)
C10	C11	C12	C13	-7.9(19)	K2	Eu1	N3	C49	-159(4)
C11	C12	C13	C14	2.9(19)	N8	Eu1	N3	N4	144.2(4)
C11	C12	C13	K2[2]	-83.6(12)	N1	Eu1	N3	N4	-30.2(5)
C12	C13	C14	C9	0.2(19)	N7	Eu1	N3	N4	166.9(4)
K2[2]	C13	C14	C9	94.2(11)	N6	Eu1	N3	N4	-118.8(4)
C12	C13	C14	K2[2]	-94.0(11)	N10	Eu1	N3	N4	85.4(5)
C10	C9	C14	C13	1.5(17)	N2	Eu1	N3	N4	-21.8(7)
C8	C9	C14	C13	177.4(11)	N9	Eu1	N3	N4	58.0(4)
C10	C9	C14	K2[2]	80.9(8)	N5	Eu1	N3	N4	-99.8(4)
C8	C9	C14	K2[2]	-103.3(7)	K1[1]	Eu1	N3	N4	-78.4(5)
C20	C15	C16	C17	-3(2)	K2	Eu1	N3	N4	57.5(4)
K2[2]	C15	C16	C17	-73.6(15)	C49	N3	N4	C50	3.5(10)
C20	C15	C16	K2[2]	70.7(12)	Eu1	N3	N4	C50	177.6(7)
C15	C16	C17	C18	6(2)	C49	N3	N4	Eu1	-174.1(7)
K2[2]	C16	C17	C18	-68.8(14)	C49	N3	N4	K2	77.3(7)
C15	C16	C17	K2[2]	75.1(14)	Eu1	N3	N4	K2	-108.6(2)
C16	C17	C18	C19	-5(2)	C51	C50	N4	N3	179.1(8)
K2[2]	C17	C18	C19	-73.6(12)	P4	C50	N4	N3	-1.2(10)
C16	C17	C18	K2[2]	68.3(15)	K2	C50	N4	N3	89.3(6)

C17	C18	C19	C20	1(2)	C51	C50	N4 Eu1 -14(4)
K2[2]	C18	C19	C20	-70.1(10)	P4	C50	N4 Eu1 165(3)
C17	C18	C19	K2[2]	70.7(13)	K2	C50	N4 Eu1 -104(4)
C18	C19	C20	C15	2.6(17)	C51	C50	N4 K2 89.7(9)
K2[2]	C19	C20	C15	-63.2(9)	P4	C50	N4 K2 -90.5(5)
C18	C19	C20	C21	178.7(11)	N8	Eu1	N4 N3 -58.2(6)
K2[2]	C19	C20	C21	112.9(10)	N1	Eu1	N4 N3 153.7(4)
C16	C15	C20	C19	-1.7(18)	N7	Eu1	N4 N3 -16.7(5)
K2[2]	C15	C20	C19	64.0(9)	N6	Eu1	N4 N3 70.9(5)
C16	C15	C20	C21	-177.7(12)	N10	Eu1	N4 N3 -87.6(5)
K2[2]	C15	C20	C21	-112.0(10)	N2	Eu1	N4 N3 167.4(4)
C19	C20	C21	N7	25.9(15)	N9	Eu1	N4 N3 -120.0(4)
C15	C20	C21	N7	-158.3(11)	N5	Eu1	N4 N3 75.5(4)
C19	C20	C21	P3	-153.2(9)	K1[1]	Eu1	N4 N3 115.1(4)
C15	C20	C21	P3	22.6(15)	K2	Eu1	N4 N3 -91.8(4)
N8	C22	C23	C28	18.8(13)	N8	Eu1	N4 C50 134(4)
P3	C22	C23	C28	-160.2(8)	N1	Eu1	N4 C50 -14(4)
N8	C22	C23	C24	-166.5(9)	N3	Eu1	N4 C50 -167(4)
P3	C22	C23	C24	14.5(13)	N7	Eu1	N4 C50 176(4)
C28	C23	C24	C25	-1.2(15)	N6	Eu1	N4 C50 -97(4)
C22	C23	C24	C25	-176.1(10)	N10	Eu1	N4 C50 105(4)
C28	C23	C24	K1	85.1(12)	N2	Eu1	N4 C50 0(4)
C22	C23	C24	K1	-89.8(10)	N9	Eu1	N4 C50 73(4)
C23	C24	C25	C26	1.8(18)	N5	Eu1	N4 C50 -92(4)
K1	C24	C25	C26	-120.3(13)	K1[1]	Eu1	N4 C50 -52(4)
C23	C24	C25	K1	122.0(9)	K2	Eu1	N4 C50 101(4)
C24	C25	C26	C27	-3(2)	N8	Eu1	N4 K2 33.5(6)
K1	C25	C26	C27	-106.5(12)	N1	Eu1	N4 K2 -114.5(3)
C25	C26	C27	C28	3(2)	N3	Eu1	N4 K2 91.8(4)
C26	C27	C28	C23	-3(2)	N7	Eu1	N4 K2 75.1(4)
C24	C23	C28	C27	1.9(17)	N6	Eu1	N4 K2 162.7(2)
C22	C23	C28	C27	176.6(11)	N10	Eu1	N4 K2 4.2(3)
C34	C29	C30	C31	-1(3)	N2	Eu1	N4 K2 -100.9(3)
C29	C30	C31	C32	-2(3)	N9	Eu1	N4 K2 -28.3(2)
C30	C31	C32	C33	4(3)	N5	Eu1	N4 K2 167.3(3)
C31	C32	C33	C34	-4(3)	K1[1]	Eu1	N4 K2 -153.10(17)
C30	C29	C34	C33	1(2)	N10	K2	N4 N3 72.5(5)
C30	C29	C34	C35	-176.6(13)	C50	K2	N4 N3 -113.9(8)
C32	C33	C34	C29	2(2)	C64	K2	N4 N3 67.5(5)
C32	C33	C34	C35	178.9(13)	C16	K2	N4 N3 -173.0(5)

			^{4}			
C29	C34	C35	N2	-140.7(14)	N9	K2	N4	N3	101.2(5)
C33	C34	C35	N2	42(2)	C17^{4}	K2	N4	N3	165.4(5)
C29	C34	C35	P2	37(2)	C18^{4}	K2	N4	N3	159.0(5)
C33	C34	C35	P2	-140.0(12)	C13^{4}	K2	N4	N3	-13.7(6)
C29	C34	C35	K1^{1}	136.4(13)	C15^{4}	K2	N4	N3	-148.7(5)
C33	C34	C35	K1^{1}	-40.8(17)	C19^{4}	K2	N4	N3	-160.5(6)
N1	C36	C37	C38	-20.3(14)	C51	K2	N4	N3	-145.8(6)
P2	C36	C37	C38	155.6(8)	N10	K2	N4	C50	-173.6(7)
K1^{1}	C36	C37	C38	56.4(9)	C64	K2	N4	C50	-178.7(7)
N1	C36	C37	C42	160.1(9)	C16^{4}	K2	N4	C50	-59.2(7)
P2	C36	C37	C42	-23.9(13)	N9	K2	N4	C50	-144.9(7)
K1^{1}	C36	C37	C42	-123.1(8)	C17^{4}	K2	N4	C50	-80.8(7)
C42	C37	C38	C39	-0.3(15)	C18^{4}	K2	N4	C50	-87.2(8)
C36	C37	C38	C39	-179.9(9)	C13^{4}	K2	N4	C50	100.2(7)
C37	C38	C39	C40	4.1(18)	C15^{4}	K2	N4	C50	-34.8(7)
C38	C39	C40	C41	-8(2)	C19^{4}	K2	N4	C50	-46.7(9)
C39	C40	C41	C42	8(2)	C51	K2	N4	C50	-31.9(6)
C40	C41	C42	C37	-4.4(19)	N10	K2	N4	Eu1	-3.9(2)
C38	C37	C42	C41	0.7(16)	C50	K2	N4	Eu1	169.8(8)
C36	C37	C42	C41	-179.8(10)	C64	K2	N4	Eu1	-8.9(3)
C48	C43	C44	C45	8(2)	C16^{4}	K2	N4	Eu1	110.6(4)
C43	C44	C45	C46	4(2)	N9	K2	N4	Eu1	24.8(2)
C44	C45	C46	C47	-9(2)	C17^{4}	K2	N4	Eu1	89.0(4)
C45	C46	C47	C48	0(2)	C18^{4}	K2	N4	Eu1	82.6(5)
C46	C47	C48	C43	13(2)	C13^{4}	K2	N4	Eu1	-90.1(4)
C46	C47	C48	C49	-178.8(13)	C15	K2	N4	Eu1	134.9(3)

C44	C43	C48	C47	-17(2)	C19^{4}	K2	N4	Eu1	123.1(6)
C44	C43	C48	C49	174.5(13)	C51	K2	N4	Eu1	137.9(5)
C47	C48	C49	N3	27.7(18)	C6	C7	N5	N6	177.6(7)
C43	C48	C49	N3	-163.8(11)	P1	C7	N5	N6	0.7(9)
C47	C48	C49	P4	-151.1(11)	K1^{1}	C7	N5	N6	-68.9(5)
C43	C48	C49	P4	17.4(16)	C6	C7	N5	Eu1	64(4)
N4	C50	C51	C52	167.8(10)	P1	C7	N5	Eu1	-113(4)
P4	C50	C51	C52	-12.0(17)	K1^{1}	C7	N5	Eu1	177(4)
K2	C50	C51	C52	-109.1(11)	C6	C7	N5	K1^{1}	-113.5(7)
N4	C50	C51	C56	-9.1(16)	P1	C7	N5	K1^{1}	69.6(5)
P4	C50	C51	C56	171.1(9)	N8	Eu1	N5	N6	-19.9(5)
K2	C50	C51	C56	74.0(11)	N1	Eu1	N5	N6	96.7(4)
N4	C50	C51	K2	-83.2(8)	N4	Eu1	N5	N6	-171.6(4)
P4	C50	C51	K2	97.1(9)	N3	Eu1	N5	N6	-140.8(4)
C56	C51	C52	C53	-4(2)	N7	Eu1	N5	N6	-42.9(4)
C50	C51	C52	C53	178.6(13)	N10	Eu1	N5	N6	-128.4(6)
K2	C51	C52	C53	106.0(14)	N2	Eu1	N5	N6	69.5(4)
C51	C52	C53	C54	6(3)	N9	Eu1	N5	N6	147.0(6)
C52	C53	C54	C55	-4(4)	K1^{1}	Eu1	N5	N6	65.6(4)
C53	C54	C55	C56	1(3)	K2	Eu1	N5	N6	-161.7(3)
C52	C51	C56	C55	1.2(19)	N8	Eu1	N5	C7	97(4)
C50	C51	C56	C55	178.1(10)	N1	Eu1	N5	C7	-146(4)
K2	C51	C56	C55	-123.7(10)	N4	Eu1	N5	C7	-54(4)
C54	C55	C56	C51	1(2)	N3	Eu1	N5	C7	-23(4)
C62	C57	C58	C59	0.0	N7	Eu1	N5	C7	74(4)
C57	C58	C59	C60	0.0	N6	Eu1	N5	C7	117(4)
C58	C59	C60	C61	0.0	N10	Eu1	N5	C7	-11(4)
C59	C60	C61	C62	0.0	N2	Eu1	N5	C7	-173(4)
C60	C61	C62	C57	0.0	N9	Eu1	N5	C7	-96(4)
C60	C61	C62	C63	-176.9(9)	K1^{1}	Eu1	N5	C7	-177(4)
C58	C57	C62	C61	0.0	K2	Eu1	N5	C7	-44(4)
C58	C57	C62	C63	176.9(9)	N8	Eu1	N5	K1^{1}	-85.5(3)
C61	C62	C63	N9	-2.7(13)	N1	Eu1	N5	K1^{1}	31.0(2)
C57	C62	C63	N9	-179.6(8)	N4	Eu1	N5	K1^{1}	122.8(2)
C61	C62	C63	P5	177.1(6)	N3	Eu1	N5	K1^{1}	153.6(2)
C57	C62	C63	P5	0.2(12)	N7	Eu1	N5	K1^{1}	-108.5(3)
N10	C64	C65	C70	8.2(16)	N6	Eu1	N5	K1^{1}	-65.6(4)
P5	C64	C65	C70	-168.1(10)	N10	Eu1	N5	K1^{1}	165.9(4)

K2	C64	C65	C70	87.9(12)	N2	Eu1	N5	K1[1]	3.9(2)
N10	C64	C65	C66	-170.8(9)	N9	Eu1	N5	K1[1]	81.4(6)
P5	C64	C65	C66	12.9(14)	K2	Eu1	N5	K1[1]	132.66(13)
K2	C64	C65	C66	-91.1(9)	C7	N5	N6	C8	-0.2(9)
C70	C65	C66	C67	2.3(17)	Eu1	N5	N6	C8	171.3(6)
C64	C65	C66	C67	-178.7(10)	K1[1]	N5	N6	C8	-82.6(6)
C65	C66	C67	C68	-6(2)	C7	N5	N6	Eu1	-171.5(6)
C66	C67	C68	C69	5(3)	K1[1]	N5	N6	Eu1	106.17(19)
C67	C68	C69	C70	0(3)	C7	N5	N6	K1[1]	82.4(6)
C66	C65	C70	C69	2(2)	Eu1	N5	N6	K1[1]	-106.17(19)
C64	C65	C70	C69	-177.4(11)	C9	C8	N6	N5	-178.8(7)
C68	C69	C70	C65	-3(2)	P1	C8	N6	N5	-0.4(8)
C76	C71	C72	C73	-4(3)	K1[1]	C8	N6	N5	82.1(5)
K1	C71	C72	C73	-68.0(18)	C9	C8	N6	Eu1	-36(3)
C76	C71	C72	K1	64.4(14)	P1	C8	N6	Eu1	142.7(19)
C71	C72	C73	C74	2(3)	K1[1]	C8	N6	Eu1	-135(2)
K1	C72	C73	C74	-66.3(12)	C9	C8	N6	K1[1]	99.1(7)
C71	C72	C73	K1	68.1(18)	P1	C8	N6	K1[1]	-82.6(5)
C72	C73	C74	C75	1(2)	N8	Eu1	N6	N5	162.6(4)
K1	C73	C74	C75	-66.4(14)	N1	Eu1	N6	N5	-78.3(4)
C72	C73	C74	K1	67.9(13)	N4	Eu1	N6	N5	9.2(5)
C73	C74	C75	C76	-3(2)	N3	Eu1	N6	N5	39.2(4)
K1	C74	C75	C76	-71.0(13)	N7	Eu1	N6	N5	134.8(4)
C73	C74	C75	K1	68.4(14)	N10	Eu1	N6	N5	126.2(6)
C74	C75	C76	C71	1(2)	N2	Eu1	N6	N5	-109.8(4)
K1	C75	C76	C71	-69.2(14)	N9	Eu1	N6	N5	-129.1(7)
C74	C75	C76	C77	178.7(13)	K1[1]	Eu1	N6	N5	-81.7(4)
K1	C75	C76	C77	108.8(13)	K2	Eu1	N6	N5	33.2(6)
C74	C75	C76	K1	69.9(12)	N8	Eu1	N6	C8	17(2)
C72	C71	C76	C75	2(2)	N1	Eu1	N6	C8	136(2)
K1	C71	C76	C75	67.3(14)	N4	Eu1	N6	C8	-136(2)
C72	C71	C76	C77	-175.5(16)	N3	Eu1	N6	C8	-106(2)
K1	C71	C76	C77	-110.2(18)	N7	Eu1	N6	C8	-11(2)
C72	C71	C76	K1	-65.2(14)	N10	Eu1	N6	C8	-19(2)
C76	C75	K1	N6[3]	-2.8(16)	N2	Eu1	N6	C8	105(2)
C74	C75	K1	N6[3]	-122.5(10)	N9	Eu1	N6	C8	86(2)
C76	C75	K1	N1[3]	138.3(11)	N5	Eu1	N6	C8	-145(2)
C74	C75	K1	N1[3]	18.6(14)	K1[1]	Eu1	N6	C8	133(2)
C76	C75	K1	C36[3]	158.4(11)	K2	Eu1	N6	C8	-112(2)

C74	C75	K1	$C36_3$	38.7(12)	N8	Eu1	N6	$K1^1$	-115.8(3)
C76	C75	K1	$N5^3$	-45.1(16)	N1	Eu1	N6	$K1^1$	3.3(2)
C74	C75	K1	$N5^3$	-164.8(8)	N4	Eu1	N6	$K1^1$	90.9(3)
C76	C75	K1	$C8^3$	-9.4(14)	N3	Eu1	N6	$K1^1$	120.9(2)
C74	C75	K1	$C8^3$	-129.1(10)	N7	Eu1	N6	$K1^1$	-143.5(3)
C76	C75	K1	C74	119.7(18)	N10	Eu1	N6	$K1^1$	-152.2(5)
C74	C75	K1	C76	-119.7(18)	N2	Eu1	N6	$K1^1$	-28.2(2)
C76	C75	K1	C72	62.4(12)	N9	Eu1	N6	$K1^1$	-47.4(8)
C74	C75	K1	C72	-57.2(10)	N5	Eu1	N6	$K1^1$	81.7(4)
C76	C75	K1	C73	93.3(13)	K2	Eu1	N6	$K1^1$	114.9(3)
C74	C75	K1	C73	-26.4(9)	C20	C21	N7	N8	-179.0(8)
C76	C75	K1	$N2^3$	103.2(13)	P3	C21	N7	N8	0.2(10)
C74	C75	K1	$N2^3$	-16.5(13)	C20	C21	N7	Eu1	-14(10)
C76	C75	K1	C71	31.0(12)	P3	C21	N7	Eu1	165(9)
C74	C75	K1	C71	-88.7(12)	N8	Eu1	N7	C21	-165(9)
C73	C74	K1	$N6^3$	-37.0(16)	N1	Eu1	N7	C21	-104(9)
C75	C74	K1	$N6^3$	93.4(11)	N4	Eu1	N7	C21	61(9)
C73	C74	K1	$N1^3$	61.3(12)	N3	Eu1	N7	C21	53(9)
C75	C74	K1	$N1^3$	-168.3(9)	N6	Eu1	N7	C21	-47(9)
C73	C74	K1	$C36_3$	81.0(12)	N10	Eu1	N7	C21	129(9)
C75	C74	K1	$C36_3$	-148.5(10)	N2	Eu1	N7	C21	-123(9)
C73	C74	K1	$N5^3$	-68(3)	N9	Eu1	N7	C21	150(9)
C75	C74	K1	$N5^3$	62(3)	N5	Eu1	N7	C21	-26(9)
C73	C74	K1	$C8^3$	-65.3(13)	$K1^1$	Eu1	N7	C21	-71(9)
C75	C74	K1	$C8^3$	65.2(11)	K2	Eu1	N7	C21	103(9)
C73	C74	K1	C75	-130.4(18)	N1	Eu1	N7	N8	61.5(6)
C73	C74	K1	C76	-98.3(13)	N4	Eu1	N7	N8	-133.4(5)
C75	C74	K1	C76	32.1(10)	N3	Eu1	N7	N8	-142.0(5)
C73	C74	K1	C72	-31.8(10)	N6	Eu1	N7	N8	118.2(5)
C75	C74	K1	C72	98.6(13)	N10	Eu1	N7	N8	-65.3(5)
C75	C74	K1	C73	130.4(18)	N2	Eu1	N7	N8	42.8(5)
C73	C74	K1	$N2^3$	37.4(12)	N9	Eu1	N7	N8	-44.9(5)
C75	C74	K1	$N2^3$	167.8(9)	N5	Eu1	N7	N8	139.2(5)
C73	C74	K1	C71	-63.5(11)	$K1^1$	Eu1	N7	N8	94.0(4)
C75	C74	K1	C71	66.9(11)	K2	Eu1	N7	N8	-91.6(4)
C75	C76	K1	$N6^3$	178.0(11)	C21	N7	N8	C22	0.5(10)
C71	C76	K1	$N6^3$	-58.1(13)	Eu1	N7	N8	C22	-178.3(7)
C77	C76	K1	$N6^3$	70.6(13)	C21	N7	N8	Eu1	178.8(7)

C75	C76	K1	N1^{3}	-89.1(16)	C23	C22	N8	N7	179.9(8)
C71	C76	K1	N1^{3}	35(2)	P3	C22	N8	N7	-1.1(9)
C77	C76	K1	N1^{3}	163.6(9)	C23	C22	N8	Eu1	9(4)
C75	C76	K1	C36^{3}	-34.6(17)	P3	C22	N8	Eu1	-172(3)
C71	C76	K1	C36^{3}	89.2(14)	N1	Eu1	N8	N7	-139.3(4)
C77	C76	K1	C36^{3}	-142.0(11)	N4	Eu1	N8	N7	77.8(6)
C75	C76	K1	N5^{3}	152.2(11)	N3	Eu1	N8	N7	46.3(5)
C71	C76	K1	N5^{3}	-84.0(13)	N6	Eu1	N8	N7	-57.4(5)
C77	C76	K1	N5^{3}	44.8(14)	N10	Eu1	N8	N7	108.1(5)
C75	C76	K1	C8^{3}	171.5(12)	N2	Eu1	N8	N7	-140.9(5)
C71	C76	K1	C8^{3}	-64.6(12)	N9	Eu1	N8	N7	137.6(5)
C77	C76	K1	C8^{3}	64.1(12)	N5	Eu1	N8	N7	-47.6(5)
C71	C76	K1	C75	124(2)	K1^{1}	Eu1	N8	N7	-95.7(4)
C77	C76	K1	C75	-107.4(19)	K2	Eu1	N8	N7	99.9(4)
C75	C76	K1	C74	-33.4(11)	N1	Eu1	N8	C22	32(3)
C71	C76	K1	C74	90.4(13)	N4	Eu1	N8	C22	-111(3)
C77	C76	K1	C74	-140.8(16)	N3	Eu1	N8	C22	-143(3)
C75	C76	K1	C72	-94.7(14)	N7	Eu1	N8	C22	171(4)
C71	C76	K1	C72	29.2(11)	N6	Eu1	N8	C22	114(3)
C77	C76	K1	C72	157.9(16)	N10	Eu1	N8	C22	-81(3)
C75	C76	K1	C73	-65.1(12)	N2	Eu1	N8	C22	30(3)
C71	C76	K1	C73	58.8(11)	N9	Eu1	N8	C22	-51(3)
C77	C76	K1	C73	-172.5(15)	N5	Eu1	N8	C22	124(3)
C75	C76	K1	N2^{3}	-103.3(12)	K1^{1}	Eu1	N8	C22	75(3)
C71	C76	K1	N2^{3}	20.6(15)	K2	Eu1	N8	C22	-89(3)
C77	C76	K1	N2^{3}	149.3(10)	C62	C63	N9	N10	-179.8(8)
C75	C76	K1	C71	-124(2)	P5	C63	N9	N10	0.3(11)
C77	C76	K1	C71	129(2)	C62	C63	N9	Eu1	75(3)
C73	C72	K1	N6^{3}	-149.2(11)	P5	C63	N9	Eu1	-105(3)
C71	C72	K1	N6^{3}	78.6(12)	C62	C63	N9	K2	-115.3(9)
C73	C72	K1	N1^{3}	-77.0(12)	P5	C63	N9	K2	64.9(7)
C71	C72	K1	N1^{3}	150.8(10)	N8	Eu1	N9	C63	47(3)
C73	C72	K1	C36^{3}	-48.9(12)	N1	Eu1	N9	C63	-73(3)
C71	C72	K1	C36^{3}	178.9(10)	N4	Eu1	N9	C63	-164(3)
C73	C72	K1	N5^{3}	-153.3(10)	N3	Eu1	N9	C63	169(3)
C71	C72	K1	N5^{3}	74.5(12)	N7	Eu1	N9	C63	69(3)

C73	C72	K1	C8^{3}	-171.5(11)	N6	Eu1	N9	C63	-22(3)
C71	C72	K1	C8^{3}	56.2(12)	N10	Eu1	N9	C63	110(3)
C73	C72	K1	C75	67.8(11)	N2	Eu1	N9	C63	-42(3)
C71	C72	K1	C75	-64.5(11)	N5	Eu1	N9	C63	-122(3)
C73	C72	K1	C74	33.7(11)	K1^{1}	Eu1	N9	C63	-59(3)
C71	C72	K1	C74	-98.5(13)	K2	Eu1	N9	C63	170(3)
C73	C72	K1	C76	100.8(13)	N8	Eu1	N9	N10	-63.3(5)
C71	C72	K1	C76	-31.5(11)	N1	Eu1	N9	N10	177.3(4)
C71	C72	K1	C73	-132.2(19)	N4	Eu1	N9	N10	85.9(5)
C73	C72	K1	N2^{3}	-85.2(12)	N3	Eu1	N9	N10	59.2(4)
C71	C72	K1	N2^{3}	142.6(11)	N7	Eu1	N9	N10	-41.4(5)
C73	C72	K1	C71	132.2(19)	N6	Eu1	N9	N10	-132.3(8)
C72	C73	K1	N6^{3}	37.4(13)	N2	Eu1	N9	N10	-151.7(5)
C74	C73	K1	N6^{3}	156.5(10)	N5	Eu1	N9	N10	128.3(5)
C72	C73	K1	N1^{3}	112.2(11)	K1^{1}	Eu1	N9	N10	-169.6(4)
C74	C73	K1	N1^{3}	-128.7(11)	K2	Eu1	N9	N10	59.7(4)
C72	C73	K1	C36^{3}	136.6(11)	N8	Eu1	N9	K2	-123.0(2)
C74	C73	K1	C36^{3}	-104.3(12)	N1	Eu1	N9	K2	117.6(2)
C72	C73	K1	N5^{3}	43.9(16)	N4	Eu1	N9	K2	26.1(2)
C74	C73	K1	N5^{3}	163.0(9)	N3	Eu1	N9	K2	-0.5(2)
C72	C73	K1	C8^{3}	9.4(13)	N7	Eu1	N9	K2	-101.1(2)
C74	C73	K1	C8^{3}	128.5(11)	N6	Eu1	N9	K2	168.0(7)
C72	C73	K1	C75	-91.4(13)	N10	Eu1	N9	K2	-59.7(4)
C74	C73	K1	C75	27.7(11)	N2	Eu1	N9	K2	148.6(2)
C72	C73	K1	C74	-119.1(18)	N5	Eu1	N9	K2	68.6(6)
C72	C73	K1	C76	-59.0(11)	K1^{1}	Eu1	N9	K2	130.69(16)
C74	C73	K1	C76	60.1(11)	N10	K2	N9	C63	-114.6(7)
C74	C73	K1	C72	119.1(18)	C50	K2	N9	C63	144.6(6)
C72	C73	K1	N2^{3}	95.5(12)	C64	K2	N9	C63	-78.4(6)
C74	C73	K1	N2^{3}	-145.4(12)	N4	K2	N9	C63	159.1(6)
C72	C73	K1	C71	-26.1(11)	C16^{4}	K2	N9	C63	51.0(6)
C74	C73	K1	C71	93.1(13)	C17^{4}	K2	N9	C63	30.6(6)
C72	C71	K1	N6^{3}	-107.1(11)	C18^{4}	K2	N9	C63	9.7(6)
C76	C71	K1	N6^{3}	128.9(12)	C13^{4}	K2	N9	C63	-111.7(6)
C72	C71	K1	N1^{3}	-39.0(14)	C15	K2	N9	C63	55.3(6)

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C76	C71	K1	N1[3]	-163.1(10)	C19[4]	K2	N9	C63	8.0(6)
C72	C71	K1	C36[3]	-1.5(14)	C51	K2	N9	C63	119.9(6)
C76	C71	K1	C36[3]	-125.6(11)	C50	K2	N9	N10	-100.8(5)
C72	C71	K1	N5[3]	-122.1(11)	C64	K2	N9	N10	36.2(4)
C76	C71	K1	N5[3]	113.9(12)	N4	K2	N9	N10	-86.4(5)
C72	C71	K1	C8[3]	-122.5(12)	C16[4]	K2	N9	N10	165.6(5)
C76	C71	K1	C8[3]	113.4(12)	C17[4]	K2	N9	N10	145.2(5)
C72	C71	K1	C75	94.0(13)	C18[4]	K2	N9	N10	124.3(5)
C76	C71	K1	C75	-30.1(11)	C13[4]	K2	N9	N10	2.9(5)
C72	C71	K1	C74	58.8(11)	C15[4]	K2	N9	N10	169.9(4)
C76	C71	K1	C74	-65.2(12)	C19[4]	K2	N9	N10	122.6(5)
C72	C71	K1	C76	124.1(19)	C51	K2	N9	N10	-125.5(5)
C76	C71	K1	C72	-124.1(19)	N10	K2	N9	Eu1	63.1(4)
C72	C71	K1	C73	25.5(10)	C50	K2	N9	Eu1	-37.7(3)
C76	C71	K1	C73	-98.6(13)	C64	K2	N9	Eu1	99.3(4)
C72	C71	K1	N2[3]	-40.7(12)	N4	K2	N9	Eu1	-23.2(2)
C76	C71	K1	N2[3]	-164.8(11)	C16[4]	K2	N9	Eu1	-131.3(3)
N4	C50	K2	N10	5.5(6)	C17[4]	K2	N9	Eu1	-151.7(3)
C51	C50	K2	N10	-114.4(7)	C18[4]	K2	N9	Eu1	-172.6(3)
P4	C50	K2	N10	116.6(4)	C13[4]	K2	N9	Eu1	66.0(3)
N4	C50	K2	C64	1.4(7)	C15[4]	K2	N9	Eu1	-126.9(3)
C51	C50	K2	C64	-118.5(7)	C19[4]	K2	N9	Eu1	-174.3(3)
P4	C50	K2	C64	112.5(4)	C51	K2	N9	Eu1	-62.4(3)
C51	C50	K2	N4	-119.9(10)	C65	C64	N10	N9	-174.0(8)
P4	C50	K2	N4	111.1(8)	P5	C64	N10	N9	2.7(9)
N4	C50	K2	C16	125.3(6)	K2	C64	N10	N9	85.1(6)

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C51	C50	K2	C16^{4}	5.4(7)	C65	C64 N10 Eu1	-53(3)
P4	C50	K2	C16^{4}	-123.6(5)	P5	C64 N10 Eu1	123(2)
N4	C50	K2	N9	29.7(6)	K2	C64 N10 Eu1	-154(3)
C51	C50	K2	N9	-90.2(7)	C65	C64 N10 K2	100.9(8)
P4	C50	K2	N9	140.8(4)	P5	C64 N10 K2	-82.4(5)
N4	C50	K2	C17^{4}	111.5(7)	C63	N9 N10 C64	-1.9(11)
C51	C50	K2	C17^{4}	-8.4(7)	Eu1	N9 N10 C64	164.9(7)
P4	C50	K2	C17^{4}	-137.4(4)	K2	N9 N10 C64	-80.9(6)
N4	C50	K2	C18^{4}	121.8(6)	C63	N9 N10 Eu1	-166.8(7)
C51	C50	K2	C18^{4}	1.9(8)	K2	N9 N10 Eu1	114.2(2)
P4	C50	K2	C18^{4}	-127.1(5)	C63	N9 N10 K2	78.9(7)
N4	C50	K2	C13^{4}	-86.9(7)	Eu1	N9 N10 K2	-114.2(2)
C51	C50	K2	C13^{4}	153.2(7)	N8	Eu1 N10 C64	-15(3)
P4	C50	K2	C13^{4}	24.2(5)	N1	Eu1 N10 C64	-129(3)
N4	C50	K2	C15^{4}	149.0(6)	N4	Eu1 N10 C64	148(3)
C51	C50	K2	C15^{4}	29.1(7)	N3	Eu1 N10 C64	116(3)
P4	C50	K2	C15^{4}	-99.9(4)	N7	Eu1 N10 C64	15(3)
N4	C50	K2	C19^{4}	155.0(5)	N6	Eu1 N10 C64	24(3)
C51	C50	K2	C19^{4}	35.1(8)	N2	Eu1 N10 C64	-96(3)
P4	C50	K2	C19^{4}	-93.9(6)	N9	Eu1 N10 C64	-126(3)
N4	C50	K2	C51	119.9(10)	N5	Eu1 N10 C64	103(3)
P4	C50	K2	C51	-129.0(8)	K1^{1}	Eu1 N10 C64	-104(3)
C65	C64	K2	N10	-115.6(10)	K2	Eu1 N10 C64	152(3)
P5	C64	K2	N10	114.9(8)	N8	Eu1 N10 N9	110.5(5)

N10 C64 K2	C50	9.7(7)	N1	Eu1 N10 N9	-3.0(5)
C65 C64 K2	C50	-105.9(7)	N4	Eu1 N10 N9	-86.9(4)
P5 C64 K2	C50	124.6(4)	N3	Eu1 N10 N9	-118.9(4)
N10 C64 K2	N4	10.3(6)	N7	Eu1 N10 N9	140.8(5)
C65 C64 K2	N4	-105.2(7)	N6	Eu1 N10 N9	149.1(5)
P5 C64 K2	N4	125.2(4)	N2	Eu1 N10 N9	29.8(5)
N10 C64 K2	$C16_4$	-97.8(6)	N5	Eu1 N10 N9	-131.2(6)
C65 C64 K2	$C16_4$	146.6(7)	$K1^1$	Eu1 N10 N9	22.0(7)
P5 C64 K2	$C16_4$	17.1(5)	K2	Eu1 N10 N9	-82.5(4)
N10 C64 K2	N9	-35.5(5)	N8	Eu1 N10 K2	-167.1(4)
C65 C64 K2	N9	-151.1(8)	N1	Eu1 N10 K2	79.4(4)
P5 C64 K2	N9	79.4(5)	N4	Eu1 N10 K2	-4.5(3)
N10 C64 K2	$C17_4$	-108.8(7)	N3	Eu1 N10 K2	-36.4(3)
C65 C64 K2	$C17_4$	135.6(7)	N7	Eu1 N10 K2	-136.7(3)
P5 C64 K2	$C17_4$	6.1(4)	N6	Eu1 N10 K2	-128.4(5)
N10 C64 K2	$C18_4$	-132.9(6)	N2	Eu1 N10 K2	112.3(3)
C65 C64 K2	$C18_4$	111.5(7)	N9	Eu1 N10 K2	82.5(4)
P5 C64 K2	$C18_4$	-18.0(4)	N5	Eu1 N10 K2	-48.7(7)
N10 C64 K2	$C13_4$	115.3(7)	$K1^1$	Eu1 N10 K2	104.5(4)
C65 C64 K2	$C13_4$	-0.2(7)	C50	K2 N10 C64	-170.8(7)
P5 C64 K2	$C13_4$	-129.8(4)	N4	K2 N10 C64	-168.1(7)
N10 C64 K2	$C15_4$	-113.8(6)	$C16_4$	K2 N10 C64	96.8(7)
C65 C64 K2	$C15_4$	130.6(7)	N9	K2 N10 C64	113.4(8)
P5 C64 K2	$C15_4$	1.1(6)	$C17_4$	K2 N10 C64	76.9(7)
N10 C64 K2	$C19_4$	-150.4(6)	$C18_4$	K2 N10 C64	51.8(7)
C65 C64 K2	C19	94.1(7)	C13	K2 N10 C64	-64.0(7)

		^{4}			^{4}		
P5	C64	K2	$C19_{4}$	-35.5(5)	$C15_{4}$	K2	N10	C64	98.6(7)
N10	C64	K2	C51	-14.8(8)	$C19_{4}$	K2	N10	C64	38.5(8)
C65	C64	K2	C51	-130.4(7)	C51	K2	N10	C64	167.0(7)
P5	C64	K2	C51	100.1(4)	C50	K2	N10	N9	75.8(5)
C52	C51	K2	N10	176.3(12)	C64	K2	N10	N9	-113.4(8)
C56	C51	K2	N10	-59.1(8)	N4	K2	N10	N9	78.5(4)
C50	C51	K2	N10	65.5(7)	$C16_{4}$	K2	N10	N9	-16.6(5)
C52	C51	K2	C50	110.7(15)	$C17_{4}$	K2	N10	N9	-36.5(5)
C56	C51	K2	C50	-124.6(11)	$C18_{4}$	K2	N10	N9	-61.6(5)
C52	C51	K2	C64	-177.5(12)	$C13_{4}$	K2	N10	N9	-177.4(5)
C56	C51	K2	C64	-52.9(8)	$C15_{4}$	K2	N10	N9	-14.8(6)
C50	C51	K2	C64	71.7(7)	$C19_{4}$	K2	N10	N9	-74.9(5)
C52	C51	K2	N4	143.8(14)	C51	K2	N10	N9	53.6(5)
C56	C51	K2	N4	-91.5(8)	C50	K2	N10	Eu1	1.2(4)
C50	C51	K2	N4	33.1(6)	C64	K2	N10	Eu1	172.0(8)
C52	C51	K2	$C16_{4}$	-63.6(12)	N4	K2	N10	Eu1	3.9(3)
C56	C51	K2	$C16_{4}$	61.0(8)	$C16_{4}$	K2	N10	Eu1	-91.2(4)
C50	C51	K2	$C16_{4}$	-174.3(7)	N9	K2	N10	Eu1	-74.6(4)
C52	C51	K2	N9	-163.9(13)	$C17_{4}$	K2	N10	Eu1	-111.1(4)
C56	C51	K2	N9	-39.3(7)	$C18_{4}$	K2	N10	Eu1	-136.2(3)
C50	C51	K2	N9	85.3(6)	$C13_{4}$	K2	N10	Eu1	107.9(4)
C52	C51	K2	$C17_{4}$	-77.0(12)	$C15_{4}$	K2	N10	Eu1	-89.5(5)
C56	C51	K2	$C17_{4}$	47.6(8)	$C19_{4}$	K2	N10	Eu1	-149.5(3)
C50	C51	K2	$C17_{4}$	172.2(7)	C51	K2	N10	Eu1	-21.0(4)

C52	C51	K2	C18$_4$	-67.8(13)	N6	C8	P1	C7	0.7(6)
C56	C51	K2	C18$_4$	56.8(8)	C9	C8	P1	C7	178.8(8)
C50	C51	K2	C18$_4$	-178.6(6)	K1^1	C8	P1	C7	-67.3(4)
C52	C51	K2	C13$_4$	77.4(13)	N6	C8	P1	K1^1	68.0(6)
C56	C51	K2	C13$_4$	-158.0(7)	C9	C8	P1	K1^1	-113.9(8)
C50	C51	K2	C13$_4$	-33.3(8)	N5	C7	P1	C8	-0.8(6)
C52	C51	K2	C15$_4$	-38.9(12)	C6	C7	P1	C8	-177.3(8)
C56	C51	K2	C15$_4$	85.7(8)	K1^1	C7	P1	C8	58.5(3)
C50	C51	K2	C15$_4$	-149.6(7)	N5	C7	P1	K1^1	-59.3(5)
C52	C51	K2	C19$_4$	-42.8(13)	C6	C7	P1	K1^1	124.2(8)
C56	C51	K2	C19$_4$	81.9(8)	N1	C36	P2	C35	-0.7(7)
C50	C51	K2	C19$_4$	-153.5(6)	C37	C36	P2	C35	-176.9(9)
C37	C36	N1	N2	177.9(8)	K1^1	C36	P2	C35	-72.6(4)
P2	C36	N1	N2	1.3(10)	N1	C36	P2	K1^1	71.9(6)
K1^1	C36	N1	N2	84.8(7)	C37	C36	P2	K1^1	-104.3(8)
C37	C36	N1	Eu1	-26(3)	N2	C35	P2	C36	-0.1(8)
P2	C36	N1	Eu1	158(2)	C34	C35	P2	C36	-178.0(12)
K1^1	C36	N1	Eu1	-119(3)	K1^1	C35	P2	C36	59.8(3)
C37	C36	N1	K1^1	93.1(8)	N2	C35	P2	K1^1	-59.9(7)
P2	C36	N1	K1^1	-83.5(5)	C34	C35	P2	K1^1	122.2(11)
N8	Eu1	N1	C36	-161(3)	N8	C22	P3	C21	0.9(7)
N4	Eu1	N1	C36	-2(3)	C23	C22	P3	C21	179.9(8)
N3	Eu1	N1	C36	13(3)	N7	C21	P3	C22	-0.7(8)
N7	Eu1	N1	C36	167(3)	C20	C21	P3	C22	178.5(9)
N6	Eu1	N1	C36	113(3)	N4	C50	P4	C49	-0.9(7)
N10	Eu1	N1	C36	-78(3)	C51	C50	P4	C49	178.8(10)
N2	Eu1	N1	C36	-158(3)	K2	C50	P4	C49	-83.9(4)
N9	Eu1	N1	C36	-79(3)	N4	C50	P4	K2	82.9(6)
N5	Eu1	N1	C36	83(3)	C51	C50	P4	K2	-97.3(10)

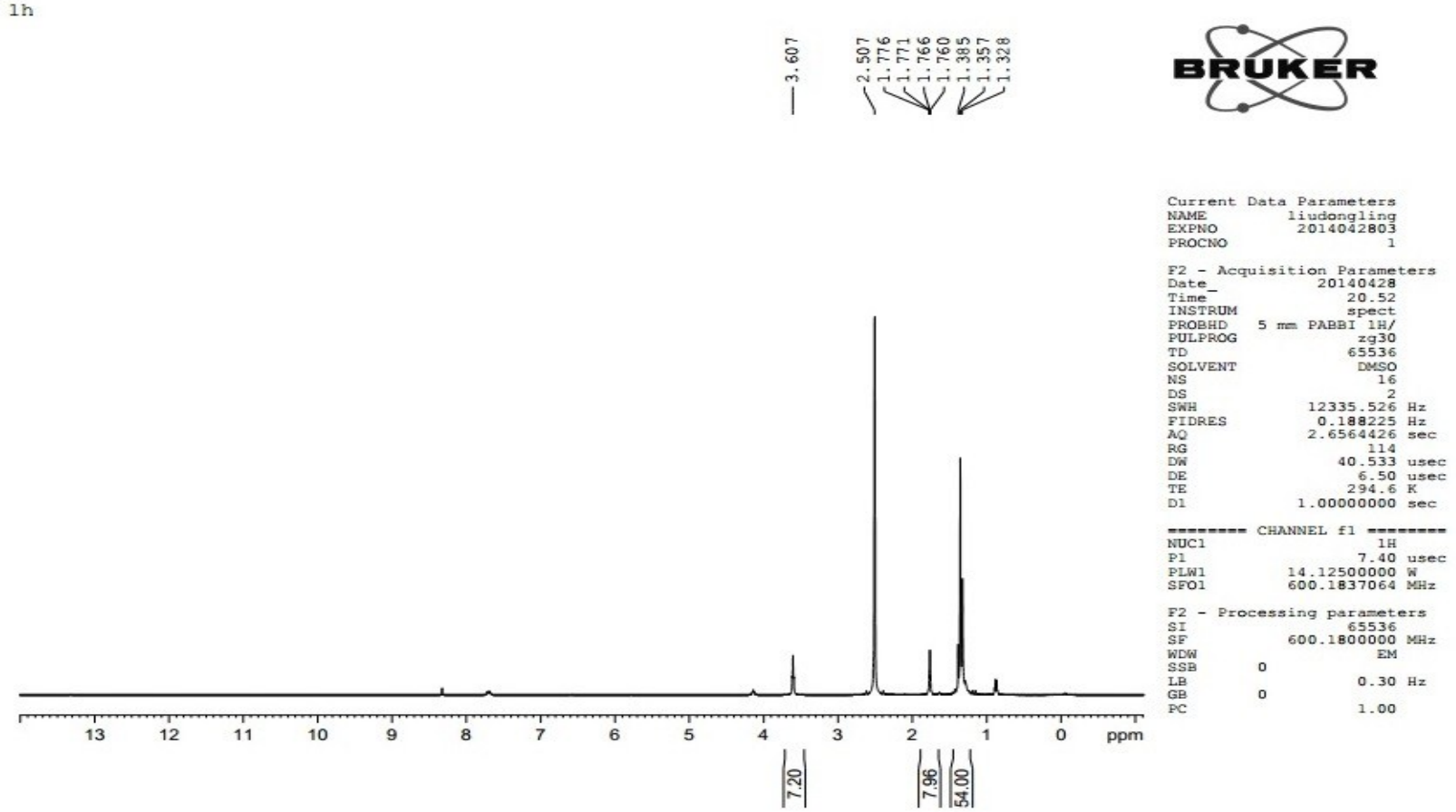
K1[1]	Eu1	N1	C36	116(3)	N3	C49	P4	C50	2.9(7)
K2	Eu1	N1	C36	-40(3)	C48	C49	P4	C50	-178.1(9)
N8	Eu1	N1	N2	-3.0(5)	N3	C49	P4	K2	-55.2(6)
N4	Eu1	N1	N2	156.6(5)	C48	C49	P4	K2	123.8(9)
N3	Eu1	N1	N2	171.7(4)	N10	K2	P4	C50	-64.0(5)
N7	Eu1	N1	N2	-34.9(6)	C64	K2	P4	C50	-79.8(5)
N6	Eu1	N1	N2	-88.5(5)	N4	K2	P4	C50	-34.9(4)
N10	Eu1	N1	N2	80.6(5)	$C16_4$	K2	P4	C50	61.8(5)
N9	Eu1	N1	N2	79.0(5)	N9	K2	P4	C50	-39.4(4)
N5	Eu1	N1	N2	-118.8(5)	$C17_4$	K2	P4	C50	56.8(6)
K1[1]	Eu1	N1	N2	-85.3(5)	$C18_4$	K2	P4	C50	87.3(6)
K2	Eu1	N1	N2	118.8(4)	$C13_4$	K2	P4	C50	-156.6(5)
N8	Eu1	N1	K1[1]	82.3(3)	$C15_4$	K2	P4	C50	83.5(5)
N4	Eu1	N1	K1[1]	-118.2(3)	$C19_4$	K2	P4	C50	112.6(5)
N3	Eu1	N1	K1[1]	-103.1(3)	C51	K2	P4	C50	25.7(5)
N7	Eu1	N1	K1[1]	50.3(4)	N10	K2	P4	C49	27.0(4)
N6	Eu1	N1	K1[1]	-3.3(2)	C50	K2	P4	C49	91.0(5)
N10	Eu1	N1	K1[1]	165.9(2)	C64	K2	P4	C49	11.2(4)
N2	Eu1	N1	K1[1]	85.3(5)	N4	K2	P4	C49	56.1(4)
N9	Eu1	N1	K1[1]	164.3(2)	$C16_4$	K2	P4	C49	152.8(4)
N5	Eu1	N1	K1[1]	-33.5(2)	N9	K2	P4	C49	51.6(4)
K2	Eu1	N1	K1[1]	-155.91(15)	$C17_4$	K2	P4	C49	147.8(5)
C36	N1	N2	C35	-1.3(11)	$C18_4$	K2	P4	C49	178.3(5)
Eu1	N1	N2	C35	-176.0(7)	$C13_4$	K2	P4	C49	-65.6(4)
K1[1]	N1	N2	C35	78.8(7)	$C15_4$	K2	P4	C49	174.5(4)
C36	N1	N2	Eu1	174.6(8)	$C19_4$	K2	P4	C49	-156.4(4)
K1[1]	N1	N2	Eu1	-105.2(2)	C51	K2	P4	C49	116.7(4)
C36	N1	N2	K1[1]	-80.1(7)	N10	C64	P5	C63	-2.0(7)
Eu1	N1	N2	K1[1]	105.2(2)	C65	C64	P5	C63	174.4(9)

C34	C35	N2	N1	178.8(10)	K2	C64	P5	C63	-73.4(4)
P2	C35	N2	N1	0.8(10)	N10	C64	P5	K2	71.3(6)
K1[1]	C35	N2	N1	-64.3(6)	C65	C64	P5	K2	-112.3(9)
C34	C35	N2	Eu1	49(8)	N9	C63	P5	C64	0.9(8)
P2	C35	N2	Eu1	-129(8)	C62	C63	P5	C64	-178.9(9)
K1[1]	C35	N2	Eu1	166(8)	N9	C63	P5	K2	-59.9(7)
C34	C35	N2	K1[1]	-116.9(11)	C62	C63	P5	K2	120.2(9)
P2	C35	N2	K1[1]	65.1(6)	N10	K2	P5	C64	-32.8(4)
N8	Eu1	N2	N1	177.4(5)	C50	K2	P5	C64	-68.3(5)
N4	Eu1	N2	N1	-27.1(5)	N4	K2	P5	C64	-55.8(4)
N3	Eu1	N2	N1	-14.4(8)	C16[4]	K2	P5	C64	-165.2(4)
N7	Eu1	N2	N1	156.3(4)	N9	K2	P5	C64	-68.1(4)
N6	Eu1	N2	N1	87.7(5)	C17[4]	K2	P5	C64	-173.7(5)
N10	Eu1	N2	N1	-112.9(5)	C18[4]	K2	P5	C64	160.6(4)
N9	Eu1	N2	N1	-97.6(5)	C13[4]	K2	P5	C64	51.1(4)
N5	Eu1	N2	N1	59.3(5)	C15[4]	K2	P5	C64	-179.3(4)
K1[1]	Eu1	N2	N1	63.1(4)	C19[4]	K2	P5	C64	147.3(4)
K2	Eu1	N2	N1	-73.3(5)	C51	K2	P5	C64	-96.8(4)
N8	Eu1	N2	C35	-52(8)	N10	K2	P5	C63	61.8(4)
N1	Eu1	N2	C35	131(8)	C50	K2	P5	C63	26.3(4)
N4	Eu1	N2	C35	104(8)	C64	K2	P5	C63	94.6(5)
N3	Eu1	N2	C35	116(8)	N4	K2	P5	C63	38.8(4)
N7	Eu1	N2	C35	-73(8)	C16[4]	K2	P5	C63	-70.6(4)
N6	Eu1	N2	C35	-142(8)	N9	K2	P5	C63	26.5(4)
N10	Eu1	N2	C35	18(8)	C17[4]	K2	P5	C63	-79.1(4)
N9	Eu1	N2	C35	33(8)	C18[4]	K2	P5	C63	-104.8(4)
N5	Eu1	N2	C35	-170(8)	C13[4]	K2	P5	C63	145.7(4)
K1[1]	Eu1	N2	C35	-166(8)	C15[4]	K2	P5	C63	-84.7(4)
K2	Eu1	N2	C35	57(8)	C19[4]	K2	P5	C63	-118.1(4)

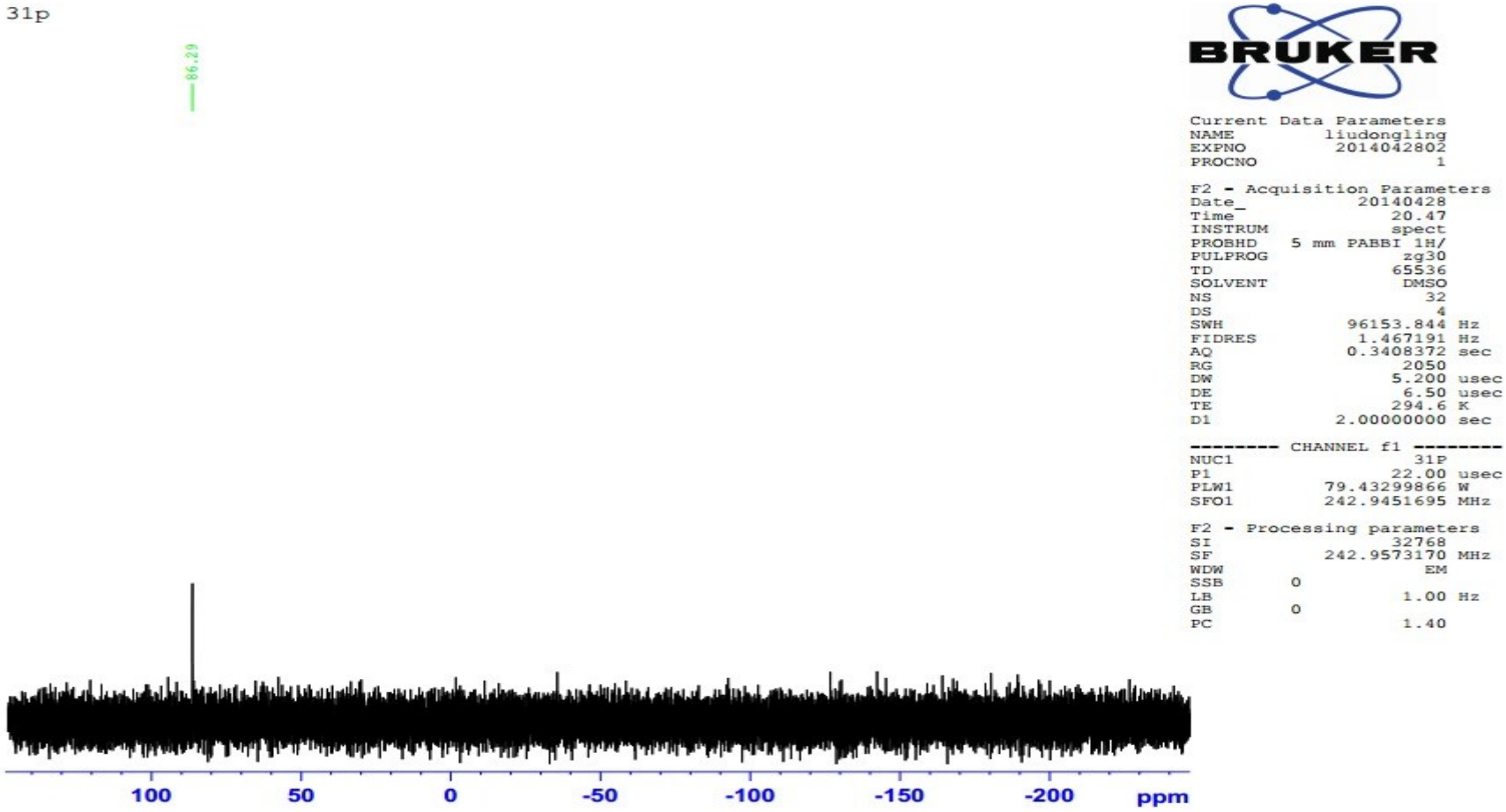
N8 Eu1 N2 K1[1] 114.3(2) C51 K2 P5 C63 -2.2(4)

[1]1/2-X, -Y, -1/2+Z; [2]-X, -1/2+Y, 1/2-Z; [3]1/2-X, -Y, 1/2+Z; [4]-X, 1/2+Y, 1/2-Z

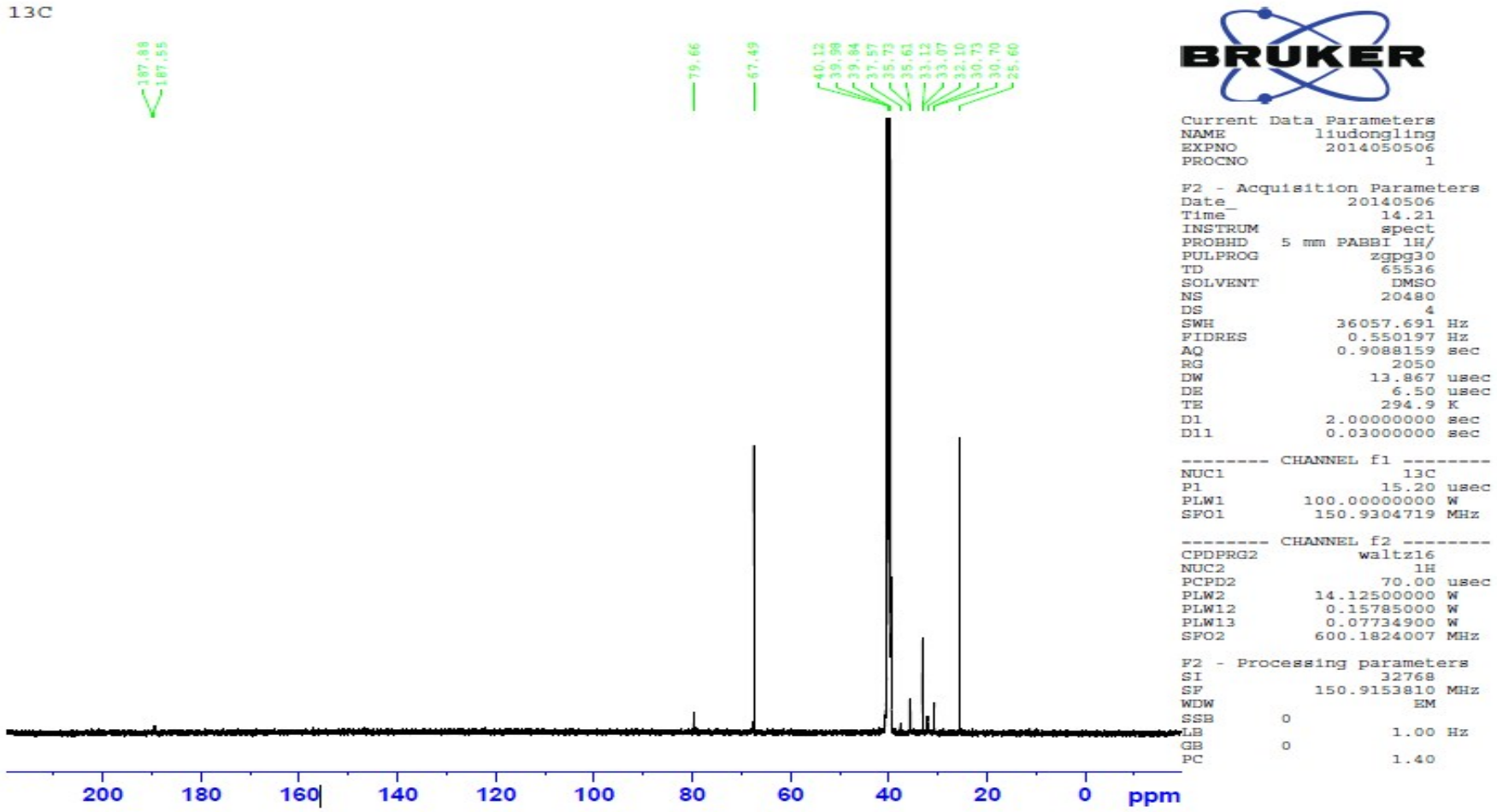
S2-1-1. The ^{1}H NMR spectrum of **2**



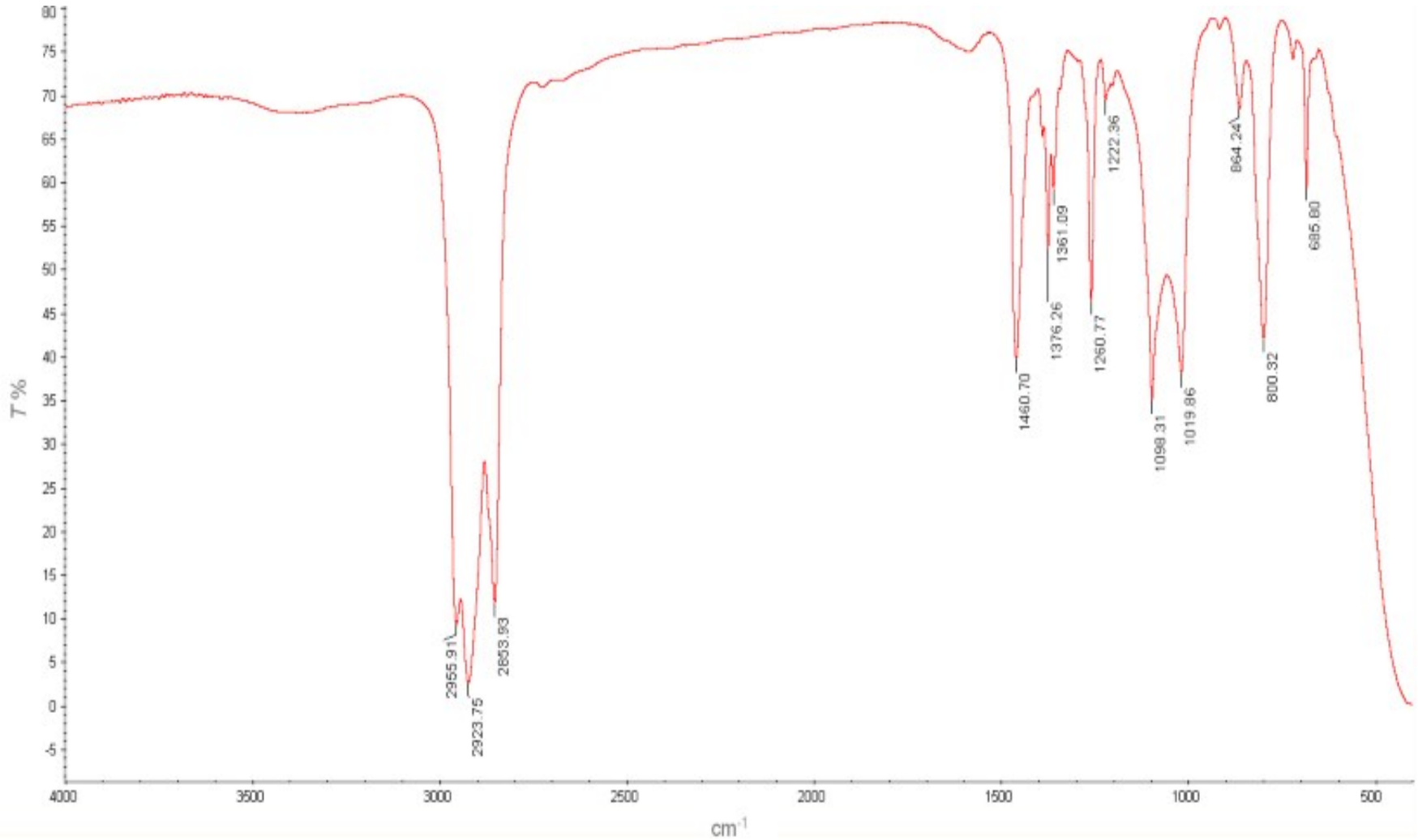
S2-1-2. The $^{31}P\{^{1}H\}$ spectrum of **2**



S2-1-3. The $^{13}C\{^{1}H\}$ spectrum of **2**

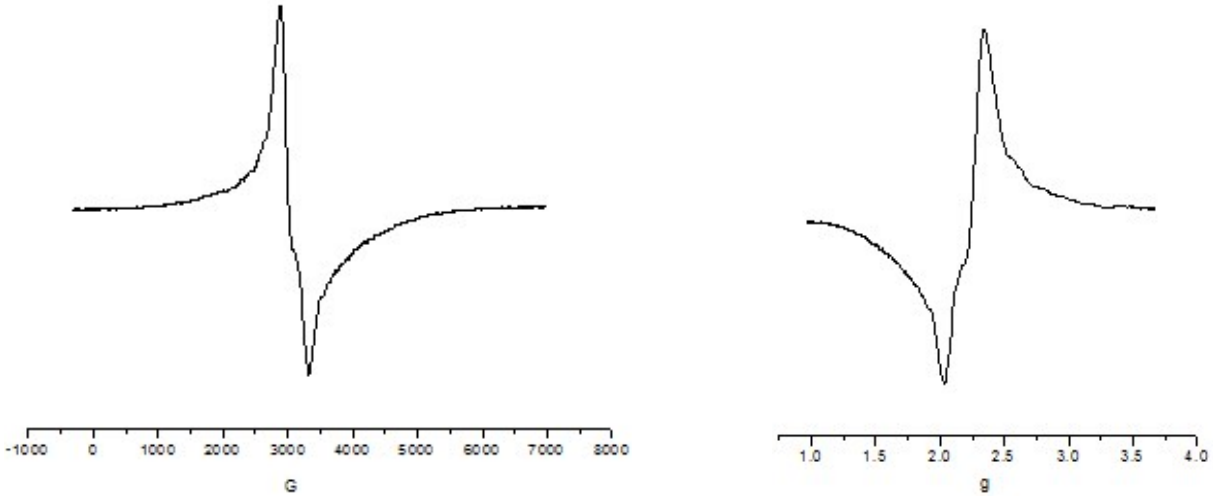


S2-1-4. The IR spectrum of **2**

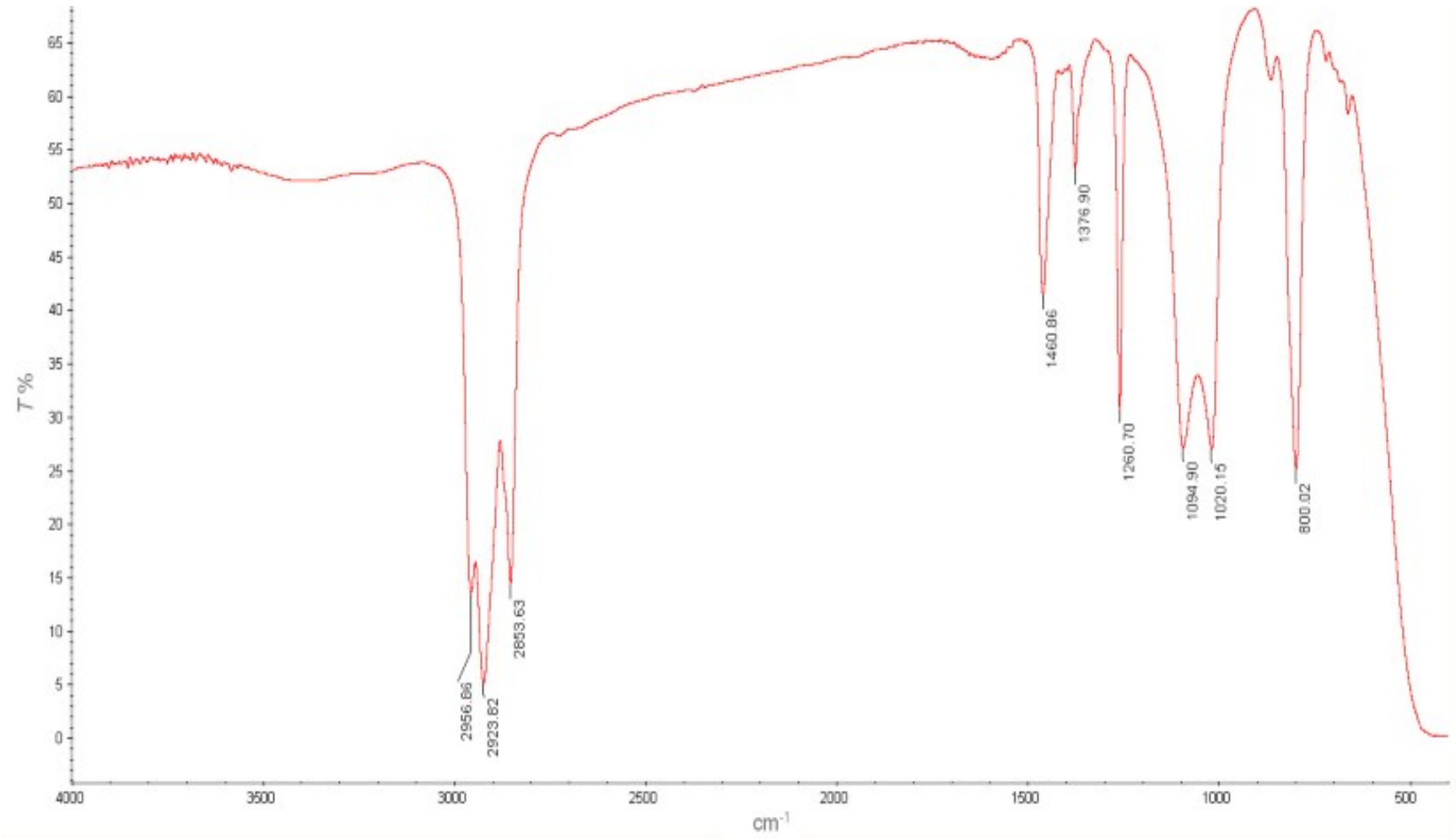


S2-2-1. The EPR spectrum of **3**

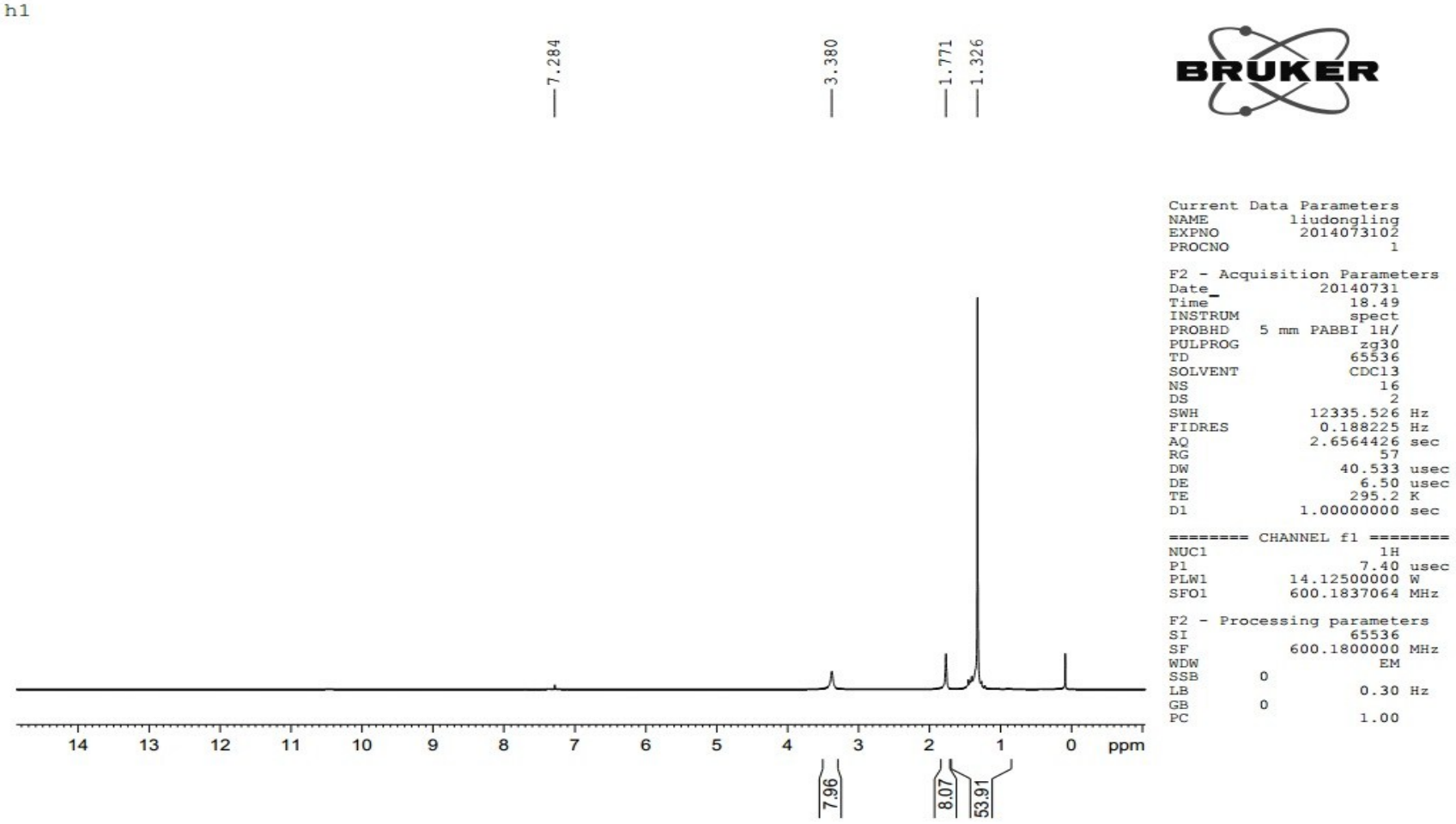
EPR measurements were carried out on a Bruker ESP-A300-10 \ 12 spectrometer at the X-band with a high sensitivity resonator at room temperature. General instrument settings are as follows: microwave frequency 9.5 GHz; microwave power, 22.8 mW; modulation amplitude,10 G; modulation frequency, 100 kHz; receiver gain 1.00×10^3; time constant, 164 ms; and conversion time, 82ms. Complex **3** was measured in a fine powder at 298K.



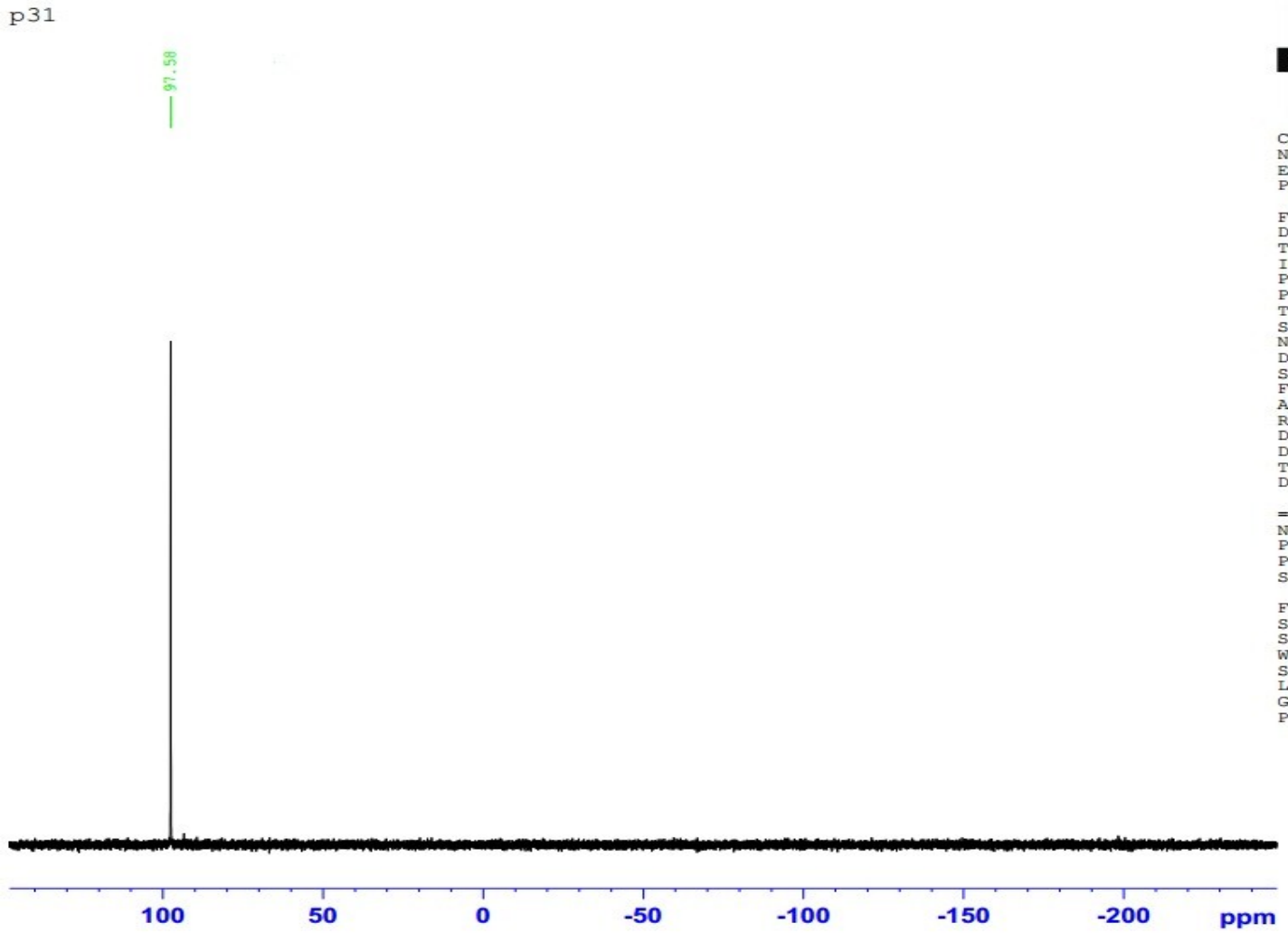
S2-2-2. The IR spectrum of **3**



S2-3-1. The ^{1}H NMR spectrum of **4**



S2-3-2. The $^{31}P\{^{1}H\}$ spectrum of **4**

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PROCNO                 1

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DE                6.50 usec
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D1           2.00000000 sec

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SFO1        242.9451695 MHz

F2 - Processing parameters
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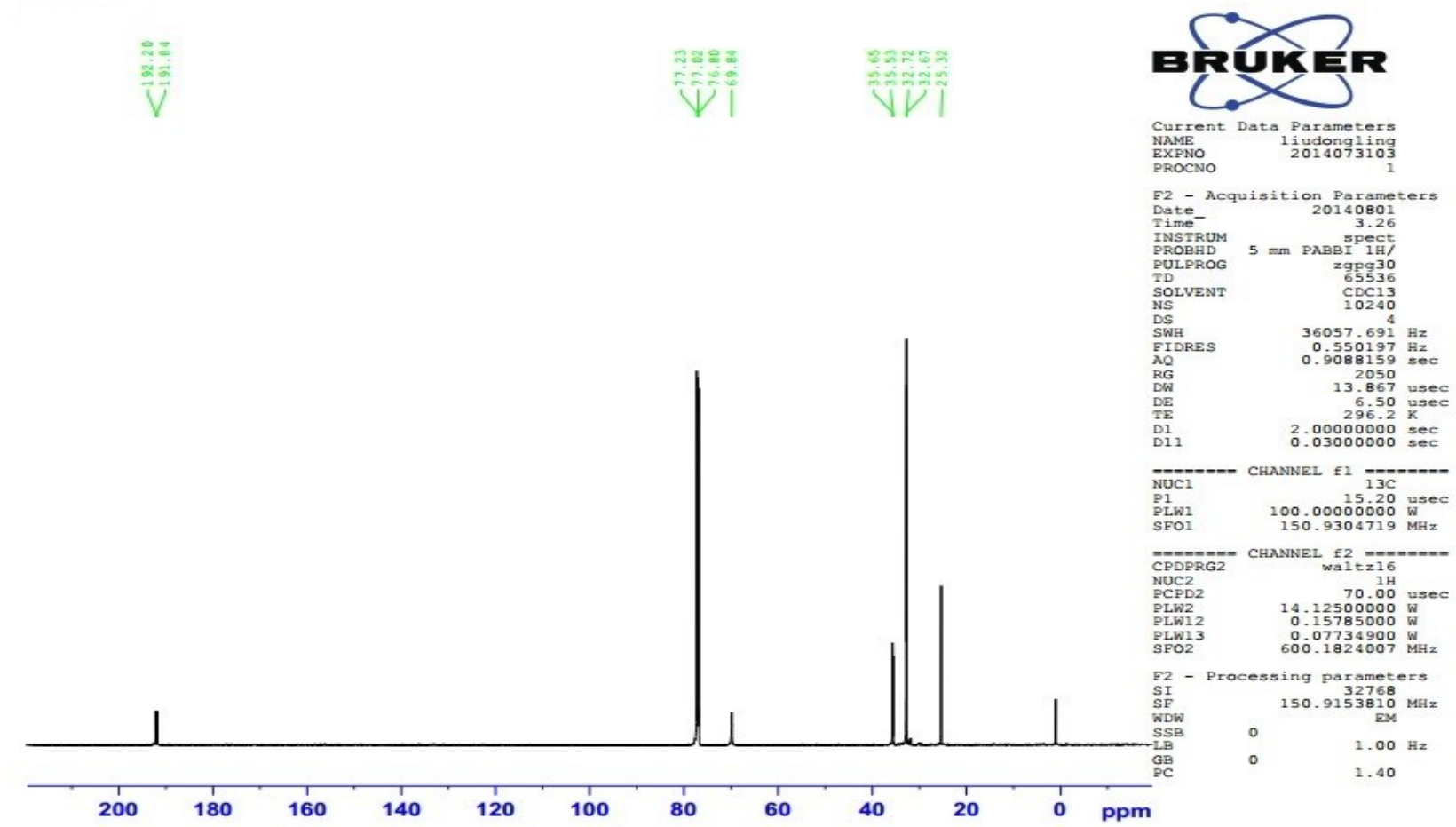
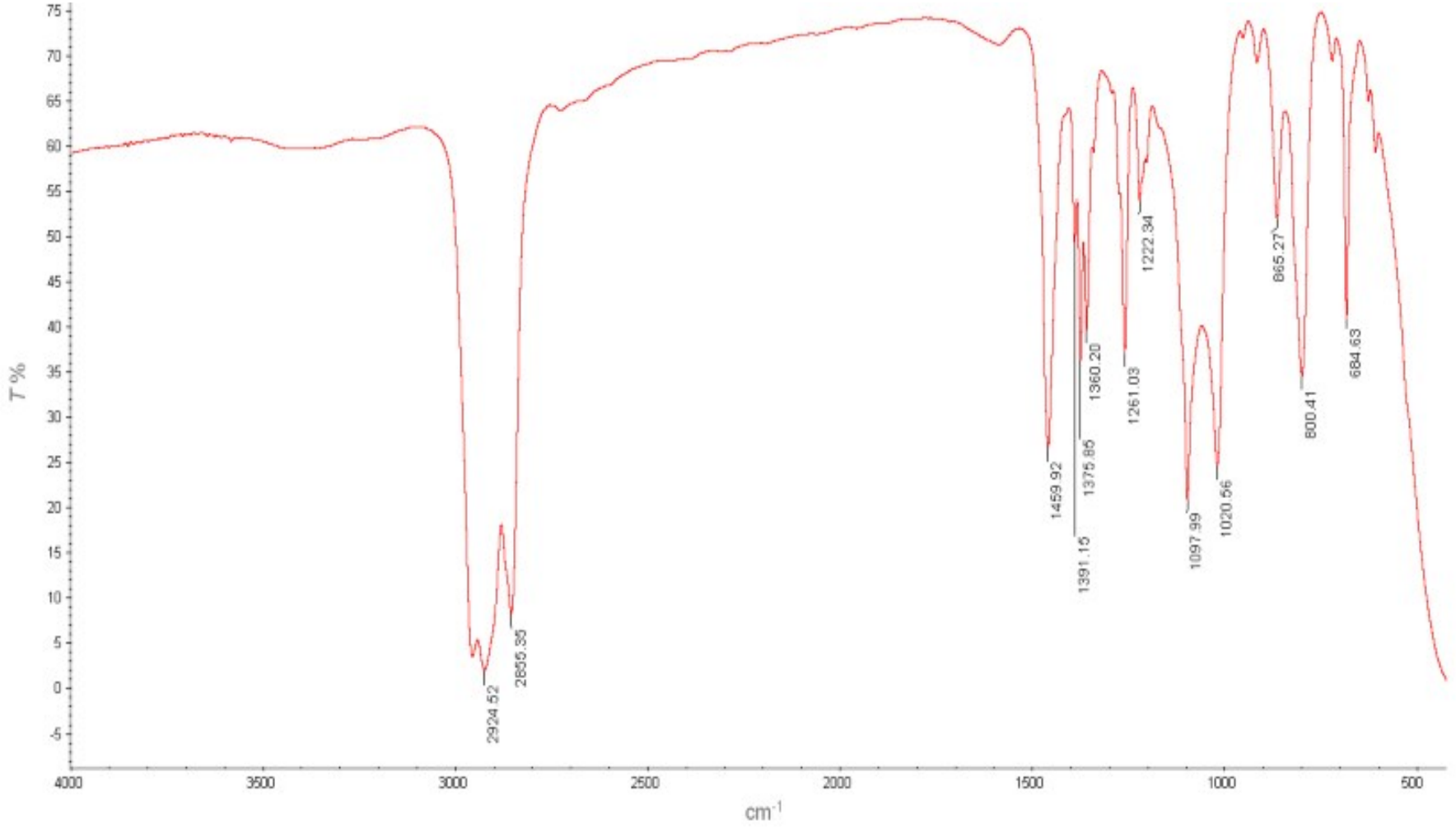
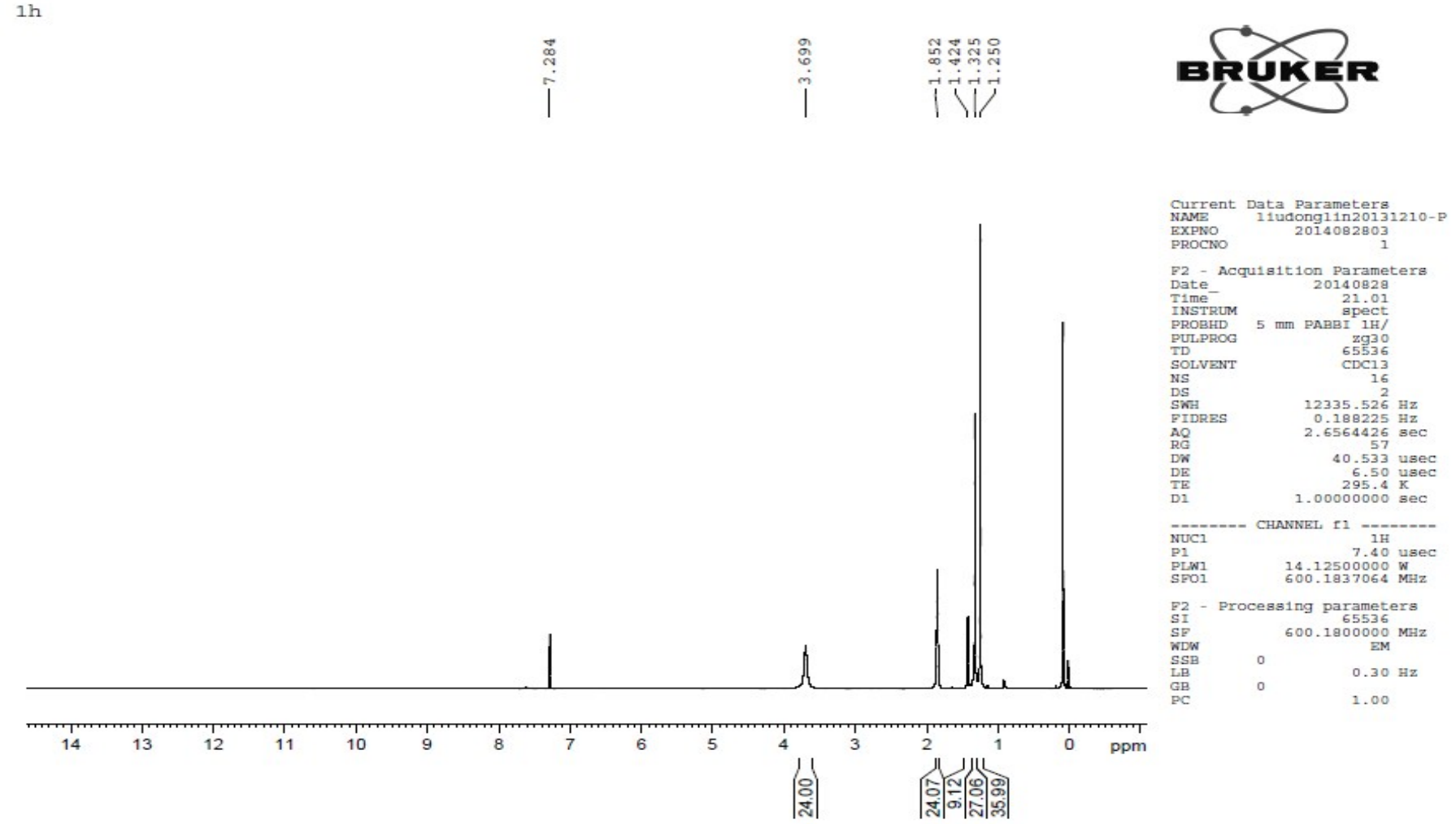
S2-3-3. The $^{13}C\{^{1}H\}$ spectrum of **4**



S2-3-4. The IR spectrum of **4**



S2-4-1. The ^{1}H NMR spectrum of **5**

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PROCNO                  1

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TE                295.4 K
D1             1.00000000 sec

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PLW1         14.12500000 W
SFO1         600.1837064 MHz

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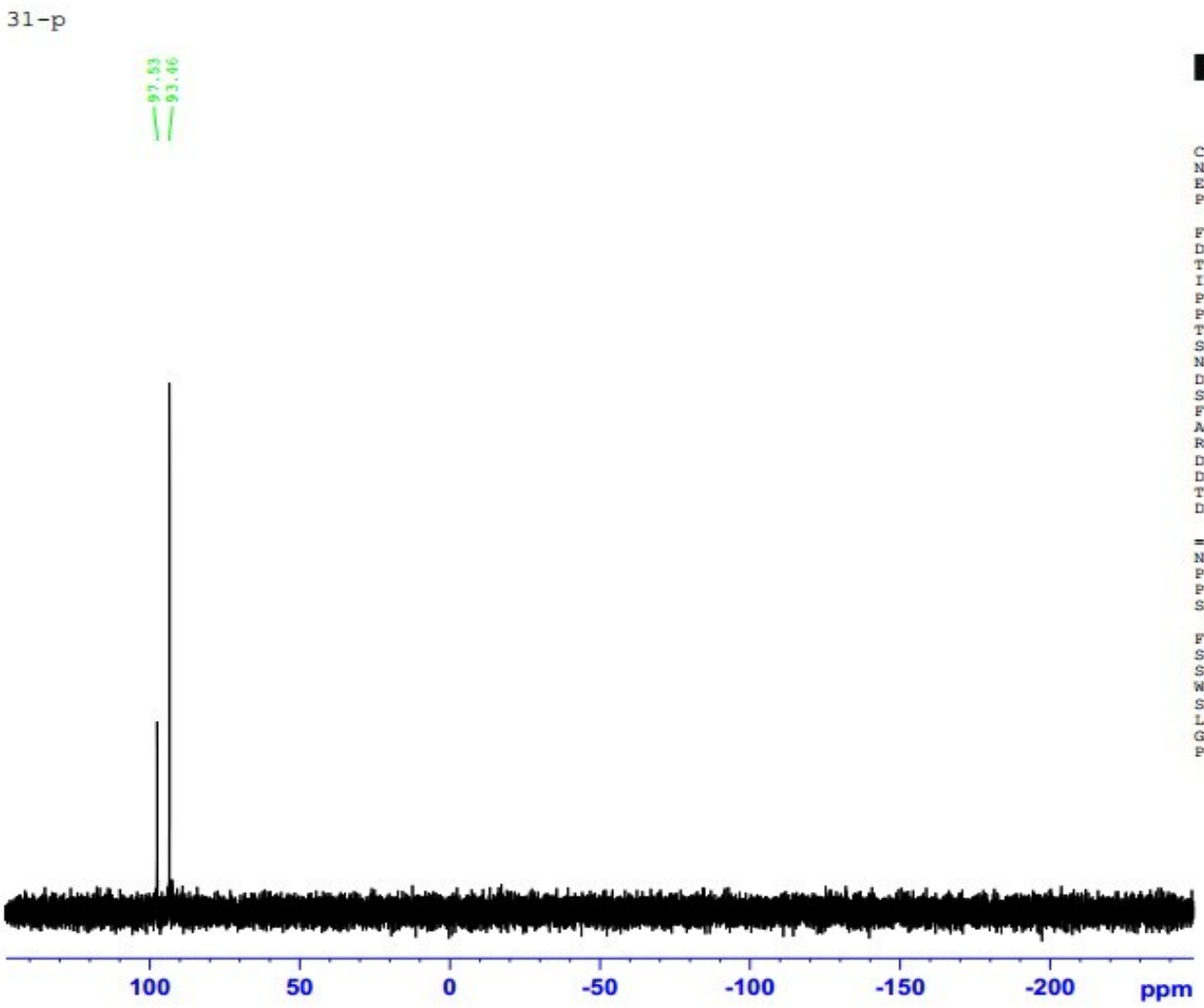
S2-4-2. The $^{31}P\{^{1}H\}$ spectrum of **5**

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FIDRES         1.467191 Hz
AQ             0.3408372 sec
RG                2050
DW                5.200 usec
DE                6.50 usec
TE               295.5 K
D1            2.00000000 sec

======== CHANNEL f1 ========
NUC1                31P
P1                22.00 usec
PLW1        79.43299866 W
SFO1       242.9451695 MHz

F2 - Processing parameters
SI                32768
SF         242.9573170 MHz
WDW                  EM
SSB       0
LB                1.00 Hz
GB        0
PC                1.40
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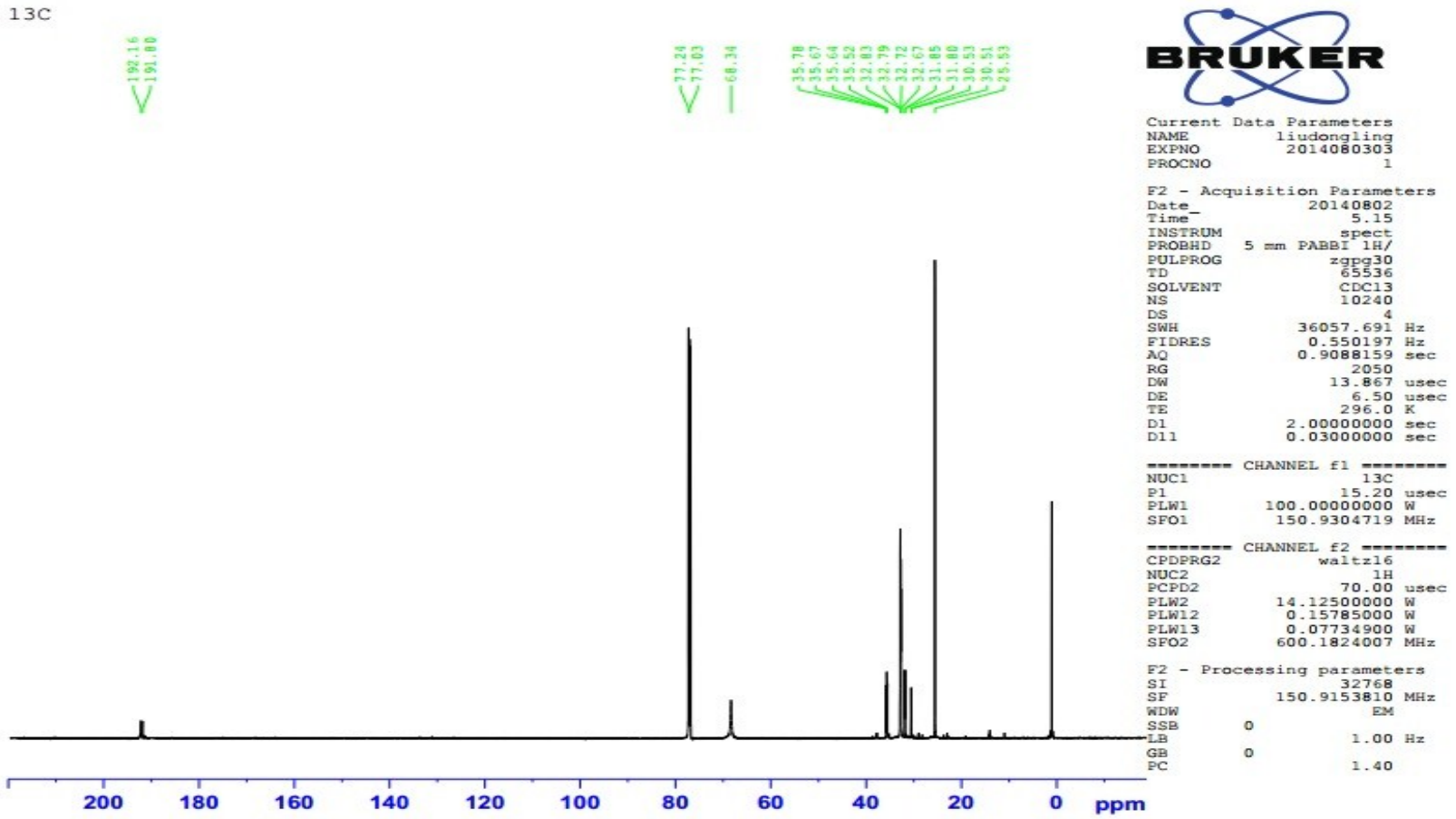
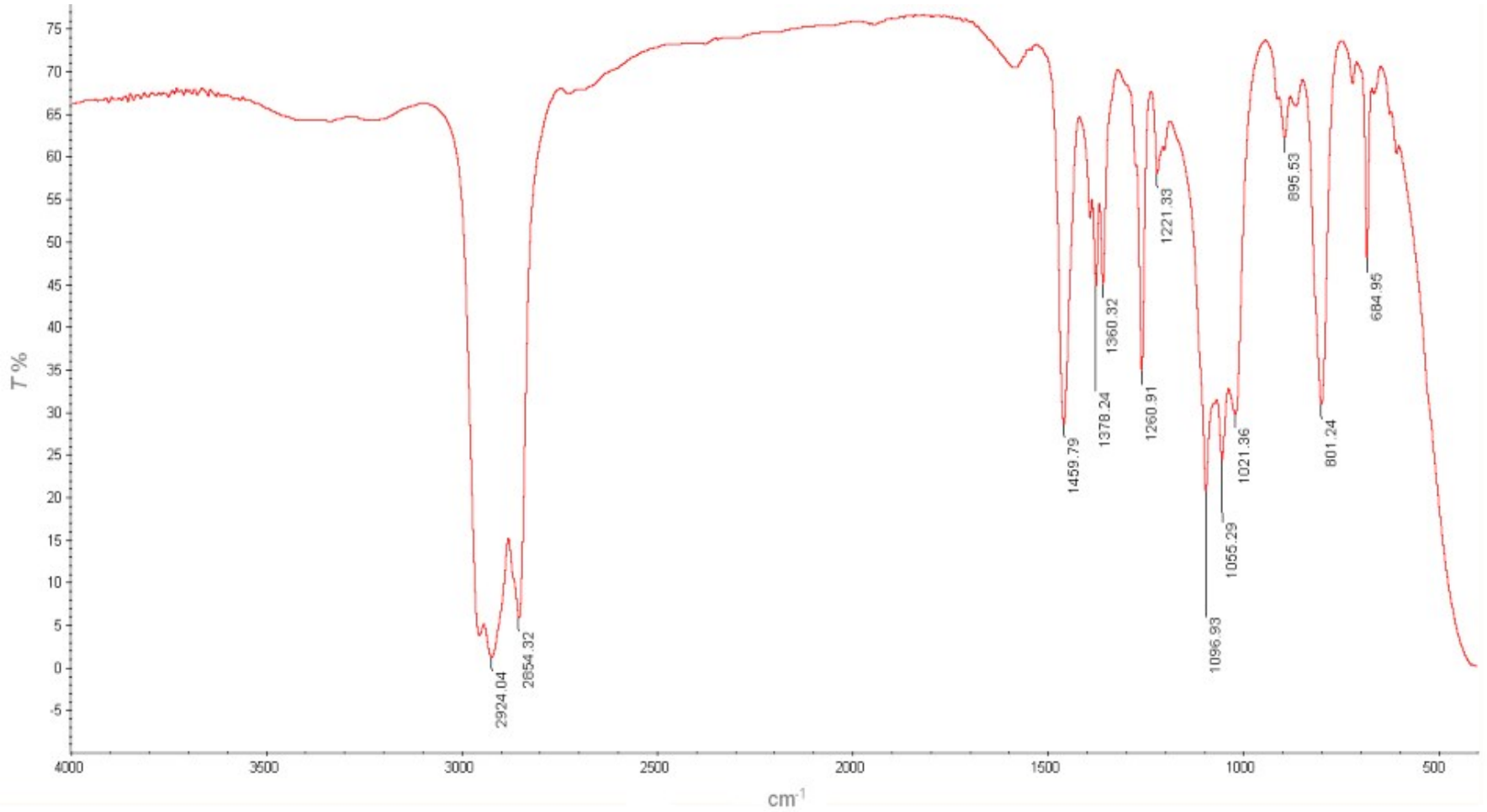
S2-4-3. The $^{13}C\{^{1}H\}$ spectrum of **5**

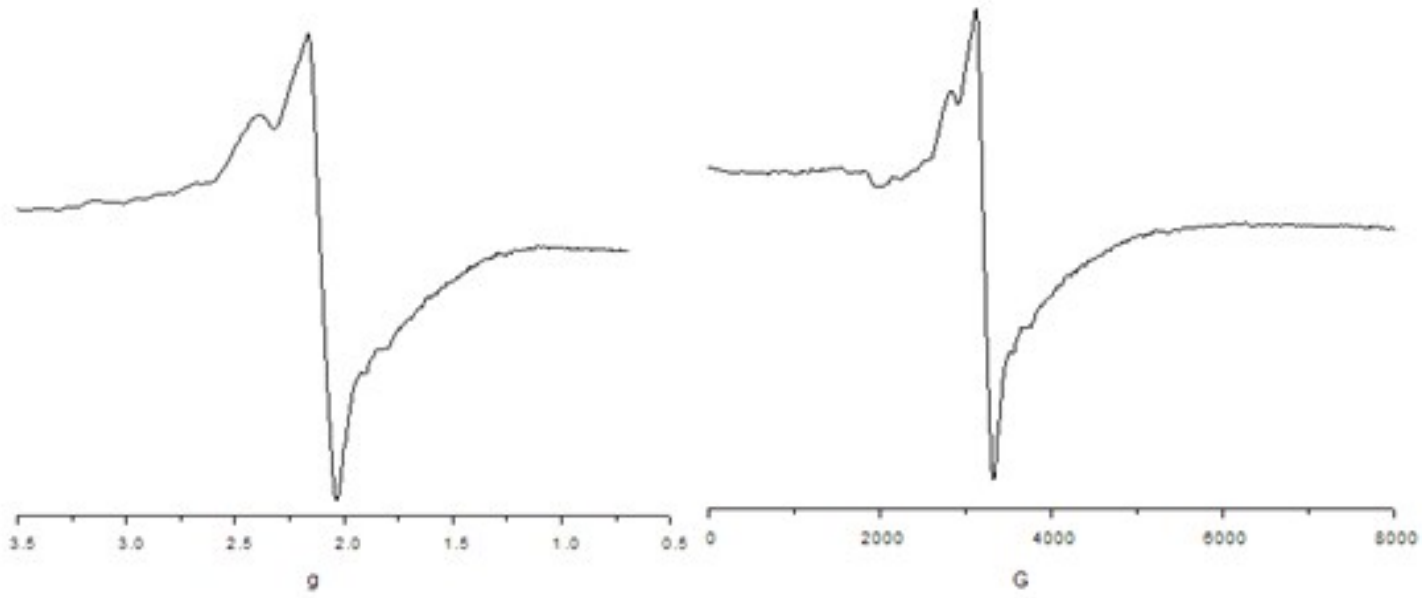


S2-4-4. The IR spectrum of **5**

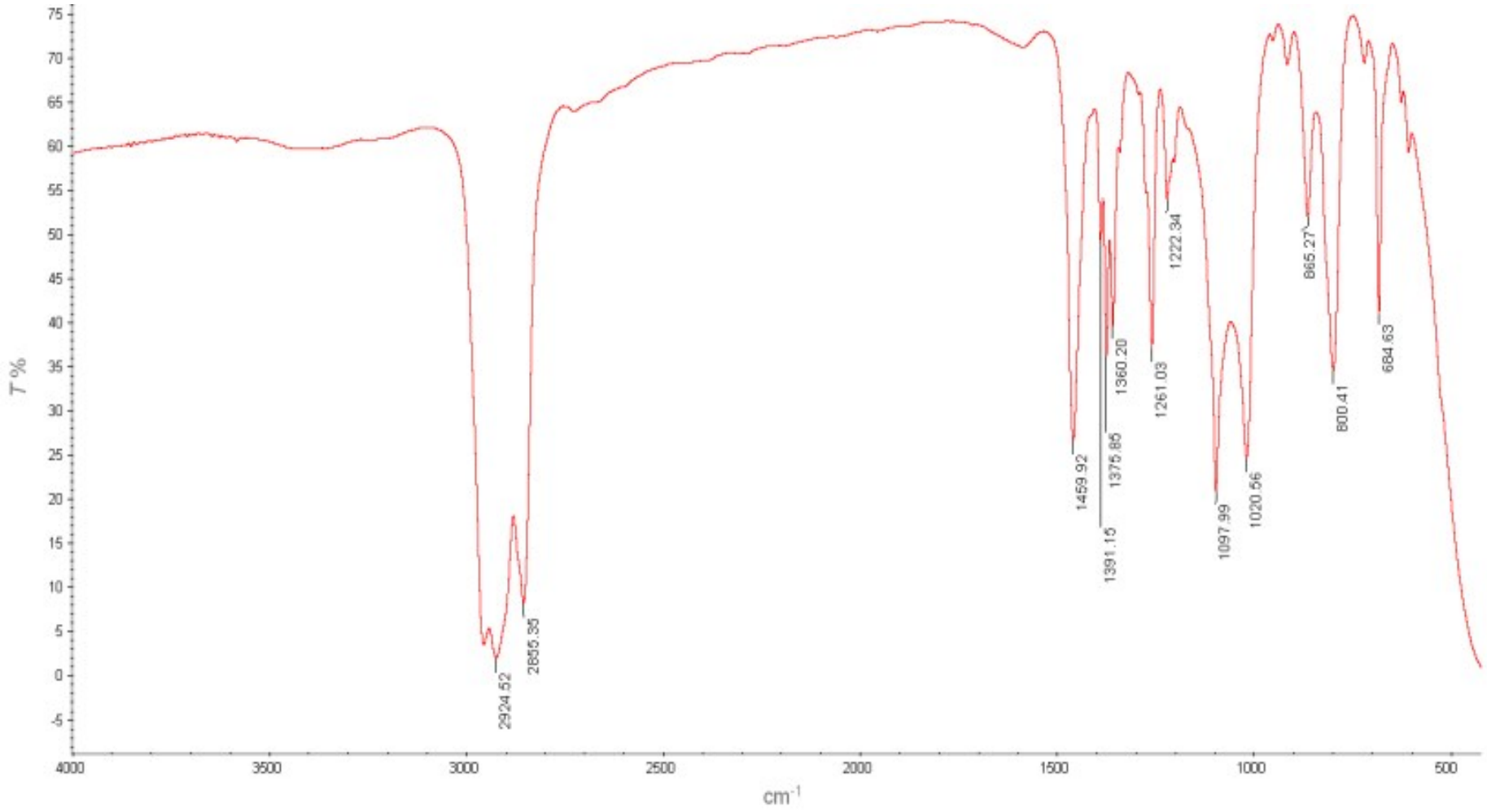


S2-5-1. The EPR spectrum of **6**

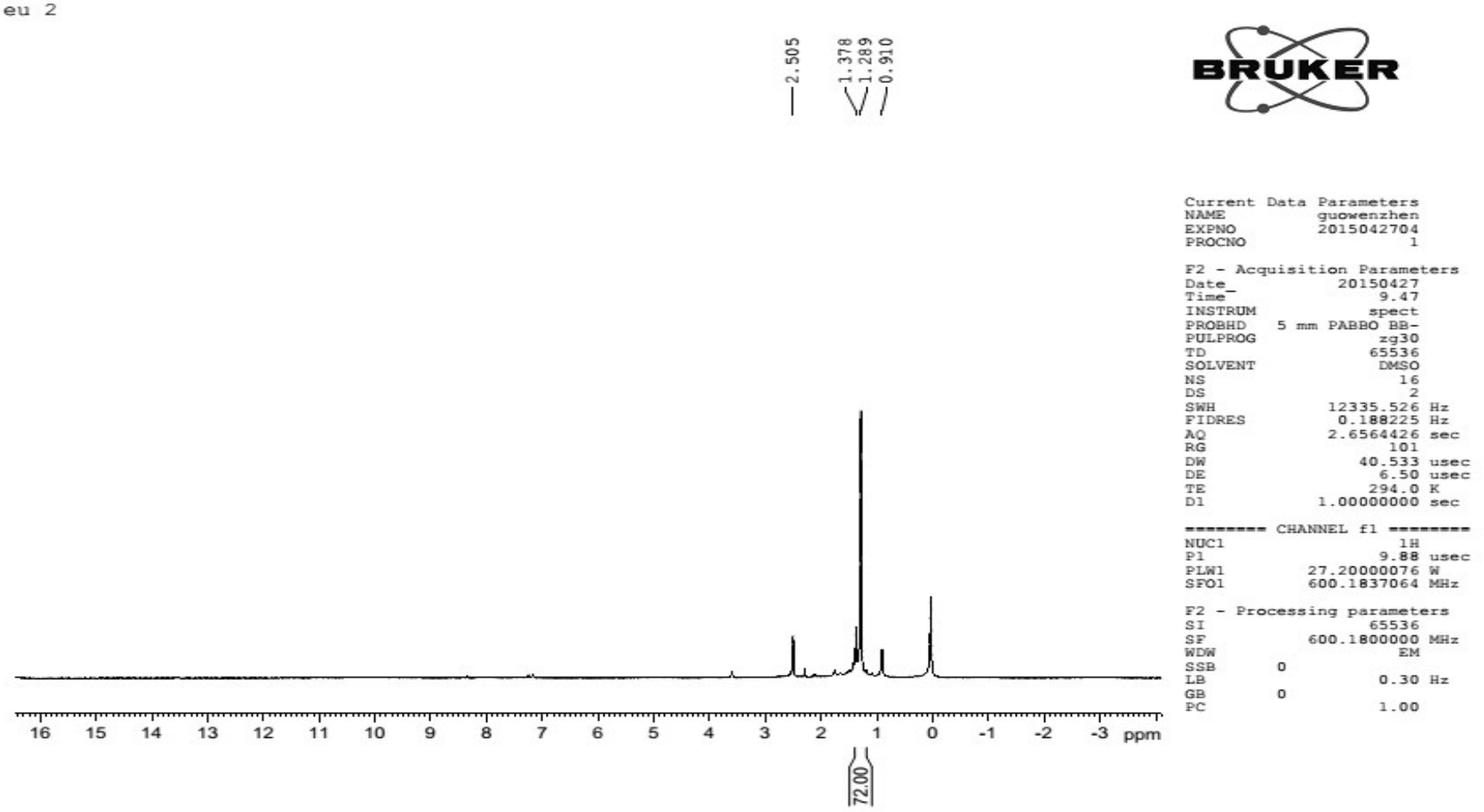
EPR measurements were carried out on a Bruker ESP-A300-10 \ 12 spectrometer at the X-band with a high sensitivity resonator at room temperature. General instrument settings are as follows: microwave frequency 9.4 GHz; microwave power, 22.2 mW; modulation amplitude,10 G; modulation frequency, 100 kHz; receiver gain 1.00×10^3; time constant, 164 ms; and conversion time, 82ms. The sample were measured in a fine powder at 298K.



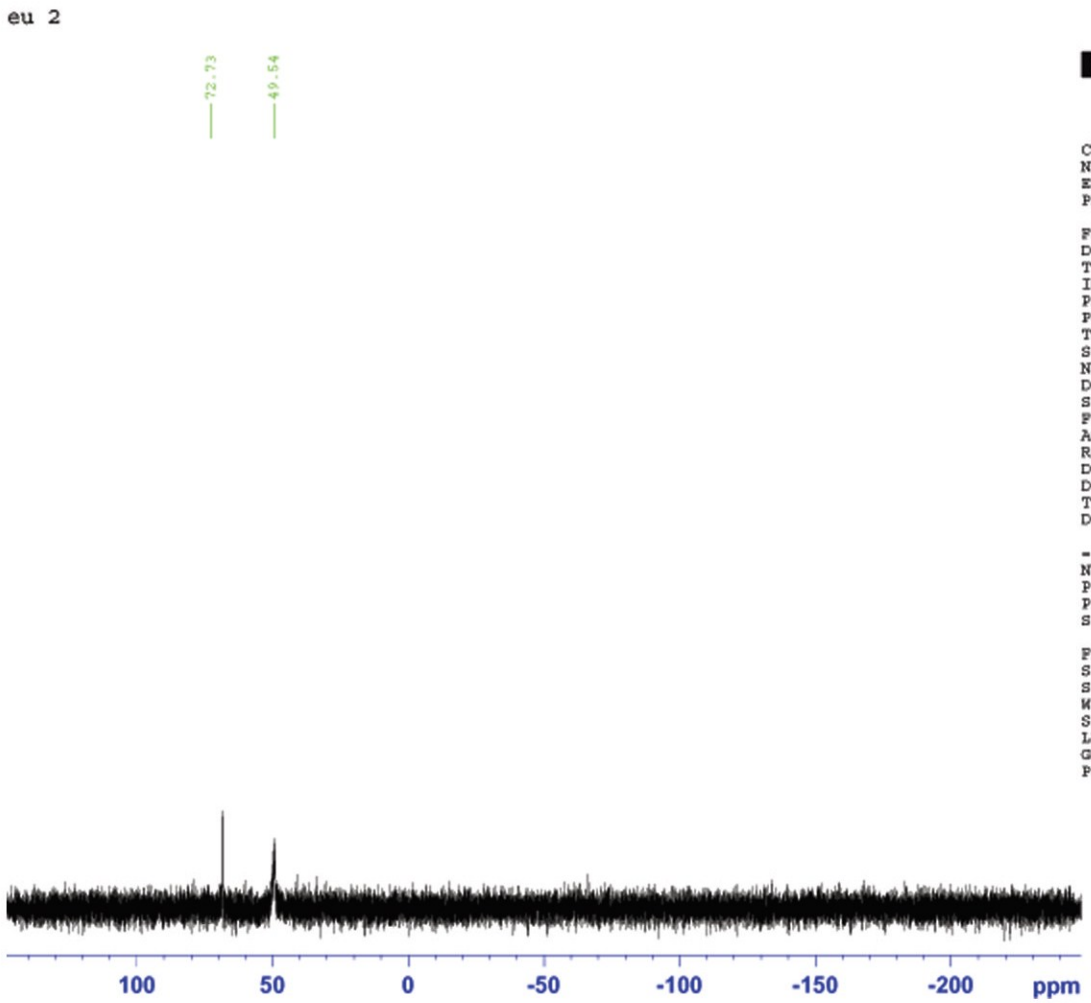
S2-5-2. The IR spectrum of **6**



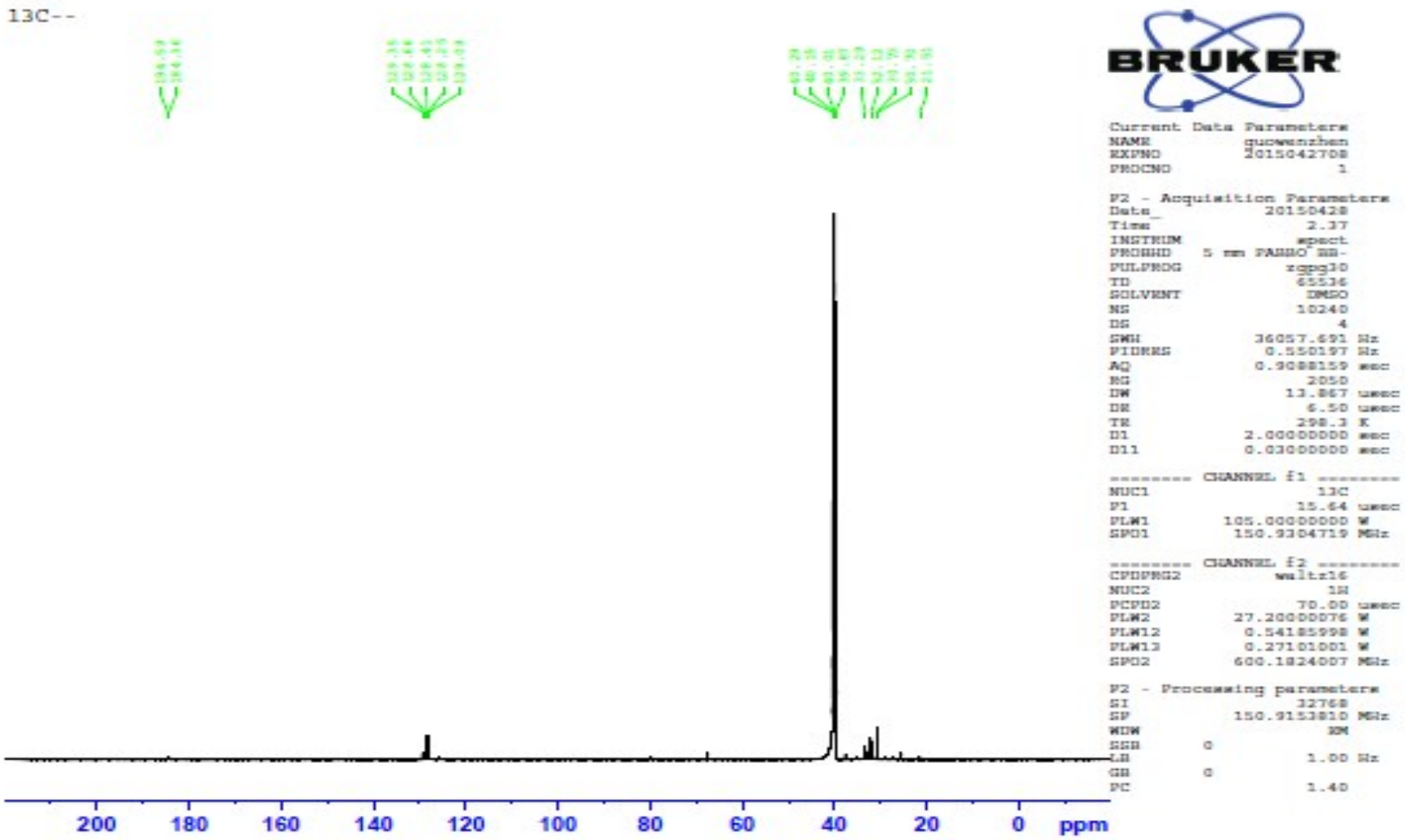
S2-6-1. The ^{1}H NMR spectrum of **7**



S2-6-2. The $^{31}P\{^{1}H\}$ spectrum of **7**

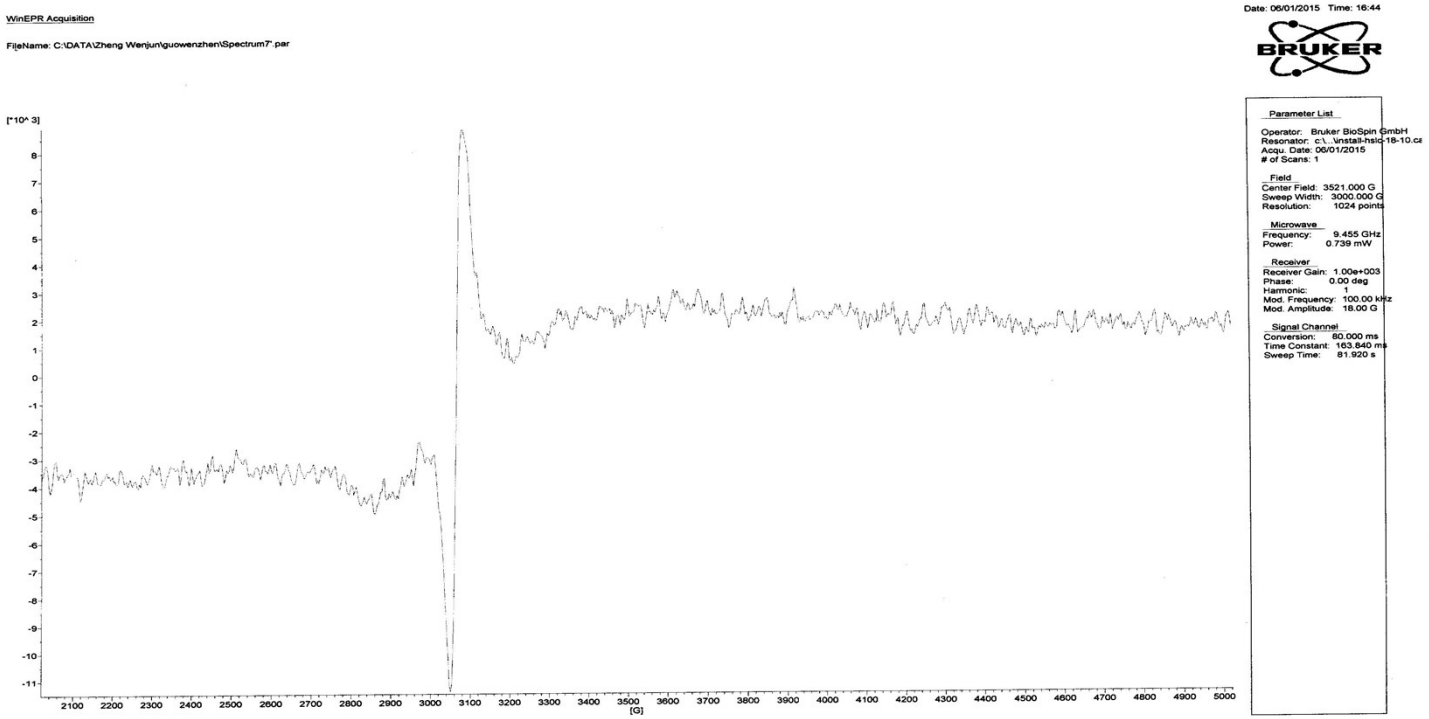


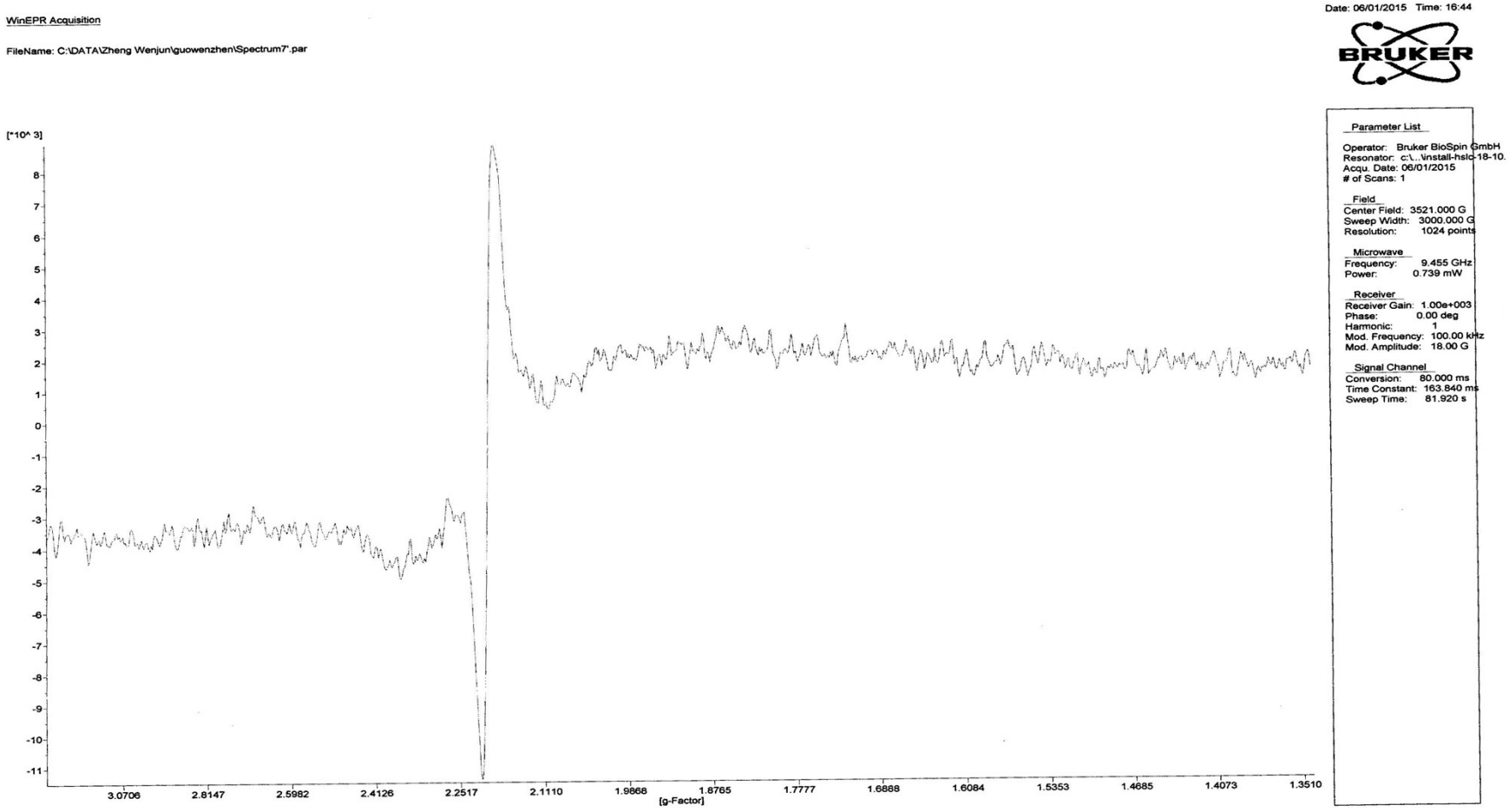
S2-6-3. The $^{13}C\{^{1}H\}$ spectrum of **7**



S2-6-4. The EPR spectra of **7**

EPR measurements were carried out on a Bruker ESP-A300-10 \ 12 spectrometer at the X-band with a high sensitivity resonator at room temperature. General instrument settings are as follows: microwave frequency 9.4 GHz; microwave power, 0.739 mW; modulation amplitude,18 G; modulation frequency, 100 kHz; receiver gain 1.00×10^3; time constant, 164 ms; and conversion time, 80ms. Complex **7** was measured in THF solution at 77K.

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Resolution: 1024 points
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Power: 0.739 mW
Receiver
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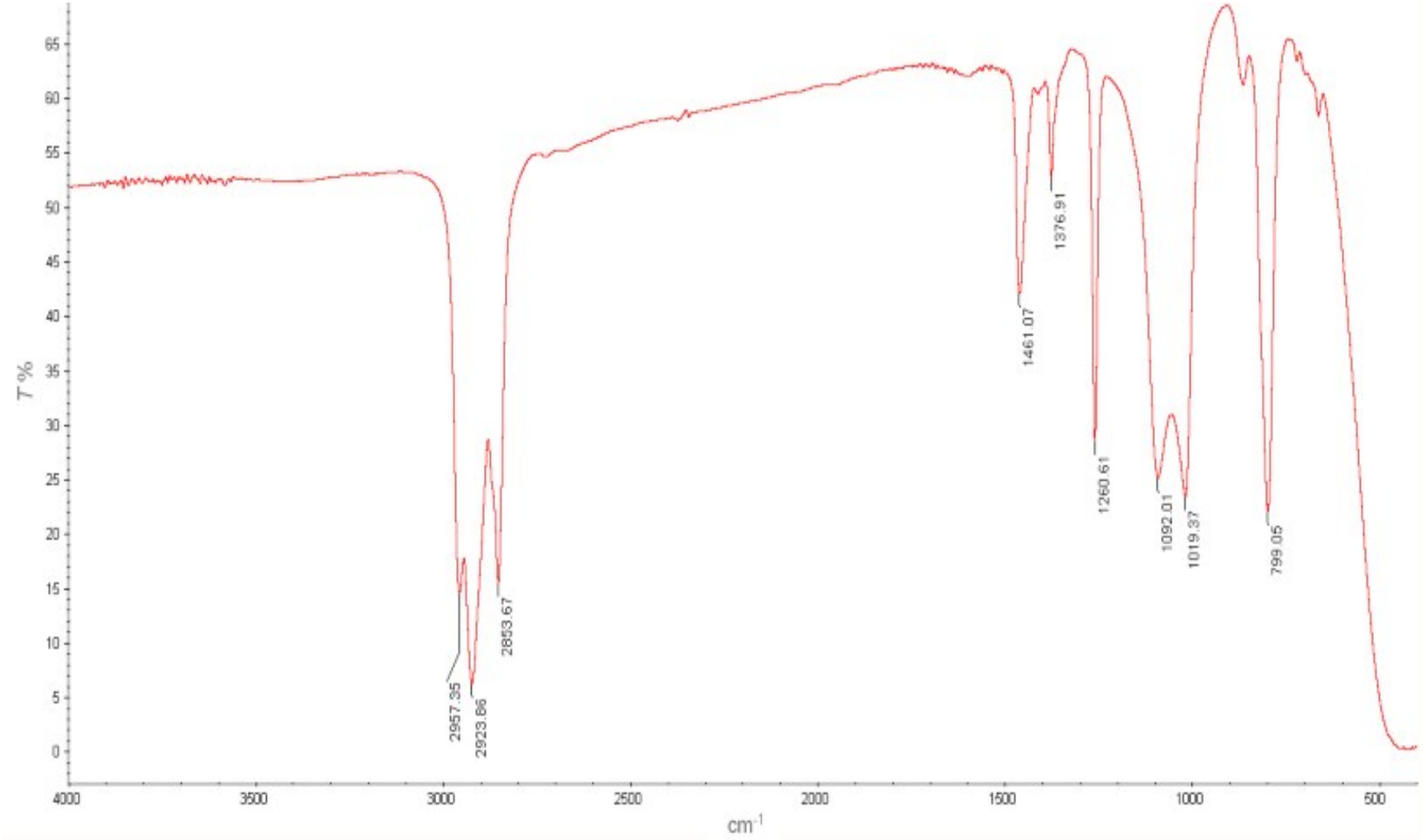
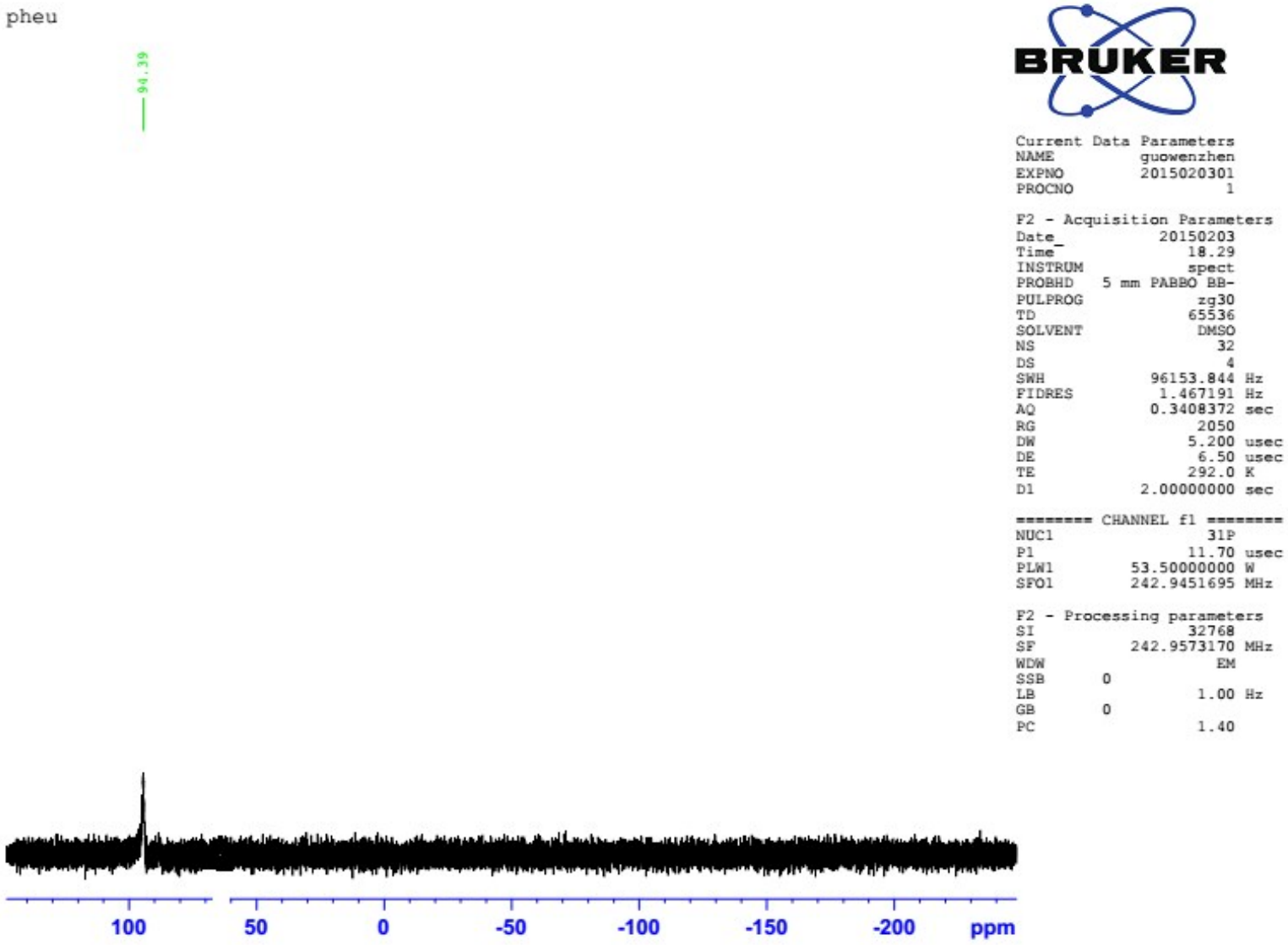
S2-6-5. The IR spectrum of **7**

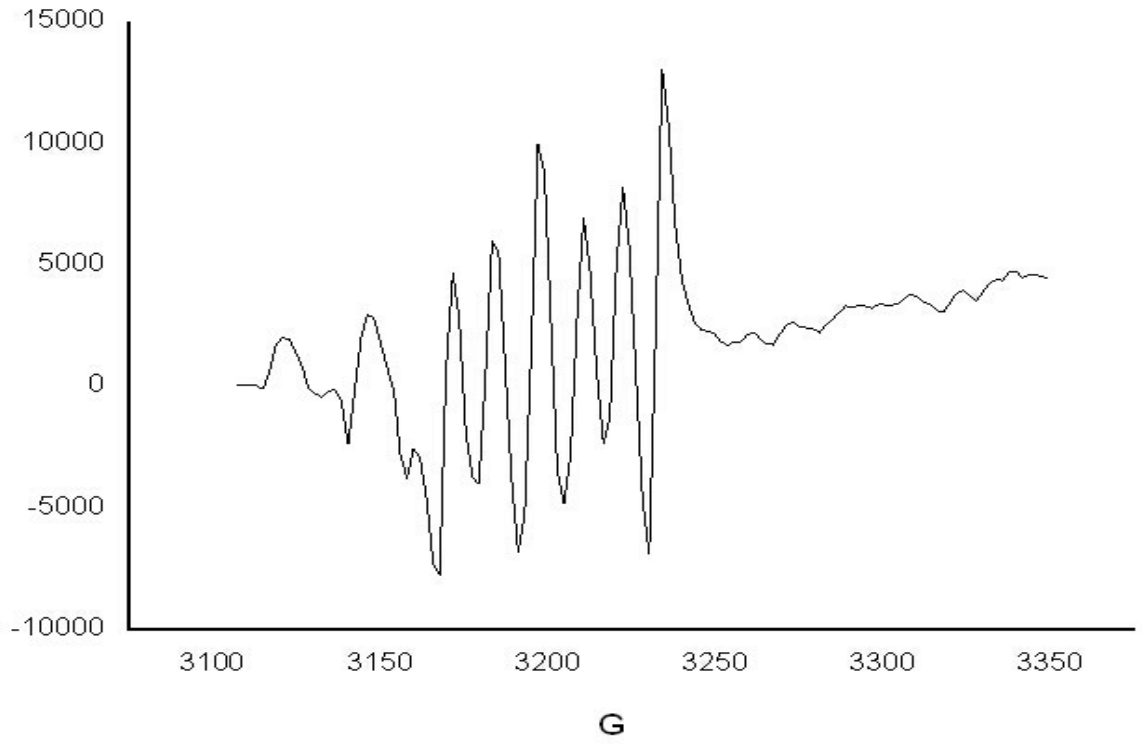


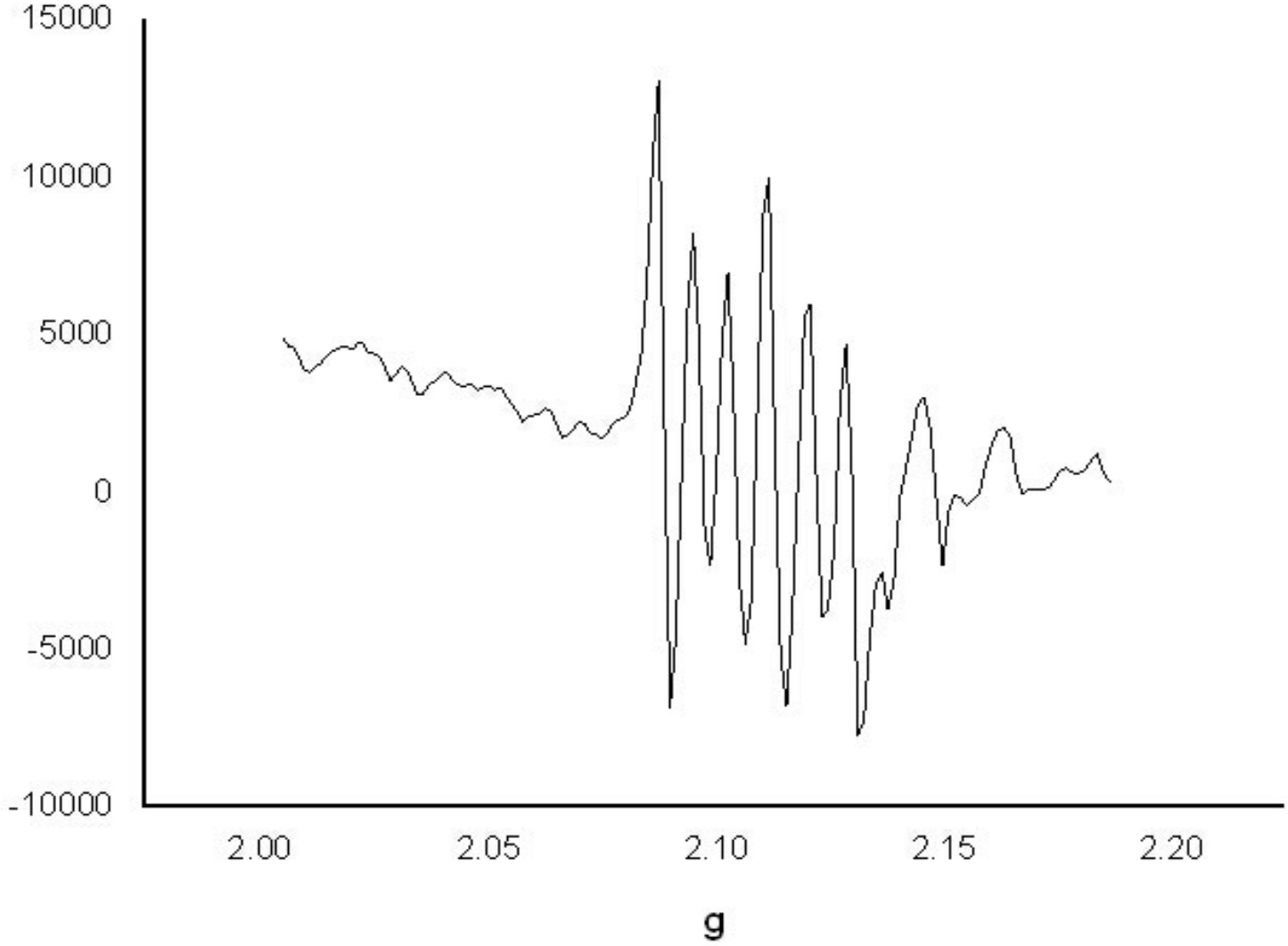
S2-7-1. The $^{31}P\{^{1}H\}$ spectrum of **8**



S2-7-2. The EPR spectra of **8**

EPR measurements were carried out on a Bruker ESP-A300-10 \ 12 spectrometer at the X-band with a high sensitivity resonator at room temperature. General instrument settings are as follows: microwave frequency 9.5 GHz; microwave power,22.6 mW; modulation amplitude,18 G; modulation frequency, 100 kHz; receiver gain 1.00×10^3; time constant, 164 ms; and conversion time, 80 ms. Complex **8** was measured in a frozen THF at 77K.

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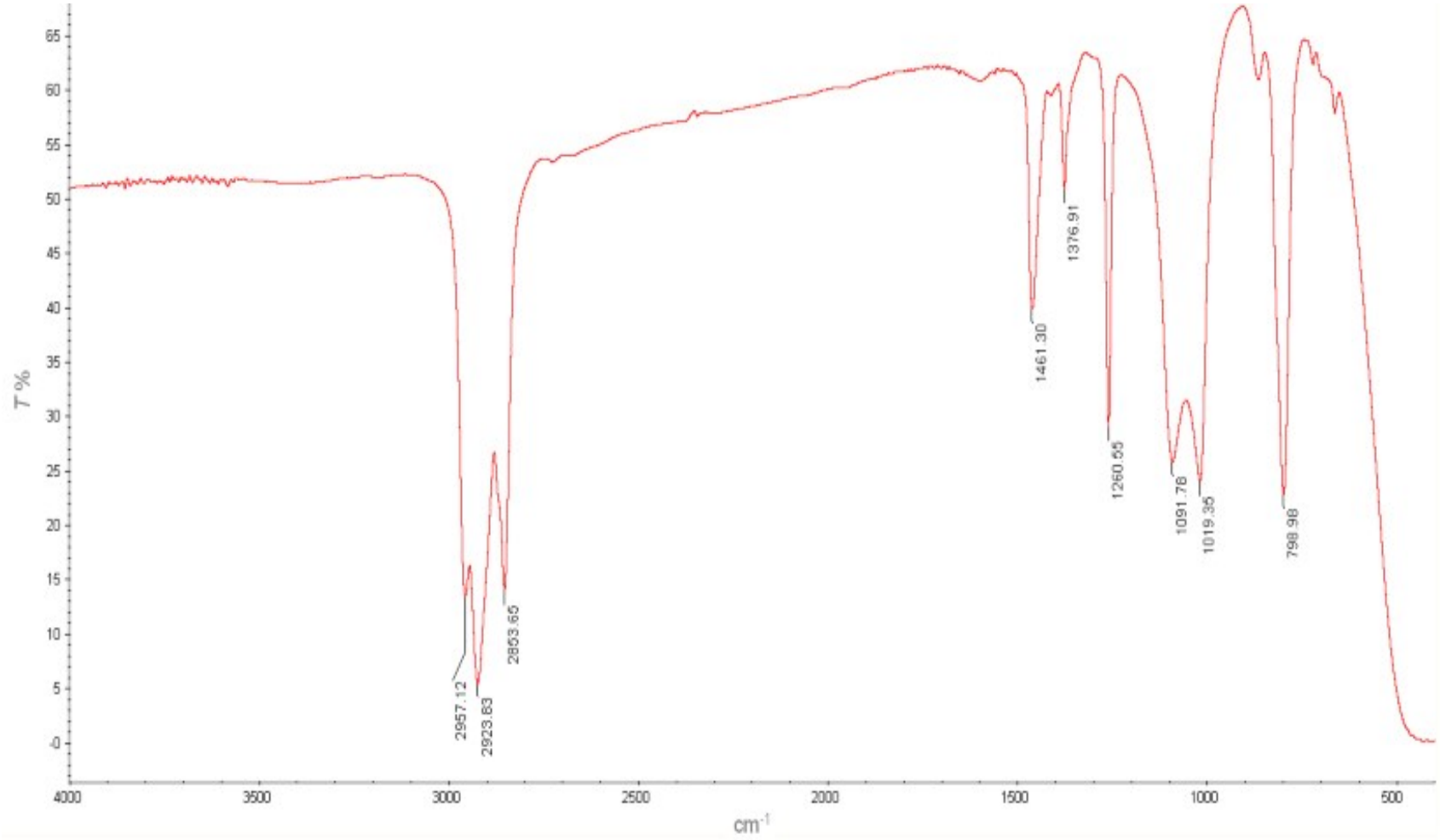
2.20
g

S2-7-3 The IR spectrum of **8**



S3. The procedure for the preparation of complexes **2**–**8**

General preparation of **2–8:** To a mixture of MCl_3 (1.0 mmol) and **1** (3.0 mmol for preparation of **2**–**4**; 4.0 mmol for **5**–**6**; 5.0 mmol for **7**–**8**) was added TMB (2.0 g) in a Carius tube (inner diameter 0.4 cm, about 15 cm long). The tube was sealed in vacuum and then heated at 200–220°C for 3 days. After the resultant mixture was cooled down to room temperature, TMB was removed under reduced pressure (0.01 mmHg) at 70–75°C in a Büchi Glass Oven. The remaining solid was dissolved in THF (40 mL) for **2**–**6** (in 40 mL toluene for **7**; in a mixture (40 mL) of toluene and THF for **8**). The solution was filtered through Celite. The filtration was concentrated to give **2–8** as colorless/colored crystals at 5°C

2: Colorless crystals (0.59 g, 72.7%). M.p. 250°C. ^{1}H NMR (600 MHz, DMSO-d_6, 23°C): δ = 3.61 (br, 8 H, OCH_2CH_2), 1.76 (br, 8 H, OCH_2CH_2), 1.39 (s, 54 H, CH_3) ppm; ^{13}C{^{1}H} NMR (150 MHz, DMSO-d_6, 23°C): δ = 187.58, 187.55 (d, $^{1}J_{C-P}$ = 4.5 Hz, *C* for dp ring), 33.12, 33.07 (d, $^{2}J_{C-P}$ = 7.5 Hz, *C* for *t*Bu), 30.73, 30.70 (d, $^{3}J_{C-P}$ = 4.5 Hz, CH_3 for *t*Bu), 67.49 (s, *C* for THF ring), 25.60 (s, *C* for THF ring) ppm; ^{31}P{^{1}H} NMR (243 MHz, DMSO-d_6, 23°C): δ = 86.29(s) ppm; IR (KBr, Nujol mull, cm^{-1}): 1460(vs), 1376(s), 1361(m), 1261(s), 1222(w), 1098(s), 1019(s), 864(w), 800(w), 685(m); Anal. Calcd. for $C_{38}H_{70}N_6O_2P_3Y$: C 55.33; H 8.55; N 10.19. Found: C 55.25; H 8.57; N 10.10.

3: Pink crystals (0.29 g, 32.0%). M.p. 234°C. IR (KBr, Nujol mull, cm^{-1}): 1461(s), 1377(s), 1261(s), 1095(w), 1020(w), 800(m); Anal. Calcd. for $C_{38}H_{70}N_6O_2P_3Er$: C 50.53; H 7.81; N 9.30. Found: C 50.53; H 7.48; N 9.21.

4: Colorless crystals (0.50 g, 60.2%). M.p. 262°C. ^{1}H NMR (600 MHz, DMSO-d_6, 23°C): δ = 3.38 (br, 8 H, OCH_2CH_2), 1.77 (br, 8 H, OCH_2CH_2), 1.33 (s, 54 H, CH_3) ppm; ^{13}C{^{1}H} NMR (150 MHz, DMSO-d_6, 23°C): δ = 192.20, 191.84 (d, $^{1}J_{C-P}$ = 54 Hz, *C* for dp ring), 33.65, 35.53 (d, $^{2}J_{C-P}$ = 18.0 Hz, *C* for *t*Bu), 32.72, 32.67 (d, $^{3}J_{C-P}$ = 7.5 Hz, CH_3 for *t*Bu), 69.84 (s, *C* for THF ring), 25.32 (s, *C* for THF

ring) ppm; $^{31}P\{^{1}H\}$ NMR (243 MHz, DMSO-d_6, 23°C): δ = 97.58(s) ppm; IR (KBr, Nujol mull, cm^{-1}): 1460(m), 1391(vs), 1376(s), 1360(w), 1261(s), 1222(w), 1097(m), 1020(m), 917(w), 865(w), 801(s), 684(s); Anal. Calcd. for $C_{38}H_{70}N_6O_2P_3Dy$: C 50.80; H 7.85; N 9.35. Found: C 50.79; H 7.75; N 9.34.

5: Colorless crystals (0.98 g, 76.7%). M.p. 280°C. ^{1}H NMR (600 MHz, $CDCl_3$, 23°C): δ = 3.67 (br, 24 H, OCH_2CH_2), 1.84 (br, 24 H, OCH_2CH_2), 1.32, 1.23 (s, 72 H, CH_3) ppm; $^{13}C\{^{1}H\}$ NMR (150 MHz, $CDCl_3$, 23°C): δ = 192.16, 191.80 (d, $^{1}J_{C-P}$ = 54.0 Hz, *C* for dp ring), 35.52, 35.64 (d, $^{2}J_{C-P}$ = 18.0 Hz, *C* for *t*Bu), 35.67, 35.78 (d, $^{2}J_{C-P}$ = 16.5 Hz, *C* for *t*Bu), 32.72, 32.79 (d, $^{3}J_{C-P}$ = 10.5 Hz, CH_3 for *t*Bu), 32.79, 32.83 (d, $^{3}J_{C-P}$ = 6.0 Hz, CH_3 for *t*Bu), 68.34 (s, *C* for THF ring), 25.53 (s, *C* for THF ring) ppm; $^{31}P\{^{1}H\}$ NMR (243 MHz, $CDCl_3$, 23°C): δ = 97.53(s), 93.46(s) ppm; IR (KBr, Nujol mull, cm^{-1}): 1459(s), 1378(vs), 1360(w), 1260(m), 1221(w), 1096(vs), 1055(vs), 1021(w), 895(w), 801(m), 685(m); Anal. Calcd. for $C_{64}H_{120}KN_8O_6P_4Y$: C 56.96; H 8.96; N 8.30. Found: C 56.82; H 8.87; N 8.25.

6: Pink crystals (0.49 g, 35.0%). M.p. >250°C dec.. IR (KBr, Nujol mull, cm^{-1}): 1460(s), 1377(s), 1261(vs), 1096(s), 1091(s), 799(s); Anal. Calcd. for $C_{64}H_{120}KN_8O_6P_4Er$: C 53.83; H 8.47; N 7.85. Found: C 53.75; H 8.38; N 7.93.

7: Red crystals (0.20 g, 42.7%). M.p. >250°C dec.. ^{1}H NMR (600 MHz, DMSO-d_6, 23°C): δ = 1.29 (s, 72 H, CH_3) ppm; $^{13}C\{^{1}H\}$ NMR (150 MHz, DMSO-d_6, 23°C): δ = 187.58, 187.55 (d, $^{1}J_{C-P}$ = 4.5 Hz, *C* for dp ring), 33.24, 32.17 (d, $^{2}J_{C-P}$ = 160.5 Hz, *C* for *t*Bu), 30.72 (s, CH_3 for *t*Bu) ppm; $^{31}P\{^{1}H\}$ NMR (243 MHz, DMSO-d_6, 23°C): δ = 72.73(s), 49.54(s) ppm; IR (KBr, Nujol mull, cm^{-1}): 2957(s), 2923(s), 2853(s), 1461(s), 1376(vs), 1260(s), 1092(m), 1019(m), 799(s); Anal. Calcd. for $[C_{40}H_{72}K_2N_8P_4Eu]_n$: C 47.15; H 7.12; N 11.00. Found: C 47.05; H 7.28; N 11.21.

8: Red crystals (0.31 g, 52.6%). M.p. >250°C dec.. $^{31}P\{^{1}H\}$ NMR (243 MHz, DMSO-d_6, 23°C): δ = 94.39(br.) ppm; IR (KBr, Nujol mull, cm^{-1}): 2957(s), 2923(s), 2853(s), 1461(s), 1376(vs), 1260(s), 1092(m), 1019(m), 799(s); Anal. Calcd. for $[C_{77}H_{58}K_2N_{10}P_5Eu]_n$: C 61.31; H 3.88; N 9.29. Found: C 61.45; H 3.78; N 9.37.