

Supporting Information Available: Tables of crystallographic data, and bond lengths and angles

An Access to Osmium Derivatives Containing a
Cyclopentadienyl Ligand Bearing a Pendant Donor
Group: Some Differences in Reactivity between (2-
diphenylphosphinoethyl)cyclopentadienyl and
Triisopropylphosphine-cyclopentadienyl Complexes

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Table 1. Crystal data and structure refinement for 2.

Identification code	2
Empirical formula	C ₂₈ H ₄₂ Cl O _{0.50} Os P ₂
Formula weight	674.21
Temperature	100(2) K
Wavelength	0.71073 Å
Crystal system, space group	triclinic, P-1
Unit cell dimensions	a = 12.3939(11) Å alpha = 98.701(2) deg. b = 13.5863(13) Å beta = 104.801(2) deg. c = 17.2113(16) Å gamma = 91.190(2) deg.
Volume	2764.4(4) Å ³
Z, Calculated density	4, 1.620 Mg/m ³
Absorption coefficient	4.842 mm ⁻¹
F(000)	1348
Crystal size	0.16 x 0.12 x 0.06 mm
Theta range for data collection	1.52 to 28.51 deg.
Limiting indices	-16<=h<=16, -18<=k<=17, -22<=l<=22
Reflections collected / unique	33425 / 12776 [R(int) = 0.0610]
Completeness to theta = 28.51	91.0 %
Max. and min. transmission	0.7599 and 0.5113
Refinement method	Full-matrix least-squares on F ²
Data / restraints / parameters	12776 / 3 / 619
Goodness-of-fit on F ²	0.860
Final R indices [I>2sigma(I)]	R1 = 0.0391, wR2 = 0.0712
R indices (all data)	R1 = 0.0632, wR2 = 0.0761
Largest diff. peak and hole	1.395 and -1.551 e.Å ⁻³

Table 2. Atomic coordinates ($\times 10^4$) and equivalent isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 2. $U(\text{eq})$ is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	$U(\text{eq})$
Os(1)	4233(1)	2988(1)	2833(1)	17(1)
Os(2)	9200(1)	6152(1)	2856(1)	17(1)
Cl(1)	7527(2)	4898(2)	5136(1)	36(1)
Cl(2)	5997(2)	3454(2)	652(2)	56(1)
P(1)	2974(2)	2176(1)	1701(1)	18(1)
P(2)	5293(2)	1892(1)	3573(1)	20(1)
P(3)	9639(2)	6615(1)	1757(1)	18(1)
P(4)	8645(2)	7483(2)	3646(1)	22(1)
C(1)	3808(6)	4284(5)	2178(5)	23(2)
C(2)	3432(6)	4397(5)	2897(5)	24(2)
C(3)	4342(7)	4495(5)	3596(5)	28(2)
C(4)	5331(6)	4408(5)	3316(5)	26(2)
C(5)	5002(6)	4282(5)	2445(5)	22(2)
C(6)	3107(6)	4055(5)	1319(4)	24(2)
C(7)	3110(6)	2966(5)	947(4)	23(2)
C(8)	1487(6)	2153(5)	1638(4)	21(2)
C(9)	1085(6)	2377(5)	2326(4)	20(2)
C(10)	-67(6)	2373(5)	2259(5)	28(2)
C(11)	-813(6)	2158(5)	1496(5)	30(2)
C(12)	-418(7)	1924(5)	818(5)	30(2)
C(13)	717(6)	1914(5)	874(4)	22(2)
C(14)	3154(6)	884(5)	1293(4)	20(2)
C(15)	3975(7)	663(6)	881(5)	33(2)
C(16)	4155(8)	-331(6)	643(6)	45(3)
C(17)	3563(7)	-1088(6)	812(5)	38(2)
C(18)	2784(7)	-858(6)	1235(5)	35(2)
C(19)	2563(6)	112(5)	1470(4)	23(2)
C(20)	6608(6)	1590(6)	3290(5)	28(2)
C(21)	7313(6)	2529(6)	3311(5)	33(2)
C(22)	6439(6)	934(6)	2455(4)	31(2)
C(23)	5838(6)	2462(6)	4657(4)	27(2)
C(24)	6772(6)	1958(6)	5191(5)	38(2)
C(25)	4935(7)	2740(6)	5095(5)	36(2)
C(26)	4593(6)	645(5)	3467(5)	23(2)
C(27)	3484(6)	643(6)	3710(5)	32(2)
C(28)	5333(6)	-138(5)	3864(5)	32(2)
C(29)	9184(6)	4654(5)	2149(5)	21(2)
C(30)	8229(6)	4659(5)	2457(5)	23(2)
C(31)	8593(6)	4819(5)	3328(5)	24(2)
C(32)	9768(6)	4904(5)	3558(5)	25(2)
C(33)	10134(6)	4814(5)	2825(5)	21(2)
C(34)	9195(7)	4605(5)	1270(5)	28(2)
C(35)	8941(6)	5585(5)	945(4)	21(2)
C(36)	9142(6)	7764(5)	1405(4)	17(2)
C(37)	7984(6)	7849(5)	1135(4)	22(2)
C(38)	7571(6)	8740(6)	945(5)	29(2)
C(39)	8285(7)	9554(6)	1030(5)	33(2)
C(40)	9430(6)	9495(6)	1302(5)	32(2)
C(41)	9845(6)	8586(5)	1483(4)	24(2)
C(42)	11096(6)	6637(5)	1707(4)	18(2)

C(43)	11361 (6)	6549 (5)	968 (5)	24 (2)
C(44)	12446 (6)	6534 (5)	919 (5)	24 (2)
C(45)	13312 (7)	6616 (5)	1625 (5)	29 (2)
C(46)	13054 (6)	6701 (5)	2363 (5)	28 (2)
C(47)	11962 (6)	6705 (5)	2410 (4)	23 (2)
C(48)	9150 (6)	8723 (5)	3507 (5)	26 (2)
C(49)	8706 (6)	9611 (6)	3972 (5)	39 (2)
C(50)	10423 (6)	8884 (6)	3676 (5)	35 (2)
C(51)	7114 (6)	7580 (5)	3437 (4)	25 (2)
C(52)	6533 (7)	6601 (6)	3463 (5)	34 (2)
C(53)	6571 (6)	7925 (5)	2628 (4)	26 (2)
C(54)	9030 (7)	7314 (8)	4738 (5)	47 (3)
C(55)	8447 (7)	7972 (7)	5310 (5)	54 (3)
C(56)	10185 (7)	7237 (8)	5113 (5)	55 (3)
O(1)	3962 (4)	4116 (3)	9238 (5)	78 (2)

Table 3. Bond lengths [Å] and angles [deg] for 2.

Os (1) -C (2)	2.176 (7)	C (14) -C (15)	1.394 (10)
Os (1) -C (1)	2.233 (7)	C (14) -C (19)	1.382 (9)
Os (1) -C (3)	2.241 (7)	C (15) -C (16)	1.390 (10)
Os (1) -C (5)	2.249 (7)	C (15) -H (15)	0.9500
Os (1) -C (4)	2.258 (7)	C (16) -C (17)	1.359 (11)
Os (1) -P (1)	2.2746 (19)	C (16) -H (16)	0.9500
Os (1) -P (2)	2.3157 (18)	C (17) -C (18)	1.365 (11)
Os (1) -H (01)	1.37 (6)	C (17) -H (17)	0.9500
Os (1) -H (02)	1.46 (6)	C (18) -C (19)	1.373 (10)
Os (2) -C (33)	2.177 (6)	C (18) -H (18)	0.9500
Os (2) -C (29)	2.204 (7)	C (19) -H (19)	0.9500
Os (2) -C (32)	2.251 (7)	C (20) -C (21)	1.521 (10)
Os (2) -C (30)	2.255 (7)	C (20) -C (22)	1.533 (10)
Os (2) -P (3)	2.2664 (19)	C (20) -H (20)	1.0000
Os (2) -C (31)	2.283 (7)	C (21) -H (21A)	0.9800
Os (2) -P (4)	2.3191 (19)	C (21) -H (21B)	0.9800
Os (2) -H (03)	1.33 (6)	C (21) -H (21C)	0.9800
Os (2) -H (04)	1.46 (6)	C (22) -H (22A)	0.9800
P (1) -C (8)	1.818 (7)	C (22) -H (22B)	0.9800
P (1) -C (14)	1.829 (7)	C (22) -H (22C)	0.9800
P (1) -C (7)	1.840 (7)	C (23) -C (25)	1.525 (10)
P (2) -C (26)	1.848 (7)	C (23) -C (24)	1.527 (9)
P (2) -C (20)	1.853 (7)	C (23) -H (23)	1.0000
P (2) -C (23)	1.854 (8)	C (24) -H (24A)	0.9800
P (3) -C (36)	1.821 (7)	C (24) -H (24B)	0.9800
P (3) -C (42)	1.830 (7)	C (24) -H (24C)	0.9800
P (3) -C (35)	1.844 (7)	C (25) -H (25A)	0.9800
P (4) -C (51)	1.851 (7)	C (25) -H (25B)	0.9800
P (4) -C (48)	1.856 (7)	C (25) -H (25C)	0.9800
P (4) -C (54)	1.867 (8)	C (26) -C (27)	1.537 (10)
C (1) -C (2)	1.418 (10)	C (26) -C (28)	1.542 (9)
C (1) -C (5)	1.434 (10)	C (26) -H (26)	1.0000
C (1) -C (6)	1.494 (10)	C (27) -H (27A)	0.9800
C (2) -C (3)	1.411 (10)	C (27) -H (27B)	0.9800
C (2) -H (2)	0.9500	C (27) -H (27C)	0.9800
C (3) -C (4)	1.428 (10)	C (28) -H (28A)	0.9800
C (3) -H (3)	0.9500	C (28) -H (28B)	0.9800
C (4) -C (5)	1.431 (10)	C (28) -H (28C)	0.9800
C (4) -H (4)	0.9500	C (29) -C (33)	1.415 (10)
C (5) -H (5)	0.9500	C (29) -C (30)	1.415 (9)
C (6) -C (7)	1.521 (9)	C (29) -C (34)	1.509 (10)
C (6) -H (6A)	0.9900	C (30) -C (31)	1.432 (10)
C (6) -H (6B)	0.9900	C (30) -H (30)	0.9500
C (7) -H (7A)	0.9900	C (31) -C (32)	1.405 (10)
C (7) -H (7B)	0.9900	C (31) -H (31)	0.9500
C (8) -C (9)	1.394 (9)	C (32) -C (33)	1.435 (10)
C (8) -C (13)	1.400 (9)	C (32) -H (32)	0.9500
C (9) -C (10)	1.402 (9)	C (33) -H (33)	0.9500
C (9) -H (9)	0.9500	C (34) -C (35)	1.529 (9)
C (10) -C (11)	1.384 (10)	C (34) -H (34A)	0.9900
C (10) -H (10)	0.9500	C (34) -H (34B)	0.9900
C (11) -C (12)	1.374 (11)	C (35) -H (35A)	0.9900
C (11) -H (11)	0.9500	C (35) -H (35B)	0.9900
C (12) -C (13)	1.386 (10)	C (36) -C (41)	1.372 (9)
C (12) -H (12)	0.9500	C (36) -C (37)	1.404 (9)
C (13) -H (13)	0.9500	C (37) -C (38)	1.377 (9)
		C (37) -H (37)	0.9500

C (38) -C (39)	1.367 (10)	C (5) -Os (1) -P (1)	106.23 (19)
C (38) -H (38)	0.9500	C (4) -Os (1) -P (1)	142.3 (2)
C (39) -C (40)	1.384 (10)	C (2) -Os (1) -P (2)	145.6 (2)
C (39) -H (39)	0.9500	C (1) -Os (1) -P (2)	159.9 (2)
C (40) -C (41)	1.395 (9)	C (3) -Os (1) -P (2)	110.7 (2)
C (40) -H (40)	0.9500	C (5) -Os (1) -P (2)	122.63 (18)
C (41) -H (41)	0.9500	C (4) -Os (1) -P (2)	100.41 (19)
C (42) -C (47)	1.386 (9)	P (1) -Os (1) -P (2)	111.98 (7)
C (42) -C (43)	1.382 (9)	C (2) -Os (1) -H (01)	100 (2)
C (43) -C (44)	1.368 (9)	C (1) -Os (1) -H (01)	134 (2)
C (43) -H (43)	0.9500	C (3) -Os (1) -H (01)	95 (3)
C (44) -C (45)	1.389 (10)	C (5) -Os (1) -H (01)	156 (3)
C (44) -H (44)	0.9500	C (4) -Os (1) -H (01)	123 (3)
C (45) -C (46)	1.376 (10)	P (1) -Os (1) -H (01)	90 (3)
C (45) -H (45)	0.9500	P (2) -Os (1) -H (01)	63 (2)
C (46) -C (47)	1.378 (10)	C (2) -Os (1) -H (02)	144 (2)
C (46) -H (46)	0.9500	C (1) -Os (1) -H (02)	107 (2)
C (47) -H (47)	0.9500	C (3) -Os (1) -H (02)	140 (2)
C (48) -C (50)	1.534 (10)	C (5) -Os (1) -H (02)	87 (2)
C (48) -C (49)	1.536 (9)	C (4) -Os (1) -H (02)	103 (2)
C (48) -H (48)	1.0000	P (1) -Os (1) -H (02)	75 (2)
C (49) -H (49A)	0.9800	P (2) -Os (1) -H (02)	65 (2)
C (49) -H (49B)	0.9800	H (01) -Os (1) -H (02)	115 (3)
C (49) -H (49C)	0.9800	C (33) -Os (2) -C (29)	37.7 (2)
C (50) -H (50A)	0.9800	C (33) -Os (2) -C (32)	37.8 (3)
C (50) -H (50B)	0.9800	C (29) -Os (2) -C (32)	62.6 (3)
C (50) -H (50C)	0.9800	C (33) -Os (2) -C (30)	61.9 (3)
C (51) -C (52)	1.511 (10)	C (29) -Os (2) -C (30)	37.0 (2)
C (51) -C (53)	1.530 (9)	C (32) -Os (2) -C (30)	61.3 (3)
C (51) -H (51)	1.0000	C (33) -Os (2) -P (3)	94.2 (2)
C (52) -H (52A)	0.9800	C (29) -Os (2) -P (3)	81.65 (19)
C (52) -H (52B)	0.9800	C (32) -Os (2) -P (3)	131.6 (2)
C (52) -H (52C)	0.9800	C (30) -Os (2) -P (3)	108.16 (19)
C (53) -H (53A)	0.9800	C (33) -Os (2) -C (31)	61.7 (3)
C (53) -H (53B)	0.9800	C (29) -Os (2) -C (31)	61.9 (3)
C (53) -H (53C)	0.9800	C (32) -Os (2) -C (31)	36.1 (2)
C (54) -C (56)	1.425 (11)	C (30) -Os (2) -C (31)	36.8 (3)
C (54) -C (55)	1.554 (10)	P (3) -Os (2) -C (31)	142.9 (2)
C (54) -H (54)	1.0000	C (33) -Os (2) -P (4)	147.3 (2)
C (55) -H (55A)	0.9800	C (29) -Os (2) -P (4)	160.03 (19)
C (55) -H (55B)	0.9800	C (32) -Os (2) -P (4)	112.2 (2)
C (55) -H (55C)	0.9800	C (30) -Os (2) -P (4)	123.07 (19)
C (56) -H (56A)	0.9800	P (3) -Os (2) -P (4)	111.82 (7)
C (56) -H (56B)	0.9800	C (31) -Os (2) -P (4)	101.92 (19)
C (56) -H (56C)	0.9800	C (33) -Os (2) -H (03)	132 (3)
O (1) -H (05)	0.8194 (4)	C (29) -Os (2) -H (03)	94 (3)
O (1) -H (06)	0.821 (5)	C (32) -Os (2) -H (03)	143 (3)
		C (30) -Os (2) -H (03)	83 (3)
C (2) -Os (1) -C (1)	37.5 (3)	P (3) -Os (2) -H (03)	65 (3)
C (2) -Os (1) -C (3)	37.2 (3)	C (31) -Os (2) -H (03)	109 (3)
C (1) -Os (1) -C (3)	62.8 (3)	P (4) -Os (2) -H (03)	79 (3)
C (2) -Os (1) -C (5)	61.8 (3)	C (33) -Os (2) -H (04)	85 (2)
C (1) -Os (1) -C (5)	37.3 (2)	C (29) -Os (2) -H (04)	119 (2)
C (3) -Os (1) -C (5)	61.9 (3)	C (32) -Os (2) -H (04)	84 (2)
C (2) -Os (1) -C (4)	61.8 (3)	C (30) -Os (2) -H (04)	144 (2)
C (1) -Os (1) -C (4)	62.5 (3)	P (3) -Os (2) -H (04)	87 (2)
C (3) -Os (1) -C (4)	37.0 (3)	C (31) -Os (2) -H (04)	116 (2)
C (5) -Os (1) -C (4)	37.0 (3)	P (4) -Os (2) -H (04)	77 (2)
C (2) -Os (1) -P (1)	97.0 (2)	H (03) -Os (2) -H (04)	133 (3)
C (1) -Os (1) -P (1)	81.6 (2)	C (8) -P (1) -C (14)	102.2 (3)
C (3) -Os (1) -P (1)	134.1 (2)	C (8) -P (1) -C (7)	103.1 (3)

C(14)-P(1)-C(7)	108.4(3)	C(6)-C(7)-H(7B)	109.9
C(8)-P(1)-Os(1)	120.3(2)	P(1)-C(7)-H(7B)	109.9
C(14)-P(1)-Os(1)	120.3(2)	H(7A)-C(7)-H(7B)	108.3
C(7)-P(1)-Os(1)	100.8(2)	C(9)-C(8)-C(13)	118.7(7)
C(26)-P(2)-C(20)	102.6(3)	C(9)-C(8)-P(1)	122.1(5)
C(26)-P(2)-C(23)	111.5(3)	C(13)-C(8)-P(1)	119.2(6)
C(20)-P(2)-C(23)	101.2(4)	C(8)-C(9)-C(10)	120.9(7)
C(26)-P(2)-Os(1)	114.8(2)	C(8)-C(9)-H(9)	119.5
C(20)-P(2)-Os(1)	114.7(2)	C(10)-C(9)-H(9)	119.5
C(23)-P(2)-Os(1)	110.9(2)	C(11)-C(10)-C(9)	119.4(7)
C(36)-P(3)-C(42)	103.6(3)	C(11)-C(10)-H(10)	120.3
C(36)-P(3)-C(35)	106.4(3)	C(9)-C(10)-H(10)	120.3
C(42)-P(3)-C(35)	104.0(3)	C(12)-C(11)-C(10)	119.8(7)
C(36)-P(3)-Os(2)	120.1(2)	C(12)-C(11)-H(11)	120.1
C(42)-P(3)-Os(2)	119.5(2)	C(10)-C(11)-H(11)	120.1
C(35)-P(3)-Os(2)	101.5(2)	C(11)-C(12)-C(13)	121.6(7)
C(51)-P(4)-C(48)	103.1(3)	C(11)-C(12)-H(12)	119.2
C(51)-P(4)-C(54)	102.0(4)	C(13)-C(12)-H(12)	119.2
C(48)-P(4)-C(54)	112.2(4)	C(12)-C(13)-C(8)	119.6(7)
C(51)-P(4)-Os(2)	114.7(2)	C(12)-C(13)-H(13)	120.2
C(48)-P(4)-Os(2)	114.0(2)	C(8)-C(13)-H(13)	120.2
C(54)-P(4)-Os(2)	110.1(3)	C(15)-C(14)-C(19)	119.2(7)
C(2)-C(1)-C(5)	105.7(6)	C(15)-C(14)-P(1)	120.5(6)
C(2)-C(1)-C(6)	127.3(7)	C(19)-C(14)-P(1)	120.0(5)
C(5)-C(1)-C(6)	126.4(7)	C(14)-C(15)-C(16)	118.9(7)
C(2)-C(1)-Os(1)	69.1(4)	C(14)-C(15)-H(15)	120.6
C(5)-C(1)-Os(1)	72.0(4)	C(16)-C(15)-H(15)	120.6
C(6)-C(1)-Os(1)	116.7(5)	C(17)-C(16)-C(15)	121.7(8)
C(3)-C(2)-C(1)	111.0(7)	C(17)-C(16)-H(16)	119.1
C(3)-C(2)-Os(1)	73.9(4)	C(15)-C(16)-H(16)	119.1
C(1)-C(2)-Os(1)	73.4(4)	C(16)-C(17)-C(18)	118.6(8)
C(3)-C(2)-H(2)	124.5	C(16)-C(17)-H(17)	120.7
C(1)-C(2)-H(2)	124.5	C(18)-C(17)-H(17)	120.7
Os(1)-C(2)-H(2)	119.8	C(19)-C(18)-C(17)	121.7(8)
C(2)-C(3)-C(4)	106.7(7)	C(19)-C(18)-H(18)	119.1
C(2)-C(3)-Os(1)	68.9(4)	C(17)-C(18)-H(18)	119.1
C(4)-C(3)-Os(1)	72.1(4)	C(18)-C(19)-C(14)	119.8(7)
C(2)-C(3)-H(3)	126.6	C(18)-C(19)-H(19)	120.1
C(4)-C(3)-H(3)	126.6	C(14)-C(19)-H(19)	120.1
Os(1)-C(3)-H(3)	123.9	C(21)-C(20)-C(22)	108.7(6)
C(3)-C(4)-C(5)	107.8(7)	C(21)-C(20)-P(2)	111.6(5)
C(3)-C(4)-Os(1)	70.8(4)	C(22)-C(20)-P(2)	114.3(5)
C(5)-C(4)-Os(1)	71.2(4)	C(21)-C(20)-H(20)	107.3
C(3)-C(4)-H(4)	126.1	C(22)-C(20)-H(20)	107.3
C(5)-C(4)-H(4)	126.1	P(2)-C(20)-H(20)	107.3
Os(1)-C(4)-H(4)	123.5	C(20)-C(21)-H(21A)	109.5
C(1)-C(5)-C(4)	108.8(6)	C(20)-C(21)-H(21B)	109.5
C(1)-C(5)-Os(1)	70.7(4)	H(21A)-C(21)-H(21B)	109.5
C(4)-C(5)-Os(1)	71.8(4)	C(20)-C(21)-H(21C)	109.5
C(1)-C(5)-H(5)	125.6	H(21A)-C(21)-H(21C)	109.5
C(4)-C(5)-H(5)	125.6	H(21B)-C(21)-H(21C)	109.5
Os(1)-C(5)-H(5)	123.5	C(20)-C(22)-H(22A)	109.5
C(1)-C(6)-C(7)	112.6(6)	C(20)-C(22)-H(22B)	109.5
C(1)-C(6)-H(6A)	109.1	H(22A)-C(22)-H(22B)	109.5
C(7)-C(6)-H(6A)	109.1	C(20)-C(22)-H(22C)	109.5
C(1)-C(6)-H(6B)	109.1	H(22A)-C(22)-H(22C)	109.5
C(7)-C(6)-H(6B)	109.1	H(22B)-C(22)-H(22C)	109.5
H(6A)-C(6)-H(6B)	107.8	C(25)-C(23)-C(24)	110.6(6)
C(6)-C(7)-P(1)	109.0(5)	C(25)-C(23)-P(2)	114.3(5)
C(6)-C(7)-H(7A)	109.9	C(24)-C(23)-P(2)	118.1(5)
P(1)-C(7)-H(7A)	109.9	C(25)-C(23)-H(23)	104.0

C (24) -C (23) -H (23)	104.0	Os (2) -C (33) -H (33)	120.0
P (2) -C (23) -H (23)	104.0	C (29) -C (34) -C (35)	113.8 (6)
C (23) -C (24) -H (24A)	109.5	C (29) -C (34) -H (34A)	108.8
C (23) -C (24) -H (24B)	109.5	C (35) -C (34) -H (34A)	108.8
H (24A) -C (24) -H (24B)	109.5	C (29) -C (34) -H (34B)	108.8
C (23) -C (24) -H (24C)	109.5	C (35) -C (34) -H (34B)	108.8
H (24A) -C (24) -H (24C)	109.5	H (34A) -C (34) -H (34B)	107.7
H (24B) -C (24) -H (24C)	109.5	C (34) -C (35) -P (3)	107.9 (5)
C (23) -C (25) -H (25A)	109.5	C (34) -C (35) -H (35A)	110.1
C (23) -C (25) -H (25B)	109.5	P (3) -C (35) -H (35A)	110.1
H (25A) -C (25) -H (25B)	109.5	C (34) -C (35) -H (35B)	110.1
C (23) -C (25) -H (25C)	109.5	P (3) -C (35) -H (35B)	110.1
H (25A) -C (25) -H (25C)	109.5	H (35A) -C (35) -H (35B)	108.4
H (25B) -C (25) -H (25C)	109.5	C (41) -C (36) -C (37)	118.6 (6)
C (27) -C (26) -C (28)	109.5 (6)	C (41) -C (36) -P (3)	122.5 (6)
C (27) -C (26) -P (2)	115.2 (5)	C (37) -C (36) -P (3)	118.5 (5)
C (28) -C (26) -P (2)	115.7 (5)	C (38) -C (37) -C (36)	120.3 (7)
C (27) -C (26) -H (26)	105.1	C (38) -C (37) -H (37)	119.9
C (28) -C (26) -H (26)	105.1	C (36) -C (37) -H (37)	119.9
P (2) -C (26) -H (26)	105.1	C (39) -C (38) -C (37)	120.2 (7)
C (26) -C (27) -H (27A)	109.5	C (39) -C (38) -H (38)	119.9
C (26) -C (27) -H (27B)	109.5	C (37) -C (38) -H (38)	119.9
H (27A) -C (27) -H (27B)	109.5	C (38) -C (39) -C (40)	120.9 (7)
C (26) -C (27) -H (27C)	109.5	C (38) -C (39) -H (39)	119.6
H (27A) -C (27) -H (27C)	109.5	C (40) -C (39) -H (39)	119.6
H (27B) -C (27) -H (27C)	109.5	C (39) -C (40) -C (41)	118.7 (7)
C (26) -C (28) -H (28A)	109.5	C (39) -C (40) -H (40)	120.7
C (26) -C (28) -H (28B)	109.5	C (41) -C (40) -H (40)	120.7
H (28A) -C (28) -H (28B)	109.5	C (36) -C (41) -C (40)	121.4 (7)
C (26) -C (28) -H (28C)	109.5	C (36) -C (41) -H (41)	119.3
H (28A) -C (28) -H (28C)	109.5	C (40) -C (41) -H (41)	119.3
H (28B) -C (28) -H (28C)	109.5	C (47) -C (42) -C (43)	118.3 (7)
C (33) -C (29) -C (30)	107.3 (7)	C (47) -C (42) -P (3)	120.7 (5)
C (33) -C (29) -C (34)	125.7 (7)	C (43) -C (42) -P (3)	121.0 (5)
C (30) -C (29) -C (34)	126.6 (7)	C (44) -C (43) -C (42)	121.7 (7)
C (33) -C (29) -Os (2)	70.1 (4)	C (44) -C (43) -H (43)	119.2
C (30) -C (29) -Os (2)	73.5 (4)	C (42) -C (43) -H (43)	119.2
C (34) -C (29) -Os (2)	116.7 (5)	C (43) -C (44) -C (45)	119.9 (7)
C (29) -C (30) -C (31)	108.5 (7)	C (43) -C (44) -H (44)	120.1
C (29) -C (30) -Os (2)	69.5 (4)	C (45) -C (44) -H (44)	120.1
C (31) -C (30) -Os (2)	72.6 (4)	C (44) -C (45) -C (46)	118.7 (7)
C (29) -C (30) -H (30)	125.8	C (44) -C (45) -H (45)	120.6
C (31) -C (30) -H (30)	125.8	C (46) -C (45) -H (45)	120.6
Os (2) -C (30) -H (30)	123.7	C (47) -C (46) -C (45)	121.3 (7)
C (32) -C (31) -C (30)	108.1 (6)	C (47) -C (46) -H (46)	119.4
C (32) -C (31) -Os (2)	70.7 (4)	C (45) -C (46) -H (46)	119.4
C (30) -C (31) -Os (2)	70.6 (4)	C (46) -C (47) -C (42)	120.1 (7)
C (32) -C (31) -H (31)	126.0	C (46) -C (47) -H (47)	120.0
C (30) -C (31) -H (31)	126.0	C (42) -C (47) -H (47)	120.0
Os (2) -C (31) -H (31)	124.4	C (50) -C (48) -C (49)	109.1 (6)
C (31) -C (32) -C (33)	107.4 (7)	C (50) -C (48) -P (4)	115.2 (5)
C (31) -C (32) -Os (2)	73.2 (4)	C (49) -C (48) -P (4)	114.4 (6)
C (33) -C (32) -Os (2)	68.3 (4)	C (50) -C (48) -H (48)	105.8
C (31) -C (32) -H (32)	126.3	C (49) -C (48) -H (48)	105.7
C (33) -C (32) -H (32)	126.3	P (4) -C (48) -H (48)	105.7
Os (2) -C (32) -H (32)	123.8	C (48) -C (49) -H (49A)	109.5
C (29) -C (33) -C (32)	108.7 (6)	C (48) -C (49) -H (49B)	109.5
C (29) -C (33) -Os (2)	72.2 (4)	H (49A) -C (49) -H (49B)	109.5
C (32) -C (33) -Os (2)	73.9 (4)	C (48) -C (49) -H (49C)	109.5
C (29) -C (33) -H (33)	125.7	H (49A) -C (49) -H (49C)	109.5
C (32) -C (33) -H (33)	125.7	H (49B) -C (49) -H (49C)	109.5

C(48)-C(50)-H(50A)	109.5	H(53A)-C(53)-H(53C)	109.5
C(48)-C(50)-H(50B)	109.5	H(53B)-C(53)-H(53C)	109.5
H(50A)-C(50)-H(50B)	109.5	C(56)-C(54)-C(55)	112.1(7)
C(48)-C(50)-H(50C)	109.5	C(56)-C(54)-P(4)	117.2(6)
H(50A)-C(50)-H(50C)	109.5	C(55)-C(54)-P(4)	116.5(6)
H(50B)-C(50)-H(50C)	109.5	C(56)-C(54)-H(54)	102.7
C(52)-C(51)-C(53)	108.8(6)	C(55)-C(54)-H(54)	102.8
C(52)-C(51)-P(4)	111.1(5)	P(4)-C(54)-H(54)	102.8
C(53)-C(51)-P(4)	114.6(5)	C(54)-C(55)-H(55A)	109.5
C(52)-C(51)-H(51)	107.4	C(54)-C(55)-H(55B)	109.5
C(53)-C(51)-H(51)	107.4	H(55A)-C(55)-H(55B)	109.5
P(4)-C(51)-H(51)	107.4	C(54)-C(55)-H(55C)	109.5
C(51)-C(52)-H(52A)	109.5	H(55A)-C(55)-H(55C)	109.5
C(51)-C(52)-H(52B)	109.5	H(55B)-C(55)-H(55C)	109.5
H(52A)-C(52)-H(52B)	109.5	C(54)-C(56)-H(56A)	109.4
C(51)-C(52)-H(52C)	109.5	C(54)-C(56)-H(56B)	109.5
H(52A)-C(52)-H(52C)	109.5	H(56A)-C(56)-H(56B)	109.5
H(52B)-C(52)-H(52C)	109.5	C(54)-C(56)-H(56C)	109.5
C(51)-C(53)-H(53A)	109.5	H(56A)-C(56)-H(56C)	109.5
C(51)-C(53)-H(53B)	109.5	H(56B)-C(56)-H(56C)	109.5
H(53A)-C(53)-H(53B)	109.5	H(05)-O(1)-H(06)	111.79(15)
C(51)-C(53)-H(53C)	109.5		

Symmetry transformations used to generate equivalent atoms:

Table 4. Anisotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 2.
 The anisotropic displacement factor exponent takes the form:
 $-2 \pi^2 [h^2 a^{*2} U_{11} + \dots + 2 h k a^* b^* U_{12}]$

	U11	U22	U33	U23	U13	U12
Os (1)	16 (1)	16 (1)	20 (1)	4 (1)	6 (1)	3 (1)
Os (2)	17 (1)	16 (1)	21 (1)	2 (1)	7 (1)	4 (1)
Cl (1)	26 (1)	51 (1)	29 (1)	2 (1)	6 (1)	2 (1)
Cl (2)	42 (1)	78 (2)	47 (2)	-12 (1)	24 (1)	-8 (1)
P (1)	19 (1)	17 (1)	20 (1)	3 (1)	6 (1)	5 (1)
P (2)	17 (1)	22 (1)	22 (1)	6 (1)	7 (1)	6 (1)
P (3)	18 (1)	15 (1)	19 (1)	-1 (1)	6 (1)	1 (1)
P (4)	20 (1)	24 (1)	20 (1)	0 (1)	6 (1)	7 (1)
C (1)	30 (4)	15 (4)	24 (4)	5 (3)	2 (4)	-1 (3)
C (2)	21 (4)	22 (4)	32 (5)	9 (4)	8 (4)	2 (3)
C (3)	43 (5)	15 (4)	23 (4)	-1 (3)	8 (4)	-6 (4)
C (4)	21 (4)	16 (4)	39 (5)	5 (4)	7 (4)	-3 (3)
C (5)	20 (4)	19 (4)	30 (5)	6 (3)	9 (3)	1 (3)
C (6)	31 (4)	19 (4)	24 (4)	9 (3)	5 (3)	4 (3)
C (7)	27 (4)	19 (4)	23 (4)	5 (3)	8 (3)	0 (3)
C (8)	23 (4)	16 (4)	24 (4)	7 (3)	5 (3)	0 (3)
C (9)	12 (4)	21 (4)	29 (4)	8 (3)	5 (3)	2 (3)
C (10)	20 (4)	20 (4)	48 (5)	4 (4)	17 (4)	0 (3)
C (11)	18 (4)	22 (4)	50 (6)	9 (4)	7 (4)	2 (3)
C (12)	34 (5)	15 (4)	35 (5)	6 (3)	-1 (4)	-2 (3)
C (13)	27 (4)	18 (4)	22 (4)	4 (3)	5 (3)	1 (3)
C (14)	21 (4)	18 (4)	21 (4)	4 (3)	5 (3)	8 (3)
C (15)	38 (5)	27 (5)	46 (5)	12 (4)	28 (4)	5 (4)
C (16)	69 (7)	30 (5)	59 (6)	14 (5)	49 (6)	22 (5)
C (17)	47 (6)	19 (4)	51 (6)	7 (4)	20 (5)	13 (4)
C (18)	31 (5)	19 (4)	54 (6)	-1 (4)	14 (4)	-4 (4)
C (19)	23 (4)	19 (4)	29 (4)	4 (3)	11 (3)	2 (3)
C (20)	22 (4)	33 (5)	37 (5)	16 (4)	15 (4)	15 (4)
C (21)	17 (4)	42 (5)	43 (5)	12 (4)	7 (4)	4 (4)
C (22)	30 (5)	43 (5)	29 (5)	11 (4)	19 (4)	19 (4)
C (23)	28 (4)	34 (5)	21 (4)	5 (4)	6 (3)	6 (4)
C (24)	27 (5)	60 (6)	24 (5)	3 (4)	1 (4)	12 (4)
C (25)	40 (5)	46 (6)	22 (5)	3 (4)	7 (4)	15 (4)
C (26)	24 (4)	17 (4)	31 (4)	6 (3)	12 (3)	4 (3)
C (27)	34 (5)	25 (5)	44 (5)	14 (4)	14 (4)	3 (4)
C (28)	33 (5)	26 (5)	43 (5)	16 (4)	16 (4)	7 (4)
C (29)	26 (4)	11 (4)	29 (4)	0 (3)	14 (4)	5 (3)
C (30)	21 (4)	13 (4)	36 (5)	2 (3)	11 (4)	-1 (3)
C (31)	32 (5)	18 (4)	31 (5)	8 (3)	19 (4)	7 (3)
C (32)	30 (5)	13 (4)	31 (5)	10 (3)	3 (4)	-1 (3)
C (33)	14 (4)	10 (4)	36 (5)	0 (3)	4 (3)	2 (3)
C (34)	35 (5)	14 (4)	35 (5)	2 (3)	11 (4)	-5 (3)
C (35)	24 (4)	14 (4)	23 (4)	-3 (3)	5 (3)	0 (3)
C (36)	24 (4)	14 (4)	14 (4)	0 (3)	7 (3)	1 (3)
C (37)	20 (4)	22 (4)	20 (4)	4 (3)	1 (3)	-4 (3)
C (38)	18 (4)	29 (5)	34 (5)	8 (4)	-3 (3)	3 (3)
C (39)	36 (5)	17 (4)	48 (6)	11 (4)	7 (4)	14 (4)
C (40)	29 (5)	21 (4)	44 (5)	10 (4)	5 (4)	3 (4)
C (41)	23 (4)	21 (4)	28 (4)	3 (3)	9 (3)	3 (3)
C (42)	17 (4)	16 (4)	24 (4)	2 (3)	9 (3)	1 (3)
C (43)	24 (4)	17 (4)	30 (5)	0 (3)	8 (4)	-4 (3)

C(44)	37(5)	12(4)	27(4)	0(3)	20(4)	5(3)
C(45)	26(4)	20(4)	43(5)	3(4)	16(4)	4(3)
C(46)	22(4)	24(4)	34(5)	4(4)	4(4)	2(3)
C(47)	24(4)	19(4)	24(4)	0(3)	7(3)	-2(3)
C(48)	24(4)	15(4)	33(5)	-5(3)	-2(3)	8(3)
C(49)	25(5)	22(5)	62(6)	-13(4)	7(4)	3(4)
C(50)	30(5)	18(4)	53(6)	-7(4)	10(4)	2(4)
C(51)	29(4)	20(4)	26(4)	-2(3)	12(3)	9(3)
C(52)	35(5)	29(5)	48(6)	5(4)	26(4)	-3(4)
C(53)	21(4)	26(4)	30(5)	0(4)	6(3)	5(3)
C(54)	43(6)	80(7)	20(5)	0(5)	12(4)	37(5)
C(55)	48(6)	93(8)	22(5)	-2(5)	15(4)	25(6)
C(56)	53(6)	89(8)	22(5)	1(5)	8(4)	43(6)
O(1)	48(5)	102(7)	65(6)	1(5)	-10(4)	-34(5)

Table 5. Hydrogen coordinates ($\times 10^4$) and isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 2.

	x	y	z	U(eq)
H(01)	3730(50)	2520(40)	3310(40)	18(9)
H(02)	4890(50)	2350(40)	2390(40)	18(9)
H(03)	8350(50)	6440(40)	2310(40)	18(9)
H(04)	10270(50)	6650(40)	3350(40)	18(9)
H(2)	2669	4407	2907	29
H(3)	4305	4598	4147	33
H(4)	6075	4430	3649	31
H(5)	5494	4209	2101	27
H(6A)	3390	4481	986	29
H(6B)	2329	4221	1304	29
H(7A)	3816	2846	789	27
H(7B)	2480	2800	453	27
H(9)	1598	2535	2848	24
H(10)	-333	2517	2732	34
H(11)	-1594	2171	1441	36
H(12)	-937	1766	298	35
H(13)	971	1745	397	27
H(15)	4404	1183	765	40
H(16)	4705	-485	355	54
H(17)	3688	-1763	638	45
H(18)	2385	-1382	1371	42
H(19)	2005	252	1753	28
H(20)	7050	1214	3707	33
H(21A)	8049	2347	3246	50
H(21B)	7403	2967	3835	50
H(21C)	6940	2879	2868	50
H(22A)	6122	1323	2025	47
H(22B)	5927	358	2414	47
H(22C)	7161	702	2394	47
H(23)	6197	3120	4634	33
H(24A)	7069	2395	5715	57
H(24B)	7371	1833	4919	57
H(24C)	6474	1324	5282	57
H(25A)	4658	2144	5259	55
H(25B)	4316	3014	4728	55
H(25C)	5250	3241	5579	55
H(26)	4387	384	2869	27
H(27A)	3140	-38	3586	49
H(27B)	2978	1078	3405	49
H(27C)	3626	887	4295	49
H(28A)	5542	59	4457	47
H(28B)	6010	-180	3668	47
H(28C)	4917	-790	3718	47
H(30)	7474	4572	2139	27
H(31)	8122	4860	3688	29
H(32)	10234	5003	4099	30
H(33)	10890	4854	2799	25
H(34A)	8637	4077	932	33
H(34B)	9940	4413	1211	33
H(35A)	8124	5656	791	25
H(35B)	9222	5595	457	25
H(37)	7483	7289	1082	26

H(38)	6787	8791	754	34
H(39)	7992	10167	901	40
H(40)	9924	10063	1365	38
H(41)	10630	8536	1662	29
H(43)	10776	6499	482	28
H(44)	12606	6467	403	29
H(45)	14069	6613	1599	34
H(46)	13641	6758	2849	33
H(47)	11801	6756	2925	27
H(48)	8842	8761	2916	32
H(49A)	9084	9684	4553	59
H(49B)	7899	9495	3891	59
H(49C)	8851	10222	3766	59
H(50A)	10607	9524	3528	52
H(50B)	10706	8343	3352	52
H(50C)	10771	8888	4256	52
H(51)	6972	8083	3882	30
H(52A)	5735	6690	3403	52
H(52B)	6861	6382	3985	52
H(52C)	6626	6097	3017	52
H(53A)	6738	7472	2180	39
H(53B)	6867	8602	2636	39
H(53C)	5759	7923	2551	39
H(54)	8700	6629	4714	57
H(55A)	8679	7796	5857	81
H(55B)	7634	7857	5099	81
H(55C)	8659	8676	5333	81
H(56A)	10563	7905	5275	83
H(56B)	10526	6836	4727	83
H(56C)	10260	6916	5596	83
H(05)	4492 (10)	3870 (50)	9520 (50)	170 (70)
H(06)	4020 (80)	4728 (4)	9330 (80)	180 (70)

Table 1. Crystal data and structure refinement for 4.

Identification code	mae89a1s
Empirical formula	C31.50 H43 Cl Os P2
Formula weight	709.25
Temperature	100(2) K
Wavelength	0.71073 Å
Crystal system, space group	triclinic, P-1
Unit cell dimensions	a = 10.987(2) Å alpha = 88.250(3) deg. b = 15.170(3) Å beta = 76.352(3) deg. c = 18.254(4) Å gamma = 80.402(3) deg.
Volume	2915.1(10) Å ³
Z, Calculated density	4, 1.616 Mg/m ³
Absorption coefficient	4.595 mm ⁻¹
F(000)	1420
Crystal size	0.28 x 0.06 x 0.04 mm
Theta range for data collection	1.77 to 28.48 deg.
Limiting indices	-14<=h<=14, -20<=k<=20, -23<=l<=23
Reflections collected / unique	34982 / 13397 [R(int) = 0.0366]
Completeness to theta = 28.48	90.8 %
Max. and min. transmission	0.8375 and 0.3594
Refinement method	Full-matrix least-squares on F ²
Data / restraints / parameters	13397 / 0 / 653
Goodness-of-fit on F ²	0.861
Final R indices [I>2sigma(I)]	R1 = 0.0303, wR2 = 0.0538
R indices (all data)	R1 = 0.0467, wR2 = 0.0566
Largest diff. peak and hole	1.683 and -0.908 e.Å ⁻³

Table 2. Atomic coordinates ($\times 10^4$) and equivalent isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 4. $U(\text{eq})$ is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	$U(\text{eq})$
Os(1)	6391(1)	1793(1)	2801(1)	15(1)
Os(2)	4470(1)	3012(1)	7970(1)	16(1)
Cl(1)	5981(1)	259(1)	2760(1)	22(1)
Cl(2)	4616(1)	4600(1)	8073(1)	24(1)
P(1)	8051(1)	1535(1)	3372(1)	17(1)
P(2)	7461(1)	1606(1)	1528(1)	15(1)
P(3)	2848(1)	2897(1)	8991(1)	17(1)
P(4)	3328(1)	3407(1)	7035(1)	18(1)
C(1)	5806(4)	2870(3)	3635(2)	20(1)
C(2)	4931(4)	2253(3)	3818(2)	22(1)
C(3)	4323(4)	2247(3)	3212(2)	23(1)
C(4)	4786(4)	2855(3)	2660(2)	23(1)
C(5)	5726(4)	3243(3)	2914(2)	21(1)
C(6)	6705(4)	3042(3)	4098(2)	25(1)
C(7)	8076(4)	2661(3)	3719(2)	24(1)
C(8)	7818(4)	910(3)	4255(2)	19(1)
C(9)	6819(4)	425(3)	4470(2)	21(1)
C(10)	6615(4)	8(3)	5166(2)	24(1)
C(11)	7379(4)	63(3)	5654(3)	29(1)
C(12)	8380(5)	522(3)	5436(3)	34(1)
C(13)	8605(4)	935(3)	4749(3)	30(1)
C(14)	9739(4)	1111(3)	2984(2)	18(1)
C(15)	10155(4)	191(3)	2931(2)	22(1)
C(16)	11402(4)	-156(3)	2591(2)	26(1)
C(17)	12261(4)	412(3)	2303(3)	30(1)
C(18)	11860(4)	1324(3)	2360(3)	27(1)
C(19)	10615(4)	1672(3)	2702(2)	24(1)
C(20)	6593(4)	1042(3)	966(2)	19(1)
C(21)	7118(4)	1018(3)	120(2)	26(1)
C(22)	5155(4)	1369(3)	1161(2)	25(1)
C(23)	9072(4)	906(2)	1333(2)	16(1)
C(24)	10042(4)	1031(3)	600(2)	21(1)
C(25)	8986(4)	-91(2)	1446(2)	22(1)
C(26)	7836(4)	2621(3)	992(2)	19(1)
C(27)	6683(4)	3283(3)	877(2)	26(1)
C(28)	8669(4)	3090(3)	1366(2)	26(1)
C(29)	5292(4)	1808(3)	8480(2)	18(1)
C(30)	6069(4)	2491(3)	8478(2)	22(1)
C(31)	6572(4)	2691(3)	7709(3)	25(1)
C(32)	6147(4)	2156(3)	7242(3)	24(1)
C(33)	5337(4)	1612(3)	7712(2)	21(1)
C(34)	4522(4)	1427(3)	9165(2)	20(1)
C(35)	3102(4)	1691(2)	9197(2)	18(1)
C(36)	1135(4)	3140(3)	9070(2)	16(1)
C(37)	476(4)	2526(3)	8855(2)	19(1)
C(38)	-783(4)	2758(3)	8833(2)	22(1)
C(39)	-1418(4)	3615(3)	9029(2)	23(1)
C(40)	-792(4)	4227(3)	9270(2)	23(1)
C(41)	468(4)	3999(3)	9291(2)	20(1)
C(42)	2918(4)	3373(2)	9900(2)	17(1)

C(43)	3778(4)	3935(3)	9932(2)	19(1)
C(44)	3842(4)	4275(3)	10611(2)	22(1)
C(45)	3038(4)	4067(3)	11271(2)	23(1)
C(46)	2176(4)	3509(3)	11252(3)	25(1)
C(47)	2117(4)	3166(3)	10569(2)	22(1)
C(48)	3057(4)	2480(3)	6491(2)	20(1)
C(49)	4262(4)	1890(3)	6058(2)	26(1)
C(50)	2193(4)	1899(3)	7000(2)	25(1)
C(51)	4099(4)	4149(3)	6295(2)	25(1)
C(52)	3698(4)	4158(3)	5540(2)	31(1)
C(53)	5533(4)	4014(3)	6156(3)	30(1)
C(54)	1674(4)	4032(3)	7346(2)	21(1)
C(55)	822(4)	4156(3)	6787(3)	33(1)
C(56)	1647(4)	4942(3)	7697(3)	27(1)
C(57)	799(5)	3394(4)	4590(3)	53(2)
C(58)	1307(5)	2546(4)	4804(3)	45(2)
C(59)	666(5)	2119(4)	5406(3)	50(2)
C(60)	-489(6)	2525(5)	5828(4)	65(2)
C(61)	-1005(5)	3354(5)	5632(4)	67(2)
C(62)	-378(5)	3785(5)	5019(4)	60(2)
C(63)	1507(6)	3855(4)	3930(3)	79(2)

Table 3. Bond lengths [Å] and angles [deg] for 4.

Os (1) -C (1)	2.178 (4)	C (15) -H (15)	0.9500
Os (1) -C (2)	2.193 (4)	C (16) -C (17)	1.385 (6)
Os (1) -C (5)	2.199 (4)	C (16) -H (16)	0.9500
Os (1) -C (3)	2.215 (4)	C (17) -C (18)	1.380 (6)
Os (1) -C (4)	2.239 (4)	C (17) -H (17)	0.9500
Os (1) -P (1)	2.2816 (12)	C (18) -C (19)	1.383 (6)
Os (1) -P (2)	2.3443 (12)	C (18) -H (18)	0.9500
Os (1) -Cl (1)	2.4489 (11)	C (19) -H (19)	0.9500
Os (2) -C (29)	2.181 (4)	C (20) -C (21)	1.516 (5)
Os (2) -C (33)	2.194 (4)	C (20) -C (22)	1.533 (5)
Os (2) -C (30)	2.197 (4)	C (20) -H (20)	1.0000
Os (2) -C (31)	2.217 (4)	C (21) -H (21A)	0.9800
Os (2) -C (32)	2.235 (4)	C (21) -H (21B)	0.9800
Os (2) -P (3)	2.2792 (12)	C (21) -H (21C)	0.9800
Os (2) -P (4)	2.3552 (12)	C (22) -H (22A)	0.9800
Os (2) -Cl (2)	2.4555 (11)	C (22) -H (22B)	0.9800
P (1) -C (8)	1.832 (4)	C (22) -H (22C)	0.9800
P (1) -C (14)	1.834 (4)	C (23) -C (24)	1.530 (5)
P (1) -C (7)	1.847 (4)	C (23) -C (25)	1.535 (5)
P (2) -C (26)	1.851 (4)	C (23) -H (23)	1.0000
P (2) -C (20)	1.867 (4)	C (24) -H (24A)	0.9800
P (2) -C (23)	1.868 (4)	C (24) -H (24B)	0.9800
P (3) -C (36)	1.828 (4)	C (24) -H (24C)	0.9800
P (3) -C (35)	1.846 (4)	C (25) -H (25A)	0.9800
P (3) -C (42)	1.852 (4)	C (25) -H (25B)	0.9800
P (4) -C (48)	1.849 (4)	C (25) -H (25C)	0.9800
P (4) -C (51)	1.868 (4)	C (26) -C (27)	1.531 (5)
P (4) -C (54)	1.870 (4)	C (26) -C (28)	1.533 (6)
C (1) -C (2)	1.429 (6)	C (26) -H (26)	1.0000
C (1) -C (5)	1.431 (5)	C (27) -H (27A)	0.9800
C (1) -C (6)	1.501 (6)	C (27) -H (27B)	0.9800
C (2) -C (3)	1.420 (6)	C (27) -H (27C)	0.9800
C (2) -H (2)	0.9500	C (28) -H (28A)	0.9800
C (3) -C (4)	1.409 (6)	C (28) -H (28B)	0.9800
C (3) -H (3)	0.9500	C (28) -H (28C)	0.9800
C (4) -C (5)	1.441 (6)	C (29) -C (33)	1.428 (6)
C (4) -H (4)	0.9500	C (29) -C (30)	1.447 (5)
C (5) -H (5)	0.9500	C (29) -C (34)	1.495 (5)
C (6) -C (7)	1.524 (5)	C (30) -C (31)	1.425 (6)
C (6) -H (6A)	0.9900	C (30) -H (30)	0.9500
C (6) -H (6B)	0.9900	C (31) -C (32)	1.399 (6)
C (7) -H (7A)	0.9900	C (31) -H (31)	0.9500
C (7) -H (7B)	0.9900	C (32) -C (33)	1.432 (6)
C (8) -C (13)	1.394 (6)	C (32) -H (32)	0.9500
C (8) -C (9)	1.395 (5)	C (33) -H (33)	0.9500
C (9) -C (10)	1.389 (5)	C (34) -C (35)	1.532 (5)
C (9) -H (9)	0.9500	C (34) -H (34A)	0.9900
C (10) -C (11)	1.373 (6)	C (34) -H (34B)	0.9900
C (10) -H (10)	0.9500	C (35) -H (35A)	0.9900
C (11) -C (12)	1.373 (6)	C (35) -H (35B)	0.9900
C (11) -H (11)	0.9500	C (36) -C (37)	1.388 (5)
C (12) -C (13)	1.372 (6)	C (36) -C (41)	1.406 (5)
C (12) -H (12)	0.9500	C (37) -C (38)	1.379 (5)
C (13) -H (13)	0.9500	C (37) -H (37)	0.9500
C (14) -C (19)	1.389 (5)	C (38) -C (39)	1.383 (6)
C (14) -C (15)	1.393 (5)	C (38) -H (38)	0.9500
C (15) -C (16)	1.385 (6)	C (39) -C (40)	1.381 (6)

C (39) -H (39)	0.9500	C (1) -Os (1) -C (3)	63.17 (16)
C (40) -C (41)	1.379 (5)	C (2) -Os (1) -C (3)	37.59 (15)
C (40) -H (40)	0.9500	C (5) -Os (1) -C (3)	62.80 (16)
C (41) -H (41)	0.9500	C (1) -Os (1) -C (4)	63.32 (16)
C (42) -C (43)	1.387 (5)	C (2) -Os (1) -C (4)	62.72 (15)
C (42) -C (47)	1.387 (5)	C (5) -Os (1) -C (4)	37.88 (15)
C (43) -C (44)	1.379 (5)	C (3) -Os (1) -C (4)	36.89 (15)
C (43) -H (43)	0.9500	C (1) -Os (1) -P (1)	80.21 (11)
C (44) -C (45)	1.377 (6)	C (2) -Os (1) -P (1)	96.21 (12)
C (44) -H (44)	0.9500	C (5) -Os (1) -P (1)	104.83 (12)
C (45) -C (46)	1.379 (6)	C (3) -Os (1) -P (1)	133.76 (12)
C (45) -H (45)	0.9500	C (4) -Os (1) -P (1)	141.58 (12)
C (46) -C (47)	1.385 (6)	C (1) -Os (1) -P (2)	137.42 (11)
C (46) -H (46)	0.9500	C (2) -Os (1) -P (2)	160.77 (11)
C (47) -H (47)	0.9500	C (5) -Os (1) -P (2)	103.44 (11)
C (48) -C (49)	1.527 (5)	C (3) -Os (1) -P (2)	124.90 (12)
C (48) -C (50)	1.533 (6)	C (4) -Os (1) -P (2)	98.20 (11)
C (48) -H (48)	1.0000	P (1) -Os (1) -P (2)	101.04 (4)
C (49) -H (49A)	0.9800	C (1) -Os (1) -Cl (1)	134.83 (11)
C (49) -H (49B)	0.9800	C (2) -Os (1) -Cl (1)	98.24 (11)
C (49) -H (49C)	0.9800	C (5) -Os (1) -Cl (1)	151.11 (12)
C (50) -H (50A)	0.9800	C (3) -Os (1) -Cl (1)	88.92 (12)
C (50) -H (50B)	0.9800	C (4) -Os (1) -Cl (1)	114.79 (12)
C (50) -H (50C)	0.9800	P (1) -Os (1) -Cl (1)	99.06 (4)
C (51) -C (53)	1.516 (6)	P (2) -Os (1) -Cl (1)	87.43 (4)
C (51) -C (52)	1.542 (6)	C (29) -Os (2) -C (33)	38.11 (15)
C (51) -H (51)	1.0000	C (29) -Os (2) -C (30)	38.60 (14)
C (52) -H (52A)	0.9800	C (33) -Os (2) -C (30)	63.74 (16)
C (52) -H (52B)	0.9800	C (29) -Os (2) -C (31)	63.30 (15)
C (52) -H (52C)	0.9800	C (33) -Os (2) -C (31)	62.61 (16)
C (53) -H (53A)	0.9800	C (30) -Os (2) -C (31)	37.65 (15)
C (53) -H (53B)	0.9800	C (29) -Os (2) -C (32)	63.18 (16)
C (53) -H (53C)	0.9800	C (33) -Os (2) -C (32)	37.72 (15)
C (54) -C (55)	1.527 (6)	C (30) -Os (2) -C (32)	62.66 (16)
C (54) -C (56)	1.533 (5)	C (31) -Os (2) -C (32)	36.62 (15)
C (54) -H (54)	1.0000	C (29) -Os (2) -P (3)	80.09 (11)
C (55) -H (55A)	0.9800	C (33) -Os (2) -P (3)	102.73 (12)
C (55) -H (55B)	0.9800	C (30) -Os (2) -P (3)	98.62 (12)
C (55) -H (55C)	0.9800	C (31) -Os (2) -P (3)	136.25 (12)
C (56) -H (56A)	0.9800	C (32) -Os (2) -P (3)	139.92 (12)
C (56) -H (56B)	0.9800	C (29) -Os (2) -P (4)	138.86 (11)
C (56) -H (56C)	0.9800	C (33) -Os (2) -P (4)	104.18 (12)
C (57) -C (62)	1.390 (7)	C (30) -Os (2) -P (4)	159.34 (12)
C (57) -C (58)	1.399 (7)	C (31) -Os (2) -P (4)	122.64 (12)
C (57) -C (63)	1.494 (8)	C (32) -Os (2) -P (4)	97.32 (12)
C (58) -C (59)	1.365 (7)	P (3) -Os (2) -P (4)	100.52 (4)
C (58) -H (58)	0.9500	C (29) -Os (2) -Cl (2)	132.72 (11)
C (59) -C (60)	1.374 (8)	C (33) -Os (2) -Cl (2)	151.79 (12)
C (59) -H (59)	0.9500	C (30) -Os (2) -Cl (2)	96.29 (11)
C (60) -C (61)	1.365 (9)	C (31) -Os (2) -Cl (2)	89.31 (12)
C (60) -H (60)	0.9500	C (32) -Os (2) -Cl (2)	116.51 (11)
C (61) -C (62)	1.377 (8)	P (3) -Os (2) -Cl (2)	99.75 (4)
C (61) -H (61)	0.9500	P (4) -Os (2) -Cl (2)	88.09 (4)
C (62) -H (62)	0.9500	C (8) -P (1) -C (14)	99.21 (18)
C (63) -H (63A)	0.9800	C (8) -P (1) -C (7)	101.05 (19)
C (63) -H (63B)	0.9800	C (14) -P (1) -C (7)	102.78 (19)
C (63) -H (63C)	0.9800	C (8) -P (1) -Os (1)	116.95 (14)
		C (14) -P (1) -Os (1)	130.49 (14)
C (1) -Os (1) -C (2)	38.17 (15)	C (7) -P (1) -Os (1)	102.10 (15)
C (1) -Os (1) -C (5)	38.17 (14)	C (26) -P (2) -C (20)	105.32 (19)
C (2) -Os (1) -C (5)	63.53 (15)	C (26) -P (2) -C (23)	100.06 (18)

C(20)-P(2)-C(23)	103.28(18)	C(10)-C(9)-C(8)	119.9(4)
C(26)-P(2)-Os(1)	117.55(14)	C(10)-C(9)-H(9)	120.0
C(20)-P(2)-Os(1)	112.72(14)	C(8)-C(9)-H(9)	120.0
C(23)-P(2)-Os(1)	116.12(13)	C(11)-C(10)-C(9)	121.2(4)
C(36)-P(3)-C(35)	102.22(18)	C(11)-C(10)-H(10)	119.4
C(36)-P(3)-C(42)	99.75(18)	C(9)-C(10)-H(10)	119.4
C(35)-P(3)-C(42)	100.64(18)	C(10)-C(11)-C(12)	118.9(4)
C(36)-P(3)-Os(2)	129.24(14)	C(10)-C(11)-H(11)	120.6
C(35)-P(3)-Os(2)	102.59(14)	C(12)-C(11)-H(11)	120.6
C(42)-P(3)-Os(2)	118.00(14)	C(13)-C(12)-C(11)	120.9(4)
C(48)-P(4)-C(51)	103.9(2)	C(13)-C(12)-H(12)	119.5
C(48)-P(4)-C(54)	100.73(19)	C(11)-C(12)-H(12)	119.5
C(51)-P(4)-C(54)	102.79(19)	C(12)-C(13)-C(8)	121.1(4)
C(48)-P(4)-Os(2)	116.78(14)	C(12)-C(13)-H(13)	119.5
C(51)-P(4)-Os(2)	113.31(14)	C(8)-C(13)-H(13)	119.5
C(54)-P(4)-Os(2)	117.34(14)	C(19)-C(14)-C(15)	118.2(4)
C(2)-C(1)-C(5)	107.9(4)	C(19)-C(14)-P(1)	122.5(3)
C(2)-C(1)-C(6)	125.4(4)	C(15)-C(14)-P(1)	119.2(3)
C(5)-C(1)-C(6)	126.6(4)	C(16)-C(15)-C(14)	120.9(4)
C(2)-C(1)-Os(1)	71.5(2)	C(16)-C(15)-H(15)	119.5
C(5)-C(1)-Os(1)	71.7(2)	C(14)-C(15)-H(15)	119.5
C(6)-C(1)-Os(1)	119.3(3)	C(15)-C(16)-C(17)	120.2(4)
C(3)-C(2)-C(1)	107.7(4)	C(15)-C(16)-H(16)	119.9
C(3)-C(2)-Os(1)	72.0(2)	C(17)-C(16)-H(16)	119.9
C(1)-C(2)-Os(1)	70.3(2)	C(18)-C(17)-C(16)	119.2(4)
C(3)-C(2)-H(2)	126.2	C(18)-C(17)-H(17)	120.4
C(1)-C(2)-H(2)	126.2	C(16)-C(17)-H(17)	120.4
Os(1)-C(2)-H(2)	123.2	C(17)-C(18)-C(19)	120.6(4)
C(4)-C(3)-C(2)	109.2(4)	C(17)-C(18)-H(18)	119.7
C(4)-C(3)-Os(1)	72.5(2)	C(19)-C(18)-H(18)	119.7
C(2)-C(3)-Os(1)	70.4(2)	C(18)-C(19)-C(14)	120.8(4)
C(4)-C(3)-H(3)	125.4	C(18)-C(19)-H(19)	119.6
C(2)-C(3)-H(3)	125.4	C(14)-C(19)-H(19)	119.6
Os(1)-C(3)-H(3)	123.3	C(21)-C(20)-C(22)	110.7(3)
C(3)-C(4)-C(5)	107.6(4)	C(21)-C(20)-P(2)	115.9(3)
C(3)-C(4)-Os(1)	70.6(2)	C(22)-C(20)-P(2)	113.5(3)
C(5)-C(4)-Os(1)	69.6(2)	C(21)-C(20)-H(20)	105.2
C(3)-C(4)-H(4)	126.2	C(22)-C(20)-H(20)	105.2
C(5)-C(4)-H(4)	126.2	P(2)-C(20)-H(20)	105.2
Os(1)-C(4)-H(4)	125.2	C(20)-C(21)-H(21A)	109.5
C(1)-C(5)-C(4)	107.7(4)	C(20)-C(21)-H(21B)	109.5
C(1)-C(5)-Os(1)	70.1(2)	H(21A)-C(21)-H(21B)	109.5
C(4)-C(5)-Os(1)	72.6(2)	C(20)-C(21)-H(21C)	109.5
C(1)-C(5)-H(5)	126.2	H(21A)-C(21)-H(21C)	109.5
C(4)-C(5)-H(5)	126.2	H(21B)-C(21)-H(21C)	109.5
Os(1)-C(5)-H(5)	122.8	C(20)-C(22)-H(22A)	109.5
C(1)-C(6)-C(7)	111.6(3)	C(20)-C(22)-H(22B)	109.5
C(1)-C(6)-H(6A)	109.3	H(22A)-C(22)-H(22B)	109.5
C(7)-C(6)-H(6A)	109.3	C(20)-C(22)-H(22C)	109.5
C(1)-C(6)-H(6B)	109.3	H(22A)-C(22)-H(22C)	109.5
C(7)-C(6)-H(6B)	109.3	H(22B)-C(22)-H(22C)	109.5
H(6A)-C(6)-H(6B)	108.0	C(24)-C(23)-C(25)	109.7(3)
C(6)-C(7)-P(1)	106.2(3)	C(24)-C(23)-P(2)	119.8(3)
C(6)-C(7)-H(7A)	110.5	C(25)-C(23)-P(2)	111.3(3)
P(1)-C(7)-H(7A)	110.5	C(24)-C(23)-H(23)	104.9
C(6)-C(7)-H(7B)	110.5	C(25)-C(23)-H(23)	104.9
P(1)-C(7)-H(7B)	110.5	P(2)-C(23)-H(23)	104.9
H(7A)-C(7)-H(7B)	108.7	C(23)-C(24)-H(24A)	109.5
C(13)-C(8)-C(9)	117.9(4)	C(23)-C(24)-H(24B)	109.5
C(13)-C(8)-P(1)	120.7(3)	H(24A)-C(24)-H(24B)	109.5
C(9)-C(8)-P(1)	121.3(3)	C(23)-C(24)-H(24C)	109.5

H(24A)-C(24)-H(24C)	109.5	H(34A)-C(34)-H(34B)	108.1
H(24B)-C(24)-H(24C)	109.5	C(34)-C(35)-P(3)	106.1(3)
C(23)-C(25)-H(25A)	109.5	C(34)-C(35)-H(35A)	110.5
C(23)-C(25)-H(25B)	109.5	P(3)-C(35)-H(35A)	110.5
H(25A)-C(25)-H(25B)	109.5	C(34)-C(35)-H(35B)	110.5
C(23)-C(25)-H(25C)	109.5	P(3)-C(35)-H(35B)	110.5
H(25A)-C(25)-H(25C)	109.5	H(35A)-C(35)-H(35B)	108.7
H(25B)-C(25)-H(25C)	109.5	C(37)-C(36)-C(41)	117.9(4)
C(27)-C(26)-C(28)	110.4(3)	C(37)-C(36)-P(3)	122.2(3)
C(27)-C(26)-P(2)	115.1(3)	C(41)-C(36)-P(3)	119.6(3)
C(28)-C(26)-P(2)	109.6(3)	C(38)-C(37)-C(36)	121.3(4)
C(27)-C(26)-H(26)	107.1	C(38)-C(37)-H(37)	119.4
C(28)-C(26)-H(26)	107.1	C(36)-C(37)-H(37)	119.4
P(2)-C(26)-H(26)	107.1	C(37)-C(38)-C(39)	120.2(4)
C(26)-C(27)-H(27A)	109.5	C(37)-C(38)-H(38)	119.9
C(26)-C(27)-H(27B)	109.5	C(39)-C(38)-H(38)	119.9
H(27A)-C(27)-H(27B)	109.5	C(40)-C(39)-C(38)	119.5(4)
C(26)-C(27)-H(27C)	109.5	C(40)-C(39)-H(39)	120.3
H(27A)-C(27)-H(27C)	109.5	C(38)-C(39)-H(39)	120.3
H(27B)-C(27)-H(27C)	109.5	C(41)-C(40)-C(39)	120.6(4)
C(26)-C(28)-H(28A)	109.5	C(41)-C(40)-H(40)	119.7
C(26)-C(28)-H(28B)	109.5	C(39)-C(40)-H(40)	119.7
H(28A)-C(28)-H(28B)	109.5	C(40)-C(41)-C(36)	120.5(4)
C(26)-C(28)-H(28C)	109.5	C(40)-C(41)-H(41)	119.7
H(28A)-C(28)-H(28C)	109.5	C(36)-C(41)-H(41)	119.7
H(28B)-C(28)-H(28C)	109.5	C(43)-C(42)-C(47)	118.2(4)
C(33)-C(29)-C(30)	107.5(4)	C(43)-C(42)-P(3)	121.1(3)
C(33)-C(29)-C(34)	126.7(4)	C(47)-C(42)-P(3)	120.7(3)
C(30)-C(29)-C(34)	125.7(4)	C(44)-C(43)-C(42)	120.9(4)
C(33)-C(29)-Os(2)	71.4(2)	C(44)-C(43)-H(43)	119.6
C(30)-C(29)-Os(2)	71.3(2)	C(42)-C(43)-H(43)	119.6
C(34)-C(29)-Os(2)	119.8(3)	C(45)-C(44)-C(43)	120.3(4)
C(31)-C(30)-C(29)	107.0(4)	C(45)-C(44)-H(44)	119.9
C(31)-C(30)-Os(2)	71.9(2)	C(43)-C(44)-H(44)	119.9
C(29)-C(30)-Os(2)	70.1(2)	C(44)-C(45)-C(46)	119.8(4)
C(31)-C(30)-H(30)	126.5	C(44)-C(45)-H(45)	120.1
C(29)-C(30)-H(30)	126.5	C(46)-C(45)-H(45)	120.1
Os(2)-C(30)-H(30)	123.1	C(45)-C(46)-C(47)	119.8(4)
C(32)-C(31)-C(30)	109.4(4)	C(45)-C(46)-H(46)	120.1
C(32)-C(31)-Os(2)	72.4(2)	C(47)-C(46)-H(46)	120.1
C(30)-C(31)-Os(2)	70.4(2)	C(46)-C(47)-C(42)	121.0(4)
C(32)-C(31)-H(31)	125.3	C(46)-C(47)-H(47)	119.5
C(30)-C(31)-H(31)	125.3	C(42)-C(47)-H(47)	119.5
Os(2)-C(31)-H(31)	123.5	C(49)-C(48)-C(50)	109.8(3)
C(31)-C(32)-C(33)	108.1(4)	C(49)-C(48)-P(4)	114.9(3)
C(31)-C(32)-Os(2)	71.0(2)	C(50)-C(48)-P(4)	110.9(3)
C(33)-C(32)-Os(2)	69.6(2)	C(49)-C(48)-H(48)	107.0
C(31)-C(32)-H(32)	125.9	C(50)-C(48)-H(48)	107.0
C(33)-C(32)-H(32)	125.9	P(4)-C(48)-H(48)	107.0
Os(2)-C(32)-H(32)	125.1	C(48)-C(49)-H(49A)	109.5
C(29)-C(33)-C(32)	108.0(4)	C(48)-C(49)-H(49B)	109.5
C(29)-C(33)-Os(2)	70.5(2)	H(49A)-C(49)-H(49B)	109.5
C(32)-C(33)-Os(2)	72.7(2)	C(48)-C(49)-H(49C)	109.5
C(29)-C(33)-H(33)	126.0	H(49A)-C(49)-H(49C)	109.5
C(32)-C(33)-H(33)	126.0	H(49B)-C(49)-H(49C)	109.5
Os(2)-C(33)-H(33)	122.5	C(48)-C(50)-H(50A)	109.5
C(29)-C(34)-C(35)	110.4(3)	C(48)-C(50)-H(50B)	109.5
C(29)-C(34)-H(34A)	109.6	H(50A)-C(50)-H(50B)	109.5
C(35)-C(34)-H(34A)	109.6	C(48)-C(50)-H(50C)	109.5
C(29)-C(34)-H(34B)	109.6	H(50A)-C(50)-H(50C)	109.5
C(35)-C(34)-H(34B)	109.6	H(50B)-C(50)-H(50C)	109.5

C (53) -C (51) -C (52)	110.1 (4)	C (54) -C (56) -H (56A)	109.5
C (53) -C (51) -P (4)	114.2 (3)	C (54) -C (56) -H (56B)	109.5
C (52) -C (51) -P (4)	115.5 (3)	H (56A) -C (56) -H (56B)	109.5
C (53) -C (51) -H (51)	105.3	C (54) -C (56) -H (56C)	109.5
C (52) -C (51) -H (51)	105.3	H (56A) -C (56) -H (56C)	109.5
P (4) -C (51) -H (51)	105.3	H (56B) -C (56) -H (56C)	109.5
C (51) -C (52) -H (52A)	109.5	C (62) -C (57) -C (58)	117.1 (6)
C (51) -C (52) -H (52B)	109.5	C (62) -C (57) -C (63)	122.1 (6)
H (52A) -C (52) -H (52B)	109.5	C (58) -C (57) -C (63)	120.8 (5)
C (51) -C (52) -H (52C)	109.5	C (59) -C (58) -C (57)	121.2 (5)
H (52A) -C (52) -H (52C)	109.5	C (59) -C (58) -H (58)	119.4
H (52B) -C (52) -H (52C)	109.5	C (57) -C (58) -H (58)	119.4
C (51) -C (53) -H (53A)	109.5	C (58) -C (59) -C (60)	120.6 (6)
C (51) -C (53) -H (53B)	109.5	C (58) -C (59) -H (59)	119.7
H (53A) -C (53) -H (53B)	109.5	C (60) -C (59) -H (59)	119.7
C (51) -C (53) -H (53C)	109.5	C (61) -C (60) -C (59)	119.4 (7)
H (53A) -C (53) -H (53C)	109.5	C (61) -C (60) -H (60)	120.3
H (53B) -C (53) -H (53C)	109.5	C (59) -C (60) -H (60)	120.3
C (55) -C (54) -C (56)	108.8 (3)	C (60) -C (61) -C (62)	120.6 (6)
C (55) -C (54) -P (4)	118.9 (3)	C (60) -C (61) -H (61)	119.7
C (56) -C (54) -P (4)	111.9 (3)	C (62) -C (61) -H (61)	119.7
C (55) -C (54) -H (54)	105.4	C (61) -C (62) -C (57)	121.1 (6)
C (56) -C (54) -H (54)	105.4	C (61) -C (62) -H (62)	119.4
P (4) -C (54) -H (54)	105.4	C (57) -C (62) -H (62)	119.4
C (54) -C (55) -H (55A)	109.5	C (57) -C (63) -H (63A)	109.5
C (54) -C (55) -H (55B)	109.5	C (57) -C (63) -H (63B)	109.5
H (55A) -C (55) -H (55B)	109.5	H (63A) -C (63) -H (63B)	109.5
C (54) -C (55) -H (55C)	109.5	C (57) -C (63) -H (63C)	109.5
H (55A) -C (55) -H (55C)	109.5	H (63A) -C (63) -H (63C)	109.5
H (55B) -C (55) -H (55C)	109.5	H (63B) -C (63) -H (63C)	109.5

Symmetry transformations used to generate equivalent atoms:

Table 4. Anisotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 4.
 The anisotropic displacement factor exponent takes the form:
 $-2 \pi^2 [h^2 a^{*2} U_{11} + \dots + 2 h k a^* b^* U_{12}]$

	U11	U22	U33	U23	U13	U12
Os (1)	15 (1)	13 (1)	16 (1)	0 (1)	-3 (1)	0 (1)
Os (2)	17 (1)	13 (1)	19 (1)	0 (1)	-5 (1)	-2 (1)
Cl (1)	24 (1)	17 (1)	25 (1)	3 (1)	-7 (1)	-7 (1)
Cl (2)	33 (1)	15 (1)	25 (1)	2 (1)	-10 (1)	-7 (1)
P (1)	17 (1)	16 (1)	17 (1)	0 (1)	-3 (1)	-3 (1)
P (2)	16 (1)	12 (1)	18 (1)	0 (1)	-4 (1)	0 (1)
P (3)	17 (1)	13 (1)	21 (1)	1 (1)	-7 (1)	-2 (1)
P (4)	22 (1)	13 (1)	20 (1)	0 (1)	-5 (1)	-3 (1)
C (1)	21 (2)	14 (2)	18 (2)	-5 (2)	2 (2)	4 (2)
C (2)	21 (2)	18 (2)	22 (2)	3 (2)	0 (2)	2 (2)
C (3)	11 (2)	25 (2)	28 (3)	-6 (2)	0 (2)	4 (2)
C (4)	20 (2)	21 (2)	22 (2)	0 (2)	-4 (2)	13 (2)
C (5)	24 (2)	13 (2)	22 (2)	-2 (2)	0 (2)	3 (2)
C (6)	29 (3)	16 (2)	26 (3)	-7 (2)	-3 (2)	0 (2)
C (7)	24 (2)	22 (2)	24 (3)	-6 (2)	-1 (2)	-6 (2)
C (8)	19 (2)	20 (2)	14 (2)	0 (2)	-3 (2)	3 (2)
C (9)	18 (2)	23 (2)	22 (2)	2 (2)	-5 (2)	-2 (2)
C (10)	27 (3)	22 (2)	22 (3)	3 (2)	-4 (2)	-6 (2)
C (11)	36 (3)	28 (3)	21 (3)	5 (2)	-8 (2)	-2 (2)
C (12)	39 (3)	44 (3)	25 (3)	6 (2)	-18 (2)	-13 (2)
C (13)	29 (3)	37 (3)	27 (3)	5 (2)	-11 (2)	-13 (2)
C (14)	18 (2)	23 (2)	15 (2)	3 (2)	-7 (2)	-2 (2)
C (15)	24 (2)	21 (2)	21 (2)	3 (2)	-6 (2)	-3 (2)
C (16)	29 (3)	24 (2)	21 (3)	-1 (2)	-4 (2)	6 (2)
C (17)	17 (2)	37 (3)	30 (3)	5 (2)	-3 (2)	7 (2)
C (18)	17 (2)	37 (3)	29 (3)	6 (2)	-9 (2)	-5 (2)
C (19)	23 (2)	24 (2)	26 (3)	4 (2)	-9 (2)	-5 (2)
C (20)	20 (2)	18 (2)	21 (2)	-1 (2)	-8 (2)	-1 (2)
C (21)	22 (2)	34 (3)	23 (3)	-4 (2)	-10 (2)	2 (2)
C (22)	24 (3)	31 (3)	20 (3)	2 (2)	-5 (2)	-7 (2)
C (23)	19 (2)	13 (2)	16 (2)	-4 (2)	-6 (2)	-1 (2)
C (24)	23 (2)	18 (2)	21 (2)	-4 (2)	-2 (2)	-2 (2)
C (25)	23 (2)	15 (2)	24 (3)	-4 (2)	-2 (2)	4 (2)
C (26)	19 (2)	15 (2)	18 (2)	3 (2)	-1 (2)	3 (2)
C (27)	28 (3)	19 (2)	27 (3)	3 (2)	-3 (2)	5 (2)
C (28)	29 (3)	14 (2)	30 (3)	-6 (2)	3 (2)	-4 (2)
C (29)	14 (2)	14 (2)	27 (3)	3 (2)	-8 (2)	3 (2)
C (30)	21 (2)	19 (2)	26 (3)	0 (2)	-12 (2)	-1 (2)
C (31)	13 (2)	25 (2)	35 (3)	3 (2)	-3 (2)	-4 (2)
C (32)	16 (2)	24 (2)	26 (3)	-4 (2)	1 (2)	4 (2)
C (33)	20 (2)	11 (2)	31 (3)	-1 (2)	-8 (2)	5 (2)
C (34)	21 (2)	16 (2)	26 (3)	5 (2)	-9 (2)	-4 (2)
C (35)	17 (2)	11 (2)	25 (2)	2 (2)	-7 (2)	-2 (2)
C (36)	14 (2)	18 (2)	18 (2)	2 (2)	-7 (2)	-2 (2)
C (37)	21 (2)	14 (2)	21 (2)	3 (2)	-6 (2)	-2 (2)
C (38)	19 (2)	22 (2)	28 (3)	4 (2)	-9 (2)	-8 (2)
C (39)	16 (2)	27 (2)	25 (3)	2 (2)	-4 (2)	-1 (2)
C (40)	20 (2)	19 (2)	29 (3)	-5 (2)	-8 (2)	6 (2)
C (41)	20 (2)	18 (2)	23 (2)	-3 (2)	-7 (2)	-2 (2)
C (42)	18 (2)	12 (2)	22 (2)	-1 (2)	-8 (2)	-1 (2)
C (43)	15 (2)	16 (2)	24 (2)	0 (2)	-4 (2)	1 (2)

C(44)	21(2)	17(2)	31(3)	-1(2)	-13(2)	-1(2)
C(45)	27(3)	20(2)	24(3)	-4(2)	-15(2)	6(2)
C(46)	27(3)	26(2)	22(3)	4(2)	-5(2)	-2(2)
C(47)	23(2)	17(2)	29(3)	3(2)	-9(2)	-8(2)
C(48)	24(2)	19(2)	18(2)	-2(2)	-10(2)	-4(2)
C(49)	32(3)	22(2)	24(3)	-6(2)	-6(2)	-6(2)
C(50)	28(3)	17(2)	30(3)	-4(2)	-8(2)	-1(2)
C(51)	33(3)	19(2)	25(3)	7(2)	-7(2)	-8(2)
C(52)	36(3)	36(3)	22(3)	12(2)	-6(2)	-12(2)
C(53)	35(3)	28(3)	30(3)	4(2)	-9(2)	-13(2)
C(54)	22(2)	15(2)	27(3)	1(2)	-7(2)	-2(2)
C(55)	35(3)	33(3)	32(3)	-5(2)	-15(2)	5(2)
C(56)	28(3)	20(2)	34(3)	-1(2)	-9(2)	-2(2)
C(57)	41(4)	73(4)	42(4)	-28(3)	-19(3)	18(3)
C(58)	26(3)	70(4)	34(3)	-14(3)	-7(3)	8(3)
C(59)	39(4)	66(4)	48(4)	-23(3)	-7(3)	-18(3)
C(60)	44(4)	96(6)	58(4)	-38(4)	6(3)	-37(4)
C(61)	23(3)	105(6)	70(5)	-59(5)	-5(3)	-4(4)
C(62)	38(4)	85(5)	56(4)	-35(4)	-23(3)	21(3)
C(63)	88(6)	73(5)	52(5)	1(4)	-5(4)	36(4)

Table 5. Hydrogen coordinates ($\times 10^4$) and isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 4.

	x	y	z	U(eq)
H(2)	4782	1909	4264	26
H(3)	3704	1889	3185	28
H(4)	4526	2985	2202	28
H(5)	6207	3670	2652	25
H(6A)	6472	2767	4599	29
H(6B)	6628	3695	4173	29
H(7A)	8620	2625	4084	28
H(7B)	8409	3044	3295	28
H(9)	6280	380	4140	26
H(10)	5933	-321	5308	28
H(11)	7219	-213	6134	34
H(12)	8924	554	5765	40
H(13)	9310	1243	4607	35
H(15)	9574	-204	3129	26
H(16)	11669	-785	2556	31
H(17)	13117	176	2069	36
H(18)	12443	1717	2162	33
H(19)	10357	2301	2743	28
H(20)	6699	402	1125	23
H(21A)	6697	620	-113	39
H(21B)	8033	798	6	39
H(21C)	6962	1622	-82	39
H(22A)	4982	1993	1007	37
H(22B)	4821	1324	1706	37
H(22C)	4745	998	895	37
H(23)	9463	1066	1742	19
H(24A)	10866	675	616	32
H(24B)	10126	1663	542	32
H(24C)	9755	833	172	32
H(25A)	8704	-315	1027	33
H(25B)	8376	-170	1921	33
H(25C)	9823	-425	1464	33
H(26)	8355	2418	480	22
H(27A)	6134	3480	1369	39
H(27B)	6209	2991	591	39
H(27C)	6970	3801	598	39
H(28A)	9027	3540	1024	39
H(28B)	9358	2648	1478	39
H(28C)	8152	3381	1835	39
H(30)	6216	2755	8907	26
H(31)	7113	3120	7540	30
H(32)	6359	2155	6707	29
H(33)	4906	1194	7544	26
H(34A)	4712	1651	9622	24
H(34B)	4751	767	9153	24
H(35A)	2591	1572	9703	21
H(35B)	2856	1347	8819	21
H(37)	901	1934	8720	23
H(38)	-1215	2328	8682	26
H(39)	-2277	3781	8999	28
H(40)	-1234	4809	9422	28
H(41)	888	4427	9456	24

H(43)	4331	4088	9480	23
H(44)	4442	4655	10625	26
H(45)	3078	4308	11738	28
H(46)	1625	3360	11706	30
H(47)	1519	2783	10558	27
H(48)	2592	2756	6109	24
H(49A)	4662	1519	6414	38
H(49B)	4854	2268	5780	38
H(49C)	4046	1505	5703	38
H(50A)	2110	1389	6708	38
H(50B)	1353	2256	7193	38
H(50C)	2564	1681	7423	38
H(51)	3798	4770	6504	30
H(52A)	4014	4646	5228	46
H(52B)	2769	4247	5637	46
H(52C)	4055	3587	5276	46
H(53A)	5894	3426	5921	45
H(53B)	5776	4046	6636	45
H(53C)	5857	4481	5820	45
H(54)	1241	3674	7767	26
H(55A)	-55	4378	7056	50
H(55B)	861	3582	6544	50
H(55C)	1114	4589	6404	50
H(56A)	1950	5355	7299	41
H(56B)	2199	4870	8053	41
H(56C)	776	5182	7964	41
H(58)	2114	2261	4526	54
H(59)	1021	1537	5533	60
H(60)	-923	2230	6252	78
H(61)	-1803	3637	5922	80
H(62)	-757	4359	4887	72
H(63A)	1575	3521	3467	118
H(63B)	2360	3884	3996	118
H(63C)	1052	4462	3895	118
