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Table 1. Crystal data and structure refinement for **3**.

Identification code	KP03
Empirical formula	$C_{34}H_{27}P$
Formula weight	466.53
Habit	plates
Colour	colorless
Crystal size	0.38 x 0.18 x 0.10 mm
Crystal system	Monoclinic
Space group	$P2_1/c$ (No.14)
Unit cell dimensions	a = 11.609(2) Å α = 90° b = 6.218(1) Å β = 91.74(2)° c = 35.287(7) Å γ = 90°
Volume	2546(1) $Å^3$
Z	4
Density (calculated)	1.217 Mg/m^3
Absorption coefficient	1.093 mm^{-1}
F(000)	984
Diffractometer	Enraf-Nonius CAD4
Wavelength	1.54178 Å (CuKα)
Temperature	200(2) K
Monochromator	graphite
θ range for data collection	2.51 to 59.93°
Scan-type	two-theta/omega-scans
Number of Standards	2 (orientation), 3 (intensity)
Interval of Standards	120 min (intensity) min
Decay of Standards	+-1 %
Index ranges	$-5 \leq h \leq 13$, $0 \leq k \leq 6$, $-39 \leq \ell \leq 39$
Reflections collected	4027
Independent reflections	3749 (R_{int} = 0.0306)

Absorption correction	DIFABS
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	3749 / 0 / 317
Goodness-of-fit on F^2	1.048
Final R indices [$I>2\sigma(I)$]	R1 = 0.0525, wR2 = 0.1430
R indices (all data)	R1 = 0.0671, wR2 = 0.1566
Extinction coefficient	0.0008(2)
Largest diff. peak and hole	0.313 and −0.405 $e\text{Å}^{-3}$

Table 2. Atomic coordinates [x 10^4] and equivalent isotropic displacement parameters [$Å^2$ x 10^3] for **3**. U(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	U(eq)
P(1)	1268(1)	5202(1)	3660(1)	30(1)
C(2)	2180(2)	6136(4)	4057(1)	26(1)
C(3)	3103(2)	7256(4)	3943(1)	24(1)
C(4)	3159(2)	7705(4)	3520(1)	27(1)
C(5)	1911(2)	7315(4)	3354(1)	27(1)
C(11)	-123(2)	6415(5)	3756(1)	37(1)
C(12)	-256(3)	8474(6)	3904(1)	53(1)
C(13)	-1338(4)	9343(9)	3953(1)	93(2)
C(14)	-2304(4)	8121(15)	3850(1)	133(3)
C(15)	-2185(3)	6138(15)	3708(1)	128(3)
C(16)	-1112(3)	5261(8)	3663(1)	74(1)
C(21)	1919(2)	5530(4)	4451(1)	26(1)
C(22)	2007(2)	7040(4)	4744(1)	33(1)
C(23)	1742(2)	6484(5)	5109(1)	39(1)
C(24)	1372(2)	4440(5)	5194(1)	40(1)
C(25)	1266(2)	2941(5)	4909(1)	39(1)
C(26)	1531(2)	3468(4)	4539(1)	33(1)
C(31)	4103(2)	7886(4)	4195(1)	25(1)
C(32)	4524(2)	9969(4)	4197(1)	35(1)
C(33)	5463(2)	10544(4)	4430(1)	41(1)
C(34)	5992(2)	9034(5)	4659(1)	38(1)
C(35)	5587(2)	6954(4)	4659(1)	35(1)
C(36)	4649(2)	6384(4)	4429(1)	31(1)
C(41)	4091(2)	6397(4)	3334(1)	26(1)
C(42)	4659(2)	7205(5)	3025(1)	36(1)
C(43)	5468(2)	5984(6)	2843(1)	48(1)
C(44)	5735(2)	3940(6)	2966(1)	49(1)
C(45)	5186(2)	3114(5)	3274(1)	46(1)
C(46)	4373(2)	4332(4)	3455(1)	38(1)
C(51)	1769(2)	6864(4)	2934(1)	29(1)
C(52)	2048(2)	4899(4)	2772(1)	37(1)
C(53)	1874(2)	4527(5)	2386(1)	45(1)
C(54)	1413(2)	6129(6)	2157(1)	49(1)
C(55)	1131(2)	8079(5)	2311(1)	48(1)
C(56)	1316(2)	8458(5)	2696(1)	37(1)

Table 3. Bond lengths [Å] and angles [°] for **3**.

P(1)-C(11)	1.823(3)	P(1)-C(2)	1.825(2)
P(1)-C(5)	1.871(2)	C(2)-C(3)	1.349(3)
C(2)-C(21)	1.480(3)	C(3)-C(31)	1.494(3)
C(3)-C(4)	1.523(3)	C(4)-C(41)	1.517(3)
C(4)-C(5)	1.565(3)	C(5)-C(51)	1.514(3)
C(11)-C(16)	1.385(4)	C(11)-C(12)	1.393(4)
C(12)-C(13)	1.383(5)	C(13)-C(14)	1.394(9)
C(14)-C(15)	1.339(9)	C(15)-C(16)	1.373(7)
C(21)-C(22)	1.397(3)	C(21)-C(26)	1.397(3)
C(22)-C(23)	1.379(4)	C(23)-C(24)	1.377(4)
C(24)-C(25)	1.375(4)	C(25)-C(26)	1.388(4)
C(31)-C(32)	1.384(3)	C(31)-C(36)	1.388(3)
C(32)-C(33)	1.392(4)	C(33)-C(34)	1.372(4)
C(34)-C(35)	1.376(4)	C(35)-C(36)	1.385(3)
C(41)-C(42)	1.386(3)	C(41)-C(46)	1.389(4)
C(42)-C(43)	1.381(4)	C(43)-C(44)	1.375(5)
C(44)-C(45)	1.376(4)	C(45)-C(46)	1.383(4)
C(51)-C(52)	1.392(4)	C(51)-C(56)	1.392(3)
C(52)-C(53)	1.388(4)	C(53)-C(54)	1.381(4)
C(54)-C(55)	1.372(4)	C(55)-C(56)	1.389(4)

C(11)-P(1)-C(2)	102.9(1)	C(11)-P(1)-C(5)	100.8(1)
C(2)-P(1)-C(5)	89.3(1)	C(3)-C(2)-C(21)	126.8(2)
C(3)-C(2)-P(1)	112.5(2)	C(21)-C(2)-P(1)	120.6(2)
C(2)-C(3)-C(31)	124.5(2)	C(2)-C(3)-C(4)	116.5(2)
C(31)-C(3)-C(4)	118.7(2)	C(41)-C(4)-C(3)	112.2(2)
C(41)-C(4)-C(5)	114.8(2)	C(3)-C(4)-C(5)	105.7(2)
C(51)-C(5)-C(4)	117.8(2)	C(51)-C(5)-P(1)	113.7(2)
C(4)-C(5)-P(1)	105.9(2)	C(16)-C(11)-C(12)	117.7(3)
C(16)-C(11)-P(1)	118.3(3)	C(12)-C(11)-P(1)	123.9(2)
C(13)-C(12)-C(11)	121.1(4)	C(12)-C(13)-C(14)	118.8(5)
C(15)-C(14)-C(13)	120.5(4)	C(14)-C(15)-C(16)	120.9(5)
C(15)-C(16)-C(11)	121.0(5)	C(22)-C(21)-C(26)	118.0(2)
C(22)-C(21)-C(2)	120.7(2)	C(26)-C(21)-C(2)	121.3(2)
C(23)-C(22)-C(21)	120.6(3)	C(24)-C(23)-C(22)	121.0(3)
C(25)-C(24)-C(23)	119.2(2)	C(24)-C(25)-C(26)	120.7(3)
C(25)-C(26)-C(21)	120.5(2)	C(32)-C(31)-C(36)	118.2(2)
C(32)-C(31)-C(3)	121.1(2)	C(36)-C(31)-C(3)	120.7(2)
C(31)-C(32)-C(33)	120.9(2)	C(34)-C(33)-C(32)	120.1(3)
C(33)-C(34)-C(35)	119.7(2)	C(34)-C(35)-C(36)	120.2(2)
C(35)-C(36)-C(31)	120.9(2)	C(42)-C(41)-C(46)	117.6(2)
C(42)-C(41)-C(4)	120.5(2)	C(46)-C(41)-C(4)	121.8(2)
C(43)-C(42)-C(41)	120.9(3)	C(44)-C(43)-C(42)	120.7(3)
C(45)-C(44)-C(43)	119.3(3)	C(44)-C(45)-C(46)	120.0(3)
C(45)-C(46)-C(41)	121.4(3)	C(52)-C(51)-C(56)	117.8(2)
C(52)-C(51)-C(5)	123.0(2)	C(56)-C(51)-C(5)	119.1(2)
C(51)-C(52)-C(53)	121.3(3)	C(54)-C(53)-C(52)	119.8(3)
C(55)-C(54)-C(53)	119.9(3)	C(54)-C(55)-C(56)	120.3(3)
C(55)-C(56)-C(51)	120.9(3)		

Table 4. Anisotropic displacement parameters [$Å^2 \times 10^3$] for **3**.
The anisotropic displacement factor exponent takes the form:
$-2\pi^2 [(ha^*)^2 U_{11} + \ldots + 2hka^* b^* U_{12}]$

	U11	U22	U33	U23	U13	U12
P(1)	36(1)	26(1)	28(1)	-2(1)	1(1)	-4(1)
C(2)	30(1)	19(1)	30(1)	3(1)	-1(1)	0(1)
C(3)	28(1)	16(1)	28(1)	2(1)	0(1)	4(1)
C(4)	33(1)	20(1)	27(1)	5(1)	1(1)	0(1)
C(5)	29(1)	24(1)	29(1)	1(1)	1(1)	3(1)
C(11)	31(1)	61(2)	20(1)	2(1)	0(1)	-3(1)
C(12)	57(2)	57(2)	45(2)	11(2)	14(1)	19(2)
C(13)	103(4)	125(4)	53(2)	30(2)	33(2)	75(3)
C(14)	52(3)	306(10)	42(2)	37(4)	10(2)	73(4)
C(15)	33(2)	304(9)	48(2)	-17(4)	-2(2)	-28(4)
C(16)	47(2)	139(4)	36(2)	-18(2)	2(1)	-34(2)
C(21)	23(1)	26(1)	29(1)	4(1)	0(1)	2(1)
C(22)	34(1)	31(2)	34(1)	-2(1)	2(1)	1(1)
C(23)	37(1)	50(2)	30(1)	-2(1)	2(1)	-1(1)
C(24)	30(1)	57(2)	32(1)	15(1)	6(1)	7(1)
C(25)	35(1)	34(2)	50(2)	19(1)	8(1)	3(1)
C(26)	36(1)	26(2)	38(1)	4(1)	3(1)	0(1)
C(31)	27(1)	19(1)	29(1)	1(1)	2(1)	1(1)
C(32)	36(1)	23(2)	46(2)	7(1)	-6(1)	1(1)
C(33)	38(1)	23(2)	60(2)	-1(1)	-7(1)	-4(1)
C(34)	28(1)	39(2)	48(2)	-5(1)	-7(1)	1(1)
C(35)	32(1)	33(2)	41(1)	7(1)	-5(1)	6(1)
C(36)	31(1)	21(1)	40(1)	6(1)	-1(1)	2(1)
C(41)	29(1)	23(1)	27(1)	2(1)	-1(1)	-4(1)
C(42)	36(1)	35(2)	37(1)	5(1)	4(1)	-7(1)
C(43)	36(1)	67(2)	41(2)	-4(2)	12(1)	-8(2)
C(44)	33(1)	63(2)	52(2)	-15(2)	4(1)	8(1)
C(45)	44(2)	37(2)	57(2)	-5(1)	0(1)	11(1)
C(46)	40(1)	31(2)	43(2)	4(1)	6(1)	1(1)
C(51)	23(1)	34(2)	30(1)	2(1)	2(1)	-1(1)
C(52)	39(1)	38(2)	33(1)	0(1)	-4(1)	2(1)
C(53)	43(2)	51(2)	40(2)	-11(1)	3(1)	-5(1)
C(54)	45(2)	71(2)	30(1)	1(2)	-2(1)	-15(2)
C(55)	45(2)	61(2)	39(2)	14(2)	-8(1)	1(1)
C(56)	32(1)	40(2)	38(1)	9(1)	-1(1)	5(1)

Table 1. Crystal data and structure refinement for **8**.

Identification code	KP06
Empirical formula	$C_{38}H_{30}NO_5PW$
Formula weight	795.45
Habit	prisms
Colour	red
Crystal size	0.40 x 0.25 x 0.10 mm
Crystal system	Monoclinic
Space group	$P2_1/n$ (no.14)
Unit cell dimensions	a = 9.713(3) Å α = 90° b = 14.517(4) Å β = 94.47(3)° c = 23.933(8) Å γ = 90°
Volume	3364(2) $Å^3$
Z	4
Density (calculated)	1.570 Mg/m^3
Absorption coefficient	3.525 mm^{-1}
F(000)	1576
Diffractometer	Nicolet R3m
Wavelength	0.71073 Å (MoKα)
Temperature	293(2) K
Monochromator	graphite
θ range for data collection	1.64 to 25.05°
Scan-type	omega-scans
Number of Standards	3
Interval of Standards	147 refl.
Decay of Standards	±1.5 %
Index ranges	$-11 \leq h \leq 11$, $-1 \leq k \leq 17$, $0 \leq \ell \leq 28$
Reflections collected	6644
Independent reflections	5969 (R_{int} = 0.0305)

Absorption correction	Semi-empirical from ψ-scans
Max. and min. transmission	0.653 and 0.988
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	5967 / 0 / 415
Goodness-of-fit on F^2	0.924
Final R indices [$I>2\sigma(I)$]	R1 = 0.0453, wR2 = 0.1072
R indices (all data)	R1 = 0.0789, wR2 = 0.1229
	wR2 = 0.1172 (2 suppressed refl)
Largest diff. peak and hole	0.658 and −1.859 $e\text{Å}^{-3}$

Table 2. Atomic coordinates [x 10^4] and equivalent isotropic displacement parameters [$Å^2$ x 10^3] for **8**. U(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	U(eq)
W(1)	3868(1)	4499(1)	1409(1)	56(1)
C(1A)	3974(10)	4964(6)	2212(4)	76(3)
O(1A)	4195(9)	5255(5)	2649(3)	111(3)
C(1B)	2227(10)	5346(5)	1199(4)	68(2)
O(1B)	1349(8)	5839(5)	1071(3)	101(2)
C(1C)	3980(9)	4199(6)	577(4)	69(2)
O(1C)	4131(7)	4098(6)	115(3)	105(2)
C(1D)	5147(10)	5536(7)	1277(4)	77(3)
O(1D)	5890(8)	6151(5)	1219(3)	117(3)
C(1E)	5491(10)	3706(7)	1617(4)	82(3)
O(1E)	6571(8)	3342(6)	1742(4)	122(3)
P(1)	3828(2)	1103(1)	689(1)	55(1)
C(2)	2156(9)	1482(5)	348(3)	64(2)
C(3)	1860(8)	2417(5)	584(3)	55(2)
C(4)	2626(7)	2465(4)	1184(3)	48(2)
C(5)	3513(8)	1786(5)	1303(3)	56(2)
C(11)	3472(7)	-71(5)	888(3)	48(2)
C(12)	2376(10)	-333(5)	1183(4)	75(3)
C(13)	2075(11)	-1225(7)	1300(5)	89(3)
C(14)	2883(11)	-1905(6)	1125(4)	88(3)
C(15)	4004(11)	-1702(6)	850(4)	84(3)
C(16)	4331(9)	-785(5)	729(4)	67(2)
C(21)	1984(8)	1310(5)	-268(3)	52(2)
C(22)	1634(8)	436(6)	-470(3)	64(2)
C(23)	1553(9)	243(6)	-1032(4)	72(3)
C(24)	1822(10)	917(8)	-1408(4)	84(3)
C(25)	2178(11)	1774(6)	-1227(4)	83(3)
C(26)	2225(9)	1982(6)	-662(3)	68(2)
C(31)	433(9)	2791(5)	498(3)	57(2)
C(32)	-711(10)	2218(7)	455(4)	84(3)
C(33)	-2049(11)	2573(10)	389(5)	107(4)
C(34)	-2232(13)	3498(11)	373(5)	116(4)
C(35)	-1132(13)	4079(8)	415(5)	101(4)
C(36)	193(11)	3722(6)	469(4)	79(3)
C(41)	2395(7)	3318(5)	1520(3)	46(2)
N(41)	1352(6)	3288(4)	1830(2)	50(2)
C(42)	398(8)	2492(5)	1895(3)	63(2)
C(43)	-120(10)	2652(6)	2471(4)	77(3)
C(44)	-241(9)	3687(6)	2500(4)	78(3)
C(45)	988(9)	4033(6)	2214(4)	70(2)
C(51)	4403(8)	1645(5)	1828(3)	55(2)
C(52)	4011(8)	1943(5)	2348(3)	59(2)
C(53)	4866(11)	1788(6)	2832(4)	80(3)
C(54)	6102(11)	1315(6)	2804(4)	83(3)
C(55)	6479(10)	1009(6)	2313(5)	85(3)
C(56)	5653(9)	1169(5)	1822(4)	73(3)

Table 3. Bond lengths [Å] and angles [°] for **8**.

W(1)-C(1E)	1.984(11)	W(1)-C(1D)	1.993(10)
W(1)-C(1A)	2.032(10)	W(1)-C(1B)	2.044(10)
W(1)-C(1C)	2.050(9)	W(1)-C(41)	2.263(7)
C(1A)-O(1A)	1.133(10)	C(1B)-O(1B)	1.138(10)
C(1C)-O(1C)	1.137(9)	C(1D)-O(1D)	1.163(10)
C(1E)-O(1E)	1.192(11)	P(1)-C(11)	1.810(8)
P(1)-C(5)	1.819(7)	P(1)-C(2)	1.844(9)
C(2)-C(21)	1.492(10)	C(2)-C(3)	1.507(10)
C(3)-C(31)	1.487(11)	C(3)-C(4)	1.566(10)
C(4)-C(5)	1.326(10)	C(4)-C(41)	1.503(9)
C(5)-C(51)	1.482(11)	C(11)-C(12)	1.376(11)
C(11)-C(16)	1.401(10)	C(12)-C(13)	1.362(11)
C(13)-C(14)	1.348(13)	C(14)-C(15)	1.348(13)
C(15)-C(16)	1.403(12)	C(21)-C(26)	1.389(10)
C(21)-C(22)	1.390(10)	C(22)-C(23)	1.371(11)
C(23)-C(24)	1.367(13)	C(24)-C(25)	1.353(13)
C(25)-C(26)	1.384(11)	C(31)-C(36)	1.372(11)
C(31)-C(32)	1.385(11)	C(32)-C(33)	1.396(14)
C(33)-C(34)	1.35(2)	C(34)-C(35)	1.36(2)
C(35)-C(36)	1.384(13)	C(41)-N(41)	1.301(9)
N(41)-C(45)	1.480(9)	N(41)-C(42)	1.497(9)
C(42)-C(43)	1.521(11)	C(43)-C(44)	1.509(12)
C(44)-C(45)	1.508(11)	C(51)-C(56)	1.398(11)
C(51)-C(52)	1.398(10)	C(52)-C(53)	1.390(11)
C(53)-C(54)	1.390(13)	C(54)-C(55)	1.335(13)
C(55)-C(56)	1.389(12)		

C(1E)-W(1)-C(1D)	89.2(4)	C(1E)-W(1)-C(1A)	88.6(4)
C(1D)-W(1)-C(1A)	85.0(3)	C(1E)-W(1)-C(1B)	178.5(3)
C(1D)-W(1)-C(1B)	89.4(4)	C(1A)-W(1)-C(1B)	90.8(4)
C(1E)-W(1)-C(1C)	91.1(4)	C(1D)-W(1)-C(1C)	85.7(3)
C(1A)-W(1)-C(1C)	170.7(3)	C(1B)-W(1)-C(1C)	89.3(4)
C(1E)-W(1)-C(41)	91.6(3)	C(1D)-W(1)-C(41)	177.6(3)
C(1A)-W(1)-C(41)	97.3(3)	C(1B)-W(1)-C(41)	89.8(3)
C(1C)-W(1)-C(41)	92.0(3)	O(1A)-C(1A)-W(1)	171.5(9)
O(1B)-C(1B)-W(1)	177.2(8)	O(1C)-C(1C)-W(1)	173.5(8)
O(1D)-C(1D)-W(1)	177.5(8)	O(1E)-C(1E)-W(1)	170.8(8)
C(11)-P(1)-C(5)	104.7(3)	C(11)-P(1)-C(2)	102.6(4)
C(5)-P(1)-C(2)	89.8(4)	C(21)-C(2)-C(3)	120.8(7)
C(21)-C(2)-P(1)	114.5(6)	C(3)-C(2)-P(1)	106.9(6)
C(31)-C(3)-C(2)	118.6(7)	C(31)-C(3)-C(4)	118.8(6)
C(2)-C(3)-C(4)	107.0(6)	C(5)-C(4)-C(41)	128.2(7)
C(5)-C(4)-C(3)	114.8(6)	C(41)-C(4)-C(3)	116.6(6)
C(4)-C(5)-C(51)	127.7(7)	C(4)-C(5)-P(1)	112.3(6)
C(51)-C(5)-P(1)	119.1(6)	C(12)-C(11)-C(16)	115.9(7)
C(12)-C(11)-P(1)	124.5(6)	C(16)-C(11)-P(1)	119.6(6)
C(13)-C(12)-C(11)	123.7(9)	C(14)-C(13)-C(12)	119.5(9)
C(13)-C(14)-C(15)	120.3(9)	C(14)-C(15)-C(16)	120.8(9)
C(11)-C(16)-C(15)	119.8(8)	C(26)-C(21)-C(22)	117.1(7)
C(26)-C(21)-C(2)	122.7(7)	C(22)-C(21)-C(2)	120.1(7)
C(23)-C(22)-C(21)	121.3(8)	C(24)-C(23)-C(22)	120.0(8)
C(25)-C(24)-C(23)	120.3(9)	C(24)-C(25)-C(26)	120.1(9)
C(25)-C(26)-C(21)	121.0(8)	C(36)-C(31)-C(32)	117.1(9)
C(36)-C(31)-C(3)	121.2(8)	C(32)-C(31)-C(3)	121.7(8)
C(31)-C(32)-C(33)	121.4(10)	C(34)-C(33)-C(32)	119.2(12)
C(33)-C(34)-C(35)	120.8(12)	C(34)-C(35)-C(36)	119.6(11)
C(31)-C(36)-C(35)	121.8(10)	N(41)-C(41)-C(4)	115.7(6)
N(41)-C(41)-W(1)	128.3(5)	C(4)-C(41)-W(1)	116.0(5)
C(41)-N(41)-C(45)	124.3(6)	C(41)-N(41)-C(42)	126.9(6)

C(45)-N(41)-C(42)	108.6(6)	N(41)-C(42)-C(43)	103.2(6)
C(44)-C(43)-C(42)	103.1(7)	C(45)-C(44)-C(43)	104.1(7)
N(41)-C(45)-C(44)	105.9(7)	C(56)-C(51)-C(52)	117.3(8)
C(56)-C(51)-C(5)	120.6(7)	C(52)-C(51)-C(5)	122.0(7)
C(53)-C(52)-C(51)	120.3(8)	C(52)-C(53)-C(54)	120.2(9)
C(55)-C(54)-C(53)	120.2(9)	C(54)-C(55)-C(56)	120.6(9)
C(55)-C(56)-C(51)	121.3(9)		

Table 4. Anisotropic displacement parameters [$Å^2 \times 10^3$] for **8**.

The anisotropic displacement factor exponent takes the form:

$-2\pi^2 [(ha^*)^2 U_{11} + \ldots + 2hka^*b^* U_{12}]$

	U11	U22	U33	U23	U13	U12
W(1)	77(1)	37(1)	55(1)	-3(1)	10(1)	-13(1)
C(1A)	108(8)	47(5)	75(7)	-7(5)	20(6)	-21(5)
O(1A)	160(7)	100(6)	73(5)	-28(4)	12(5)	-39(5)
C(1B)	90(7)	42(5)	73(6)	-12(4)	18(5)	-5(4)
O(1B)	124(6)	67(4)	115(6)	9(4)	20(5)	29(4)
C(1C)	73(6)	73(6)	62(6)	1(5)	14(5)	-5(5)
O(1C)	120(6)	135(6)	63(4)	-13(4)	26(4)	-20(5)
C(1D)	96(7)	76(6)	59(5)	-7(5)	4(5)	-15(6)
O(1D)	134(6)	93(5)	121(6)	22(5)	-7(5)	-70(5)
C(1E)	60(6)	74(7)	110(8)	-5(6)	0(6)	-25(5)
O(1E)	89(5)	96(6)	180(9)	38(6)	6(6)	-3(5)
P(1)	77(2)	35(1)	55(1)	-1(1)	17(1)	7(1)
C(2)	110(7)	31(4)	50(5)	1(4)	10(5)	8(4)
C(3)	62(5)	36(4)	68(5)	-8(4)	4(4)	-8(4)
C(4)	56(5)	24(3)	64(5)	0(3)	11(4)	1(3)
C(5)	87(6)	34(4)	48(5)	2(3)	14(4)	-8(4)
C(11)	47(4)	45(4)	50(4)	-8(4)	5(4)	-3(4)
C(12)	92(7)	45(5)	92(7)	16(5)	26(5)	9(4)
C(13)	89(7)	65(6)	116(9)	12(6)	30(6)	-8(5)
C(14)	106(8)	47(6)	111(9)	9(6)	7(7)	-2(6)
C(15)	109(8)	37(5)	105(8)	-12(5)	5(6)	17(5)
C(16)	87(6)	38(4)	79(6)	-1(4)	10(5)	9(4)
C(21)	64(5)	39(4)	55(5)	-5(4)	11(4)	2(4)
C(22)	71(5)	58(5)	66(5)	-3(5)	18(4)	-21(4)
C(23)	83(6)	63(6)	72(6)	-25(5)	16(5)	-17(5)
C(24)	96(7)	95(8)	59(6)	-11(6)	-4(5)	1(6)
C(25)	128(9)	57(6)	64(6)	10(5)	3(6)	7(6)
C(26)	106(7)	48(5)	53(5)	3(4)	11(5)	6(5)
C(31)	73(6)	53(5)	46(4)	-7(4)	8(4)	-5(4)
C(32)	72(7)	83(7)	97(8)	-5(6)	-4(6)	-9(6)
C(33)	70(8)	133(11)	115(10)	-8(9)	-9(6)	-15(8)
C(34)	83(8)	145(13)	120(10)	-4(10)	2(7)	23(9)
C(35)	114(9)	80(7)	111(9)	15(7)	14(8)	35(7)
C(36)	99(7)	50(5)	90(7)	4(5)	13(6)	8(5)
C(41)	55(5)	33(4)	50(4)	-6(3)	3(4)	-2(3)
N(41)	63(4)	38(3)	52(4)	-1(3)	10(3)	-2(3)
C(42)	71(6)	51(5)	68(6)	-6(4)	19(4)	-14(4)
C(43)	84(6)	78(6)	73(6)	-1(5)	30(5)	-24(5)
C(44)	80(6)	70(6)	85(7)	-20(5)	21(5)	-6(5)
C(45)	85(6)	56(5)	72(6)	-18(5)	30(5)	-1(5)
C(51)	81(6)	30(4)	53(5)	-1(3)	6(4)	0(4)
C(52)	59(5)	56(5)	62(5)	10(4)	-1(4)	1(4)
C(53)	117(8)	49(5)	70(6)	-7(5)	-5(6)	6(5)
C(54)	102(8)	53(6)	88(7)	-3(5)	-30(6)	6(5)
C(55)	92(7)	50(5)	111(9)	-21(6)	-10(7)	16(5)
C(56)	89(7)	44(5)	84(7)	-10(5)	-8(5)	10(5)

Table 5. Hydrogen coordinates (x 10^4) and isotropic displacement parameters ($Å^2$ x 10^3) for **8**.

	x	y	z	U(eq)
H(2)	1477(9)	1075(5)	503(3)	76
H(3)	2397(8)	2835(5)	364(3)	66
H(12)	1809(10)	126(5)	1310(4)	91
H(13)	1317(11)	-1365(7)	1500(5)	106
H(14)	2666(11)	-2516(6)	1194(4)	106
H(15)	4567(11)	-2175(6)	738(4)	100
H(16)	5115(9)	-651(5)	545(4)	81
H(22)	1452(8)	-28(6)	-218(3)	77
H(23)	1315(9)	-346(6)	-1158(4)	87
H(24)	1759(10)	785(8)	-1789(4)	100
H(25)	2392(11)	2223(6)	-1483(4)	100
H(26)	2422(9)	2582(6)	-544(3)	82
H(32)	-584(10)	1583(7)	471(4)	101
H(33)	-2806(11)	2180(10)	357(5)	128
H(34)	-3122(13)	3738(11)	333(5)	139
H(35)	-1268(13)	4713(8)	407(5)	121
H(36)	941(11)	4123(6)	487(4)	95
H(42A)	887(8)	1911(5)	1882(3)	76
H(42B)	-358(8)	2496(5)	1606(3)	76
H(43A)	-1008(10)	2359(6)	2501(4)	93
H(43B)	532(10)	2421(6)	2765(4)	93
H(44A)	-1097(9)	3897(6)	2305(4)	93
H(44B)	-205(9)	3896(6)	2886(4)	93
H(45A)	756(9)	4593(6)	2006(4)	84
H(45B)	1755(9)	4161(6)	2487(4)	84
H(52)	3174(8)	2247(5)	2370(3)	71
H(53)	4610(11)	2002(6)	3175(4)	95
H(54)	6669(11)	1211(6)	3130(4)	100
H(55)	7301(10)	685(6)	2299(5)	102
H(56)	5937(9)	956(5)	1483(4)	88

Table 1. Crystal data and structure refinement for **9**.

Identification code	DOE32
Empirical formula	$C_{36}H_{27}O_6PW$
Formula weight	770.40
Habit	plates
Colour	orange
Crystal size	0.25 x 0.20 x 0.08 mm
Crystal system	Triclinic
Space group	$P\bar{1}$ (no.2)
Unit cell dimensions	a = 10.943(3) Å α = 104.72(2)°
	b = 12.047(3) Å β = 105.24(2)°
	c = 13.965(4) Å γ = 98.76(2)°
Volume	1669.9(8) $Å^3$
Z	2
Density (calculated)	1.532 Mg/m^3
Absorption coefficient	3.549 mm^{-1}
F(000)	760
Diffractometer	Nicolet R3m
Wavelength	0.71073 Å (MoKα)
Temperature	293(2) K
Monochromator	graphite
θ range for data collection	1.59 to 25.05°
Scan-type	omega-scans
Number of Standards	3
Interval of Standards	every 147 refl
Decay of Standards	16 %
Index ranges	$-13 \leq h \leq 12$, $-14 \leq k \leq 13$, $0 \leq \ell \leq 16$
Reflections collected	6138
Independent reflections	5876 (R_{int} = 0.0512)

Absorption correction	Semi-empirical from ψ-scans
Max. and min. transmission	0.958 and 0.618
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	5876 / 0 / 399
Goodness-of-fit on F^2	1.105
Final R indices [$I>2\sigma(I)$]	R1 = 0.0574, wR2 = 0.1348
R indices (all data)	R1 = 0.0841, wR2 = 0.1566
Largest diff. peak and hole	2.380 and -1.612 $e\text{Å}^{-3}$

Table 2. Atomic coordinates [x 10^4] and equivalent isotropic displacement parameters [$Å^2$ x 10^3] for **9**. U(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	U(eq)
W(1)	2317(1)	5044(1)	3269(1)	61(1)
P(1)	4871(3)	9315(2)	2601(2)	57(1)
O(1)	1016(13)	2332(8)	2180(9)	125(4)
O(2)	-405(11)	5696(10)	2601(14)	177(7)
O(3)	1761(20)	4566(11)	5261(11)	201(8)
O(4)	5090(17)	4516(20)	3881(12)	262(13)
O(5)	2691(13)	5023(9)	1112(7)	125(4)
O(6)	3309(7)	7720(6)	4792(5)	62(2)
C(1)	1503(15)	3313(11)	2577(10)	85(4)
C(2)	590(15)	5461(12)	2830(14)	109(5)
C(3)	2011(20)	4776(12)	4540(10)	116(6)
C(4)	4086(18)	4704(20)	3682(11)	146(9)
C(5)	2554(15)	5083(10)	1905(9)	86(4)
C(6)	3239(9)	6897(8)	3915(8)	50(2)
C(7)	2681(12)	7440(10)	5521(9)	75(3)
C(8)	3893(10)	7515(8)	3330(8)	55(2)
C(9)	3846(9)	8596(8)	3225(7)	53(2)
C(10)	3656(10)	9547(9)	1524(7)	57(3)
C(11)	3977(12)	10440(9)	1177(8)	66(3)
C(12)	5241(14)	11266(9)	1471(8)	74(4)
C(13)	6383(15)	10832(12)	1470(10)	92(4)
C(14)	7580(17)	11621(14)	1705(13)	116(6)
C(15)	7646(22)	12808(17)	1965(14)	129(8)
C(16)	6561(23)	13228(15)	1964(14)	130(7)
C(17)	5354(17)	12458(11)	1705(10)	97(5)
C(18)	2974(10)	9348(9)	3610(8)	58(3)
C(19)	1643(10)	8840(9)	3335(9)	65(3)
C(20)	833(12)	9517(11)	3596(10)	77(3)
C(21)	1280(12)	10744(10)	4130(9)	68(3)
C(22)	2581(14)	11214(10)	4350(10)	79(3)
C(23)	3445(12)	10538(10)	4106(8)	67(3)
C(24)	325(16)	11444(14)	4330(13)	114(6)
C(25)	5578(10)	8151(9)	2026(8)	58(3)
C(26)	5237(11)	7537(9)	977(9)	65(3)
C(27)	5840(13)	6670(11)	637(10)	82(4)
C(28)	6795(14)	6385(13)	1307(14)	92(4)
C(29)	7187(13)	7014(14)	2355(13)	94(4)
C(30)	6604(12)	7901(12)	2714(10)	80(3)
C(31)	2271(11)	8851(9)	1135(8)	62(3)
C(32)	1928(12)	7647(10)	829(10)	77(3)
C(33)	643(15)	7027(13)	473(11)	98(4)
C(34)	-324(14)	7628(16)	423(12)	105(5)
C(35)	-26(15)	8836(17)	724(13)	110(5)
C(36)	1271(13)	9453(12)	1083(11)	87(4)

Table 3. Bond lengths [Å] and angles [°] for 9.

W(1)-C(3)	1.985(13)	W(1)-C(5)	2.000(12)
W(1)-C(1)	2.008(13)	W(1)-C(4)	2.01(2)
W(1)-C(2)	2.01(2)	W(1)-C(6)	2.151(9)
P(1)-C(25)	1.816(11)	P(1)-C(9)	1.836(9)
P(1)-C(10)	1.840(11)	O(1)-C(1)	1.144(14)
O(2)-C(2)	1.15(2)	O(3)-C(3)	1.19(2)
O(4)-C(4)	1.13(2)	O(5)-C(5)	1.142(14)
O(6)-C(6)	1.342(11)	O(6)-C(7)	1.448(11)
C(6)-C(8)	1.479(13)	C(8)-C(9)	1.354(13)
C(9)-C(18)	1.517(14)	C(10)-C(11)	1.324(13)
C(10)-C(31)	1.498(14)	C(11)-C(12)	1.47(2)
C(12)-C(17)	1.37(2)	C(12)-C(13)	1.43(2)
C(13)-C(14)	1.40(2)	C(14)-C(15)	1.37(2)
C(15)-C(16)	1.36(3)	C(16)-C(17)	1.39(2)
C(18)-C(23)	1.372(14)	C(18)-C(19)	1.400(14)
C(19)-C(20)	1.350(15)	C(20)-C(21)	1.42(2)
C(21)-C(22)	1.37(2)	C(21)-C(24)	1.48(2)
C(22)-C(23)	1.39(2)	C(25)-C(26)	1.383(14)
C(25)-C(30)	1.40(2)	C(26)-C(27)	1.37(2)
C(27)-C(28)	1.36(2)	C(28)-C(29)	1.38(2)
C(29)-C(30)	1.38(2)	C(31)-C(32)	1.365(15)
C(31)-C(36)	1.40(2)	C(32)-C(33)	1.38(2)
C(33)-C(34)	1.37(2)	C(34)-C(35)	1.37(2)
C(35)-C(36)	1.39(2)		

C(3)-W(1)-C(5)	172.4(5)	C(3)-W(1)-C(1)	85.7(5)
C(5)-W(1)-C(1)	86.8(5)	C(3)-W(1)-C(4)	90.5(8)
C(5)-W(1)-C(4)	88.4(7)	C(1)-W(1)-C(4)	90.5(8)
C(3)-W(1)-C(2)	91.9(8)	C(5)-W(1)-C(2)	89.5(7)
C(1)-W(1)-C(2)	91.8(6)	C(4)-W(1)-C(2)	176.8(8)
C(3)-W(1)-C(6)	98.3(5)	C(5)-W(1)-C(6)	89.1(4)
C(1)-W(1)-C(6)	175.8(4)	C(4)-W(1)-C(6)	88.4(7)
C(2)-W(1)-C(6)	89.1(4)	C(25)-P(1)-C(9)	103.4(4)
C(25)-P(1)-C(10)	107.1(5)	C(9)-P(1)-C(10)	102.3(5)
C(6)-O(6)-C(7)	121.6(8)	O(1)-C(1)-W(1)	178.7(14)
O(2)-C(2)-W(1)	178.3(18)	O(3)-C(3)-W(1)	176.0(16)
O(4)-C(4)-W(1)	177.4(18)	O(5)-C(5)-W(1)	175.2(11)
O(6)-C(6)-C(8)	106.5(8)	O(6)-C(6)-W(1)	132.6(7)
C(8)-C(6)-W(1)	120.8(7)	C(9)-C(8)-C(6)	127.9(9)
C(8)-C(9)-C(18)	124.9(8)	C(8)-C(9)-P(1)	122.4(8)
C(18)-C(9)-P(1)	112.7(7)	C(11)-C(10)-C(31)	119.5(10)
C(11)-C(10)-P(1)	119.0(8)	C(31)-C(10)-P(1)	121.0(7)
C(10)-C(11)-C(12)	129.2(11)	C(17)-C(12)-C(13)	118.3(13)
C(17)-C(12)-C(11)	121.5(14)	C(13)-C(12)-C(11)	120.1(10)
C(14)-C(13)-C(12)	120.0(14)	C(15)-C(14)-C(13)	119.4(18)
C(16)-C(15)-C(14)	120.9(17)	C(15)-C(16)-C(17)	120.7(18)
C(12)-C(17)-C(16)	120.7(18)	C(23)-C(18)-C(19)	120.1(10)
C(23)-C(18)-C(9)	120.7(9)	C(19)-C(18)-C(9)	118.8(9)
C(20)-C(19)-C(18)	119.8(11)	C(19)-C(20)-C(21)	122.1(11)
C(22)-C(21)-C(20)	116.3(10)	C(22)-C(21)-C(24)	124.4(12)
C(20)-C(21)-C(24)	119.2(13)	C(21)-C(22)-C(23)	123.0(11)
C(18)-C(23)-C(22)	118.7(11)	C(26)-C(25)-C(30)	117.7(11)
C(26)-C(25)-P(1)	126.1(9)	C(30)-C(25)-P(1)	116.1(8)

C(27)-C(26)-C(25)	120.7(11)	C(28)-C(27)-C(26)	121.8(12)
C(27)-C(28)-C(29)	118.6(12)	C(28)-C(29)-C(30)	120.6(13)
C(29)-C(30)-C(25)	120.4(13)	C(32)-C(31)-C(36)	117.8(11)
C(32)-C(31)-C(10)	123.2(11)	C(36)-C(31)-C(10)	119.0(10)
C(31)-C(32)-C(33)	122.0(13)	C(34)-C(33)-C(32)	119.6(14)
C(33)-C(34)-C(35)	120.4(14)	C(34)-C(35)-C(36)	119.6(15)
C(35)-C(36)-C(31)	120.6(13)		

Table 4. Anisotropic displacement parameters [$Å^2$ x 10^3] for **9**.

The anisotropic displacement factor exponent takes the form:

$-2\pi^2 [(ha^*)^2 U_{11} + ... + 2hka^*b^* U_{12}]$

	U11	U22	U33	U23	U13	U12
W(1)	62(1)	52(1)	74(1)	22(1)	28(1)	13(1)
P(1)	57(2)	58(2)	50(2)	12(1)	24(1)	-4(1)
O(1)	183(12)	60(6)	122(9)	19(6)	53(8)	5(6)
O(2)	66(7)	105(9)	338(21)	51(11)	32(10)	37(6)
O(3)	365(24)	109(9)	148(12)	43(9)	147(14)	-15(12)
O(4)	198(16)	395(27)	139(12)	-37(14)	-13(11)	235(19)
O(5)	209(12)	93(7)	58(6)	6(5)	61(7)	-13(7)
O(6)	64(4)	64(4)	62(4)	22(4)	30(4)	1(3)
C(1)	130(12)	51(7)	81(9)	21(6)	44(8)	19(7)
C(2)	70(9)	67(8)	173(16)	46(9)	7(10)	3(7)
C(3)	221(19)	68(8)	62(8)	13(7)	69(11)	13(10)
C(4)	119(13)	239(23)	55(8)	-5(11)	-2(9)	111(15)
C(5)	129(12)	53(7)	59(8)	8(6)	27(8)	-3(7)
C(6)	41(5)	46(5)	55(6)	8(5)	14(4)	6(4)
C(7)	94(9)	66(7)	84(8)	21(6)	60(7)	17(6)
C(8)	54(6)	51(6)	59(6)	10(5)	27(5)	2(4)
C(9)	48(6)	55(6)	45(5)	5(4)	16(4)	-4(4)
C(10)	67(7)	53(6)	44(5)	14(5)	16(5)	-1(5)
C(11)	88(8)	63(6)	48(6)	19(5)	26(6)	7(6)
C(12)	124(11)	48(6)	49(6)	9(5)	44(7)	-5(7)
C(13)	113(11)	69(8)	92(10)	16(7)	55(9)	-13(8)
C(14)	121(13)	96(11)	120(13)	21(10)	58(11)	-25(10)
C(15)	148(18)	108(15)	98(12)	19(11)	41(13)	-52(13)
C(16)	188(21)	81(11)	97(12)	36(9)	37(14)	-37(13)
C(17)	152(14)	60(7)	72(8)	20(6)	39(9)	-4(8)
C(18)	54(6)	64(6)	54(6)	23(5)	22(5)	-3(5)
C(19)	61(7)	57(6)	77(7)	15(6)	34(6)	4(5)
C(20)	65(7)	95(9)	100(9)	53(8)	48(7)	24(7)
C(21)	86(9)	70(7)	69(7)	31(6)	41(7)	32(6)
C(22)	107(10)	55(6)	83(9)	17(6)	51(8)	17(7)
C(23)	75(7)	66(7)	48(6)	8(5)	23(6)	-6(6)
C(24)	143(14)	132(13)	138(13)	84(11)	92(12)	84(11)
C(25)	52(6)	69(7)	56(6)	24(5)	25(5)	1(5)
C(26)	64(7)	65(7)	65(7)	17(6)	23(6)	16(5)
C(27)	97(10)	86(9)	62(7)	1(6)	43(7)	23(8)
C(28)	82(9)	95(10)	130(13)	44(10)	62(10)	45(8)
C(29)	72(9)	118(12)	104(11)	45(10)	32(8)	32(8)
C(30)	72(8)	98(9)	83(9)	29(7)	42(7)	23(7)
C(31)	63(7)	58(6)	56(6)	14(5)	16(5)	2(5)
C(32)	71(8)	60(7)	89(9)	22(6)	18(7)	-6(6)
C(33)	87(10)	81(9)	98(11)	21(8)	12(8)	-18(8)
C(34)	61(9)	131(14)	94(11)	38(10)	-6(8)	-11(9)
C(35)	74(10)	133(14)	129(13)	67(12)	11(9)	27(10)
C(36)	76(9)	82(9)	97(10)	38(8)	15(7)	8(7)

Table 5. Hydrogen coordinates (x 10^4) and isotropic displacement parameters ($Å^2$ x 10^3) for 9.

	x	y	z	U(eq)
H(7A)	2731(73)	8155(12)	6043(39)	113
H(7B)	3112(52)	6934(61)	5850(48)	113
H(7C)	1784(23)	7046(66)	5155(14)	113
H(8)	4398(10)	7112(8)	2992(8)	67
H(11)	3304(12)	10561(9)	677(8)	79
H(13)	6333(15)	10025(12)	1313(10)	111
H(14)	8322(17)	11341(14)	1685(13)	139
H(15)	8444(22)	13335(17)	2144(14)	155
H(16)	6625(23)	14037(15)	2138(14)	156
H(17)	4617(17)	12758(11)	1691(10)	117
H(19)	1318(10)	8040(9)	2975(9)	78
H(20)	-47(12)	9167(11)	3419(10)	93
H(22)	2901(14)	12022(10)	4676(10)	94
H(23)	4325(12)	10885(10)	4276(8)	80
H(24A)	460(76)	11718(89)	5066(14)	170
H(24B)	-542(16)	10960(34)	3978(76)	170
H(24C)	437(80)	12109(60)	4075(86)	170
H(26)	4591(11)	7715(9)	497(9)	78
H(27)	5589(13)	6266(11)	-73(10)	98
H(28)	7178(14)	5778(13)	1065(14)	110
H(29)	7849(13)	6838(14)	2822(13)	112
H(30)	6896(12)	8336(12)	3418(10)	96
H(32)	2580(12)	7231(10)	863(10)	93
H(33)	436(15)	6207(13)	267(11)	117
H(34)	-1191(14)	7213(16)	183(12)	126
H(35)	-687(15)	9241(17)	689(13)	132
H(36)	1475(13)	10274(12)	1290(11)	104

Table 1. Crystal data and structure refinement for **11**.

Identification code	kp09
Empirical formula	$C_{37}H_{30}NO_4PW$
Formula weight	767.44
Habit	plates
Colour	red
Crystal size	0.40 x 0.25 x 0.15 mm
Crystal system	Monoclinic
Space group	$P2_1/n$ (No.14)
Unit cell dimensions	a = 14.190(7) Å α = 90° b = 13.340(7) Å β = 114.83(4)° c = 18.534(11) Å γ = 90°
Volume	3184(3) $Å^3$
Z	4
Density (calculated)	1.601 Mg/m^3
Absorption coefficient	3.719 mm^{-1}
F(000)	1520
Diffractometer	Nicolet R3m
Wavelength	0.71073 Å (MoKα)
Temperature	293(2) K
Monochromator	graphite
θ range for data collection	1.54 to 25.11°
Scan-type	omega-scans
Number of Standards	3
Interval of Standards	every 147 refl
Decay of Standards	+-1 %
Index ranges	$-15 \leq h \leq 16$, $0 \leq k \leq 15$, $-22 \leq \ell \leq 0$
Reflections collected	5836
Independent reflections	5652 (R_{int} = 0.0688)

Absorption correction	Semi-empirical from ψ-scans
Max. and min. transmission	1.000 and 0.689
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	5651 / 0 / 397
Goodness-of-fit on F^2	0.905
Final R indices [$I>2\sigma(I)$]	R1 = 0.0424, wR2 = 0.0989
R indices (all data)	R1 = 0.0647, wR2 = 0.1060
	wR2 = 0.1052 (1 suppressed refl)
Largest diff. peak and hole	2.528 (near W) and -1.611 eÅ^{-3}

Table 2. Atomic coordinates [x 10^4] and equivalent isotropic displacement parameters [$Å^2$ x 10^3] for **11**. U(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	U(eq)
W(1)	1578(1)	2126(1)	5113(1)	42(1)
C(1A)	2951(7)	1681(6)	5959(5)	52(2)
O(1A)	3742(5)	1400(5)	6416(4)	78(2)
C(1B)	883(6)	1180(6)	5563(4)	54(2)
O(1B)	489(5)	619(5)	5824(4)	83(2)
C(1C)	183(6)	2493(7)	4247(5)	59(2)
O(1C)	-619(5)	2692(6)	3746(4)	99(2)
C(1D)	1687(6)	1030(6)	4420(5)	57(2)
O(1D)	1765(5)	364(5)	4045(4)	84(2)
P(1)	2421(1)	3511(1)	4683(1)	37(1)
N(1)	1628(4)	3597(4)	6519(3)	45(1)
C(1)	1488(5)	3485(5)	5775(4)	38(2)
C(2)	1339(5)	4431(6)	5341(4)	46(2)
C(3)	1726(5)	4624(5)	4812(4)	41(2)
C(4)	3783(5)	3711(5)	5341(4)	39(2)
C(5)	4612(5)	3191(5)	5354(4)	40(2)
C(6)	1833(7)	2755(6)	7077(4)	63(2)
C(7)	1803(9)	3208(7)	7809(5)	75(3)
C(8)	2052(9)	4270(8)	7799(5)	89(3)
C(9)	1644(7)	4556(6)	6931(4)	60(2)
C(10)	1611(5)	5643(5)	4463(4)	44(2)
C(11)	1394(6)	5810(7)	3655(5)	63(2)
C(12)	1260(7)	6780(8)	3358(6)	75(3)
C(13)	1326(6)	7598(7)	3835(6)	68(3)
C(14)	1515(6)	7431(7)	4616(6)	66(2)
C(15)	1672(6)	6470(6)	4914(5)	60(2)
C(16)	2353(5)	3630(5)	3675(4)	42(2)
C(17)	3075(6)	4187(6)	3523(4)	51(2)
C(18)	2977(7)	4279(7)	2750(5)	67(2)
C(19)	2160(7)	3844(7)	2126(5)	67(2)
C(20)	1461(7)	3280(7)	2292(5)	71(2)
C(21)	1556(6)	3176(6)	3062(4)	61(2)
C(22)	4006(5)	4447(5)	6005(4)	41(2)
C(23)	4058(6)	5458(6)	5897(5)	53(2)
C(24)	4296(6)	6120(6)	6522(5)	65(2)
C(25)	4457(6)	5777(7)	7261(5)	69(3)
C(26)	4415(6)	4761(7)	7385(4)	64(2)
C(27)	4206(6)	4097(6)	6759(4)	54(2)
C(28)	4754(5)	2360(5)	4899(4)	42(2)
C(29)	5757(7)	2102(7)	5017(5)	66(2)
C(30)	5966(7)	1303(8)	4651(6)	80(3)
C(31)	5154(8)	774(7)	4086(6)	77(3)
C(32)	4156(7)	1014(7)	3937(6)	76(3)
C(33)	3966(6)	1805(6)	4347(5)	58(2)

Table 3. Bond lengths [Å] and angles [°] for **11**.

W(1)-C(1B)	1.988(8)	W(1)-C(1D)	1.993(8)
W(1)-C(1A)	2.010(9)	W(1)-C(1C)	2.016(9)
W(1)-C(1)	2.223(7)	W(1)-P(1)	2.507(2)
C(1A)-O(1A)	1.149(9)	C(1B)-O(1B)	1.155(8)
C(1C)-O(1C)	1.157(10)	C(1D)-O(1D)	1.163(9)
P(1)-C(4)	1.820(7)	P(1)-C(16)	1.837(7)
P(1)-C(3)	1.853(7)	N(1)-C(1)	1.317(8)
N(1)-C(6)	1.471(9)	N(1)-C(9)	1.485(9)
C(1)-C(2)	1.463(10)	C(2)-C(3)	1.335(9)
C(3)-C(10)	1.485(9)	C(4)-C(5)	1.358(9)
C(4)-C(22)	1.500(9)	C(5)-C(28)	1.457(9)
C(6)-C(7)	1.501(10)	C(7)-C(8)	1.462(12)
C(8)-C(9)	1.513(11)	C(10)-C(15)	1.365(10)
C(10)-C(11)	1.414(10)	C(11)-C(12)	1.387(11)
C(12)-C(13)	1.382(13)	C(13)-C(14)	1.375(13)
C(14)-C(15)	1.376(12)	C(16)-C(21)	1.363(10)
C(16)-C(17)	1.387(10)	C(17)-C(18)	1.386(10)
C(18)-C(19)	1.376(12)	C(19)-C(20)	1.379(12)
C(20)-C(21)	1.382(11)	C(22)-C(23)	1.369(10)
C(22)-C(27)	1.386(9)	C(23)-C(24)	1.381(10)
C(24)-C(25)	1.369(12)	C(25)-C(26)	1.380(12)
C(26)-C(27)	1.388(10)	C(28)-C(33)	1.373(10)
C(28)-C(29)	1.389(11)	C(29)-C(30)	1.362(11)
C(30)-C(31)	1.382(13)	C(31)-C(32)	1.361(12)
C(32)-C(33)	1.392(10)		

C(1B)-W(1)-C(1D)	89.5(3)	C(1B)-W(1)-C(1A)	88.6(3)
C(1D)-W(1)-C(1A)	88.5(3)	C(1B)-W(1)-C(1C)	89.7(3)
C(1D)-W(1)-C(1C)	88.9(3)	C(1A)-W(1)-C(1C)	176.9(3)
C(1B)-W(1)-C(1)	97.6(3)	C(1D)-W(1)-C(1)	172.5(3)
C(1A)-W(1)-C(1)	94.1(3)	C(1C)-W(1)-C(1)	88.7(3)
C(1B)-W(1)-P(1)	171.3(2)	C(1D)-W(1)-P(1)	99.2(2)
C(1A)-W(1)-P(1)	91.7(2)	C(1C)-W(1)-P(1)	90.4(2)
C(1)-W(1)-P(1)	73.7(2)	O(1A)-C(1A)-W(1)	176.8(7)
O(1B)-C(1B)-W(1)	179.0(7)	O(1C)-C(1C)-W(1)	179.2(9)
O(1D)-C(1D)-W(1)	177.1(7)	C(4)-P(1)-C(16)	104.9(3)
C(4)-P(1)-C(3)	105.6(3)	C(16)-P(1)-C(3)	105.0(3)
C(4)-P(1)-W(1)	114.2(2)	C(16)-P(1)-W(1)	124.0(2)
C(3)-P(1)-W(1)	101.4(2)	C(1)-N(1)-C(6)	123.2(6)
C(1)-N(1)-C(9)	126.8(6)	C(6)-N(1)-C(9)	109.9(5)
N(1)-C(1)-C(2)	113.6(6)	N(1)-C(1)-W(1)	130.7(5)
C(2)-C(1)-W(1)	115.4(4)	C(3)-C(2)-C(1)	124.0(6)
C(2)-C(3)-C(10)	119.5(6)	C(2)-C(3)-P(1)	110.3(5)
C(10)-C(3)-P(1)	130.1(5)	C(5)-C(4)-C(22)	115.9(6)
C(5)-C(4)-P(1)	127.2(5)	C(22)-C(4)-P(1)	116.4(4)
C(4)-C(5)-C(28)	135.1(6)	N(1)-C(6)-C(7)	104.8(7)
C(8)-C(7)-C(6)	106.3(7)	C(7)-C(8)-C(9)	105.7(7)
N(1)-C(9)-C(8)	104.2(7)	C(15)-C(10)-C(11)	116.8(7)
C(15)-C(10)-C(3)	120.4(6)	C(11)-C(10)-C(3)	122.8(7)
C(12)-C(11)-C(10)	120.0(9)	C(13)-C(12)-C(11)	121.4(9)
C(14)-C(13)-C(12)	118.4(8)	C(13)-C(14)-C(15)	120.0(9)
C(10)-C(15)-C(14)	123.3(8)	C(21)-C(16)-C(17)	119.6(7)
C(21)-C(16)-P(1)	118.7(6)	C(17)-C(16)-P(1)	121.6(5)
C(18)-C(17)-C(16)	119.7(7)	C(19)-C(18)-C(17)	121.0(8)
C(18)-C(19)-C(20)	118.3(8)	C(19)-C(20)-C(21)	121.2(8)
C(16)-C(21)-C(20)	120.2(8)	C(23)-C(22)-C(27)	118.5(7)
C(23)-C(22)-C(4)	122.1(7)	C(27)-C(22)-C(4)	119.3(7)
C(22)-C(23)-C(24)	121.1(8)	C(25)-C(24)-C(23)	120.3(8)
C(24)-C(25)-C(26)	119.6(8)	C(25)-C(26)-C(27)	119.8(8)

C(22)-C(27)-C(26)	120.6(8)	C(33)-C(28)-C(29)	116.4(7)
C(33)-C(28)-C(5)	125.0(6)	C(29)-C(28)-C(5)	118.6(7)
C(30)-C(29)-C(28)	122.6(9)	C(29)-C(30)-C(31)	119.4(8)
C(32)-C(31)-C(30)	120.0(8)	C(31)-C(32)-C(33)	119.4(9)
C(28)-C(33)-C(32)	122.1(8)		

Table 4. Anisotropic displacement parameters [$Å^2 \times 10^3$] for **11**.

The anisotropic displacement factor exponent takes the form:

$-2\pi^2 [(ha^*)^2 U_{11} + \ldots + 2hka^*b^* U_{12}]$

	U11	U22	U33	U23	U13	U12
W(1)	40(1)	41(1)	48(1)	-4(1)	23(1)	-4(1)
C(1A)	64(5)	36(4)	59(5)	-3(4)	29(4)	1(4)
O(1A)	60(4)	69(4)	93(5)	13(4)	20(4)	12(3)
C(1B)	56(5)	55(5)	54(4)	-1(4)	25(4)	-6(4)
O(1B)	104(5)	79(4)	83(4)	-1(4)	55(4)	-37(4)
C(1C)	46(5)	74(6)	60(5)	-4(4)	25(4)	-7(4)
O(1C)	49(4)	151(7)	82(4)	-3(5)	13(4)	10(4)
C(1D)	47(5)	63(5)	65(5)	-14(4)	27(4)	-1(4)
O(1D)	81(4)	77(4)	96(5)	-46(4)	40(4)	-9(3)
P(1)	36(1)	40(1)	39(1)	-2(1)	20(1)	1(1)
N(1)	49(3)	44(3)	53(3)	-5(3)	32(3)	-4(3)
C(1)	28(3)	51(4)	41(4)	-3(3)	20(3)	-5(3)
C(2)	40(4)	51(5)	57(4)	-1(4)	30(4)	6(3)
C(3)	38(4)	44(4)	45(4)	3(3)	20(3)	5(3)
C(4)	41(4)	41(4)	42(4)	-1(3)	26(3)	-2(3)
C(5)	34(4)	46(4)	39(3)	-2(3)	15(3)	6(3)
C(6)	88(6)	59(5)	50(4)	0(4)	38(4)	-1(5)
C(7)	110(8)	74(6)	53(5)	-5(4)	45(5)	-3(5)
C(8)	136(9)	85(7)	62(6)	-20(5)	56(6)	-18(7)
C(9)	76(6)	56(5)	62(5)	-12(4)	43(5)	-8(4)
C(10)	31(4)	49(4)	51(4)	11(3)	16(3)	9(3)
C(11)	56(5)	69(6)	65(5)	10(4)	28(4)	17(4)
C(12)	68(6)	83(7)	79(6)	36(5)	36(5)	15(5)
C(13)	46(5)	54(5)	100(7)	31(5)	25(5)	14(4)
C(14)	52(5)	53(5)	94(7)	11(5)	32(5)	7(4)
C(15)	74(6)	44(5)	72(5)	-2(4)	40(5)	9(4)
C(16)	39(4)	47(4)	43(4)	1(3)	19(3)	4(3)
C(17)	44(4)	62(5)	48(4)	-3(4)	19(4)	0(4)
C(18)	59(5)	96(7)	60(5)	25(5)	40(5)	22(5)
C(19)	73(6)	88(7)	47(5)	8(5)	30(5)	26(5)
C(20)	76(6)	85(6)	48(5)	-15(4)	21(5)	-7(5)
C(21)	56(5)	76(6)	51(5)	-8(4)	23(4)	-4(4)
C(22)	28(3)	50(4)	45(4)	-11(3)	14(3)	1(3)
C(23)	50(4)	52(5)	57(5)	-6(4)	23(4)	1(4)
C(24)	59(5)	54(5)	82(6)	-21(5)	28(5)	5(4)
C(25)	47(5)	84(7)	70(6)	-44(5)	19(4)	-3(5)
C(26)	57(5)	96(7)	41(4)	-15(4)	22(4)	-3(5)
C(27)	52(5)	59(5)	47(4)	-6(4)	15(4)	0(4)
C(28)	39(4)	39(4)	51(4)	6(3)	21(3)	11(3)
C(29)	69(5)	64(5)	81(6)	-4(5)	46(5)	7(5)
C(30)	67(6)	84(7)	108(8)	3(6)	57(6)	34(6)
C(31)	94(7)	61(6)	99(7)	-11(5)	63(6)	15(5)
C(32)	73(6)	61(6)	92(7)	-29(5)	33(5)	-3(5)
C(33)	54(5)	49(5)	74(5)	-6(4)	31(4)	7(4)

Table 5. Hydrogen coordinates (x 10^4) and isotropic displacement parameters ($Å^2$ x 10^3) for **11**.

	x	y	z	U(eq)
H(2)	950(5)	4929(6)	5440(4)	55
H(5)	5237(5)	3420(5)	5745(4)	48
H(6A)	2508(7)	2461(6)	7198(4)	75
H(6B)	1306(7)	2240(6)	6857(4)	75
H(7A)	1119(9)	3129(7)	7800(5)	90
H(7B)	2307(9)	2886(7)	8283(5)	90
H(8A)	2797(9)	4375(8)	8064(5)	107
H(8B)	1721(9)	4667(8)	8065(5)	107
H(9A)	952(7)	4839(6)	6744(4)	72
H(9B)	2098(7)	5040(6)	6846(4)	72
H(11)	1342(6)	5271(7)	3323(5)	75
H(12)	1123(7)	6883(8)	2827(6)	90
H(13)	1245(6)	8246(7)	3633(6)	82
H(14)	1538(6)	7968(7)	4944(6)	79
H(15)	1826(6)	6380(6)	5449(5)	72
H(17)	3623(6)	4497(6)	3938(4)	62
H(18)	3471(7)	4641(7)	2651(5)	80
H(19)	2081(7)	3928(7)	1606(5)	81
H(20)	916(7)	2964(7)	1879(5)	86
H(21)	1074(6)	2795(6)	3162(4)	73
H(23)	3930(6)	5703(6)	5395(5)	63
H(24)	4347(6)	6802(6)	6441(5)	78
H(25)	4595(6)	6226(7)	7677(5)	83
H(26)	4525(6)	4522(7)	7885(4)	77
H(27)	4202(6)	3411(6)	6848(4)	65
H(29)	6307(7)	2491(7)	5360(5)	80
H(30)	6649(7)	1115(8)	4780(6)	96
H(31)	5288(8)	255(7)	3807(6)	92
H(32)	3607(7)	652(7)	3564(6)	91
H(33)	3282(6)	1963(6)	4244(5)	69