Acta Crystallographica Section E
Structure Reports Online
ISSN 1600-5368

Chlorido[(1,2,5,6-η)-1,3,5,7-cyclooctatetraene]phenylplatinum(II)

Ah-Ran Song,[a] In-Chul Hwang[b] and Kwang Ha[a]*

[a]School of Applied Chemical Engineering, Center for Functional Nano Fine Chemicals, Chonnam National University, Gwangju 500-757, Republic of Korea, and [b]Department of Chemistry, Pohang University of Science and Technology, Pohang 790-784, Republic of Korea
Correspondence e-mail: hakwang@chonnam.ac.kr

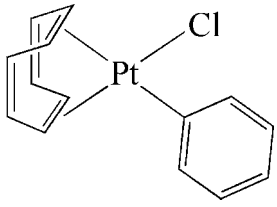
Received 5 July 2007; accepted 12 July 2007

Key indicators: single-crystal X-ray study; T = 293 K; mean σ(C–C) = 0.015 Å; R factor = 0.038; wR factor = 0.081; data-to-parameter ratio = 17.4.

In the title complex, $[Pt(C_6H_5)Cl(C_8H_8)]$, the Pt^{II} centre lies in a square-planar environment defined by the Cl and σ-bonded phenyl C atoms and the mid-points of the two π-coordinated double bonds of 1,3,5,7-cyclooctatetraene. Because of the different *trans* influences of the Cl atom and the phenyl group, the Pt—C bonds *trans* to the phenyl group are longer than those *trans* to the Cl atom. The asymmetric unit contains four independent molecules with identical geometry within experimental errors.

Related literature

For related literature, see: Song *et al.* (2007).



Experimental

Crystal data

$[Pt(C_6H_5)Cl(C_8H_8)]$
M_r = 411.78
Triclinic, $P\overline{1}$
a = 13.1746 (9) Å
b = 13.5924 (9) Å
c = 14.7998 (10) Å
α = 90.199 (1)°
β = 105.024 (1)°
γ = 99.466 (1)°
V = 2521.9 (3) Å^3
Z = 8
Mo $K\alpha$ radiation
μ = 11.31 mm^{-1}
T = 293 (2) K
0.25 × 0.20 × 0.15 mm

Data collection

Bruker SMART 1000 CCD diffractometer
Absorption correction: multi-scan (*SADABS*; Bruker, 2000)
T_{min} = 0.571, T_{max} = 1.000
(expected range = 0.105–0.183)
14816 measured reflections
10050 independent reflections
7293 reflections with $I > 2\sigma(I)$
R_{int} = 0.021

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.038
$wR(F^2)$ = 0.081
S = 0.98
10050 reflections
577 parameters
H-atom parameters constrained
$\Delta\rho_{max}$ = 1.42 e Å^{-3}
$\Delta\rho_{min}$ = −1.11 e Å^{-3}

Table 1
Comparison of Pt—ligand bond lengths (Å) in the four molecules within the asymmetric unit.

Pt—ligand	*A*	*B*	*C*	*D*
Pt—Cl	2.304 (2)	2.338 (2)	2.329 (2)	2.307 (2)
Pt—C1	2.329 (8)	2.343 (8)	2.340 (8)	2.316 (9)
Pt—C2	2.321 (8)	2.316 (8)	2.327 (9)	2.311 (9)
Pt—C5	2.127 (8)	2.118 (8)	2.125 (8)	2.121 (8)
Pt—C6	2.113 (8)	2.114 (8)	2.130 (7)	2.141 (9)
Pt—C9	2.009 (8)	1.998 (7)	2.025 (9)	2.010 (8)

Data collection: *SMART* (Bruker, 2000); cell refinement: *SAINT* (Bruker, 2000); data reduction: *SAINT*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 1997); program(s) used to refine structure: *SHELXL97* (Sheldrick, 1997); molecular graphics: *ORTEP-3* (Farrugia, 1997); software used to prepare material for publication: *SHELXL97*.

This study received financial support from Chonnam National University in 2006.

Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: DN2218).

References

Bruker (2000). *SADABS* (Version 2.03), *SMART* (Version 5.618) and *SAINT* (Version 6.02a). Bruker AXS Inc., Madison, Wisconsin, USA.
Farrugia, L. J. (1997). *J. Appl. Cryst.* **30**, 565.
Sheldrick, G. M. (1997). *SHELXS97* and *SHELXL97*. University of Göttingen, Germany.
Song, A.-R., Hwang, I.-C. & Ha, K. (2007). *Acta Cryst.* E**63**, m1879.

 doi:10.1107/S1600536807034083

supplementary materials

Acta Cryst. (2007). E**63**, m2163 [**doi:10.1107/S1600536807034083**]

Chlorido[(1,2,5,6-η)-1,3,5,7-cyclooctatetraene]phenylplatinum(II)

A.-R. Song, I.-C. Hwang and K. Ha

Comment

The crystal structure analysis of the title complex, [Pt(C_6H_5)Cl(C_8H_8)], reveals that an asymmetric unit contains four chemically equivalent, but crystallographically independent molecules (Fig. 1).

In the complex, the central Pt^{II} ion lies in an essentially square-planar environment defined by the Cl and σ-bonded phenyl C atoms and by the two midpoints (M1x, M2x; *x* = a, b, c, d) of the π-coordinated double bonds of the 1,3,5,7-cyclooctatetraene (cot) ligand (M1x and M2x denote the midpoints of the olefinic bonds C1x—C2x and C5x—C6x, respectively). The Pt, Cl, C9x atoms and the midpoints lie in a coordination plane with the largest deviation of 0.031 Å (C9b) from the least-squares plane, and with bond angles in the range 84.8°–94.8°. The dihedral angles between the respective least-squares planes and phenyl rings in four complexes are 76.93°, 71.16°, 85.90° or 71.73°.

Owing to the different *trans* influences of the Cl atom and phenyl group, the Pt—C bonds *trans* to C9x are on average 0.201 Å longer than those *trans* to Cl (mean lengths: Pt—C1x/C2x = 2.325 Å, Pt—C5x/C6x = 2.124 Å). The mean distances between the Pt atom and the midpoints are 2.225 Å (M1x) and 2.005 Å (M2x). The COT ligand coordinates symmetrically to the Pt atom in the "tub" conformation, and displays some increase in the coordinated double-bond distances (1.352 (12)–1.428 (12) Å) compared to the non-coordinated double bonds (1.280 (11)–1.327 (12) Å). The four coordinating C atoms (C1x, C2x, C5x and C6x) and the four non-coordinating C atoms (C3x, C4x, C7x and C8x) lie on respective planes, with the torsion angles C1x—C2x—C5x—C6x = −0.7 (8)–1.1 (8)° and C3x—C4x—C7x—C8x = −1.2 (8)–0.5 (8)°. The Pt atom is displaced on average by 1.550 Å from the plane C1x/C2x/C5x/C6x, and by 2.495 Å from the plane C3x/C4x/C7x/C8x. In the complex, the cot ring angles lie in the range 120.1 (8)°–124.7 (9)°.

Experimental

A solution of [$PtCl_2$(C_8H_8)] (0.0829 g, 0.224 mmol) and [Pt(C_6H_5)$_2$(C_8H_8)] (0.1005 g, 0.222 mmol) in CH_2Cl_2 (30 ml) was stirred for 48 h at room temperature. Pentane was added to the solution, the orange precipitate formed by −5 °C was removed by filtration. Evaporation of the solvent gave a yellow powder (0.0188 g). Crystals suitable for X-ray analysis were obtained by slow evaporation from a pentane solution.

Refinement

All H atoms were fixed geometrically and treated as riding with C—H = 0.93 \%A (aromatic) or 0.98 \%A (methine) with Uĩso~(H) = 1.2U~eq~(C).

Figures

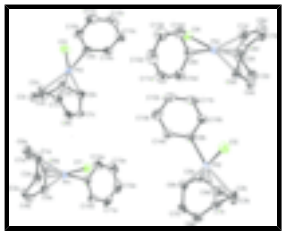


Fig. 1. View of the four complexes within the asymmetric unit showing the atom-labelling scheme. Ellipsoids are drawn at the 30% probability level. H atoms have been omitted for clarity.

Chlorido[(1,2,5,6-η)-1,3,5,7-cyclooctatetraene]phenylplatinum(II)

Crystal data

$[Pt(C_6H_5)Cl(C_8H_8)]$	$Z = 8$
$M_r = 411.78$	$F_{000} = 1536$
Triclinic, $P\overline{1}$	$D_x = 2.169$ Mg m^{-3}
Hall symbol: -P 1	Mo $K\alpha$ radiation $\lambda = 0.71073$ Å
$a = 13.1746$ (9) Å	Cell parameters from 4742 reflections
$b = 13.5924$ (9) Å	$\theta = 2.3$–26.4°
$c = 14.7998$ (10) Å	$\mu = 11.31$ mm^{-1}
$\alpha = 90.199$ (1)°	$T = 293$ (2) K
$\beta = 105.024$ (1)°	Cylinder, yellow
$\gamma = 99.466$ (1)°	0.25 × 0.20 × 0.15 mm
$V = 2521.9$ (3) Å^3	

Data collection

Bruker SMART 1000 CCD diffractometer	10050 independent reflections
Radiation source: fine-focus sealed tube	7293 reflections with $I > 2\sigma(I)$
Monochromator: graphite	$R_{int} = 0.021$
$T = 293(2)$ K	$\theta_{max} = 26.4^\circ$
φ and ω scans	$\theta_{min} = 1.5^\circ$
Absorption correction: multi-scan (SADABS; Bruker, 2000)	$h = -12 \rightarrow 16$
$T_{min} = 0.571$, $T_{max} = 1.000$	$k = -16 \rightarrow 15$
14816 measured reflections	$l = -18 \rightarrow 17$

Refinement

Refinement on F^2	Secondary atom site location: difference Fourier map
Least-squares matrix: full	Hydrogen site location: inferred from neighbouring sites
$R[F^2 > 2\sigma(F^2)] = 0.038$	H-atom parameters constrained
$wR(F^2) = 0.081$	$w = 1/[\sigma^2(F_o^2) + (0.0278P)^2]$

	where $P = (F_o^2 + 2F_c^2)/3$
$S = 0.98$	$(\Delta/\sigma)_{max} = 0.001$
10050 reflections	$\Delta\rho_{max} = 1.42$ e Å^{-3}
577 parameters	$\Delta\rho_{min} = -1.10$ e Å^{-3}
Primary atom site location: structure-invariant direct methods	Extinction correction: none

Special details

Geometry. All e.s.d.'s (except the e.s.d. in the dihedral angle between two l.s. planes) are estimated using the full covariance matrix. The cell e.s.d.'s are taken into account individually in the estimation of e.s.d.'s in distances, angles and torsion angles; correlations between e.s.d.'s in cell parameters are only used when they are defined by crystal symmetry. An approximate (isotropic) treatment of cell e.s.d.'s is used for estimating e.s.d.'s involving l.s. planes.

Refinement. Refinement of F^2 against ALL reflections. The weighted *R*-factor *wR* and goodness of fit *S* are based on F^2, conventional *R*-factors *R* are based on *F*, with *F* set to zero for negative F^2. The threshold expression of $F^2 > \sigma(F^2)$ is used only for calculating *R*-factors(gt) *etc*. and is not relevant to the choice of reflections for refinement. *R*-factors based on F^2 are statistically about twice as large as those based on *F*, and *R*- factors based on ALL data will be even larger.

Fractional atomic coordinates and isotropic or equivalent isotropic displacement parameters (Å^2)

	x	*y*	*z*	U_{iso}*/U_{eq}
Pt1	0.75425 (2)	0.05213 (2)	0.00332 (2)	0.03832 (9)
Cl1	0.64525 (16)	0.09078 (16)	0.09255 (15)	0.0493 (5)
C1A	0.6543 (6)	0.1110 (7)	−0.1330 (6)	0.050 (2)
H1A	0.6079	0.1577	−0.1243	0.059*
C2A	0.6147 (7)	0.0130 (8)	−0.1309 (6)	0.063 (3)
H2A	0.5429	−0.0030	−0.1216	0.076*
C3A	0.6516 (10)	−0.0678 (8)	−0.1765 (7)	0.081 (3)
H3A	0.6030	−0.1059	−0.2263	0.097*
C4A	0.7473 (10)	−0.0875 (8)	−0.1505 (8)	0.078 (3)
H4A	0.7644	−0.1397	−0.1814	0.093*
C5A	0.8284 (8)	−0.0312 (8)	−0.0751 (7)	0.061 (3)
H5A	0.8790	−0.0701	−0.0374	0.073*
C6A	0.8679 (7)	0.0704 (8)	−0.0757 (7)	0.063 (3)
H6A	0.9422	0.0920	−0.0398	0.076*
C7A	0.8295 (8)	0.1311 (8)	−0.1570 (7)	0.070 (3)
H7A	0.8772	0.1581	−0.1905	0.084*
C8A	0.7336 (8)	0.1478 (7)	−0.1828 (7)	0.065 (3)
H8A	0.7140	0.1849	−0.2352	0.078*
C9A	0.8677 (6)	0.0426 (7)	0.1219 (6)	0.044 (2)
C10A	0.8879 (6)	−0.0479 (7)	0.1570 (6)	0.051 (2)
H10A	0.8504	−0.1068	0.1243	0.062*
C11A	0.9640 (7)	−0.0515 (8)	0.2412 (7)	0.065 (3)
H11A	0.9761	−0.1130	0.2650	0.077*
C12A	1.0208 (8)	0.0339 (11)	0.2892 (7)	0.081 (4)
H12A	1.0727	0.0312	0.3449	0.097*
C13A	1.0009 (7)	0.1229 (9)	0.2549 (8)	0.081 (3)

H13A	1.0384	0.1817	0.2880	0.097*
C14A	0.9266 (7)	0.1276 (8)	0.1724 (7)	0.067 (3)
H14A	0.9155	0.1897	0.1496	0.080*
Pt2	0.24071 (3)	0.13962 (2)	0.51937 (2)	0.04122 (9)
Cl2	0.10337 (18)	0.21454 (18)	0.54705 (18)	0.0648 (7)
C1B	0.1702 (7)	−0.0199 (6)	0.5571 (7)	0.055 (2)
H1B	0.0944	−0.0314	0.5558	0.066*
C2B	0.2390 (7)	0.0271 (6)	0.6363 (6)	0.055 (2)
H2B	0.2057	0.0451	0.6846	0.066*
C3B	0.3519 (7)	0.0145 (6)	0.6711 (6)	0.055 (2)
H3B	0.3740	−0.0170	0.7267	0.065*
C4B	0.4201 (7)	0.0475 (7)	0.6240 (7)	0.058 (3)
H4B	0.4905	0.0390	0.6476	0.070*
C5B	0.3920 (6)	0.0977 (6)	0.5353 (7)	0.053 (2)
H5B	0.4477	0.1504	0.5251	0.064*
C6B	0.3208 (6)	0.0502 (6)	0.4540 (6)	0.049 (2)
H6B	0.3340	0.0746	0.3952	0.058*
C7B	0.2714 (7)	−0.0540 (6)	0.4501 (6)	0.054 (2)
H7B	0.2903	−0.0994	0.4128	0.065*
C8B	0.2025 (7)	−0.0866 (7)	0.4958 (6)	0.059 (3)
H8B	0.1726	−0.1540	0.4897	0.071*
C9B	0.2847 (6)	0.2603 (6)	0.4528 (6)	0.043 (2)
C10B	0.3340 (7)	0.3488 (6)	0.5044 (7)	0.056 (2)
H10B	0.3422	0.3517	0.5687	0.068*
C11B	0.3711 (7)	0.4323 (7)	0.4621 (8)	0.068 (3)
H11B	0.4046	0.4903	0.4984	0.082*
C12B	0.3593 (8)	0.4307 (7)	0.3679 (8)	0.069 (3)
H12B	0.3847	0.4872	0.3397	0.083*
C13B	0.3097 (8)	0.3451 (8)	0.3154 (7)	0.070 (3)
H13B	0.3013	0.3430	0.2510	0.084*
C14B	0.2719 (7)	0.2613 (6)	0.3581 (6)	0.054 (2)
H14B	0.2368	0.2041	0.3212	0.065*
Pt3	0.75795 (2)	0.56154 (2)	−0.02313 (2)	0.04247 (10)
Cl3	0.89540 (17)	0.68604 (17)	−0.03954 (19)	0.0667 (7)
C1C	0.8416 (8)	0.4314 (7)	−0.0552 (7)	0.066 (3)
H1C	0.9187	0.4483	−0.0479	0.079*
C2C	0.7781 (7)	0.4540 (7)	−0.1375 (7)	0.056 (2)
H2C	0.8158	0.4857	−0.1817	0.067*
C3C	0.6695 (8)	0.4024 (7)	−0.1796 (6)	0.064 (3)
H3C	0.6548	0.3654	−0.2358	0.077*
C4C	0.5911 (8)	0.4070 (7)	−0.1395 (7)	0.066 (3)
H4C	0.5235	0.3713	−0.1674	0.079*
C5C	0.6075 (6)	0.4656 (6)	−0.0542 (7)	0.053 (2)
H5C	0.5473	0.4974	−0.0496	0.063*
C6C	0.6727 (8)	0.4407 (6)	0.0329 (7)	0.064 (3)
H6C	0.6507	0.4582	0.0884	0.076*
C7C	0.7324 (9)	0.3554 (7)	0.0429 (6)	0.068 (3)
H7C	0.7160	0.3042	0.0810	0.082*
C8C	0.8065 (8)	0.3495 (7)	0.0007 (7)	0.071 (3)

H8C	0.8379	0.2926	0.0059	0.086*
C9C	0.7030 (7)	0.6638 (6)	0.0429 (7)	0.052 (2)
C10C	0.6319 (8)	0.7219 (7)	−0.0084 (7)	0.069 (3)
H10C	0.6107	0.7155	−0.0734	0.083*
C11C	0.5926 (8)	0.7905 (7)	0.0399 (9)	0.073 (3)
H11C	0.5460	0.8304	0.0068	0.088*
C12C	0.6233 (8)	0.7979 (7)	0.1355 (9)	0.075 (3)
H12C	0.5973	0.8429	0.1674	0.089*
C13C	0.6912 (7)	0.7405 (7)	0.1845 (7)	0.062 (3)
H13C	0.7112	0.7465	0.2496	0.075*
C14C	0.7301 (7)	0.6746 (6)	0.1399 (7)	0.053 (2)
H14C	0.7762	0.6355	0.1750	0.063*
Pt4	0.24901 (3)	0.64012 (2)	0.50050 (2)	0.04303 (10)
Cl4	0.36282 (16)	0.71145 (16)	0.41460 (15)	0.0517 (5)
C1D	0.3456 (8)	0.7358 (8)	0.6342 (6)	0.063 (3)
H1D	0.3923	0.7964	0.6241	0.076*
C2D	0.3859 (8)	0.6502 (8)	0.6361 (6)	0.068 (3)
H2D	0.4581	0.6567	0.6277	0.082*
C3D	0.3525 (11)	0.5642 (10)	0.6877 (8)	0.093 (4)
H3D	0.4005	0.5460	0.7402	0.112*
C4D	0.2571 (14)	0.5137 (9)	0.6609 (8)	0.110 (5)
H4D	0.2402	0.4581	0.6941	0.132*
C5D	0.1726 (8)	0.5385 (8)	0.5806 (7)	0.072 (3)
H5D	0.1232	0.4812	0.5451	0.086*
C6D	0.1318 (9)	0.6268 (8)	0.5785 (8)	0.077 (3)
H6D	0.0581	0.6224	0.5403	0.093*
C7D	0.1648 (10)	0.7040 (8)	0.6544 (8)	0.081 (3)
H7D	0.1146	0.7203	0.6832	0.097*
C8D	0.2648 (10)	0.7513 (7)	0.6829 (7)	0.076 (3)
H8D	0.2843	0.7954	0.7351	0.091*
C9D	0.1368 (6)	0.5940 (6)	0.3809 (6)	0.044 (2)
C10D	0.1077 (7)	0.4927 (7)	0.3491 (6)	0.052 (2)
H10D	0.1413	0.4448	0.3840	0.063*
C11D	0.0301 (7)	0.4643 (8)	0.2670 (7)	0.063 (3)
H11D	0.0113	0.3972	0.2471	0.075*
C12D	−0.0193 (7)	0.5329 (9)	0.2148 (7)	0.068 (3)
H12D	−0.0723	0.5130	0.1598	0.082*
C13D	0.0092 (8)	0.6318 (9)	0.2435 (8)	0.081 (3)
H13D	−0.0235	0.6791	0.2069	0.097*
C14D	0.0858 (7)	0.6621 (7)	0.3259 (7)	0.062 (3)
H14D	0.1034	0.7295	0.3447	0.075*

Atomic displacement parameters (Å^2)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Pt1	0.03622 (18)	0.0448 (2)	0.03543 (18)	0.01073 (15)	0.00968 (14)	0.00399 (15)
Cl1	0.0459 (12)	0.0617 (14)	0.0460 (12)	0.0162 (11)	0.0176 (10)	0.0055 (11)
C1A	0.044 (5)	0.066 (6)	0.042 (5)	0.022 (5)	0.008 (4)	0.006 (5)

C2A	0.049 (6)	0.091 (8)	0.036 (5)	0.001 (6)	−0.009 (4)	−0.001 (5)
C3A	0.124 (10)	0.060 (7)	0.040 (6)	−0.009 (7)	0.003 (7)	−0.018 (5)
C4A	0.121 (10)	0.058 (7)	0.061 (7)	0.031 (7)	0.025 (7)	−0.002 (6)
C5A	0.074 (7)	0.070 (7)	0.055 (6)	0.041 (6)	0.029 (5)	0.008 (5)
C6A	0.047 (6)	0.089 (8)	0.067 (7)	0.022 (6)	0.031 (5)	0.004 (6)
C7A	0.077 (7)	0.082 (8)	0.069 (7)	0.018 (6)	0.046 (6)	0.025 (6)
C8A	0.088 (7)	0.066 (7)	0.052 (6)	0.028 (6)	0.029 (6)	0.018 (5)
C9A	0.035 (4)	0.056 (6)	0.046 (5)	0.019 (4)	0.012 (4)	0.007 (4)
C10A	0.048 (5)	0.057 (6)	0.053 (6)	0.016 (5)	0.017 (4)	0.008 (5)
C11A	0.062 (6)	0.088 (8)	0.057 (7)	0.042 (6)	0.021 (5)	0.034 (6)
C12A	0.051 (6)	0.151 (12)	0.043 (6)	0.042 (8)	−0.001 (5)	−0.001 (7)
C13A	0.058 (7)	0.087 (9)	0.082 (8)	0.019 (6)	−0.013 (6)	−0.022 (7)
C14A	0.059 (6)	0.068 (7)	0.064 (7)	0.016 (5)	−0.003 (5)	−0.001 (6)
Pt2	0.0467 (2)	0.03656 (19)	0.0405 (2)	0.00732 (16)	0.01160 (15)	−0.00008 (15)
Cl2	0.0615 (15)	0.0645 (16)	0.0802 (18)	0.0242 (13)	0.0310 (13)	0.0090 (14)
C1B	0.044 (5)	0.044 (6)	0.071 (7)	−0.004 (4)	0.014 (5)	0.013 (5)
C2B	0.068 (6)	0.054 (6)	0.051 (6)	0.010 (5)	0.031 (5)	0.015 (5)
C3B	0.071 (6)	0.052 (6)	0.033 (5)	0.001 (5)	0.007 (5)	0.004 (4)
C4B	0.049 (6)	0.057 (6)	0.063 (6)	0.020 (5)	−0.003 (5)	0.004 (5)
C5B	0.045 (5)	0.052 (6)	0.072 (7)	0.017 (5)	0.027 (5)	0.019 (5)
C6B	0.057 (5)	0.049 (6)	0.048 (5)	0.014 (5)	0.025 (5)	−0.002 (4)
C7B	0.067 (6)	0.044 (6)	0.055 (6)	0.018 (5)	0.015 (5)	−0.009 (5)
C8B	0.070 (7)	0.041 (6)	0.055 (6)	0.007 (5)	−0.002 (5)	−0.008 (5)
C9B	0.046 (5)	0.036 (5)	0.046 (5)	0.005 (4)	0.013 (4)	0.006 (4)
C10B	0.071 (6)	0.036 (5)	0.060 (6)	0.010 (5)	0.014 (5)	−0.004 (5)
C11B	0.063 (6)	0.034 (5)	0.102 (9)	0.003 (5)	0.015 (6)	−0.004 (6)
C12B	0.069 (7)	0.046 (6)	0.095 (9)	0.013 (5)	0.027 (6)	0.021 (6)
C13B	0.080 (7)	0.064 (7)	0.071 (7)	0.019 (6)	0.025 (6)	0.022 (6)
C14B	0.070 (6)	0.046 (5)	0.047 (6)	0.007 (5)	0.020 (5)	0.003 (4)
Pt3	0.0442 (2)	0.0390 (2)	0.0488 (2)	0.00902 (16)	0.01913 (16)	0.00806 (16)
Cl3	0.0537 (14)	0.0526 (14)	0.095 (2)	−0.0053 (12)	0.0314 (14)	0.0033 (14)
C1C	0.077 (7)	0.059 (7)	0.077 (8)	0.036 (6)	0.035 (6)	−0.001 (6)
C2C	0.059 (6)	0.068 (7)	0.053 (6)	0.014 (5)	0.034 (5)	−0.001 (5)
C3C	0.091 (8)	0.064 (7)	0.042 (6)	0.019 (6)	0.020 (6)	0.004 (5)
C4C	0.067 (7)	0.050 (6)	0.061 (7)	−0.011 (5)	−0.003 (5)	−0.006 (5)
C5C	0.038 (5)	0.051 (6)	0.073 (7)	−0.003 (4)	0.026 (5)	0.005 (5)
C6C	0.090 (7)	0.039 (5)	0.070 (7)	−0.008 (5)	0.047 (6)	0.011 (5)
C7C	0.119 (9)	0.041 (6)	0.047 (6)	0.012 (6)	0.026 (6)	0.012 (5)
C8C	0.100 (9)	0.055 (7)	0.061 (7)	0.033 (6)	0.013 (6)	−0.003 (5)
C9C	0.065 (6)	0.035 (5)	0.062 (6)	0.020 (5)	0.020 (5)	0.013 (5)
C10C	0.087 (8)	0.055 (6)	0.072 (7)	0.028 (6)	0.020 (6)	0.022 (6)
C11C	0.060 (7)	0.061 (7)	0.106 (10)	0.031 (6)	0.022 (7)	0.010 (7)
C12C	0.069 (7)	0.053 (7)	0.105 (10)	−0.001 (6)	0.036 (7)	−0.024 (7)
C13C	0.063 (6)	0.056 (6)	0.063 (7)	0.008 (5)	0.010 (5)	−0.012 (5)
C14C	0.054 (6)	0.046 (5)	0.062 (6)	0.017 (5)	0.017 (5)	0.003 (5)
Pt4	0.0513 (2)	0.03866 (19)	0.0395 (2)	0.00395 (16)	0.01497 (16)	0.00282 (15)
Cl4	0.0522 (13)	0.0488 (13)	0.0546 (14)	−0.0013 (11)	0.0210 (11)	0.0012 (11)
C1D	0.068 (7)	0.064 (7)	0.049 (6)	−0.004 (6)	0.007 (5)	−0.008 (5)
C2D	0.078 (7)	0.077 (8)	0.042 (6)	0.022 (6)	−0.004 (5)	0.002 (5)

C3D	0.149 (12)	0.082 (10)	0.044 (7)	0.044 (9)	0.002 (8)	0.008 (7)
C4D	0.229 (18)	0.065 (9)	0.046 (8)	0.035 (10)	0.050 (10)	0.011 (7)
C5D	0.095 (8)	0.064 (7)	0.058 (7)	−0.016 (6)	0.040 (6)	0.010 (6)
C6D	0.101 (8)	0.066 (7)	0.087 (9)	0.012 (7)	0.064 (7)	0.009 (6)
C7D	0.127 (10)	0.061 (7)	0.071 (8)	0.007 (7)	0.063 (8)	−0.001 (6)
C8D	0.115 (9)	0.056 (7)	0.054 (7)	0.008 (7)	0.022 (7)	−0.007 (5)
C9D	0.034 (4)	0.052 (5)	0.044 (5)	−0.004 (4)	0.014 (4)	−0.007 (4)
C10D	0.047 (5)	0.055 (6)	0.058 (6)	0.002 (5)	0.025 (5)	−0.001 (5)
C11D	0.053 (6)	0.058 (6)	0.078 (8)	−0.008 (5)	0.030 (6)	−0.008 (6)
C12D	0.035 (5)	0.097 (9)	0.058 (7)	−0.013 (6)	0.002 (5)	−0.015 (6)
C13D	0.059 (7)	0.083 (9)	0.087 (9)	0.007 (6)	−0.002 (6)	0.001 (7)
C14D	0.061 (6)	0.050 (6)	0.068 (7)	0.009 (5)	0.004 (5)	0.006 (5)

Geometric parameters (Å, °)

Pt1—C9A	2.009 (8)	Pt3—C9C	2.025 (9)
Pt1—C6A	2.113 (8)	Pt3—C5C	2.125 (8)
Pt1—C5A	2.127 (8)	Pt3—C6C	2.130 (7)
Pt1—Cl1	2.304 (2)	Pt3—C2C	2.327 (9)
Pt1—C2A	2.321 (8)	Pt3—Cl3	2.329 (2)
Pt1—C1A	2.329 (8)	Pt3—C1C	2.340 (8)
C1A—C2A	1.352 (12)	C1C—C2C	1.355 (12)
C1A—C8A	1.455 (11)	C1C—C8C	1.475 (13)
C1A—H1A	0.9800	C1C—H1C	0.9800
C2A—C3A	1.495 (14)	C2C—C3C	1.461 (12)
C2A—H2A	0.9800	C2C—H2C	0.9800
C3A—C4A	1.292 (14)	C3C—C4C	1.327 (12)
C3A—H3A	0.9300	C3C—H3C	0.9300
C4A—C5A	1.443 (14)	C4C—C5C	1.438 (13)
C4A—H4A	0.9300	C4C—H4C	0.9300
C5A—C6A	1.395 (12)	C5C—C6C	1.428 (12)
C5A—H5A	0.9800	C5C—H5C	0.9800
C6A—C7A	1.486 (12)	C6C—C7C	1.492 (12)
C6A—H6A	0.9800	C6C—H6C	0.9800
C7A—C8A	1.280 (11)	C7C—C8C	1.300 (12)
C7A—H7A	0.9300	C7C—H7C	0.9300
C8A—H8A	0.9300	C8C—H8C	0.9300
C9A—C14A	1.376 (12)	C9C—C14C	1.387 (12)
C9A—C10A	1.376 (10)	C9C—C10C	1.399 (11)
C10A—C11A	1.389 (11)	C10C—C11C	1.412 (13)
C10A—H10A	0.9300	C10C—H10C	0.9300
C11A—C12A	1.359 (13)	C11C—C12C	1.366 (14)
C11A—H11A	0.9300	C11C—H11C	0.9300
C12A—C13A	1.353 (14)	C12C—C13C	1.353 (12)
C12A—H12A	0.9300	C12C—H12C	0.9300
C13A—C14A	1.361 (12)	C13C—C14C	1.351 (11)
C13A—H13A	0.9300	C13C—H13C	0.9300
C14A—H14A	0.9300	C14C—H14C	0.9300
Pt2—C9B	1.998 (7)	Pt4—C9D	2.010 (8)

Pt2—C6B	2.114 (8)	Pt4—C5D	2.121 (8)
Pt2—C5B	2.118 (8)	Pt4—C6D	2.141 (9)
Pt2—C2B	2.316 (8)	Pt4—Cl4	2.307 (2)
Pt2—Cl2	2.338 (2)	Pt4—C2D	2.311 (9)
Pt2—C1B	2.343 (8)	Pt4—C1D	2.316 (9)
C1B—C2B	1.363 (12)	C1D—C2D	1.355 (12)
C1B—C8B	1.466 (12)	C1D—C8D	1.473 (13)
C1B—H1B	0.9800	C1D—H1D	0.9800
C2B—C3B	1.481 (12)	C2D—C3D	1.468 (14)
C2B—H2B	0.9800	C2D—H2D	0.9800
C3B—C4B	1.300 (11)	C3D—C4D	1.289 (16)
C3B—H3B	0.9300	C3D—H3D	0.9300
C4B—C5B	1.470 (11)	C4D—C5D	1.486 (16)
C4B—H4B	0.9300	C4D—H4D	0.9300
C5B—C6B	1.398 (11)	C5D—C6D	1.390 (13)
C5B—H5B	0.9800	C5D—H5D	0.9800
C6B—C7B	1.453 (11)	C6D—C7D	1.464 (14)
C6B—H6B	0.9800	C6D—H6D	0.9800
C7B—C8B	1.291 (11)	C7D—C8D	1.325 (13)
C7B—H7B	0.9300	C7D—H7D	0.9300
C8B—H8B	0.9300	C8D—H8D	0.9300
C9B—C14B	1.368 (11)	C9D—C14D	1.378 (11)
C9B—C10B	1.390 (11)	C9D—C10D	1.411 (11)
C10B—C11B	1.378 (11)	C10D—C11D	1.377 (12)
C10B—H10B	0.9300	C10D—H10D	0.9300
C11B—C12B	1.362 (13)	C11D—C12D	1.354 (12)
C11B—H11B	0.9300	C11D—H11D	0.9300
C12B—C13B	1.365 (13)	C12D—C13D	1.370 (13)
C12B—H12B	0.9300	C12D—H12D	0.9300
C13B—C14B	1.388 (11)	C13D—C14D	1.377 (13)
C13B—H13B	0.9300	C13D—H13D	0.9300
C14B—H14B	0.9300	C14D—H14D	0.9300
C9A—Pt1—C6A	91.4 (3)	C9C—Pt3—C5C	91.4 (4)
C9A—Pt1—C5A	91.6 (4)	C9C—Pt3—C6C	92.1 (4)
C6A—Pt1—C5A	38.4 (3)	C5C—Pt3—C6C	39.2 (3)
C9A—Pt1—Cl1	89.0 (2)	C9C—Pt3—C2C	162.1 (3)
C6A—Pt1—Cl1	160.3 (3)	C5C—Pt3—C2C	79.6 (3)
C5A—Pt1—Cl1	161.2 (3)	C6C—Pt3—C2C	90.6 (3)
C9A—Pt1—C2A	163.3 (4)	C9C—Pt3—Cl3	89.0 (2)
C6A—Pt1—C2A	91.7 (4)	C5C—Pt3—Cl3	160.1 (3)
C5A—Pt1—C2A	80.7 (4)	C6C—Pt3—Cl3	160.7 (3)
Cl1—Pt1—C2A	93.6 (3)	C2C—Pt3—Cl3	94.2 (2)
C9A—Pt1—C1A	162.5 (3)	C9C—Pt3—C1C	163.5 (4)
C6A—Pt1—C1A	80.3 (3)	C5C—Pt3—C1C	91.4 (4)
C5A—Pt1—C1A	91.3 (3)	C6C—Pt3—C1C	79.9 (4)
Cl1—Pt1—C1A	93.7 (2)	C2C—Pt3—C1C	33.8 (3)
C2A—Pt1—C1A	33.8 (3)	Cl3—Pt3—C1C	93.9 (3)
C2A—C1A—C8A	123.1 (9)	C2C—C1C—C8C	122.2 (10)
C2A—C1A—Pt1	72.8 (5)	C2C—C1C—Pt3	72.6 (5)

C8A—C1A—Pt1	103.3 (5)	C8C—C1C—Pt3	104.1 (6)
C2A—C1A—H1A	116.0	C2C—C1C—H1C	116.2
C8A—C1A—H1A	116.0	C8C—C1C—H1C	116.2
Pt1—C1A—H1A	116.0	Pt3—C1C—H1C	116.2
C1A—C2A—C3A	123.0 (9)	C1C—C2C—C3C	124.7 (9)
C1A—C2A—Pt1	73.4 (5)	C1C—C2C—Pt3	73.6 (6)
C3A—C2A—Pt1	101.0 (6)	C3C—C2C—Pt3	103.5 (6)
C1A—C2A—H2A	116.3	C1C—C2C—H2C	115.2
C3A—C2A—H2A	116.3	C3C—C2C—H2C	115.2
Pt1—C2A—H2A	116.3	Pt3—C2C—H2C	115.2
C4A—C3A—C2A	123.6 (10)	C4C—C3C—C2C	121.5 (9)
C4A—C3A—H3A	118.2	C4C—C3C—H3C	119.2
C2A—C3A—H3A	118.2	C2C—C3C—H3C	119.2
C3A—C4A—C5A	122.0 (10)	C3C—C4C—C5C	122.1 (9)
C3A—C4A—H4A	119.0	C3C—C4C—H4C	119.0
C5A—C4A—H4A	119.0	C5C—C4C—H4C	119.0
C6A—C5A—C4A	124.6 (9)	C6C—C5C—C4C	121.9 (9)
C6A—C5A—Pt1	70.2 (5)	C6C—C5C—Pt3	70.6 (5)
C4A—C5A—Pt1	108.9 (7)	C4C—C5C—Pt3	110.3 (6)
C6A—C5A—H5A	114.7	C6C—C5C—H5C	115.3
C4A—C5A—H5A	114.7	C4C—C5C—H5C	115.3
Pt1—C5A—H5A	114.7	Pt3—C5C—H5C	115.3
C5A—C6A—C7A	122.0 (10)	C5C—C6C—C7C	123.6 (9)
C5A—C6A—Pt1	71.4 (5)	C5C—C6C—Pt3	70.2 (4)
C7A—C6A—Pt1	108.3 (6)	C7C—C6C—Pt3	108.7 (6)
C5A—C6A—H6A	115.5	C5C—C6C—H6C	115.1
C7A—C6A—H6A	115.5	C7C—C6C—H6C	115.1
Pt1—C6A—H6A	115.5	Pt3—C6C—H6C	115.1
C8A—C7A—C6A	123.0 (9)	C8C—C7C—C6C	122.8 (9)
C8A—C7A—H7A	118.5	C8C—C7C—H7C	118.6
C6A—C7A—H7A	118.5	C6C—C7C—H7C	118.6
C7A—C8A—C1A	122.4 (9)	C7C—C8C—C1C	121.3 (9)
C7A—C8A—H8A	118.8	C7C—C8C—H8C	119.4
C1A—C8A—H8A	118.8	C1C—C8C—H8C	119.4
C14A—C9A—C10A	117.4 (8)	C14C—C9C—C10C	118.2 (9)
C14A—C9A—Pt1	120.6 (6)	C14C—C9C—Pt3	121.2 (6)
C10A—C9A—Pt1	121.9 (7)	C10C—C9C—Pt3	120.5 (7)
C9A—C10A—C11A	120.3 (9)	C9C—C10C—C11C	119.2 (10)
C9A—C10A—H10A	119.8	C9C—C10C—H10C	120.4
C11A—C10A—H10A	119.8	C11C—C10C—H10C	120.4
C12A—C11A—C10A	120.7 (9)	C12C—C11C—C10C	119.5 (9)
C12A—C11A—H11A	119.7	C12C—C11C—H11C	120.2
C10A—C11A—H11A	119.7	C10C—C11C—H11C	120.2
C13A—C12A—C11A	119.1 (9)	C13C—C12C—C11C	120.8 (10)
C13A—C12A—H12A	120.5	C13C—C12C—H12C	119.6
C11A—C12A—H12A	120.5	C11C—C12C—H12C	119.6
C12A—C13A—C14A	120.9 (11)	C14C—C13C—C12C	120.7 (10)
C12A—C13A—H13A	119.6	C14C—C13C—H13C	119.6
C14A—C13A—H13A	119.6	C12C—C13C—H13C	119.6

C13A—C14A—C9A	121.6 (10)	C13C—C14C—C9C	121.5 (8)
C13A—C14A—H14A	119.2	C13C—C14C—H14C	119.2
C9A—C14A—H14A	119.2	C9C—C14C—H14C	119.2
C9B—Pt2—C6B	92.5 (3)	C9D—Pt4—C5D	92.7 (4)
C9B—Pt2—C5B	90.3 (3)	C9D—Pt4—C6D	91.5 (4)
C6B—Pt2—C5B	38.6 (3)	C5D—Pt4—C6D	38.1 (3)
C9B—Pt2—C2B	160.3 (3)	C9D—Pt4—Cl4	89.8 (2)
C6B—Pt2—C2B	90.6 (3)	C5D—Pt4—Cl4	162.1 (3)
C5B—Pt2—C2B	80.1 (3)	C6D—Pt4—Cl4	159.6 (3)
C9B—Pt2—Cl2	89.0 (2)	C9D—Pt4—C2D	164.8 (4)
C6B—Pt2—Cl2	159.9 (2)	C5D—Pt4—C2D	80.8 (4)
C5B—Pt2—Cl2	161.5 (3)	C6D—Pt4—C2D	91.7 (4)
C2B—Pt2—Cl2	94.8 (2)	Cl4—Pt4—C2D	92.4 (3)
C9B—Pt2—C1B	164.9 (4)	C9D—Pt4—C1D	160.9 (4)
C6B—Pt2—C1B	79.3 (3)	C5D—Pt4—C1D	91.1 (4)
C5B—Pt2—C1B	91.0 (3)	C6D—Pt4—C1D	80.0 (4)
C2B—Pt2—C1B	34.0 (3)	Cl4—Pt4—C1D	92.4 (3)
Cl2—Pt2—C1B	94.5 (2)	C2D—Pt4—C1D	34.1 (3)
C2B—C1B—C8B	122.7 (8)	C2D—C1D—C8D	123.5 (10)
C2B—C1B—Pt2	71.9 (5)	C2D—C1D—Pt4	72.8 (6)
C8B—C1B—Pt2	103.4 (6)	C8D—C1D—Pt4	104.1 (6)
C2B—C1B—H1B	116.3	C2D—C1D—H1D	115.7
C8B—C1B—H1B	116.3	C8D—C1D—H1D	115.7
Pt2—C1B—H1B	116.3	Pt4—C1D—H1D	115.7
C1B—C2B—C3B	124.3 (9)	C1D—C2D—C3D	122.4 (10)
C1B—C2B—Pt2	74.1 (5)	C1D—C2D—Pt4	73.2 (5)
C3B—C2B—Pt2	104.0 (5)	C3D—C2D—Pt4	103.9 (7)
C1B—C2B—H2B	115.2	C1D—C2D—H2D	116.0
C3B—C2B—H2B	115.2	C3D—C2D—H2D	116.0
Pt2—C2B—H2B	115.2	Pt4—C2D—H2D	116.0
C4B—C3B—C2B	120.1 (8)	C4D—C3D—C2D	120.7 (11)
C4B—C3B—H3B	120.0	C4D—C3D—H3D	119.6
C2B—C3B—H3B	120.0	C2D—C3D—H3D	119.6
C3B—C4B—C5B	123.6 (8)	C3D—C4D—C5D	124.2 (11)
C3B—C4B—H4B	118.2	C3D—C4D—H4D	117.9
C5B—C4B—H4B	118.2	C5D—C4D—H4D	117.9
C6B—C5B—C4B	122.9 (8)	C6D—C5D—C4D	122.9 (11)
C6B—C5B—Pt2	70.6 (5)	C6D—C5D—Pt4	71.7 (5)
C4B—C5B—Pt2	108.7 (6)	C4D—C5D—Pt4	107.1 (8)
C6B—C5B—H5B	115.3	C6D—C5D—H5D	115.4
C4B—C5B—H5B	115.3	C4D—C5D—H5D	115.4
Pt2—C5B—H5B	115.3	Pt4—C5D—H5D	115.4
C5B—C6B—C7B	122.3 (8)	C5D—C6D—C7D	124.5 (11)
C5B—C6B—Pt2	70.8 (5)	C5D—C6D—Pt4	70.2 (5)
C7B—C6B—Pt2	110.1 (6)	C7D—C6D—Pt4	109.2 (7)
C5B—C6B—H6B	115.1	C5D—C6D—H6D	114.7
C7B—C6B—H6B	115.1	C7D—C6D—H6D	114.7
Pt2—C6B—H6B	115.1	Pt4—C6D—H6D	114.7
C8B—C7B—C6B	123.1 (9)	C8D—C7D—C6D	121.5 (11)

C8B—C7B—H7B	118.5	C8D—C7D—H7D	119.2
C6B—C7B—H7B	118.5	C6D—C7D—H7D	119.2
C7B—C8B—C1B	121.5 (9)	C7D—C8D—C1D	121.7 (10)
C7B—C8B—H8B	119.2	C7D—C8D—H8D	119.1
C1B—C8B—H8B	119.2	C1D—C8D—H8D	119.1
C14B—C9B—C10B	116.8 (8)	C14D—C9D—C10D	117.3 (8)
C14B—C9B—Pt2	124.0 (7)	C14D—C9D—Pt4	120.2 (7)
C10B—C9B—Pt2	119.3 (6)	C10D—C9D—Pt4	122.5 (7)
C11B—C10B—C9B	121.3 (9)	C11D—C10D—C9D	120.6 (9)
C11B—C10B—H10B	119.4	C11D—C10D—H10D	119.7
C9B—C10B—H10B	119.4	C9D—C10D—H10D	119.7
C12B—C11B—C10B	120.8 (10)	C12D—C11D—C10D	120.7 (10)
C12B—C11B—H11B	119.6	C12D—C11D—H11D	119.6
C10B—C11B—H11B	119.6	C10D—C11D—H11D	119.6
C11B—C12B—C13B	119.1 (9)	C11D—C12D—C13D	119.6 (10)
C11B—C12B—H12B	120.5	C11D—C12D—H12D	120.2
C13B—C12B—H12B	120.5	C13D—C12D—H12D	120.2
C12B—C13B—C14B	120.0 (10)	C12D—C13D—C14D	120.8 (10)
C12B—C13B—H13B	120.0	C12D—C13D—H13D	119.6
C14B—C13B—H13B	120.0	C14D—C13D—H13D	119.6
C9B—C14B—C13B	122.0 (9)	C13D—C14D—C9D	120.9 (9)
C9B—C14B—H14B	119.0	C13D—C14D—H14D	119.5
C13B—C14B—H14B	119.0	C9D—C14D—H14D	119.5
C9A—Pt1—C1A—C2A	170.6 (9)	C9C—Pt3—C2C—C1C	−169.4 (9)
C6A—Pt1—C1A—C2A	108.0 (6)	C5C—Pt3—C2C—C1C	−108.5 (6)
C5A—Pt1—C1A—C2A	71.1 (6)	C6C—Pt3—C2C—C1C	−70.6 (6)
Cl1—Pt1—C1A—C2A	−90.8 (6)	Cl3—Pt3—C2C—C1C	90.6 (6)
C9A—Pt1—C1A—C8A	49.7 (13)	C9C—Pt3—C2C—C3C	−46.7 (13)
C6A—Pt1—C1A—C8A	−13.0 (6)	C5C—Pt3—C2C—C3C	14.2 (6)
C5A—Pt1—C1A—C8A	−49.9 (7)	C6C—Pt3—C2C—C3C	52.0 (6)
Cl1—Pt1—C1A—C8A	148.2 (6)	Cl3—Pt3—C2C—C3C	−146.7 (6)
C2A—Pt1—C1A—C8A	−121.0 (9)	C1C—Pt3—C2C—C3C	122.7 (9)
C8A—C1A—C2A—C3A	2.4 (14)	C1C—C2C—C3C—C4C	66.0 (14)
Pt1—C1A—C2A—C3A	−92.5 (9)	Pt3—C2C—C3C—C4C	−13.3 (11)
C8A—C1A—C2A—Pt1	94.9 (8)	C2C—C3C—C4C—C5C	2.1 (15)
C9A—Pt1—C2A—C1A	−170.2 (9)	C3C—C4C—C5C—C6C	−67.2 (12)
C6A—Pt1—C2A—C1A	−69.7 (6)	C3C—C4C—C5C—Pt3	12.0 (12)
C5A—Pt1—C2A—C1A	−106.6 (6)	C9C—Pt3—C5C—C6C	−91.6 (6)
Cl1—Pt1—C2A—C1A	91.4 (5)	C2C—Pt3—C5C—C6C	104.0 (6)
C9A—Pt1—C2A—C3A	−48.8 (14)	Cl3—Pt3—C5C—C6C	177.5 (6)
C6A—Pt1—C2A—C3A	51.8 (7)	C1C—Pt3—C5C—C6C	72.2 (6)
C5A—Pt1—C2A—C3A	14.8 (7)	C9C—Pt3—C5C—C4C	150.6 (7)
Cl1—Pt1—C2A—C3A	−147.2 (6)	C6C—Pt3—C5C—C4C	−117.9 (9)
C1A—Pt1—C2A—C3A	121.4 (9)	C2C—Pt3—C5C—C4C	−13.9 (7)
C1A—C2A—C3A—C4A	64.9 (15)	Cl3—Pt3—C5C—C4C	59.6 (11)
Pt1—C2A—C3A—C4A	−12.4 (13)	C1C—Pt3—C5C—C4C	−45.7 (7)
C2A—C3A—C4A—C5A	−1.1 (18)	C4C—C5C—C6C—C7C	2.5 (13)
C3A—C4A—C5A—C6A	−62.9 (15)	Pt3—C5C—C6C—C7C	−99.8 (8)
C3A—C4A—C5A—Pt1	15.7 (13)	C4C—C5C—C6C—Pt3	102.3 (8)

C9A—Pt1—C5A—C6A	−90.3 (6)	C9C—Pt3—C6C—C5C	89.7 (6)
Cl1—Pt1—C5A—C6A	178.2 (6)	C2C—Pt3—C6C—C5C	−72.7 (6)
C2A—Pt1—C5A—C6A	104.7 (6)	Cl3—Pt3—C6C—C5C	−177.4 (6)
C1A—Pt1—C5A—C6A	72.4 (6)	C1C—Pt3—C6C—C5C	−104.8 (6)
C9A—Pt1—C5A—C4A	148.8 (7)	C9C—Pt3—C6C—C7C	−150.4 (7)
C6A—Pt1—C5A—C4A	−120.9 (10)	C5C—Pt3—C6C—C7C	119.9 (9)
Cl1—Pt1—C5A—C4A	57.2 (12)	C2C—Pt3—C6C—C7C	47.2 (7)
C2A—Pt1—C5A—C4A	−16.3 (7)	Cl3—Pt3—C6C—C7C	−57.5 (12)
C1A—Pt1—C5A—C4A	−48.5 (7)	C1C—Pt3—C6C—C7C	15.0 (7)
C4A—C5A—C6A—C7A	−0.6 (14)	C5C—C6C—C7C—C8C	61.6 (14)
Pt1—C5A—C6A—C7A	−100.4 (8)	Pt3—C6C—C7C—C8C	−16.6 (12)
C4A—C5A—C6A—Pt1	99.9 (9)	C6C—C7C—C8C—C1C	4.4 (16)
C9A—Pt1—C6A—C5A	90.7 (6)	C2C—C1C—C8C—C7C	−69.1 (14)
Cl1—Pt1—C6A—C5A	−178.3 (6)	Pt3—C1C—C8C—C7C	9.0 (12)
C2A—Pt1—C6A—C5A	−72.8 (6)	C5C—Pt3—C9C—C14C	104.0 (8)
C1A—Pt1—C6A—C5A	−104.7 (6)	C6C—Pt3—C9C—C14C	64.8 (8)
C9A—Pt1—C6A—C7A	−150.8 (7)	C2C—Pt3—C9C—C14C	163.3 (9)
C5A—Pt1—C6A—C7A	118.5 (10)	Cl3—Pt3—C9C—C14C	−95.9 (7)
Cl1—Pt1—C6A—C7A	−59.8 (12)	C1C—Pt3—C9C—C14C	4.4 (17)
C2A—Pt1—C6A—C7A	45.7 (7)	C5C—Pt3—C9C—C10C	−72.6 (7)
C1A—Pt1—C6A—C7A	13.7 (7)	C6C—Pt3—C9C—C10C	−111.8 (8)
C5A—C6A—C7A—C8A	65.0 (14)	C2C—Pt3—C9C—C10C	−13.3 (15)
Pt1—C6A—C7A—C8A	−14.0 (13)	Cl3—Pt3—C9C—C10C	87.5 (7)
C6A—C7A—C8A—C1A	1.7 (17)	C1C—Pt3—C9C—C10C	−172.2 (10)
C2A—C1A—C8A—C7A	−67.7 (14)	C14C—C9C—C10C—C11C	1.4 (14)
Pt1—C1A—C8A—C7A	10.2 (12)	Pt3—C9C—C10C—C11C	178.2 (7)
C6A—Pt1—C9A—C14A	84.4 (7)	C9C—C10C—C11C—C12C	−0.9 (15)
C5A—Pt1—C9A—C14A	122.8 (7)	C10C—C11C—C12C—C13C	0.2 (16)
Cl1—Pt1—C9A—C14A	−76.0 (7)	C11C—C12C—C13C—C14C	0.0 (15)
C2A—Pt1—C9A—C14A	−175.0 (10)	C12C—C13C—C14C—C9C	0.5 (15)
C1A—Pt1—C9A—C14A	23.3 (14)	C10C—C9C—C14C—C13C	−1.2 (14)
C6A—Pt1—C9A—C10A	−97.3 (7)	Pt3—C9C—C14C—C13C	−178.0 (7)
C5A—Pt1—C9A—C10A	−58.9 (7)	C9D—Pt4—C1D—C2D	173.1 (8)
Cl1—Pt1—C9A—C10A	102.4 (6)	C5D—Pt4—C1D—C2D	71.6 (7)
C2A—Pt1—C9A—C10A	3.3 (15)	C6D—Pt4—C1D—C2D	108.2 (7)
C1A—Pt1—C9A—C10A	−158.4 (9)	Cl4—Pt4—C1D—C2D	−90.8 (6)
C14A—C9A—C10A—C11A	1.0 (12)	C9D—Pt4—C1D—C8D	51.8 (13)
Pt1—C9A—C10A—C11A	−177.4 (6)	C5D—Pt4—C1D—C8D	−49.6 (7)
C9A—C10A—C11A—C12A	−1.2 (13)	C6D—Pt4—C1D—C8D	−13.0 (7)
C10A—C11A—C12A—C13A	1.3 (15)	Cl4—Pt4—C1D—C8D	147.9 (6)
C11A—C12A—C13A—C14A	−1.4 (16)	C2D—Pt4—C1D—C8D	−121.2 (10)
C12A—C13A—C14A—C9A	1.3 (16)	C8D—C1D—C2D—C3D	−0.2 (16)
C10A—C9A—C14A—C13A	−1.1 (14)	Pt4—C1D—C2D—C3D	−96.0 (10)
Pt1—C9A—C14A—C13A	177.3 (8)	C8D—C1D—C2D—Pt4	95.8 (9)
C9B—Pt2—C1B—C2B	165.5 (10)	C9D—Pt4—C2D—C1D	−171.3 (10)
C6B—Pt2—C1B—C2B	107.4 (6)	C5D—Pt4—C2D—C1D	−106.0 (7)
C5B—Pt2—C1B—C2B	70.4 (6)	C6D—Pt4—C2D—C1D	−69.4 (7)
Cl2—Pt2—C1B—C2B	−91.9 (5)	Cl4—Pt4—C2D—C1D	90.6 (6)
C9B—Pt2—C1B—C8B	45.1 (15)	C9D—Pt4—C2D—C3D	−51.2 (16)

C6B—Pt2—C1B—C8B	−13.0 (6)	C5D—Pt4—C2D—C3D	14.1 (8)
C5B—Pt2—C1B—C8B	−50.0 (6)	C6D—Pt4—C2D—C3D	50.8 (8)
C2B—Pt2—C1B—C8B	−120.4 (8)	Cl4—Pt4—C2D—C3D	−149.2 (7)
Cl2—Pt2—C1B—C8B	147.7 (6)	C1D—Pt4—C2D—C3D	120.1 (11)
C8B—C1B—C2B—C3B	−1.8 (13)	C1D—C2D—C3D—C4D	68.0 (17)
Pt2—C1B—C2B—C3B	−96.3 (8)	Pt4—C2D—C3D—C4D	−10.7 (15)
C8B—C1B—C2B—Pt2	94.5 (8)	C2D—C3D—C4D—C5D	−3(2)
C9B—Pt2—C2B—C1B	−168.8 (9)	C3D—C4D—C5D—C6D	−63.2 (18)
C6B—Pt2—C2B—C1B	−69.7 (6)	C3D—C4D—C5D—Pt4	15.7 (17)
C5B—Pt2—C2B—C1B	−107.0 (6)	C9D—Pt4—C5D—C6D	−89.1 (7)
Cl2—Pt2—C2B—C1B	90.9 (5)	Cl4—Pt4—C5D—C6D	173.5 (8)
C9B—Pt2—C2B—C3B	−46.6 (13)	C2D—Pt4—C5D—C6D	104.8 (7)
C6B—Pt2—C2B—C3B	52.5 (6)	C1D—Pt4—C5D—C6D	72.2 (7)
C5B—Pt2—C2B—C3B	15.2 (6)	C9D—Pt4—C5D—C4D	151.1 (8)
Cl2—Pt2—C2B—C3B	−146.9 (6)	C6D—Pt4—C5D—C4D	−119.8 (11)
C1B—Pt2—C2B—C3B	122.2 (9)	Cl4—Pt4—C5D—C4D	53.7 (15)
C1B—C2B—C3B—C4B	67.3 (12)	C2D—Pt4—C5D—C4D	−15.0 (8)
Pt2—C2B—C3B—C4B	−12.8 (11)	C1D—Pt4—C5D—C4D	−47.6 (8)
C2B—C3B—C4B—C5B	−0.4 (15)	C4D—C5D—C6D—C7D	−1.2 (16)
C3B—C4B—C5B—C6B	−63.6 (13)	Pt4—C5D—C6D—C7D	−100.1 (10)
C3B—C4B—C5B—Pt2	14.8 (12)	C4D—C5D—C6D—Pt4	98.9 (10)
C9B—Pt2—C5B—C6B	−93.5 (5)	C9D—Pt4—C6D—C5D	92.4 (7)
C2B—Pt2—C5B—C6B	103.8 (5)	Cl4—Pt4—C6D—C5D	−174.2 (7)
Cl2—Pt2—C5B—C6B	178.8 (5)	C2D—Pt4—C6D—C5D	−72.7 (7)
C1B—Pt2—C5B—C6B	71.4 (5)	C1D—Pt4—C6D—C5D	−104.9 (7)
C9B—Pt2—C5B—C4B	147.2 (7)	C9D—Pt4—C6D—C7D	−146.8 (8)
C6B—Pt2—C5B—C4B	−119.3 (9)	C5D—Pt4—C6D—C7D	120.8 (12)
C2B—Pt2—C5B—C4B	−15.5 (6)	Cl4—Pt4—C6D—C7D	−53.5 (15)
Cl2—Pt2—C5B—C4B	59.5 (11)	C2D—Pt4—C6D—C7D	48.1 (8)
C1B—Pt2—C5B—C4B	−47.9 (7)	C1D—Pt4—C6D—C7D	15.9 (8)
C4B—C5B—C6B—C7B	−2.0 (13)	C5D—C6D—C7D—C8D	60.8 (14)
Pt2—C5B—C6B—C7B	−102.2 (8)	Pt4—C6D—C7D—C8D	−17.9 (13)
C4B—C5B—C6B—Pt2	100.2 (8)	C6D—C7D—C8D—C1D	6.0 (16)
C9B—Pt2—C6B—C5B	87.4 (5)	C2D—C1D—C8D—C7D	−70.3 (14)
C2B—Pt2—C6B—C5B	−73.1 (5)	Pt4—C1D—C8D—C7D	8.2 (12)
Cl2—Pt2—C6B—C5B	−178.9 (5)	C5D—Pt4—C9D—C14D	126.8 (7)
C1B—Pt2—C6B—C5B	−105.4 (5)	C6D—Pt4—C9D—C14D	88.7 (7)
C9B—Pt2—C6B—C7B	−154.2 (6)	Cl4—Pt4—C9D—C14D	−70.9 (7)
C5B—Pt2—C6B—C7B	118.4 (8)	C2D—Pt4—C9D—C14D	−169.3 (11)
C2B—Pt2—C6B—C7B	45.3 (6)	C1D—Pt4—C9D—C14D	25.6 (14)
Cl2—Pt2—C6B—C7B	−60.5 (10)	C5D—Pt4—C9D—C10D	−53.9 (7)
C1B—Pt2—C6B—C7B	13.0 (6)	C6D—Pt4—C9D—C10D	−92.0 (7)
C5B—C6B—C7B—C8B	67.7 (12)	Cl4—Pt4—C9D—C10D	108.4 (6)
Pt2—C6B—C7B—C8B	−11.9 (11)	C2D—Pt4—C9D—C10D	10.0 (16)
C6B—C7B—C8B—C1B	−1.1 (15)	C1D—Pt4—C9D—C10D	−155.1 (9)
C2B—C1B—C8B—C7B	−65.2 (13)	C14D—C9D—C10D—C11D	−1.0 (12)
Pt2—C1B—C8B—C7B	11.7 (11)	Pt4—C9D—C10D—C11D	179.7 (6)
C6B—Pt2—C9B—C14B	50.4 (7)	C9D—C10D—C11D—C12D	0.5 (13)
C5B—Pt2—C9B—C14B	88.9 (7)	C10D—C11D—C12D—C13D	0.8 (14)

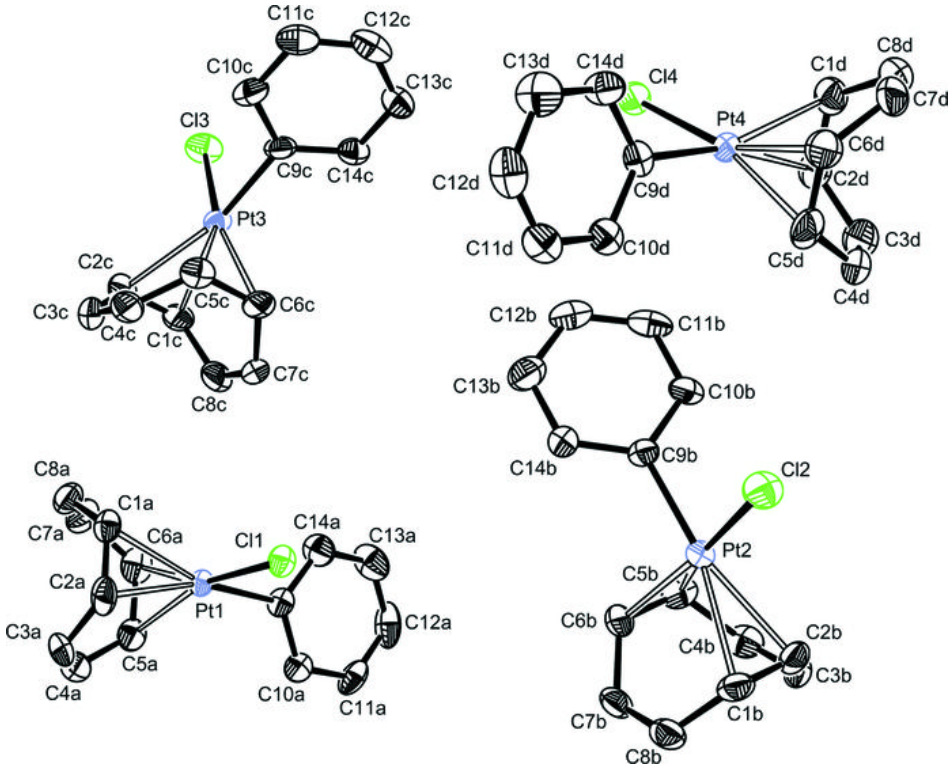
C2B—Pt2—C9B—C14B	149.2 (9)	C11D—C12D—C13D—C14D	−1.5 (16)
Cl2—Pt2—C9B—C14B	−109.6 (7)	C12D—C13D—C14D—C9D	0.9 (16)
C1B—Pt2—C9B—C14B	−6.2 (17)	C10D—C9D—C14D—C13D	0.3 (13)
C6B—Pt2—C9B—C10B	−127.9 (7)	Pt4—C9D—C14D—C13D	179.6 (7)
C5B—Pt2—C9B—C10B	−89.3 (7)	C1A—C2A—C5A—C6A	1.1 (8)
C2B—Pt2—C9B—C10B	−29.1 (13)	C3A—C4A—C7A—C8A	−0.1 (9)
Cl2—Pt2—C9B—C10B	72.2 (6)	C3A—C2A—C1A—C8A	2.4 (14)
C1B—Pt2—C9B—C10B	175.5 (10)	C4A—C5A—C6A—C7A	−0.6 (14)
C14B—C9B—C10B—C11B	−2.0 (12)	C2A—C3A—C4A—C5A	−1.1 (18)
Pt2—C9B—C10B—C11B	176.3 (7)	C6A—C7A—C8A—C1A	1.7 (17)
C9B—C10B—C11B—C12B	0.8 (14)	C1B—C2B—C5B—C6B	0.5 (7)
C10B—C11B—C12B—C13B	0.2 (15)	C3B—C4B—C7B—C8B	0.5 (8)
C11B—C12B—C13B—C14B	0.1 (14)	C3B—C2B—C1B—C8B	−1.8 (13)
C10B—C9B—C14B—C13B	2.4 (13)	C4B—C5B—C6B—C7B	−2.0 (13)
Pt2—C9B—C14B—C13B	−175.9 (6)	C2B—C3B—C4B—C5B	−0.4 (15)
C12B—C13B—C14B—C9B	−1.5 (14)	C6B—C7B—C8B—C1B	−1.1 (15)
C9C—Pt3—C1C—C2C	168.5 (10)	C1C—C2C—C5C—C6C	−0.7 (8)
C5C—Pt3—C1C—C2C	68.9 (6)	C3C—C4C—C7C—C8C	−1.2 (8)
C6C—Pt3—C1C—C2C	106.6 (6)	C3C—C2C—C1C—C8C	0.7 (15)
Cl3—Pt3—C1C—C2C	−91.8 (6)	C4C—C5C—C6C—C7C	2.5 (13)
C9C—Pt3—C1C—C8C	48.8 (16)	C2C—C3C—C4C—C5C	2.1 (15)
C5C—Pt3—C1C—C8C	−50.9 (7)	C6C—C7C—C8C—C1C	4.4 (16)
C6C—Pt3—C1C—C8C	−13.2 (7)	C1D—C2D—C5D—C6D	0.3 (8)
C2C—Pt3—C1C—C8C	−119.8 (10)	C3D—C4D—C7D—C8D	−0.6 (10)
Cl3—Pt3—C1C—C8C	148.4 (6)	C3D—C2D—C1D—C8D	−0.2 (16)
C8C—C1C—C2C—C3C	0.7 (15)	C4D—C5D—C6D—C7D	−1.2 (16)
Pt3—C1C—C2C—C3C	−95.3 (9)	C2D—C3D—C4D—C5D	−3(2)
C8C—C1C—C2C—Pt3	96.0 (9)	C6D—C7D—C8D—C1D	6.0 (16)

Table 1

Comparison of Pt—ligand bond lengths (Å) in the four molecules within the asymmetric unit

Pt—Ligand	A	B	C	D
Pt—Cl	2.304 (2)	2.338 (2)	2.329 (2)	2.307 (2)
Pt—C1	2.329 (8)	2.343 (8)	2.340 (8)	2.316 (9)
Pt—C2	2.321 (8)	2.316 (8)	2.327 (9)	2.311 (9)
Pt—C5	2.127 (8)	2.118 (8)	2.125 (8)	2.121 (8)
Pt—C6	2.113 (8)	2.114 (8)	2.130 (7)	2.141 (9)
Pt—C9	2.009 (8)	1.998 (7)	2.025 (9)	2.010 (8)

Fig. 1


C11c
C12c
C10c
C13c
Cl3
C9c
C14c
Pt3
C2c
C3c
C5c
C6c
C4c
C1c
C7c
C8c
C13d
C14d
Cl4
C1d
C8d
C7d
Pt4
C6d
C12d
C9d
C2d
C11d
C10d
C5d
C3d
C4d
C12b
C11b
C13b
C10b
C14b
C9b
Cl2
Pt2
C5b
C6b
C4b
C2b
C3b
C7b
C1b
C8b
C8a
C1a
C7a
C6a
Cl1
C14a
C13a
C2a
Pt1
C12a
C3a
C5a
C4a
C10a
C11a