

Data collection: Stoe *DIF4*. Cell refinement: Stoe *DIF4*. Data reduction: local programs. Program(s) used to solve structure: *SHELXTL/PC* (Sheldrick, 1990). Program(s) used to refine structure: *SHELXL92*. Molecular graphics: *SHELXTL/PC*. Software used to prepare material for publication: local programs.

Table 1. Fractional atomic coordinates and equivalent isotropic thermal parameters ( $\text{\AA}^2$ )

$$U_{\text{eq}} = (1/3)\sum_i \sum_j U_{ij} a_i^* a_j^* \mathbf{a}_i \cdot \mathbf{a}_j$$

	x	y	z	$U_{\text{eq}}$
I11	0.60757 (7)	0.95391 (7)	0.59843 (2)	0.0355 (3)
I12	-0.10433 (7)	0.28859 (8)	0.70853 (3)	0.0416 (3)
P11	0.3948 (3)	0.7214 (3)	0.54224 (9)	0.0300 (9)
P12	-0.0356 (3)	0.4498 (3)	0.60488 (10)	0.0336 (9)
P13	0.4298 (3)	0.5181 (3)	0.61856 (10)	0.0326 (9)
P14	0.0487 (3)	0.7136 (3)	0.65868 (10)	0.0328 (9)
S11	0.1336 (2)	0.8301 (3)	0.56735 (10)	0.0339 (9)
S12	0.2200 (3)	0.3403 (3)	0.57317 (11)	0.0396 (10)
S13	0.2974 (3)	0.6468 (3)	0.70389 (9)	0.0341 (10)
I21	0.92987 (7)	0.42035 (6)	0.09946 (2)	0.0345 (3)
I22	0.24888 (7)	1.15486 (7)	0.20126 (2)	0.0348 (3)
P21	0.7128 (3)	0.6192 (3)	0.04305 (10)	0.0304 (9)
P22	0.4409 (3)	1.0597 (3)	0.10047 (9)	0.0313 (9)
P23	0.4903 (3)	0.6036 (3)	0.11877 (11)	0.0341 (9)
P24	0.6897 (3)	0.9926 (3)	0.15833 (10)	0.0309 (9)
S21	0.8262 (2)	0.8836 (2)	0.06822 (10)	0.0329 (9)
S22	0.3291 (3)	0.7979 (3)	0.07082 (11)	0.0380 (9)
S23	0.6025 (3)	0.7582 (3)	0.20408 (9)	0.0353 (10)

Table 2. Geometric parameters ( $\text{\AA}$ ,  $^\circ$ )

I11—P11	2.474 (3)	I21—P21	2.478 (3)
I12—P12	2.474 (3)	I22—P22	2.483 (3)
P11—S11	2.117 (3)	P21—S21	2.119 (3)
P11—P13	2.207 (3)	P21—P23	2.206 (3)
P12—S12	2.113 (3)	P22—S22	2.113 (3)
P12—P14	2.208 (4)	P22—P24	2.210 (3)
P13—S13	2.099 (3)	P23—S23	2.098 (4)
P13—S12	2.135 (3)	P23—S22	2.129 (4)
P14—S13	2.090 (3)	P24—S23	2.091 (3)
P14—S11	2.129 (3)	P24—S21	2.134 (3)
S11—P11—P13	102.49 (11)	S21—P21—P23	102.30 (11)
S11—P11—I11	102.43 (11)	S21—P21—I21	102.53 (11)
P13—P11—I11	96.00 (10)	P23—P21—I21	96.42 (10)
S12—P12—P14	102.00 (12)	S22—P22—P24	102.02 (12)
S12—P12—I12	102.80 (11)	S22—P22—I22	101.61 (11)
P14—P12—I12	96.84 (10)	P24—P22—I22	96.97 (10)
S13—P13—S12	102.91 (12)	S23—P23—S22	102.72 (12)
S13—P13—P11	101.15 (12)	S23—P23—P21	101.78 (12)
S12—P13—P11	93.25 (12)	S22—P23—P21	92.53 (12)
S13—P14—S11	103.17 (12)	S23—P24—S21	102.94 (12)
S13—P14—P12	101.65 (12)	S23—P24—P22	101.72 (12)
S11—P14—P12	94.03 (12)	S21—P24—P22	92.91 (11)
P11—S11—P14	106.64 (12)	P21—S21—P24	107.00 (12)
P12—S12—P13	107.14 (12)	P22—S22—P23	107.42 (12)
P14—S13—P13	100.19 (12)	P24—S23—P23	100.51 (12)

The following method, derived from published procedures (Topsom & Wilkins, 1956; Baudler & Mozaffar-Zanganeh, 1976) has been found to give pure  $\alpha$ - $\text{P}_4\text{S}_3\text{I}_2$  though the course of the reaction remains obscure. All operations were carried out under nitrogen using Schlenk methods.

A mixture of  $\text{I}_2$  (10g, 39.4 mmol) and recrystallized  $\text{S}_8$  (3.8g, 14.8 mmol) was dissolved in dried  $\text{CS}_2$  (50  $\text{cm}^3$ ). A solution of  $\text{P}_4$  (4.9g, 39.5 mmol) in  $\text{CS}_2$  (10  $\text{cm}^3$ ) was added, giving a clear orange-red solution. A brick-red precipitate appeared after 15 min; the mixture was then stirred for 20 h at 293 K. The solvent was distilled out at atmospheric pressure and the molten product then held at 393 K for 3 h. The yellow-brown mass obtained on cooling to room temperature was extracted with

$\text{CS}_2$  by a modified Soxhlett procedure.  $\alpha$ - $\text{P}_4\text{S}_3\text{I}_2$  was crystallized from the extract at 203 K. Large crystals were obtained by the slow cooling of a saturated solution of this material from 333 to 293 K. A suitable single crystal was cleaved from the aggregate formed.

We thank SERC for financial support.

Lists of structure factors and anisotropic thermal parameters have been deposited with the British Library Document Supply Centre as Supplementary Publication No. SUP 55800 (12 pp.). Copies may be obtained through The Technical Editor, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England. [CIF reference: MU1018]

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## Bis[1,2-bis(diphenylphosphino)ethane]-platinum(II) Iodide Bis(deuteriochloroform) Solvate

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## Abstract

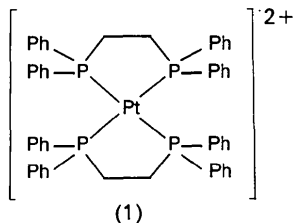
In the  $[(\text{Ph}_2\text{PCH}_2)_2\text{Pt}]^{2+}$  cation the Pt atom lies on a crystallographic inversion centre (and has necessarily planar coordination) with Pt—P = 2.3310(13) and 2.3250(14)  $\text{\AA}$  and intra-ring P—Pt—P = 82.09(5) $^\circ$ . The unique five-membered  $\text{PtP}_2\text{C}_2$  ring has close to an envelope conformation. The iodide ion lies in a general posi-

tion and is hydrogen bonded to the deuterium of the deuteriochloroform of solvation with  $I \cdots C = 3.891(8)$ ,  $I \cdots D = 2.96 \text{ \AA}$  and  $I \cdots D-C = 166^\circ$ .

### Comment

We have previously reported (McCrinde, Arsenault, Farwaha, Hampden-Smith, Rice & McAlees, 1988; McCrinde, Arsenault, Farwaha, McAlees & Sneddon, 1989) that a range of halogenomethylpalladium(II) and -platinum(II) complexes can be obtained by reaction of diazomethane with the corresponding halogeno complexes. In the course of an investigation of the reactions of such halogenomethyl species with nucleophilic reagents, we have treated 1,2-bis(diphenylphosphino)ethanebis(iodomethyl)platinum(II) [generated *in situ* from 1,5-cyclooctadiene-bis(iodomethyl)platinum(II)] with sodium cyanide under phase transfer conditions. A  $^1\text{H}$  NMR spectrum of the organic (dichloromethane) soluble products revealed the presence of a substantial portion of free phosphine ligand and several other products. Chromatography of this mixture through a very short column of silica gel afforded the unreacted phosphine as the major component of the less polar fractions. When the material from the more polar fractions was left in solution in deuteriochloroform for several days, a minute amount (*ca* 1% yield) of colourless crystals was deposited. Attempts to obtain NMR spectra of the crystalline compound were thwarted by its low solubility in deuteriochloroform and its apparent instability in solution; the crystals proved to be very suitable for the X-ray diffraction study which we report below.

The crystals were shown to contain discrete cations bis[1,2-bis(diphenylphosphino)ethane]platinum(II) $^{2+}$  (1) (Fig. 1, with dimensions in Table 2), anions  $\text{I}^-$ , and deuteriochloroform  $\text{CDCl}_3$  molecules of solvation. In the cation the Pt atom lies on a crystallographic inversion centre (and has necessarily planar coordination) with  $\text{Pt}-\text{P} = 2.3310(13)$  and  $2.3250(14) \text{ \AA}$  and intra-ring  $\text{P}-\text{Pt}-\text{P} = 82.09(5)^\circ$ . The five-membered  $\text{PtP}_2\text{C}_2$  ring has close to an envelope conformation with  $\text{C}2$  (Fig. 1) =  $0.702(5) \text{ \AA}$  from the best plane through C1, P1, Pt, P2, and with torsion angles  $\text{C}1-\text{P}1-\text{Pt}-\text{P}2 = -17.0(2)$  and  $\text{P}1-\text{C}1-\text{C}2-\text{P}2 = 40.4(4)^\circ$ .



A search of the 1992 release of the Cambridge Structural Database (Allen, Kennard & Taylor, 1983) showed that the bis[1,2-bis(diphenylphosphino)ethane]platinum-

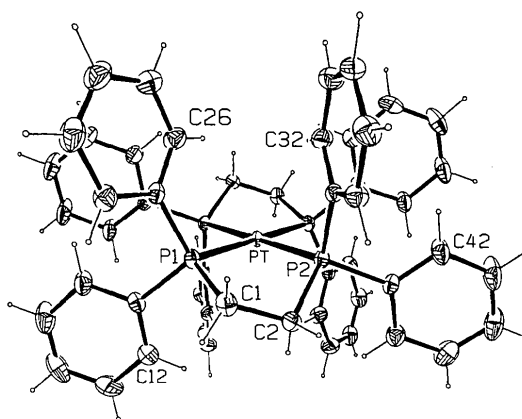


Fig. 1. An ORTEP view of (1), with the non-H atoms shown as thermal ellipsoids drawn at the 25% probability level; H atoms are drawn as spheres of an arbitrary size.

(II) cation had been reported previously as the dichloride salt hexahydrate solvate (Engelhardt, Patrick, Raston, Twiss & White, 1984) and as the trichloro(ethylene)platinato salt (Pahor & Bruno, 1977). Although neither of these structures is isomorphous with that reported here for the iodide salt, the cations in each case lie on inversion centres and have very similar conformations (the five-membered  $\text{PtP}_2\text{C}_2$  ring is close to an envelope conformation), with mean  $\text{Pt}-\text{P} = 2.334(2) \text{ \AA}$  for the dichloride salt and  $2.32(1) \text{ \AA}$  for the platinato salt.

In the crystal lattice (Fig. 2) the iodide ions lie in general positions in axial pockets above and below the  $\text{PtP}_4$  moiety but too far from Pt to be bonding [ $\text{Pt} \cdots \text{I} = 5.0434(4) \text{ \AA}$ ]. Each iodide is hydrogen bonded to the deuterium of the deuteriochloroform of solvation with  $\text{I} \cdots \text{C} = 3.891(8)$ ,  $\text{I} \cdots \text{D} = 2.96 \text{ \AA}$ ,  $\text{I} \cdots \text{D}-\text{C} = 166^\circ$ . All other intermolecular or inter-ion distances correspond to normal van der Waals interactions.

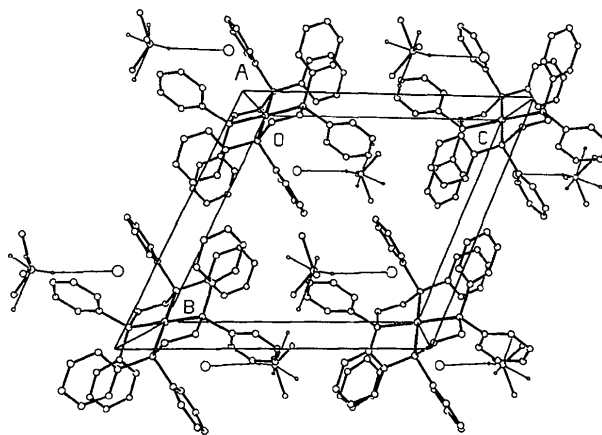


Fig. 2. A view of the unit cell of  $(1) \cdot 2\text{I}^- \cdot 2\text{CDCl}_3$ . Phenyl and  $\text{CH}_2$  H atoms are omitted and the remaining atoms are shown as spheres of arbitrary sizes. The chlorine atoms of the  $\text{CDCl}_3$  molecules are disordered over two sites. The hydrogen bonds linking the iodide ions and  $\text{CDCl}_3$  molecules are indicated.

**Experimental***Crystal data*[Pt(C<sub>26</sub>H<sub>24</sub>P<sub>2</sub>)<sub>2</sub>]<sub>2</sub>·2CDCl<sub>3</sub>*M<sub>r</sub>* = 1486.52

Triclinic

*P* $\bar{1}$ *a* = 10.2649 (14) Å*b* = 12.1774 (18) Å*c* = 12.9520 (22) Å $\alpha$  = 114.19 (1)° $\beta$  = 96.47 (1)° $\gamma$  = 75.09 (1)°*V* = 1427.1 (7) Å<sup>3</sup>*Z* = 1*D<sub>x</sub>* = 1.728 Mg m<sup>-3</sup>Mo *K*α radiation $\lambda$  = 0.70930 Å

Cell parameters from 25

reflections

 $\theta$  = 5.50–28.00° $\mu$  = 3.98 mm<sup>-1</sup>*T* = 293 K

Block

0.22 × 0.19 × 0.12 mm

Colourless

*Data collection*

Enraf–Nonius CAD-4

diffractometer

 $\omega/2\theta$  scans

Absorption correction:

by integration from crystal  
shape*T<sub>min</sub>* = 0.4237, *T<sub>max</sub>* =  
0.6484

6406 measured reflections

6406 independent reflections

4553 observed reflections

[*I<sub>net</sub>* > 3.0σ(*I<sub>net</sub>*)] $\theta_{\max}$  = 26.93°*h* = 0 → 13*k* = -15 → 15*l* = -16 → 16

3 standard reflections

frequency: 120 min

intensity variation: &lt;1%

*Refinement*Refinement on *F*Final *R* = 0.033*wR* = 0.037*S* = 1.31

4553 reflections

319 parameters

C—H, C—D 0.95 Å riding

*w* = 1/[σ<sup>2</sup>(*F*) + 0.0012*F*<sup>2</sup>](Δ/σ)<sub>max</sub> = 0.004Δρ<sub>max</sub> = 0.53 e Å<sup>-3</sup>Δρ<sub>min</sub> = -0.84 e Å<sup>-3</sup>

Atomic scattering factors

from *International Tables*for *X-ray Crystallogra-**phy* (1974, Vol. IV, Table

2.2B)

Table 1. Fractional atomic coordinates and equivalent isotropic thermal parameters (Å<sup>2</sup>)
$$U_{\text{eq}} = \frac{1}{3} \sum_i \sum_j U_{ij} a_i^* a_j^* \mathbf{a}_i \cdot \mathbf{a}_j$$

	<i>x</i>	<i>y</i>	<i>z</i>	<i>U<sub>eq</sub></i>
Pt	0.0	0.0	0.0	0.0326 (1)
P1	0.12922 (13)	-0.03608 (10)	0.14779 (10)	0.0415 (4)
P2	0.13619 (13)	0.13701 (10)	0.03270 (10)	0.0380 (4)
C1	0.2816 (5)	0.0232 (4)	0.1655 (4)	0.054 (1)
C2	0.2982 (5)	0.0598 (4)	0.0701 (4)	0.044 (1)
C11	0.1918 (6)	-0.1948 (4)	0.1297 (4)	0.049 (1)
C12	0.2877 (7)	-0.2686 (5)	0.0521 (6)	0.086 (3)
C13	0.3384 (9)	-0.3908 (6)	0.0358 (8)	0.118 (4)
C14	0.2972 (9)	-0.4373 (5)	0.1017 (6)	0.109 (3)
C15	0.2004 (9)	-0.3661 (5)	0.1779 (5)	0.099 (3)
C16	0.1439 (7)	-0.2450 (5)	0.1919 (5)	0.071 (3)
C21	0.0507 (5)	0.0460 (4)	0.2849 (4)	0.046 (1)
C22	0.1261 (6)	0.0396 (5)	0.3805 (4)	0.065 (3)
C23	0.0695 (7)	0.1118 (5)	0.4875 (5)	0.079 (3)
C24	-0.0527 (8)	0.1872 (5)	0.4993 (5)	0.084 (3)
C25	-0.1243 (7)	0.1927 (6)	0.4067 (5)	0.079 (3)
C26	-0.0747 (6)	0.1224 (5)	0.2990 (5)	0.063 (3)
C31	0.0775 (5)	0.2775 (4)	0.1565 (4)	0.039 (1)
C32	-0.0560 (5)	0.3162 (4)	0.1823 (5)	0.056 (1)
C33	-0.1024 (6)	0.4228 (5)	0.2769 (5)	0.071 (3)
C34	-0.0120 (7)	0.4864 (5)	0.3479 (5)	0.067 (3)
C35	0.1208 (6)	0.4469 (5)	0.3223 (5)	0.063 (3)
C36	0.1664 (5)	0.3434 (4)	0.2264 (4)	0.052 (1)
C41	0.1768 (5)	0.1865 (4)	-0.0714 (4)	0.046 (1)

C42	0.1292 (7)	0.3070 (5)	-0.0613 (4)	0.073 (3)
C43	0.1681 (9)	0.3434 (5)	-0.1383 (5)	0.103 (3)
C44	0.2504 (8)	0.2634 (5)	-0.2247 (5)	0.096 (3)
C45	0.2965 (7)	0.1460 (6)	-0.2340 (5)	0.087 (3)
C46	0.2611 (7)	0.1041 (5)	-0.1594 (5)	0.067 (3)
C11	-0.6814 (3)	0.2584 (3)	0.4776 (2)	0.120 (1)
C12	-0.5073 (4)	0.4141 (3)	0.5972 (3)	0.149 (1)
C13	-0.4184 (4)	0.1570 (3)	0.5348 (3)	0.179 (1)
C11*	-0.669 (1)	0.327 (1)	0.502 (1)	0.094 (4)
C12*	-0.428 (2)	0.321 (1)	0.617 (1)	0.105 (5)
C13*	-0.501 (1)	0.101 (1)	0.489 (1)	0.092 (4)
C	-0.5151 (7)	0.2666 (6)	0.4969 (5)	0.081 (3)
I	-0.43305 (4)	0.25827 (3)	0.20732 (3)	0.0674 (1)
D	-0.4805	0.2528	0.4265	0.063

Table 2. Geometric parameters (Å, °)

Pt—P1	2.3310 (13)	P2—C31	1.816 (4)
Pt—P2	2.3250 (14)	P2—C41	1.810 (6)
P1—C1	1.840 (6)	C1—C2	1.514 (9)
P1—C11	1.797 (5)	C11—C	1.719 (8)
P1—C21	1.805 (5)	C12—C	1.749 (7)
P2—C2	1.809 (5)	C13—C	1.659 (8)
P1—Pt—P2	82.09 (5)	P2—C2—C1	109.8 (4)
Pt—P1—C1	108.6 (2)	P1—C11—C12	119.2 (5)
Pt—P1—C11	116.8 (2)	P1—C11—C16	122.3 (4)
Pt—P1—C21	114.8 (2)	P1—C21—C22	118.8 (4)
C1—P1—C11	104.5 (3)	P1—C21—C26	121.7 (4)
C1—P1—C21	103.8 (2)	P2—C31—C32	119.5 (4)
C11—P1—C21	107.0 (3)	P2—C31—C36	121.0 (4)
Pt—P2—C2	104.0 (2)	P2—C41—C42	121.0 (4)
Pt—P2—C31	109.8 (2)	P2—C41—C46	119.6 (4)
Pt—P2—C41	125.1 (2)	C11—C—C12	108.3 (3)
C2—P2—C31	106.7 (2)	C11—C—C13	113.1 (5)
C2—P2—C41	103.8 (3)	C12—C—C13	111.2 (4)
C31—P2—C41	106.0 (2)	I—D—C	166
P1—C1—C2	112.2 (4)		

Data collection and cell refinement: Enraf–Nonius CAD-4 software. The  $\theta$ -scan width was (0.6+0.35tan $\theta$ )° with a  $\theta$ -scan rate of 3° min<sup>-1</sup> and background counts for 15 s on each side of every scan. Data reduction, program used to solve and refine structure: *SDP-Plus* (B. A. Frenz & Associates, Inc., 1983). Software used to prepare material for publication: *SDP-Plus*, WordPerfect 5.1. The data were corrected for absorption [Gaussian integration, grid 8 × 12 × 12]. All H atoms were visible in difference maps, were positioned geometrically (C—H, C—D 0.95 Å, *U<sub>iso</sub>* 0.063 Å<sup>2</sup>) and were included as riding atoms in the structure factor calculations. A molecule of deuteriochloroform [with its three chlorine atoms disordered (0.85/0.15 from difference map peak heights)] was also found in the asymmetric unit. Diagrams were prepared with *ORTEPII* (Johnson, 1976).

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Lists of structure factors, anisotropic thermal parameters, H-atom coordinates and complete geometry have been deposited with the British Library Document Supply Centre as Supplementary Publication No. SUP 55673 (52 pp.). Copies may be obtained through The Technical Editor, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England. [CIF reference: BR1014]

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### Structure of the Two-Coordinate Cadmium Complex Bis(pentafluorophenyl)cadmium(II), [Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>]

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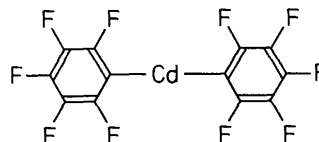
#### Abstract

In the neutral complex [Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>], the Cd atom is coordinated to two pentafluorophenyl ligands. The Cd—C bond lengths are 2.109 (3) and 2.111 (3) Å. The molecule is slightly bent at the metal atom [C—Cd—C 173.9 (1)°]. The angle between the aromatic rings of the ligands is 76.6°. There are no Cd...F contacts shorter than the van der Waals distance.

#### Comment

[Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>] has been used as a starting material in the synthesis of the multinuclear cadmium complexes [{Cd(C<sub>6</sub>F<sub>5</sub>)(ER)}<sub>n</sub>] (E = O, S; R = alkyl, aryl; n = 2, 4) (Strasdeit, Duhme, Büsching, Pohl & Saak, 1992). The structure determination was performed to establish whether bridging ligands are present in the solid state. Crystals of the related compound diphenylzinc contain dimers with μ-C<sub>6</sub>H<sub>5</sub> groups (Markies *et al.*, 1990), while bis(pentafluorophenyl)mercury(II) is monomeric (Kunchur & Mathew, 1966; Wilkinson, Riede & Müller, 1991). In the non-coordinating solvent C<sub>6</sub>D<sub>6</sub>, the title compound gives rise to a <sup>13</sup>C NMR spectrum that has four multiplets, as expected for a monomeric species: δ = 119.2 [<sup>2</sup>J(C,F) 64 Hz, *ipso*-C], 137.3 [<sup>1</sup>J(C,F) (-)255 Hz, *m*-C], 141.3 [<sup>1</sup>J(C,F) (-)251 Hz, <sup>2</sup>J(C,F) *ca* 14 Hz, <sup>3</sup>J(C,F)

*ca* 5 Hz, *p*-C], 147.8 p.p.m. [<sup>1</sup>J(C,F) (-)229 Hz, *o*-C]. The <sup>13</sup>C, <sup>19</sup>F coupling constants were only partly determined; <sup>13</sup>C, <sup>111</sup>, <sup>113</sup>Cd couplings were not observed.



Single crystals of [Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>] were obtained by combined thermal decarboxylation of Cd(O<sub>2</sub>CC<sub>6</sub>F<sub>5</sub>)<sub>2</sub> and vacuum sublimation according to a literature method (Schmeißer & Weidenbruch, 1967; Sartori & Weidenbruch, 1967). [Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>] is very sensitive to water and was handled under an atmosphere of dry nitrogen. The intermediate product of the hydrolysis [{Cd(C<sub>6</sub>F<sub>5</sub>)(μ<sub>3</sub>-OH)}<sub>4</sub>] has been structurally characterized (Weidenbruch, Herrndorf, Schäfer, Pohl & Saak, 1989).

[Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>] represents a rare example of pure (*i.e.* without additional secondary bonds) two-coordination of Cd<sup>II</sup> in the solid state (Fig. 1). It is most intriguing that the two-coordination is not enforced by sterically demanding ligands such as those occurring in [Cd{C(SiMe<sub>3</sub>)<sub>2</sub>(SiMe<sub>2</sub>CHCH<sub>2</sub>)}<sub>2</sub>] (Ayoko, Buttrus, Eaborn, Hitchcock & Smith, 1987). In this latter compound, the Cd—C bond lengths are 2.17 Å; in [Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>] the mean Cd—C bond length (2.11 Å) is smaller and has the same value as in gaseous CdMe<sub>2</sub> (Rao, Stoicheff & Turner, 1960). Using the bond-valence method (O'Keeffe & Brese, 1991), the Cd—C bond length for two-coordination is calculated to be 2.05 Å which is too low. However, for other coordination units, *e.g.* CdHal<sub>2</sub> and CdN<sub>6</sub>, this method yields results that are in much better agreement with experimental values. The C—Cd—C fragment of [Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>] deviates from linearity by 6.1°, presumably as a result of packing forces. The aromatic rings of the two ligands form an angle of 76.6° with one another.

The C—C bond lengths do not differ significantly. In contrast, two groups of C—F bonds can be discerned. The average length of the four *ortho* C—F

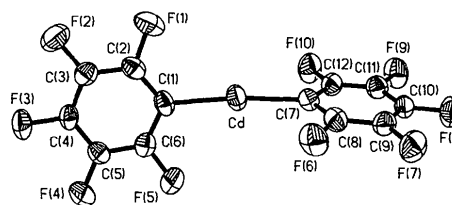


Fig. 1. View of [Cd(C<sub>6</sub>F<sub>5</sub>)<sub>2</sub>] showing the atomic numbering scheme. Thermal ellipsoids are drawn at the 50% probability level.