

Inorganic Chemistry

including bioinorganic chemistry

Inorg. Chem., 1996, 35(13), 3998-4002, DOI:[10.1021/ic9514814](https://doi.org/10.1021/ic9514814)

Terms & Conditions

Electronic Supporting Information files are available without a subscription to ACS Web Editions. The American Chemical Society holds a copyright ownership interest in any copyrightable Supporting Information. Files available from the ACS website may be downloaded for personal use only. Users are not otherwise permitted to reproduce, republish, redistribute, or sell any Supporting Information from the ACS website, either in whole or in part, in either machine-readable form or any other form without permission from the American Chemical Society. For permission to reproduce, republish and redistribute this material, requesters must process their own requests via the RightsLink permission system. Information about how to use the RightsLink permission system can be found at <http://pubs.acs.org/page/copyright/permissions.html>



ACS Publications

MOST TRUSTED. MOST CITED. MOST READ.

Copyright © 1996 American Chemical Society

P4002-1
p1 of 16**Table 1. Crystal data and structure refinement for [Cp*IrCl(dab)](PF₆).**

Empirical formula	C ₂₈ H ₃₅ ClF ₆ IrN ₂ P
Formula weight	772.20
Temperature	173 K
Wavelength	0.71073 Å
Crystal system	orthorhombic
Space group	Pnma
Unit cell dimensions	a = 16.187(2) Å b = 15.823(2) Å c = 11.6770(10) Å
Volume	2990.8(6) Å ³
Z	4
Density (calculated)	1.715 Mg/m ³
Absorption coefficient	4.665 mm ⁻¹
F(000)	1520
Crystal size	0.4 x 0.3 x 0.3 mm
θ range for data collection	2.15 to 29.00°
Index ranges	-14 ≤ h ≤ 22, -21 ≤ k ≤ 21, -4 ≤ l ≤ 15
Reflections collected	5052
Independent reflections	4083 (R _{int} = 0.0389)
Refinement method	Full-matrix least-squares on F ²
Data / restraints / parameters	4081 / 0 / 185
Goodness-of-fit on F ²	1.041
Final R indices [I > 2σ(I)]	R1 = 0.0588, wR2 = 0.1454
R indices (all data)	R1 = 0.0843, wR2 = 0.1644
Largest diff. peak and hole	4.152 and -5.061 e Å ⁻³

Table 2. Atomic coordinates [x 10⁴] and equivalent isotropic displacement parameters [Å² x 10³] for [Cp*IrCl(dab)](PF₆). U(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	U(eq)
Ir	361(1)	2500	2022(1)	19(1)
Cl	-1059(2)	2500	2460(3)	35(1)
N	486(3)	1686(4)	3422(6)	23(1)
C(1)	1384(14)	2500	762(17)	29(4)
C(2)	880(10)	1770(10)	591(11)	23(3)
C(3)	64(10)	2052(10)	290(13)	32(3)
C(4)	2279(16)	2500	899(23)	54(7)
C(5)	1168(13)	860(13)	577(18)	59(6)
C(6)	-632(14)	1496(16)	-79(21)	71(7)

C(6)	-632(14)	1496(16)	-79(21)	71(7)
C(1A)	59(18)	2500	197(23)	32(6)
C(2A)	565(11)	1787(12)	480(13)	21(3)
C(3A)	1331(11)	2050(12)	845(14)	27(4)
C(4A)	-744(21)	2500	-318(32)	63(10)
C(5A)	359(16)	876(21)	272(27)	71(8)
C(6A)	2074(15)	1487(18)	1029(21)	60(7)
C(7)	-841(7)	422(7)	3160(10)	55(3)
C(8)	49(6)	196(5)	3207(7)	32(2)
C(9)	295(7)	-645(6)	3098(8)	45(2)
C(10)	1107(8)	-880(6)	3201(9)	53(3)
C(11)	1694(7)	-288(6)	3422(9)	50(2)
C(12)	1496(5)	569(5)	3529(8)	35(2)
C(13)	677(5)	792(5)	3380(7)	29(2)
C(14)	2158(5)	1205(7)	3794(9)	51(3)
C(15)	398(4)	2032(5)	4405(7)	28(2)
P	1740(2)	2500	-2628(3)	35(1)
F(1)	1673(8)	1787(5)	-1730(7)	111(3)
F(2)	1694(8)	1781(6)	-3548(9)	136(4)
F(3)	2656(8)	2500	-2679(21)	179(10)
F(4)	752(8)	2500	-2637(21)	144(7)

Table 3. Selected bond lengths [Å] and angles [°] for [Cp*IrCl(dab)](PF₆).

Cp-Ir	1.834(9)	Cp-Cl	2.908(25)
CpA-Ir	1.820(11)	CpA-Cl	3.083(30)
Cp-Ir-Cl	117.1	CpA-Ir-Cl	122.4
Cp-IrNC15C15#1N#1	74.66(63)	CpA-IrNC15C15#1N#1	69.38(76)
Aryl-IrNC15C15#1N#1	81.69(28)		

Symmetry transformations used to generate equivalent atoms:

#1 x, -y+1/2, z

Carbon atoms and Cp indicated by A belong to the eclipsed form

Table 4. Bond lengths [Å] and angles [°] for [Cp*IrCl(dab)](PF₆).

Ir-Cl	2.354(3)	Ir-N	2.091(7)
Ir-N#1	2.091(7)	Ir-C(1)	2.215(21)
Ir-C(2)	2.198(14)	Ir-C(3)	2.196(15)
Ir-C(2)#1	2.198(14)	Ir-C(3)#1	2.296(15)
Ir-C(1A)	2.187(27)	Ir-C(2A)	2.150(16)

P4002-3

Ir-C(3A)	2.205(17)	Ir-C(2A)#1	2.150(16)
Ir-C(3A)#1	2.205(17)	N-C(13)	1.450(10)
N-C(15)	1.280(10)	C(1)-C(2)	1.43(2)
C(1)-C(2)#1	1.43(2)	C(2)-C(3)	1.44(2)
C(3)-C(3)#1	1.42(3)	C(1)-C(4)	1.46(3)
C(2)-C(5)	1.51(2)	C(3)-C(6)	1.49(3)
C(1A)-C(2A)	1.43(3)	C(1A)-C(2A)#1	1.43(3)
C(2A)-C(3A)	1.38(2)	C(3A)-C(3A)#1	1.42(4)
C(1A)-C(4A)	1.43(4)	C(2A)-C(5A)	1.50(4)
C(3A)-C(6A)	1.51(3)	C(7)-C(8)	1.485(15)
C(8)-C(9)	1.395(13)	C(8)-C(13)	1.401(12)
C(9)-C(10)	1.371(15)	C(10)-C(11)	1.359(15)
C(11)-C(12)	1.398(13)	C(12)-C(13)	1.383(11)
C(12)-C(14)	1.502(13)	C(15)-C(15)#1	1.482(15)
P-F(1)	1.544(8)	P-F(1)#1	1.544(8)
P-F(2)	1.567(9)	P-F(2)#1	1.567(9)
P-F(3)	1.483(14)	P-F(4)	1.599(14)
N-Ir-N#1	76.0(4)	N#1-Ir-C(2A)	164.3(5)
N-Ir-C(2A)	108.5(5)	N#1-Ir-C(2A)#1	108.5(5)
N-Ir-C(2A)#1	164.3(5)	C(2A)-Ir-C(2A)#1	63.3(10)
N#1-Ir-C(1A)	141.6(2)	N-Ir-C(1A)	141.6(2)
C(2A)-Ir-C(1A)	38.6(7)	C(2A)#1-Ir-C(1A)	38.6(7)
N#1-Ir-C(3)	160.1(5)	N-Ir-C(3)	122.8(5)
N#1-Ir-C(3)#1	122.8(5)	N-Ir-C(3)#1	160.1(5)
C(3)-Ir-C(3)#1	37.7(9)	N#1-Ir-C(2)	151.7(4)
N-Ir-C(2)	103.5(4)	C(3)-Ir-C(2)	38.2(6)
C(3)#1-Ir-C(2)	63.5(6)	N#1-Ir-C(2)#1	103.5(4)
N-Ir-C(2)#1	151.7(4)	C(3)-Ir-C(2)#1	63.5(6)
C(3)#1-Ir-C(2)#1	38.2(6)	C(2)-Ir-C(2)#1	63.4(8)
N#1-Ir-C(3A)#1	102.7(5)	N-Ir-C(3A)#1	128.1(5)
C(2A)-Ir-C(3A)#1	62.5(6)	C(2A)#1-Ir-C(3A)#1	36.8(6)
C(1A)-Ir-C(3A)#1	63.4(9)	N#1-Ir-C(3A)	128.1(5)
N-Ir-C(3A)	102.7(5)	C(2A)-Ir-C(3A)	36.8(6)
C(2A)#1-Ir-C(3A)	62.5(6)	C(1A)-Ir-C(3A)	63.4(9)
C(3A)#1-Ir-C(3A)	37.7(10)	N#1-Ir-C(1)	116.5(4)
N-Ir-C(1)	116.5(4)	C(3)-Ir-C(1)	63.4(7)
C(3)#1-Ir-C(1)	63.4(7)	C(2)-Ir-C(1)	37.8(5)
C(2)#1-Ir-C(1)	37.8(5)	C(15)-N-C(13)	118.1(7)
C(15)-N-Ir	115.3(5)	C(13)-N-Ir	126.6(5)
C(2)-C(1)-C(2)#1	108(2)	C(2)-C(1)-C(4)	125.7(10)
C(2)#1-C(1)-C(4)	125.7(10)	C(2)-C(1)-Ir	70.5(10)
C(2)#1-C(1)-Ir	70.5(10)	C(4)-C(1)-Ir	132(2)
C(1)-C(2)-C(3)	108.0(14)	C(1)-C(2)-C(5)	127(2)
C(3)-C(2)-C(5)	125(2)	C(1)-C(2)-Ir	71.8(10)
C(3)-C(2)-Ir	70.8(8)	C(5)-C(2)-Ir	128.8(11)

C(3)#1-C(3)-C(2)	108.1(9)	C(3)#1-C(3)-C(6)	126.1(12)
C(2)-C(3)-C(6)	126(2)	C(3)#1-C(3)-Ir	71.1(4)
C(2)-C(3)-Ir	71.0(8)	C(6)-C(3)-Ir	128.4(13)
C(4A)-C(1A)-C(2A)#1	128.0(12)	C(4A)-C(1A)-C(2A)	128.0(12)
C(2A)#1-C(1A)-C(2A)	104(2)	C(4A)-C(1A)-Ir	128(2)
C(2A)#1-C(1A)-Ir	69.3(12)	C(2A)-C(1A)-Ir	69.3(12)
C(3A)-C(2A)-C(1A)	111(2)	C(3A)-C(2A)-C(5A)	123(2)
C(1A)-C(2A)-C(5A)	126(2)	C(3A)-C(2A)-Ir	73.8(10)
C(1A)-C(2A)-Ir	72.1(12)	C(5A)-C(2A)-Ir	127(2)
C(2A)-C(3A)-C(3A)#1	107.6(11)	C(2A)-C(3A)-C(6A)	126(2)
C(3A)#1-C(3A)-C(6A)	126.1(12)	C(2A)-C(3A)-Ir	69.4(9)
C(3A)#1-C(3A)-Ir	71.2(5)	C(6A)-C(3A)-Ir	131.9(13)
C(9)-C(8)-C(13)	116.5(9)	C(9)-C(8)-C(7)	120.3(8)
C(13)-C(8)-C(7)	123.2(8)	C(10)-C(9)-C(8)	121.7(9)
C(11)-C(10)-C(9)	119.9(9)	C(10)-C(11)-C(12)	121.7(10)
C(13)-C(12)-C(11)	117.1(9)	C(13)-C(12)-C(14)	122.6(8)
C(11)-C(12)-C(14)	120.3(8)	C(12)-C(13)-C(8)	122.9(8)
C(12)-C(13)-N	116.6(7)	C(8)-C(13)-N	120.5(7)
N-C(15)-C(15)#1	115.3(4)	F(3)-P-F(1)#1	95.6(8)
F(3)-P-F(1)	95.6(8)	F(1)#1-P-F(1)	94.0(7)
F(3)-P-F(2)	91.1(8)	F(1)#1-P-F(2)	173.2(7)
F(1)-P-F(2)	86.0(6)	F(3)-P-F(2)#1	91.1(8)
F(1)#1-P-F(2)#1	86.0(6)	F(1)-P-F(2)#1	173.2(7)
F(2)-P-F(2)#1	93.1(9)	F(3)-P-F(4)	177.3(13)
F(1)#1-P-F(4)	86.3(8)	F(1)-P-F(4)	86.3(8)
F(2)-P-F(4)	87.0(8)	F(2)#1-P-F(4)	87.0(8)

Symmetry transformations used to generate equivalent atoms:

#1 x, -y+1/2, z

Table 5. Anisotropic displacement parameters [$\text{\AA}^2 \times 10^3$] for [Cp*IrCl(dab)](PF₆). The anisotropic displacement factor exponent takes the form: $-2\pi^2[(ha^*)^2U_{11} + \dots + 2hka^*b^*U_{12}]$

	U11	U22	U33	U23	U13	U12
Ir	19(1)	8(1)	30(1)	0	2(1)	0
Cl	21(1)	30(2)	54(2)	0	1(1)	0
N	19(3)	16(3)	36(3)	2(3)	1(2)	-3(2)
C(7)	46(5)	32(5)	88(8)	13(5)	-5(5)	-13(5)
C(8)	37(4)	15(4)	44(4)	4(3)	2(4)	-4(4)
C(9)	68(7)	12(4)	54(5)	3(4)	2(5)	-14(4)
C(10)	79(7)	18(4)	61(6)	3(4)	10(6)	10(5)
C(11)	50(5)	35(5)	65(6)	8(5)	5(5)	18(5)

C(12)	35(4)	22(4)	47(5)	6(4)	4(4)	10(4)
C(13)	34(4)	14(4)	38(4)	2(3)	0(3)	7(3)
C(14)	34(4)	41(6)	78(7)	0(5)	-9(5)	5(4)
C(15)	33(4)	14(4)	37(4)	0(3)	4(3)	-2(3)
P	40(2)	23(2)	42(2)	0	4(1)	0
F(1)	184(10)	62(5)	88(5)	38(5)	13(7)	-2(7)
F(2)	187(10)	100(7)	120(7)	-58(6)	21(8)	-41(8)
F(3)	33(5)	80(11)	423(31)	0	-12(11)	0
F(4)	49(6)	52(8)	331(23)	0	-5(11)	0

Table 6. Hydrogen coordinates ($\times 10^4$) and isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for $[\text{Cp}^*\text{IrCl}(\text{dab})](\text{PF}_6)$.

	x	y	z	U(eq)
H(4A)	2446(16)	3002	1298(23)	81
H(4B)	2537(16)	2486	159(23)	81
H(4C)	2444(16)	2012	1330(23)	81
H(5A)	1446(13)	746(13)	-132(18)	89
H(5B)	700(13)	492(13)	650(18)	89
H(5C)	1540(13)	766(13)	1204(18)	89
H(6A)	-500(14)	918(16)	91(21)	107
H(6B)	-718(14)	1558(16)	-888(21)	107
H(6C)	-1126(14)	1655(16)	322(21)	107
H(4AA)	-1042(21)	2007	-77(32)	95
H(4BB)	-688(21)	2495	-1137(32)	95
H(4CC)	-1039(21)	2998	-87(32)	95
H(5AA)	540(16)	716(21)	-480(27)	107
H(5BB)	-227(16)	797(21)	332(27)	107
H(5CC)	633(16)	532(21)	832(27)	107
H(6AA)	2533(15)	1823(18)	1281(21)	90
H(6BB)	2213(15)	1211(18)	323(21)	90
H(6CC)	1947(15)	1070(18)	1600(21)	90
H(7A)	-923(7)	862(7)	2606(10)	83
H(7B)	-1019(7)	615(7)	3899(10)	83
H(7C)	-1157(7)	-66(7)	2945(10)	83
H(9)	-101(7)	-1056(6)	2950(8)	54
H(10)	1256(8)	-1445(6)	3120(9)	63
H(11)	2241(7)	-456(6)	3505(9)	60
H(14A)	2690(5)	962(7)	3641(9)	76
H(14B)	2125(5)	1363(7)	4587(9)	76
H(14C)	2081(5)	1697(7)	3324(9)	76
H(15)	337(4)	1717(5)	5073(7)	34

P4002-6

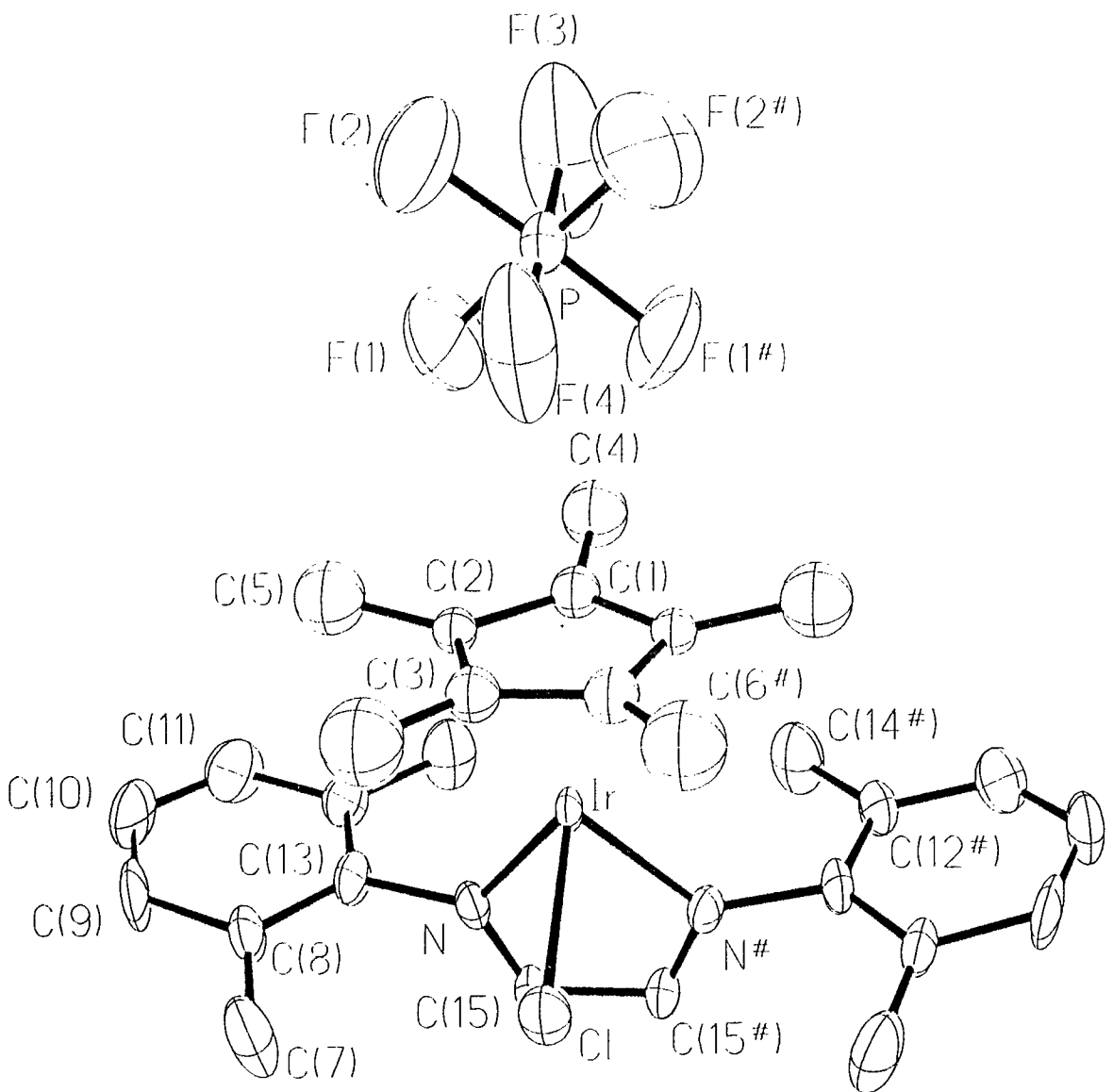


Figure 2: ORTEP plot of $[\text{Cp}^*\text{IrCl}(\text{dab})]\text{PF}_6$, staggered form

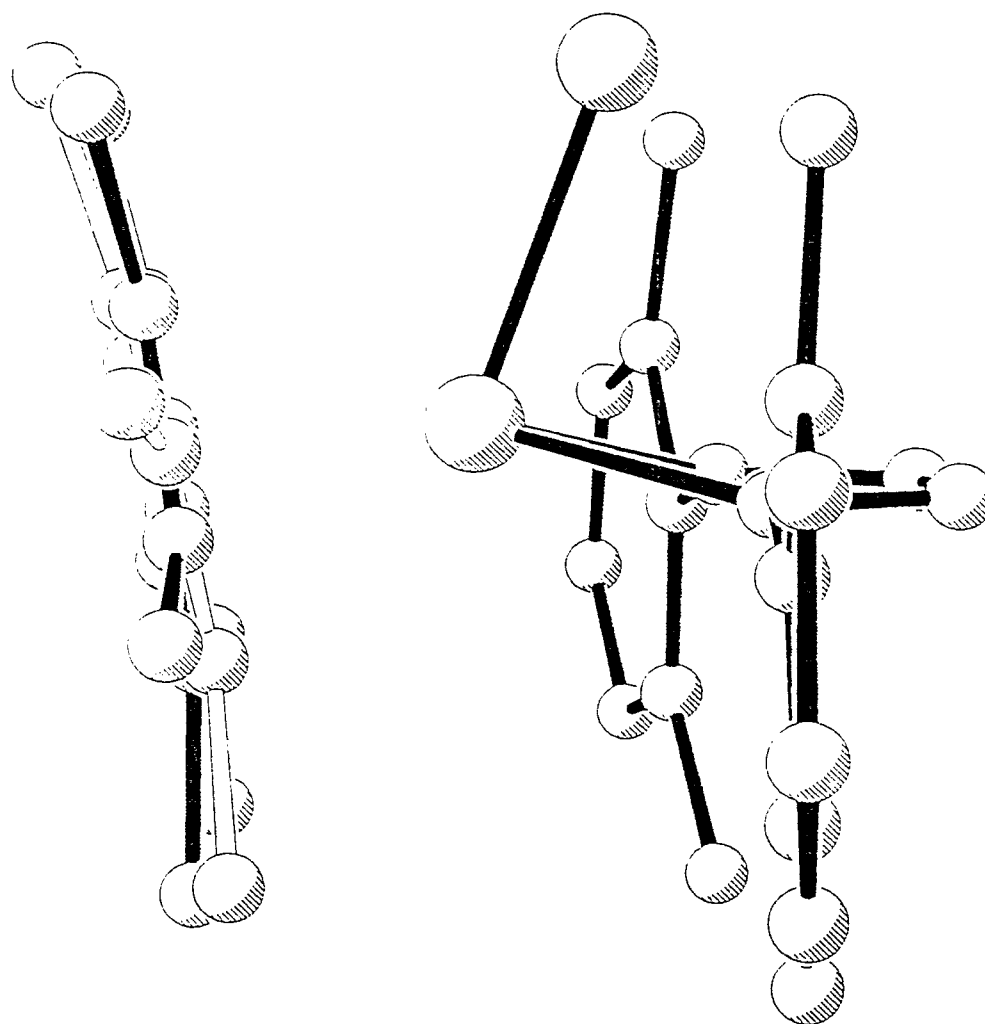


Figure 3: Molecular structure of [Cp*IrCl(dab)]PF₆ in the crystal, staggered and eclipsed form

P4002-8

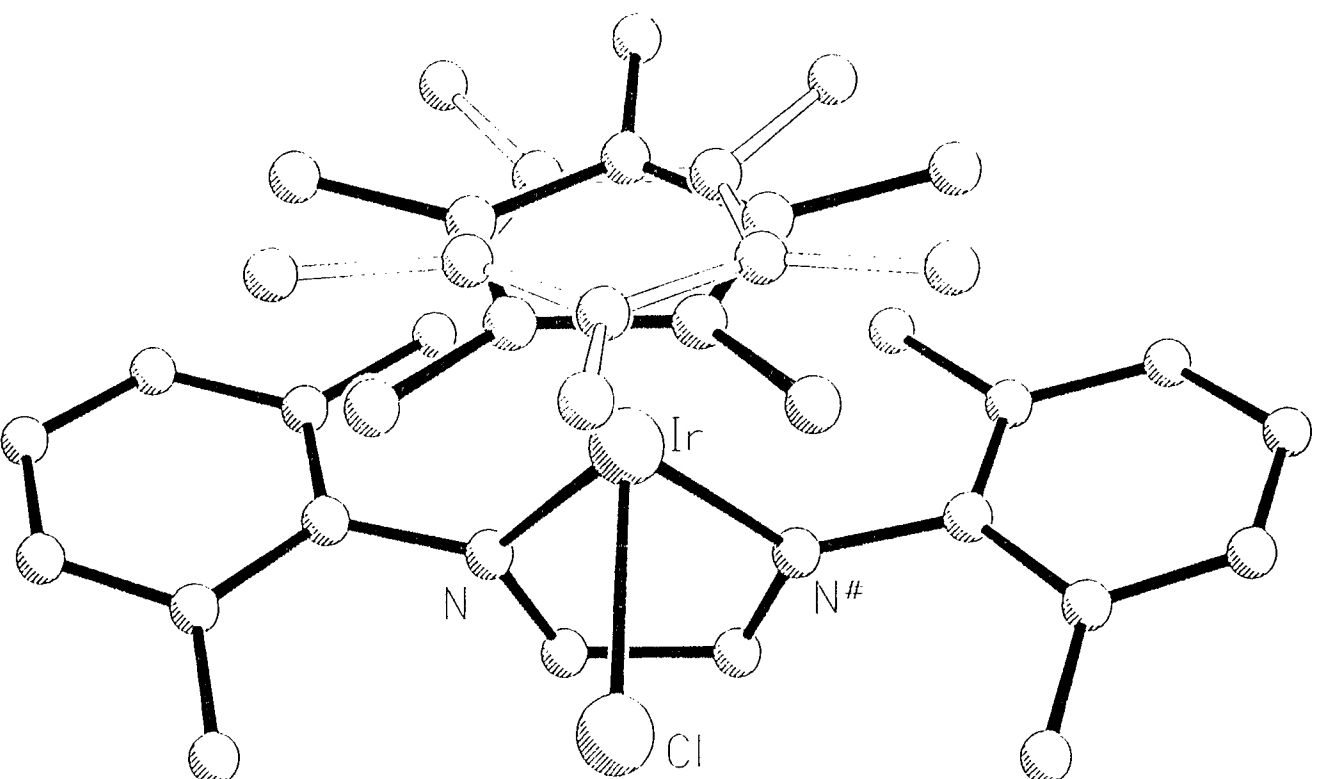


Figure 4: Molecular structure of [Cp*IrCl(dab)]PF₆ in the crystal, staggered and eclipsed form

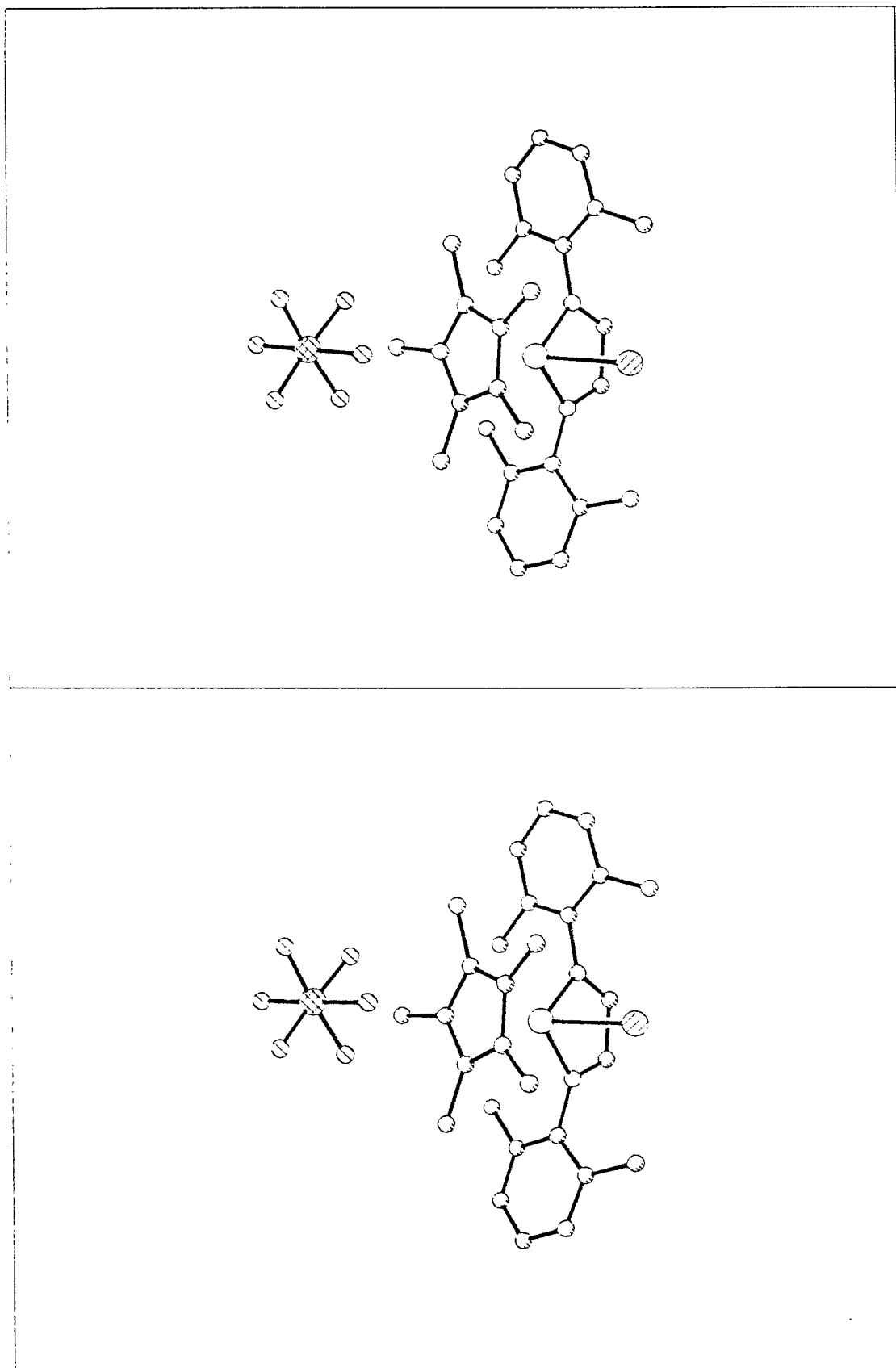


Figure 5: Stereo view of [Cp*IrCl(dab)]PF₆ (staggered form)

Table 1. Crystal data and structure refinement for Cp*Ir(dab).

Empirical formula	C ₂₈ H ₃₅ IrN ₂
Formula weight	591.78
Temperature	173(2) K
Wavelength	0.71073 Å
Crystal system	monoclinic
Space group	P2 ₁ /n
Unit cell dimensions	a = 8.484(2) Å b = 14.535(3) Å c = 20.956(4) Å
	β = 98.88(3)°
Volume	2553.2(9) Å ³
Z	4
Density (calculated)	1.540 Mg/m ³
Absorption coefficient	5.246 mm ⁻¹
F(000)	1176
Crystal size	0.4 x 0.3 x 0.1 mm
q range for data collection	1.71 to 28.00°
Index ranges	0 ≤ h ≤ 11, 0 ≤ k ≤ 19, -27 ≤ l ≤ 27
Reflections collected	6466
Independent reflections	6075 (R _{int} = 0.0199)
Refinement method	Full-matrix least-squares on F ²
Data / restraints / parameters	6060 / 0 / 280
Goodness-of-fit on F ²	1.329
Final R indices [I > 2s(I)]	R1 = 0.0586, wR2 = 0.1479
R indices (all data)	R1 = 0.0687, wR2 = 0.1590
Largest diff. peak and hole	2.321 and -2.117 eÅ ⁻³

Table 2. Atomic coordinates [x 10⁴] and equivalent isotropic displacement parameters [Å² x 10³] for Cp*Ir(dab). U(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

	x	y	z	U(eq)
Ir	4568(1)	2295(1)	1578(1)	28(1)
N(1)	4801(11)	1344(6)	924(4)	34(2)
N(2)	4409(12)	1131(6)	2053(4)	35(2)
C(1)	5818(15)	3512(8)	1998(6)	43(3)
C(2)	5486(14)	3640(8)	1321(6)	40(3)
C(3)	3792(17)	3626(8)	1142(6)	46(3)
C(4)	3102(14)	3455(10)	1729(7)	49(3)
C(5)	4394(19)	3448(8)	2250(6)	50(3)
C(6)	7512(20)	3515(10)	2384(9)	72(5)
C(7)	6668(21)	3822(11)	866(8)	70(5)

R27211

P4002-11

C(8)	2902(24)	3801(11)	468(7)	84(6)
C(9)	1317(19)	3491(13)	1754(10)	81(6)
C(10)	4237(25)	3372(10)	2965(7)	75(6)
C(11)	2034(17)	1505(12)	-58(7)	62(4)
C(12)	3712(16)	1662(8)	-201(6)	42(3)
C(13)	3984(21)	1907(10)	-818(6)	59(4)
C(14)	5466(24)	2037(10)	-966(7)	70(5)
C(15)	6752(19)	1888(10)	-493(8)	61(4)
C(16)	6631(15)	1638(9)	145(6)	46(3)
C(17)	5015(15)	1550(8)	282(5)	39(3)
C(18)	8014(16)	1461(14)	662(8)	72(5)
C(19)	4728(14)	439(8)	1094(5)	38(2)
C(20)	4542(13)	333(8)	1710(5)	35(2)
C(21)	7224(16)	1079(9)	3006(6)	51(3)
C(22)	5584(16)	1061(8)	3186(6)	43(3)
C(23)	5374(21)	1038(9)	3847(6)	58(4)
C(24)	3891(23)	999(10)	4015(7)	65(4)
C(25)	2549(21)	988(10)	3541(8)	62(4)
C(26)	2674(17)	1032(9)	2883(7)	50(3)
C(27)	4228(14)	1069(7)	2720(5)	35(2)
C(28)	1242(16)	1022(11)	2368(9)	66(4)

Table 3. Selected bond lengths [Å] and angles [°] for Cp*Ir(dab).

Cp-IrN1C19C20N2	88.87(44)	C12-C17)-IrN1C19C20N2	89.04(37)
C22-C27)-IrN1C19C20N2	89.00(36)		

Table 4. Bond lengths [Å] and angles [°] for Cp*Ir(dab).

Ir-N(1)	1.977(9)	Ir-N(2)	1.978(9)
Ir-C(4)	2.151(14)	Ir-C(1)	2.175(12)
Ir-C(3)	2.199(12)	Ir-C(2)	2.199(12)
Ir-C(5)	2.209(12)	N(1)-C(19)	1.366(14)
N(1)-C(17)	1.419(14)	N(2)-C(20)	1.379(13)
N(2)-C(27)	1.432(14)	C(1)-C(5)	1.394(19)
C(1)-C(2)	1.416(17)	C(1)-C(6)	1.536(19)
C(2)-C(3)	1.428(18)	C(2)-C(7)	1.509(18)
C(3)-C(4)	1.463(18)	C(3)-C(8)	1.518(17)
C(4)-C(5)	1.423(19)	C(4)-C(9)	1.525(18)
C(5)-C(10)	1.528(17)	C(11)-C(12)	1.515(18)
C(12)-C(17)	1.389(17)	C(12)-C(13)	1.395(17)
C(13)-C(14)	1.353(23)	C(14)-C(15)	1.374(23)
C(15)-C(16)	1.405(19)	C(16)-C(17)	1.448(17)
C(16)-C(18)	1.493(20)	C(19)-C(20)	1.334(15)

C(21)-C(22)	1.498(19)	C(22)-C(27)	1.389(16)
C(22)-C(23)	1.423(17)	C(23)-C(24)	1.359(23)
C(24)-C(25)	1.391(23)	C(25)-C(26)	1.402(20)
C(26)-C(27)	1.413(17)	C(26)-C(28)	1.495(21)
N(1)-Ir-N(2)	76.9(4)	N(1)-Ir-C(4)	140.7(5)
N(2)-Ir-C(4)	120.8(4)	N(1)-Ir-C(1)	138.9(4)
N(2)-Ir-C(1)	123.8(4)	C(4)-Ir-C(1)	63.8(5)
N(1)-Ir-C(3)	112.6(4)	N(2)-Ir-C(3)	157.4(5)
C(4)-Ir-C(3)	39.3(5)	C(1)-Ir-C(3)	63.2(5)
N(1)-Ir-C(2)	112.0(4)	N(2)-Ir-C(2)	159.4(4)
C(4)-Ir-C(2)	64.7(5)	C(1)-Ir-C(2)	37.8(4)
C(3)-Ir-C(2)	37.9(5)	N(1)-Ir-C(5)	174.8(4)
N(2)-Ir-C(5)	108.1(4)	C(4)-Ir-C(5)	38.1(5)
C(1)-Ir-C(5)	37.1(5)	C(3)-Ir-C(5)	63.3(5)
C(2)-Ir-C(5)	62.8(4)	C(19)-N(1)-C(17)	117.9(9)
C(19)-N(1)-Ir	118.7(7)	C(17)-N(1)-Ir	123.4(7)
C(20)-N(2)-C(27)	119.1(9)	C(20)-N(2)-Ir	116.0(7)
C(27)-N(2)-Ir	124.9(7)	C(5)-C(1)-C(2)	109.8(11)
C(5)-C(1)-C(6)	126.6(13)	C(2)-C(1)-C(6)	123.5(13)
C(5)-C(1)-Ir	72.8(7)	C(2)-C(1)-Ir	72.1(7)
C(6)-C(1)-Ir	124.8(9)	C(1)-C(2)-C(3)	107.4(11)
C(1)-C(2)-C(7)	127.4(12)	C(3)-C(2)-C(7)	125.2(12)
C(1)-C(2)-Ir	70.2(7)	C(3)-C(2)-Ir	71.0(7)
C(7)-C(2)-Ir	127.1(9)	C(2)-C(3)-C(4)	107.3(10)
C(2)-C(3)-C(8)	125.4(14)	C(4)-C(3)-C(8)	127.3(14)
C(2)-C(3)-Ir	71.1(7)	C(4)-C(3)-Ir	68.6(7)
C(8)-C(3)-Ir	127.6(9)	C(5)-C(4)-C(3)	106.6(11)
C(5)-C(4)-C(9)	128.7(13)	C(3)-C(4)-C(9)	123.5(13)
C(5)-C(4)-Ir	73.2(8)	C(3)-C(4)-Ir	72.1(7)
C(9)-C(4)-Ir	129.4(11)	C(1)-C(5)-C(4)	108.6(11)
C(1)-C(5)-C(10)	126(2)	C(4)-C(5)-C(10)	125.4(14)
C(1)-C(5)-Ir	70.1(7)	C(4)-C(5)-Ir	68.7(7)
C(10)-C(5)-Ir	126.5(9)	C(17)-C(12)-C(13)	118.6(13)
C(17)-C(12)-C(11)	120.4(11)	C(13)-C(12)-C(11)	121.1(13)
C(14)-C(13)-C(12)	122.7(14)	C(13)-C(14)-C(15)	118.3(13)
C(14)-C(15)-C(16)	124.2(13)	C(15)-C(16)-C(17)	114.9(13)
C(15)-C(16)-C(18)	124.9(12)	C(17)-C(16)-C(18)	120.2(11)
C(12)-C(17)-N(1)	120.8(11)	C(12)-C(17)-C(16)	121.2(11)
N(1)-C(17)-C(16)	118.1(11)	C(20)-C(19)-N(1)	112.2(10)
C(19)-C(20)-N(2)	116.1(10)	C(27)-C(22)-C(23)	118.0(13)
C(27)-C(22)-C(21)	121.6(11)	C(23)-C(22)-C(21)	120.4(12)
C(24)-C(23)-C(22)	120.9(14)	C(23)-C(24)-C(25)	120.2(13)
C(24)-C(25)-C(26)	121.7(14)	C(25)-C(26)-C(27)	117.0(14)
C(25)-C(26)-C(28)	122.3(13)	C(27)-C(26)-C(28)	120.7(12)
C(22)-C(27)-C(26)	122.2(11)	C(22)-C(27)-N(2)	119.0(11)

827 13

P4002-13

C(26)-C(27)-N(2) 118.8(11)

Table 5ⁱ. Anisotropic displacement parameters [$\text{\AA}^2 \times 10^3$] for $\text{Cp}^*\text{Ir}(\text{dab})$. The anisotropic displacement factor exponent takes the form: $-2p^2 [(ha^*)^2 U_{11} + \dots + 2hka^*b^*U_{12}$

	U11	U22	U33	U23	U13	U12
Ir	29(1)	28(1)	27(1)	-1(1)	4(1)	0(1)
N(1)	38(5)	33(5)	34(5)	-6(4)	11(4)	-4(4)
N(2)	43(5)	26(4)	35(5)	3(4)	8(4)	1(4)
C(1)	46(7)	32(6)	50(7)	6(5)	1(5)	-6(5)
C(2)	42(6)	42(6)	36(6)	-2(5)	11(5)	3(5)
C(3)	62(8)	31(6)	41(6)	-3(5)	-7(6)	6(6)
C(4)	32(6)	62(8)	55(8)	0(6)	11(5)	-5(6)
C(5)	85(10)	30(6)	39(6)	-8(5)	19(7)	-3(6)
C(6)	70(10)	42(8)	92(12)	7(8)	-25(9)	-14(7)
C(7)	81(11)	58(9)	78(11)	1(8)	34(9)	-16(8)
C(8)	129(16)	49(9)	55(9)	1(7)	-43(10)	15(10)
C(9)	64(10)	82(12)	107(14)	17(11)	49(10)	26(9)
C(10)	154(18)	39(7)	40(7)	-3(6)	41(9)	0(9)
C(11)	48(8)	81(11)	55(8)	-4(8)	-1(6)	-9(8)
C(12)	50(7)	41(6)	33(6)	-6(5)	3(5)	0(5)
C(13)	94(12)	50(8)	32(6)	1(6)	5(7)	4(8)
C(14)	127(15)	49(8)	43(7)	-1(6)	38(9)	-23(9)
C(15)	67(9)	55(8)	71(10)	-20(8)	45(8)	-16(7)
C(16)	47(7)	44(7)	52(7)	-7(6)	26(6)	-5(5)
C(17)	56(7)	31(5)	33(5)	-8(4)	17(5)	-13(5)
C(18)	32(7)	113(15)	72(10)	-9(10)	15(7)	-6(8)
C(19)	49(7)	30(5)	34(5)	-7(4)	7(5)	2(5)
C(20)	39(6)	33(5)	35(6)	-4(4)	5(5)	2(5)
C(21)	60(8)	42(7)	45(7)	2(6)	-14(6)	-1(6)
C(22)	59(8)	38(6)	32(6)	3(5)	5(5)	5(6)
C(23)	96(12)	46(7)	28(6)	-3(5)	-1(7)	6(8)
C(24)	106(13)	53(9)	39(7)	4(6)	26(8)	6(9)
C(25)	80(11)	43(7)	72(10)	4(7)	46(9)	8(7)
C(26)	54(8)	34(6)	68(9)	-2(6)	31(7)	0(6)
C(27)	45(6)	27(5)	32(5)	1(4)	5(5)	5(5)
C(28)	37(7)	61(9)	108(13)	12(9)	29(8)	6(6)

S211 19

P4002-14

Table 6.ⁱ Hydrogen coordinates ($\times 10^4$) and isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for $\text{Cp}^*\text{Ir}(\text{dab})$.

	x	y	z	U(eq)
H(6A)	7725(20)	4101(10)	2591(9)	108
H(6B)	8270(20)	3406(10)	2096(9)	108
H(6C)	7598(20)	3039(10)	2705(9)	108
H(7A)	6695(21)	4468(11)	775(8)	105
H(7B)	6354(21)	3488(11)	472(8)	105
H(7C)	7709(21)	3625(11)	1063(8)	105
H(8A)	3036(24)	4433(11)	353(7)	126
H(8B)	1788(24)	3671(11)	458(7)	126
H(8C)	3319(24)	3409(11)	165(7)	126
H(9A)	795(19)	2985(13)	1513(10)	121
H(9B)	891(19)	4059(13)	1570(10)	121
H(9C)	1142(19)	3450(13)	2195(10)	121
H(10A)	3240(25)	3083(10)	3007(7)	113
H(10B)	4273(25)	3976(10)	3152(7)	113
H(10C)	5099(25)	3010(10)	3184(7)	113
H(11A)	1280(17)	1631(12)	-439(7)	93
H(11B)	1839(17)	1906(12)	285(7)	93
H(11C)	1921(17)	877(12)	70(7)	93
H(13)	3112(21)	1983(10)	-1141(6)	71
H(14)	5610(24)	2224(10)	-1378(7)	84
H(15)	7767(19)	1958(10)	-602(8)	73
H(18A)	8544(16)	908(14)	564(8)	108
H(18B)	7640(16)	1392(14)	1069(8)	108
H(18C)	8747(16)	1969(14)	686(8)	108
H(19)	4800(14)	-48(8)	812(5)	45
H(20)	4505(13)	-245(8)	1898(5)	42
H(21A)	7564(16)	461(9)	2942(6)	77
H(21B)	7950(16)	1363(9)	3346(6)	77
H(21C)	7210(16)	1423(9)	2614(6)	77
H(23)	6263(21)	1051(9)	4167(6)	69
H(24)	3774(23)	980(10)	4449(7)	77
H(25)	1544(21)	951(10)	3665(8)	74
H(28A)	753(16)	424(11)	2349(9)	100
H(28B)	1561(16)	1162(11)	1959(9)	100
H(28C)	492(16)	1475(11)	2465(9)	100

24815

P4002-15

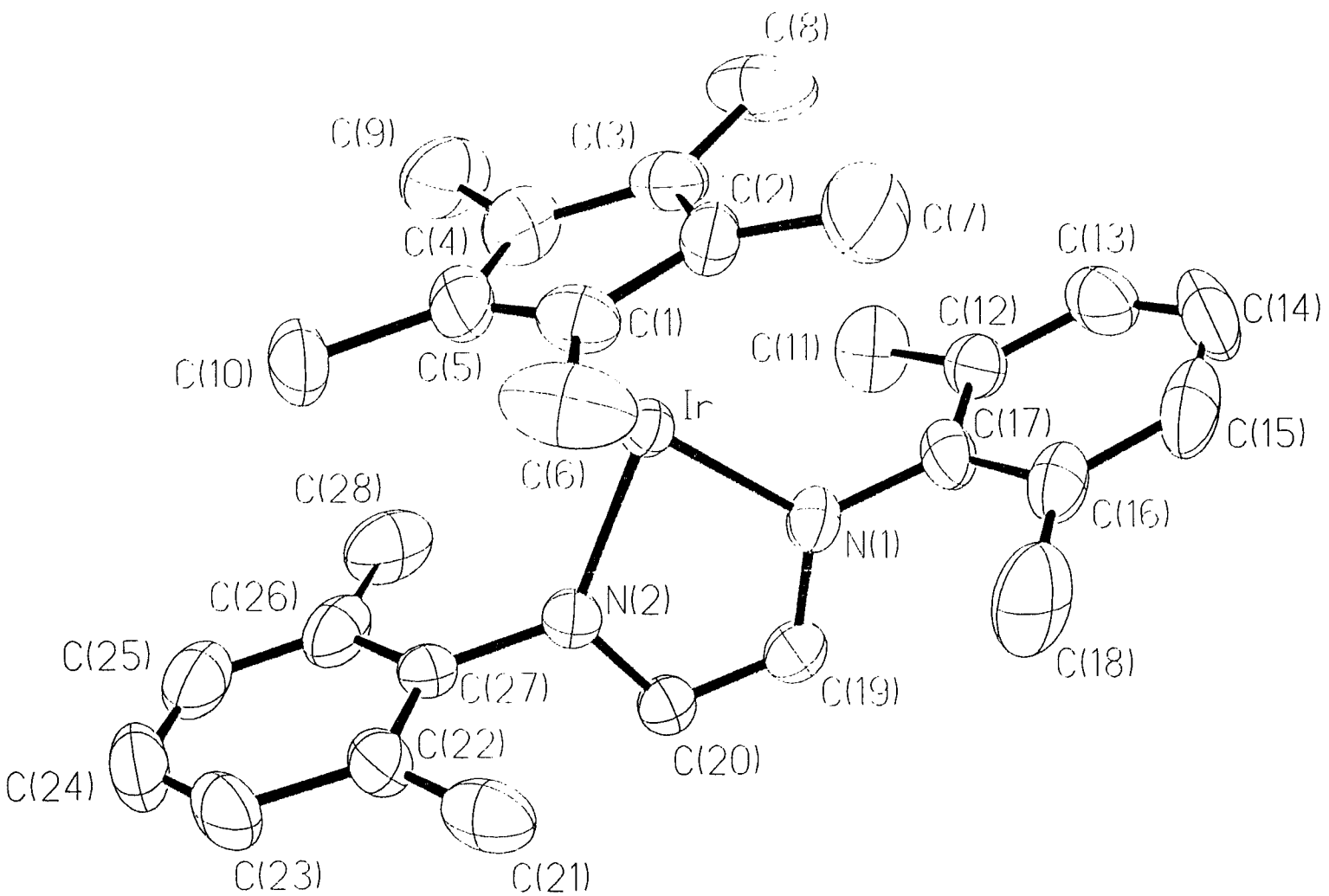


Figure 6: ORTEP plot of $[\text{Cp}^*\text{IrCl}(\text{dab})]$

88816

P4002-16

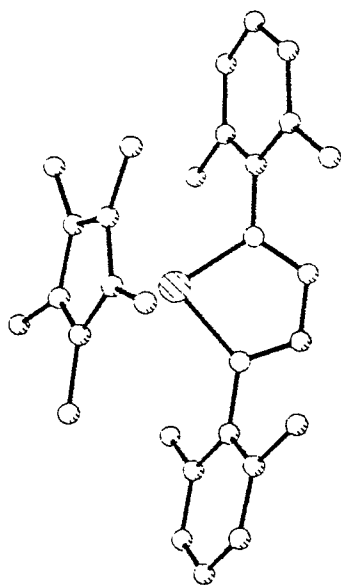
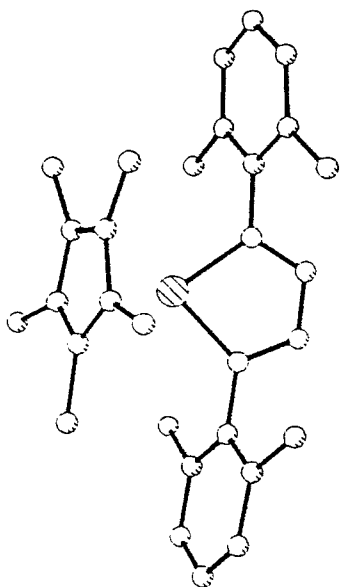


Figure 7: stereo view of $[\text{Cp}^*\text{IrCl}(\text{dab})]$