

[Cu(Hdmg)₂(im)] (Morehouse, Polychronopoulou & Williams, 1980), [Cu(Hdpg)₂(H₂O)] (Falk, Ivanova, Roos & Vännard, 1970) (Hdmg – dimethylglyoximate, im – imidazole, Hdpg – dipropylglyoximate) and [Cu₂(Hdmg)₄] (Vaciego & Zambonelli, 1970)}.

The Cu—S distance of 2.941 (1) Å is similar to that found in the complex [Cu(pic)₂(tu)₂] [2.943 (1) Å, pic – picolate] (Ferrari, Capacchi, Fava, Montenero & Nardelli, 1972) where the thiourea molecules are oriented almost parallel to the equatorial plane, in contrast with the present complex where the angle between the equatorial and thiourea planes is 81.3°.

The intramolecular O—H—O hydrogen bonds bridging the dioxime ligands are asymmetric [O(1)⋯O(2) = 2.656 (6), O(2)—H(15) = 0.79 (8), O(1)⋯H(15) = 1.87 (8) Å]. The O(1) atom is also involved both in a second intramolecular hydrogen bond [O(1)⋯N(2) = 3.089 (5) Å] and in two intermolecular hydrogen bonds with thiourea ligands.

Hexacoordination has not previously been structurally confirmed for copper dioximate complexes, although it has been assumed for a water adduct (Falk, Ivanova, Roos & Vännard, 1970); otherwise only pentacoordinate complexes have been reported. The complex [Cu(hd)₂(tu)₂] thus represents a new structural type among compounds of this class.

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Structure of Two Crystalline Forms of μ -(1,2-Phenylenediaminato-*N,N,N',N'*)-bis[dicarbonyl(triphenylphosphine)ruthenium(I)](*Ru—Ru*) [$\{\text{Ru}(\text{CO})_2[\text{P}(\text{C}_6\text{H}_5)_3]\}_2$]- $\{\mu$ -1,2- $\text{C}_6\text{H}_4(\text{NH})_2$ }]

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Abstract. [$\{\text{Ru}(\text{CO})_2[\text{P}(\text{C}_6\text{H}_5)_3]\}_2$]- $\{\mu$ -1,2- $\text{C}_6\text{H}_4(\text{NH})_2$ }]₂- $\frac{2}{3}\text{C}_7\text{H}_8$ (*A*), $\text{C}_{46}\text{H}_{36}\text{N}_2\text{O}_4\text{P}_2\text{Ru}_2\frac{2}{3}\text{C}_7\text{H}_8$, $M_r = 1006.3$, monoclinic, $P2_1/c$, $a = 10.040$ (4), $b = 17.802$ (2), $c = 27.279$ (9) Å, $\beta = 98.26$ (3)°, $V = 4825$ (3) Å³, $Z = 4$, $D_x = 1.39$ g cm⁻³, Mo $K\alpha$ radiation (graphite crystal monochromator, $\lambda = 0.71073$ Å), $\mu(\text{Mo } K\alpha) = 7.21$ cm⁻¹, $F(000) = 2037$, $T = 293$ K. Final conventional R factor = 0.049 for 3908 'observed' reflections and 512 variables. [$\{\text{Ru}(\text{CO})_2[\text{P}(\text{C}_6\text{H}_5)_3]\}_2$]- $\{\mu$ -1,2- $\text{C}_6\text{H}_4(\text{NH})_2$ }]₂. C_9H_{12} (*B*), $\text{C}_{46}\text{H}_{36}\text{N}_2\text{O}_4\text{P}_2\text{Ru}_2\cdot\text{C}_9\text{H}_{12}$, $M_r = 1065.1$, monoclinic, $P2_1/m$, $a = 9.9994$ (1), $b = 25.477$ (2), $c = 10.515$ (2) Å, $\beta =$

114.51 (1)°, $V = 2437.4$ (5) Å³, $Z = 2$, $D_x = 1.45$ g cm⁻³, Mo $K\alpha$ radiation (graphite crystal monochromator, $\lambda = 0.71073$ Å), $\mu(\text{Mo } K\alpha) = 7.17$ cm⁻¹, $F(000) = 1084$, $T = 293$ K. Final conventional R factor = 0.036 for 5414 'observed' reflections and 332 variables. The above structures correspond to two different crystalline forms (depending on the solvent) adopted by the compound previously formulated as [$\text{Ru}_2\{\mu$ -1,2- $\text{C}_6\text{H}_4(\text{NH})_2\}(\text{CO})_2(\text{PPh}_3)_2$] (*C*). The asymmetric unit contents are an entire formula unit in structure (*A*) and a half formula unit in structure (*B*). The Ru—Ru lengths found in both cases are equal and significantly short (2.56 Å).

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Introduction. When we studied the reactivity of compound (C) [Ru₂{μ-1,2-C₆H₄(NH)₂}(CO)₂(PPh₃)₂] (Anillo, Riera, Obeso-Rosete, Font-Altaba & Solans, 1987), we found that it showed unexpected behaviour for a molecule with a triple Ru—Ru bond as proposed on the basis of its previous structural analysis by X-ray diffraction. An assumed derivative of compound (C), of which the crystal structure (A) was determined by X-ray diffraction methods, gave the formula [Ru₂{μ-1,2-C₆H₄(NH)₂}(CO)₄(PPh₃)₂], with molecular parameters analogous to those previously found for compound (C). This fact led us to the idea that both might be the same compound (C) which was kept unreacted and used later as a sample for its structural characterization. The new formula is also supported by the mass spectrum, and its infrared spectrum is also better understood (four CO ligands) as for a unique isomer and not an isomeric *syn-anti* mixture in solution; the chemical reactivity also suggests this formula with a simple Ru—Ru bond. As we had some crystals from the original crystallization of compound (C) we decided to re-determine its structure by X-ray diffraction to compare it with that of compound (A), which resulted in structure (B) which crystallizes in a different space group but with the same molecular geometry as (A). The different crystalline habits showed by (A) and (B) are related to the use of different solvents in each case, either toluene, (A), or mesitylene, (B), leading to different space groups.

Experimental. A new method to obtain compound (C) with a better yield is as follows: A mixture of [Ru(CO)₃(PPh₃)₂] (1 g) and 1,2-C₆H₄(NH)₂ (0.15 g) is refluxed in mesitylene (10 cm³) for 1 h. The reaction solution is left at room temperature and after one day yellow crystals are collected, washed twice with hexane and dried *in vacuo*. Yield ca 80%. A purer compound can be obtained by dissolving the former crystals in toluene and chromatographing the solution through Al₂O₃ (activity II), rejecting the first pale fraction {in which some unreacted [Ru(CO)₃(PPh₃)₂] is usually present} and collecting the yellow fraction eluted with toluene. Further crystals can be formed by adding hexane at room temperature.

The procedure to obtain the crystals employed in the previous structural determination of (C) is: A mixture of [Ru{C₆H₄(NH)₂}(PPh₃)₃] (0.1 g) and Cr(CO)₆ (excess) is refluxed in mesitylene (3 cm³) for 1 h. The reaction solution is chromatographed (Al₂O₃, activity II) and the first yellow fraction eluted with toluene [in which the compound (C) is detected]; by adding hexane to this solution yellow crystals are obtained. Analysis: Found C, 60.62; H, 4.35; N, 2.60%; calculated for C₄₆H₃₆N₂O₄P₂Ru₂.C₉H₁₂ (B): C, 62.02; H, 4.54; N, 2.63%; ¹H NMR

Table 1. *Experimental data*

	(A)	(B)
Crystal colour	Brownish yellow	Yellow
Crystal shape	Nearly cubic	Prismatic
Crystal size (mm)	0.2 × 0.2 × 0.2	0.4 × 0.2 × 0.1
Drift correction	0.996 to 1.025	0.98 to 1.01
θ limits (°)	1–25	0–30
<i>h, k, l</i> range	–11, 0, 0 to 11, 21, 32	–14, 0, 0 to 14, 35, 14
Number of measured reflections	8974	7616
Number of unique reflections	8462	7251
<i>R</i> _{int} (for some doubly measured reflections)	0.013	0.018
Observed reflections <i>I</i> > 3σ(<i>I</i>)	3908	5414
Number of refined parameters	512	332
<i>R, wR</i>	0.049, 0.050	0.032, 0.036
<i>g</i> value	0.001	0.0002
Shift/e.s.d. (max. ratio)	1.782	0.040
Δρ (e Å ⁻³) maximum	1.14	0.45
Δρ (e Å ⁻³) minimum	–0.63	–0.45

(300 MHz, CDCl₃, 295 K) δ = 5.21 (*m*) and 4.83 (*m*) (4H, C₆H₄ diimine), 2.27 (*s*, 9H, CH₃ mesitylene); ³¹P {¹H} NMR (300 MHz, CDCl₃, 295 K) δ = 28.03 (*s*); IR (toluene, cm⁻¹) ν(CO) 2002, 1968, 1931. FAB mass spectrum: *m/e* ratio: 946 (*M*⁺), 918 (*M*⁺ – CO), 889 (*M*⁺ – 2CO), 861 (*M*⁺ – 3CO), 832 (*M*⁺ – 4CO).

Experimental data for both structures (A) and (B) are collected in Table 1.

Enraf–Nonius CAD-4 single-crystal diffractometer, Mo Kα radiation, graphite crystal monochromator. Unit-cell dimensions were determined from the angular settings of 25 reflections with 20 < θ < 30°. Space group from systematic absences (A, B) and structure determination (B). ω–2θ scan technique with a variable scan rate and a maximum scan time of 60 s per reflection. Intensity checked by monitoring three standard reflections every 60 min. Drift corrections. Profile analysis (Lehmann & Larsen, 1974; Grant & Gabe, 1978) and empirical absorption correction using ψ scans (North, Phillips & Mathews, 1968) (correction factors 0.90 to 1.00) were applied to all the reflections of (B).

Lorentz and polarization corrections were applied and data reduced to |*F*_o| values. The structures were solved by Patterson method using the program SHELXS86 (Sheldrick, 1985) and Fourier synthesis. Isotropic and anisotropic least-squares refinements using SHELX76 (Sheldrick, 1976), followed by a difference Fourier synthesis allowed the location of some hydrogen atoms; the rest of the hydrogen atoms were geometrically placed. Positional and anisotropic thermal parameters of the non-hydrogen atoms were refined. Hydrogen atoms were geometrically placed and the overall isotropic temperature factors refined, except some of those belonging to molecule (B), for which positional parameters were refined. Function minimized ∑w(*F*_o – *F*_c)², *w* = 1/[σ²(*F*_o) + *gF*_o²] with σ(*F*_o) from counting statistics (*g* in Table 1). Atomic scattering factors from *International Tables for X-ray Crystallography* (1974, Vol. IV). The plot was drawn with the PLUTO program

Table 2. Fractional positional and thermal parameters (with e.s.d.'s)

$$U_{eq} = \frac{1}{3} \sum_i \sum_j U_{ij} a_i^* a_j^* a_i \cdot a_j$$

(A)	x	y	z	$U_{eq} (\text{\AA}^2 \times 10^2)$
Ru1	0.50550 (7)	0.17836 (4)	0.55076 (3)	3.68 (3)
Ru2	0.46214 (8)	0.23936 (4)	0.46504 (3)	3.76 (3)
P1	0.6564 (3)	0.1388 (1)	0.6208 (1)	3.77 (9)
P2	0.5407 (2)	0.2945 (2)	0.3953 (1)	3.96 (9)
N1	0.5880 (7)	0.2843 (5)	0.5292 (3)	4.0 (3)
N2	0.6219 (7)	0.1620 (4)	0.4919 (3)	3.5 (3)
C1	0.727 (1)	0.2713 (6)	0.5247 (3)	4.0 (3)
C2	0.746 (1)	0.2014 (5)	0.5024 (3)	4.0 (3)
C3	0.873 (1)	0.1780 (6)	0.4962 (4)	4.9 (4)
C4	0.982 (1)	0.2257 (8)	0.5110 (4)	6.6 (5)
C5	0.964 (1)	0.2926 (8)	0.5313 (4)	6.7 (5)
C6	0.835 (1)	0.3174 (6)	0.5390 (4)	5.9 (4)
C11	0.414 (1)	0.0861 (7)	0.5448 (4)	4.8 (4)
O11	0.363 (1)	0.0298 (5)	0.5400 (3)	7.7 (4)
C12	0.378 (1)	0.2192 (6)	0.5859 (4)	5.3 (4)
O12	0.301 (1)	0.2470 (5)	0.6079 (3)	7.6 (4)
C21	0.348 (1)	0.1710 (6)	0.4282 (4)	5.0 (4)
O21	0.275 (1)	0.1295 (4)	0.4068 (3)	8.1 (4)
C22	0.323 (1)	0.3056 (6)	0.4674 (4)	4.9 (4)
O22	0.238 (1)	0.3475 (5)	0.4706 (4)	8.5 (4)
C31	0.588 (1)	0.0658 (6)	0.6575 (4)	4.9 (4)
C32	0.651 (1)	-0.0040 (7)	0.6694 (5)	7.2 (5)
C33	0.593 (1)	-0.0575 (8)	0.6962 (5)	7.9 (6)
C34	0.475 (2)	-0.0412 (9)	0.7125 (5)	8.6 (6)
C35	0.409 (1)	0.0271 (9)	0.7030 (5)	8.1 (6)
C36	0.463 (1)	0.0809 (8)	0.6738 (5)	7.6 (5)
C41	0.812 (1)	0.0982 (6)	0.6062 (4)	4.5 (4)
C42	0.940 (1)	0.1285 (7)	0.6246 (4)	6.3 (5)
C43	1.056 (1)	0.0955 (9)	0.6114 (5)	7.6 (6)
C44	1.045 (1)	0.0333 (8)	0.5786 (6)	8.2 (6)
C45	0.918 (1)	0.0052 (7)	0.5602 (5)	6.8 (5)
C46	0.806 (1)	0.0375 (6)	0.5738 (4)	5.0 (4)
C51	0.714 (1)	0.2085 (6)	0.6681 (4)	4.4 (4)
C52	0.769 (1)	0.1864 (7)	0.7161 (4)	5.5 (4)
C53	0.820 (1)	0.2397 (8)	0.7507 (4)	6.5 (5)
C54	0.812 (1)	0.3148 (9)	0.7381 (4)	8.3 (6)
C55	0.755 (2)	0.3373 (8)	0.6917 (5)	9.9 (7)
C56	0.704 (1)	0.2837 (7)	0.6561 (4)	7.5 (5)
C61	0.703 (1)	0.2578 (6)	0.3854 (3)	4.3 (4)
C62	0.711 (1)	0.1827 (6)	0.3745 (4)	5.0 (4)
C63	0.834 (1)	0.1504 (7)	0.3688 (4)	6.4 (5)
C64	0.949 (1)	0.195 (1)	0.3746 (4)	7.7 (6)
C65	0.944 (1)	0.2689 (9)	0.3852 (4)	7.2 (6)
C66	0.820 (1)	0.3009 (7)	0.3904 (4)	5.4 (4)
C71	0.439 (1)	0.2791 (6)	0.3355 (4)	4.5 (4)
C72	0.299 (1)	0.2822 (7)	0.3324 (4)	6.3 (5)
C73	0.214 (1)	0.2723 (8)	0.2872 (5)	8.5 (6)
C74	0.272 (1)	0.2550 (7)	0.2447 (4)	7.8 (5)
C75	0.410 (1)	0.2518 (7)	0.2479 (4)	6.5 (5)
C76	0.490 (1)	0.2629 (6)	0.2923 (4)	5.7 (4)
C81	0.560 (1)	0.3968 (6)	0.3971 (4)	4.7 (4)
C82	0.547 (1)	0.4398 (8)	0.3547 (5)	8.4 (6)
C83	0.569 (2)	0.5176 (8)	0.3584 (7)	11.0 (8)
C84	0.593 (2)	0.5513 (8)	0.4020 (7)	10.4 (8)
C85	0.604 (2)	0.5093 (9)	0.4427 (6)	10.2 (8)
C86	0.590 (1)	0.4312 (7)	0.4404 (5)	7.6 (6)
C91	1.077 (1)	0.4793 (8)	0.6526 (5)	12.00
C92	1.075 (1)	0.4828 (8)	0.7036 (5)	12.00
C93	0.964 (1)	0.5136 (8)	0.7218 (5)	12.00
C94	0.855 (1)	0.5409 (8)	0.6891 (5)	12.00
C95	0.857 (1)	0.5373 (8)	0.6382 (5)	12.00
C96	0.968 (1)	0.5065 (8)	0.6199 (5)	12.00
C97	0.970 (1)	0.5027 (8)	0.5652 (5)	12.00
(B)				
Ru1	0.24623 (2)	0.19976 (1)	0.06059 (2)	3.00 (1)
P1	0.34682 (7)	0.11770 (2)	0.03520 (6)	3.20 (2)
N1	0.4348 (3)	0.25000	0.1646 (3)	3.3 (1)
N2	0.2846 (3)	0.25000	-0.0865 (3)	3.3 (1)
O11	-0.0613 (2)	0.1664 (1)	-0.1272 (3)	7.3 (1)
O12	0.1843 (3)	0.1763 (1)	0.3105 (2)	7.9 (1)
C1	0.5236 (4)	0.25000	0.0887 (4)	3.4 (1)
C2	0.4379 (4)	0.25000	-0.0561 (4)	3.4 (1)
C3	0.5013 (5)	0.25000	-0.1487 (4)	4.5 (1)
C4	0.6556 (5)	0.25000	-0.0959 (5)	5.5 (2)
C5	0.7392 (4)	0.25000	0.0439 (5)	5.4 (2)
C6	0.6745 (4)	0.25000	0.1395 (4)	4.3 (1)
C11	0.0551 (3)	0.1793 (1)	-0.0560 (3)	4.2 (1)
C12	0.2098 (3)	0.1835 (1)	0.2156 (3)	4.6 (1)
C31	0.2717 (3)	0.0922 (1)	-0.1440 (3)	3.6 (1)
C32	0.2449 (3)	0.0395 (1)	-0.1753 (3)	4.9 (1)

Table 2 (cont.)

C33	0.1909 (4)	0.0224 (1)	-0.3129 (4)	6.3 (1)
C34	0.1628 (4)	0.0573 (2)	-0.4193 (4)	6.4 (1)
C35	0.1906 (4)	0.1099 (1)	-0.3895 (3)	6.6 (1)
C36	0.2429 (4)	0.1276 (1)	-0.2524 (3)	5.4 (1)
C41	0.3129 (3)	0.0635 (1)	0.1329 (3)	3.8 (1)
C42	0.1698 (3)	0.0547 (1)	0.1170 (4)	5.2 (1)
C43	0.1366 (4)	0.0145 (1)	0.1877 (4)	6.5 (2)
C44	0.2465 (5)	-0.0168 (1)	0.2777 (4)	7.1 (2)
C45	0.3896 (4)	-0.0089 (1)	0.2941 (4)	7.0 (2)
C46	0.4225 (4)	0.0305 (1)	0.2216 (3)	5.2 (1)
C51	0.5449 (3)	0.1145 (1)	0.0869 (3)	3.9 (1)
C52	0.6372 (3)	0.1297 (1)	0.2217 (3)	5.3 (1)
C53	0.7884 (3)	0.1274 (1)	0.2669 (4)	6.5 (1)
C54	0.8478 (3)	0.1117 (1)	0.1765 (5)	6.8 (2)
C55	0.7582 (4)	0.0979 (2)	0.0416 (4)	6.5 (2)
C56	0.6070 (3)	0.0989 (1)	-0.0031 (3)	5.1 (1)
C61	-0.0246 (9)	0.25000	-0.4456 (10)	11.2 (2)
C62	-0.1759 (6)	0.25000	-0.4495 (6)	7.3 (1)
C63	-0.2499 (4)	0.2967 (2)	-0.4510 (4)	7.4 (1)
C64	-0.3889 (5)	0.2973 (2)	-0.4580 (5)	7.4 (1)
C65	-0.4583 (7)	0.25000	-0.4655 (7)	7.5 (2)
C66	-0.4577 (6)	0.3482 (2)	-0.4492 (6)	10.9 (2)

(Motherwell, 1976). Geometrical calculations were performed with *PARST* (Nardelli, 1983).

Discussion. Positional parameters and equivalent isotropic thermal parameters for (A) and (B) are shown in Table 2.* A selection of distances and angles for both structures is collected in Table 3. For molecule (A), Fig. 1 shows a plot with the atomic numbering scheme. Molecule (B) follows a similar labelling.

The space group for compound (A) was determined unequivocally from systematic absences. During the structure determination and refinement no problems were found and the four carbonyl groups came out very clearly from the beginning and refined well (see Table 2 for thermal factors).

For structure (B) the space group assignment was not evident from systematic absences. We initially solved the structure in the noncentrosymmetric space group $P2_1$, finding the mirror plane and strong correlations. Therefore we decided to solve the structure in the centrosymmetric space group. The agreement factors were $R = 0.024$ and $R = 0.032$ for the noncentrosymmetric and centrosymmetric space groups, respectively. In both space groups four carbonyl ligands were unequivocally determined (see Table 2 for thermal factors). In addition, the FAB mass spectrum of the compound shows (see *Experimental*) the maximum m/e ratio at 946 corresponding to the cation $[\text{Ru}_2(\text{C}_6\text{H}_6\text{N}_2)(\text{CO})_4\{\text{P}(\text{C}_6\text{H}_5)_3\}_2]^+$ (M^+) and other peaks for the cations resulting from a stepwise release of ligands which indicate the above stoichiometry for compound (A).

* Lists of structure amplitudes, anisotropic thermal parameters, H-atom parameters, distances, angles and principal torsion angles have been deposited with the British Library Document Supply Centre as Supplementary Publication No. SUP 53041 (71 pp.). Copies may be obtained through The Technical Editor, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England.

Table 3. Selected bond lengths (Å) and bond angles (°) (with e.s.d.'s)

	(A)*	(B)†
Ru1—Ru2	2.558 (1)	2.560 (1)
Ru1—P1	2.372 (3)	2.382 (1)
Ru1—N1	2.167 (8)	2.163 (2)
Ru1—N2	2.149 (8)	2.161 (2)
Ru1—C11	1.87 (1)	1.866 (3)
Ru1—C12	1.85 (1)	1.858 (3)
P1—C31	1.83 (1)	1.834 (2)
P1—C41	1.81 (1)	1.835 (3)
P1—C51	1.83 (1)	1.825 (3)
C11—O11	1.13 (1)	1.140 (3)
C12—O12	1.15 (1)	1.143 (3)
N1—C1	1.44 (1)	1.419 (4)
N2—C2	1.42 (1)	1.431 (4)
C1—C2	1.41 (1)	1.403 (5)
C2—C3	1.37 (1)	1.364 (5)
C3—C4	1.40 (2)	1.407 (6)
C4—C5	1.33 (2)	1.357 (6)
C5—C6	1.41 (2)	1.404 (6)
C6—C1	1.37 (1)	1.376 (5)
Ru2—Ru1—P1	150.7 (1)	151.3 (1)
Ru2—Ru1—N1	53.8 (2)	53.7 (1)
Ru2—Ru1—N2	53.5 (2)	53.7 (1)
Ru2—Ru1—C11	104.5 (3)	106.2 (1)
Ru2—Ru1—C12	105.6 (4)	102.9 (1)
P1—Ru1—N1	105.2 (2)	104.8 (1)
P1—Ru1—N2	102.4 (2)	103.4 (1)
P1—Ru1—C11	94.2 (3)	92.7 (1)
P1—Ru1—C12	96.2 (4)	98.5 (1)
N1—Ru1—N2	69.1 (3)	68.6 (1)
N1—Ru1—C11	158.3 (4)	159.7 (1)
N1—Ru1—C12	96.1 (4)	97.8 (1)
N2—Ru1—C11	97.6 (4)	97.6 (1)
N2—Ru1—C12	158.7 (4)	156.6 (1)
C11—Ru1—C12	91.4 (5)	89.7 (1)

*Averaged values.

†Mirror plane related.

A comparison of bond distances and angles for molecules (A) and (B) shows that both are virtually identical, with normal differences derived from distinct packings due to different solvents. All this information allows us to conclude that molecules of structures (A) and (B) are of the same compound, mentioned in the title of this paper, and therefore structure (C) should be substituted by structure (B) of the present communication.

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Structure of *cis*-Tetrachlorobis(1-ethylimidazole- κ N³)platinum(IV)

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Abstract. [PtCl₄(C₅H₈N₂)₂], *M_r* = 529.2, monoclinic, *P*2₁/*n*, *a* = 12.749 (4), *b* = 9.217 (3), *c* = 14.898 (5) Å, β = 110.06 (5)°, *V* = 1644.4 (9) Å³, *Z* = 4, *D_m* = 2.12 (3), *D_x* = 2.14 Mg m⁻³, Mo *K* α , λ = 0.71069 Å,

0108-2701/90/112046-04\$03.00

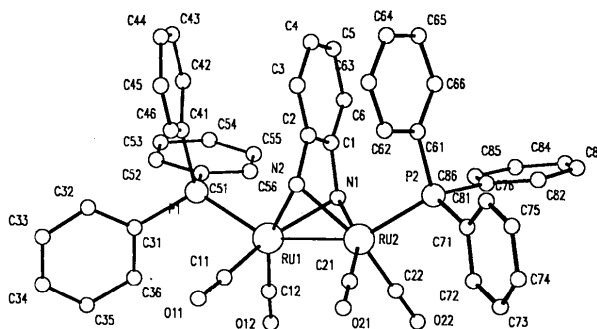


Fig. 1. *PLUTO* (Motherwell, 1976) diagram showing the atomic arrangement and numbering for molecule (A); molecule (B) follows a similar labelling.

The molecule shows a mirror plane containing the diimine ring, which is a crystallographic mirror plane for structure (B).

The distance between the two ruthenium atoms, 2.559 (1) Å, is significantly short for a single Ru^I—Ru^I bond.

Both ruthenium atoms exhibit a significantly distorted octahedral environment due to the very diverse nature of the ligands.

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μ = 9.61 mm⁻¹, *F*(000) = 1000, *T* = 294 (2) K, *R* = 0.036 for 2110 unique observed reflections. The complex consists of mononuclear PtCl₄(1-ethylimidazole)₂ units. The coordination around Pt^{IV} is

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