

The Pt—Cl bond lengths [2.316 (4) *trans* to S and 2.309 (3) Å *trans* to N] are normal for this type of complex (Sotman *et al.*, 1988). The Pt—S distance is 2.209 (4) Å. The results of X-ray structure determinations of the *cis*-[Pt(dmsO)LCl<sub>2</sub>] complexes show that Pt—S bond lengths decrease following the ligand *L* sequence: dmsO [av. 2.234 (6) Å (Melanson & Rochon, 1975) and 2.248 (5) Å (Shibaeva, 1985)] > MeCN [av. 2.220 (6) Å for two crystallographically independent molecules (Moiseev *et al.*, 1989)] > PhCH<sub>2</sub>CN [2.215 (1) Å (Belsky, Kononov & Kukushkin, 1990)] > py [2.209 (4) Å] > 2Me—C<sub>5</sub>H<sub>4</sub>N [2.200 (3) Å (Melanson & Rochon, 1977)] > NH<sub>3</sub> [2.186 (4) Å (Melanson & Rochon, 1978a)]. The observed variations in the Pt—S bond lengths provide a rare example of the *cis* influence of the ligands.

The Pt—N distance [2.027 (10) Å] is normal and agrees with Pt—N bond lengths in (Ph<sub>3</sub>PCH<sub>2</sub>Ph)[PtPyCl<sub>3</sub>] [2.028 (6) Å (Belsky, Kukushkin, Kononov, Moiseev & Yakovlev, 1990)] and (Et<sub>4</sub>N)[PtPyCl<sub>3</sub>] [2.018 (6) Å (Kukushkin *et al.*, 1990)]. The pyridine ring is planar. The dihedral angle between the py plane and the PtNSCl(1)Cl(2) plane is 56.8°. The value of the dihedral angle in *cis*-[Pt(dmsO)(2Me-C<sub>5</sub>H<sub>4</sub>N)Cl<sub>2</sub>] with the more sterically hindered 2-methylpyridine ligand is 87.1° (Melanson & Rochon, 1977).

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## Structure of Ethylenediammonium *catena*-Poly[ $\mu$ -(2-pyridinecarboxylato- $\kappa$ N, $\kappa$ O: $\kappa$ O')-tris(2-pyridinecarboxylato- $\kappa$ N, $\kappa$ O)neodymate] Hexahydrate

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**Abstract.** C<sub>2</sub>H<sub>10</sub>N<sub>2</sub><sup>2+</sup>·[{Nd(C<sub>6</sub>H<sub>4</sub>NO<sub>2</sub>)<sub>4</sub>}<sub>2</sub>]<sup>2-</sup>·6H<sub>2</sub>O, *M<sub>r</sub>* = 1435.5, monoclinic, *Cc*, *a* = 13.654 (9), *b* = 21.813 (11), *c* = 20.136 (12) Å,  $\beta$  = 99.36 (4)°, *V* = 5917 (7) Å<sup>3</sup>, *Z* = 4, *D<sub>m</sub>* = 1.60, *D<sub>x</sub>* = 1.611 (2) Mg m<sup>-3</sup>,  $\lambda$ (Mo *K* $\alpha$ ) = 0.71069 Å,  $\mu$  = 1.83 mm<sup>-1</sup>, *F*(000) = 2880, *T* = 304 (1) K, final *R* = 0.0395 for 7450 reflections. The Nd ions are surrounded by four N and five carboxylic O atoms. The structure consists of a polymeric chain of complex anions, ethylenediammonium cations and water of hydration.

**Introduction.** In a previous paper (Starynowicz, 1991) the crystal structure of barium neodymium  $\alpha$ -picoli-

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nate has been reported. It seemed interesting to investigate neodymium coordination in another ( $\alpha$ -picolinato)neodymate system. This work is a part of our study on the structures and properties of complexes with lanthanide–nitrogen bonds.

**Experimental.** The title compound was prepared by adding ethylenediamine and 2-pyridinecarboxylic ( $\alpha$ -picolinic) acid to a warm aqueous suspension of freshly precipitated neodymium hydroxide. After two days, parallelepiped pink-violet crystals were formed. A specimen 0.7 × 0.35 × 0.2 mm was cut from a larger crystal. *D<sub>m</sub>* by flotation in C<sub>2</sub>H<sub>4</sub>Br<sub>2</sub>/CHCl<sub>3</sub>. Oscillation and Weissenberg photographs indicated

the monoclinic crystal system and space group  $Cc$  or  $C2/c$ . Syntex  $P2_1$  diffractometer, Mo  $K\alpha$  radiation for lattice parameters (15 reflections,  $21 < 2\theta < 29^\circ$ ), variable  $\omega/2\theta$  scan,  $4 < 2\theta < 60^\circ$ , two standards every 50 reflections, mean relative e.s.d. of the control reflections 3.5%. 8673 intensities measured, 8672 unique, out of which 7449 had  $I \geq 3\sigma(I)$ , index range  $h 0 \rightarrow 19$ ,  $k 0 \rightarrow 30$ ,  $l -28 \rightarrow 27$ , absorption corrections with locally modified program *ABSORB* (Ugozzoli, 1987), transmission factors between 0.722 and 1.043. Structure was solved with *SHELXS86* (Sheldrick, 1986) and refined with locally modified *SHELX76* (Sheldrick, 1976) in the non-centrosymmetric space group  $Cc$ . Neutral-atom scattering factors from *International Tables for X-ray Crystallography* (1974, Vol. IV), real and imaginary components of anomalous dispersion included for all non-H atoms. The Nd atoms were located from a Patterson map; the remaining non-H atoms from subsequent difference syntheses; C-bonded hydrogens placed geometrically, water and N-bonded hydrogens from difference syntheses, not all found. The structure orientation with respect to the polar axes (Jones, 1986) with better  $R$  was chosen. Final full-matrix least-squares refinement based on  $F$  [non-H atoms anisotropic, hydrogens isotropic with constrained positional parameters and common temperature factors, separately for hydrogens bonded to C(ethylenediamine), C(picolate), N and O, the constraints refined as additional parameters, and two hydrogens were geometrically fixed],  $R = 0.0395$ ,  $wR = 0.0369$ , the maximum shift/e.s.d. ratio was 0.20,  $\Delta\rho$  between  $-1.37$  and  $1.49 e \text{ \AA}^{-3}$ , the highest peaks around Nd atoms and  $w = 1/\sigma^2(F)$ . 903 parameters refined.

**Discussion.** Final atomic parameters are given in Table 1,\* the geometry of the coordination environment of the Nd ions is shown in Table 2, and the *ORTEP* (Johnson, 1976) view of the complex anion fragment is given in Fig. 1.

All the distances are within the range observed by Sinha (1976). It is, however, interesting to note that the bonds between Nd ions and the bridging O atoms (O17 or O28) are not longer than other neodymium-carboxylic oxygen bonds, contrary to what has been observed elsewhere (*e.g.* *Đào*, 1987). The coordination figure of Nd1 may best be described as a capped square antiprism (CSA) with  $\Delta = 0.086 \text{ \AA}^2$  ( $\Delta = \sum d_i^2/9$ ,  $d_i$  is the distance between the real position of the  $i$ th atom, and the relevant vertex

Table 1. Final atomic coordinates and equivalent isotropic thermal  $U$  factors

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

	$x$	$y$	$z$	$U_{eq}(\text{\AA}^2)$
Nd1	0	0.21370 (2)	0	0.0318 (1)
Nd2	0.19194 (4)	0.47612 (2)	-0.02744 (3)	0.0306 (1)
O11	0.0676 (5)	0.2168 (3)	-0.1045 (3)	0.048 (2)
O21	0.1511 (8)	0.1855 (3)	-0.1834 (4)	0.088 (4)
O12	0.1803 (4)	0.5291 (3)	0.0777 (3)	0.045 (2)
O22	0.1032 (5)	0.5684 (3)	0.1563 (4)	0.065 (3)
O13	0.0309 (4)	0.1386 (3)	0.0898 (3)	0.042 (2)
O23	0.1314 (6)	0.0860 (4)	0.1672 (4)	0.071 (3)
O14	0.2666 (5)	0.3905 (3)	-0.0805 (3)	0.047 (2)
O24	0.3729 (6)	0.3123 (3)	-0.0801 (4)	0.066 (3)
O15	-0.1484 (4)	0.2478 (3)	0.0432 (3)	0.049 (2)
O25	-0.3102 (5)	0.2688 (3)	0.0290 (3)	0.058 (2)
O16	0.0654 (4)	0.4578 (3)	-0.1229 (3)	0.045 (2)
O26	-0.0723 (5)	0.4796 (4)	-0.1931 (4)	0.070 (3)
O17	0.1760 (5)	0.3888 (3)	0.0445 (4)	0.054 (2)
O27	0.0774 (5)	0.3135 (3)	-0.0024 (3)	0.047 (2)
O18	0.3007 (4)	0.5646 (3)	-0.0134 (3)	0.041 (2)
O28	0.3687 (5)	0.6480 (3)	-0.0493 (3)	0.049 (2)
OW1	-0.5040 (5)	0.1194 (3)	-0.7548 (3)	0.054 (2)
OW2	-0.7451 (7)	-0.1476 (4)	-0.7808 (4)	0.076 (3)
OW3	-0.7489 (6)	-0.0144 (3)	-0.7748 (4)	0.063 (3)
OW4	-0.1691 (6)	-0.1177 (3)	-0.3666 (4)	0.070 (3)
OW5	-0.0252 (12)	-0.0800 (8)	-0.2659 (8)	0.189 (9)
OW6	-0.0330 (13)	-0.1771 (11)	-0.1915 (10)	0.258 (13)
N1	0.0702 (6)	0.1051 (3)	-0.0509 (4)	0.044 (2)
N2	0.0134 (5)	0.4725 (3)	0.0184 (4)	0.043 (2)
N3	0.1860 (5)	0.1931 (4)	0.0466 (4)	0.045 (2)
N4	0.3720 (5)	0.4382 (3)	0.0295 (4)	0.037 (2)
N5	-0.1359 (5)	0.2804 (3)	-0.0817 (4)	0.046 (2)
N6	0.0802 (5)	0.5718 (3)	-0.0731 (4)	0.041 (2)
N7	0.0482 (5)	0.2735 (3)	0.1171 (4)	0.041 (2)
N8	0.2621 (6)	0.5186 (3)	-0.1369 (3)	0.042 (2)
N9	-0.2542 (6)	0.2338 (4)	-0.8410 (4)	0.053 (3)
N10	-0.3418 (6)	0.1805 (3)	-0.6834 (4)	0.049 (3)
C1	-0.3287 (7)	0.2127 (4)	-0.7985 (4)	0.046 (3)
C2	-0.2741 (8)	0.1900 (5)	-0.7323 (5)	0.054 (3)
C11	0.0617 (8)	0.0486 (5)	-0.0277 (5)	0.055 (3)
C21	0.0910 (13)	-0.0028 (5)	-0.0581 (8)	0.095 (7)
C31	0.1250 (12)	0.0039 (5)	-0.1186 (8)	0.090 (6)
C41	0.1371 (11)	0.0627 (5)	-0.1431 (7)	0.078 (5)
C51	0.1063 (7)	0.1118 (4)	-0.1089 (4)	0.047 (3)
C61	0.1101 (7)	0.1762 (4)	-0.1341 (5)	0.048 (3)
C12	-0.0655 (7)	0.4389 (5)	-0.0074 (6)	0.054 (3)
C22	-0.1453 (8)	0.4306 (6)	0.0253 (7)	0.074 (5)
C32	-0.1463 (9)	0.4582 (7)	0.0856 (7)	0.086 (6)
C42	-0.0653 (9)	0.4928 (5)	0.1125 (6)	0.067 (4)
C52	0.0146 (7)	0.4982 (4)	0.0786 (5)	0.047 (3)
C62	0.1050 (6)	0.5348 (4)	0.1070 (4)	0.041 (3)
C13	0.2605 (8)	0.2206 (5)	0.0236 (5)	0.059 (4)
C23	0.3620 (8)	0.2078 (7)	0.0482 (6)	0.069 (4)
C33	0.3794 (8)	0.1620 (7)	0.0964 (7)	0.088 (5)
C43	0.3022 (7)	0.1346 (6)	0.1206 (5)	0.067 (4)
C53	0.2059 (7)	0.1511 (4)	0.0951 (4)	0.043 (3)
C63	0.1174 (6)	0.1231 (4)	0.1197 (4)	0.042 (3)
C14	0.4253 (8)	0.4640 (5)	0.0865 (5)	0.055 (3)
C24	0.5123 (8)	0.4387 (5)	0.1170 (6)	0.062 (4)
C34	0.5490 (7)	0.3871 (5)	0.0914 (6)	0.059 (4)
C44	0.4969 (7)	0.3612 (4)	0.0352 (5)	0.050 (3)
C54	0.4071 (6)	0.3885 (4)	0.0052 (4)	0.037 (2)
C64	0.3459 (6)	0.3607 (4)	-0.0569 (4)	0.037 (3)
C15	-0.1263 (8)	0.3003 (5)	-0.1441 (6)	0.063 (4)
C25	-0.2039 (9)	0.3265 (7)	-0.1875 (6)	0.079 (5)
C35	-0.2917 (9)	0.3309 (6)	-0.1661 (6)	0.076 (5)
C45	-0.3036 (8)	0.3122 (5)	-0.1032 (6)	0.055 (4)
C55	-0.2223 (7)	0.2871 (4)	-0.0626 (4)	0.044 (3)
C65	-0.2279 (6)	0.2655 (4)	0.0096 (4)	0.041 (3)
C16	0.0882 (7)	0.6295 (4)	-0.0506 (5)	0.049 (3)
C26	0.0222 (9)	0.6748 (4)	-0.0707 (6)	0.060 (4)
C36	-0.0579 (9)	0.6612 (5)	-0.1176 (6)	0.070 (4)
C46	-0.0688 (8)	0.6024 (5)	-0.1416 (6)	0.064 (4)
C56	0.0028 (7)	0.5588 (4)	-0.1202 (5)	0.045 (3)
C66	-0.0025 (6)	0.4938 (4)	-0.1481 (4)	0.045 (3)
C17	0.0279 (7)	0.2555 (5)	0.1781 (5)	0.052 (3)
C27	0.0542 (11)	0.2897 (6)	0.2355 (6)	0.079 (5)
C37	0.1016 (11)	0.3440 (6)	0.2322 (7)	0.086 (5)
C47	0.1215 (10)	0.3639 (5)	0.1708 (6)	0.071 (4)
C57	0.0960 (6)	0.3266 (4)	0.1150 (4)	0.041 (3)
C67	0.1186 (6)	0.3442 (3)	0.0467 (4)	0.039 (3)
C18	0.2495 (8)	0.4929 (5)	-0.1983 (5)	0.057 (4)
C28	0.2883 (9)	0.5164 (6)	-0.2513 (5)	0.066 (4)
C38	0.3424 (10)	0.5696 (6)	-0.2423 (6)	0.076 (5)
C48	0.3535 (8)	0.5973 (5)	-0.1797 (6)	0.056 (4)
C58	0.3145 (6)	0.5709 (4)	-0.1286 (4)	0.039 (3)
C68	0.3300 (6)	0.5965 (4)	-0.0585 (4)	0.036 (2)

\* Lists of structure factors, anisotropic thermal parameters and H-atom parameters have been deposited with the British Library Document Supply Centre as Supplementary Publication No. SUP 53371 (52 pp.). Copies may be obtained through The Technical Editor, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England.

Table 2. Distances (Å) and angles (°) for the Nd coordination spheres

Nd1—O11	2.432 (6)	Nd1—O13	2.425 (6)
—O15	2.447 (6)	—O27	2.424 (7)
—O28 <sup>b</sup>	2.382 (7)	—N1	2.811 (7)
—N3	2.599 (7)	—N5	2.697 (7)
—N7	2.681 (8)		
Nd2—O12	2.440 (6)	Nd1—O14	2.454 (7)
—O16	2.400 (6)	—O17	2.424 (7)
—O18	2.424 (6)	—N2	2.745 (7)
—N4	2.670 (7)	—N6	2.659 (7)
—N8	2.706 (7)		
O13—Nd1—O11	128.3 (3)	O15—Nd1—O13	89.7 (2)
O15—Nd1—O11	138.7 (3)	O27—Nd1—O13	126.7 (3)
O27—Nd1—O11	74.3 (3)		
O27—Nd1—O15	97.1 (3)	O28 <sup>b</sup> —Nd1—O13	86.1 (3)
O28 <sup>b</sup> —Nd1—O11	91.3 (3)	O28 <sup>b</sup> —Nd1—O27	146.4 (3)
O28 <sup>b</sup> —Nd1—O15	73.8 (3)	N1—Nd1—O13	71.0 (3)
N1—Nd1—O11	60.5 (3)	N1—Nd1—O27	125.0 (3)
N1—Nd1—O15	137.5 (3)		
N1—Nd1—O28 <sup>b</sup>	67.6 (3)	N3—Nd1—O13	64.7 (3)
N3—Nd1—O11	80.3 (3)	N3—Nd1—O27	76.1 (3)
N3—Nd1—O15	137.8 (3)	N3—Nd1—N1	67.4 (3)
N3—Nd1—O28 <sup>b</sup>	132.2 (3)	N5—Nd1—O13	146.9 (3)
N5—Nd1—O11	77.2 (3)	N5—Nd1—O27	76.3 (3)
N5—Nd1—O15	61.7 (3)	N5—Nd1—N1	118.3 (3)
N5—Nd1—O28 <sup>b</sup>	71.0 (3)		
N5—Nd1—N3	148.0 (3)	N7—Nd1—O13	71.6 (3)
N7—Nd1—O11	132.4 (3)	N7—Nd1—O27	62.3 (3)
N7—Nd1—O15	68.8 (3)	N7—Nd1—N1	132.9 (3)
N7—Nd1—O28 <sup>b</sup>	136.0 (3)		
N7—Nd1—N3	71.4 (3)	O16—Nd2—O14	79.7 (3)
N7—Nd1—N5	108.7 (3)	O17—Nd2—O14	75.3 (3)
O14—Nd2—O12	146.0 (3)		
O16—Nd2—O12	129.3 (2)	O18—Nd2—O14	111.5 (3)
O17—Nd2—O12	80.1 (3)	O18—Nd2—O17	132.0 (3)
O17—Nd2—O16	103.0 (3)	N2—Nd2—O14	125.4 (3)
O18—Nd2—O12	69.3 (2)	N2—Nd2—O17	66.8 (3)
O18—Nd2—O16	125.0 (2)		
N2—Nd2—O12	62.3 (3)	N4—Nd2—O14	62.1 (3)
N2—Nd2—O16	72.6 (3)	N4—Nd2—O17	70.5 (3)
N2—Nd2—O18	123.0 (3)	N4—Nd2—N2	130.8 (3)
N4—Nd2—O12	87.7 (3)	N6—Nd2—O14	134.6 (3)
N4—Nd2—O16	141.7 (3)	N6—Nd2—O17	136.1 (3)
N4—Nd2—O18	72.1 (3)	N6—Nd2—N2	69.4 (3)
N6—Nd2—O12	79.3 (3)		
N6—Nd2—O16	63.6 (3)	N8—Nd2—O14	71.3 (3)
N6—Nd2—O18	73.8 (3)	N8—Nd2—O17	146.5 (3)
N6—Nd2—N4	145.9 (3)	N8—Nd2—N2	137.3 (3)
N8—Nd2—O12	128.8 (3)		
N8—Nd2—O16	73.1 (3)		
N8—Nd2—O18	62.0 (3)		
N8—Nd2—N4	91.9 (3)		
N8—Nd2—N6	73.1 (3)		

Symmetry code: (i)  $x - \frac{1}{2}, y - \frac{1}{2}, z$ .

in the ideal, least-squares-fitted polyhedron; Drew, 1977) for N1 as the cap, O28, O11, N3 and O13 as the capped base, and O15, N5, O27 and N7 as the non-capped base, no particular symmetry around the metal ion being displayed. The best-fitted tricapped trigonal prism (TTP; O13, O28, O15 and N3, O11, O27 as the bases, N1, N5, N7 as the caps, approximate point symmetry  $C_{2v}$ ) has been found to have  $\Delta = 0.111 \text{ \AA}^2$ . The coordination figure of Nd2 is one intermediate between CSA (the non-capped base — O14, O16, N2, O17, the capped base — N8, N6, O12, N4, the cap — O18,  $\Delta = 0.093 \text{ \AA}^2$ ) and TTP (the bases — O12, N4, O17 and N6, N8, O16, the caps — O18, O14, N2,  $\Delta = 0.094 \text{ \AA}^2$ ), in both cases without symmetry. The coordination environments of Nd1 and Nd2 are essentially the same as that of Nd1 in neodymium barium  $\alpha$ -picolinate, which in the case

of Nd1 (of the present structure) may be shown by taking O11, N5, O28 and N3, N7, O13 as the bases, and O17, O15, N1 as the caps of the TTP,  $\Delta$  being then  $0.196 \text{ \AA}^2$ . The tetrakis( $\alpha$ -picolinate)neodymate subunits accept bridging oxygens from neighbouring subunits to the ninth coordination site of the Nd ions so as to form infinite chains along the [110] and  $[1\bar{1}0]$  directions. The tendency towards polymerization in Nd- $\alpha$ -picolinate ligand systems is demonstrated both in this compound and in neodymium barium  $\alpha$ -picolinate. The structure is held together by an elaborate network of intermolecular hydrogen bonds, some of them bifurcated. The crystal packing is shown in Fig. 2.

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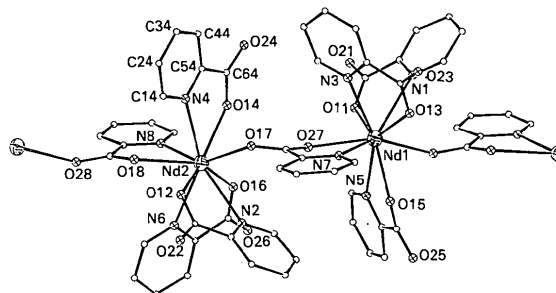


Fig. 1. Molecular diagram of a fragment of the chain showing the complex anion. The numbering patterns of the C atoms follow that for the C14 to C64 atoms.

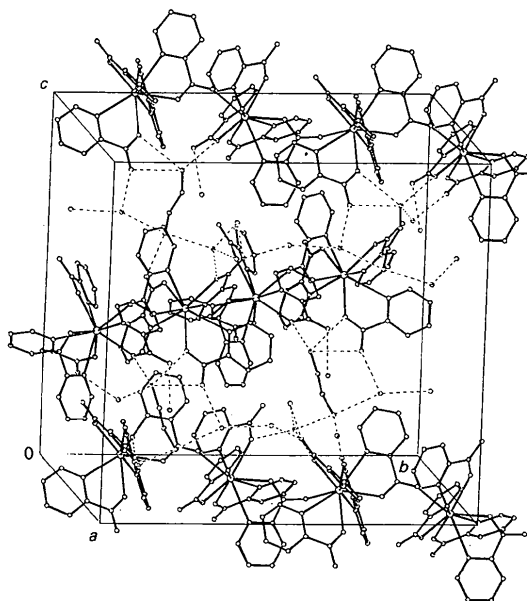


Fig. 2. View of the crystal structure. The dashed lines represent hydrogen bonds.

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## Structure of 1,1,1,2,2-Pentacarbonyl- $\mu$ -hydrido- $\mu$ -2 $\eta$ -[(*Z,s-cis,Z*)-*N*-isopropyl-cinnamylideneamino- $\mu$ -*N*, $\mu$ -C $\eta$ ]-diruthenium(*Ru*–*Ru*), HRu<sub>2</sub>(CO)<sub>5</sub>(C<sub>12</sub>H<sub>14</sub>N)

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**Abstract.** C<sub>17</sub>H<sub>15</sub>NO<sub>5</sub>Ru<sub>2</sub>, *M<sub>r</sub>* = 515.45, orthorhombic, *Pcab*, *a* = 12.828 (1), *b* = 16.813 (1), *c* = 34.324 (2) Å, *V* = 7402.9 (8) Å<sup>3</sup>, *Z* = 16, *D<sub>x</sub>* = 1.85 g cm<sup>-3</sup>,  $\lambda(\text{Mo } K\alpha) = 0.71073$  Å,  $\mu = 16.3$  cm<sup>-1</sup>, *F*(000) = 4032, *T* = 295 K, *R* = 0.038 for 5117 reflections with *I* > 2.5 $\sigma$ (*I*). The two crystallographically independent molecules are essentially identical except for one torsion angle. The Ru–Ru bond is bridged asymmetrically by both a hydride atom and an *N*-isopropyl cinnamaldimin-4-yl ligand.

**Introduction.** Transition metal hydrido complexes are believed to be the key intermediates in important catalytic processes like hydrogenation, hydroformylation, hydrocyanation, and double-bond migration of olefins (see *e.g.* Crabtree, 1988). The presence of hydrides in combination with unsaturated ligands on transition metal carbonyl moieties affords an opportunity to study the chemical and structural properties of such crucial species in detail.

In the course of our study on the coordination and reactivity of monoazadienes (*R*<sup>1</sup>CH=CHCH=NR<sup>2</sup>) on transition metal carbonyls we recently reported the preparation of a series of linear tetranuclear clusters, Ru<sub>4</sub>(CO)<sub>10</sub>[*R*<sup>1</sup>C=CHCH=NR<sup>2</sup>]<sub>2</sub> (1*a*: *R*<sup>1</sup> = Me, *R*<sup>2</sup> = *i*-Pr; 1*b*: *R*<sup>1</sup> = Me, *R*<sup>2</sup> = *c*-Hex; 1*c*: *R*<sup>1</sup> = Me, *R*<sup>2</sup> = *t*-Bu; 1*d*: *R*<sup>1</sup> = Ph, *R*<sup>2</sup> = *i*-Pr; 1*e*: *R*<sup>1</sup> = Ph, *R*<sup>2</sup> = *t*-Bu) (Polm, Mul, Elsevier, Vrieze, Christophersen & Stam, 1988; Mul, Elsevier, Polm, Vrieze,

Zoutberg, Heijdenrijk & Stam, 1990). These clusters are formed in high yield by thermolysis of Ru<sub>2</sub>(CO)<sub>6</sub>[*R*<sup>1</sup>C=CHCH<sub>2</sub>NR<sup>2</sup>]. In one case an intermediate, a dinuclear hydrido complex, HRu<sub>2</sub>(CO)<sub>5</sub>[Ph–C=CHCH=N-*i*-Pr] (2*d*), could be isolated. We now report the crystal structure of this dinuclear hydrido complex.

**Experimental.** The air-sensitive title compound was prepared by thermolysis of Ru<sub>2</sub>(CO)<sub>6</sub>[Ph–C=CHCH<sub>2</sub>N-*i*-Pr] in refluxing heptane and purified by chromatography on silica employing hexane/dichloromethane (9/1) as the eluent (Mul *et al.*, 1990). Crystals suitable for X-ray diffraction work were grown by cooling a concentrated hexane solution at 243 K. X-ray data for a light-brown crystal (0.12 × 0.25 × 0.63 mm), sealed in a Lindemann-glass capillary, were collected on an Enraf–Nonius CAD-4F diffractometer using Zr-filtered Mo *K* $\alpha$  radiation. Lattice parameters and their e.s.d.'s were derived from the setting angles of 25 SET4 reflections (14 <  $\theta$  < 18°). The space group was determined from the observed systematic absences. A total of 9711 reflections [ $\theta$  < 27.5°;  $\omega/2\theta$  scan;  $\Delta\omega = 0.60 + 0.35\tan(\theta)^\circ$ ; 0 < *h* < 16, 0 < *k* < 21, 0 < *l* < 44] were scanned. Three reference reflections (204, 220, 012) showed a small linear decay of 1% during the 132 h of X-ray exposure time. The intensities were corrected for Lp for the small decay and for absorption (Gaussian integration; grid 8 × 8 × 8; corrections 1.22 to 1.49), resulting in a set of 5117 unique

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