Acta Crystallographica Section E
Structure Reports Online
ISSN 1600-5368

(*N*-*tert*-Butylpyrazine-2-carboxamide-κN^4)chloridobis(dimethylglyoximato-$\kappa^2 N,N'$)cobalt(III) hemihydrate

S. Martin,[a] C. Revathi,[a] Babu Varghese[b] and A. Dayalan[a]*

[a]Department of Chemistry, Loyola College (Autonomous), Chennai 600 034, Tamil Nadu, India, and [b]Sophisticated Analytical Instruments Facility, Indian Institute of Technology Madras, Chennai 600 036, India
Correspondence e-mail: dayalansgp@gmail.com

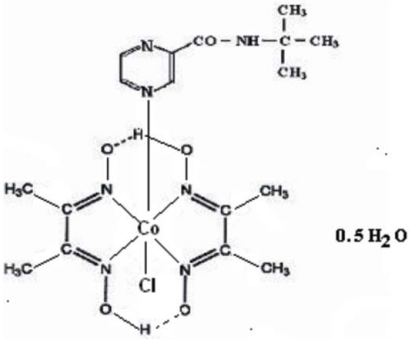
Received 17 September 2007; accepted 29 September 2007

Key indicators: single-crystal X-ray study; T = 293 K; mean σ(C–C) = 0.005 Å; H-atom completeness 97%; disorder in solvent or counterion; R factor = 0.039; wR factor = 0.121; data-to-parameter ratio = 14.0.

The title compound, $[Co(C_4H_7N_2O_2)_2Cl(C_9H_{13}N_3O)]\cdot 0.5H_2O$, *viz*. *trans*-$[Co(dmgH)_2Cl(t\text{-}BuPzAM)]\cdot 0.5H_2O$, has two molecules in the asymmetric unit with some differences in the conformation and positions of the H atoms with regard to the hydroxy groups of the glyoximate groups. The water molecule is disordered equally over two sites.

Related literature

For related literature, see: Dayalan & Vijayaraghavan (2001); Gupta *et al.* (2000, 2001, 2004); Ohkubo & Fukuzumi (2005); Phor *et al.* (1985); Razavelt *et al.* (2005); Trommel *et al.* (2001); Vijayaraghavanan & Dayalan (1992).



Experimental

Crystal data

$[Co(C_4H_7N_2O_2)_2Cl(C_9H_{13}N_3O)]\cdot 0.5H_2O$
M_r = 521.84
Monoclinic, $P2_1/c$
a = 11.4320 (2) Å
b = 15.8134 (4) Å
c = 26.2781 (6) Å
β = 90.06 (2)°
V = 4750.52 (18) Å^3
Z = 8
Mo $K\alpha$ radiation
μ = 0.88 mm^{-1}
T = 293 (2) K
0.30 × 0.30 × 0.20 mm

Data collection

Bruker Kappa-APEXII CCD diffractometer
Absorption correction: multi-scan (*SADABS*; Bruker, 1999)
T_{min} = 0.779, T_{max} = 0.844
92600 measured reflections
8366 independent reflections
7136 reflections with $I > 2\sigma(I)$
R_{int} = 0.028

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.039
$wR(F^2)$ = 0.121
S = 1.17
8366 reflections
599 parameters
2 restraints
H atoms treated by a mixture of independent and constrained refinement
$\Delta\rho_{max}$ = 0.62 e Å^{-3}
$\Delta\rho_{min}$ = −0.48 e Å^{-3}

Table 1
Hydrogen-bond geometry (Å, °).

D—H···A	D—H	H···A	D···A	D—H···A
O1—H1···O3	0.82	1.69	2.476 (4)	161
O2—H2···O4	0.82	1.69	2.483 (4)	162
O6—H6···O8	0.82	1.72	2.507 (4)	161
O9—H9*A*···O7	0.82	1.68	2.483 (4)	165

Data collection: *APEX2* (Bruker–Nonius, 2004); cell refinement: *APEX2* and *SAINT* (Bruker–Nonius, 2004); data reduction: *SAINT* and *XPREP* (Bruker–Nonius, 2004); program(s) used to solve structure: *SIR92* (Altomare *et al.*, 1993); program(s) used to refine structure: *SHELXL97* (Sheldrick, 1997); molecular graphics: *ORTEP-32* (Farrugia, 1997); software used to prepare material for publication: *SHELXL97*.

The authors are thankful to Rev. Fr. A. Albert Muthumali, S. J., Principal, Loyola College (Autonomous), Chennai, India, for providing the necessary facilities, the Head, SAIF, CDRI, Lucknow, India, for supplying elemental data and the Head, SAIF, IIT Madras, Chennai, India, for recording NMR spectra and for the X-ray data collection.

Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: BG2106).

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  doi:10.1107/S1600536807047903

supplementary materials

Acta Cryst. (2007). E**63**, m2670 [**doi:10.1107/S1600536807047903**]

(*N*-*tert*-Butylpyrazine-2-carboxamide-κN^4)chloridobis(dimethylglyoximato-$\kappa^2 N,N'$)cobalt(III) hemihydrate

S. Martin, C. Revathi, B. Varghese and A. Dayalan

Comment

Dimethylglyoximatocobalt(III) complexes, generally known as cobaloximes, have been studied extensively as model compounds for vitamin-B_{12} (Trommel, *et al.*, 2001; Ohkubo & Fukuzumi, 2005). Most of the work on cobaloximes include electron-transfer reactions (Dayalan & Vijayaraghavan,2001) and catalytic activity (Razavelt, *et al.*, 2005) in solution. There are few literature evidences (Gupta, *et al.*, 2000; Gupta, *et al.*, 2001; Gupta, *et al.*, 2004) relating the structural aspects of cobaloximes. We report here the synthesis, physical characterization and the crystal structure of a typical cobaloxime *viz*., pyrazine-2-*tert*-butylcarboxamidochlorocobaloxime. Figure 1 shows the *ORTEP* representation of the two independent molecules in the asymmetric unit, with 50% anisotropic ellipsoids. Figure 2 presents a packing diagram of the structure depicting the hydrogen bonding interactions. The geometry around the metal atom is octahedral; the bonds to chlorines and pyrazine N atoms are almost perpendicular to the mean glyoximate planes. The difference Fourier clearly shows one O—H group in each one of the glyoximate moieties attached to Co2, while in those attached to Co1, both hydrogen atoms are bound to only one of the glyoximate moieties. The planar glyoximate groups subtend dihedral angles of 7.76 (13)° (Co1) and 0.95 (13)° (Co2). There are strong intra molecular O—H···O hydrogen bonds linking the glyoximate moieties (Figure 2). There is one crystal water molecule per asymmetric unit (disordered into two positions O11, O11') hydrogen bonded to the chlorine atoms Cl2, attached to Co2. The corresponding water H atoms could not be located in the difference map and were not included in the model.

Experimental

The green colored Trans-Hydrogen dichlorobis(dimethylgloximato) cobaltate(III), $H[Co(dmgH)_2Cl_2]$ was prepared by the method reported in the literature (Phor, *et al.*, 1985). Using this complex, as the starting material, the cobaloxime: pyrazine-2-*tert*-butylcarboxamidopyrazinechlorocobaloxime *viz*., $[Co(dmgH)_2(t\text{-}BuPzAM)Cl]$ was prepared by adopting the method reported earlier (Vijayaraghavanan & Dayalan, 1992). Hydrogen dichlorobis (dimethylglyoximato)cobaltate(III) (0.01 mole) and 0.01 mole of Pyrazine-2-*tert*-butylcarboxamide were taken in about 60 ml of absolute alcohol and stirred for 1 hr, with warming over hot water bath, until the green colour due to dichlorocobaloxime was discharged to get the required brown colored complex. The resulting complex was filtered, washed with alcohol and dried in a vacuum desiccator. Crystals of the complex were grown in ethanol by slow evaporation.

Refinement

Even though the unit cell satisfies orthorhombic metric conditions within the limits of s.u., R_{int} pointed clearly to a monoclinic symmetry (R_{int} *ortho*=0.59, R_{int}mono=0.027). The structure was solved and refined in $P2_1/c$. All the H atoms were located in a difference Fourier map. H atoms linked to carbon and oxygen atoms were relocated at idealized positions and allowed to ride with C—H(aromatic): 0.93A%, and $1.2U_{eq}$C; C—H(tertiary): 0.96A%, and $1.5U_{eq}$C; O—H: 0.82A%, and

1.5U_{eq}O. N—H hydrogen distances were restrained (N—H:0.83 (1)) and refined isotropically. Ther disordered crystal water molecule is split into two equally populated sites (O11 and O11', with 50% occupancy each).

Figures

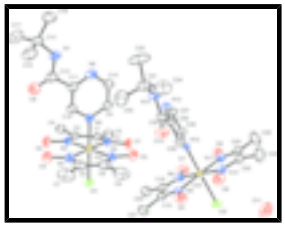

Fig. 1. The *ORTEP* representation of the asymmetric unit with 35% probability anisotropic ellipsoid. Hydrogen atoms and disordered crystal water molecule omitted, for clarity.

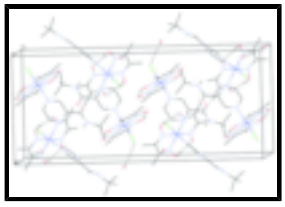

Fig. 2. Packing diagram of the molecules in the unit cell. Hydrogen bonds shown in dotted lines.

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Crystal data

$[Co(C_4H_7N_2O_2)_2Cl(C_9H_{13}N_3O)]\cdot 0.5H_2O$	F_{000} = 2136
M_r = 521.84	D_x = 1.434 Mg m^{-3}
Monoclinic, $P2_1/c$	Mo $K\alpha$ radiation λ = 0.71073 Å
Hall symbol: -P 2ybc	Cell parameters from 5042 reflections
a = 11.4320 (2) Å	θ = 2.2–24.0º
b = 15.8134 (4) Å	μ = 0.88 mm^{-1}
c = 26.2781 (6) Å	T = 293 (2) K
β = 90.06 (2)º	Plate, brown
V = 4750.52 (18) Å^3	0.30 × 0.30 × 0.20 mm
Z = 8	

Data collection

Bruker Kappa-APEXII CCD diffractometer	8366 independent reflections
Radiation source: fine-focus sealed tube	7136 reflections with $I > 2\sigma(I)$
Monochromator: graphite	R_{int} = 0.028
T = 293(2) K	θ_{max} = 25.0º
ω and φ scans	θ_{min} = 1.5º
Absorption correction: multi-scan (SADABS; Bruker, 1999)	h = −13→13
T_{min} = 0.779, T_{max} = 0.844	k = −18→18
92600 measured reflections	l = −31→31

Refinement

Refinement on F^2	Secondary atom site location: difference Fourier map
Least-squares matrix: full	Hydrogen site location: inferred from neighbouring sites
$R[F^2 > 2\sigma(F^2)] = 0.039$	H atoms treated by a mixture of independent and constrained refinement
$wR(F^2) = 0.121$	$w = 1/[\sigma^2(F_o^2) + (0.0498P)^2 + 4.9702P]$ where $P = (F_o^2 + 2F_c^2)/3$
$S = 1.17$	$(\Delta/\sigma)_{max} < 0.001$
8366 reflections	$\Delta\rho_{max} = 0.62$ e Å^{-3}
599 parameters	$\Delta\rho_{min} = -0.48$ e Å^{-3}
2 restraints	Extinction correction: none
Primary atom site location: structure-invariant direct methods	

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}	Occ. (<1)
Co1	0.19069 (3)	0.40860 (3)	0.881531 (15)	0.04025 (12)	
Co2	0.68130 (3)	0.16125 (2)	0.932065 (14)	0.03599 (12)	
Cl1	0.29360 (7)	0.49466 (5)	0.93160 (3)	0.0526 (2)	
Cl2	0.84549 (7)	0.18912 (6)	0.97384 (4)	0.0594 (2)	
O1	0.2782 (2)	0.27258 (15)	0.94263 (10)	0.0616 (6)	
H1	0.3243	0.2754	0.9188	0.092*	
O2	−0.0168 (2)	0.50395 (15)	0.89776 (9)	0.0575 (6)	
H2	0.0129	0.5249	0.8723	0.086*	
O3	0.3940 (2)	0.31032 (17)	0.86636 (11)	0.0678 (7)	
O4	0.1109 (2)	0.55231 (16)	0.82713 (10)	0.0636 (7)	
O5	−0.1258 (3)	0.4237 (2)	0.72781 (11)	0.0833 (9)	
O6	0.7355 (2)	0.29998 (16)	0.86563 (10)	0.0632 (7)	
H6	0.7663	0.2588	0.8522	0.095*	
O7	0.5523 (2)	0.16829 (17)	1.02569 (8)	0.0594 (6)	
O8	0.8124 (2)	0.15686 (18)	0.84180 (10)	0.0649 (7)	
O9	0.6362 (2)	0.02904 (16)	1.00172 (9)	0.0615 (6)	

H9A	0.6060	0.0710	1.0145	0.092*	
O10	0.4877 (2)	0.20804 (16)	0.74627 (8)	0.0578 (6)	
O11	0.0668 (6)	0.0909 (6)	0.9244 (4)	0.131 (3)	0.50
O11'	0.0274 (10)	−0.0106 (12)	0.9790 (4)	0.248 (9)	0.50
N1	0.1903 (2)	0.32829 (16)	0.93528 (10)	0.0439 (6)	
N2	0.0507 (2)	0.44081 (16)	0.91462 (10)	0.0422 (6)	
N3	0.1944 (3)	0.49340 (18)	0.83087 (10)	0.0513 (7)	
N4	0.3315 (2)	0.37604 (19)	0.84952 (11)	0.0532 (7)	
N5	0.1012 (2)	0.33275 (16)	0.83651 (9)	0.0419 (6)	
N6	−0.0132 (2)	0.22650 (19)	0.76889 (10)	0.0529 (7)	
N7	−0.1513 (3)	0.2913 (2)	0.69531 (11)	0.0591 (8)	
N8	0.5929 (2)	0.21253 (17)	0.98524 (9)	0.0436 (6)	
N9	0.6790 (2)	0.27532 (16)	0.90817 (10)	0.0436 (6)	
N10	0.7705 (2)	0.11158 (18)	0.87964 (10)	0.0476 (6)	
N11	0.6847 (2)	0.04996 (16)	0.95777 (10)	0.0455 (6)	
N12	0.53778 (19)	0.13526 (14)	0.89466 (8)	0.0318 (5)	
N13	0.3360 (2)	0.09520 (17)	0.84150 (10)	0.0446 (6)	
N14	0.3224 (3)	0.1300 (2)	0.74051 (10)	0.0519 (7)	
C1	0.1072 (3)	0.3342 (2)	0.96801 (12)	0.0441 (7)	
C2	0.0209 (3)	0.3986 (2)	0.95452 (12)	0.0438 (7)	
C3	0.1040 (4)	0.2855 (3)	1.01639 (15)	0.0698 (11)	
H3A	0.1820	0.2693	1.0257	0.105*	
H3B	0.0569	0.2358	1.0119	0.105*	
H3C	0.0709	0.3200	1.0428	0.105*	
C4	−0.0885 (3)	0.4132 (2)	0.98398 (15)	0.0599 (9)	
H4A	−0.1238	0.4654	0.9732	0.090*	
H4B	−0.0703	0.4164	1.0196	0.090*	
H4C	−0.1419	0.3674	0.9781	0.090*	
C5	0.2836 (4)	0.4923 (2)	0.80097 (13)	0.0609 (10)	
C6	0.3647 (3)	0.4230 (3)	0.81171 (15)	0.0628 (10)	
C7	0.3023 (5)	0.5578 (3)	0.76089 (17)	0.0937 (16)	
H7A	0.2283	0.5815	0.7511	0.141*	
H7B	0.3386	0.5323	0.7318	0.141*	
H7C	0.3519	0.6017	0.7740	0.141*	
C8	0.4763 (4)	0.4079 (3)	0.7832 (2)	0.0947 (17)	
H8A	0.5262	0.3714	0.8028	0.142*	
H8B	0.5151	0.4608	0.7774	0.142*	
H8C	0.4589	0.3817	0.7511	0.142*	
C9	0.1165 (3)	0.2493 (2)	0.83801 (12)	0.0484 (7)	
H9	0.1671	0.2261	0.8619	0.058*	
C10	0.0583 (3)	0.1969 (2)	0.80457 (13)	0.0526 (8)	
H10	0.0694	0.1388	0.8071	0.063*	
C11	−0.0292 (3)	0.3095 (2)	0.76843 (12)	0.0476 (7)	
C12	0.0257 (3)	0.3632 (2)	0.80229 (12)	0.0488 (8)	
H12	0.0101	0.4209	0.8013	0.059*	
C13	−0.1088 (3)	0.3476 (3)	0.72809 (13)	0.0569 (9)	
C14	−0.2259 (3)	0.3111 (2)	0.65050 (13)	0.0567 (9)	
C15	−0.1623 (4)	0.3724 (3)	0.61602 (15)	0.0743 (12)	
H15A	−0.1484	0.4243	0.6339	0.111*	

H15B	−0.2092	0.3834	0.5864	0.111*
H15C	−0.0889	0.3482	0.6058	0.111*
C16	−0.2478 (5)	0.2279 (3)	0.62361 (19)	0.0955 (17)
H16A	−0.1743	0.2019	0.6153	0.143*
H16B	−0.2913	0.2379	0.5929	0.143*
H16C	−0.2916	0.1910	0.6455	0.143*
C17	−0.3399 (4)	0.3488 (3)	0.66804 (18)	0.0834 (13)
H17A	−0.3253	0.4018	0.6847	0.125*
H17B	−0.3772	0.3108	0.6914	0.125*
H17C	−0.3901	0.3578	0.6392	0.125*
C18	0.5706 (3)	0.2921 (2)	0.98100 (12)	0.0470 (7)
C19	0.6235 (3)	0.32953 (19)	0.93559 (13)	0.0474 (8)
C20	0.5008 (4)	0.3412 (3)	1.01852 (15)	0.0691 (11)
H20A	0.4574	0.3030	1.0397	0.104*
H20B	0.4476	0.3779	1.0008	0.104*
H20C	0.5524	0.3745	1.0393	0.104*
C21	0.6167 (4)	0.4217 (2)	0.92368 (18)	0.0730 (12)
H21A	0.6423	0.4537	0.9527	0.110*
H21B	0.5374	0.4365	0.9156	0.110*
H21C	0.6661	0.4341	0.8951	0.110*
C22	0.7898 (3)	0.0309 (2)	0.88436 (15)	0.0578 (9)
C23	0.7377 (3)	−0.0052 (2)	0.92970 (15)	0.0570 (9)
C24	0.8640 (4)	−0.0181 (3)	0.84738 (19)	0.0903 (15)
H24A	0.8934	0.0195	0.8217	0.136*
H24B	0.8176	−0.0615	0.8317	0.136*
H24C	0.9284	−0.0436	0.8652	0.136*
C25	0.7458 (5)	−0.0962 (3)	0.9446 (2)	0.0982 (17)
H25A	0.7551	−0.1005	0.9808	0.147*
H25B	0.8119	−0.1216	0.9280	0.147*
H25C	0.6757	−0.1251	0.9344	0.147*
C26	0.4487 (3)	0.09584 (19)	0.91725 (11)	0.0417 (7)
H26	0.4541	0.0815	0.9515	0.050*
C27	0.3490 (3)	0.0762 (2)	0.89058 (12)	0.0487 (8)
H27	0.2885	0.0485	0.9074	0.058*
C28	0.4248 (2)	0.13517 (18)	0.81967 (10)	0.0353 (6)
C29	0.5259 (2)	0.15585 (18)	0.84576 (10)	0.0361 (6)
H29	0.5859	0.1843	0.8291	0.043*
C30	0.4141 (3)	0.1617 (2)	0.76477 (11)	0.0416 (7)
C31	0.2904 (3)	0.1486 (3)	0.68706 (12)	0.0613 (10)
C32	0.1821 (5)	0.0962 (4)	0.67658 (17)	0.115 (2)
H32A	0.2000	0.0374	0.6810	0.173*
H32B	0.1563	0.1059	0.6423	0.173*
H32C	0.1212	0.1122	0.6998	0.173*
C33	0.2628 (5)	0.2417 (3)	0.68204 (19)	0.0954 (16)
H33A	0.3333	0.2740	0.6864	0.143*
H33B	0.2072	0.2577	0.7076	0.143*
H33C	0.2306	0.2526	0.6489	0.143*
C34	0.3904 (5)	0.1230 (3)	0.65208 (15)	0.0874 (14)
H34A	0.4561	0.1596	0.6578	0.131*

H34B	0.3656	0.1275	0.6173	0.131*
H34C	0.4127	0.0656	0.6591	0.131*
H7	−0.133 (3)	0.2419 (10)	0.6996 (15)	0.064 (13)*
H14	0.278 (3)	0.101 (2)	0.7576 (13)	0.061 (12)*

Atomic displacement parameters (Å^2)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Co1	0.0387 (2)	0.0422 (2)	0.0398 (2)	0.00500 (17)	−0.00959 (16)	−0.00484 (17)
Co2	0.0374 (2)	0.0339 (2)	0.0367 (2)	−0.00246 (16)	−0.00596 (16)	0.00130 (16)
Cl1	0.0478 (4)	0.0535 (5)	0.0566 (5)	0.0013 (3)	−0.0129 (3)	−0.0159 (4)
Cl2	0.0508 (5)	0.0577 (5)	0.0696 (6)	−0.0058 (4)	−0.0235 (4)	−0.0023 (4)
O1	0.0552 (14)	0.0551 (14)	0.0744 (16)	0.0222 (11)	−0.0217 (12)	−0.0014 (12)
O2	0.0526 (13)	0.0568 (14)	0.0630 (14)	0.0199 (11)	−0.0130 (11)	0.0055 (12)
O3	0.0477 (13)	0.0603 (16)	0.095 (2)	0.0139 (12)	−0.0015 (13)	−0.0215 (14)
O4	0.0710 (16)	0.0537 (14)	0.0661 (16)	0.0037 (13)	−0.0198 (13)	0.0123 (12)
O5	0.111 (2)	0.070 (2)	0.0687 (18)	0.0054 (17)	−0.0454 (17)	−0.0072 (15)
O6	0.0688 (16)	0.0582 (15)	0.0627 (15)	−0.0142 (12)	0.0061 (12)	0.0176 (12)
O7	0.0679 (15)	0.0744 (17)	0.0360 (12)	−0.0099 (13)	0.0003 (11)	0.0040 (11)
O8	0.0557 (14)	0.0785 (18)	0.0604 (15)	−0.0041 (13)	0.0187 (12)	0.0028 (13)
O9	0.0762 (17)	0.0552 (15)	0.0531 (14)	−0.0011 (12)	−0.0038 (12)	0.0200 (12)
O10	0.0665 (15)	0.0694 (16)	0.0374 (11)	−0.0237 (13)	−0.0042 (10)	0.0077 (11)
O11	0.066 (4)	0.161 (8)	0.166 (8)	0.018 (5)	0.012 (5)	−0.038 (7)
O11'	0.166 (10)	0.44 (2)	0.134 (9)	0.200 (13)	−0.060 (8)	−0.139 (12)
N1	0.0445 (14)	0.0398 (14)	0.0472 (15)	0.0094 (11)	−0.0192 (12)	−0.0065 (11)
N2	0.0405 (13)	0.0406 (14)	0.0455 (14)	0.0095 (11)	−0.0139 (11)	−0.0058 (12)
N3	0.0568 (16)	0.0513 (16)	0.0457 (15)	−0.0060 (13)	−0.0103 (13)	−0.0003 (13)
N4	0.0427 (15)	0.0569 (17)	0.0600 (18)	−0.0013 (13)	−0.0028 (13)	−0.0215 (14)
N5	0.0407 (13)	0.0473 (15)	0.0375 (13)	0.0019 (11)	−0.0045 (10)	−0.0027 (11)
N6	0.0542 (16)	0.0636 (19)	0.0410 (14)	−0.0138 (14)	−0.0043 (12)	−0.0023 (13)
N7	0.0677 (19)	0.063 (2)	0.0460 (16)	−0.0100 (17)	−0.0225 (14)	0.0035 (15)
N8	0.0456 (14)	0.0493 (16)	0.0359 (13)	−0.0056 (12)	−0.0085 (11)	−0.0029 (11)
N9	0.0436 (14)	0.0422 (14)	0.0450 (14)	−0.0098 (11)	−0.0097 (11)	0.0080 (12)
N10	0.0363 (13)	0.0548 (17)	0.0518 (16)	0.0003 (12)	0.0005 (11)	−0.0042 (13)
N11	0.0458 (14)	0.0397 (14)	0.0510 (15)	−0.0024 (12)	−0.0124 (12)	0.0074 (12)
N12	0.0373 (12)	0.0282 (11)	0.0300 (11)	0.0003 (9)	0.0012 (9)	−0.0014 (9)
N13	0.0433 (14)	0.0490 (15)	0.0416 (14)	−0.0100 (12)	−0.0047 (11)	0.0013 (12)
N14	0.0562 (17)	0.0667 (19)	0.0327 (14)	−0.0186 (15)	−0.0074 (12)	0.0015 (13)
C1	0.0478 (17)	0.0433 (17)	0.0412 (16)	−0.0025 (14)	−0.0136 (14)	−0.0022 (13)
C2	0.0418 (16)	0.0423 (17)	0.0473 (18)	−0.0019 (13)	−0.0070 (13)	−0.0116 (14)
C3	0.074 (3)	0.072 (3)	0.063 (2)	−0.008 (2)	−0.0149 (19)	0.019 (2)
C4	0.051 (2)	0.056 (2)	0.072 (2)	−0.0057 (16)	0.0080 (17)	−0.0145 (18)
C5	0.076 (2)	0.063 (2)	0.0438 (18)	−0.021 (2)	−0.0018 (18)	−0.0100 (17)
C6	0.063 (2)	0.069 (2)	0.057 (2)	−0.0193 (19)	0.0118 (18)	−0.0249 (19)
C7	0.128 (4)	0.092 (3)	0.061 (3)	−0.040 (3)	0.009 (3)	0.007 (2)
C8	0.086 (3)	0.094 (3)	0.104 (4)	−0.027 (3)	0.043 (3)	−0.038 (3)
C9	0.0442 (17)	0.0531 (19)	0.0479 (18)	0.0004 (14)	−0.0064 (14)	−0.0025 (15)
C10	0.057 (2)	0.0503 (19)	0.0504 (19)	−0.0090 (16)	−0.0063 (15)	−0.0021 (15)

C11	0.0481 (17)	0.059 (2)	0.0356 (16)	−0.0074 (15)	−0.0034 (13)	−0.0009 (14)
C12	0.0498 (18)	0.0533 (19)	0.0431 (17)	0.0009 (15)	−0.0093 (14)	−0.0014 (14)
C13	0.060 (2)	0.069 (3)	0.0424 (18)	−0.0054 (18)	−0.0146 (15)	−0.0027 (17)
C14	0.061 (2)	0.066 (2)	0.0433 (18)	−0.0154 (18)	−0.0194 (16)	0.0015 (16)
C15	0.077 (3)	0.096 (3)	0.050 (2)	−0.018 (2)	−0.0136 (19)	0.012 (2)
C16	0.129 (4)	0.073 (3)	0.084 (3)	−0.009 (3)	−0.062 (3)	−0.004 (2)
C17	0.063 (3)	0.113 (4)	0.074 (3)	−0.010 (2)	−0.013 (2)	0.016 (3)
C18	0.0469 (17)	0.0482 (19)	0.0460 (17)	0.0005 (14)	−0.0146 (14)	−0.0132 (14)
C19	0.0480 (18)	0.0355 (16)	0.059 (2)	−0.0018 (13)	−0.0195 (15)	−0.0050 (14)
C20	0.068 (2)	0.071 (3)	0.068 (2)	0.008 (2)	−0.0103 (19)	−0.030 (2)
C21	0.077 (3)	0.040 (2)	0.102 (3)	−0.0010 (18)	−0.031 (2)	0.003 (2)
C22	0.0475 (19)	0.056 (2)	0.070 (2)	0.0124 (16)	−0.0085 (16)	−0.0154 (18)
C23	0.055 (2)	0.0414 (18)	0.074 (2)	0.0075 (15)	−0.0159 (18)	0.0001 (17)
C24	0.081 (3)	0.092 (3)	0.098 (3)	0.033 (3)	0.005 (3)	−0.028 (3)
C25	0.125 (4)	0.046 (2)	0.123 (4)	0.022 (3)	−0.014 (3)	0.009 (3)
C26	0.0469 (17)	0.0436 (17)	0.0345 (15)	−0.0086 (13)	−0.0014 (12)	0.0052 (13)
C27	0.0462 (17)	0.057 (2)	0.0426 (17)	−0.0170 (15)	−0.0008 (13)	0.0082 (15)
C28	0.0402 (15)	0.0344 (14)	0.0314 (14)	−0.0006 (12)	−0.0001 (11)	−0.0036 (11)
C29	0.0375 (14)	0.0396 (15)	0.0311 (14)	−0.0031 (12)	0.0015 (11)	−0.0021 (12)
C30	0.0464 (17)	0.0452 (17)	0.0331 (15)	−0.0014 (14)	−0.0022 (13)	−0.0045 (13)
C31	0.068 (2)	0.083 (3)	0.0332 (16)	−0.020 (2)	−0.0126 (15)	0.0017 (17)
C32	0.118 (4)	0.170 (6)	0.056 (3)	−0.081 (4)	−0.040 (3)	0.016 (3)
C33	0.110 (4)	0.100 (4)	0.077 (3)	0.010 (3)	−0.027 (3)	0.029 (3)
C34	0.108 (4)	0.115 (4)	0.039 (2)	−0.018 (3)	0.002 (2)	−0.012 (2)

Geometric parameters (Å, °)

Co1—N4	1.888 (3)	C7—H7A	0.9600
Co1—N3	1.890 (3)	C7—H7B	0.9600
Co1—N2	1.892 (3)	C7—H7C	0.9600
Co1—N1	1.899 (3)	C8—H8A	0.9600
Co1—N5	1.970 (2)	C8—H8B	0.9600
Co1—Cl1	2.2282 (9)	C8—H8C	0.9600
Co2—N11	1.885 (3)	C9—C10	1.379 (5)
Co2—N10	1.886 (3)	C9—H9	0.9300
Co2—N8	1.906 (3)	C10—H10	0.9300
Co2—N9	1.910 (3)	C11—C12	1.380 (5)
Co2—N12	1.955 (2)	C11—C13	1.521 (5)
Co2—Cl2	2.2177 (9)	C12—H12	0.9300
O1—N1	1.350 (3)	C14—C17	1.507 (6)
O1—H1	0.8200	C14—C15	1.513 (5)
O2—N2	1.337 (3)	C14—C16	1.515 (6)
O2—H2	0.8200	C15—H15A	0.9600
O3—N4	1.337 (4)	C15—H15B	0.9600
O4—N3	1.337 (4)	C15—H15C	0.9600
O5—C13	1.218 (5)	C16—H16A	0.9600
O6—N9	1.349 (3)	C16—H16B	0.9600
O6—H6	0.8200	C16—H16C	0.9600
O7—N8	1.355 (3)	C17—H17A	0.9600

O8—N10	1.316 (4)	C17—H17B	0.9600
O9—N11	1.323 (4)	C17—H17C	0.9600
O9—H9A	0.8200	C18—C19	1.463 (5)
O10—C30	1.218 (4)	C18—C20	1.488 (5)
O11'—O11^{i}	1.314 (19)	C19—C21	1.493 (5)
N1—C1	1.286 (4)	C20—H20A	0.9600
N2—C2	1.288 (4)	C20—H20B	0.9600
N3—C5	1.288 (5)	C20—H20C	0.9600
N4—C6	1.298 (5)	C21—H21A	0.9600
N5—C9	1.331 (4)	C21—H21B	0.9600
N5—C12	1.335 (4)	C21—H21C	0.9600
N6—C11	1.326 (5)	C22—C23	1.449 (6)
N6—C10	1.329 (4)	C22—C24	1.505 (5)
N7—C13	1.330 (5)	C23—C25	1.495 (5)
N7—C14	1.486 (4)	C24—H24A	0.9600
N7—H7	0.82 (3)	C24—H24B	0.9600
N8—C18	1.288 (4)	C24—H24C	0.9600
N9—C19	1.287 (4)	C25—H25A	0.9600
N10—C22	1.301 (5)	C25—H25B	0.9600
N11—C23	1.293 (5)	C25—H25C	0.9600
N12—C29	1.333 (3)	C26—C27	1.372 (4)
N12—C26	1.334 (4)	C26—H26	0.9300
N13—C28	1.327 (4)	C27—H27	0.9300
N13—C27	1.333 (4)	C28—C29	1.382 (4)
N14—C30	1.325 (4)	C28—C30	1.507 (4)
N14—C31	1.480 (4)	C29—H29	0.9300
N14—H14	0.82 (3)	C31—C33	1.512 (6)
C1—C2	1.461 (4)	C31—C32	1.514 (5)
C1—C3	1.487 (5)	C31—C34	1.523 (6)
C2—C4	1.490 (5)	C32—H32A	0.9600
C3—H3A	0.9600	C32—H32B	0.9600
C3—H3B	0.9600	C32—H32C	0.9600
C3—H3C	0.9600	C33—H33A	0.9600
C4—H4A	0.9600	C33—H33B	0.9600
C4—H4B	0.9600	C33—H33C	0.9600
C4—H4C	0.9600	C34—H34A	0.9600
C5—C6	1.463 (6)	C34—H34B	0.9600
C5—C7	1.492 (6)	C34—H34C	0.9600
C6—C8	1.499 (6)		
N4—Co1—N3	81.95 (14)	N6—C10—C9	122.2 (3)
N4—Co1—N2	179.10 (12)	N6—C10—H10	118.9
N3—Co1—N2	98.75 (12)	C9—C10—H10	118.9
N4—Co1—N1	98.70 (13)	N6—C11—C12	122.7 (3)
N3—Co1—N1	176.55 (11)	N6—C11—C13	118.8 (3)
N2—Co1—N1	80.55 (11)	C12—C11—C13	118.5 (3)
N4—Co1—N5	90.50 (11)	N5—C12—C11	120.4 (3)
N3—Co1—N5	91.20 (11)	N5—C12—H12	119.8
N2—Co1—N5	90.05 (10)	C11—C12—H12	119.8

N1—Co1—N5	92.18 (11)	O5—C13—N7	126.8 (3)
N4—Co1—Cl1	88.85 (8)	O5—C13—C11	119.4 (3)
N3—Co1—Cl1	88.31 (9)	N7—C13—C11	113.8 (3)
N2—Co1—Cl1	90.61 (8)	N7—C14—C17	109.7 (3)
N1—Co1—Cl1	88.33 (8)	N7—C14—C15	109.5 (3)
N5—Co1—Cl1	179.23 (8)	C17—C14—C15	110.3 (4)
N11—Co2—N10	82.07 (12)	N7—C14—C16	106.3 (3)
N11—Co2—N8	98.34 (12)	C17—C14—C16	110.1 (4)
N10—Co2—N8	179.22 (12)	C15—C14—C16	110.9 (4)
N11—Co2—N9	178.16 (11)	C14—C15—H15A	109.5
N10—Co2—N9	99.23 (12)	C14—C15—H15B	109.5
N8—Co2—N9	80.34 (11)	H15A—C15—H15B	109.5
N11—Co2—N12	90.04 (10)	C14—C15—H15C	109.5
N10—Co2—N12	89.95 (10)	H15A—C15—H15C	109.5
N8—Co2—N12	90.72 (10)	H15B—C15—H15C	109.5
N9—Co2—N12	91.27 (10)	C14—C16—H16A	109.5
N11—Co2—Cl2	89.49 (8)	C14—C16—H16B	109.5
N10—Co2—Cl2	89.23 (8)	H16A—C16—H16B	109.5
N8—Co2—Cl2	90.11 (8)	C14—C16—H16C	109.5
N9—Co2—Cl2	89.22 (8)	H16A—C16—H16C	109.5
N12—Co2—Cl2	179.11 (7)	H16B—C16—H16C	109.5
N1—O1—H1	109.5	C14—C17—H17A	109.5
N2—O2—H2	109.5	C14—C17—H17B	109.5
N9—O6—H6	109.5	H17A—C17—H17B	109.5
N11—O9—H9A	109.5	C14—C17—H17C	109.5
C1—N1—O1	120.1 (3)	H17A—C17—H17C	109.5
C1—N1—Co1	116.8 (2)	H17B—C17—H17C	109.5
O1—N1—Co1	122.7 (2)	N8—C18—C19	112.6 (3)
C2—N2—O2	120.3 (3)	N8—C18—C20	123.9 (3)
C2—N2—Co1	117.3 (2)	C19—C18—C20	123.5 (3)
O2—N2—Co1	122.5 (2)	N9—C19—C18	113.0 (3)
C5—N3—O4	122.0 (3)	N9—C19—C21	123.9 (4)
C5—N3—Co1	116.0 (3)	C18—C19—C21	123.0 (3)
O4—N3—Co1	122.0 (2)	C18—C20—H20A	109.5
C6—N4—O3	122.8 (3)	C18—C20—H20B	109.5
C6—N4—Co1	115.8 (3)	H20A—C20—H20B	109.5
O3—N4—Co1	121.4 (2)	C18—C20—H20C	109.5
C9—N5—C12	117.5 (3)	H20A—C20—H20C	109.5
C9—N5—Co1	121.2 (2)	H20B—C20—H20C	109.5
C12—N5—Co1	121.3 (2)	C19—C21—H21A	109.5
C11—N6—C10	116.1 (3)	C19—C21—H21B	109.5
C13—N7—C14	125.5 (3)	H21A—C21—H21B	109.5
C13—N7—H7	117 (3)	C19—C21—H21C	109.5
C14—N7—H7	117 (3)	H21A—C21—H21C	109.5
C18—N8—O7	120.3 (3)	H21B—C21—H21C	109.5
C18—N8—Co2	117.2 (2)	N10—C22—C23	113.2 (3)
O7—N8—Co2	122.5 (2)	N10—C22—C24	122.6 (4)
C19—N9—O6	120.5 (3)	C23—C22—C24	124.1 (4)
C19—N9—Co2	116.8 (2)	N11—C23—C22	113.4 (3)

O6—N9—Co2	122.6 (2)	N11—C23—C25	122.0 (4)
C22—N10—O8	122.9 (3)	C22—C23—C25	124.6 (4)
C22—N10—Co2	115.5 (3)	C22—C24—H24A	109.5
O8—N10—Co2	121.5 (2)	C22—C24—H24B	109.5
C23—N11—O9	121.7 (3)	H24A—C24—H24B	109.5
C23—N11—Co2	115.7 (2)	C22—C24—H24C	109.5
O9—N11—Co2	122.5 (2)	H24A—C24—H24C	109.5
C29—N12—C26	117.8 (2)	H24B—C24—H24C	109.5
C29—N12—Co2	121.22 (19)	C23—C25—H25A	109.5
C26—N12—Co2	121.03 (19)	C23—C25—H25B	109.5
C28—N13—C27	116.2 (3)	H25A—C25—H25B	109.5
C30—N14—C31	125.2 (3)	C23—C25—H25C	109.5
C30—N14—H14	116 (3)	H25A—C25—H25C	109.5
C31—N14—H14	118 (3)	H25B—C25—H25C	109.5
N1—C1—C2	112.8 (3)	N12—C26—C27	120.8 (3)
N1—C1—C3	123.6 (3)	N12—C26—H26	119.6
C2—C1—C3	123.5 (3)	C27—C26—H26	119.6
N2—C2—C1	112.3 (3)	N13—C27—C26	122.3 (3)
N2—C2—C4	124.4 (3)	N13—C27—H27	118.8
C1—C2—C4	123.3 (3)	C26—C27—H27	118.8
C1—C3—H3A	109.5	N13—C28—C29	122.5 (3)
C1—C3—H3B	109.5	N13—C28—C30	119.0 (3)
H3A—C3—H3B	109.5	C29—C28—C30	118.5 (3)
C1—C3—H3C	109.5	N12—C29—C28	120.4 (3)
H3A—C3—H3C	109.5	N12—C29—H29	119.8
H3B—C3—H3C	109.5	C28—C29—H29	119.8
C2—C4—H4A	109.5	O10—C30—N14	125.6 (3)
C2—C4—H4B	109.5	O10—C30—C28	119.6 (3)
H4A—C4—H4B	109.5	N14—C30—C28	114.8 (3)
C2—C4—H4C	109.5	N14—C31—C33	109.1 (3)
H4A—C4—H4C	109.5	N14—C31—C32	105.4 (3)
H4B—C4—H4C	109.5	C33—C31—C32	110.3 (4)
N3—C5—C6	113.3 (3)	N14—C31—C34	109.6 (3)
N3—C5—C7	122.3 (4)	C33—C31—C34	111.3 (4)
C6—C5—C7	124.4 (4)	C32—C31—C34	111.1 (4)
N4—C6—C5	113.0 (3)	C31—C32—H32A	109.5
N4—C6—C8	122.8 (4)	C31—C32—H32B	109.5
C5—C6—C8	124.2 (4)	H32A—C32—H32B	109.5
C5—C7—H7A	109.5	C31—C32—H32C	109.5
C5—C7—H7B	109.5	H32A—C32—H32C	109.5
H7A—C7—H7B	109.5	H32B—C32—H32C	109.5
C5—C7—H7C	109.5	C31—C33—H33A	109.5
H7A—C7—H7C	109.5	C31—C33—H33B	109.5
H7B—C7—H7C	109.5	H33A—C33—H33B	109.5
C6—C8—H8A	109.5	C31—C33—H33C	109.5
C6—C8—H8B	109.5	H33A—C33—H33C	109.5
H8A—C8—H8B	109.5	H33B—C33—H33C	109.5
C6—C8—H8C	109.5	C31—C34—H34A	109.5
H8A—C8—H8C	109.5	C31—C34—H34B	109.5

H8B—C8—H8C	109.5	H34A—C34—H34B	109.5
N5—C9—C10	120.9 (3)	C31—C34—H34C	109.5
N5—C9—H9	119.5	H34A—C34—H34C	109.5
C10—C9—H9	119.5	H34B—C34—H34C	109.5
N4—Co1—N1—C1	176.3 (2)	Co1—N1—C1—C3	−170.2 (3)
N2—Co1—N1—C1	−3.2 (2)	O2—N2—C2—C1	−178.1 (2)
N5—Co1—N1—C1	−92.9 (2)	Co1—N2—C2—C1	2.5 (3)
Cl1—Co1—N1—C1	87.7 (2)	O2—N2—C2—C4	1.8 (4)
N4—Co1—N1—O1	2.8 (2)	Co1—N2—C2—C4	−177.6 (2)
N2—Co1—N1—O1	−176.6 (2)	N1—C1—C2—N2	−5.0 (4)
N5—Co1—N1—O1	93.7 (2)	C3—C1—C2—N2	170.5 (3)
Cl1—Co1—N1—O1	−85.7 (2)	N1—C1—C2—C4	175.1 (3)
N3—Co1—N2—C2	−176.5 (2)	C3—C1—C2—C4	−9.4 (5)
N1—Co1—N2—C2	0.1 (2)	O4—N3—C5—C6	179.6 (3)
N5—Co1—N2—C2	92.3 (2)	Co1—N3—C5—C6	1.3 (4)
Cl1—Co1—N2—C2	−88.1 (2)	O4—N3—C5—C7	1.7 (5)
N3—Co1—N2—O2	4.2 (2)	Co1—N3—C5—C7	−176.7 (3)
N1—Co1—N2—O2	−179.2 (2)	O3—N4—C6—C5	−178.6 (3)
N5—Co1—N2—O2	−87.0 (2)	Co1—N4—C6—C5	−0.9 (4)
Cl1—Co1—N2—O2	92.6 (2)	O3—N4—C6—C8	0.2 (5)
N4—Co1—N3—C5	−1.4 (2)	Co1—N4—C6—C8	177.9 (3)
N2—Co1—N3—C5	178.0 (2)	N3—C5—C6—N4	−0.3 (4)
N5—Co1—N3—C5	−91.7 (3)	C7—C5—C6—N4	177.6 (3)
Cl1—Co1—N3—C5	87.7 (2)	N3—C5—C6—C8	−179.1 (4)
N4—Co1—N3—O4	−179.7 (2)	C7—C5—C6—C8	−1.1 (6)
N2—Co1—N3—O4	−0.3 (2)	C12—N5—C9—C10	1.4 (5)
N5—Co1—N3—O4	89.9 (2)	Co1—N5—C9—C10	−176.5 (2)
Cl1—Co1—N3—O4	−90.7 (2)	C11—N6—C10—C9	−2.5 (5)
N3—Co1—N4—C6	1.2 (2)	N5—C9—C10—N6	1.5 (5)
N1—Co1—N4—C6	−175.3 (2)	C10—N6—C11—C12	0.9 (5)
N5—Co1—N4—C6	92.4 (3)	C10—N6—C11—C13	179.2 (3)
Cl1—Co1—N4—C6	−87.2 (2)	C9—N5—C12—C11	−3.0 (5)
N3—Co1—N4—O3	179.0 (2)	Co1—N5—C12—C11	174.9 (2)
N1—Co1—N4—O3	2.4 (2)	N6—C11—C12—N5	2.0 (5)
N5—Co1—N4—O3	−89.9 (2)	C13—C11—C12—N5	−176.4 (3)
Cl1—Co1—N4—O3	90.5 (2)	C14—N7—C13—O5	2.0 (7)
N4—Co1—N5—C9	64.1 (3)	C14—N7—C13—C11	−176.5 (3)
N3—Co1—N5—C9	146.1 (3)	N6—C11—C13—O5	178.7 (4)
N2—Co1—N5—C9	−115.2 (3)	C12—C11—C13—O5	−2.9 (5)
N1—Co1—N5—C9	−34.6 (3)	N6—C11—C13—N7	−2.6 (5)
N4—Co1—N5—C12	−113.8 (3)	C12—C11—C13—N7	175.8 (3)
N3—Co1—N5—C12	−31.8 (3)	C13—N7—C14—C17	−63.4 (5)
N2—Co1—N5—C12	67.0 (3)	C13—N7—C14—C15	57.7 (5)
N1—Co1—N5—C12	147.5 (3)	C13—N7—C14—C16	177.6 (4)
N11—Co2—N8—C18	−179.6 (2)	O7—N8—C18—C19	178.8 (2)
N9—Co2—N8—C18	1.8 (2)	Co2—N8—C18—C19	−2.4 (3)
N12—Co2—N8—C18	−89.4 (2)	O7—N8—C18—C20	−0.2 (4)
Cl2—Co2—N8—C18	90.9 (2)	Co2—N8—C18—C20	178.7 (2)
N11—Co2—N8—O7	−0.7 (2)	O6—N9—C19—C18	−178.2 (2)

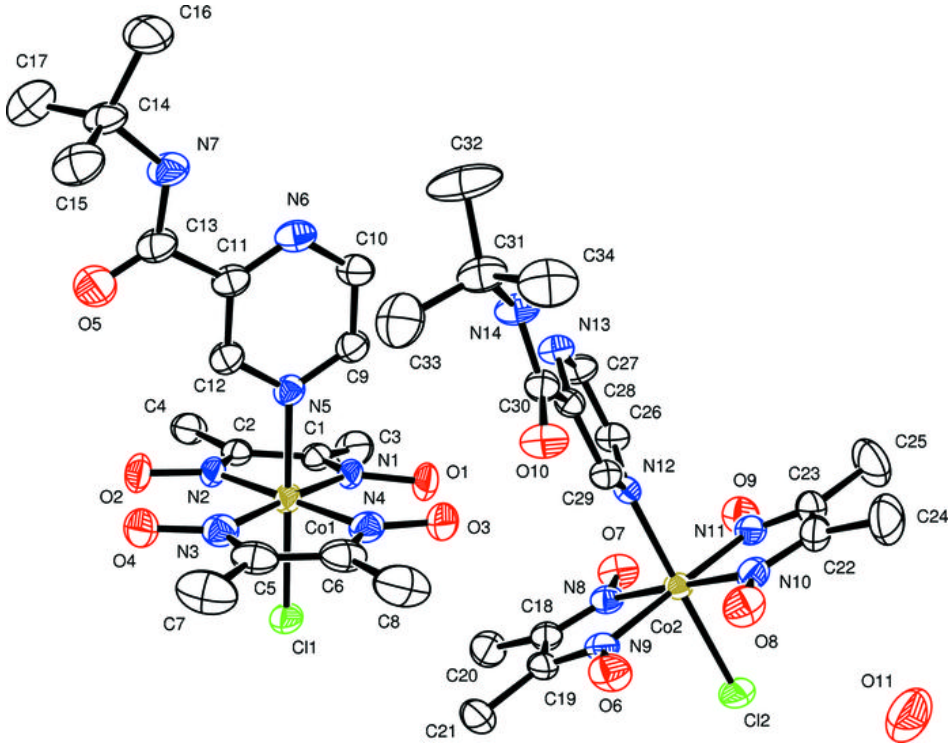
N9—Co2—N8—O7	−179.4 (2)	Co2—N9—C19—C18	−0.4 (3)
N12—Co2—N8—O7	89.4 (2)	O6—N9—C19—C21	−0.3 (5)
Cl2—Co2—N8—O7	−90.2 (2)	Co2—N9—C19—C21	177.6 (3)
N10—Co2—N9—C19	180.0 (2)	N8—C18—C19—N9	1.8 (4)
N8—Co2—N9—C19	−0.7 (2)	C20—C18—C19—N9	−179.3 (3)
N12—Co2—N9—C19	89.8 (2)	N8—C18—C19—C21	−176.2 (3)
Cl2—Co2—N9—C19	−90.9 (2)	C20—C18—C19—C21	2.7 (5)
N10—Co2—N9—O6	−2.2 (2)	O8—N10—C22—C23	178.4 (3)
N8—Co2—N9—O6	177.1 (2)	Co2—N10—C22—C23	0.2 (4)
N12—Co2—N9—O6	−92.4 (2)	O8—N10—C22—C24	1.1 (5)
Cl2—Co2—N9—O6	86.9 (2)	Co2—N10—C22—C24	−177.1 (3)
N11—Co2—N10—C22	1.0 (2)	O9—N11—C23—C22	−177.1 (3)
N9—Co2—N10—C22	179.7 (2)	Co2—N11—C23—C22	2.8 (4)
N12—Co2—N10—C22	−89.0 (2)	O9—N11—C23—C25	1.1 (5)
Cl2—Co2—N10—C22	90.6 (2)	Co2—N11—C23—C25	−178.9 (3)
N11—Co2—N10—O8	−177.2 (2)	N10—C22—C23—N11	−2.0 (4)
N9—Co2—N10—O8	1.5 (2)	C24—C22—C23—N11	175.2 (4)
N12—Co2—N10—O8	92.8 (2)	N10—C22—C23—C25	179.9 (4)
Cl2—Co2—N10—O8	−87.6 (2)	C24—C22—C23—C25	−2.9 (6)
N10—Co2—N11—C23	−2.2 (2)	C29—N12—C26—C27	1.0 (4)
N8—Co2—N11—C23	178.5 (2)	Co2—N12—C26—C27	−178.6 (2)
N12—Co2—N11—C23	87.7 (2)	C28—N13—C27—C26	−0.5 (5)
Cl2—Co2—N11—C23	−91.5 (2)	N12—C26—C27—N13	−0.2 (5)
N10—Co2—N11—O9	177.8 (2)	C27—N13—C28—C29	0.3 (4)
N8—Co2—N11—O9	−1.6 (2)	C27—N13—C28—C30	−177.6 (3)
N12—Co2—N11—O9	−92.3 (2)	C26—N12—C29—C28	−1.2 (4)
Cl2—Co2—N11—O9	88.5 (2)	Co2—N12—C29—C28	178.5 (2)
N11—Co2—N12—C29	−132.3 (2)	N13—C28—C29—N12	0.5 (4)
N10—Co2—N12—C29	−50.2 (2)	C30—C28—C29—N12	178.5 (3)
N8—Co2—N12—C29	129.4 (2)	C31—N14—C30—O10	−2.8 (6)
N9—Co2—N12—C29	49.0 (2)	C31—N14—C30—C28	178.0 (3)
N11—Co2—N12—C26	47.4 (2)	N13—C28—C30—O10	170.2 (3)
N10—Co2—N12—C26	129.4 (2)	C29—C28—C30—O10	−7.9 (4)
N8—Co2—N12—C26	−51.0 (2)	N13—C28—C30—N14	−10.6 (4)
N9—Co2—N12—C26	−131.3 (2)	C29—C28—C30—N14	171.4 (3)
O1—N1—C1—C2	178.9 (2)	C30—N14—C31—C33	−63.1 (5)
Co1—N1—C1—C2	5.3 (3)	C30—N14—C31—C32	178.6 (4)
O1—N1—C1—C3	3.4 (5)	C30—N14—C31—C34	59.0 (5)

Symmetry codes: (i) −*x*, −*y*, −*z*+2.

Hydrogen-bond geometry (Å, °)

D—H···*A*	*D*—H	H···*A*	*D*···*A*	*D*—H···*A*
O1—H1···O3	0.82	1.69	2.476 (4)	161
O2—H2···O4	0.82	1.69	2.483 (4)	162
O6—H6···O8	0.82	1.72	2.507 (4)	161
O9—H9A···O7	0.82	1.68	2.483 (4)	165

Fig. 1


C16
C17
C14
N7
C15
C13
N6
C11
C10
O5
C12
C9
N5
C4
C2
C1
C3
N1
O1
O2
N2
N4
O3
Co1
O4
N3
C5
C6
C8
C7
Cl1
C32
C31
C34
C33
N14
N13
C27
C28
C30
C26
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C29
N12
C25
O9
C23
C24
O7
N11
C22
N8
N10
C18
Co2
O8
N9
C20
C19
O6
O11
C21
Cl2

Fig. 2