# The azide-bridged mixed-valent cobalt(II,III) compound [(CH₃)₃NH]₂[Co$^{II}$Co$^{III}_2$(N₃)₁₀]

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The crystal structure of the title compound, poly[bis(trimethylammonium) hexa-$\mu_{1,1}$-azido-tetraazidotricobaltate-(II,III)], [(CH₃)₃NH]₂[Co$^{II}$Co$^{III}_2$(N₃)₁₀], consists of anionic chains [Co$^{II}$Co$^{III}_2$(N₃)₁₀]$^{2-}$ extending parallel to the $c$ axis and [(CH₃)₃NH]$^+$ counter-cations situated between the chains. In the anionic chain, one tetrahedrally coordinated Co$^{II}$ atom (site symmetry 2) and two octahedrally coordinated Co$^{III}$ atoms are arranged alternately and are linked by $\mu_{1,1}$-azide bridges. The anionic chains and cations are connected via N—H⋯N hydrogen bonding into a three-dimensional structure.

## Related literature

For background to transition-metal azido-complexes templated by counter-cations of various sizes, see: Liu *et al.* (2006, 2008). For related cobalt complexes, see: Zhang *et al.* (2010).
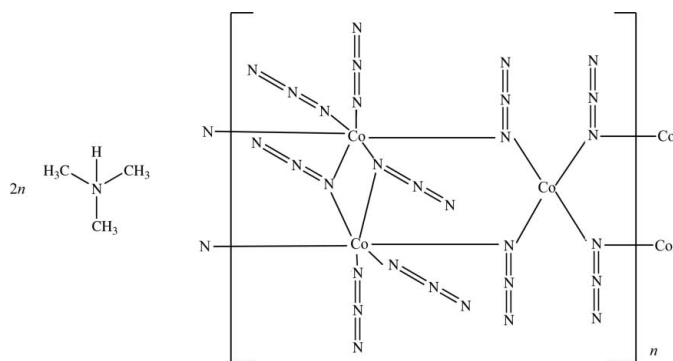


## Experimental

### Crystal data

| | |
|---|---|
| (C₃H₁₀N)₂[Co₃(N₃)₁₀] | $a$ = 21.7200 (6) Å |
| $M_r$ = 717.33 | $b$ = 11.3812 (4) Å |
| Monoclinic, $C2/c$ | $c$ = 12.1628 (4) Å |
| $\beta$ = 115.524 (2)° | $\mu$ = 1.88 mm$^{-1}$ |
| $V$ = 2713.21 (15) Å$^3$ | $T$ = 293 K |
| $Z$ = 4 | $0.10 \times 0.06 \times 0.05$ mm |
| Mo $K\alpha$ radiation | |

### Data collection

| | |
|---|---|
| Rigaku Saturn diffractometer | 22049 measured reflections |
| Absorption correction: multi-scan (*REQAB*; Jacobson, 1998) | 2389 independent reflections |
| $T_{min}$ = 0.708, $T_{max}$ = 0.823 | 1481 reflections with $I > 2\sigma(I)$ |
| | $R_{int}$ = 0.103 |

### Refinement

| | |
|---|---|
| $R[F^2 > 2\sigma(F^2)]$ = 0.032 | 24 restraints |
| $wR(F^2)$ = 0.061 | H-atom parameters constrained |
| $S$ = 0.98 | $\Delta\rho_{max}$ = 0.31 e Å$^{-3}$ |
| 2389 reflections | $\Delta\rho_{min}$ = −0.35 e Å$^{-3}$ |
| 190 parameters | |

**Table 1**
Selected bond lengths (Å).

| | | | |
|---|---|---|---|
| Co1—N7 | 1.944 (3) | Co1—N13 | 2.008 (3) |
| Co1—N4 | 1.948 (3) | Co2—N1$^{ii}$ | 1.968 (3) |
| Co1—N10 | 1.964 (3) | Co2—N1 | 1.968 (3) |
| Co1—N1 | 1.979 (3) | Co2—N10$^{i}$ | 2.014 (3) |
| Co1—N13$^{i}$ | 2.008 (3) | Co2—N10$^{iii}$ | 2.014 (3) |

Symmetry codes: (i) $-x, -y, -z$; (ii) $-x, y, -z + \frac{1}{2}$; (iii) $x, -y, z + \frac{1}{2}$.

**Table 2**
Hydrogen-bond geometry (Å, °).

| $D$—H⋯$A$ | $D$—H | H⋯$A$ | $D$⋯$A$ | $D$—H⋯$A$ |
|---|---|---|---|---|
| N16—H16⋯N7 | 0.91 | 2.02 | 2.890 | 159 |

Data collection: *CrystalClear* (Rigaku/MSC, 2006); cell refinement: *CrystalClear*; data reduction: *CrystalClear*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 2008); program(s) used to refine structure: *SHELXL97* (Sheldrick, 2008); molecular graphics: *SHELXTL* (Sheldrick, 2008); software used to prepare material for publication: *publCIF* (Westrip, 2010).

## References

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## supporting information

# The azide-bridged mixed-valent cobalt(II,III) compound [(CH$_3$)$_3$NH]$_2$[Co$^{II}$Co$_2$$^{III}$(N$_3$)$_{10}$]

## Yan-Ju Liu, Yu-Xian Li, Min Xu and Xia Wang

### S1. Comment

Azido-bridged complexes have attracted a lot of attention in recent times because of their importance in diverse fields, encompassing condensed matter physics, materials chemistry, biological chemistry, *etc*. Having diverse coordination modes and being an efficient magnetic coupler, the azide anion is a versatile ligand in bridging different transition metals, generating rich and fascinating architectures ranging from discrete polynuclears to extended three-dimensional networks with interesting magnetic properties (antiferromagnetic, ferromagnetic, ferrimagnetic, canted and alternating systems). In fact, remarkable structural variations of azido-bridged complexes have been reported by using various ancillary ligands, with different number of coordination sites and steric hindrance, to control over the dimensions of complexes and bridging modes of the azide anions, thus leading to the control over their magnetic properties. However, only a few metal-azido systems devoid of ancillary ligands have been obtained by varying the size of the coutercations (Liu *et al.*, 2006, 2008). A small coutercation such as (CH$_3$)$_4$N$^+$ produced the one-dimensional ferromagnetic complex [(CH$_3$)$_4$N][Cu(N$_3$)$_3$], in which the Cu(II) ions are connected by a triple azido-bridge, including two $\mu_{1,3}$-N$_3$ and one $\mu_{1,1}$-N$_3$ anions. When more bulky coutercations were employed, the mononuclear paramagnetic complex [(CH$_3$CH$_2$)$_4$N]$_2$[Cu(N$_3$)$_4$], the dinuclear antiferromagnetic complex [(CH$_3$CH$_2$CH$_2$CH$_2$)$_4$N]$_2$[Cu$_2$(N$_3$)$_6$] and the one-dimensional ferromagnetic complex [(CH$_3$CH$_2$CH$_2$)$_4$N]$_2$[Cu$_3$(N$_3$)$_8$] were obtained separately. For magnese(II)-azido complexes, use of small coutercations like (CH$_3$)$_4$N$^+$ and Cs$^+$ produced compounds with interesting three-dimensional structures [(CH$_3$)$_4$N][Mn(N$_3$)$_3$] and Cs[Mn(N$_3$)$_3$], where the cations are situated in the voids the anionic Mn$^{II}$-azido network. When using the more bulky cation (CH$_3$CH$_2$)$_4$N$^+$, the one-dimensional ferromagnetic complex [(CH$_3$CH$_2$)$_4$N][Mn(N$_3$)$_3$] was obtained. Despite the results obtained above, azido-bridged complexes with mixed-valent metal ions have not been reported. In this work, we report on a mixed-valence cobalt(II,III) complex, [(CH$_3$)$_3$NH]$_2$[Co$^{II}$Co$^{III}$$_2$(N$_3$)$_{10}$], (I).

The structure of (I) consists of anionic chains [Co$^{II}$Co$^{III}$(N$_3$)$_{10}$]$^{2-}$ extending parallel to the *c*-axis. The [(CH$_3$)$_3$NH]$^+$ countercations are situated between the chains (Fig. 1). In the [Co$^{II}$Co$^{III}$$_2$(N$_3$)$_{10}$]$^{2-}$ anionic chain, the Co$^{II}$ atom (Co2, site symmetry 2) is tetrahedrally coordinated by N atoms, whereas the Co$^{III}$ atom (Co1) is octahedrally coordinated. Co$^{II}$ and Co$^{III}$ atoms are linked by $\mu_{1,1}$-azido ligands and are alternatively arranged along the chain direction. The Co1—N distances range between 1.944 (3)–2.008 (3) Å, slightly longer than those expected for Co$^{III}$. The Co2—N distances range between 1.968 (3)–2.014 (3) Å, slightly shorter than those expected for Co$^{II}$ (Zhang *et al.*, 2010). The anionic chain and the cations are connected *via* N—H···N hydrogen bonding between the donating N—H function of the cation and non-bridging azido groups of the anion (Fig 2).

## S2. Experimental

In a test tube a 5 ml methanol solution of 0.10$M$ Co(ClO$_4$)$_2$·6H$_2$O was layered carefully with 3 ml methanol and then with 10 ml methanol solution of 0.20$M$ HCl, 0.20$M$ NaN$_3$, and 0.10$M$ trimethylamine. The tube was sealed and kept undisturbed. Tiny red columnar crystals appeared overnight. Crystallization time of one week produced crystals in a yield of 25% based on the metal salt.

## S3. Refinement

Hydrogen atoms were added geometrically and were refined using a riding model, with C—H = 0.98 Å (CH$_3$) and N—H = 0.89 Å.
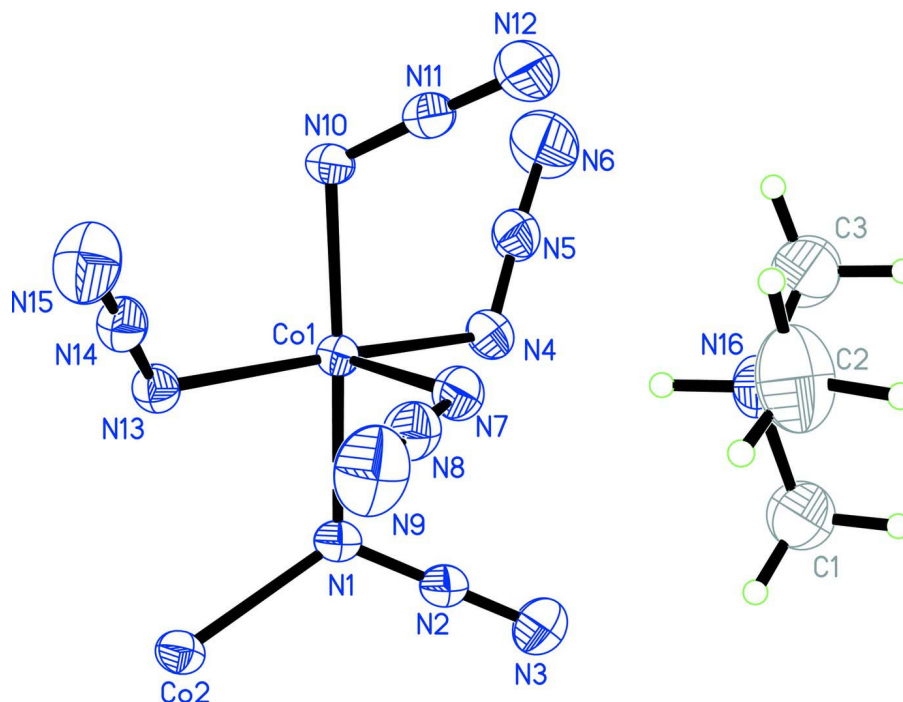


**Figure 1**

The asymmetric unit of the title structure. All non-H atoms are labelled and are shown with displacement ellipsoids at the 30% probability level. H atoms have been omitted.
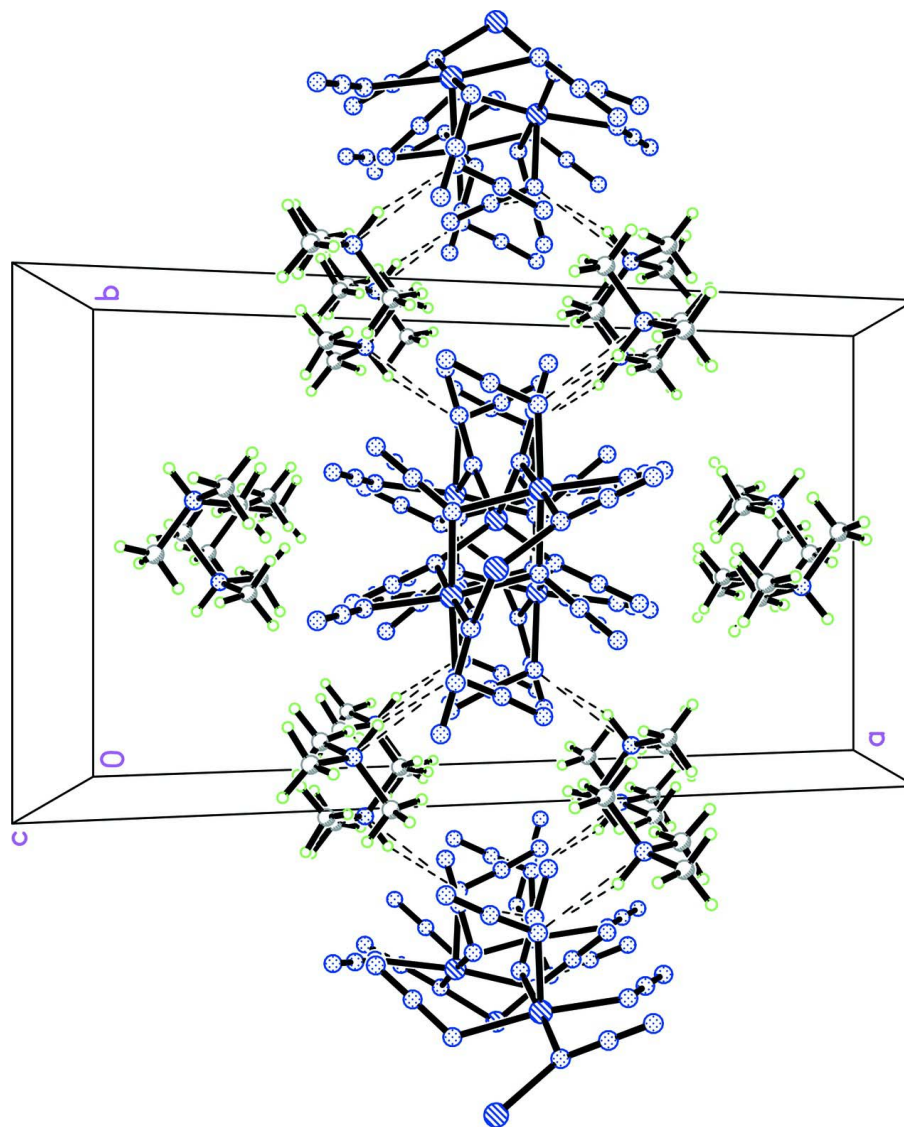
**Figure 2**
A view of the crystal packing along the *c* axis.

**poly[bis(trimethylammonium) [hexa-$\mu_{1,1}$-azido-tetraazidotricobaltate(II,III)]]**

*Crystal data*

| | |
|---|---|
| (C₃H₁₀N)₂[Co₃(N₃)₁₀] | $F(000) = 1444$ |
| $M_r = 717.33$ | $D_x = 1.756$ Mg m⁻³ |
| Monoclinic, *C*2/*c* | Mo *Kα* radiation, $\lambda = 0.71073$ Å |
| Hall symbol: -C 2yc | Cell parameters from 14377 reflections |
| $a = 21.7200$ (6) Å | $\theta = 3.4–25.0°$ |
| $b = 11.3812$ (4) Å | $\mu = 1.88$ mm⁻¹ |
| $c = 12.1628$ (4) Å | $T = 293$ K |
| $\beta = 115.524$ (2)° | Pillar, red |
| $V = 2713.21$ (15) Å³ | $0.10 \times 0.06 \times 0.05$ mm |
| $Z = 4$ | |

*Data collection*

| | |
|---|---|
| Rigaku Saturn diffractometer | 22049 measured reflections |
| Radiation source: fine-focus sealed tube | 2389 independent reflections |
| Graphite monochromator | 1481 reflections with $I > 2\sigma(I)$ |
| Detector resolution: 0.76 pixels mm⁻¹ | $R_{int} = 0.103$ |
| dtprofit.ref scans | $\theta_{max} = 25.0°$, $\theta_{min} = 3.6°$ |
| Absorption correction: multi-scan (*REQAB*; Jacobson, 1998) | $h = -25 \rightarrow 25$ |
| | $k = -13 \rightarrow 13$ |
| $T_{min} = 0.708$, $T_{max} = 0.823$ | $l = -14 \rightarrow 14$ |

*Refinement*

| | |
|---|---|
| Refinement on $F^2$ | Hydrogen site location: inferred from neighbouring sites |
| Least-squares matrix: full | |
| $R[F^2 > 2\sigma(F^2)] = 0.032$ | H-atom parameters constrained |
| $wR(F^2) = 0.061$ | $w = 1/[\sigma^2(F_o^2) + (0.0204P)^2]$ |
| $S = 0.98$ | where $P = (F_o^2 + 2F_c^2)/3$ |
| 2389 reflections | $(\Delta/\sigma)_{max} = 0.001$ |
| 190 parameters | $\Delta\rho_{max} = 0.31$ e Å⁻³ |
| 24 restraints | $\Delta\rho_{min} = -0.35$ e Å⁻³ |
| Primary atom site location: structure-invariant direct methods | Extinction correction: *SHELXL97* (Sheldrick, 2008), Fc*=kFc[1+0.001xFc²$\lambda$³/sin(2$\theta$)]⁻¹ᐟ⁴ |
| Secondary atom site location: difference Fourier map | Extinction coefficient: 0.00084 (18) |

*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 (Å²)*

| | $x$ | $y$ | $z$ | $U_{iso}*/U_{eq}$ |
|---|---|---|---|---|
| Co1 | 0.04965 (2) | 0.10300 (4) | 0.05706 (4) | 0.03529 (17) |
| Co2 | 0.0000 | −0.04737 (5) | 0.2500 | 0.0402 (2) |
| N1 | 0.06948 (14) | 0.0409 (2) | 0.2209 (3) | 0.0428 (6) |
| N2 | 0.12002 (17) | 0.0827 (3) | 0.3042 (3) | 0.0448 (6) |
| N3 | 0.16669 (18) | 0.1210 (3) | 0.3810 (3) | 0.0740 (10) |
| N4 | 0.14720 (14) | 0.1256 (2) | 0.1097 (3) | 0.0523 (7) |
| N5 | 0.16894 (15) | 0.1348 (3) | 0.0363 (3) | 0.0540 (7) |
| N6 | 0.1925 (2) | 0.1442 (4) | −0.0308 (4) | 0.1069 (15) |
| N7 | 0.04578 (16) | 0.2621 (2) | 0.1120 (3) | 0.0489 (8) |
| N8 | −0.00656 (18) | 0.3009 (3) | 0.1097 (3) | 0.0504 (8) |
| N9 | −0.05415 (18) | 0.3426 (3) | 0.1100 (3) | 0.0806 (12) |
| N10 | 0.02748 (13) | 0.1593 (3) | −0.1084 (2) | 0.0434 (6) |
| N11 | 0.04393 (15) | 0.2609 (3) | −0.1156 (2) | 0.0492 (6) |
| N12 | 0.0599 (2) | 0.3555 (3) | −0.1195 (3) | 0.0930 (13) |

| | | | |
|---|---|---|---|
| N13 | −0.04827 (13) | 0.0595 (2) | 0.0083 (2) | 0.0384 (6) |
| N14 | −0.09288 (16) | 0.1253 (3) | −0.0627 (3) | 0.0425 (6) |
| N15 | −0.13450 (17) | 0.1858 (3) | −0.1255 (3) | 0.0715 (10) |
| N16 | 0.16193 (14) | 0.4179 (3) | 0.2144 (3) | 0.0539 (8) |
| H16 | 0.1336 | 0.3554 | 0.1828 | 0.065* |
| C1 | 0.2022 (2) | 0.3949 (5) | 0.3459 (4) | 0.1044 (17) |
| H1A | 0.2292 | 0.4628 | 0.3840 | 0.157* |
| H1B | 0.2316 | 0.3287 | 0.3565 | 0.157* |
| H1C | 0.1719 | 0.3783 | 0.3826 | 0.157* |
| C2 | 0.1190 (3) | 0.5217 (4) | 0.1950 (5) | 0.1125 (19) |
| H2A | 0.0852 | 0.5067 | 0.2242 | 0.169* |
| H2B | 0.0970 | 0.5396 | 0.1096 | 0.169* |
| H2C | 0.1468 | 0.5871 | 0.2384 | 0.169* |
| C3 | 0.2062 (2) | 0.4251 (5) | 0.1509 (4) | 0.1121 (19) |
| H3A | 0.1787 | 0.4379 | 0.0655 | 0.168* |
| H3B | 0.2311 | 0.3529 | 0.1621 | 0.168* |
| H3C | 0.2377 | 0.4891 | 0.1837 | 0.168* |

*Atomic displacement parameters (Å²)*

| | $U^{11}$ | $U^{22}$ | $U^{33}$ | $U^{12}$ | $U^{13}$ | $U^{23}$ |
|---|---|---|---|---|---|---|
| Co1 | 0.0382 (3) | 0.0364 (3) | 0.0331 (3) | −0.0041 (2) | 0.0171 (2) | −0.0013 (2) |
| Co2 | 0.0487 (4) | 0.0370 (4) | 0.0412 (5) | 0.000 | 0.0253 (4) | 0.000 |
| N1 | 0.0456 (15) | 0.0502 (15) | 0.0338 (16) | −0.0052 (12) | 0.0181 (13) | 0.0022 (12) |
| N2 | 0.0475 (15) | 0.0518 (15) | 0.0353 (16) | −0.0042 (13) | 0.0180 (13) | 0.0033 (13) |
| N3 | 0.065 (2) | 0.095 (3) | 0.052 (2) | −0.019 (2) | 0.015 (2) | −0.006 (2) |
| N4 | 0.0449 (15) | 0.0647 (16) | 0.0528 (17) | −0.0104 (12) | 0.0264 (12) | −0.0027 (13) |
| N5 | 0.0453 (15) | 0.0637 (16) | 0.0561 (18) | −0.0079 (12) | 0.0249 (13) | −0.0055 (13) |
| N6 | 0.097 (3) | 0.148 (4) | 0.112 (4) | −0.027 (3) | 0.079 (3) | −0.026 (3) |
| N7 | 0.061 (2) | 0.0407 (19) | 0.051 (2) | −0.0085 (16) | 0.0293 (18) | −0.0088 (15) |
| N8 | 0.062 (2) | 0.040 (2) | 0.050 (2) | −0.0019 (17) | 0.025 (2) | −0.0050 (15) |
| N9 | 0.071 (3) | 0.068 (3) | 0.103 (3) | 0.009 (2) | 0.037 (3) | −0.020 (2) |
| N10 | 0.0570 (15) | 0.0435 (16) | 0.0329 (14) | −0.0095 (13) | 0.0222 (12) | 0.0004 (13) |
| N11 | 0.0626 (15) | 0.0478 (16) | 0.0348 (15) | −0.0086 (14) | 0.0186 (12) | 0.0007 (13) |
| N12 | 0.150 (4) | 0.054 (2) | 0.064 (3) | −0.036 (2) | 0.036 (3) | 0.004 (2) |
| N13 | 0.0378 (15) | 0.0388 (15) | 0.0414 (17) | −0.0002 (10) | 0.0197 (13) | −0.0025 (11) |
| N14 | 0.0408 (15) | 0.0412 (16) | 0.0447 (17) | −0.0017 (11) | 0.0176 (13) | −0.0036 (11) |
| N15 | 0.058 (2) | 0.058 (2) | 0.081 (3) | 0.0085 (19) | 0.014 (2) | 0.005 (2) |
| N16 | 0.0501 (19) | 0.050 (2) | 0.061 (2) | −0.0163 (15) | 0.0234 (19) | −0.0118 (16) |
| C1 | 0.083 (3) | 0.143 (5) | 0.067 (4) | −0.039 (3) | 0.013 (3) | 0.007 (3) |
| C2 | 0.115 (4) | 0.052 (3) | 0.165 (6) | 0.015 (3) | 0.055 (4) | −0.001 (3) |
| C3 | 0.093 (4) | 0.173 (5) | 0.099 (4) | −0.055 (4) | 0.069 (3) | −0.045 (4) |

*Geometric parameters (Å, °)*

| | | | |
|---|---|---|---|
| Co1—N7 | 1.944 (3) | N11—N12 | 1.139 (4) |
| Co1—N4 | 1.948 (3) | N13—N14 | 1.234 (4) |
| Co1—N10 | 1.964 (3) | N13—Co1$^i$ | 2.008 (3) |

| | | | |
|---|---|---|---|
| Co1—N1 | 1.979 (3) | N14—N15 | 1.131 (4) |
| Co1—N13ⁱ | 2.008 (3) | N16—C2 | 1.460 (5) |
| Co1—N13 | 2.008 (3) | N16—C3 | 1.473 (4) |
| Co2—N1ⁱⁱ | 1.968 (3) | N16—C1 | 1.478 (5) |
| Co2—N1 | 1.968 (3) | N16—H16 | 0.9100 |
| Co2—N10ⁱ | 2.014 (3) | C1—H1A | 0.9600 |
| Co2—N10ⁱⁱⁱ | 2.014 (3) | C1—H1B | 0.9600 |
| N1—N2 | 1.224 (4) | C1—H1C | 0.9600 |
| N2—N3 | 1.129 (4) | C2—H2A | 0.9600 |
| N4—N5 | 1.181 (4) | C2—H2B | 0.9600 |
| N5—N6 | 1.140 (4) | C2—H2C | 0.9600 |
| N7—N8 | 1.209 (4) | C3—H3A | 0.9600 |
| N8—N9 | 1.139 (4) | C3—H3B | 0.9600 |
| N10—N11 | 1.225 (4) | C3—H3C | 0.9600 |
| N10—Co2ⁱ | 2.014 (3) | | |
| | | | |
| N7—Co1—N4 | 88.05 (12) | Co1—N10—Co2ⁱ | 121.43 (14) |
| N7—Co1—N10 | 91.18 (12) | N12—N11—N10 | 178.5 (4) |
| N4—Co1—N10 | 92.62 (12) | N14—N13—Co1ⁱ | 114.1 (2) |
| N7—Co1—N1 | 90.55 (12) | N14—N13—Co1 | 118.0 (2) |
| N4—Co1—N1 | 88.97 (12) | Co1ⁱ—N13—Co1 | 100.22 (11) |
| N10—Co1—N1 | 177.69 (12) | N15—N14—N13 | 178.2 (4) |
| N7—Co1—N13ⁱ | 176.56 (13) | C2—N16—C3 | 112.7 (4) |
| N4—Co1—N13ⁱ | 94.61 (11) | C2—N16—C1 | 110.9 (4) |
| N10—Co1—N13ⁱ | 86.53 (11) | C3—N16—C1 | 111.2 (3) |
| N1—Co1—N13ⁱ | 91.67 (11) | C2—N16—H16 | 107.3 |
| N7—Co1—N13 | 97.71 (11) | C3—N16—H16 | 107.3 |
| N4—Co1—N13 | 173.16 (12) | C1—N16—H16 | 107.3 |
| N10—Co1—N13 | 90.96 (11) | N16—C1—H1A | 109.5 |
| N1—Co1—N13 | 87.29 (11) | N16—C1—H1B | 109.5 |
| N13ⁱ—Co1—N13 | 79.78 (11) | H1A—C1—H1B | 109.5 |
| N1ⁱⁱ—Co2—N1 | 118.61 (16) | N16—C1—H1C | 109.5 |
| N1ⁱⁱ—Co2—N10ⁱ | 120.58 (11) | H1A—C1—H1C | 109.5 |
| N1—Co2—N10ⁱ | 97.86 (11) | H1B—C1—H1C | 109.5 |
| N1ⁱⁱ—Co2—N10ⁱⁱⁱ | 97.86 (11) | N16—C2—H2A | 109.5 |
| N1—Co2—N10ⁱⁱⁱ | 120.58 (11) | N16—C2—H2B | 109.5 |
| N10ⁱ—Co2—N10ⁱⁱⁱ | 101.58 (16) | H2A—C2—H2B | 109.5 |
| N2—N1—Co2 | 122.3 (2) | N16—C2—H2C | 109.5 |
| N2—N1—Co1 | 115.0 (2) | H2A—C2—H2C | 109.5 |
| Co2—N1—Co1 | 120.82 (15) | H2B—C2—H2C | 109.5 |
| N3—N2—N1 | 179.9 (5) | N16—C3—H3A | 109.5 |
| N5—N4—Co1 | 119.7 (3) | N16—C3—H3B | 109.5 |
| N6—N5—N4 | 177.2 (4) | H3A—C3—H3B | 109.5 |
| N8—N7—Co1 | 120.8 (2) | N16—C3—H3C | 109.5 |
| N9—N8—N7 | 176.5 (4) | H3A—C3—H3C | 109.5 |

| | | | |
|---|---|---|---|
| N11—N10—Co1 | 115.5 (2) | H3B—C3—H3C | 109.5 |
| N11—N10—Co2ⁱ | 121.6 (2) | | |

Symmetry codes: (i) −*x*, −*y*, −*z*; (ii) −*x*, *y*, −*z*+1/2; (iii) *x*, −*y*, *z*+1/2.

*Hydrogen-bond geometry (Å, °)*

| *D*—H···*A* | *D*—H | H···*A* | *D*···*A* | *D*—H···*A* |
|---|---|---|---|---|
| N16—H16···N7 | 0.91 | 2.02 | 2.890 | 159 |