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# *catena*-Poly[[{2-[3-(dimethylamino)-propyliminomethyl]-4-nitrophenolato}-copper(II)]-$\mu$-acetato]

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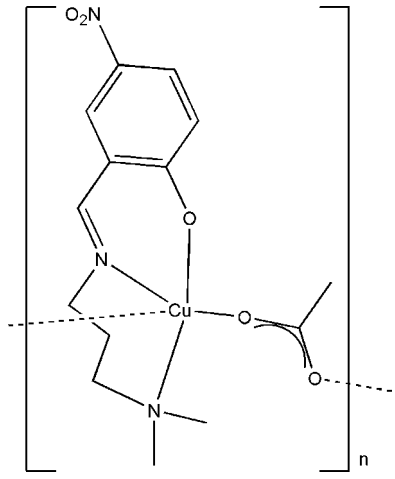
Key indicators: single-crystal X-ray study; $T$ = 298 K; mean $\sigma$(C–C) = 0.009 Å; $R$ factor = 0.079; $wR$ factor = 0.184; data-to-parameter ratio = 16.7.

The title compound, $[Cu(C_{12}H_{16}N_3O_3)(CH_3COO)]_n$ or $[Cu(CMP)(CH_3COO)]_n$ {CMP is 2-[3-(dimethylamino)propyliminomethyl]-4-nitrophenol}, was synthesized by the reaction of 2-hydroxy-5-nitrobenzaldehyde, *N*,*N*-dimethylpropane-1,3-diamine and copper(II) acetate monohydrate in a methanol solution. The compound is an acetate-bridged polymeric copper(II) complex. The $Cu^{II}$ atom is coordinated in a square-pyramidal manner by one Schiff base CMP ligand and two acetate anions. The Schiff base molecule acts as a tridentate ligand, coordinating the $Cu^{II}$ ion through its phenolate O atom, imine N atom and amine N atom. The acetate anion acts as a bridging group, coordinating two adjacent $Cu^{II}$ ions through its two O atoms, one in the basal plane and the other in the apical position. The [Cu(CMP)] units are linked through the bridging acetate groups, forming chains running along the *c* axis.

## Related literature

For azido-bridged polynuclear complexes, see: Escuer & Aromí (2006); Massoud *et al.* (2007). For thiocyanato-bridged polynuclear complexes, see: Zhang *et al.* (2001); Dey *et al.* (2004). For cyano-bridged polynuclear complexes, see: Liu *et al.* (2006); Mondal *et al.* (2001). For our previously reported Schiff base complexes, see: Li (2007*a*,*b*). For related structures, see: Hebbachi & Benali-Cherif (2005); Wang & You (2007); Diao *et al.* (2007); Usman *et al.* (2003).




## Experimental

### Crystal data

$[Cu(C_{12}H_{16}N_3O_3)(C_2H_3O_2)]$
$M_r$ = 372.86
Monoclinic, $P2_1/c$
$a$ = 13.834 (3) Å
$b$ = 11.661 (2) Å
$c$ = 9.988 (2) Å
$\beta$ = 99.86 (3)°
$V$ = 1587.5 (6) Å$^3$
$Z$ = 4
Mo $K\alpha$ radiation
$\mu$ = 1.41 mm$^{-1}$
$T$ = 298 (2) K
0.27 × 0.23 × 0.20 mm

### Data collection

Bruker SMART APEX CCD area-detector diffractometer
Absorption correction: multi-scan (*SADABS*; Sheldrick, 1996)
$T_{min}$ = 0.703, $T_{max}$ = 0.767
9081 measured reflections
3522 independent reflections
2037 reflections with $I > 2\sigma(I)$
$R_{int}$ = 0.087

### Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.079
$wR(F^2)$ = 0.184
$S$ = 1.00
3522 reflections
211 parameters
H-atom parameters constrained
$\Delta\rho_{max}$ = 0.85 e Å$^{-3}$
$\Delta\rho_{min}$ = −0.61 e Å$^{-3}$

**Table 1**
Selected geometric parameters (Å, °).

| | | | |
|---|---|---|---|
| Cu1—O3 | 1.946 (4) | Cu1—N2 | 2.091 (5) |
| Cu1—O4 | 1.965 (4) | Cu1—O5$^{i}$ | 2.265 (4) |
| Cu1—N1 | 1.992 (5) | | |
| O3—Cu1—O4 | 87.07 (17) | N1—Cu1—N2 | 93.3 (2) |
| O3—Cu1—N1 | 90.17 (18) | O3—Cu1—O5$^{i}$ | 92.62 (16) |
| O4—Cu1—N1 | 161.58 (19) | O4—Cu1—O5$^{i}$ | 107.21 (17) |
| O3—Cu1—N2 | 173.93 (19) | N1—Cu1—O5$^{i}$ | 91.10 (18) |
| O4—Cu1—N2 | 88.09 (19) | N2—Cu1—O5$^{i}$ | 92.32 (18) |

Symmetry code: (i) $x, -y+\frac{3}{2}, z-\frac{1}{2}$.

Data collection: *SMART* (Bruker, 1998); cell refinement: *SAINT* (Bruker, 1998); data reduction: *SAINT*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 1997*a*); program(s) used to refine structure: *SHELXL97* (Sheldrick, 1997*a*); molecular graphics: *SHELXTL* (Sheldrick, 1997*b*); software used to prepare material for publication: *SHELXTL*.

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Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: AT2461).

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# supplementary materials

*Acta Cryst.* (2007). E**63**, m2982-m2983 [ **doi:10.1107/S1600536807057376** ]

# *catena*-Poly[[{2-[3-(dimethylamino)propyliminomethyl]-4-nitrophenolato}copper(II)]-$\mu$-acetato]

**W.-H. Li**

## Comment

Polynuclear complexes are very interesting in both structures and properties in coordination chemistry. The azide, thiocyanate, and cyanide anions are often used to construct versatile polynuclear complexes (Escuer & Aromí, 2006; Massoud *et al.*, 2007; Zhang *et al.*, 2001; Dey *et al.*, 2004; Liu *et al.*, 2006; Mondal *et al.*, 2001). In comparison, the acetato-bridged polynuclear complexes are rarely seen. Recently, we have reported the crystal structures of some Schiff base complexes (Li, 2007*a*,b). In order to investigate the coordination modes of the acetate anions, the author reports herein the crystal structure of an acetato-bridged polynuclear copper(II) complex with Schiff base ligand 4-chloro-2-[(3-dimethylaminopropylimino)methyl]phenol (CMP).

The Cu atom in the acetato-bridged polynuclear complex is square-pyramidal coordinated by one Schiff base ligand CMP and two acetate anions (Fig. 1). The Schiff base molecule acts as a tridentate ligand coordinating the copper ion through the phenolic O atom, imine N atom and amine N atom. The acetate anion acts as a bridging group coordinating adjacent two copper ions through the two O atoms, one at the basal plane and the other one at the apical position. All the coordinated bond lengths and angles (Table 1) are comparable to the values in other similar Schiff base copper(II) complexes (Hebbachi & Benali-Cherif, 2005; Wang & You, 2007; Diao *et al.*, 2007; Usman *et al.*, 2003).

In the crystal structure, the [Cu(CMP)] units are linked through the bridging acetate groups, forming chains running along the *c* axis (Fig. 2).

## Experimental

5-Nitro-2-hydroxybenzaldehyde (0.1 mmol, 16.7 mg), *N*,*N*-dimethylpropane-1,3-diamine (0.1 mmol, 10.2 mg), and copper(II) acetate monohydrate (0.1 mmol, 19.9 mg) were mixed in methanol (20 ml) and the mixture was stirred for 30 min at room temperature. The reaction mixture was fitered. Blue block-shaped single crystals suitable for X-ray diffraction were formed from the filtrate after a week.

## Refinement

All H atom positions were positioned geometrically (C—H = 0.93–0.97 Å) and refined as riding, with $U_{iso}$(H) values set at 1.2$U_{eq}$(C) and 1.5$U_{eq}$(methyl C).

## Figures

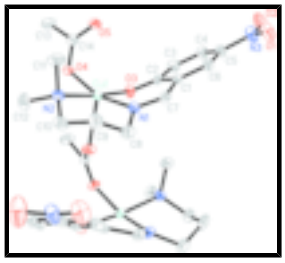

Fig. 1. The molecular structure of (I), shown with 30% probability displacement ellipsoids.

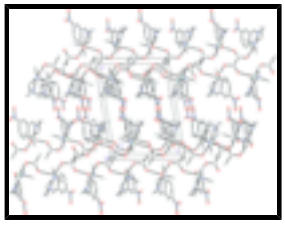

Fig. 2. Molecular packing of (I).

## *catena*-Poly[[{2-[3-(dimethylamino)propyliminomethyl]-4- nitrophenolato}copper(II)]-μ-acetato]

*Crystal data*

| | |
|---|---|
| $[Cu(C_{12}H_{16}N_3O_3)(C_2H_3O_2)]$ | $F_{000}$ = 772 |
| $M_r$ = 372.86 | $D_x$ = 1.560 Mg m$^{-3}$ |
| Monoclinic, $P2_1/c$ | Mo $K\alpha$ radiation<br>λ = 0.71073 Å |
| Hall symbol: -P 2ybc | Cell parameters from 1027 reflections |
| $a$ = 13.834 (3) Å | θ = 2.3–24.5º |
| $b$ = 11.661 (2) Å | μ = 1.41 mm$^{-1}$ |
| $c$ = 9.988 (2) Å | $T$ = 298 (2) K |
| β = 99.86 (3)º | Block, blue |
| $V$ = 1587.5 (6) Å$^3$ | 0.27 × 0.23 × 0.20 mm |
| $Z$ = 4 | |

*Data collection*

| | |
|---|---|
| Bruker SMART APEX CCD area-detector diffractometer | 3522 independent reflections |
| Radiation source: fine-focus sealed tube | 2037 reflections with $I > 2\sigma(I)$ |
| Monochromator: graphite | $R_{int}$ = 0.087 |
| $T$ = 298(2) K | $\theta_{max}$ = 27.5º |
| ω scans | $\theta_{min}$ = 1.5º |
| Absorption correction: multi-scan (SADABS; Sheldrick, 1996) | $h$ = −17→17 |
| $T_{min}$ = 0.703, $T_{max}$ = 0.767 | $k$ = −15→12 |
| 9081 measured reflections | $l$ = −12→12 |

*Refinement*

| | |
|---|---|
| Refinement on $F^2$ | Secondary atom site location: difference Fourier map |
| Least-squares matrix: full | Hydrogen site location: inferred from neighbouring sites |
| $R[F^2 > 2\sigma(F^2)] = 0.079$ | H-atom parameters constrained |
| $wR(F^2) = 0.184$ | $w = 1/[\sigma^2(F_o^2) + (0.0706P)^2]$ where $P = (F_o^2 + 2F_c^2)/3$ |
| $S = 1.00$ | $(\Delta/\sigma)_{max} < 0.001$ |
| 3522 reflections | $\Delta\rho_{max} = 0.85$ e Å$^{-3}$ |
| 211 parameters | $\Delta\rho_{min} = -0.61$ e Å$^{-3}$ |
| Primary atom site location: structure-invariant direct methods | Extinction correction: none |

*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* | $U_{iso}$*/$U_{eq}$ |
|---|---|---|---|---|
| Cu1 | 0.82621 (5) | 0.77042 (6) | 0.15549 (7) | 0.0297 (3) |
| O1 | 0.4913 (4) | 0.3131 (5) | 0.2555 (6) | 0.0722 (16) |
| O2 | 0.6056 (5) | 0.1905 (6) | 0.3039 (8) | 0.105 (3) |
| O3 | 0.8450 (3) | 0.6052 (4) | 0.1489 (4) | 0.0371 (11) |
| O4 | 0.9473 (3) | 0.7753 (4) | 0.2908 (4) | 0.0368 (10) |
| O5 | 0.8694 (3) | 0.7033 (4) | 0.4489 (4) | 0.0398 (11) |
| N1 | 0.6858 (4) | 0.7516 (4) | 0.0710 (5) | 0.0359 (13) |
| N2 | 0.8117 (4) | 0.9467 (4) | 0.1846 (5) | 0.0375 (13) |
| N3 | 0.5767 (5) | 0.2850 (6) | 0.2657 (7) | 0.0584 (17) |
| C1 | 0.6773 (4) | 0.5540 (5) | 0.1479 (6) | 0.0331 (14) |
| C2 | 0.7805 (4) | 0.5326 (5) | 0.1707 (5) | 0.0301 (14) |
| C3 | 0.8105 (5) | 0.4200 (6) | 0.2173 (6) | 0.0438 (17) |
| H3 | 0.8766 | 0.4006 | 0.2282 | 0.053* |
| C4 | 0.7456 (5) | 0.3407 (6) | 0.2461 (7) | 0.0453 (17) |
| H4 | 0.7677 | 0.2688 | 0.2781 | 0.054* |
| C5 | 0.6451 (5) | 0.3667 (6) | 0.2278 (6) | 0.0401 (16) |
| C6 | 0.6122 (5) | 0.4719 (5) | 0.1788 (6) | 0.0384 (15) |
| H6 | 0.5455 | 0.4884 | 0.1661 | 0.046* |

| | | | | |
|---|---|---|---|---|
| C7 | 0.6381 (4) | 0.6600 (6) | 0.0865 (6) | 0.0363 (15) |
| H7 | 0.5708 | 0.6619 | 0.0547 | 0.044* |
| C8 | 0.6331 (5) | 0.8417 (6) | −0.0144 (7) | 0.0504 (19) |
| H8A | 0.5644 | 0.8207 | −0.0362 | 0.061* |
| H8B | 0.6585 | 0.8453 | −0.0991 | 0.061* |
| C9 | 0.6408 (5) | 0.9577 (6) | 0.0489 (7) | 0.055 (2) |
| H9A | 0.6170 | 0.9539 | 0.1347 | 0.065* |
| H9B | 0.5986 | 1.0102 | −0.0099 | 0.065* |
| C10 | 0.7438 (5) | 1.0050 (6) | 0.0742 (7) | 0.0496 (18) |
| H10A | 0.7706 | 0.9991 | −0.0092 | 0.060* |
| H10B | 0.7410 | 1.0858 | 0.0964 | 0.060* |
| C11 | 0.7785 (6) | 0.9636 (6) | 0.3160 (6) | 0.057 (2) |
| H11A | 0.7702 | 1.0440 | 0.3311 | 0.085* |
| H11B | 0.8266 | 0.9329 | 0.3878 | 0.085* |
| H11C | 0.7172 | 0.9248 | 0.3147 | 0.085* |
| C12 | 0.9085 (5) | 1.0048 (6) | 0.1915 (8) | 0.056 (2) |
| H12A | 0.9020 | 1.0846 | 0.2119 | 0.084* |
| H12B | 0.9303 | 0.9972 | 0.1057 | 0.084* |
| H12C | 0.9556 | 0.9700 | 0.2615 | 0.084* |
| C13 | 1.0367 (5) | 0.7595 (6) | 0.5095 (7) | 0.054 (2) |
| H13A | 1.0349 | 0.8321 | 0.5545 | 0.081* |
| H13B | 1.0914 | 0.7581 | 0.4619 | 0.081* |
| H13C | 1.0437 | 0.6990 | 0.5757 | 0.081* |
| C14 | 0.9432 (5) | 0.7429 (5) | 0.4103 (6) | 0.0332 (15) |

*Atomic displacement parameters (Å$^2$)*

| | $U^{11}$ | $U^{22}$ | $U^{33}$ | $U^{12}$ | $U^{13}$ | $U^{23}$ |
|---|---|---|---|---|---|---|
| Cu1 | 0.0299 (4) | 0.0322 (5) | 0.0270 (4) | −0.0009 (3) | 0.0052 (3) | 0.0021 (3) |
| O1 | 0.057 (4) | 0.059 (4) | 0.109 (5) | −0.012 (3) | 0.038 (3) | 0.006 (3) |
| O2 | 0.086 (5) | 0.052 (4) | 0.183 (7) | −0.002 (4) | 0.043 (5) | 0.040 (5) |
| O3 | 0.032 (2) | 0.032 (3) | 0.048 (3) | −0.0026 (19) | 0.0119 (19) | −0.008 (2) |
| O4 | 0.044 (2) | 0.041 (3) | 0.025 (2) | −0.003 (2) | 0.0045 (17) | 0.004 (2) |
| O5 | 0.038 (2) | 0.054 (3) | 0.029 (2) | −0.006 (2) | 0.0133 (18) | 0.001 (2) |
| N1 | 0.034 (3) | 0.040 (4) | 0.033 (3) | −0.001 (2) | 0.006 (2) | 0.006 (2) |
| N2 | 0.050 (3) | 0.032 (3) | 0.033 (3) | 0.002 (2) | 0.013 (2) | 0.002 (2) |
| N3 | 0.059 (4) | 0.040 (4) | 0.081 (5) | −0.002 (3) | 0.024 (4) | 0.000 (4) |
| C1 | 0.047 (4) | 0.028 (4) | 0.026 (3) | −0.005 (3) | 0.009 (3) | −0.007 (3) |
| C2 | 0.033 (3) | 0.030 (4) | 0.028 (3) | −0.001 (3) | 0.006 (2) | −0.010 (3) |
| C3 | 0.049 (4) | 0.036 (4) | 0.046 (4) | 0.005 (3) | 0.004 (3) | 0.001 (3) |
| C4 | 0.054 (4) | 0.029 (4) | 0.052 (4) | 0.000 (3) | 0.007 (3) | 0.001 (3) |
| C5 | 0.049 (4) | 0.031 (4) | 0.043 (4) | −0.006 (3) | 0.015 (3) | −0.005 (3) |
| C6 | 0.038 (3) | 0.036 (4) | 0.043 (4) | −0.007 (3) | 0.012 (3) | −0.010 (3) |
| C7 | 0.030 (3) | 0.046 (4) | 0.032 (3) | −0.007 (3) | 0.001 (3) | −0.003 (3) |
| C8 | 0.052 (4) | 0.051 (5) | 0.044 (4) | 0.003 (3) | −0.004 (3) | 0.008 (4) |
| C9 | 0.052 (4) | 0.044 (5) | 0.061 (5) | 0.003 (4) | −0.009 (4) | 0.022 (4) |
| C10 | 0.063 (5) | 0.035 (4) | 0.052 (4) | 0.007 (3) | 0.012 (4) | 0.011 (3) |
| C11 | 0.082 (6) | 0.055 (5) | 0.033 (4) | 0.021 (4) | 0.009 (4) | 0.006 (4) |

| | | | | | | |
|---|---|---|---|---|---|---|
| C12 | 0.054 (4) | 0.035 (4) | 0.074 (5) | −0.007 (3) | 0.000 (4) | 0.003 (4) |
| C13 | 0.051 (4) | 0.081 (6) | 0.031 (3) | −0.003 (4) | 0.007 (3) | −0.001 (4) |
| C14 | 0.036 (3) | 0.032 (4) | 0.031 (3) | 0.008 (3) | 0.005 (3) | −0.001 (3) |

*Geometric parameters (Å, °)*

| | | | |
|---|---|---|---|
| Cu1—O3 | 1.946 (4) | C4—C5 | 1.404 (9) |
| Cu1—O4 | 1.965 (4) | C4—H4 | 0.9300 |
| Cu1—N1 | 1.992 (5) | C5—C6 | 1.370 (9) |
| Cu1—N2 | 2.091 (5) | C6—H6 | 0.9300 |
| Cu1—O5$^{i}$ | 2.265 (4) | C7—H7 | 0.9300 |
| O1—N3 | 1.215 (8) | C8—C9 | 1.490 (10) |
| O2—N3 | 1.211 (8) | C8—H8A | 0.9700 |
| O3—C2 | 1.276 (7) | C8—H8B | 0.9700 |
| O4—C14 | 1.262 (7) | C9—C10 | 1.509 (9) |
| O5—C14 | 1.241 (7) | C9—H9A | 0.9700 |
| O5—Cu1$^{ii}$ | 2.265 (4) | C9—H9B | 0.9700 |
| N1—C7 | 1.280 (7) | C10—H10A | 0.9700 |
| N1—C8 | 1.467 (8) | C10—H10B | 0.9700 |
| N2—C11 | 1.476 (8) | C11—H11A | 0.9600 |
| N2—C10 | 1.485 (8) | C11—H11B | 0.9600 |
| N2—C12 | 1.492 (8) | C11—H11C | 0.9600 |
| N3—C5 | 1.438 (9) | C12—H12A | 0.9600 |
| C1—C6 | 1.385 (8) | C12—H12B | 0.9600 |
| C1—C2 | 1.429 (8) | C12—H12C | 0.9600 |
| C1—C7 | 1.444 (9) | C13—C14 | 1.502 (9) |
| C2—C3 | 1.431 (9) | C13—H13A | 0.9600 |
| C3—C4 | 1.353 (9) | C13—H13B | 0.9600 |
| C3—H3 | 0.9300 | C13—H13C | 0.9600 |
| O3—Cu1—O4 | 87.07 (17) | N1—C7—C1 | 127.0 (6) |
| O3—Cu1—N1 | 90.17 (18) | N1—C7—H7 | 116.5 |
| O4—Cu1—N1 | 161.58 (19) | C1—C7—H7 | 116.5 |
| O3—Cu1—N2 | 173.93 (19) | N1—C8—C9 | 114.3 (5) |
| O4—Cu1—N2 | 88.09 (19) | N1—C8—H8A | 108.7 |
| N1—Cu1—N2 | 93.3 (2) | C9—C8—H8A | 108.7 |
| O3—Cu1—O5$^{i}$ | 92.62 (16) | N1—C8—H8B | 108.7 |
| O4—Cu1—O5$^{i}$ | 107.21 (17) | C9—C8—H8B | 108.7 |
| N1—Cu1—O5$^{i}$ | 91.10 (18) | H8A—C8—H8B | 107.6 |
| N2—Cu1—O5$^{i}$ | 92.32 (18) | C8—C9—C10 | 113.5 (6) |
| C2—O3—Cu1 | 123.4 (4) | C8—C9—H9A | 108.9 |
| C14—O4—Cu1 | 118.0 (4) | C10—C9—H9A | 108.9 |
| C14—O5—Cu1$^{ii}$ | 126.3 (4) | C8—C9—H9B | 108.9 |
| C7—N1—C8 | 116.9 (5) | C10—C9—H9B | 108.9 |
| C7—N1—Cu1 | 121.8 (4) | H9A—C9—H9B | 107.7 |
| C8—N1—Cu1 | 121.3 (4) | N2—C10—C9 | 114.6 (5) |
| C11—N2—C10 | 110.3 (5) | N2—C10—H10A | 108.6 |
| C11—N2—C12 | 108.2 (5) | C9—C10—H10A | 108.6 |

| | | | |
|---|---|---|---|
| C10—N2—C12 | 105.9 (5) | N2—C10—H10B | 108.6 |
| C11—N2—Cu1 | 107.9 (4) | C9—C10—H10B | 108.6 |
| C10—N2—Cu1 | 114.2 (4) | H10A—C10—H10B | 107.6 |
| C12—N2—Cu1 | 110.2 (4) | N2—C11—H11A | 109.5 |
| O2—N3—O1 | 122.4 (7) | N2—C11—H11B | 109.5 |
| O2—N3—C5 | 119.3 (7) | H11A—C11—H11B | 109.5 |
| O1—N3—C5 | 118.3 (6) | N2—C11—H11C | 109.5 |
| C6—C1—C2 | 120.9 (6) | H11A—C11—H11C | 109.5 |
| C6—C1—C7 | 118.3 (6) | H11B—C11—H11C | 109.5 |
| C2—C1—C7 | 120.7 (6) | N2—C12—H12A | 109.5 |
| O3—C2—C1 | 124.4 (6) | N2—C12—H12B | 109.5 |
| O3—C2—C3 | 119.5 (6) | H12A—C12—H12B | 109.5 |
| C1—C2—C3 | 116.0 (6) | N2—C12—H12C | 109.5 |
| C4—C3—C2 | 122.0 (6) | H12A—C12—H12C | 109.5 |
| C4—C3—H3 | 119.0 | H12B—C12—H12C | 109.5 |
| C2—C3—H3 | 119.0 | C14—C13—H13A | 109.5 |
| C3—C4—C5 | 120.2 (6) | C14—C13—H13B | 109.5 |
| C3—C4—H4 | 119.9 | H13A—C13—H13B | 109.5 |
| C5—C4—H4 | 119.9 | C14—C13—H13C | 109.5 |
| C6—C5—C4 | 120.1 (6) | H13A—C13—H13C | 109.5 |
| C6—C5—N3 | 119.6 (6) | H13B—C13—H13C | 109.5 |
| C4—C5—N3 | 120.3 (6) | O5—C14—O4 | 125.4 (6) |
| C5—C6—C1 | 120.7 (6) | O5—C14—C13 | 120.3 (5) |
| C5—C6—H6 | 119.7 | O4—C14—C13 | 114.3 (6) |
| C1—C6—H6 | 119.7 | | |

Symmetry codes: (i) *x*, −*y*+3/2, *z*−1/2; (ii) *x*, −*y*+3/2, *z*+1/2.

**Fig. 1**

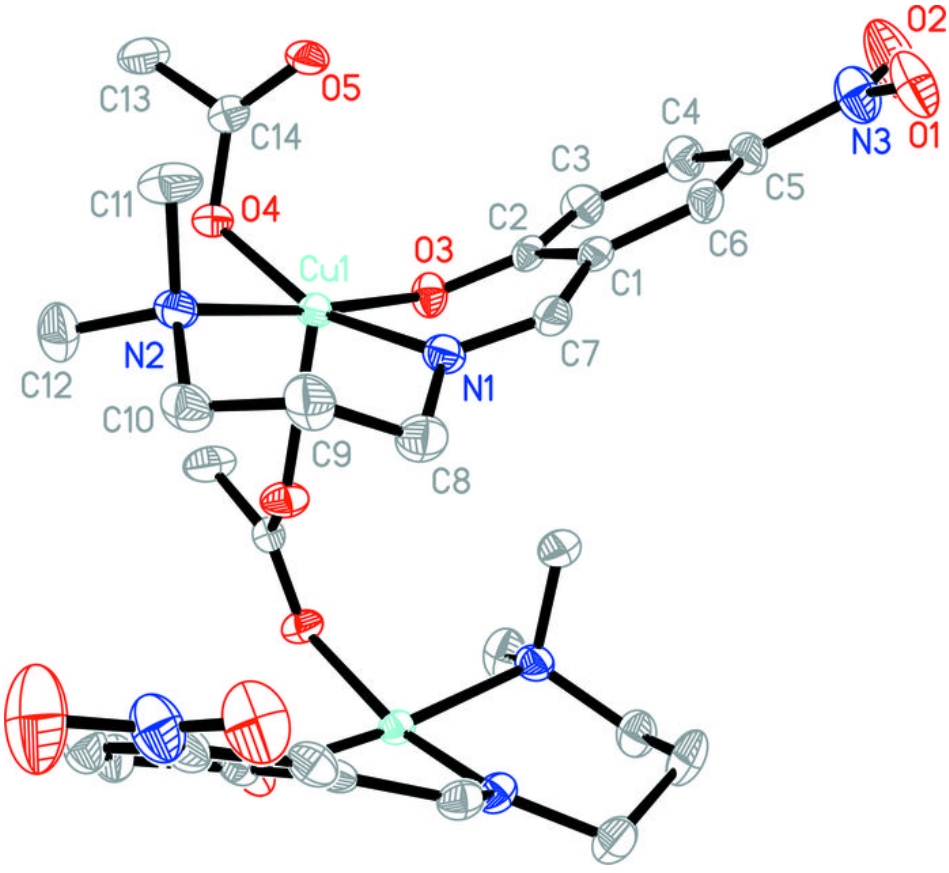
O2
O5
C13
C14
C4
C3
N3
O1
C11
O4
C5
C2
O3
C6
Cu1
C1
N2
C7
C12
N1
C10
C9
C8

**Fig. 2**