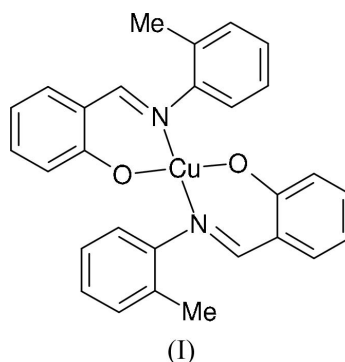


Hai-Liang Zhu,<sup>a\*</sup> Kui Cheng,<sup>a</sup>  
Zhong-Lu You<sup>b</sup> and Yu-Guang Li<sup>a</sup><sup>a</sup>Department of Chemistry, Wuhan University of Science and Engineering, Wuhan 430073, People's Republic of China, and <sup>b</sup>Department of Chemistry, Liaoning Normal University, Dalian 116029, People's Republic of ChinaCorrespondence e-mail:  
hailiang\_zhu@163.com**Key indicators**Single-crystal X-ray study  
*T* = 298 K  
Mean  $\sigma(\text{C}-\text{C}) = 0.011 \text{ \AA}$   
*R* factor = 0.060  
*wR* factor = 0.197  
Data-to-parameter ratio = 16.7For details of how these key indicators were automatically derived from the article, see <http://journals.iucr.org/e>.**Bis[2-(*o*-tolyliminomethyl)phenolato]copper(II)**

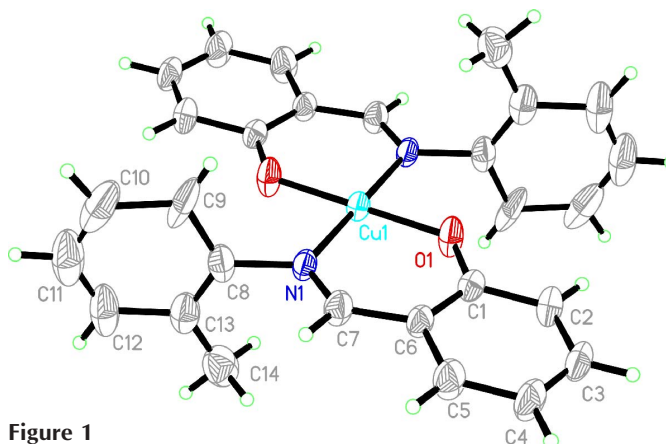
The title compound,  $[\text{Cu}(\text{C}_{14}\text{H}_{12}\text{NO})_2]$ , is a mononuclear copper(II) compound. The  $\text{Cu}^{\text{II}}$  atom, lying on a centre of symmetry, is four-coordinated by two N atoms and two O atoms from two Schiff base ligands, giving a square-planar geometry.

Received 9 March 2005  
Accepted 21 March 2005  
Online 31 March 2005**Comment**

Transition metal compounds containing Schiff base ligands have been of great interest for many years. These compounds play an important role in the development of coordination chemistry related to catalysis and enzymatic reactions, magnetism and molecular architectures (Costamagna *et al.*, 1992; Bhatia *et al.*, 1981). As an extension of the work on this series, a mononuclear copper(II) complex, (I), is reported here.



The title complex is a mononuclear copper(II) compound (Fig. 1). The Schiff base acts as a bidentate ligand and ligates



**Figure 1**  
The structure of the title compound, (I), showing 30% probability displacement ellipsoids and the atom-numbering scheme. Unlabelled atoms are related to labelled atoms by  $-x, 2 - y, -z$ .

to the Cu<sup>II</sup> atom through the phenolate O and imine N atoms. The two *trans* angles are both 180°, by crystallographic symmetry, as the Cu atom lies on an inversion centre. All other angles around the Cu<sup>II</sup> atom are close to 90° (Table 1), which indicates a slightly distorted square-planar geometry of the Cu<sup>II</sup> atom. The Cu1—N1 bond length of 1.998 (4) Å is a little longer than the corresponding bond distance of 1.927 (3) Å observed in a Schiff base copper(II) complex reported recently (You *et al.*, 2004). The Cu—O bond distance of 1.877 (3) Å is shorter than the corresponding value of 1.975 (3) Å observed in another Schiff base complex (You & Zhu, 2004). The C7=N1 bond distance of 1.300 (6) Å conforms to the value for a double bond, while the C8—N1 bond distance of 1.469 (6) Å conforms to the value for a single bond.

### Experimental

*o*-Toluidine and salicylaldehyde were available commercially and were used without further purification. *o*-Toluidine (2.0 mmol, 214 mg) and salicylaldehyde (2.0 mmol, 244 mg) were dissolved in methanol (100 ml). The mixture was stirred for 1 h to give a clear yellow solution. To this solution was added a methanol solution (30 ml) of Cu(NO<sub>3</sub>)<sub>2</sub>·3H<sub>2</sub>O (1.0 mmol, 241 mg) with stirring. After keeping the resulting solution in air for 15 d, black block-shaped crystals were formed at the bottom of the vessel on slow evaporation of the solvent. The crystals were isolated, washed three times with methanol and dried in a vacuum desiccator using P<sub>4</sub>O<sub>10</sub> (yield 92.7%). Analysis found: C 69.3, H 5.0, N 5.8%; calculated for C<sub>28</sub>H<sub>24</sub>CuN<sub>2</sub>O<sub>2</sub>: C 69.5, H 5.0, N 5.7%.

#### Crystal data

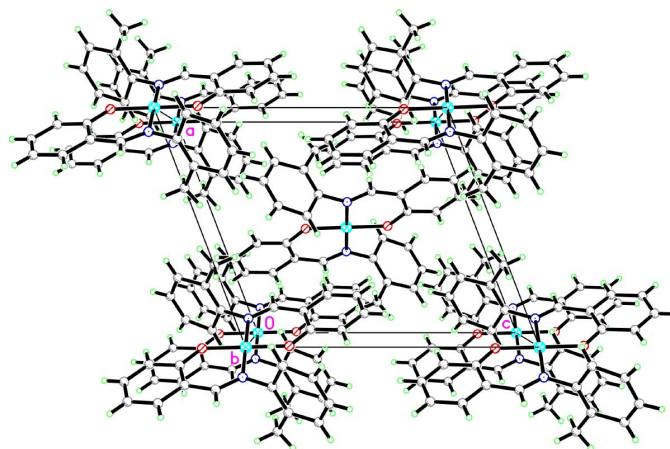
[Cu(C <sub>14</sub> H <sub>12</sub> NO) <sub>2</sub> ]	$D_x = 1.374 \text{ Mg m}^{-3}$
$M_r = 484.03$	Mo $K\alpha$ radiation
Monoclinic, $P2_1/n$	Cell parameters from 1213 reflections
$a = 10.931 (2) \text{ \AA}$	$\theta = 2.8\text{--}21.8^\circ$
$b = 9.149 (2) \text{ \AA}$	$\mu = 0.96 \text{ mm}^{-1}$
$c = 12.522 (1) \text{ \AA}$	$T = 298 (2) \text{ K}$
$\beta = 110.94 (2)^\circ$	Block, black
$V = 1169.6 (4) \text{ \AA}^3$	$0.25 \times 0.15 \times 0.11 \text{ mm}$
$Z = 2$	

#### Data collection

Bruker SMART CCD area-detector diffractometer	2541 independent reflections
$\omega$ scans	1393 reflections with $I > 2\sigma(I)$
Absorption correction: multi-scan (SADABS; Sheldrick, 1996)	$R_{\text{int}} = 0.054$
$T_{\text{min}} = 0.795$ , $T_{\text{max}} = 0.902$	$\theta_{\text{max}} = 27.0^\circ$
11859 measured reflections	$h = -13 \rightarrow 13$
	$k = -11 \rightarrow 11$
	$l = -15 \rightarrow 15$

#### Refinement

Refinement on $F^2$	$w = 1/[\sigma^2(F_o^2) + (0.0887P)^2 + 0.8345P]$
$R[F^2 > 2\sigma(F^2)] = 0.060$	where $P = (F_o^2 + 2F_c^2)/3$
$wR(F^2) = 0.197$	$(\Delta/\sigma)_{\text{max}} < 0.001$
$S = 1.08$	$\Delta\rho_{\text{max}} = 0.53 \text{ e \AA}^{-3}$
2541 reflections	$\Delta\rho_{\text{min}} = -0.26 \text{ e \AA}^{-3}$
152 parameters	
H-atom parameters constrained	



**Figure 2**  
The crystal packing of (I), viewed along the *b* axis.

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

Cu1—O1	1.877 (4)	Cu1—N1	1.999 (4)
O1 <sup>i</sup> —Cu1—O1	180	O1—Cu1—N1	91.65 (15)
O1 <sup>i</sup> —Cu1—N1	88.35 (15)	N1—Cu1—N1 <sup>i</sup>	180

Symmetry code: (i)  $-x, 2 - y, -z$ .

All the H atoms were placed in geometrically idealized positions and constrained to ride on their parent atoms, with C—H distances of 0.93–0.96 Å, and with  $U_{\text{iso}}(\text{H}) = 1.2$  or  $1.5U_{\text{eq}}(\text{C})$ .

Data collection: SMART (Siemens, 1996); cell refinement: SAINT (Siemens, 1996); data reduction: SAINT; program(s) used to solve structure: SHELXS97 (Sheldrick, 1997a); program(s) used to refine structure: SHELXL97 (Sheldrick, 1997a); molecular graphics: SHELXTL (Sheldrick, 1997b); software used to prepare material for publication: SHELXTL.

This project is sponsored by the Scientific Research Foundation for Returned Overseas Chinese Scholars.

### References

- Bhatia, S. C., Bindlish, J. M., Saini, A. R. & Jain, P. C. (1981). *J. Chem. Soc. Dalton Trans.* pp. 1773–1779.
- Costamagna, J., Vargas, J., Latorre, R., Alvarado, A. & Mena, G. (1992). *Coord. Chem. Rev.* **119**, 67–88.
- Sheldrick, G. M. (1996). *SADABS*. University of Göttingen, Germany.
- Sheldrick, G. M. (1997a). *SHELXL97* and *SHELXS97*. University of Göttingen, Germany.
- Sheldrick, G. M. (1997b). *SHELXTL*. Version 5.1. Bruker AXS Inc., Madison, Wisconsin, USA.
- Siemens (1996). SMART and SAINT. Siemens Analytical X-ray Instruments Inc., Madison, Wisconsin, USA.
- You, Z.-L., Chen, B., Zhu, H.-L. & Liu, W.-S. (2004). *Acta Cryst.* **E60**, m884–m886.
- You, Z.-L. & Zhu, H.-L. (2004). *Acta Cryst.* **C60**, m445–m446.