

Retraction of articles by H. Zhong *et al.*

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A series of 41 papers by H. Zhong *et al.* are retracted.

As a result of problems with the data sets and incorrect atom assignments, 41 papers by H. Zhong *et al.* are retracted. Full details of all the articles are given in Table 1.

Table 1

Details of articles to be retracted, in order of publication.

Title	Reference	DOI	Refcode
<i>Aquachlorobis(1,10-phenanthroline)cobalt(II) chloride thiourea solvate</i>	Zhong, Zeng, Liu & Luo (2006a)	10.1107/S1600536806041122	KERQEE
<i>cis-Dichlorobis(1,10-phenanthroline)cobalt(II)</i>	Zhong, Zeng & Luo (2006)	10.1107/S1600536806047295	MEQFOE
<i>Tris(quinolin-8-olato-κ²N,O)cobalt(III) glyoxal hemisolvate monohydrate</i>	Zhong, Zeng, Liu & Luo (2006b)	10.1107/S1600536806050240	MEQHEW
<i>(8-Quinololinol-κ²N,O)bis(8-quinolinolato-κ²N,O)nickel(II) glyoxal hemisolvate monohydrate</i>	Zhong, Zeng, Liu & Luo (2007)	10.1107/S1600536806053232	METVUD
<i>Aquachlorobis(1,10-phenanthroline)cobalt(II) chloride thioacetamide solvate</i>	Zhong, Zeng & Luo (2007)	10.1107/S1600536806053530	METQIM
<i>(8-Quinololinol-κ²N,O)-bis(8-quinolinolato-κ²N,O)zinc(II) glyoxal hemisolvate monohydrate</i>	Zhong, Zeng, Luo, Li & Xiao (2007)	10.1107/S1600536807001171	DEXTEG
<i>(Dimethylglyoxime-κ²N,N')bis(1,10-phenanthroline-κ²N,N')nickel(II) dinitrate dihydrate</i>	Zhong, Zeng, Yang, Luo & Li (2007a)	10.1107/S1600536807004102	YEYGOZ
<i>(Dimethylglyoxime-κ²N,N')bis(1,10-phenanthroline-κ²N,N')zinc(II) dinitrate dihydrate</i>	Zhong, Zeng, Yang, Luo & Li (2007b)	10.1107/S1600536807004096	YEYGUF
<i>Chloridobis(1,10-phenanthroline-κN,N')copper(I) hexahydrate</i>	Zhong, Zeng, Yang, Luo & Xiao (2007)	10.1107/S160053680700791X	HEGKOU1
<i>Tetrakis(pyridine-κN)bis(thiocyanato-κN)cobalt(II)</i>	Zhong, Zeng, Yang & Luo (2007a)	10.1107/S1600536807017461	ITCPCO1
<i>Tetrakis(pyridine-κN)bis(thiocyanato-κN)copper(II)</i>	Zhong, Zeng, Yang & Luo (2007b)	10.1107/S160053680701879X	AVUJEG02
<i>Tetrakis(nitrato-κ²O,O')bis(4-phenylpyridine-κN)cerium(IV)</i>	Zhong, Zeng, Yang & Luo (2007c)	10.1107/S1600536807018831	CICDOI
<i>Bis(4,4'-bipyridine-κ²N,N')tetrakis(nitrato-κ²O,O')cerium(IV)</i>	Zhong, Zeng, Yang & Luo (2007d)	10.1107/S1600536807021502	YIDNEF
<i>(1,10-Phenanthroline)tris(phenoxyacetato)lanthanum(III)</i>	Zhong, Zeng, Yang, Luo & Xu (2007)	10.1107/S1600536807027171	EDUROL
<i>(1,10-Phenanthroline)tris(phenoxyacetato)cerium(III)</i>	Zhong, Yang, Luo & Xu (2007a)	10.1107/S1600536807028061	EDUTUT
<i>(1,10-Phenanthroline)tri(3-phenylpropanoato)lanthanum(III)</i>	Zhong, Yang, Luo & Xu (2007b)	10.1107/S1600536807028693	RIGQEE
<i>(1,10-Phenanthroline-κ²N,N')tris(phenoxyacetato)-κO;κO;κO,O'-neodymium(III)</i>	Zhong, Yang, Luo & Xu (2007c)	10.1107/S1600536807030371	UDUMEM
<i>Bis(2,2'-bipyridyl-κ²N,N')bis(thiocyanato-κN)nickel(II)</i>	Zhong, Yang, Luo & Xu (2007d)	10.1107/S1600536807031613	YEJGOJ01
<i>Bis(2,2'-bipyridyl-κ²N,N')bis(isothiocyanato-κN)copper(II)</i>	Zhong, Yang, Luo & Xu (2007e)	10.1107/S1600536807033181	UFAPOH
<i>Bis(2,2'-bipyridyl-κ²N,N')bis(thiocyanato-κN)zinc(II)</i>	Zhong, Yang, Luo & Xu (2007f)	10.1107/S1600536807035337	TIGFAR
<i>(1,10-Phenanthroline-κ²N,N')tris(3-phenylpropanoato-κO)neodymium(III)</i>	Zhong, Yang, Luo & Xu (2007g)	10.1107/S1600536807035350	TIGFEV
<i>2-Fluoro-3,5-dinitrobenzamide monohydrate</i>	Zhong, Yang, Xie & Luo (2007j)	10.1107/S1600536807038676	VIKGAY
<i>2-Fluoro-3,5-dinitrobenzoic acid-ammonia (1/1)</i>	Zhong, Yang, Xie & Luo (2007k)	10.1107/S1600536807039724	KILKIA
<i>1-Hydroxy-4,6-dinitropyridine-2-carboxamide monohydrate</i>	Zhong, Yang, Xie & Luo (2007l)	10.1107/S1600536807040779	AFETAH
<i>N-(2-Hydroxyphenyl)carbamic acid-ammonia (1/1)</i>	Zhong, Yang, Xie & Luo (2007m)	10.1107/S160053680704086X	AFINAF
<i>catena-Poly[[bis(μ-anilinoacetato-κ²O:O')bis(μ-anilinoacetato-κ²O:O')bis(1,10-phenanthroline-κ²N,N')samarium(III)]-μ-anilinoacetato-κ²O:O']</i>	Zhong, Yang, Xie & Luo (2007a)	10.1107/S1600536807043528	PILDAQ
<i>2-Hydroxy-5-nitrobenzene-1,3-dicarboxylic acid monohydrate</i>	Zhong, Yang, Xie & Luo (2007n)	10.1107/S1600536807045199	XILWIZ
<i>catena-Poly[[tetra-μ-anilinoacetato-bis(1,10-phenanthroline)-dineodymium(III)]-di-μ-anilinoacetato]</i>	Zhong, Yang, Xie & Luo (2007b)	10.1107/S1600536807048489	WIMWEV
<i>Hexaaquacopper(II) bis(4-methylbenzenesulfonate)</i>	Zhong, Yang, Xie & Luo (2007c)	10.1107/S1600536807049525	TOLSCV01

Table 1 (continued)

Title	Reference	DOI	Refcode
<i>catena-Poly[[tetra-μ-anilinoacetato-bis(1,10-phenanthroline)-dilanthanum(III)]-di-μ-anilinoacetato]</i>	Zhong, Yang, Xie & Luo (2007d)	10.1107/S1600536807051240	GIMZEI
<i>Hexaaquachromium(II) bis(4-methylbenzenesulfonate)</i>	Zhong, Yang, Xie & Luo (2007e)	10.1107/S1600536807051227	GIMZIM
<i>Hexaaquamanganese(II) bis(4-methylbenzenesulfonate)</i>	Zhong, Yang, Xie & Luo (2007f)	10.1107/S1600536807052051	QUKQES01
<i>catena-Poly[(acetato-κO)(1,10-phenanthroline-κ^2N,N')cobalt(II)]-μ-acetato-κ^2O:O']</i>	Zhong, Yang, Xie & Luo (2007g)	10.1107/S1600536807053494	NIQLAB
<i>Hexaaquanickel(II) bis(4-aminobenzenesulfonate)</i>	Zhong, Zhong, Xie & Luo (2007a)	10.1107/S1600536807054372	HIPZOW
<i>catena-Poly[(acetato-κO)(1,10-phenanthroline-κ^2N,N')copper(II)]-μ-acetato-κ^2O:O']</i>	Zhong, Yang, Xie & Luo (2007h)	10.1107/S160053680705622X	XIRGOV
<i>Hexaaquazinc(II) bis(4-aminobenzenesulfonate)</i>	Zhong, Zhong, Xie & Luo (2007b)	10.1107/S1600536807056498	XIRJEO
<i>catena-Poly[(acetato-κO)(1,10-phenanthroline-κ^2N,N')nickel(II)]-μ-acetato-κ^2O:O']</i>	Zhong, Yang, Xie & Luo (2007i)	10.1107/S1600536807058540	HIQJOH
<i>Hexaaquacobalt(II) bis(4-aminobenzenesulfonate)</i>	Zhong, Xie & Luo (2007)	10.1107/S1600536807058527	HIQJUN
<i>catena-Poly[[tetra-μ-anilinoacetato-bis(1,10-phenanthroline)-dieuropium(III)]-di-μ-anilinoacetato]</i>	Zhong, Yang, Duan & Hong (2007)	10.1107/S1600536807060643	YIQMAN
<i>(Dimethylglyoxime-κ^2N,N')bis(1,10-phenanthroline-κ^2N,N')copper(II) dinirate dihydrate</i>	Zhong, Yang, Luo & Li (2007)	10.1107/S1600536807061193	YIQNUI
<i>catena-Poly[(1,10-phenanthroline-κ^2N,N')praseodymium(III)]-di-μ-phenoxyacetato-κ^4O:O'-[(1,10-phenanthroline-κ^2N,N')praseodymium(III)]-di-μ-phenoxyacetato-κ^4O:O'-di-μ-phenoxyacetato-κ^3O,O':κ^3O:O,O']</i>	Zhong, Yang, Luo & Xu (2008)	10.1107/S1600536807068614	GISJIC

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cis-Dichlorobis(1,10-phenanthroline)cobalt(II)Received 31 October 2006
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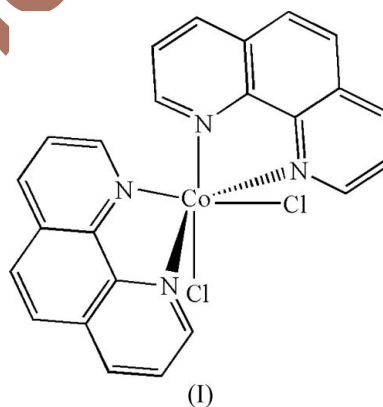
Key indicators

Single-crystal X-ray study
 $T = 273$ K
Mean $\sigma(\text{C}-\text{C}) = 0.005$ Å
 R factor = 0.044
 wR factor = 0.151
Data-to-parameter ratio = 16.8For details of how these key indicators were
automatically derived from the article, see
<http://journals.iucr.org/e>.

In the molecule of the title compound, *cis*-[CoCl₂(C₁₂H₈N₂)₂], the Co^{II} atom has a distorted octahedral coordination formed by four N atoms from two 1,10-phenanthroline ligands and two Cl atoms. In the crystal structure, molecules are linked into a three-dimensional framework by C—H···Cl hydrogen bonds. The supramolecular network is also consolidated by π – π stacking interactions.

Comment

In recent years, simple metal complexes of phenanthroline and its derivatives with π – π stacking have attracted great interest because they can be used to study the hydrolysis of biologically important phosphate diesters with poor electron-withdrawing groups (Wall *et al.*, 1999). These complexes can also be used to develop new diagnostic and therapeutic agents in DNA binding and cleavage (Barton, 1986; Deisenhofer & Michel, 1989; Naing *et al.*, 1995). A series of metal complexes incorporating different aromatic ligands such as phenanthroline, (phen), benzimidazole and quinoline has been prepared; their crystal structures provide useful information about π – π stacking (Wu *et al.*, 2003; Pan & Xu, 2004; Li *et al.*, 2005). We report here the crystal structure of the title compound, (I).



In the molecule of the title compound, (I) (Fig. 1), the ligand bond lengths and angles are within normal ranges (Allen *et al.*, 1987). The four N atoms of two phen ligands and two Cl atoms are coordinated to the Co^{II} atom, in a distorted octahedral arrangement (Table 1). Atoms N1 and Cl1 occupy the axial sites. The Co–N bonds [average 2.326 (2) Å] are somewhat shorter than the Co–Cl distances [average 2.4435 (8) Å]. The dihedral angle between the nearly planar phen ligands is 66.67 (3)°.

In the crystal structure, molecules are linked into a three-dimensional framework by C—H···Cl hydrogen bonds

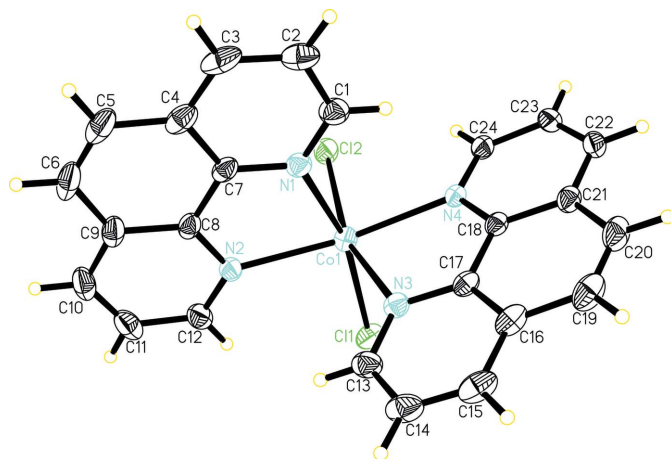


Figure 1
The molecular structure of (I), showing the atom-numbering scheme. Displacement ellipsoids are drawn at the 30% probability level.

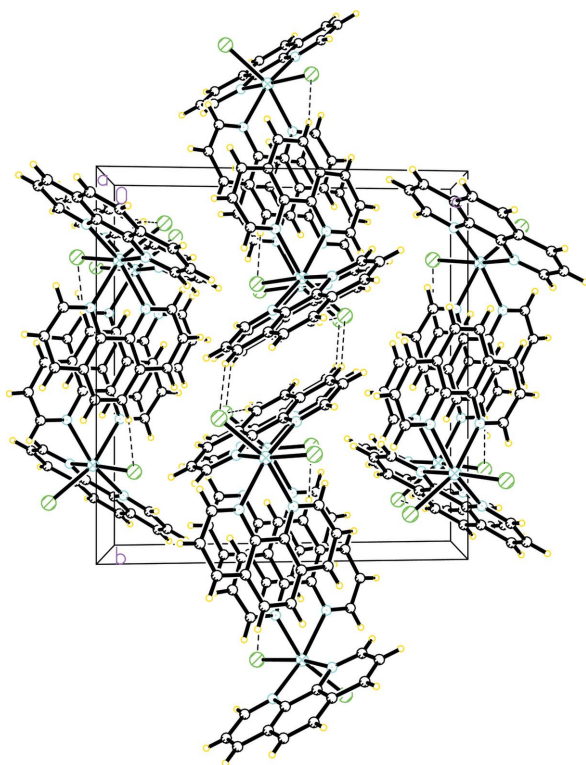


Figure 2
A packing diagram of (I). Hydrogen bonds are shown as dashed lines.

(Table 2). There are π - π stacking interactions between adjacent phen ligands, with a centroid-centroid distance of 3.618 (4) Å (symmetry code: $1 - x, -y, 1 - z$). These π - π stacking interactions and hydrogen bonds lead to a supramolecular network structure (Fig. 2).

Experimental

Cobalt dichloride hexahydrate (475 mg, 2 mmol), phen (396 mg, 2 mmol) and thioacetamide (75 mg, 1 mmol) were dissolved in ethanol (25 ml). The mixture was heated for 6 h under reflux with stirring. It was then filtered to give a clear solution, into which diethyl

ether vapour was allowed to condense in a closed vessel. After being allowed to stand for a few days at room temperature, some pink single crystals suitable for X-ray diffraction analysis precipitated.

Crystal data

[CuCl₂(C₁₂H₈N₂)₂]
M_r = 490.24
Monoclinic, *P*2₁/*c*
a = 9.4644 (3) Å
b = 15.1972 (5) Å
c = 14.5250 (5) Å
 β = 98.905 (1)°
V = 2063.98 (12) Å³

Z = 4
D_x = 1.578 Mg m⁻³
Mo *K*α radiation
 μ = 1.11 mm⁻¹
T = 273 (2) K
Block, pink
0.26 × 0.26 × 0.26 mm

Data collection

Bruker APEX-II area-detector diffractometer
 φ and ω scans
Absorption correction: multi-scan (SADABS; Sheldrick, 1996)
T_{min} = 0.761, *T_{max}* = 0.761

15028 measured reflections
4710 independent reflections
3486 reflections with *I* > 2σ(*I*)
R_{int} = 0.024
 θ_{\max} = 27.8°

Refinement

Refinement on *F*²
R [*F*² > 2σ(*F*²)] = 0.044
wR (*F*²) = 0.151
S = 1.00
4710 reflections
280 parameters
H-atom parameters constrained

$w = 1/[\sigma^2(F_o^2) + (0.1P)^2 + 0.745P]$
where $P = (F_o^2 + 2F_c^2)/3$
(Δ/σ)_{max} < 0.001
 $\Delta\rho_{\max} = 0.46 \text{ e } \text{Å}^{-3}$
 $\Delta\rho_{\min} = -0.78 \text{ e } \text{Å}^{-3}$

Table 1

Selected geometric parameters (Å, °).

Co1—C11	2.4381 (8)	Co1—N2	2.298 (2)
Co1—C12	2.4488 (8)	Co1—N3	2.369 (2)
Co1—N1	2.345 (2)	Co1—N4	2.291 (2)
C11—Co1—C12	104.11 (3)	Cl2—Co1—N4	90.82 (6)
C11—Co1—N1	161.10 (6)	N1—Co1—N2	71.54 (9)
C11—Co1—N2	94.19 (6)	N1—Co1—N3	82.81 (8)
C11—Co1—N3	86.92 (6)	N1—Co1—N4	89.15 (8)
C11—Co1—N4	102.53 (6)	N2—Co1—N3	97.27 (8)
C12—Co1—N1	90.35 (6)	N2—Co1—N4	158.89 (9)
C12—Co1—N2	97.56 (6)	N3—Co1—N4	71.20 (8)
C12—Co1—N3	160.76 (7)		

Table 2

Hydrogen-bond geometry (Å, °).

<i>D</i> —H... <i>A</i>	<i>D</i> —H	H... <i>A</i>	<i>D</i> ... <i>A</i>	<i>D</i> —H... <i>A</i>
C6—H6...Cl2 ⁱ	0.93	2.63	3.537 (3)	165
C19—H19...Cl1 ⁱⁱ	0.93	2.65	3.573 (3)	172
C22—H22...Cl1 ⁱⁱⁱ	0.93	2.79	3.651 (3)	154
C24—H24...Cl2	0.93	2.71	3.361 (3)	128

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

H atoms were positioned geometrically, with C—H = 0.93 Å, and constrained to ride on their parent atoms, with *U*_{iso}(H) = 1.2*U*_{eq}(C).

Data collection: *SMART* (Siemens, 1996); cell refinement: *SAINTE* (Siemens, 1996); data reduction: *SAINTE*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 1997); program(s) used to refine structure: *SHELXL97* (Sheldrick, 1997); molecular graphics:

SHELXTL (Siemens, 1996); software used to prepare material for publication: *SHELXTL*.

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