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Retraction of articles

This article reports the retraction of 39 articles published in *Acta Crystallographica Section E* between 2004 and 2009.

After thorough investigation (see Harrison *et al.*, 2010), 39 additional articles are retracted as a result of problems with the data sets or incorrect atom assignments. 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	Retracted by	DOI	Refcode
trans-Bis{1-[3-(cyclohexylamino)propyliminomethyl]-2-naphtholato}copper(II) dichloride dihydrate	Zhang (2004)	Journal	10.1107/S1600536804028296	BIPDUA
Bis(4-bromo-2-formylphenolato-κ^2O,O')copper(II)	Sun & Gao (2005)	Author	10.1107/S160053680500187X	FEYSUY
Bis(salicylaldehydo)zinc(II)	Xiong & Liu (2005)	Journal	10.1107/S1600536805010913	GAMDUU
Bis(4-bromo-2-formylphenolato-κ^2O,O')zinc(II)	Chen (2006)	Journal	10.1107/S1600536805040432	SAZCUS
Bis(2-formylphenolato-κ^2O,O')nickel(II)	Li & Chen (2006)	Journal	10.1107/S1600536806012931	IDAZAP
Bis(2-formylphenolato)cobalt(II)	Qiu (2006)	Journal	10.1107/S1600536806015704	GEJDUV
Bis(2-formylphenolato-κ^2O,O')manganese(II)	Wang & Fang (2006)	Journal	10.1107/S1600536806021039	IDOVED
Tetraaqua(1,10-phenanthroline-κ^2N,N')copper(II) naphthalene-1,5-disulfonate dihydrate	Liu *et al.* (2006)	Author	10.1107/S1600536806030637	GENYOO
Tetraaqua(1,10-phenanthroline-κ^2N,N')nickel(II) naphthalene-1,5-disulfonate dihydrate	Liu & Fan (2006)	Author	10.1107/S1600536806035410	KERBEP
{6,6′-Diethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-trinitratolutetium(III)copper(II)	Sui *et al.* (2006)	Journal	10.1107/S160053680604565X	HESPEP
Bis(2-formylphenolato-κ^2O,O')iron(II)	Yang *et al.* (2007)	Author	10.1107/S1600536807021721	PIFCAJ
2,6-Dimethoxybenzohydrazide	Qadeer *et al.* (2007*a*)	Journal	10.1107/S1600536807022593	PIFHES
2-(2,4-Dichlorophenylsulfanyl)acetohydrazide	Qadeer *et al.* (2007*b*)	Journal	10.1107/S1600536807022891	YIFSOW
{6,6′-Diethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-trinitratoeuropium(III)zinc(II)	Hu *et al.* (2007)	Author	10.1107/S1600536807031121	WIHKEE
{μ-6,6′-Diethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-trinitratocerium(III)zinc(II)	Sui, Zhang, Hu & Yin (2007)	Author	10.1107/S1600536807032564	WIHREL
{μ-6,6′-Diethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-trinitratopraseodymium(III)zinc(II)	Chen *et al.* (2007)	Author	10.1107/S1600536807032540	WIHRIP
{μ-6,6′-Diethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-trinitratopraseodymium(III)nickel(II)	Sui, Li *et al.* (2007)	Author	10.1107/S1600536807032618	UFACUA
{6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato-1$\kappa^4O^1,O^{1'},O^6,O^{6'}$:2$\kappa^4O^1,N,N',O^{1'}$}(methanol-1κO)-μ-nitrato-1:2κ^2O:O′-dinitrato-1κ^4O,O'-cerium(III)zinc(II)	Sui, Fang, Hu & Lin (2007)	Author	10.1107/S1600536807033314	UDUYIC
{6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-methanol-μ-nitrato-dinitratosamarium(III)nickel(II)	Sui, Zhang, Hu & Jiang (2007)	Author	10.1107/S1600536807037130	AFECEU
{6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-methanol-μ-nitrato-dinitratopraseodymium(III)zinc(II)	Sui, Fang & Yuan (2007)	Author	10.1107/S1600536807037488	AFICEY
{6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-methanol-μ-nitrato-dinitratolutetium(III)zinc(II)	Sui, Sui *et al.* (2007)	Author	10.1107/S1600536807037737	AFEFOH
catena-Poly[[chloridonickel(II)]-di-μ-chlorido-[chloridonickel(II)]-μ-4,4′-methylenebis(3,5-dimethylpyrazole)-κ^2N^2:$N^{2'}$]	Huang & Chen (2007)	Author	10.1107/S1600536807039384	VIJYOD
{2,2′-[o-Phenylenebis(nitrilomethylidyne)]diphenolato}zinc(II)	Liu *et al.* (2007*a*)	Author	10.1107/S1600536807040640	DIKYUS
trans-Bis(ethylenediamine-κ^2N,N')bis(nitrato-κO)zinc(II)	Liu, Zeng & Chen (2007)	Author	10.1107/S1600536807042390	XIKYEW
[N,N′-(o-Phenylene)bis(picolinamido)-κ^4N,N',N'',N''']cobalt(II)	Liu & Zeng (2007*a*)	Author	10.1107/S1600536807044571	XILFII
[N,N′-(o-Phenylene)dipicolinamide-κ^4N]nickel(II)	Liu & Zeng (2007*b*)	Author	10.1107/S1600536807048386	WINWEW
{2,2′-[o-Phenylenebis(nitrilomethylidyne)]diphenolato}manganese(II)	Liu *et al.* (2007*b*)	Author	10.1107/S1600536807052993	VIQPIV
N-(2-Amino-3-pyridyl)urea monohydrate	Li *et al.* (2007)	Author	10.1107/S1600536807047526	SIMFEA
N-(2-Fluorophenyl)carbamic acid monohydrate	Yang (2007)	Author	10.1107/S1600536807052464	WINMOW
Aqua(dimethylglyoxime-κ^2N,N')(3,5-dinitro-2-oxidobenzoato-κ^2O^1,O^2)-copper(II)	Liu & Wen (2007)	Author	10.1107/S1600536807054244	HIQCAM
μ-Acetato-tri-μ-ferrocenecarboxylatobis[(N,N-dimethylformamide)-copper(II)]	Liu, Lin *et al.* (2007)	Journal	10.1107/S1600536807059041	HIQQEE

 doi:10.1107/S1600536809054300

Table 1 (continued)

Title	Reference	Retracted by	DOI	Refcode
{μ-6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-μ-nitrato-dinitratoeuropium(III)zinc(II)	Hu *et al.* (2008)	Author	10.1107/S160053680706151X	MIRPAF
Bis(4-chloro-2-formylphenolato)nickel(II)	Li *et al.* (2008)	Author	10.1107/S1600536807056309	RISTET
{μ-6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-μ-nitrato-dinitratoterbium(III)zinc(II)	Chen *et al.* (2008)	Author	10.1107/S1600536808006958	QIXHIP
Bis(2-ethoxy-6-formylphenolato-κ^2O^1,O^6)nickel(II)	Han (2008)	Journal	10.1107/S160053680800809X	QIXLIT
{μ-6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-μ-nitrato-dinitratoholmium(III)zinc(II)	Xiao, Sui *et al.* (2008)	Author	10.1107/S1600536808013743	BIZTUA
{μ-6,6′-Diethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}-trinitratoholmium(III)nickel(II)	Xiao, Fu *et al.* (2008)	Author	10.1107/S1600536808013755	BIZVAI
Hydrogen-bonding patterns in the cocrystal terephthalic acid–4,4′-bipyridine (2/1)	Wang *et al.* (2009)	Journal	10.1107/S160053680903236X	DUCZEH
{6,6′-Dimethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato-1$\kappa^4O^1,O^{1'},O^6,O^{6'}$:2$\kappa^4O^1,N,N',O^{1'}$}(ethanol-1κO)-μ-nitrato-1:2κ^2O:O′-dinitrato-1κ^4O,O′-samarium(III)zinc(II)	Huang *et al.* (2009)	Journal	10.1107/S1600536809033558	YUCWAV

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Sui, Y., Zhang, J.-H., Hu, R.-H. & Jiang, R.-Q. (2007). *Acta Cryst.* E**63**, m2256–m2257.
Sui, Y., Zhang, J.-H., Hu, R.-H. & Yin, L.-Y. (2007). *Acta Cryst.* E**63**, m2089–m2090.
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{2,2′-[*o*-Phenylenebis(nitrilomethylidyne)]diphenolato}manganese(II)

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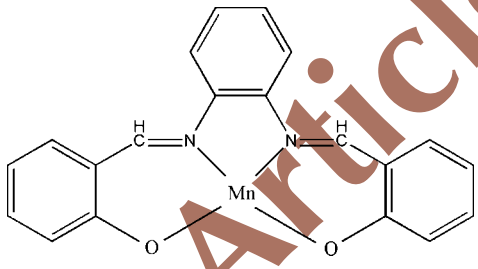
Key indicators: single-crystal X-ray study; T = 293 K; mean σ(C–C) = 0.010 Å; R factor = 0.059; wR factor = 0.161; data-to-parameter ratio = 12.9.

The title complex, $[Mn(C_{20}H_{14}N_2O_2)]$, is a mononuclear manganese(II) compound. The manganese(II) ion is four-coordinated in a square-planar geometry by two imine N and two phenolate O atoms from one 2,2′-[*o*-phenylenebis(nitrilomethylidyne)]diphenolate Schiff base ligand. No strong hydrogen bonds were found in the crystal structure.

Related literature

For related literature, see: Liu *et al.* (2007).



Experimental

Crystal data

$[Mn(C_{20}H_{14}N_2O_2)]$
M_r = 369.27
Orthorhombic, $P2_12_12_1$
a = 5.4676 (6) Å
b = 16.6244 (19) Å
c = 17.324 (2) Å
V = 1574.7 (3) Å^3
Z = 4
Mo $K\alpha$ radiation
μ = 0.85 mm^{-1}
T = 293 (2) K
0.25 × 0.08 × 0.07 mm

Data collection

Bruker SMART CCD area-detector diffractometer
Absorption correction: none
9864 measured reflections
2930 independent reflections
2298 reflections with $I > 2\sigma(I)$
R_{int} = 0.046

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.059
$wR(F^2)$ = 0.161
S = 1.06
2930 reflections
227 parameters
H-atom parameters constrained
$\Delta\rho_{max}$ = 0.81 e Å^{-3}
$\Delta\rho_{min}$ = −0.37 e Å^{-3}
Absolute structure: Flack (1983), 1204 Friedel pairs
Flack parameter: −0.13 (5)

Data collection: *SMART* (Bruker, 1997); cell refinement: *SAINT* (Bruker, 1997); data reduction: *SAINT*; 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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Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: HG2322).

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supplementary materials

Acta Cryst. (2007). E**63**, m2854 [**doi:10.1107/S1600536807052993**]

{2,2'-[*o*-Phenylenebis(nitrilomethylidyne)]diphenolato}manganese(II)

Y.-Q. Liu, X.-R. Zeng, Q.-Y. Luo and Y.-P. Xu

Comment

The X-ray structure determination shows the title complex to be a discrete molecular compound (Fig.1). Each manganese(II) ion is four-coordinated in a square-planar geometry by two imine N and two phenolate O atoms from one 2,2'-[*o*-phenylenebis(nitrilomethylidyne)]- diphenolate Schiff base ligand, coordination bond length are listed as: Mn1—N1 1.853 (5) Å; Mn1—N2 1.852 (5) Å; Mn1—O1 1.834 (4) Å; Mn1—O2 1.841 (4) Å. Atom O1, O2, N1 and N2 are approximately coplanar with the central Mn cation, the maximum deviation from the least-squares plane through all five atoms being 0.0141Å for atom O1. The structure of a related complex, $ZnC_{20}H_{14}N_2O_2$ has been reported (Liu *et al.*, 2007). No strong hydrogen bonds are found with the the three-dimensional framework of the crystal mainly constructed by weak intermolecular interactions.

Experimental

A mixture of 2,2'-[*o*-phenylenebis(nitrilomethylidyne)]- diphenolate Schiff base (0.341 g, 0.001 mol)and $MnSO_4{\cdot}H_2O$ (0.169 g, 0.001 mol) in the More ratio of 1:1 was added to methanol, The mixture was heated at 365 K or so for 5 h under reflux with stirring·The resulting solution was then filtered off. Single crystals suitable for X-ray diffraction analysis formed after a week by slow evaporation of the solvent.

Refinement

All H atoms were located at calculated positions and refined as riding on their parent C atoms with the C—H bond length fixed to 0.93Å with U_{iso}(H) = 1.2 times U_{eq}(C).

Figures

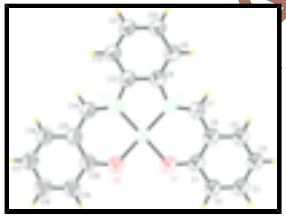

Fig. 1. The asymmetric unit of (I), showing atom labelling and 50% probability displacement ellipsoids for the non-hydrogen atoms.

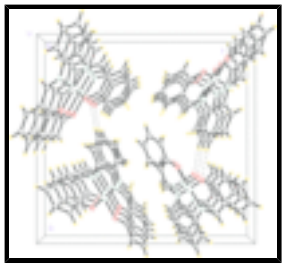

Fig. 2. The packing diagram of (I), viewed along the *a* axis.

{2,2'-[*o*-Phenylenebis(nitrilomethylidyne)]diphenolato}manganese(II)

Crystal data

$[Mn(C_{20}H_{14}N_2O_2)]$	F_{000} = 756.0
M_r = 369.27	D_x = 1.558 Mg m^{-3}
Orthorhombic, $P2_12_12_1$	Mo $K\alpha$ radiation λ = 0.71073 Å
Hall symbol: P 2ac 2ab	Cell parameters from 3944 reflections
a = 5.4676 (6) Å	θ = 1.0–28.3°
b = 16.6244 (19) Å	μ = 0.85 mm^{-1}
c = 17.324 (2) Å	T = 293 (2) K
V = 1574.7 (3) Å^3	Block, brown
Z = 4	0.25 × 0.08 × 0.07 mm

Data collection

Bruker SMART CCD area-detector diffractometer	2298 reflections with $I > 2\sigma(I)$
Radiation source: fine-focus sealed tube	R_{int} = 0.046
Monochromator: graphite	θ_{max} = 25.5°
T = 293(2) K	θ_{min} = 1.7°
φ and ω scans	h = −6→6
Absorption correction: none	k = −20→20
9864 measured reflections	l = −20→20
2930 independent reflections	

Refinement

Refinement on F^2	H-atom parameters constrained
Least-squares matrix: full	$w = 1/[\sigma^2(F_o^2) + (0.0556P)^2 + 2.0762P]$ where $P = (F_o^2 + 2F_c^2)/3$
$R[F^2 > 2\sigma(F^2)]$ = 0.059	$(\Delta/\sigma)_{max} < 0.001$
$wR(F^2)$ = 0.161	$\Delta\rho_{max}$ = 0.81 e Å^{-3}
S = 1.06	$\Delta\rho_{min}$ = −0.37 e Å^{-3}
2930 reflections	Extinction correction: SHELXL97 (Sheldrick, 1997), $Fc^*=kFc[1+0.001xFc^2\lambda^3/\sin(2\theta)]^{-1/4}$
227 parameters	Extinction coefficient: 0.020 (3)
Primary atom site location: structure-invariant direct methods	Absolute structure: Flack (1983)
Secondary atom site location: difference Fourier map	Flack parameter: −0.13 (5)
Hydrogen site location: inferred from neighbouring sites	

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 $F^2 > 2\text{sigma}(F^2)$ 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}
Mn1	0.15024 (15)	0.77722 (5)	0.31030 (4)	0.0471 (3)
O1	0.1505 (9)	0.8737 (2)	0.3616 (2)	0.0654 (11)
O2	0.4255 (9)	0.8173 (2)	0.2628 (2)	0.0626 (12)
N1	−0.1267 (10)	0.7379 (3)	0.3591 (3)	0.0609 (13)
N2	0.1512 (11)	0.6815 (3)	0.2556 (3)	0.0602 (13)
C1	−0.0151 (14)	0.9022 (4)	0.4090 (4)	0.0649 (17)
C2	0.0095 (13)	0.9814 (4)	0.4377 (4)	0.0660 (17)
H2	0.1447	1.0119	0.4235	0.079*
C3	−0.1621 (14)	1.0137 (4)	0.4859 (4)	0.0668 (16)
H3	−0.1421	1.0664	0.5028	0.080*
C4	−0.3658 (14)	0.9706 (4)	0.5105 (4)	0.0674 (17)
H4	−0.4777	0.9933	0.5446	0.081*
C5	−0.3974 (13)	0.8939 (4)	0.4834 (4)	0.0664 (18)
H5	−0.5348	0.8648	0.4982	0.080*
C6	−0.2241 (13)	0.8582 (4)	0.4332 (4)	0.0648 (17)
C7	−0.2680 (13)	0.7784 (4)	0.4071 (3)	0.0625 (15)
H7	−0.4076	0.7527	0.4253	0.075*
C8	−0.1898 (13)	0.6582 (4)	0.3369 (4)	0.0616 (16)
C9	−0.3811 (13)	0.6121 (4)	0.3653 (4)	0.0635 (16)
H9	−0.4812	0.6321	0.4042	0.076*
C10	−0.4224 (13)	0.5357 (4)	0.3353 (4)	0.0648 (17)
H10	−0.5559	0.5057	0.3520	0.078*
C11	−0.2629 (14)	0.5040 (4)	0.2800 (4)	0.0649 (17)
H11	−0.2875	0.4521	0.2617	0.078*
C12	−0.0690 (14)	0.5489 (4)	0.2523 (4)	0.0636 (17)
H12	0.0362	0.5275	0.2155	0.076*
C13	−0.0334 (13)	0.6267 (4)	0.2803 (4)	0.0615 (16)
C14	0.2948 (12)	0.6644 (4)	0.1966 (4)	0.0618 (16)
H14	0.2688	0.6156	0.1717	0.074*
C15	0.4841 (13)	0.7136 (4)	0.1683 (4)	0.0639 (16)
C16	0.6217 (13)	0.6860 (4)	0.1047 (4)	0.0657 (17)
H16	0.5813	0.6371	0.0820	0.079*
C17	0.8115 (12)	0.7291 (4)	0.0758 (4)	0.0670 (16)

H17	0.8961	0.7108	0.0327	0.080*
C18	0.8798 (14)	0.8022 (4)	0.1118 (4)	0.0663 (17)
H18	1.0134	0.8312	0.0936	0.080*
C19	0.7471 (13)	0.8303 (4)	0.1739 (4)	0.0650 (17)
H19	0.7913	0.8789	0.1965	0.078*
C20	0.5471 (13)	0.7875 (4)	0.2040 (4)	0.0632 (16)

Atomic displacement parameters (Å^2)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Mn1	0.0554 (5)	0.0423 (4)	0.0437 (4)	0.0039 (4)	−0.0010 (4)	0.0021 (3)
O1	0.075 (3)	0.056 (2)	0.065 (3)	−0.003 (2)	0.009 (3)	−0.0109 (19)
O2	0.067 (3)	0.057 (2)	0.064 (3)	0.000 (2)	0.010 (2)	0.001 (2)
N1	0.068 (3)	0.055 (3)	0.059 (3)	−0.003 (3)	0.009 (3)	−0.004 (2)
N2	0.070 (3)	0.052 (3)	0.058 (3)	0.001 (3)	0.006 (3)	−0.005 (2)
C1	0.075 (5)	0.056 (4)	0.064 (4)	−0.001 (3)	0.008 (4)	−0.010 (3)
C2	0.076 (4)	0.057 (3)	0.065 (4)	0.000 (3)	0.007 (4)	−0.010 (3)
C3	0.077 (4)	0.058 (3)	0.065 (4)	0.001 (4)	0.007 (4)	−0.010 (3)
C4	0.076 (5)	0.060 (4)	0.066 (4)	0.001 (4)	0.008 (4)	−0.009 (3)
C5	0.074 (5)	0.060 (4)	0.065 (4)	0.001 (3)	0.008 (3)	−0.008 (3)
C6	0.073 (4)	0.058 (4)	0.063 (4)	0.000 (3)	0.008 (3)	−0.007 (3)
C7	0.069 (4)	0.058 (3)	0.061 (3)	−0.001 (4)	0.009 (3)	−0.005 (3)
C8	0.070 (4)	0.054 (3)	0.060 (3)	−0.004 (3)	0.006 (3)	−0.003 (3)
C9	0.072 (4)	0.056 (3)	0.063 (4)	−0.005 (3)	0.005 (3)	−0.002 (3)
C10	0.074 (5)	0.056 (4)	0.064 (4)	−0.006 (3)	0.005 (3)	−0.003 (3)
C11	0.075 (4)	0.055 (4)	0.065 (4)	−0.005 (3)	0.004 (3)	−0.004 (3)
C12	0.074 (5)	0.054 (3)	0.063 (4)	−0.004 (3)	0.004 (3)	−0.004 (3)
C13	0.072 (4)	0.053 (3)	0.060 (3)	−0.003 (3)	0.004 (3)	−0.004 (3)
C14	0.071 (4)	0.055 (3)	0.059 (3)	0.003 (3)	0.007 (3)	−0.005 (3)
C15	0.071 (4)	0.059 (4)	0.062 (4)	0.004 (3)	0.008 (3)	0.000 (3)
C16	0.072 (5)	0.062 (4)	0.063 (4)	0.004 (4)	0.009 (4)	0.000 (3)
C17	0.072 (4)	0.064 (4)	0.065 (4)	0.005 (4)	0.010 (3)	0.002 (3)
C18	0.070 (4)	0.063 (4)	0.065 (4)	0.004 (3)	0.011 (4)	0.004 (3)
C19	0.069 (4)	0.061 (4)	0.065 (4)	0.003 (3)	0.011 (3)	0.003 (3)
C20	0.068 (4)	0.058 (4)	0.063 (4)	0.002 (3)	0.010 (3)	0.002 (3)

Geometric parameters (Å, °)

Mn1—O1	1.834 (4)	C8—C9	1.387 (9)
Mn1—O2	1.841 (4)	C8—C13	1.402 (9)
Mn1—N2	1.852 (5)	C9—C10	1.390 (9)
Mn1—N1	1.853 (5)	C9—H9	0.9300
O1—C1	1.310 (7)	C10—C11	1.399 (9)
O2—C20	1.314 (7)	C10—H10	0.9300
N1—C7	1.320 (7)	C11—C12	1.383 (9)
N1—C8	1.422 (8)	C11—H11	0.9300
N2—C14	1.320 (8)	C12—C13	1.396 (8)
N2—C13	1.425 (8)	C12—H12	0.9300
C1—C2	1.414 (9)	C14—C15	1.408 (9)

C1—C6	1.419 (10)	C14—H14	0.9300
C2—C3	1.366 (9)	C15—C16	1.410 (9)
C2—H2	0.9300	C15—C20	1.418 (9)
C3—C4	1.392 (9)	C16—C17	1.357 (9)
C3—H3	0.9300	C16—H16	0.9300
C4—C5	1.369 (8)	C17—C18	1.416 (9)
C4—H4	0.9300	C17—H17	0.9300
C5—C6	1.417 (9)	C18—C19	1.379 (9)
C5—H5	0.9300	C18—H18	0.9300
C6—C7	1.422 (9)	C19—C20	1.405 (9)
C7—H7	0.9300	C19—H19	0.9300
O1—Mn1—O2	84.2 (2)	C13—C8—N1	112.8 (6)
O1—Mn1—N2	178.2 (2)	C8—C9—C10	119.7 (6)
O2—Mn1—N2	94.6 (2)	C8—C9—H9	120.2
O1—Mn1—N1	95.1 (2)	C10—C9—H9	120.2
O2—Mn1—N1	179.3 (2)	C9—C10—C11	119.9 (6)
N2—Mn1—N1	86.1 (2)	C9—C10—H10	120.0
C1—O1—Mn1	128.2 (4)	C11—C10—H10	120.0
C20—O2—Mn1	128.6 (4)	C12—C11—C10	120.8 (6)
C7—N1—C8	120.2 (6)	C12—C11—H11	119.6
C7—N1—Mn1	125.8 (4)	C10—C11—H11	119.6
C8—N1—Mn1	113.8 (4)	C11—C12—C13	119.1 (6)
C14—N2—C13	121.1 (5)	C11—C12—H12	120.4
C14—N2—Mn1	125.6 (4)	C13—C12—H12	120.4
C13—N2—Mn1	113.2 (4)	C12—C13—C8	120.2 (6)
O1—C1—C2	119.4 (6)	C12—C13—N2	125.9 (6)
O1—C1—C6	123.7 (6)	C8—C13—N2	113.8 (5)
C2—C1—C6	116.9 (6)	N2—C14—C15	125.6 (6)
C3—C2—C1	121.0 (7)	N2—C14—H14	117.2
C3—C2—H2	119.5	C15—C14—H14	117.2
C1—C2—H2	119.5	C14—C15—C16	118.4 (6)
C2—C3—C4	122.3 (6)	C14—C15—C20	122.0 (6)
C2—C3—H3	118.8	C16—C15—C20	119.5 (6)
C4—C3—H3	118.8	C17—C16—C15	121.6 (6)
C5—C4—C3	118.4 (7)	C17—C16—H16	119.2
C5—C4—H4	120.8	C15—C16—H16	119.2
C3—C4—H4	120.8	C16—C17—C18	119.6 (6)
C4—C5—C6	121.1 (7)	C16—C17—H17	120.2
C4—C5—H5	119.5	C18—C17—H17	120.2
C6—C5—H5	119.5	C19—C18—C17	119.6 (7)
C5—C6—C1	120.3 (6)	C19—C18—H18	120.2
C5—C6—C7	118.2 (6)	C17—C18—H18	120.2
C1—C6—C7	121.5 (6)	C18—C19—C20	121.9 (7)
N1—C7—C6	125.3 (6)	C18—C19—H19	119.1
N1—C7—H7	117.4	C20—C19—H19	119.1
C6—C7—H7	117.4	O2—C20—C19	119.3 (6)
C9—C8—C13	120.1 (6)	O2—C20—C15	122.9 (6)
C9—C8—N1	127.0 (6)	C19—C20—C15	117.8 (6)

Fig. 1

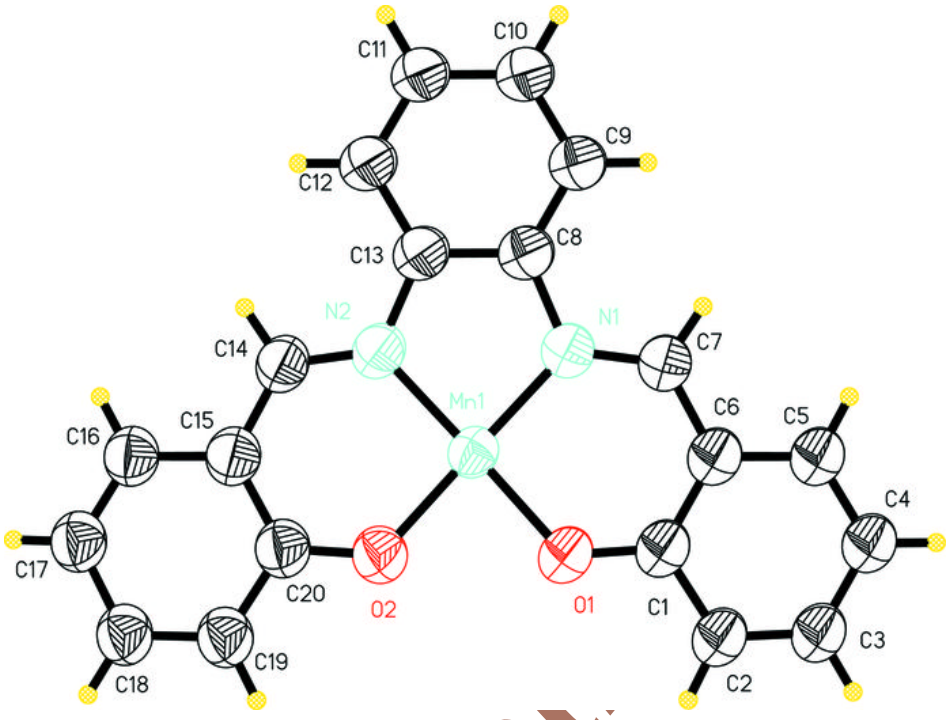

Fig. 2