Acta Crystallographica Section E
Structure Reports Online
ISSN 1600-5368

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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Acta Crystallographica Section E
Structure Reports Online
ISSN 1600-5368

{6,6′-Diethoxy-2,2′-[ethane-1,2-diyl-bis(nitrilomethylidyne)]diphenolato}-trinitratoeuropium(III)zinc(II)

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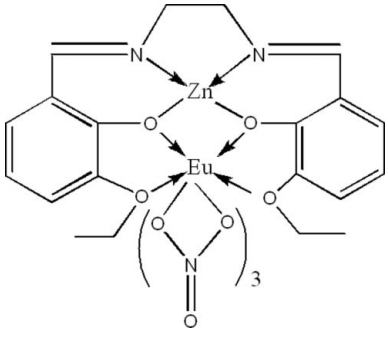
Received 25 June 2007; accepted 26 June 2007

Key indicators: single-crystal X-ray study; T = 293 K; mean σ(C–C) = 0.005 Å; R factor = 0.025; wR factor = 0.058; data-to-parameter ratio = 17.2.

A heteronuclear Zn^{II}–Eu^{III} complex (systematic name: {6,6′-diethoxy-2,2′-[ethane-1,2-diylbis(nitrilomethylidyne)]-diphenolato-1$\kappa^4O^1,O^{1'},O^6,O^{6'}$:2$\kappa^4O^1,N,N',O^{1'}$}trinitrato-1$\kappa^6O,O'$-europium(III)zinc(II)), [EuZn($C_{20}H_{22}N_2O_4$)(NO_3)$_3$], with the hexadentate Schiff base compartmental ligand N,N'-bis(3-ethoxysalicylidene)ethylenediamine, has been synthesized and structurally characterized. The Zn and Eu atoms are doubly bridged by two phenolate O atoms provided by the Schiff base ligand. The coordination of Zn is square planar with the donor centers of two imine N atoms and two phenolate O atoms. The Eu center has a decacoordination environment formed by the phenolate O atoms, two ethoxy O atoms and two O atoms from each of the three nitrates. No classical intermolecular hydrogen bonds are found. Some weak C—H···O and O···Zn interactions [O···Zn = 3.193 (4) Å] generate a two-dimensional zigzag sheet.

Related literature

For related literature, see: Baggio *et al.* (2000); Caravan *et al.* (1999); Edder *et al.* (2000); Knoer *et al.* (2005); Sui *et al.* (2006).



Experimental

Crystal data

[EuZn($C_{20}H_{22}N_2O_4$)(NO_3)$_3$]
M_r = 757.76
Orthorhombic, $P2_12_12_1$
a = 8.6599 (3) Å
b = 13.8416 (5) Å
c = 21.1681 (7) Å
V = 2537.35 (15) Å^3
Z = 4
Mo $K\alpha$ radiation
μ = 3.47 mm^{-1}
T = 293 (2) K
0.25 × 0.23 × 0.21 mm

Data collection

Bruker APEX II area-detector diffractometer
Absorption correction: multi-scan (*SADABS*; Bruker, 2004)
T_{min} = 0.438, T_{max} = 0.484
19197 measured reflections
6234 independent reflections
5081 reflections with $I > 2\sigma(I)$
R_{int} = 0.028

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.025
$wR(F^2)$ = 0.058
S = 1.00
6234 reflections
363 parameters
H-atom parameters constrained
$\Delta\rho_{max}$ = 0.54 e Å^{-3}
$\Delta\rho_{min}$ = −0.70 e Å^{-3}
Absolute structure: Flack (1983), 2674 Friedel pairs
Flack parameter: 0.016 (10)

Table 1
Selected bond lengths (Å).

Eu1—O1	2.356 (2)	Eu1—O9	2.491 (3)
Eu1—O2	2.404 (2)	Eu1—O11	2.537 (3)
Eu1—O3	2.608 (2)	Eu1—O12	2.495 (3)
Eu1—O4	2.658 (2)	Zn1—O1	1.901 (2)
Eu1—O5	2.474 (3)	Zn1—O2	1.899 (2)
Eu1—O6	2.565 (3)	Zn1—N1	1.916 (3)
Eu1—O8	2.441 (2)	Zn1—N2	1.909 (3)

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

D—H···A	D—H	H···A	D···A	D—H···A
C18—H18A···O5	0.96	2.44	3.142 (5)	130
C8—H8A···O13^{i}	0.97	2.42	3.295 (5)	151
C10—H10···O13^{ii}	0.93	2.37	3.291 (5)	169

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

Data collection: *APEX2* (Bruker, 2004); cell refinement: *APEX2*; data reduction: *APEX2*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 1997); program(s) used to refine structure: *SHELXL97* (Sheldrick, 1997); molecular graphics: *APEX2*; software used to prepare material for publication: *APEX2* and *publCIF* (Westrip, 2007).

We gratefully acknowledge financial support from the Department of Education, JiangXi Province (No. 2007317), and the Natural Science Foundation of JiangXi Province (No. 0620029).

Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: HG2247).

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supplementary materials

Acta Cryst. (2007). E**63**, m2039-m2040 [**doi:10.1107/S1600536807031121**]

{6,6'-Diethoxy-2,2'-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato}trinitratoeuropium(III)zinc(II)

R.-H. Hu, Y. Sui, X.-N. Fang and H.-M. Chen

Comment

The potential applications of trivalent lanthanide complexes as contrast agent for magnetic resonance imaging and stains for fluorescence imaging have prompted considerable interest in the preparation, magnetic and optical properties of 3 d-4f hetorometallic dinuclear complexes (Baggio *et al.*, 2000; Caravan *et al.*, 1999; Edder *et al.*, 2000; Knoer *et al.*, 2005). As part of our investigations into the structure and applications of 3 d-4f hetorometallic Schiff base complexes(Sui *et al.*, 2006), we report here the synthesis and X-ray crystal structure analysis of the title complex, (I), a new Zn^{II}—Eu^{III} complex with salen-type Schiff base *N*,*N*'-bis(3-ethoxysalicylidene) ethylenediamine(H_2L).

Complex (I) crystallizes in the space group $P2_12_12_1$, with zinc and europium doubly bridged by two phenolate O atoms provided by a salen-type Schiff base ligand. The inner salen-type cavity is occupied by zinc(II), while europium(III) is present in the open and larger portion of the dinucleating compartmental Schiff base ligand. The dihedral angles between the mean planes of Zn1/O1/O2 and Eu1/O1/O2 is 3.59 (15)° suggesting that the bridging moiety is almost planar; the deviation of atoms from the least squares Zn1/O1/O2/Eu1 plane being 0.0301 (3)Å for Zn, 0.0210 (2)Å for Eu, −0.0259 (3)Å for O1 and −0.0252 (3)Å for O2.

The europium(III) center in (I) has a decacoordination environment of O atoms. In addition to the phenolate ligands, two ethoxy O atoms coordinate to this metal center, two O atoms from each of the three nitrates chelate to europium to complete the decacoordination. The three kinds of Eu—O bond distances are significantly different, the shortest being the Eu—O(phenolate) and longest being the Eu—*O*(ethoxy) separations.

The coordination of zinc(II) is approximately square planar. The donor centers are alternatively above and below the mean N_2O_2 plane with an average deviation from the plane of 0.0873 (2) Å, while Zn1 is 0.0401 (3)Å below this square plane.

Adjacent molecules are held together by weak interactions (O7···Zn1=3.193 (4) Å, C8—H8A···$O13^{i}$=3.297 (5) and C10—H10···$O13^{ii}$=3.289 (5); symmetry codes:(i)-*x* + 1, *y*, *z*; (ii)1 − *x*, 1/2 + *y*, 1/2 − *z*). these link the molecules into a two-dimensional zigzag sheet(Fig 2).

Experimental

H_2L was prepared by the 2:1 condensation of 3-ethoxysalicylaldehyde and ethylenediamine in methanol. Complex (I) was obtained by the treatment of zinc(II) acetate dihydrate (0.188 g, 1 mmol) with H_2L(0.356 g, 1 mmol) in methanol solution (80 ml) under reflux for 3 h and then for another 3 h after the addition of europium(III) nitrate hexahydrate (0.447 g, 1 mmol). The reaction mixture was cooled and the resulting precipitate was filtered off, washed with diethyl ether and dried *in vacuo*. Single crystals of (I) suitable for X-ray analysis were obtained by slow evaporation at room temperature of a

methanol solution. Analysis calculated for $C_{20}H_{22}EuN_5O_{13}Zn$: C 31.70, H 2.93, Eu 20.05, N 9.24,Zn 8.63%; found: C 31.80, H 2.95, Eu 20.10, N 9.29, Zn 8.59%. IR(KBr, cm^{-1}): 1642(C=N), 1386,1490(nitrate).

Refinement

The H atoms were positioned geometrically and treated as riding on their parent atoms, with C—H distances of 0.97 (methylene) and 0.96 Å (methyl), and with $U_{iso}(H) = 1.5U_{eq}(C)$ for methyl H atoms and $1.2U_{eq}(C)$ for other H atoms.

Figures

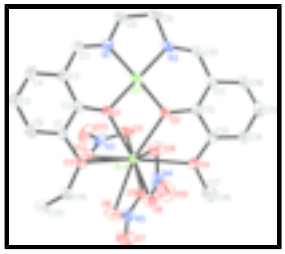

Fig.1. The molecular structure of (I), showing 30% probability displacement ellipsoids. All the H atoms on carbon have been omitted for clarity.

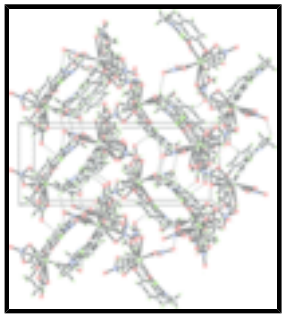

Fig.2. The packing diagram of (I), viewed along the *b* axis; hydrogen bonds are shown as dashed lines.

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

{6,6'-diethoxy-2,2'-[ethane-1,2-diylbis(nitrilomethylidyne)]diphenolato-\ 1κ^4*O*^{1},*O*$^{1'}$,*O*^{6},*O*$^{6'}$:2κ^4*O*^{1},\ *N*,*N*',*O*$^{1'}$}trinitrato-1κ^6*O*,*O*'-\ europium(III)zinc(II))

Crystal data

$[EuZn(C_{20}H_{22}N_2O_4)(NO_3)_3]$	F_{000} = 1496
M_r = 757.76	D_x = 1.984 Mg m^{-3}
Orthorhombic, $P2_12_12_1$	Mo $K\alpha$ radiation λ = 0.71073 Å
Hall symbol: P 2ac 2ab	Cell parameters from 19197 reflections
a = 8.6599 (3) Å	θ = 1.8–28.3°
b = 13.8416 (5) Å	μ = 3.47 mm^{-1}
c = 21.1681 (7) Å	*T* = 293 (2) K
V = 2537.35 (15) $Å^3$	Block, yellow
Z = 4	0.25 × 0.23 × 0.21 mm

Data collection

Bruker APEX II area-detector	6234 independent reflections

diffractometer
Radiation source: fine-focus sealed tube
Monochromator: graphite
Detector resolution: 0 pixels mm^{-1}
T = 293(2) K
φ and ω scans
Absorption correction: multi-scan (SADABS; Bruker, 2004)
T_{min} = 0.438, T_{max} = 0.484
19197 measured reflections

5081 reflections with $I > 2\sigma(I)$
R_{int} = 0.028
θ_{max} = 28.3°
θ_{min} = 1.8°
h = −11→11
k = −18→18
l = −28→28

Refinement

Refinement on F^2
Least-squares matrix: full
$R[F^2 > 2\sigma(F^2)]$ = 0.025
$wR(F^2)$ = 0.058
S = 1.00
6234 reflections
363 parameters
Primary atom site location: structure-invariant direct methods
Secondary atom site location: difference Fourier map

Hydrogen site location: inferred from neighbouring sites
H-atom parameters constrained
$w = 1/[\sigma^2(F_o^2) + (0.0245P)^2]$ where $P = (F_o^2 + 2F_c^2)/3$
$(\Delta/\sigma)_{max}$ = 0.001
$\Delta\rho_{max}$ = 0.54 e Å^{-3}
$\Delta\rho_{min}$ = −0.70 e Å^{-3}
Extinction correction: none
Absolute structure: Flack (1983), 2674 Friedel pairs
Flack parameter: 0.016 (10)

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}
Eu1	0.242201 (18)	0.499235 (12)	0.097727 (7)	0.03628 (5)
Zn1	0.56391 (5)	0.55577 (3)	0.18350 (2)	0.04392 (11)
O2	0.4097 (3)	0.62355 (15)	0.13762 (11)	0.0419 (6)
N4	0.3637 (4)	0.5069 (3)	−0.02934 (15)	0.0566 (8)
C2	0.5193 (4)	0.3547 (2)	0.15599 (15)	0.0359 (8)
N2	0.6759 (4)	0.6680 (2)	0.20904 (14)	0.0414 (8)
O4	0.1869 (3)	0.68330 (16)	0.07006 (12)	0.0432 (6)

C12	0.4098 (4)	0.7190 (2)	0.12700 (16)	0.0359 (8)
C16	0.5074 (5)	0.8813 (2)	0.13284 (19)	0.0513 (10)
H16	0.5821	0.9246	0.1468	0.062*
C10	0.6457 (4)	0.7550 (3)	0.19084 (18)	0.0435 (9)
H10	0.7111	0.8037	0.2050	0.052*
C13	0.2871 (4)	0.7543 (2)	0.09017 (15)	0.0371 (8)
C1	0.4575 (4)	0.2880 (2)	0.11395 (16)	0.0368 (8)
C15	0.3925 (5)	0.9137 (2)	0.0968 (2)	0.0566 (11)
H15	0.3882	0.9787	0.0860	0.068*
C11	0.5195 (4)	0.7832 (2)	0.15049 (17)	0.0400 (8)
O3	0.3415 (3)	0.32452 (16)	0.07600 (12)	0.0417 (6)
C14	0.2790 (5)	0.8508 (2)	0.07525 (17)	0.0465 (9)
H14	0.1978	0.8740	0.0508	0.056*
O8	0.2234 (3)	0.4914 (2)	−0.01720 (12)	0.0567 (7)
O1	0.4588 (3)	0.44371 (16)	0.15447 (10)	0.0387 (5)
N1	0.6990 (3)	0.4858 (2)	0.23870 (13)	0.0420 (7)
O11	0.1820 (4)	0.5324 (2)	0.21299 (13)	0.0563 (8)
O12	0.1404 (3)	0.38857 (18)	0.18092 (14)	0.0544 (7)
O10	0.4189 (5)	0.5000 (3)	−0.08457 (14)	0.0880 (10)
N3	0.1395 (4)	0.4483 (3)	0.22528 (17)	0.0534 (9)
O9	0.4472 (3)	0.5278 (2)	0.01736 (13)	0.0632 (8)
O5	−0.0346 (3)	0.53691 (19)	0.11283 (15)	0.0589 (7)
O6	0.0026 (4)	0.4113 (2)	0.05566 (15)	0.0716 (9)
C9	0.8113 (5)	0.6449 (3)	0.24831 (18)	0.0502 (10)
H9A	0.8298	0.6961	0.2786	0.060*
H9B	0.9024	0.6378	0.2221	0.060*
C17	0.0523 (5)	0.7141 (3)	0.03450 (17)	0.0487 (9)
H17A	0.0104	0.6592	0.0117	0.058*
H17B	0.0833	0.7622	0.0037	0.058*
C19	0.2698 (5)	0.2597 (2)	0.02957 (16)	0.0491 (10)
H19A	0.3498	0.2217	0.0093	0.059*
H19B	0.2199	0.2983	−0.0028	0.059*
C7	0.7200 (4)	0.3941 (3)	0.23771 (17)	0.0416 (8)
H7	0.7902	0.3684	0.2664	0.050*
O7	−0.2336 (4)	0.4603 (3)	0.07427 (19)	0.1008 (12)
O13	0.0984 (4)	0.4247 (3)	0.27906 (14)	0.0865 (12)
C3	0.6437 (5)	0.3281 (3)	0.19573 (18)	0.0424 (9)
C6	0.5145 (4)	0.1941 (2)	0.1115 (2)	0.0479 (9)
H6	0.4729	0.1498	0.0832	0.057*
C18	−0.0701 (6)	0.7556 (3)	0.0759 (2)	0.0619 (11)
H18A	−0.1075	0.7066	0.1041	0.093*
H18B	−0.1536	0.7789	0.0503	0.093*
H18C	−0.0278	0.8081	0.1000	0.093*
N5	−0.0911 (4)	0.4696 (3)	0.08097 (17)	0.0595 (10)
C4	0.6946 (5)	0.2322 (3)	0.1937 (2)	0.0529 (11)
H4	0.7714	0.2117	0.2213	0.063*
C8	0.7765 (5)	0.5516 (3)	0.28201 (17)	0.0501 (9)
H8A	0.8718	0.5226	0.2970	0.060*
H8B	0.7109	0.5641	0.3183	0.060*

C5	0.6319 (5)	0.1673 (3)	0.1509 (2)	0.0562 (11)
H5	0.6703	0.1047	0.1490	0.067*
C20	0.1536 (6)	0.1932 (3)	0.0580 (2)	0.0638 (12)
H20A	0.2045	0.1491	0.0861	0.096*
H20B	0.1030	0.1575	0.0250	0.096*
H20C	0.0786	0.2301	0.0810	0.096*

Atomic displacement parameters (Å^2)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Eu1	0.03650 (9)	0.02909 (7)	0.04323 (9)	−0.00144 (11)	−0.00520 (7)	−0.00242 (8)
Zn1	0.0443 (2)	0.03303 (19)	0.0544 (2)	−0.00166 (19)	−0.0123 (2)	−0.0040 (2)
O2	0.0413 (15)	0.0242 (10)	0.0603 (15)	−0.0015 (11)	−0.0160 (12)	−0.0026 (10)
N4	0.073 (2)	0.0412 (17)	0.055 (2)	−0.001 (2)	−0.0013 (17)	0.004 (2)
C2	0.039 (2)	0.0262 (15)	0.0424 (17)	0.0016 (14)	0.0071 (16)	0.0025 (14)
N2	0.0392 (19)	0.0394 (16)	0.0456 (17)	−0.0043 (14)	−0.0003 (15)	−0.0108 (14)
O4	0.0390 (14)	0.0331 (12)	0.0575 (16)	0.0024 (11)	−0.0120 (12)	0.0036 (11)
C12	0.040 (2)	0.0265 (15)	0.0415 (18)	−0.0019 (15)	0.0044 (17)	−0.0041 (14)
C16	0.060 (3)	0.0266 (17)	0.067 (3)	−0.0089 (17)	0.003 (2)	−0.0052 (17)
C10	0.040 (2)	0.0377 (18)	0.053 (2)	−0.0100 (16)	0.0055 (19)	−0.0121 (17)
C13	0.043 (2)	0.0274 (15)	0.0407 (18)	0.0019 (14)	0.0041 (16)	−0.0032 (13)
C1	0.038 (2)	0.0266 (15)	0.0462 (19)	−0.0005 (14)	0.0041 (17)	0.0033 (15)
C15	0.074 (3)	0.0262 (17)	0.070 (3)	0.0011 (17)	0.016 (2)	0.0038 (18)
C11	0.043 (2)	0.0291 (16)	0.048 (2)	−0.0067 (15)	0.0066 (18)	−0.0020 (16)
O3	0.0491 (16)	0.0280 (11)	0.0481 (14)	−0.0025 (11)	−0.0042 (12)	−0.0058 (11)
C14	0.059 (3)	0.0315 (17)	0.049 (2)	0.0056 (17)	0.002 (2)	0.0037 (15)
O8	0.0579 (18)	0.0592 (17)	0.0530 (14)	−0.0081 (18)	−0.0075 (12)	0.0009 (13)
O1	0.0375 (14)	0.0260 (10)	0.0526 (13)	0.0022 (11)	−0.0108 (11)	−0.0034 (11)
N1	0.0379 (15)	0.0454 (18)	0.0426 (15)	0.0027 (13)	−0.0063 (12)	−0.0050 (14)
O11	0.059 (2)	0.0578 (17)	0.0515 (16)	0.0024 (14)	−0.0056 (14)	−0.0162 (13)
O12	0.0609 (19)	0.0451 (14)	0.0571 (16)	0.0023 (13)	0.0048 (15)	0.0038 (15)
O10	0.123 (3)	0.081 (2)	0.0597 (17)	−0.016 (3)	0.0224 (19)	0.003 (2)
N3	0.043 (2)	0.066 (2)	0.051 (2)	0.0182 (19)	0.0018 (16)	0.014 (2)
O9	0.0508 (17)	0.086 (2)	0.0531 (15)	−0.0078 (15)	−0.0056 (14)	0.0006 (14)
O5	0.0466 (17)	0.0468 (14)	0.083 (2)	−0.0018 (13)	−0.0086 (15)	−0.0024 (14)
O6	0.051 (2)	0.087 (2)	0.076 (2)	−0.0141 (17)	−0.0012 (16)	−0.0347 (19)
C9	0.040 (2)	0.060 (2)	0.051 (2)	−0.0020 (18)	−0.0094 (18)	−0.0168 (19)
C17	0.043 (2)	0.046 (2)	0.057 (2)	0.0049 (18)	−0.012 (2)	0.0046 (18)
C19	0.064 (3)	0.0359 (17)	0.048 (2)	−0.0046 (19)	−0.008 (2)	−0.0070 (15)
C7	0.035 (2)	0.0441 (19)	0.0453 (19)	0.0080 (16)	−0.0031 (17)	0.0031 (17)
O7	0.045 (2)	0.140 (3)	0.117 (3)	−0.023 (2)	−0.008 (2)	−0.001 (3)
O13	0.088 (3)	0.118 (3)	0.0534 (17)	0.043 (2)	0.0201 (17)	0.0235 (19)
C3	0.042 (2)	0.0388 (18)	0.047 (2)	0.0036 (16)	−0.0056 (18)	−0.0016 (17)
C6	0.043 (2)	0.0292 (17)	0.071 (3)	0.0032 (15)	0.005 (2)	−0.0088 (18)
C18	0.057 (3)	0.053 (2)	0.076 (3)	0.012 (2)	0.005 (2)	0.010 (2)
N5	0.044 (2)	0.076 (3)	0.058 (2)	−0.0154 (18)	−0.0044 (17)	0.0121 (18)
C4	0.045 (2)	0.042 (2)	0.072 (3)	0.0097 (17)	−0.007 (2)	0.011 (2)
C8	0.047 (2)	0.051 (2)	0.053 (2)	0.0015 (19)	−0.0118 (18)	−0.0137 (18)

C5	0.061 (3)	0.0314 (18)	0.076 (3)	0.0110 (19)	−0.002 (2)	−0.001 (2)
C20	0.071 (3)	0.047 (2)	0.074 (3)	−0.015 (2)	−0.017 (2)	0.001 (2)

Geometric parameters (Å, °)

Eu1—O1	2.356 (2)	C15—H15	0.9300
Eu1—O2	2.404 (2)	O3—C19	1.468 (4)
Eu1—O3	2.608 (2)	C14—H14	0.9300
Eu1—O4	2.658 (2)	N1—C7	1.282 (4)
Eu1—O5	2.474 (3)	N1—C8	1.456 (4)
Eu1—O6	2.565 (3)	O11—N3	1.249 (4)
Eu1—O8	2.441 (2)	O12—N3	1.251 (4)
Eu1—O9	2.491 (3)	N3—O13	1.237 (4)
Eu1—O11	2.537 (3)	O5—N5	1.250 (4)
Eu1—O12	2.495 (3)	O6—N5	1.263 (4)
Zn1—O1	1.901 (2)	C9—C8	1.506 (6)
Zn1—O2	1.899 (2)	C9—H9A	0.9700
Zn1—N1	1.916 (3)	C9—H9B	0.9700
Zn1—N2	1.909 (3)	C17—C18	1.491 (6)
O2—C12	1.340 (4)	C17—H17A	0.9700
N4—O9	1.259 (4)	C17—H17B	0.9700
N4—O10	1.266 (4)	C19—C20	1.490 (6)
N4—O8	1.260 (4)	C19—H19A	0.9700
C2—O1	1.339 (4)	C19—H19B	0.9700
C2—C1	1.390 (5)	C7—C3	1.436 (5)
C2—C3	1.415 (5)	C7—H7	0.9300
N2—C10	1.291 (4)	O7—N5	1.249 (4)
N2—C9	1.472 (5)	C3—C4	1.399 (5)
O4—C13	1.378 (4)	C6—C5	1.366 (6)
O4—C17	1.452 (4)	C6—H6	0.9300
C12—C11	1.393 (5)	C18—H18A	0.9600
C12—C13	1.405 (5)	C18—H18B	0.9600
C16—C15	1.332 (5)	C18—H18C	0.9600
C16—C11	1.412 (5)	C4—C5	1.385 (6)
C16—H16	0.9300	C4—H4	0.9300
C10—C11	1.440 (5)	C8—H8A	0.9700
C10—H10	0.9300	C8—H8B	0.9700
C13—C14	1.374 (4)	C5—H5	0.9300
C1—O3	1.382 (4)	C20—H20A	0.9600
C1—C6	1.391 (5)	C20—H20B	0.9600
C15—C14	1.390 (6)	C20—H20C	0.9600
O1—Eu1—O2	64.79 (8)	C16—C15—C14	120.4 (3)
O1—Eu1—O8	123.15 (8)	C16—C15—H15	119.8
O2—Eu1—O8	114.98 (9)	C14—C15—H15	119.8
O1—Eu1—O5	140.73 (9)	C12—C11—C16	117.9 (4)
O2—Eu1—O5	112.86 (9)	C12—C11—C10	123.8 (3)
O8—Eu1—O5	94.22 (10)	C16—C11—C10	118.3 (3)
O1—Eu1—O9	80.36 (9)	C1—O3—C19	118.2 (3)
O2—Eu1—O9	72.30 (9)	C1—O3—Eu1	118.47 (18)

O8—Eu1—O9	51.23 (9)	C19—O3—Eu1	123.0 (2)
O5—Eu1—O9	138.20 (9)	C13—C14—C15	119.8 (4)
O1—Eu1—O12	73.81 (9)	C13—C14—H14	120.1
O2—Eu1—O12	113.87 (8)	C15—C14—H14	120.1
O8—Eu1—O12	130.74 (10)	N4—O8—Eu1	97.5 (2)
O5—Eu1—O12	72.29 (9)	C2—O1—Zn1	123.7 (2)
O9—Eu1—O12	146.26 (9)	C2—O1—Eu1	128.6 (2)
O1—Eu1—O11	74.48 (9)	Zn1—O1—Eu1	106.25 (10)
O2—Eu1—O11	69.91 (9)	C7—N1—C8	124.3 (3)
O8—Eu1—O11	162.36 (10)	C7—N1—Zn1	125.2 (3)
O5—Eu1—O11	68.80 (10)	C8—N1—Zn1	110.5 (2)
O9—Eu1—O11	140.77 (9)	N3—O11—Eu1	95.3 (2)
O12—Eu1—O11	50.19 (9)	N3—O12—Eu1	97.3 (2)
O1—Eu1—O6	131.77 (10)	O13—N3—O11	121.5 (4)
O2—Eu1—O6	161.76 (10)	O13—N3—O12	121.2 (4)
O8—Eu1—O6	65.09 (10)	O11—N3—O12	117.2 (3)
O5—Eu1—O6	50.29 (9)	N4—O9—Eu1	95.2 (2)
O9—Eu1—O6	114.52 (9)	N5—O5—Eu1	98.8 (2)
O12—Eu1—O6	70.61 (10)	N5—O6—Eu1	94.0 (2)
O11—Eu1—O6	104.69 (10)	N2—C9—C8	107.1 (3)
O1—Eu1—O3	61.63 (8)	N2—C9—H9A	110.3
O2—Eu1—O3	121.79 (8)	C8—C9—H9A	110.3
O8—Eu1—O3	78.75 (9)	N2—C9—H9B	110.3
O5—Eu1—O3	122.53 (8)	C8—C9—H9B	110.3
O9—Eu1—O3	77.99 (9)	H9A—C9—H9B	108.5
O12—Eu1—O3	70.83 (8)	O4—C17—C18	112.3 (3)
O11—Eu1—O3	113.91 (9)	O4—C17—H17A	109.1
O6—Eu1—O3	76.43 (9)	C18—C17—H17A	109.1
O1—Eu1—O4	124.64 (8)	O4—C17—H17B	109.1
O2—Eu1—O4	59.99 (7)	C18—C17—H17B	109.1
O8—Eu1—O4	79.11 (9)	H17A—C17—H17B	107.9
O5—Eu1—O4	69.63 (8)	O3—C19—C20	113.1 (3)
O9—Eu1—O4	79.95 (9)	O3—C19—H19A	109.0
O12—Eu1—O4	132.88 (8)	C20—C19—H19A	109.0
O11—Eu1—O4	90.07 (9)	O3—C19—H19B	109.0
O6—Eu1—O4	103.45 (9)	C20—C19—H19B	109.0
O3—Eu1—O4	155.45 (9)	H19A—C19—H19B	107.8
O2—Zn1—O1	84.32 (10)	N1—C7—C3	125.1 (3)
O2—Zn1—N2	95.74 (12)	N1—C7—H7	117.4
O1—Zn1—N2	177.16 (12)	C3—C7—H7	117.4
O2—Zn1—N1	172.23 (12)	C4—C3—C2	117.9 (3)
O1—Zn1—N1	94.44 (11)	C4—C3—C7	118.6 (4)
N2—Zn1—N1	85.88 (14)	C2—C3—C7	123.5 (3)
C12—O2—Zn1	124.9 (2)	C5—C6—C1	119.7 (4)
C12—O2—Eu1	130.3 (2)	C5—C6—H6	120.2
Zn1—O2—Eu1	104.50 (9)	C1—C6—H6	120.2
O9—N4—O10	121.7 (4)	C17—C18—H18A	109.5
O9—N4—O8	115.7 (3)	C17—C18—H18B	109.5
O10—N4—O8	122.6 (3)	H18A—C18—H18B	109.5

O1—C2—C1	116.4 (3)	C17—C18—H18C	109.5
O1—C2—C3	123.5 (3)	H18A—C18—H18C	109.5
C1—C2—C3	120.0 (3)	H18B—C18—H18C	109.5
C10—N2—C9	122.2 (3)	O7—N5—O5	121.6 (4)
C10—N2—Zn1	124.9 (3)	O7—N5—O6	121.4 (4)
C9—N2—Zn1	112.8 (2)	O5—N5—O6	117.0 (3)
C13—O4—C17	117.2 (3)	C5—C4—C3	120.7 (4)
C13—O4—Eu1	120.13 (19)	C5—C4—H4	119.6
C17—O4—Eu1	122.7 (2)	C3—C4—H4	119.6
O2—C12—C11	124.7 (3)	N1—C8—C9	109.3 (3)
O2—C12—C13	115.8 (3)	N1—C8—H8A	109.8
C11—C12—C13	119.5 (3)	C9—C8—H8A	109.8
C15—C16—C11	122.1 (4)	N1—C8—H8B	109.8
C15—C16—H16	119.0	C9—C8—H8B	109.8
C11—C16—H16	119.0	H8A—C8—H8B	108.3
N2—C10—C11	125.7 (3)	C6—C5—C4	121.0 (3)
N2—C10—H10	117.2	C6—C5—H5	119.5
C11—C10—H10	117.2	C4—C5—H5	119.5
C14—C13—O4	126.1 (3)	C19—C20—H20A	109.5
C14—C13—C12	120.3 (3)	C19—C20—H20B	109.5
O4—C13—C12	113.5 (3)	H20A—C20—H20B	109.5
O3—C1—C2	114.1 (3)	C19—C20—H20C	109.5
O3—C1—C6	125.3 (3)	H20A—C20—H20C	109.5
C2—C1—C6	120.5 (3)	H20B—C20—H20C	109.5

Hydrogen-bond geometry (Å, °)

D—H···*A*	*D*—H	H···*A*	*D*···*A*	*D*—H···*A*
C18—H18A···O5	0.96	2.44	3.142 (5)	130
C8—H8A···O13^{i}	0.97	2.42	3.295 (5)	151
C10—H10···O13^{ii}	0.93	2.37	3.291 (5)	169

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

Fig. 1

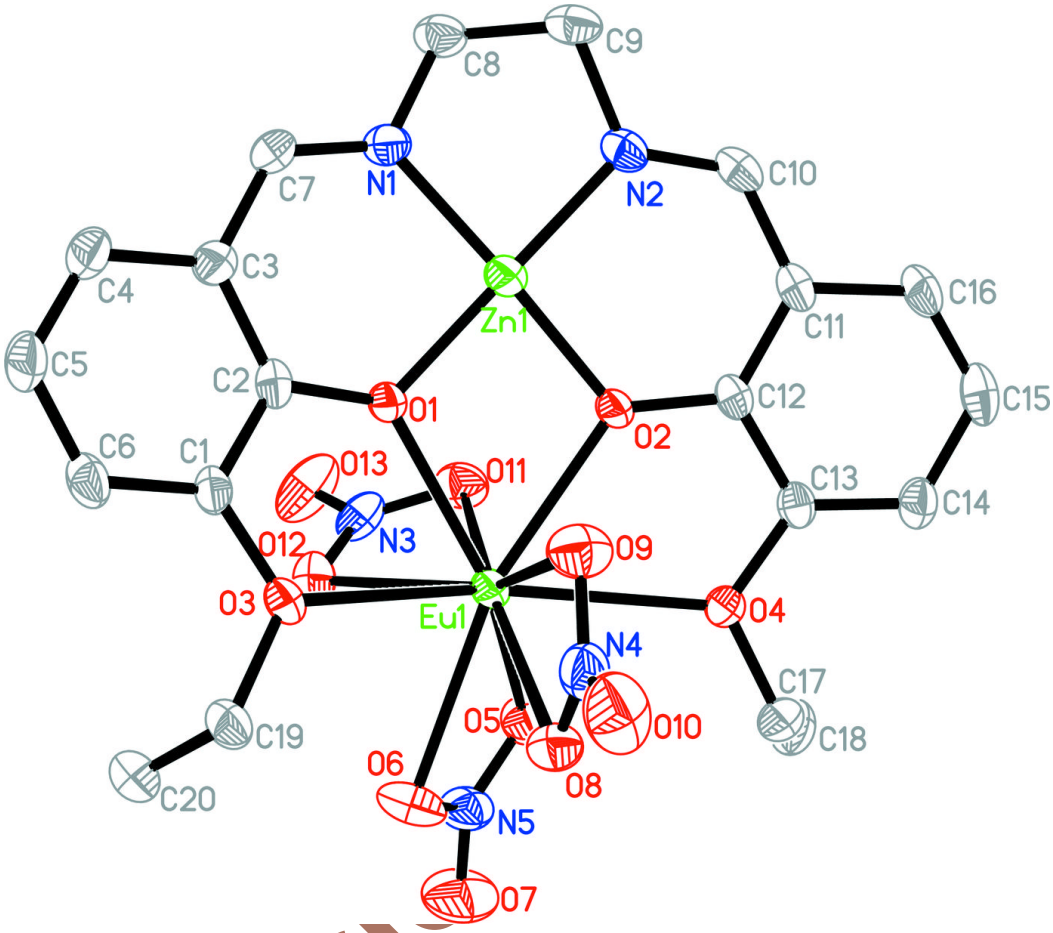
C8
C9
C7
N1
N2
C10
C4
C3
Zn1
C16
C11
C5
C2
O1
C12
C15
O2
C6
C1
O13
O11
C13
C14
N3
O12
O9
O3
Eu1
O4
N4
C17
O5
O10
C19
C18
O6
O8
C20
N5
O7

Fig. 2