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Hexakis(μ-naphthalene-1-acetato)-bis[(1,10-phenanthroline)europium(III)] *N*,*N*-dimethylformamide disolvate

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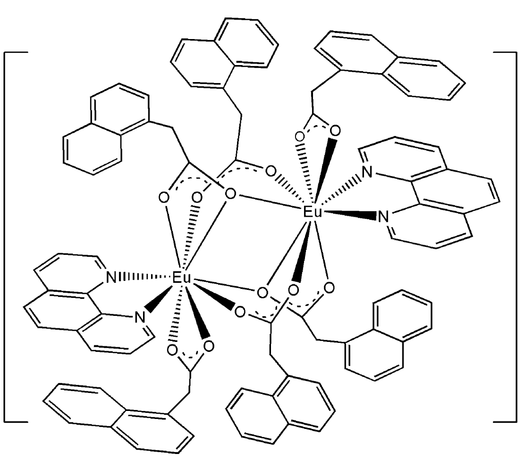
Key indicators: single-crystal X-ray study; T = 298 K; mean σ(C–C) = 0.016 Å; R factor = 0.057; wR factor = 0.117; data-to-parameter ratio = 13.7.

The title complex, $[Eu_2(C_{12}H_9O_2)_6(C_{12}H_8N_2)_2]\cdot 2C_3H_7NO$, is centrosymmetric. The Eu atom is nine-coordinate. Molecules are linked into a chain by C—H···O hydrogen bonds parallel to the *a*-axis direction and into a sheet by C—H···π hydrogen bonds parallel to the [100] plane, the combination of the chains and sheets generating a three-dimensional framework structure.

Related literature

For related literature, see: Bernstein *et al.* (1995); Yang *et al.* (2001); Xi *et al.* (2007).



Experimental

Crystal data

$[Eu_2(C_{12}H_9O_2)_6(C_{12}H_8N_2)_2]\cdot 2C_3H_7NO$
M_r = 1921.67
Monoclinic, $P2_1/c$
a = 13.529 (2) Å
b = 15.095 (2) Å
c = 22.171 (3) Å
β = 103.866 (2)°
V = 4395.8 (11) Å^3
Z = 2
Mo $K\alpha$ radiation
μ = 1.48 mm^{-1}
T = 298 (2) K
0.41 × 0.14 × 0.11 mm

Data collection

Siemens SMART 1000 CCD area-detector diffractometer
Absorption correction: multi-scan (*SADABS*; Sheldrick, 1996)
T_{min} = 0.582, T_{max} = 0.854
21103 measured reflections
7667 independent reflections
4416 reflections with $I > 2\sigma(I)$
R_{int} = 0.077

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.057
$wR(F^2)$ = 0.117
S = 1.04
7667 reflections
559 parameters
H-atom parameters constrained
$\Delta\rho_{max}$ = 1.67 e Å^{-3}
$\Delta\rho_{min}$ = −1.39 e Å^{-3}

Table 1
Selected bond lengths (Å).

Eu1—O1^i	2.367 (5)	Eu1—O2	2.503 (5)
Eu1—O3	2.389 (5)	Eu1—O1	2.578 (5)
Eu1—O4^i	2.406 (5)	Eu1—N2	2.578 (7)
Eu1—O6	2.477 (6)	Eu1—N1	2.635 (6)
Eu1—O5	2.488 (6)		

Symmetry code: (i) $-x+1, -y+1, -z+2$.

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

*Cg*1 is the centroid of the C3–C8 ring.

D—H···*A*	*D*—H	H···*A*	*D*···*A*	*D*—H···*A*
C6—H6···O7^{ii}	0.93	2.58	3.469 (15)	161
C37—H37···O4^i	0.93	2.38	3.053 (10)	130
C46—H46···O3	0.93	2.48	3.096 (11)	124
C47—H47···O2^{iii}	0.93	2.46	3.314 (11)	152
C50—H50*A*···O6^{iv}	0.96	2.60	3.397 (14)	140
C18—H18···*Cg*1^v	0.93	2.91	3.682 (13)	141

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

Data collection: *SMART* (Siemens, 1996); cell refinement: *SMART*; data reduction: *SAINT* (Siemens, 1996); 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: AT2403).

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supplementary materials

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Hexakis(μ-naphthalene-1-acetato)bis[(1,10-phenanthroline)europium(III)] *N*,*N*-dimethylformamide disolvate

Y.-F. Liu, H.-T. Xia, D.-Q. Wang and S.-P. Yang

Comment

The complexes between rare earth elements and organic ligands have received significant attention in recent years because of their potential fluorescence, magnetic and porous characteristics, are widely used in many fields (Yang *et al.*, 2001). Among rare earth ions, the europium(III) has been extensively applied in the fluorimetric determination, electroluminescent devices, ultraviolet dosimeters and fluorescent labels and molecular biology (Xi *et al.*, 2007). The carboxylate anions are versatile ligand, which produces various coordination modes, so we synthesize a europium complex with 1-naphthylacetic acid (NAA) and 1,10-phenanthroline (phen), we report here its crystal structure, (I).

The structure of (I) consists of centrosymmetric binuclear units. Each central Eu(III) ion is nine-coordinated by seven oxygen atoms of different NNA ligands and two nitrogen atoms of one phen ligand, the coordination geometry of Eu atom can be described as a cage geometry (Fig. 1). The bond distances of between the europium center and carboxylic oxygen atoms are 2.367 (5)–2.578 (5) Å. In addition, the dihedral angles between the least-square-plane Eu_2O_2 and naphthyl rings are 58.23(0.14)° (C3–C12 ring), 43.76(0.21)° (C15–C24 ring) and 71.71(0.18)° (C27–C36 ring), and the dihedral angle between Eu_2O_2 plane and phen ring is 81.71(0.14)°.

In the complex (I), the NNA ligands coordinated to the Eu(III) ion have three types of coordination modes, *via*, NNA acts as chelating-bridging tridentate ligand, chelating bidentate ligand and bidentate-bridging ligand. The O—C—O bond angles of three types of coordination modes are 121.3 (9)° (O1—C1—O2), 122.2 (7)° (O5—C25—O6), and 126.0 (8)° (O3—C13—O4), respectively.

In (I), the molecules are linked into sheets by means of C—H···π hydrogen bond (Fig. 2 and Table 2) and chains parallel to the *a* axis direction with $R_4^4(30)$ rings (Bernstein *et al.*, 1995) surrounds an $R_2^2(14)$ ring centred at (n, 1/2, 1) (n = zero or integer) (Fig. 3) by C—H···O hydrogen bonds (Fig. 3 and Table 2). The action of *a* chains are to link adjacent [100] sheet into the three-dimensional framework structure.

Experimental

To a stirred solution of 1-naphthylacetic acid (0.5586 g, 3 mmol) and 1,10-phenanthroline monohydrate (0.198 g, 1 mmol) in 30 ml me thanol, and a solution of $Eu(NO_3)_3{\cdot}6H_2O$ (0.446 g, 1 mmol) in water (10 ml) was added. The mixed solution was heated to 333 K and stirred for 3 h, and then cooled to room temperature. The precipitate was washed with water and then dissolved in DMF. A colorless crystal suitable for X-ray diffraction was obtained by evaporation of DMF solution [m.p. 558–559 K]. IR (KBr, cm^{-1}): ν 3440, 3052, 1610, 1422, 1360, 1290, 1256, 1140, 1100, 838, 778, 724, 628, 536.

Refinement

The space group was uniquely assigned from the systematic absences. All H atoms were located in difference Fourier maps. H atoms bonded to C atoms were treated as riding atoms, with C—H distances of 0.93 Å (aryl, formyl), 0.97 Å (methylene) and 0.96 Å (methyl), and with U_{iso}(H) = 1.2U_{eq}(C) (aryl, formyl, methylene) or 1.5 U_{eq}(C) (methyl).

Figures

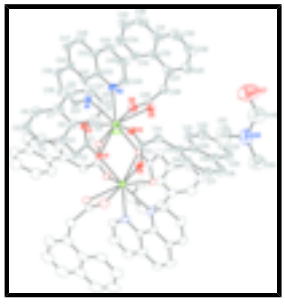


Fig. 1. The molecular structure of (I), showing the atom-labelling scheme. Displacement ellipsoids are at the 30% probability level. Unlabelled atoms in the molecule are related to labelled atoms by (1 − *x*, 1 − *y*, 2 − *z*).

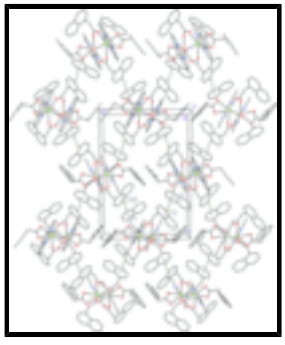


Fig. 2. A larger portion of the crystal structure of (I), showing the formation of a hydrogen-bonded chain built from C—H···π. For clarity, H atoms not involved in the hydrogen bonding have been omitted. Dashed lines indicate hydrogen bonds. [Symmetry codes: (A) 1 − *x*, −1/2 + *y*, 3/2 − *z*, (B) 1 − *x*, 1/2 + *y*, 3/2 − *z*].

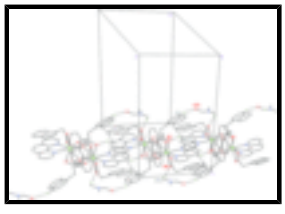


Fig. 3. A larger portion of the crystal structure of (I), showing the formation of a hydrogen-bonded chain built from C—H···O. For clarity, H atoms not involved in the hydrogen bonding have been omitted. Dashed lines indicate hydrogen bonds. [Symmetry codes: (C) *x*, *y*, 1 + *z*,, (D) − *x*, 1 − *y*, 1 − *z*, (E) − *x*, 1 − *y*, 2 − *z*].

Hexakis(μ-naphthalene-1-acetato)bis[(1,10-phenanthroline)europium(III)] *N*,*N*-dimethylformamide disolvate

Crystal data

$[Eu_2(C_{12}H_9O_2)_6(C_{12}H_8N_2)_2]\cdot 2C_3H_7NO$	F_{000} = 1952
M_r = 1921.67	D_x = 1.452 Mg m^{-3}
Monoclinic, $P2_1/c$	Mo $K\alpha$ radiation λ = 0.71073 Å
Hall symbol: -P 2ybc	Cell parameters from 3934 reflections
a = 13.529 (2) Å	θ = 2.4–25.3º
b = 15.095 (2) Å	μ = 1.48 mm^{-1}
c = 22.171 (3) Å	*T* = 298 (2) K
β = 103.866 (2)º	Block, colourless

V = 4395.8 (11) Å^3	0.41 × 0.14 × 0.11 mm
Z = 2	

Data collection

Siemens SMART 1000 CCD area-detector diffractometer	7667 independent reflections
Radiation source: fine-focus sealed tube	4416 reflections with $I > 2\sigma(I)$
Monochromator: graphite	R_{int} = 0.077
T = 298(2) K	θ_{max} = 25.0º
φ and ω scans	θ_{min} = 1.7º
Absorption correction: multi-scan (SADABS; Sheldrick, 1996)	h = −16→15
T_{min} = 0.582, T_{max} = 0.854	k = −17→16
21103 measured reflections	l = −20→26

Refinement

Refinement on F^2	Secondary atom site location: difference Fourier map
Least-squares matrix: full	Hydrogen site location: inferred from neighbouring sites
$R[F^2 > 2\sigma(F^2)]$ = 0.057	H-atom parameters constrained
$wR(F^2)$ = 0.117	$w = 1/[\sigma^2(F_o^2) + 24.9916P]$ where $P = (F_o^2 + 2F_c^2)/3$
S = 1.04	$(\Delta/\sigma)_{max}$ = 0.004
7667 reflections	$\Delta\rho_{max}$ = 1.67 e Å^{-3}
559 parameters	$\Delta\rho_{min}$ = −1.39 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}
Eu1	0.38256 (3)	0.42912 (3)	1.011917 (19)	0.03380 (13)
N1	0.2282 (5)	0.4434 (4)	1.0646 (3)	0.0408 (17)
N2	0.2103 (5)	0.3629 (5)	0.9541 (3)	0.0473 (19)

N3	0.3673 (9)	0.3365 (7)	0.2527 (5)	0.080 (3)
O1	0.4398 (4)	0.5807 (3)	0.9788 (2)	0.0348 (12)
O2	0.2758 (4)	0.5565 (4)	0.9613 (2)	0.0429 (14)
O3	0.4044 (4)	0.4244 (4)	0.9082 (2)	0.0396 (13)
O4	0.5474 (4)	0.4867 (4)	0.8956 (2)	0.0407 (14)
O5	0.4121 (5)	0.2712 (4)	0.9892 (3)	0.0511 (16)
O6	0.4044 (4)	0.3010 (4)	1.0838 (3)	0.0527 (16)
O7	0.2329 (9)	0.2455 (8)	0.2360 (5)	0.152 (4)
C1	0.3479 (6)	0.5990 (5)	0.9511 (4)	0.035 (2)
C2	0.3339 (6)	0.6740 (6)	0.9052 (4)	0.051 (2)
H2A	0.3589	0.7280	0.9274	0.061*
H2B	0.3757	0.6626	0.8761	0.061*
C3	0.2264 (7)	0.6893 (7)	0.8691 (4)	0.051 (3)
C4	0.1781 (8)	0.7624 (7)	0.8795 (5)	0.064 (3)
H4	0.2122	0.8021	0.9094	0.077*
C5	0.0777 (8)	0.7824 (8)	0.8474 (5)	0.072 (3)
H5	0.0462	0.8343	0.8556	0.087*
C6	0.0290 (8)	0.7249 (8)	0.8048 (5)	0.067 (3)
H6	−0.0382	0.7368	0.7844	0.081*
C7	0.0740 (8)	0.6484 (7)	0.7896 (5)	0.062 (3)
C8	0.1765 (7)	0.6296 (7)	0.8229 (4)	0.056 (3)
C9	0.2210 (8)	0.5517 (7)	0.8089 (5)	0.071 (3)
H9	0.2868	0.5382	0.8310	0.085*
C10	0.1725 (10)	0.4944 (8)	0.7645 (5)	0.093 (4)
H10	0.2047	0.4434	0.7554	0.111*
C11	0.0718 (10)	0.5146 (9)	0.7324 (6)	0.095 (4)
H11	0.0367	0.4754	0.7025	0.114*
C12	0.0257 (9)	0.5885 (8)	0.7441 (5)	0.084 (4)
H12	−0.0402	0.6004	0.7214	0.100*
C13	0.4723 (6)	0.4354 (6)	0.8798 (3)	0.0374 (19)
C14	0.4617 (7)	0.3844 (6)	0.8197 (4)	0.054 (3)
H14A	0.4137	0.3365	0.8192	0.065*
H14B	0.4322	0.4238	0.7855	0.065*
C15	0.5582 (7)	0.3455 (7)	0.8076 (5)	0.058 (3)
C16	0.5895 (8)	0.3710 (7)	0.7563 (5)	0.070 (3)
H16	0.5524	0.4138	0.7302	0.084*
C17	0.6765 (9)	0.3345 (8)	0.7415 (5)	0.077 (3)
H17	0.6971	0.3534	0.7065	0.093*
C18	0.7293 (9)	0.2717 (8)	0.7789 (6)	0.078 (3)
H18	0.7878	0.2489	0.7696	0.094*
C19	0.7005 (8)	0.2395 (8)	0.8306 (6)	0.069 (3)
C20	0.6133 (8)	0.2796 (7)	0.8466 (5)	0.059 (3)
C21	0.5844 (8)	0.2474 (7)	0.8991 (5)	0.067 (3)
H21	0.5290	0.2725	0.9108	0.080*
C22	0.6365 (9)	0.1793 (8)	0.9334 (6)	0.085 (4)
H22	0.6154	0.1581	0.9677	0.102*
C23	0.7216 (10)	0.1409 (8)	0.9176 (6)	0.091 (4)
H23	0.7569	0.0947	0.9410	0.109*
C24	0.7510 (9)	0.1721 (8)	0.8679 (6)	0.082 (4)

H24	0.8080	0.1472	0.8580	0.098*
C25	0.4104 (7)	0.2472 (6)	1.0421 (5)	0.049 (2)
C26	0.4134 (8)	0.1476 (6)	1.0558 (5)	0.067 (3)
H26A	0.4796	0.1242	1.0544	0.081*
H26B	0.4041	0.1380	1.0974	0.081*
C27	0.3332 (10)	0.0995 (7)	1.0104 (6)	0.075 (3)
C28	0.3575 (10)	0.0461 (7)	0.9655 (6)	0.087 (4)
H28	0.4250	0.0382	0.9639	0.105*
C29	0.2783 (14)	0.0038 (8)	0.9222 (7)	0.102 (4)
H29	0.2948	−0.0338	0.8928	0.122*
C30	0.1817 (14)	0.0155 (9)	0.9219 (7)	0.106 (5)
H30	0.1322	−0.0127	0.8916	0.128*
C31	0.1516 (12)	0.0680 (9)	0.9648 (7)	0.093 (4)
C32	0.2295 (10)	0.1096 (7)	1.0102 (6)	0.078 (3)
C33	0.1995 (10)	0.1613 (7)	1.0562 (6)	0.081 (4)
H33	0.2489	0.1879	1.0875	0.097*
C34	0.0969 (11)	0.1725 (8)	1.0550 (6)	0.091 (4)
H34	0.0769	0.2064	1.0851	0.109*
C35	0.0267 (11)	0.1329 (9)	1.0089 (8)	0.103 (5)
H35	−0.0418	0.1421	1.0076	0.124*
C36	0.0488 (12)	0.0830 (10)	0.9664 (7)	0.105 (5)
H36	−0.0033	0.0567	0.9367	0.126*
C37	0.2361 (7)	0.4825 (6)	1.1183 (5)	0.053 (3)
H37	0.2995	0.5043	1.1388	0.064*
C38	0.1536 (8)	0.4935 (7)	1.1472 (5)	0.064 (3)
H38	0.1627	0.5216	1.1855	0.076*
C39	0.0615 (7)	0.4618 (6)	1.1171 (5)	0.060 (3)
H39	0.0060	0.4678	1.1347	0.072*
C40	0.0497 (6)	0.4202 (7)	1.0598 (5)	0.054 (2)
C41	0.1347 (6)	0.4122 (6)	1.0349 (4)	0.048 (2)
C42	0.1262 (7)	0.3708 (6)	0.9760 (5)	0.053 (3)
C43	0.0299 (8)	0.3387 (7)	0.9433 (5)	0.066 (3)
C44	0.0262 (8)	0.2989 (7)	0.8856 (6)	0.079 (4)
H44	−0.0354	0.2774	0.8620	0.095*
C45	0.1105 (8)	0.2915 (8)	0.8642 (5)	0.080 (3)
H45	0.1079	0.2647	0.8261	0.097*
C46	0.2017 (7)	0.3245 (7)	0.8998 (5)	0.065 (3)
H46	0.2597	0.3192	0.8845	0.078*
C47	−0.0453 (7)	0.3864 (7)	1.0257 (6)	0.068 (3)
H47	−0.1023	0.3911	1.0420	0.081*
C48	−0.0538 (7)	0.3482 (7)	0.9709 (6)	0.070 (3)
H48	−0.1171	0.3268	0.9497	0.084*
C49	0.3093 (12)	0.2756 (11)	0.2205 (7)	0.111 (5)
H49	0.3254	0.2539	0.1848	0.133*
C50	0.4563 (9)	0.3670 (8)	0.2346 (6)	0.098 (4)
H50A	0.4694	0.3292	0.2026	0.146*
H50B	0.5135	0.3657	0.2698	0.146*
H50C	0.4454	0.4265	0.2192	0.146*
C51	0.3418 (11)	0.3734 (10)	0.3059 (6)	0.137 (6)

H51A	0.2725	0.3590	0.3055	0.206*
H51B	0.3496	0.4366	0.3055	0.206*
H51C	0.3861	0.3495	0.3428	0.206*

Atomic displacement parameters (Å^2)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Eu1	0.0235 (2)	0.0386 (2)	0.0409 (2)	−0.0030 (2)	0.01099 (15)	−0.0029 (3)
N1	0.039 (4)	0.039 (4)	0.050 (4)	0.009 (4)	0.019 (3)	0.003 (4)
N2	0.026 (4)	0.058 (5)	0.058 (5)	−0.009 (4)	0.010 (4)	−0.008 (4)
N3	0.098 (9)	0.076 (7)	0.068 (7)	0.013 (6)	0.024 (6)	0.008 (6)
O1	0.025 (3)	0.038 (3)	0.041 (3)	0.001 (3)	0.007 (2)	−0.001 (3)
O2	0.020 (3)	0.049 (4)	0.060 (4)	0.007 (3)	0.009 (3)	0.014 (3)
O3	0.032 (3)	0.049 (3)	0.041 (3)	−0.006 (3)	0.015 (2)	−0.007 (3)
O4	0.034 (3)	0.055 (4)	0.036 (3)	−0.008 (3)	0.013 (3)	−0.007 (3)
O5	0.059 (4)	0.037 (4)	0.062 (4)	−0.003 (3)	0.024 (4)	−0.003 (3)
O6	0.057 (4)	0.049 (4)	0.054 (4)	0.001 (3)	0.017 (3)	0.009 (3)
O7	0.106 (9)	0.172 (11)	0.169 (11)	−0.009 (8)	0.013 (8)	0.051 (9)
C1	0.027 (5)	0.044 (5)	0.038 (5)	0.001 (4)	0.013 (4)	−0.007 (4)
C2	0.043 (6)	0.055 (6)	0.055 (6)	−0.001 (5)	0.011 (5)	0.020 (5)
C3	0.043 (6)	0.059 (7)	0.053 (6)	0.002 (5)	0.013 (5)	0.023 (5)
C4	0.057 (7)	0.065 (7)	0.067 (7)	0.004 (6)	0.006 (6)	0.015 (6)
C5	0.069 (8)	0.074 (8)	0.073 (8)	0.019 (7)	0.017 (6)	0.016 (7)
C6	0.054 (7)	0.076 (8)	0.070 (8)	0.009 (6)	0.008 (6)	0.031 (7)
C7	0.063 (7)	0.068 (8)	0.053 (7)	−0.008 (6)	0.008 (6)	0.019 (6)
C8	0.051 (7)	0.062 (7)	0.053 (7)	0.004 (6)	0.008 (5)	0.023 (6)
C9	0.070 (8)	0.074 (8)	0.060 (7)	0.003 (6)	−0.001 (6)	0.010 (6)
C10	0.102 (10)	0.084 (9)	0.078 (9)	0.006 (8)	−0.006 (8)	0.002 (7)
C11	0.102 (11)	0.085 (10)	0.079 (9)	−0.008 (8)	−0.014 (8)	0.003 (8)
C12	0.079 (9)	0.088 (10)	0.073 (8)	−0.004 (8)	−0.003 (7)	0.021 (7)
C13	0.036 (5)	0.038 (5)	0.038 (5)	0.001 (5)	0.008 (4)	−0.005 (5)
C14	0.053 (6)	0.063 (6)	0.047 (6)	−0.005 (5)	0.014 (5)	−0.017 (5)
C15	0.056 (7)	0.066 (7)	0.058 (7)	−0.011 (6)	0.025 (5)	−0.022 (6)
C16	0.074 (8)	0.071 (8)	0.069 (8)	−0.001 (6)	0.026 (6)	−0.014 (6)
C17	0.083 (9)	0.091 (9)	0.072 (8)	−0.012 (7)	0.045 (7)	−0.020 (7)
C18	0.072 (8)	0.085 (9)	0.083 (9)	−0.002 (7)	0.030 (7)	−0.029 (7)
C19	0.062 (8)	0.068 (8)	0.079 (9)	−0.007 (6)	0.023 (7)	−0.021 (7)
C20	0.059 (7)	0.056 (7)	0.067 (7)	−0.009 (6)	0.022 (6)	−0.018 (6)
C21	0.066 (8)	0.064 (7)	0.073 (8)	0.001 (6)	0.022 (6)	−0.013 (6)
C22	0.083 (9)	0.081 (9)	0.090 (10)	0.003 (8)	0.016 (8)	−0.008 (8)
C23	0.087 (10)	0.077 (9)	0.102 (11)	0.008 (8)	0.010 (8)	−0.009 (8)
C24	0.074 (9)	0.082 (9)	0.092 (10)	0.001 (7)	0.023 (8)	−0.024 (8)
C25	0.041 (6)	0.034 (6)	0.073 (7)	−0.004 (4)	0.015 (5)	−0.004 (6)
C26	0.071 (8)	0.047 (6)	0.086 (8)	0.001 (6)	0.023 (6)	0.009 (6)
C27	0.094 (10)	0.043 (7)	0.089 (9)	−0.008 (6)	0.021 (8)	0.008 (6)
C28	0.106 (10)	0.056 (8)	0.100 (10)	−0.008 (7)	0.025 (9)	0.010 (7)
C29	0.129 (13)	0.070 (9)	0.106 (12)	−0.018 (10)	0.028 (11)	0.004 (8)
C30	0.120 (14)	0.073 (10)	0.112 (13)	−0.023 (10)	−0.001 (11)	0.016 (9)

C31	0.101 (12)	0.055 (8)	0.116 (12)	−0.020 (9)	0.013 (9)	0.023 (9)
C32	0.088 (10)	0.046 (7)	0.094 (10)	−0.020 (7)	0.014 (8)	0.013 (7)
C33	0.077 (9)	0.054 (7)	0.111 (10)	−0.012 (7)	0.020 (8)	0.013 (7)
C34	0.080 (10)	0.073 (9)	0.118 (12)	−0.009 (8)	0.022 (9)	0.018 (8)
C35	0.089 (11)	0.080 (11)	0.129 (14)	−0.014 (9)	0.006 (11)	0.022 (9)
C36	0.105 (13)	0.077 (10)	0.120 (13)	−0.027 (10)	0.003 (10)	0.015 (10)
C37	0.036 (6)	0.066 (7)	0.069 (7)	0.006 (5)	0.034 (5)	0.016 (6)
C38	0.055 (7)	0.073 (7)	0.073 (7)	0.013 (6)	0.036 (6)	0.009 (6)
C39	0.048 (6)	0.065 (7)	0.082 (8)	0.013 (5)	0.043 (6)	0.020 (6)
C40	0.035 (5)	0.057 (6)	0.076 (7)	0.002 (5)	0.028 (5)	0.022 (6)
C41	0.031 (5)	0.049 (6)	0.068 (6)	0.002 (5)	0.020 (5)	0.018 (5)
C42	0.034 (6)	0.053 (6)	0.075 (8)	−0.005 (5)	0.020 (5)	0.011 (5)
C43	0.044 (7)	0.066 (7)	0.086 (9)	−0.012 (6)	0.015 (6)	0.011 (6)
C44	0.052 (8)	0.077 (8)	0.097 (10)	−0.025 (7)	−0.002 (7)	0.002 (7)
C45	0.061 (8)	0.094 (9)	0.080 (8)	−0.025 (7)	0.004 (6)	−0.014 (7)
C46	0.045 (6)	0.079 (8)	0.070 (7)	−0.021 (6)	0.011 (5)	−0.015 (6)
C47	0.038 (6)	0.069 (7)	0.100 (9)	−0.004 (5)	0.024 (6)	0.030 (7)
C48	0.035 (6)	0.068 (8)	0.102 (10)	−0.019 (6)	0.006 (6)	0.023 (7)
C49	0.105 (13)	0.118 (13)	0.105 (12)	−0.005 (11)	0.016 (10)	0.021 (10)
C50	0.098 (11)	0.091 (9)	0.102 (10)	0.001 (8)	0.021 (8)	0.026 (8)
C51	0.159 (15)	0.146 (14)	0.119 (13)	0.043 (12)	0.058 (11)	0.001 (11)

Geometric parameters (Å, °)

Eu1—O1^{i}	2.367 (5)	C19—C24	1.384 (14)
Eu1—O3	2.389 (5)	C19—C20	1.444 (13)
Eu1—O4^{i}	2.406 (5)	C20—C21	1.401 (13)
Eu1—O6	2.477 (6)	C21—C22	1.370 (13)
Eu1—O5	2.488 (6)	C21—H21	0.9300
Eu1—O2	2.503 (5)	C22—C23	1.407 (15)
Eu1—O1	2.578 (5)	C22—H22	0.9300
Eu1—N2	2.578 (7)	C23—C24	1.343 (15)
Eu1—N1	2.635 (6)	C23—H23	0.9300
Eu1—Eu1^{i}	3.9700 (9)	C24—H24	0.9300
N1—C37	1.309 (10)	C25—C26	1.533 (12)
N1—C41	1.362 (10)	C26—C27	1.481 (13)
N2—C46	1.315 (11)	C26—H26A	0.9700
N2—C42	1.345 (10)	C26—H26B	0.9700
N3—C49	1.304 (16)	C27—C28	1.381 (14)
N3—C51	1.420 (14)	C27—C32	1.409 (15)
N3—C50	1.434 (14)	C28—C29	1.410 (16)
O1—C1	1.278 (8)	C28—H28	0.9300
O1—Eu1^{i}	2.367 (5)	C29—C30	1.317 (17)
O2—C1	1.233 (9)	C29—H29	0.9300
O3—C13	1.242 (9)	C30—C31	1.373 (18)
O4—C13	1.259 (9)	C30—H30	0.9300
O4—Eu1^{i}	2.406 (5)	C31—C32	1.418 (16)
O5—C25	1.234 (10)	C31—C36	1.418 (18)

O6—C25	1.247 (10)	C32—C33	1.419 (15)
O7—C49	1.250 (15)	C33—C34	1.393 (15)
C1—C2	1.504 (10)	C33—H33	0.9300
C2—C3	1.500 (11)	C34—C35	1.358 (16)
C2—H2A	0.9700	C34—H34	0.9300
C2—H2B	0.9700	C35—C36	1.294 (17)
C3—C4	1.331 (12)	C35—H35	0.9300
C3—C8	1.410 (13)	C36—H36	0.9300
C4—C5	1.406 (12)	C37—C38	1.424 (11)
C4—H4	0.9300	C37—H37	0.9300
C5—C6	1.335 (13)	C38—C39	1.353 (12)
C5—H5	0.9300	C38—H38	0.9300
C6—C7	1.385 (13)	C39—C40	1.391 (12)
C6—H6	0.9300	C39—H39	0.9300
C7—C12	1.395 (14)	C40—C41	1.395 (11)
C7—C8	1.434 (12)	C40—C47	1.421 (12)
C8—C9	1.390 (13)	C41—C42	1.427 (12)
C9—C10	1.356 (13)	C42—C43	1.417 (12)
C9—H9	0.9300	C43—C44	1.403 (14)
C10—C11	1.411 (15)	C43—C48	1.416 (14)
C10—H10	0.9300	C44—C45	1.342 (14)
C11—C12	1.334 (15)	C44—H44	0.9300
C11—H11	0.9300	C45—C46	1.388 (12)
C12—H12	0.9300	C45—H45	0.9300
C13—C14	1.516 (10)	C46—H46	0.9300
C14—C15	1.513 (12)	C47—C48	1.324 (13)
C14—H14A	0.9700	C47—H47	0.9300
C14—H14B	0.9700	C48—H48	0.9300
C15—C16	1.362 (13)	C49—H49	0.9300
C15—C20	1.409 (13)	C50—H50A	0.9600
C16—C17	1.407 (13)	C50—H50B	0.9600
C16—H16	0.9300	C50—H50C	0.9600
C17—C18	1.347 (14)	C51—H51A	0.9600
C17—H17	0.9300	C51—H51B	0.9600
C18—C19	1.383 (14)	C51—H51C	0.9600
C18—H18	0.9300		
$O1^{i}$—Eu1—O3	73.98 (16)	C17—C16—H16	119.0
$O1^{i}$—Eu1—$O4^{i}$	77.01 (17)	C18—C17—C16	118.7 (11)
O3—Eu1—$O4^{i}$	136.22 (18)	C18—C17—H17	120.6
$O1^{i}$—Eu1—O6	86.18 (19)	C16—C17—H17	120.6
O3—Eu1—O6	124.9 (2)	C17—C18—C19	123.0 (12)
$O4^{i}$—Eu1—O6	84.4 (2)	C17—C18—H18	118.5
$O1^{i}$—Eu1—O5	75.43 (18)	C19—C18—H18	118.5
O3—Eu1—O5	73.3 (2)	C18—C19—C24	123.8 (12)
$O4^{i}$—Eu1—O5	129.0 (2)	C18—C19—C20	117.7 (11)
O6—Eu1—O5	51.9 (2)	C24—C19—C20	118.4 (12)
$O1^{i}$—Eu1—O2	123.48 (18)	C21—C20—C15	122.9 (10)

O3—Eu1—O2	77.43 (18)	C21—C20—C19	117.8 (11)
O4^{i}—Eu1—O2	92.48 (18)	C15—C20—C19	119.2 (10)
O6—Eu1—O2	148.75 (19)	C22—C21—C20	120.8 (11)
O5—Eu1—O2	138.44 (19)	C22—C21—H21	119.6
O1^{i}—Eu1—O1	73.28 (19)	C20—C21—H21	119.6
O3—Eu1—O1	68.75 (18)	C21—C22—C23	120.9 (13)
O4^{i}—Eu1—O1	71.92 (17)	C21—C22—H22	119.6
O6—Eu1—O1	151.40 (18)	C23—C22—H22	119.6
O5—Eu1—O1	135.95 (19)	C24—C23—C22	118.8 (13)
O2—Eu1—O1	51.02 (16)	C24—C23—H23	120.6
O1^{i}—Eu1—N2	142.8 (2)	C22—C23—H23	120.6
O3—Eu1—N2	79.4 (2)	C23—C24—C19	123.2 (13)
O4^{i}—Eu1—N2	138.9 (2)	C23—C24—H24	118.4
O6—Eu1—N2	88.4 (2)	C19—C24—H24	118.4
O5—Eu1—N2	72.4 (2)	O5—C25—O6	122.2 (9)
O2—Eu1—N2	73.7 (2)	O5—C25—C26	118.1 (9)
O1—Eu1—N2	120.01 (19)	O6—C25—C26	119.7 (10)
O1^{i}—Eu1—N1	149.65 (19)	C27—C26—C25	111.4 (8)
O3—Eu1—N1	136.33 (19)	C27—C26—H26A	109.3
O4^{i}—Eu1—N1	76.7 (2)	C25—C26—H26A	109.3
O6—Eu1—N1	76.3 (2)	C27—C26—H26B	109.3
O5—Eu1—N1	110.6 (2)	C25—C26—H26B	109.3
O2—Eu1—N1	72.69 (18)	H26A—C26—H26B	108.0
O1—Eu1—N1	112.18 (18)	C28—C27—C32	118.0 (12)
N2—Eu1—N1	62.2 (2)	C28—C27—C26	120.9 (13)
O1^{i}—Eu1—Eu1^{i}	38.45 (13)	C32—C27—C26	121.1 (12)
O3—Eu1—Eu1^{i}	66.43 (12)	C27—C28—C29	118.8 (13)
O4^{i}—Eu1—Eu1^{i}	70.40 (13)	C27—C28—H28	120.6
O6—Eu1—Eu1^{i}	122.03 (14)	C29—C28—H28	120.6
O5—Eu1—Eu1^{i}	108.46 (14)	C30—C29—C28	122.3 (15)
O2—Eu1—Eu1^{i}	85.44 (12)	C30—C29—H29	118.9
O1—Eu1—Eu1^{i}	34.83 (11)	C28—C29—H29	118.9
N2—Eu1—Eu1^{i}	143.13 (17)	C29—C30—C31	122.2 (16)
N1—Eu1—Eu1^{i}	139.44 (15)	C29—C30—H30	118.9
C37—N1—C41	117.4 (7)	C31—C30—H30	118.9
C37—N1—Eu1	122.6 (5)	C30—C31—C32	117.0 (15)
C41—N1—Eu1	120.0 (6)	C30—C31—C36	124.5 (16)
C46—N2—C42	118.3 (8)	C32—C31—C36	118.5 (16)
C46—N2—Eu1	119.8 (6)	C27—C32—C31	121.7 (14)
C42—N2—Eu1	121.8 (6)	C27—C32—C33	120.8 (12)
C49—N3—C51	119.8 (14)	C31—C32—C33	117.5 (14)
C49—N3—C50	120.5 (13)	C34—C33—C32	120.6 (12)
C51—N3—C50	119.7 (12)	C34—C33—H33	119.7
C1—O1—Eu1^{i}	154.9 (5)	C32—C33—H33	119.7
C1—O1—Eu1	90.3 (5)	C35—C34—C33	118.3 (14)

Eu1^{i}—O1—Eu1	106.72 (19)	C35—C34—H34	120.8
C1—O2—Eu1	94.9 (5)	C33—C34—H34	120.8
C13—O3—Eu1	139.5 (5)	C36—C35—C34	124.2 (17)
C13—O4—Eu1^{i}	133.5 (5)	C36—C35—H35	117.9
C25—O5—Eu1	92.8 (5)	C34—C35—H35	117.9
C25—O6—Eu1	92.9 (6)	C35—C36—C31	120.7 (16)
O2—C1—O1	121.3 (7)	C35—C36—H36	119.6
O2—C1—C2	122.6 (7)	C31—C36—H36	119.6
O1—C1—C2	116.0 (7)	N1—C37—C38	124.1 (9)
C3—C2—C1	115.2 (7)	N1—C37—H37	118.0
C3—C2—H2A	108.5	C38—C37—H37	118.0
C1—C2—H2A	108.5	C39—C38—C37	117.7 (10)
C3—C2—H2B	108.5	C39—C38—H38	121.2
C1—C2—H2B	108.5	C37—C38—H38	121.2
H2A—C2—H2B	107.5	C38—C39—C40	120.1 (9)
C4—C3—C8	119.1 (9)	C38—C39—H39	120.0
C4—C3—C2	119.2 (9)	C40—C39—H39	120.0
C8—C3—C2	121.6 (9)	C39—C40—C41	118.4 (9)
C3—C4—C5	123.0 (10)	C39—C40—C47	122.6 (9)
C3—C4—H4	118.5	C41—C40—C47	119.0 (10)
C5—C4—H4	118.5	N1—C41—C40	122.4 (9)
C6—C5—C4	118.2 (11)	N1—C41—C42	117.1 (8)
C6—C5—H5	120.9	C40—C41—C42	120.4 (9)
C4—C5—H5	120.9	N2—C42—C43	122.5 (10)
C5—C6—C7	122.9 (10)	N2—C42—C41	118.7 (8)
C5—C6—H6	118.6	C43—C42—C41	118.7 (9)
C7—C6—H6	118.6	C44—C43—C48	125.4 (10)
C6—C7—C12	124.0 (11)	C44—C43—C42	116.1 (10)
C6—C7—C8	117.9 (10)	C48—C43—C42	118.5 (11)
C12—C7—C8	118.1 (11)	C45—C44—C43	120.7 (10)
C9—C8—C3	123.0 (9)	C45—C44—H44	119.6
C9—C8—C7	118.1 (10)	C43—C44—H44	119.6
C3—C8—C7	118.9 (10)	C44—C45—C46	119.0 (11)
C10—C9—C8	122.7 (11)	C44—C45—H45	120.5
C10—C9—H9	118.6	C46—C45—H45	120.5
C8—C9—H9	118.6	N2—C46—C45	123.3 (10)
C9—C10—C11	118.0 (12)	N2—C46—H46	118.3
C9—C10—H10	121.0	C45—C46—H46	118.3
C11—C10—H10	121.0	C48—C47—C40	120.9 (10)
C12—C11—C10	121.5 (12)	C48—C47—H47	119.6
C12—C11—H11	119.2	C40—C47—H47	119.6
C10—C11—H11	119.2	C47—C48—C43	122.5 (10)
C11—C12—C7	121.5 (12)	C47—C48—H48	118.7
C11—C12—H12	119.2	C43—C48—H48	118.7
C7—C12—H12	119.2	O7—C49—N3	122.3 (17)
O3—C13—O4	126.0 (8)	O7—C49—H49	118.8
O3—C13—C14	116.9 (7)	N3—C49—H49	118.8
O4—C13—C14	117.1 (7)	N3—C50—H50A	109.5

C15—C14—C13	116.7 (7)	N3—C50—H50B	109.5
C15—C14—H14A	108.1	H50A—C50—H50B	109.5
C13—C14—H14A	108.1	N3—C50—H50C	109.5
C15—C14—H14B	108.1	H50A—C50—H50C	109.5
C13—C14—H14B	108.1	H50B—C50—H50C	109.5
H14A—C14—H14B	107.3	N3—C51—H51A	109.5
C16—C15—C20	119.2 (10)	N3—C51—H51B	109.5
C16—C15—C14	119.5 (10)	H51A—C51—H51B	109.5
C20—C15—C14	121.2 (9)	N3—C51—H51C	109.5
C15—C16—C17	122.0 (11)	H51A—C51—H51C	109.5
C15—C16—H16	119.0	H51B—C51—H51C	109.5
$O1^{i}$—Eu1—N1—C37	28.0 (9)	C6—C7—C8—C9	178.3 (9)
O3—Eu1—N1—C37	−148.6 (6)	C12—C7—C8—C9	−1.4 (14)
$O4^{i}$—Eu1—N1—C37	−2.8 (6)	C6—C7—C8—C3	−0.2 (14)
O6—Eu1—N1—C37	84.6 (7)	C12—C7—C8—C3	−179.9 (9)
O5—Eu1—N1—C37	124.3 (6)	C3—C8—C9—C10	180.0 (10)
O2—Eu1—N1—C37	−99.7 (7)	C7—C8—C9—C10	1.5 (16)
O1—Eu1—N1—C37	−66.6 (7)	C8—C9—C10—C11	−1.6 (18)
N2—Eu1—N1—C37	−180.0 (7)	C9—C10—C11—C12	2(2)
$Eu1^{i}$—Eu1—N1—C37	−39.1 (7)	C10—C11—C12—C7	−1(2)
$O1^{i}$—Eu1—N1—C41	−154.3 (5)	C6—C7—C12—C11	−178.3 (11)
O3—Eu1—N1—C41	29.1 (7)	C8—C7—C12—C11	1.4 (17)
$O4^{i}$—Eu1—N1—C41	175.0 (6)	Eu1—O3—C13—O4	−30.2 (15)
O6—Eu1—N1—C41	−97.7 (6)	Eu1—O3—C13—C14	151.8 (6)
O5—Eu1—N1—C41	−58.0 (6)	$Eu1^{i}$—O4—C13—O3	10.3 (13)
O2—Eu1—N1—C41	78.1 (6)	$Eu1^{i}$—O4—C13—C14	−171.7 (5)
O1—Eu1—N1—C41	111.1 (6)	O3—C13—C14—C15	−139.8 (9)
N2—Eu1—N1—C41	−2.2 (6)	O4—C13—C14—C15	42.0 (12)
$Eu1^{i}$—Eu1—N1—C41	138.6 (5)	C13—C14—C15—C16	−119.9 (10)
$O1^{i}$—Eu1—N2—C46	−23.9 (9)	C13—C14—C15—C20	63.7 (12)
O3—Eu1—N2—C46	20.7 (7)	C20—C15—C16—C17	−1.1 (15)
$O4^{i}$—Eu1—N2—C46	175.1 (6)	C14—C15—C16—C17	−177.6 (9)
O6—Eu1—N2—C46	−105.4 (7)	C15—C16—C17—C18	0.9 (17)
O5—Eu1—N2—C46	−55.1 (7)	C16—C17—C18—C19	1.7 (17)
O2—Eu1—N2—C46	100.6 (7)	C17—C18—C19—C24	176.8 (11)
O1—Eu1—N2—C46	78.4 (7)	C17—C18—C19—C20	−3.9 (17)
N1—Eu1—N2—C46	179.2 (8)	C16—C15—C20—C21	−177.7 (10)
$Eu1^{i}$—Eu1—N2—C46	42.4 (8)	C14—C15—C20—C21	−1.3 (14)
$O1^{i}$—Eu1—N2—C42	160.1 (6)	C16—C15—C20—C19	−1.2 (14)
O3—Eu1—N2—C42	−155.3 (7)	C14—C15—C20—C19	175.3 (8)
$O4^{i}$—Eu1—N2—C42	−0.9 (8)	C18—C19—C20—C21	−179.7 (9)
O6—Eu1—N2—C42	78.6 (7)	C24—C19—C20—C21	−0.3 (14)
O5—Eu1—N2—C42	128.9 (7)	C18—C19—C20—C15	3.5 (14)
O2—Eu1—N2—C42	−75.5 (7)	C24—C19—C20—C15	−177.1 (9)
O1—Eu1—N2—C42	−97.7 (7)	C15—C20—C21—C22	175.8 (10)
N1—Eu1—N2—C42	3.2 (6)	C19—C20—C21—C22	−0.8 (15)

Eu1^{i}—Eu1—N2—C42	−133.6 (6)	C20—C21—C22—C23	1.1 (17)
O1^{i}—Eu1—O1—C1	161.2 (5)	C21—C22—C23—C24	−0.1 (18)
O3—Eu1—O1—C1	82.3 (4)	C22—C23—C24—C19	−1.1 (19)
O4^{i}—Eu1—O1—C1	−117.3 (4)	C18—C19—C24—C23	−179.3 (12)
O6—Eu1—O1—C1	−152.9 (5)	C20—C19—C24—C23	1.4 (17)
O5—Eu1—O1—C1	114.7 (5)	Eu1—O5—C25—O6	−5.4 (10)
O2—Eu1—O1—C1	−8.5 (4)	Eu1—O5—C25—C26	173.2 (7)
N2—Eu1—O1—C1	19.3 (5)	Eu1—O6—C25—O5	5.4 (10)
N1—Eu1—O1—C1	−50.5 (5)	Eu1—O6—C25—C26	−173.1 (8)
Eu1^{i}—Eu1—O1—C1	161.2 (5)	O5—C25—C26—C27	−52.7 (13)
O1^{i}—Eu1—O1—Eu1^{i}	0.0	O6—C25—C26—C27	125.9 (11)
O3—Eu1—O1—Eu1^{i}	−78.9 (2)	C25—C26—C27—C28	107.6 (11)
O4^{i}—Eu1—O1—Eu1^{i}	81.4 (2)	C25—C26—C27—C32	−69.9 (13)
O6—Eu1—O1—Eu1^{i}	45.8 (5)	C32—C27—C28—C29	−0.5 (15)
O5—Eu1—O1—Eu1^{i}	−46.5 (3)	C26—C27—C28—C29	−178.2 (10)
O2—Eu1—O1—Eu1^{i}	−169.7 (3)	C27—C28—C29—C30	2.1 (19)
N2—Eu1—O1—Eu1^{i}	−141.9 (2)	C28—C29—C30—C31	−2(2)
N1—Eu1—O1—Eu1^{i}	148.3 (2)	C29—C30—C31—C32	0(2)
O1^{i}—Eu1—O2—C1	−3.0 (5)	C29—C30—C31—C36	179.9 (13)
O3—Eu1—O2—C1	−63.9 (5)	C28—C27—C32—C31	−1.3 (16)
O4^{i}—Eu1—O2—C1	73.1 (5)	C26—C27—C32—C31	176.3 (10)
O6—Eu1—O2—C1	156.4 (5)	C28—C27—C32—C33	178.0 (10)
O5—Eu1—O2—C1	−109.9 (5)	C26—C27—C32—C33	−4.3 (16)
O1—Eu1—O2—C1	8.8 (4)	C30—C31—C32—C27	1.7 (17)
N2—Eu1—O2—C1	−146.3 (5)	C36—C31—C32—C27	−178.3 (11)
N1—Eu1—O2—C1	148.4 (5)	C30—C31—C32—C33	−177.7 (11)
Eu1^{i}—Eu1—O2—C1	3.0 (4)	C36—C31—C32—C33	2.4 (17)
O1^{i}—Eu1—O3—C13	−17.2 (9)	C27—C32—C33—C34	178.6 (10)
O4^{i}—Eu1—O3—C13	33.2 (10)	C31—C32—C33—C34	−2.0 (16)
O6—Eu1—O3—C13	−90.6 (9)	C32—C33—C34—C35	0.0 (17)
O5—Eu1—O3—C13	−96.4 (9)	C33—C34—C35—C36	2(2)
O2—Eu1—O3—C13	113.5 (9)	C34—C35—C36—C31	−2(2)
O1—Eu1—O3—C13	60.8 (9)	C30—C31—C36—C35	179.4 (13)
N2—Eu1—O3—C13	−171.0 (9)	C32—C31—C36—C35	−1(2)
N1—Eu1—O3—C13	161.1 (8)	C41—N1—C37—C38	0.4 (13)
Eu1^{i}—Eu1—O3—C13	23.1 (9)	Eu1—N1—C37—C38	178.1 (7)
O1^{i}—Eu1—O5—C25	99.6 (6)	N1—C37—C38—C39	−0.2 (14)
O3—Eu1—O5—C25	176.9 (6)	C37—C38—C39—C40	−0.2 (14)
O4^{i}—Eu1—O5—C25	40.2 (6)	C38—C39—C40—C41	0.2 (14)
O6—Eu1—O5—C25	2.9 (5)	C38—C39—C40—C47	−179.4 (9)
O2—Eu1—O5—C25	−135.9 (5)	C37—N1—C41—C40	−0.3 (12)
O1—Eu1—O5—C25	145.5 (5)	Eu1—N1—C41—C40	−178.1 (6)
N2—Eu1—O5—C25	−99.3 (6)	C37—N1—C41—C42	179.1 (8)
N1—Eu1—O5—C25	−49.1 (6)	Eu1—N1—C41—C42	1.3 (10)
Eu1^{i}—Eu1—O5—C25	119.6 (5)	C39—C40—C41—N1	0.0 (14)

O1^{i}—Eu1—O6—C25	−77.3 (5)	C47—C40—C41—N1	179.6 (8)
O3—Eu1—O6—C25	−9.9 (6)	C39—C40—C41—C42	−179.4 (8)
O4^{i}—Eu1—O6—C25	−154.6 (5)	C47—C40—C41—C42	0.2 (13)
O5—Eu1—O6—C25	−2.9 (5)	C46—N2—C42—C43	0.6 (14)
O2—Eu1—O6—C25	119.8 (6)	Eu1—N2—C42—C43	176.7 (7)
O1—Eu1—O6—C25	−120.9 (6)	C46—N2—C42—C41	179.9 (8)
N2—Eu1—O6—C25	65.9 (5)	Eu1—N2—C42—C41	−4.0 (11)
N1—Eu1—O6—C25	127.7 (6)	N1—C41—C42—N2	1.7 (12)
Eu1^{i}—Eu1—O6—C25	−92.0 (5)	C40—C41—C42—N2	−178.9 (8)
Eu1—O2—C1—O1	−16.4 (8)	N1—C41—C42—C43	−179.0 (8)
Eu1—O2—C1—C2	162.8 (7)	C40—C41—C42—C43	0.4 (13)
Eu1^{i}—O1—C1—O2	149.4 (9)	N2—C42—C43—C44	−0.9 (15)
Eu1—O1—C1—O2	15.8 (7)	C41—C42—C43—C44	179.9 (9)
Eu1^{i}—O1—C1—C2	−29.9 (16)	N2—C42—C43—C48	178.5 (9)
Eu1—O1—C1—C2	−163.4 (6)	C41—C42—C43—C48	−0.8 (14)
O2—C1—C2—C3	−4.3 (12)	C48—C43—C44—C45	−178.5 (11)
O1—C1—C2—C3	174.9 (8)	C42—C43—C44—C45	0.8 (16)
C1—C2—C3—C4	111.3 (10)	C43—C44—C45—C46	−0.5 (18)
C1—C2—C3—C8	−70.9 (11)	C42—N2—C46—C45	−0.3 (15)
C8—C3—C4—C5	1.4 (15)	Eu1—N2—C46—C45	−176.4 (8)
C2—C3—C4—C5	179.4 (9)	C44—C45—C46—N2	0.2 (18)
C3—C4—C5—C6	0.4 (16)	C39—C40—C47—C48	179.1 (10)
C4—C5—C6—C7	−2.2 (16)	C41—C40—C47—C48	−0.5 (15)
C5—C6—C7—C12	−178.3 (11)	C40—C47—C48—C43	0.1 (16)
C5—C6—C7—C8	2.1 (15)	C44—C43—C48—C47	179.8 (11)
C4—C3—C8—C9	−179.9 (9)	C42—C43—C48—C47	0.5 (16)
C2—C3—C8—C9	2.2 (14)	C51—N3—C49—O7	−3(2)
C4—C3—C8—C7	−1.5 (14)	C50—N3—C49—O7	177.8 (13)
C2—C3—C8—C7	−179.4 (8)		

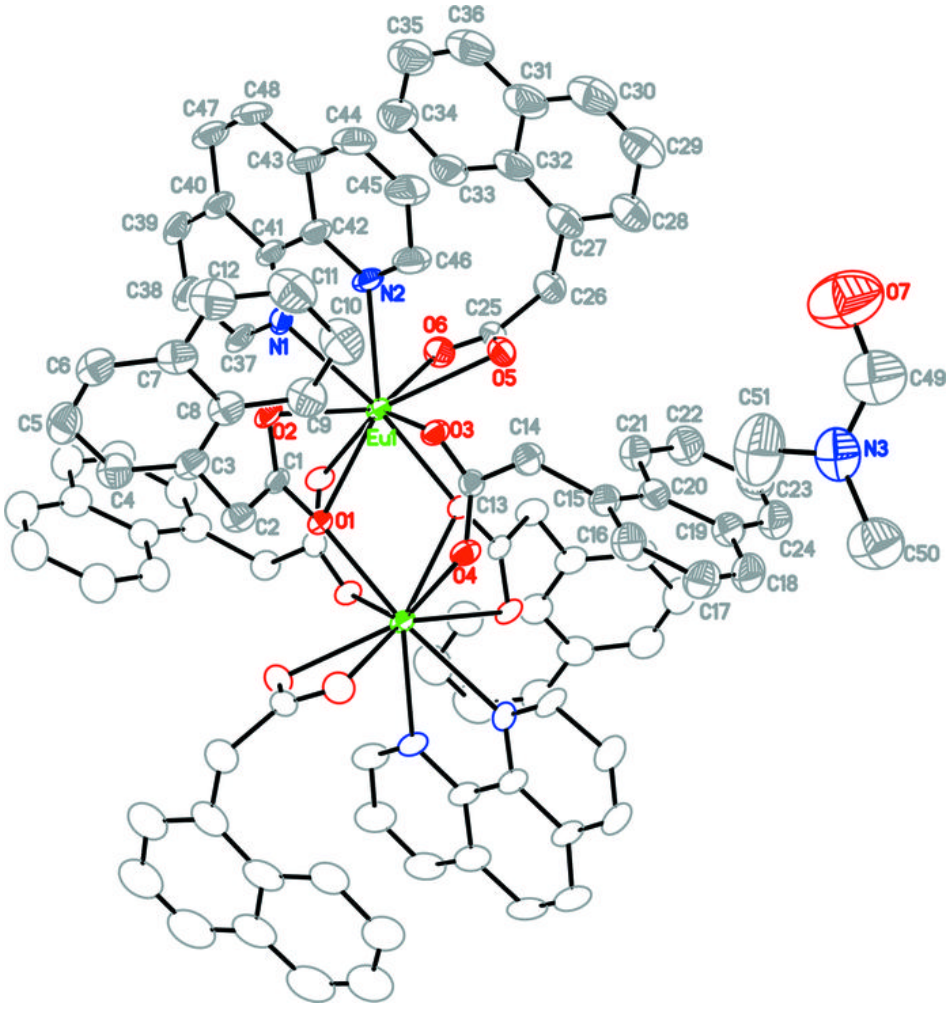
Symmetry codes: (i) −*x*+1, −*y*+1, −*z*+2.

Hydrogen-bond geometry (Å, °)

D—H···*A*	*D*—H	H···*A*	*D*···*A*	*D*—H···*A*
C6—H6···O7^{ii}	0.93	2.58	3.469 (15)	161
C37—H37···O4^{i}	0.93	2.38	3.053 (10)	130
C46—H46···O3	0.93	2.48	3.096 (11)	124
C47—H47···O2^{iii}	0.93	2.46	3.314 (11)	152
C50—H50A···O6^{iv}	0.96	2.60	3.397 (14)	140
C18—H18···Cg1^{v}	0.93	2.91	3.682 (13)	141

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

Fig. 1


C35
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O1
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C16
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O4
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C17

Fig. 2

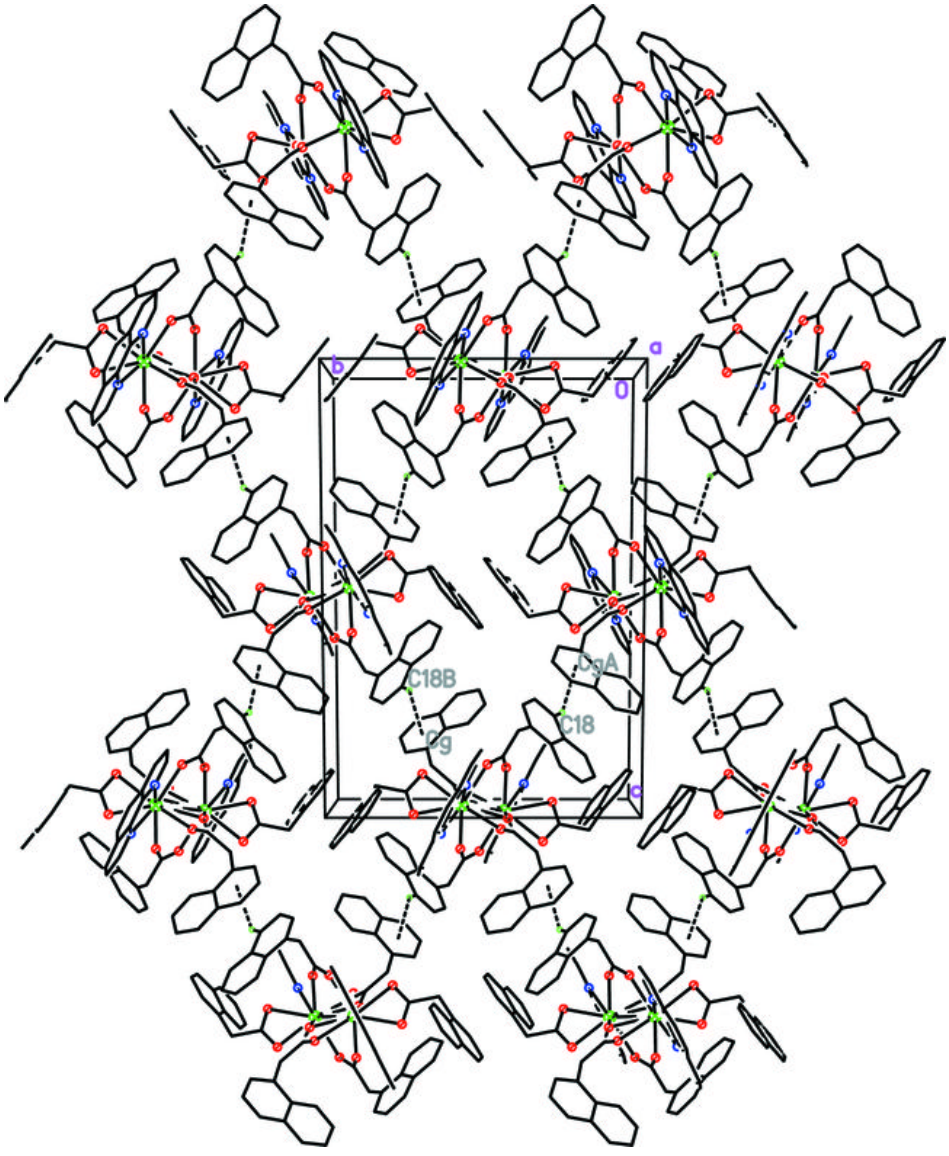

Fig. 3