Acta Crystallographica Section E
Structure Reports Online
ISSN 1600-5368

Bis(4-formylbenzoato-κO)bis(1*H*-imidazole-κN^3)zinc(II)

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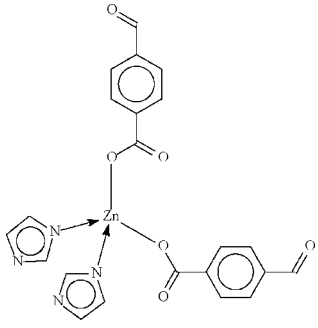
Received 14 November 2007; accepted 14 November 2007

Key indicators: single-crystal X-ray study; T = 295 K; mean σ(C–C) = 0.012 Å; R factor = 0.040; wR factor = 0.150; data-to-parameter ratio = 15.0.

The zinc centre in the title complex, $[Zn(C_8H_5O_3)_2(C_3H_4N_2)_2]$, shows tetrahedral coordination. Adjacent molecules are linked by N—H···O hydrogen bonds into a layer structure.

Related literature

For the diaqua complex, see Deng *et al.* (2006*a*), and for the aqua phenanthroline adduct, see Deng *et al.* (2006*b*). The monohydrated bis(benzimidazole) adduct is hydrogen bonded into a chain structure (see Deng *et al.*, 2007).



Experimental

Crystal data

$[Zn(C_8H_5O_3)_2(C_3H_4N_2)_2]$
M_r = 499.77
Monoclinic, $P2_1$
a = 11.9413 (9) Å
b = 7.0455 (5) Å
c = 14.2092 (9) Å
β = 109.904 (2)°
V = 1124.1 (1) Å^3
Z = 2
Mo $K\alpha$ radiation
μ = 1.14 mm^{-1}
T = 295 (2) K
0.36 × 0.25 × 0.21 mm

Data collection

Rigaku R-AXIS RAPID IP diffractometer
Absorption correction: multi-scan (*ABSCOR*; Higashi, 1995)
T_{min} = 0.662, T_{max} = 0.796
11106 measured reflections
4493 independent reflections
2901 reflections with $I > 2\sigma(I)$
R_{int} = 0.042

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.040
$wR(F^2)$ = 0.150
S = 1.13
4493 reflections
299 parameters
1 restraint
H-atom parameters constrained
$\Delta\rho_{max}$ = 1.17 e Å^{-3}
$\Delta\rho_{min}$ = −1.12 e Å^{-3}
Absolute structure: Flack (1983), 1716 Friedel pairs
Flack parameter: 0.01 (2)

Table 1
Selected geometric parameters (Å, °).

Zn1—O1	1.938 (5)	Zn1—N1	2.007 (5)
Zn1—O4	1.966 (5)	Zn1—N3	2.007 (6)
O1—Zn1—O4	118.3 (2)	O4—Zn1—N1	97.4 (2)
O1—Zn1—N1	114.7 (2)	O4—Zn1—N3	111.7 (2)
O1—Zn1—N3	101.9 (2)	N1—Zn1—N3	113.4 (2)

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

D—H···A	D—H	H···A	D···A	D—H···A
N2—H2*N*···O2^{i}	0.86	1.92	2.749 (7)	163
N4—H4*N*···O5^{ii}	0.86	1.93	2.754 (7)	162

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

Data collection: *RAPID-AUTO* (Rigaku, 1998); cell refinement: *RAPID-AUTO*; data reduction: *CrystalStructure* (Rigaku/MSC, 2002); program(s) used to solve structure: *SHELXS97* (Sheldrick, 1997); program(s) used to refine structure: *SHELXL97* (Sheldrick, 1997); molecular graphics: *X-SEED* (Barbour, 2001) and *OLEX* (Dolomanov *et al.*, 2003); software used to prepare material for publication: *publCIF* (Westrip, 2007).

The authors thank the Heilongjiang Province Natural Science Foundation (grant No. B200501), the Scientific Fund for Remarkable Teachers of Heilongjiang Province (grant No. 1054 G036) and the University of Malaya for supporting this study.

Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: XU2375).

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 doi:10.1107/S1600536807059296

supplementary materials

Acta Cryst. (2007). E**63**, m3113 [**doi:10.1107/S1600536807059296**]

Bis(4-formylbenzoato-κO)bis(1*H*-imidazole-κN^3)zinc(II)

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Comment

As a part of our ongoing investigation on 4-formylbenzoate complexes (Deng *et al.*, 2006*a*, 2006*b*, 2007), the title Zn^{II} complex has been prepared and its structure is reported here. The molecular structure is shown in Fig. 1. The Zn^{II} ion displays a tetrahedral coordination geometry (Table 1). Adjacent molecules are linked by N—H···O hydrogen bonds into a layer structure (Table 2 and Fig. 2).

Experimental

Zinc sulfate heptahydrate (1.44 g, 5 mmol) was added to an aqueous solution (25 ml) of 4-formylbenzoic acid (1.5 g, 10 mmol) and imidazole (0.68 g, 10 mmol). The pH value of the mixture was about 6. The solution was allowed to evaporate at room temperature; colorless prismatic crystals separated from the filtered solution after several days. CH&N elemental analysis. Calc. for $C_{22}H_{18}N_4O_6Zn$: C 52.87, H 3.63, N 11.21%. Found: C 52.88, H 3.68, N 11.18%.

Refinement

The carbon- and nitrogen bound H atoms were generated geometrically (C–H 0.93, N–H 0.86 Å) and were included in the refinement in the riding model approximation, with U(H) set to 1.2U_{eq}(C,*N*).

The final difference Fourier map had a large peak /deep hole near Zn1.

Figures

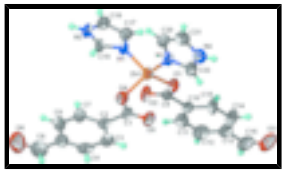

Fig. 1. Thermal ellipsoid plot of the molecular structure. Displacement ellipsoids are drawn at the 50% probability level, and H atoms are drawn as spheres of arbitrary radii.

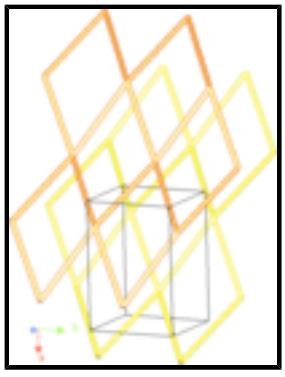

Fig. 2. *OLEX* (Dolomanov *et al.*, 2003) representation of the hydrogen-bonded layer structure.

Bis(4-formylbenzoato-κ*O*)bis(1*H*-imidazole-κN^3)zinc(II)

Crystal data

$[Zn(C_8H_5O_3)_2(C_3H_4N_2)_2]$	F_{000} = 512
M_r = 499.77	D_x = 1.477 Mg m^{-3}
Monoclinic, $P2_1$	Mo $K\alpha$ radiation λ = 0.71073 Å
Hall symbol: P 2yb	Cell parameters from 8013 reflections
a = 11.9413 (9) Å	θ = 3.1–27.5º
b = 7.0455 (5) Å	μ = 1.14 mm^{-1}
c = 14.2092 (9) Å	T = 295 (2) K
β = 109.904 (2)º	Prism, colorless
V = 1124.1 (1) Å^3	0.36 × 0.25 × 0.21 mm
Z = 2	

Data collection

Rigaku RAXIS-RAPID IP diffractometer	4493 independent reflections
Radiation source: fine-focus sealed tube	2901 reflections with $I > 2\sigma(I)$
Monochromator: graphite	R_{int} = 0.042
T = 295(2) K	θ_{max} = 27.5º
ω scan	θ_{min} = 3.1º
Absorption correction: multi-scan (ABSCOR; Higashi, 1995)	h = −15→15
T_{min} = 0.662, T_{max} = 0.796	k = −9→8
11106 measured reflections	l = −18→18

Refinement

Refinement on F^2	Hydrogen site location: inferred from neighbouring sites
Least-squares matrix: full	H-atom parameters constrained
$R[F^2 > 2\sigma(F^2)]$ = 0.040	$w = 1/[\sigma^2(F_o^2) + (0.0471P)^2 + 1.7346P]$ where $P = (F_o^2 + 2F_c^2)/3$
$wR(F^2)$ = 0.150	$(\Delta/\sigma)_{max}$ = 0.001
S = 1.13	$\Delta\rho_{max}$ = 1.17 e Å^{-3}
4493 reflections	$\Delta\rho_{min}$ = −1.11 e Å^{-3}
299 parameters	Extinction correction: none
1 restraint	Absolute structure: Flack (1983) parameter from 1716 Friedel pairs
Primary atom site location: structure-invariant direct methods	Flack parameter: 0.01 (2)
Secondary atom site location: difference Fourier map	

Fractional atomic coordinates and isotropic or equivalent isotropic displacement parameters (Å^2)

	x	*y*	*z*	U_{iso}*/U_{eq}
Zn1	0.77235 (5)	0.49998 (13)	0.20968 (4)	0.0464 (2)
O1	0.8971 (4)	0.3416 (7)	0.1932 (4)	0.0585 (13)
O2	0.7697 (4)	0.1549 (8)	0.0823 (4)	0.0684 (15)
O3	1.3608 (7)	−0.2711 (12)	0.1953 (5)	0.111 (3)
O4	0.6612 (4)	0.3861 (8)	0.2687 (3)	0.0608 (13)
O5	0.7938 (4)	0.3692 (9)	0.4217 (4)	0.0719 (15)
O6	0.1902 (7)	0.3427 (14)	0.4523 (6)	0.126 (3)
N1	0.6505 (4)	0.5887 (8)	0.0812 (4)	0.0461 (12)
N2	0.4747 (5)	0.6479 (9)	−0.0238 (5)	0.0631 (17)
H2n	0.3998	0.6732	−0.0469	0.076*
N3	0.8663 (4)	0.7125 (8)	0.2943 (4)	0.0473 (13)
N4	1.0097 (5)	0.8557 (10)	0.4062 (4)	0.0622 (16)
H4n	1.0774	0.8759	0.4521	0.075*
C1	0.6901 (5)	0.3684 (10)	0.3637 (5)	0.0498 (16)
C2	0.5873 (6)	0.3511 (9)	0.4011 (4)	0.0462 (15)
C3	0.6076 (7)	0.3316 (11)	0.5034 (5)	0.0585 (18)
H3	0.6847	0.3235	0.5489	0.070*
C4	0.5090 (8)	0.3245 (11)	0.5363 (5)	0.064 (2)
H4	0.5215	0.3125	0.6043	0.077*
C5	0.3954 (7)	0.3348 (11)	0.4702 (6)	0.0616 (19)
C6	0.3780 (7)	0.3571 (12)	0.3701 (6)	0.064 (2)
H6	0.3008	0.3680	0.3249	0.077*
C7	0.4699 (6)	0.3635 (11)	0.3360 (5)	0.0535 (17)
H7	0.4550	0.3765	0.2677	0.064*
C8	0.2937 (10)	0.3301 (16)	0.5073 (8)	0.091 (3)
H8	0.3094	0.3168	0.5757	0.109*
C9	0.8711 (5)	0.1953 (10)	0.1381 (5)	0.0450 (14)
C10	0.9721 (6)	0.0645 (9)	0.1431 (5)	0.0459 (16)
C11	0.9491 (7)	−0.1102 (12)	0.0963 (6)	0.064 (2)
H11	0.8710	−0.1469	0.0618	0.077*
C12	1.0425 (8)	−0.2306 (12)	0.1007 (6)	0.074 (2)
H12	1.0270	−0.3478	0.0688	0.089*
C13	1.1581 (7)	−0.1771 (12)	0.1522 (6)	0.062 (2)
C14	1.1811 (6)	−0.0046 (18)	0.1993 (5)	0.073 (2)
H14	1.2593	0.0317	0.2336	0.087*
C15	1.0887 (5)	0.1152 (11)	0.1958 (6)	0.062 (2)
H15	1.1047	0.2310	0.2292	0.075*
C16	1.2565 (9)	−0.3093 (15)	0.1549 (7)	0.082 (3)
H16	1.2368	−0.4270	0.1241	0.098*
C17	0.6563 (6)	0.5897 (11)	−0.0136 (5)	0.0551 (17)
H17	0.7242	0.5678	−0.0300	0.066*
C18	0.5469 (7)	0.6276 (12)	−0.0788 (5)	0.064 (2)
H18	0.5252	0.6379	−0.1480	0.077*
C19	0.5387 (5)	0.6224 (10)	0.0710 (5)	0.0496 (16)
H19	0.5089	0.6274	0.1235	0.060*

C20	0.8343 (6)	0.8961 (11)	0.3001 (5)	0.0549 (17)
H20	0.7622	0.9505	0.2619	0.066*
C21	0.9231 (6)	0.9861 (16)	0.3696 (5)	0.0631 (17)
H21	0.9248	1.1126	0.3887	0.076*
C22	0.9740 (6)	0.6922 (12)	0.3605 (5)	0.0578 (18)
H22	1.0180	0.5803	0.3731	0.069*

Atomic displacement parameters (Å^2)

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Zn1	0.0356 (3)	0.0558 (4)	0.0432 (3)	0.0037 (4)	0.0074 (2)	−0.0028 (5)
O1	0.041 (2)	0.057 (3)	0.070 (3)	0.004 (2)	0.009 (2)	−0.011 (3)
O2	0.035 (2)	0.080 (4)	0.074 (3)	0.004 (2)	−0.002 (2)	−0.016 (3)
O3	0.096 (5)	0.148 (7)	0.102 (5)	0.067 (5)	0.051 (4)	0.033 (5)
O4	0.054 (3)	0.076 (4)	0.044 (2)	−0.005 (2)	0.006 (2)	0.003 (2)
O5	0.049 (3)	0.101 (4)	0.055 (3)	0.007 (3)	0.005 (2)	0.016 (3)
O6	0.090 (5)	0.172 (8)	0.134 (6)	0.009 (6)	0.061 (5)	0.006 (6)
N1	0.032 (2)	0.061 (3)	0.043 (3)	0.005 (2)	0.010 (2)	−0.004 (2)
N2	0.034 (3)	0.072 (4)	0.072 (4)	0.007 (3)	0.003 (3)	0.008 (3)
N3	0.037 (3)	0.056 (4)	0.044 (3)	0.004 (2)	0.007 (2)	0.001 (3)
N4	0.058 (4)	0.071 (4)	0.048 (3)	−0.015 (3)	0.006 (3)	−0.015 (3)
C1	0.040 (3)	0.052 (4)	0.051 (4)	0.007 (3)	0.007 (3)	0.002 (3)
C2	0.055 (4)	0.042 (4)	0.042 (3)	0.005 (3)	0.018 (3)	−0.001 (3)
C3	0.062 (4)	0.061 (5)	0.053 (4)	0.010 (3)	0.019 (3)	0.003 (4)
C4	0.096 (6)	0.054 (5)	0.048 (4)	0.006 (4)	0.032 (4)	0.009 (3)
C5	0.061 (5)	0.057 (5)	0.074 (5)	0.007 (4)	0.031 (4)	0.004 (4)
C6	0.050 (4)	0.075 (5)	0.070 (5)	−0.006 (4)	0.025 (4)	−0.004 (4)
C7	0.049 (4)	0.062 (5)	0.047 (3)	0.003 (3)	0.013 (3)	−0.006 (3)
C8	0.099 (8)	0.095 (8)	0.099 (7)	0.014 (6)	0.060 (6)	0.003 (6)
C9	0.040 (3)	0.048 (4)	0.046 (3)	0.005 (3)	0.012 (3)	0.001 (3)
C10	0.040 (3)	0.046 (4)	0.054 (4)	0.008 (2)	0.019 (3)	0.003 (3)
C11	0.059 (5)	0.060 (5)	0.073 (5)	−0.003 (4)	0.023 (4)	−0.013 (4)
C12	0.096 (7)	0.055 (5)	0.077 (5)	0.016 (4)	0.037 (5)	−0.010 (4)
C13	0.067 (5)	0.069 (5)	0.058 (4)	0.019 (4)	0.032 (4)	0.008 (4)
C14	0.046 (3)	0.090 (6)	0.079 (4)	0.027 (6)	0.017 (3)	−0.012 (7)
C15	0.033 (3)	0.067 (5)	0.083 (5)	0.003 (3)	0.013 (3)	−0.021 (4)
C16	0.093 (7)	0.091 (7)	0.073 (5)	0.042 (6)	0.042 (5)	0.018 (5)
C17	0.053 (4)	0.066 (5)	0.043 (3)	0.002 (3)	0.012 (3)	0.003 (3)
C18	0.058 (4)	0.076 (6)	0.046 (4)	0.001 (4)	0.003 (3)	0.008 (4)
C19	0.031 (3)	0.062 (4)	0.049 (3)	0.004 (3)	0.005 (3)	−0.003 (3)
C20	0.049 (4)	0.065 (5)	0.051 (4)	0.011 (3)	0.017 (3)	0.003 (3)
C21	0.077 (4)	0.054 (4)	0.061 (4)	−0.004 (5)	0.027 (3)	−0.010 (5)
C22	0.045 (4)	0.064 (5)	0.052 (4)	−0.003 (3)	0.000 (3)	−0.010 (4)

Geometric parameters (Å, °)

Zn1—O1	1.938 (5)	C5—C6	1.375 (10)
Zn1—O4	1.966 (5)	C5—C8	1.480 (12)
Zn1—N1	2.007 (5)	C6—C7	1.342 (9)

Zn1—N3	2.007 (6)	C6—H6	0.9300
O1—C9	1.267 (8)	C7—H7	0.9300
O2—C9	1.235 (7)	C8—H8	0.9300
O3—C16	1.212 (11)	C9—C10	1.500 (9)
O4—C1	1.281 (7)	C10—C11	1.382 (10)
O5—C1	1.232 (7)	C10—C15	1.384 (9)
O6—C8	1.220 (11)	C11—C12	1.385 (11)
N1—C19	1.315 (7)	C11—H11	0.9300
N1—C17	1.373 (8)	C12—C13	1.377 (12)
N2—C19	1.315 (8)	C12—H12	0.9300
N2—C18	1.354 (10)	C13—C14	1.369 (14)
N2—H2n	0.8600	C13—C16	1.489 (11)
N3—C22	1.318 (8)	C14—C15	1.377 (10)
N3—C20	1.360 (9)	C14—H14	0.9300
N4—C22	1.320 (10)	C15—H15	0.9300
N4—C21	1.348 (11)	C16—H16	0.9300
N4—H4n	0.8600	C17—C18	1.346 (10)
C1—C2	1.499 (9)	C17—H17	0.9300
C2—C7	1.395 (9)	C18—H18	0.9300
C2—C3	1.397 (9)	C19—H19	0.9300
C3—C4	1.408 (11)	C20—C21	1.337 (10)
C3—H3	0.9300	C20—H20	0.9300
C4—C5	1.364 (11)	C21—H21	0.9300
C4—H4	0.9300	C22—H22	0.9300
O1—Zn1—O4	118.3 (2)	C5—C8—H8	118.5
O1—Zn1—N1	114.7 (2)	O2—C9—O1	124.4 (6)
O1—Zn1—N3	101.9 (2)	O2—C9—C10	119.1 (6)
O4—Zn1—N1	97.4 (2)	O1—C9—C10	116.5 (5)
O4—Zn1—N3	111.7 (2)	C11—C10—C15	119.3 (6)
N1—Zn1—N3	113.4 (2)	C11—C10—C9	120.0 (7)
C9—O1—Zn1	120.4 (4)	C15—C10—C9	120.7 (6)
C1—O4—Zn1	120.7 (4)	C10—C11—C12	119.9 (8)
C19—N1—C17	106.2 (5)	C10—C11—H11	120.1
C19—N1—Zn1	123.5 (4)	C12—C11—H11	120.1
C17—N1—Zn1	129.1 (4)	C13—C12—C11	120.2 (8)
C19—N2—C18	108.4 (5)	C13—C12—H12	119.9
C19—N2—H2n	125.8	C11—C12—H12	119.9
C18—N2—H2n	125.8	C14—C13—C12	120.1 (7)
C22—N3—C20	106.6 (6)	C14—C13—C16	121.1 (8)
C22—N3—Zn1	123.9 (5)	C12—C13—C16	118.8 (9)
C20—N3—Zn1	129.5 (4)	C13—C14—C15	120.1 (7)
C22—N4—C21	109.2 (6)	C13—C14—H14	120.0
C22—N4—H4n	125.4	C15—C14—H14	120.0
C21—N4—H4n	125.4	C14—C15—C10	120.5 (8)
O5—C1—O4	123.6 (6)	C14—C15—H15	119.8
O5—C1—C2	121.4 (6)	C10—C15—H15	119.8
O4—C1—C2	115.0 (5)	O3—C16—C13	123.3 (10)
C7—C2—C3	118.4 (6)	O3—C16—H16	118.4
C7—C2—C1	121.3 (6)	C13—C16—H16	118.4

C3—C2—C1	120.3 (6)	C18—C17—N1	108.4 (7)
C2—C3—C4	118.7 (7)	C18—C17—H17	125.8
C2—C3—H3	120.6	N1—C17—H17	125.8
C4—C3—H3	120.6	C17—C18—N2	106.4 (6)
C5—C4—C3	121.1 (7)	C17—C18—H18	126.8
C5—C4—H4	119.4	N2—C18—H18	126.8
C3—C4—H4	119.4	N1—C19—N2	110.6 (6)
C4—C5—C6	118.9 (7)	N1—C19—H19	124.7
C4—C5—C8	119.8 (8)	N2—C19—H19	124.7
C6—C5—C8	121.2 (8)	C21—C20—N3	109.1 (7)
C7—C6—C5	121.5 (7)	C21—C20—H20	125.4
C7—C6—H6	119.2	N3—C20—H20	125.4
C5—C6—H6	119.2	C20—C21—N4	105.9 (8)
C6—C7—C2	121.3 (7)	C20—C21—H21	127.1
C6—C7—H7	119.4	N4—C21—H21	127.1
C2—C7—H7	119.4	N3—C22—N4	109.2 (7)
O6—C8—C5	123.0 (10)	N3—C22—H22	125.4
O6—C8—H8	118.5	N4—C22—H22	125.4
O4—Zn1—O1—C9	61.0 (5)	C4—C5—C8—O6	178.4 (10)
N3—Zn1—O1—C9	−176.1 (5)	C6—C5—C8—O6	1.1 (15)
N1—Zn1—O1—C9	−53.2 (6)	Zn1—O1—C9—O2	9.4 (9)
O1—Zn1—O4—C1	81.4 (6)	Zn1—O1—C9—C10	−170.2 (4)
N3—Zn1—O4—C1	−36.4 (6)	O2—C9—C10—C11	−8.5 (10)
N1—Zn1—O4—C1	−155.2 (5)	O1—C9—C10—C11	171.1 (6)
O1—Zn1—N1—C19	149.5 (5)	O2—C9—C10—C15	172.6 (7)
O4—Zn1—N1—C19	23.6 (6)	O1—C9—C10—C15	−7.7 (10)
N3—Zn1—N1—C19	−94.0 (5)	C15—C10—C11—C12	−1.4 (11)
O1—Zn1—N1—C17	−16.0 (7)	C9—C10—C11—C12	179.8 (7)
O4—Zn1—N1—C17	−141.9 (6)	C10—C11—C12—C13	0.4 (13)
N3—Zn1—N1—C17	100.5 (6)	C11—C12—C13—C14	0.1 (13)
O1—Zn1—N3—C22	−31.2 (6)	C11—C12—C13—C16	−179.6 (8)
O4—Zn1—N3—C22	96.1 (6)	C12—C13—C14—C15	0.4 (13)
N1—Zn1—N3—C22	−155.0 (5)	C16—C13—C14—C15	−179.9 (8)
O1—Zn1—N3—C20	152.0 (6)	C13—C14—C15—C10	−1.4 (13)
O4—Zn1—N3—C20	−80.7 (6)	C11—C10—C15—C14	1.9 (12)
N1—Zn1—N3—C20	28.2 (6)	C9—C10—C15—C14	−179.3 (7)
Zn1—O4—C1—O5	−20.8 (10)	C14—C13—C16—O3	−2.4 (14)
Zn1—O4—C1—C2	157.8 (5)	C12—C13—C16—O3	177.2 (8)
O5—C1—C2—C7	175.5 (7)	C19—N1—C17—C18	1.1 (8)
O4—C1—C2—C7	−3.1 (10)	Zn1—N1—C17—C18	168.6 (5)
O5—C1—C2—C3	−1.3 (11)	N1—C17—C18—N2	−0.6 (9)
O4—C1—C2—C3	−179.8 (6)	C19—N2—C18—C17	−0.2 (9)
C7—C2—C3—C4	0.3 (11)	C17—N1—C19—N2	−1.2 (8)
C1—C2—C3—C4	177.1 (7)	Zn1—N1—C19—N2	−169.6 (5)
C2—C3—C4—C5	0.5 (11)	C18—N2—C19—N1	0.9 (9)
C3—C4—C5—C6	−1.6 (12)	C22—N3—C20—C21	0.3 (8)
C3—C4—C5—C8	−179.0 (8)	Zn1—N3—C20—C21	177.4 (5)
C4—C5—C6—C7	1.9 (13)	N3—C20—C21—N4	0.0 (8)
C8—C5—C6—C7	179.3 (9)	C22—N4—C21—C20	−0.2 (8)

C5—C6—C7—C2	−1.1 (13)	C20—N3—C22—N4	−0.4 (8)
C3—C2—C7—C6	0.0 (11)	Zn1—N3—C22—N4	−177.7 (5)
C1—C2—C7—C6	−176.8 (7)	C21—N4—C22—N3	0.4 (8)

Hydrogen-bond geometry (Å, °)

D—H···*A*	*D*—H	H···*A*	*D*···*A*	*D*—H···*A*
N2—H2*n*···O2^{i}	0.86	1.92	2.749 (7)	163
N4—H4*n*···O5^{ii}	0.86	1.93	2.754 (7)	162

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

Fig. 1

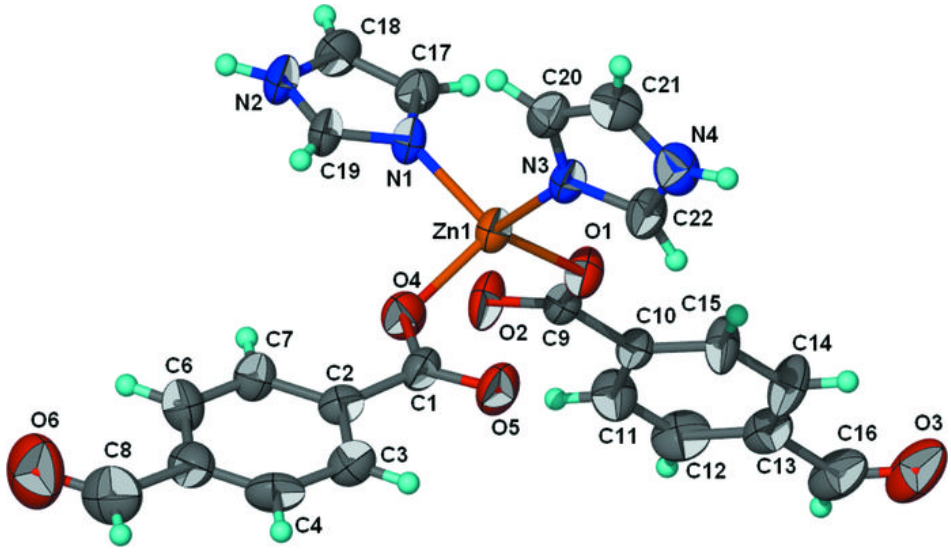
C18
C17
N2
C19
N1
C20
C21
N4
N3
C22
Zn1
O1
O4
O2
C9
C10
C15
C14
C7
C6
C2
C1
O5
O6
C8
C3
C4
C11
C12
C13
C16
O3

Fig. 2