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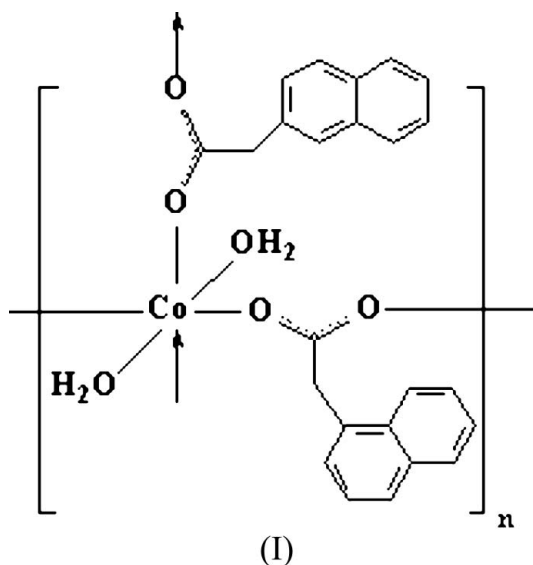
Key indicators

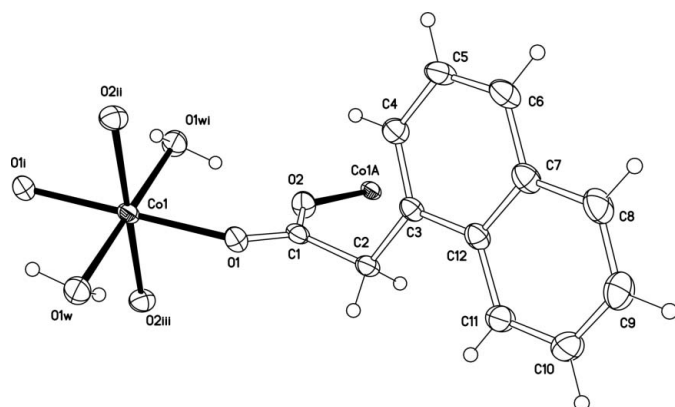
Single-crystal X-ray study
 $T = 273$ K
Mean $\sigma(\text{C}-\text{C}) = 0.005$ Å
 R factor = 0.052
 wR factor = 0.159
Data-to-parameter ratio = 15.8For details of how these key indicators were
automatically derived from the article, see
<http://journals.iucr.org/e>.A two-dimensional grid-like cobalt^{II} coordination
polymer: poly[[diaquacobalt(II)]-di- μ_2 -naphthalene-
1-acetato]In the title compound, $[\text{Co}(\text{C}_{12}\text{H}_9\text{O}_2)_2(\text{H}_2\text{O})_2]_n$, the Co^{II} atom
lies on an inversion centre and has a slightly distorted
octahedral coordination environment involving four carboxylate
and two water O atoms. In the crystal structure, each
naphthaleneacetate ligand coordinates two metal centres
through its carboxylate O atoms, adopting a bis-monodentate
mode to give rise to a two-dimensional network. A three-
dimensional supramolecular network is consolidated by
intermolecular $\text{O}-\text{H}\cdots\text{O}$ hydrogen bonds.

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Comment

As an interesting field of crystal engineering and materials
chemistry, coordination polymers have been rapidly devel-
oped in recent years (Żurowska *et al.*, 2006; Ye *et al.*, 2006). In
an effort to establish strategies aimed at designing novel
metal-organic frameworks, we have chosen some carboxylate
ligands, such as 2,4-dichlorophenoxyacetate (Gu *et al.*, 2006),
phenylenedioxydiacetate (Gao *et al.*, 2005) and carboxyl-
phenoxyacetate (Huo *et al.*, 2005), to bind metal centres into
novel metal-organic networks. We report here the synthesis
and crystal structure of the title coordination polymer, (I).As illustrated in Fig. 1, the Co^{II} atom of (I) occupies a
special position on an inversion centre, and has a slightly
distorted octahedral coordination environment. The Co^{II}
atom is coordinated by six O atoms, four from three different
naphthaleneacetate ligands [average $\text{Co}-\text{O}$ distance =
 $2.096(2)$ Å] and two from two water molecules [$\text{Co}-\text{OW}$ =
 $2.126(2)$ Å]. The carboxylate groups of the anionic ligands are


Figure 1

The asymmetric unit of (I), together with additional atoms to complete the coordination of Co1 and the carboxylate bridge, with the atom-numbering scheme. Displacement ellipsoids are drawn at the 30% probability level. [Symmetry codes: (i) $-x + \frac{1}{2}, -y + \frac{3}{2}, -z$; (ii) $x, -y + 1, z - \frac{1}{2}$; (iii) $-x + \frac{1}{2}, y + \frac{1}{2}, -z + \frac{1}{2}$; (A) $-x + \frac{1}{2}, y - \frac{1}{2}, -z + \frac{1}{2}$].

all electron-delocalized, as evidenced by the characteristic C—O bond lengths (Table 1).

Each naphthaleneacetate group displays a bis-monodentate bridging mode, connecting two adjacent Co^{II} atoms. As a result, a polynuclear one-dimensional cobalt chain is formed, running along the diagonal of the *bc* plane, in which the adjacent Co...Co distance is 5.358 (2) Å. Adjacent chains are parallel to each other and are further connected by other naphthaleneacetate groups, resulting in the formation of a two-dimensional grid-like lamellar framework (Fig. 2).

Intermolecular O—H...O hydrogen bonds (Table 2) link the sheets of (I) into a three-dimensional supramolecular framework, and may be effective in the stabilization of the crystal structure.

Experimental

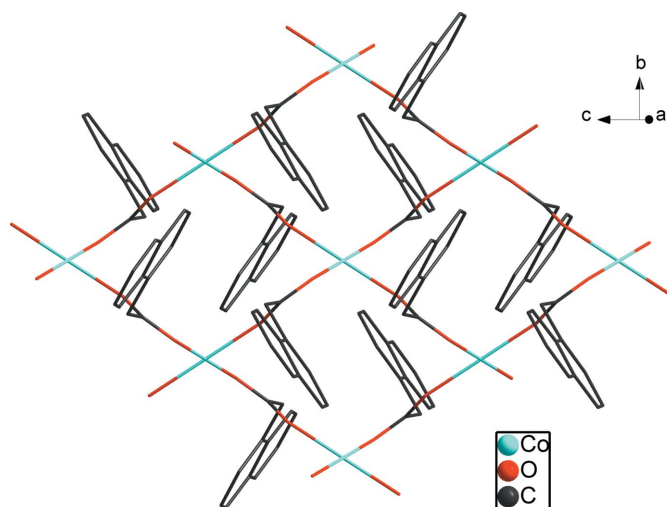
Cobalt(II) diacetate trihydrate (4.76 g, 20 mmol) and naphthaleneacetic acid (3.72 g, 20 mmol) were dissolved in a 1:1 ethanol–water mixture (100 ml), and the pH was adjusted to 7 with 0.1 M sodium hydroxide. The resulting solution was stirred for 20 min at room temperature and then filtered. Pink single crystals of (I) were isolated from the solution at room temperature over several days.

Crystal data

$[\text{Co}(\text{C}_{12}\text{H}_9\text{O}_2)_2(\text{H}_2\text{O})_2]$	$Z = 4$
$M_r = 465.35$	$D_x = 1.566 \text{ Mg m}^{-3}$
Monoclinic, $C2/c$	Mo $K\alpha$ radiation
$a = 36.954 (5) \text{ \AA}$	$\mu = 0.91 \text{ mm}^{-1}$
$b = 6.1913 (10) \text{ \AA}$	$T = 273 (2) \text{ K}$
$c = 8.7464 (13) \text{ \AA}$	Block, pink
$\beta = 99.524 (9)^\circ$	$0.31 \times 0.26 \times 0.18 \text{ mm}$
$V = 1973.5 (5) \text{ \AA}^3$	

Data collection

Bruker SMART diffractometer	6297 measured reflections
ω scans	2238 independent reflections
Absorption correction: multi-scan (SADABS; Sheldrick, 1996)	1628 reflections with $I > 2\sigma(I)$
$T_{\min} = 0.765, T_{\max} = 0.853$	$R_{\text{int}} = 0.043$
	$\theta_{\text{max}} = 27.5^\circ$


Figure 2

A view of the two-dimensional layer structure of (I). H atoms and aqua ligands have been omitted.

Refinement

Refinement on F^2
 $R[F^2 > 2\sigma(F^2)] = 0.052$
 $wR(F^2) = 0.159$
 $S = 1.06$
 2238 reflections
 142 parameters

H-atom parameters constrained
 $w = 1/[\sigma^2(F_o^2) + (0.0977P)^2]$
 where $P = (F_o^2 + 2F_c^2)/3$
 $(\Delta/\sigma)_{\text{max}} < 0.001$
 $\Delta\rho_{\text{max}} = 0.61 \text{ e \AA}^{-3}$
 $\Delta\rho_{\text{min}} = -0.83 \text{ e \AA}^{-3}$

Table 1

Selected geometric parameters (Å, °).

Co1—O1	2.062 (2)	O1—C1	1.256 (4)
Co1—O2 ⁱ	2.130 (2)	O2—C1	1.265 (4)
Co1—O1W	2.126 (2)		
O1 ⁱⁱ —Co1—O1	180	O2 ⁱⁱⁱ —Co1—O2 ⁱ	180
O1 ⁱⁱ —Co1—O2 ⁱ	94.17 (9)	O1W ⁱⁱ —Co1—O2 ⁱ	90.23 (10)
O1—Co1—O2 ⁱ	85.83 (9)	O1W—Co1—O2 ⁱ	89.77 (10)
O1 ⁱⁱ —Co1—O1W	89.31 (10)	O1W ⁱⁱ —Co1—O1W	180
O1—Co1—O1W	90.69 (10)		

Symmetry codes: (i) $-x + \frac{1}{2}, y + \frac{1}{2}, -z + \frac{1}{2}$; (ii) $-x + \frac{1}{2}, -y + \frac{3}{2}, -z$; (iii) $x, -y + 1, z - \frac{1}{2}$.

Table 2

Hydrogen-bond geometry (Å, °).

$D-H\cdots A$	$D-H$	$H\cdots A$	$D\cdots A$	$D-H\cdots A$
O1W—H1W1...O2 ⁱⁱ	0.85	1.85	2.701 (3)	176
O1W—H1W2...O2 ⁱ	0.85	2.16	3.004 (3)	176

Symmetry codes: (i) $-x + \frac{1}{2}, y + \frac{1}{2}, -z + \frac{1}{2}$; (ii) $-x + \frac{1}{2}, -y + \frac{3}{2}, -z$.

H atoms were positioned geometrically, with O—H = 0.85 Å (for water H) and C—H = 0.93 and 0.97 Å, for aromatic and methylene H, respectively, and constrained to ride on their parent atoms, with $U_{\text{iso}}(\text{H}) = xU_{\text{eq}}(\text{C}, \text{O})$, where $x = 1.5$ for water H and $x = 1.2$ for all other H atoms.

Data collection: SMART (Bruker, 2004); cell refinement: SAINT (Bruker, 2004); data reduction: SAINT; program(s) used to solve structure: SHELXS97 (Sheldrick, 1997); program(s) used to refine structure: SHELXL97 (Sheldrick, 1997); molecular graphics:

SHELXTL (Bruker, 2002); software used to prepare material for publication: *SHELXL97*.

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