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Polymeric potassium triformatocobalt(II)

Susanne Wöhlert,[a]* Mario Wriedt,[b] Inke Jess[a] and Christian Näther[a]

[a]Institut für Anorganische Chemie, Christian-Albrechts-Universität Kiel, Max-Eyth-Strasse 2, 24118 Kiel, Germany, and [b]Departement of Chemistry, Texas A&M University, College Station, Texas 77843, USA
Correspondence e-mail: swoehlert@ac.uni-kiel.de

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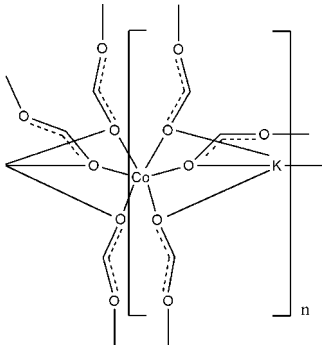
Key indicators: single-crystal X-ray study; T = 293 K; mean σ(O–C) = 0.002 Å; R factor = 0.020; wR factor = 0.046; data-to-parameter ratio = 16.5.

In the crystal structure of the title compound, poly[tri-μ-formato-cobalt(II)potassium], $[CoK(CHO_2)_3]_n$ the Co^{2+} cations are coordinated by six O-bonded formate anions in an octahedral coordination mode and the K^+ cations are eightfold coordinated by seven O-bonded formate anions within irregular polyhedra. The Co^{2+} cations are connected by bridging formate anions into a three-dimensional coordination network in which the K^+ cations are embedded. The asymmetric unit consits of one Co^{2+} cation located on a center of inversion, one K^+ cation located on a twofold axis and two crystallographically independent formato anions, of which one is located on a twofold axis and the other occupies a general position.

Related literature

For background to this work see: Boeckmann *et al.* (2010); Wriedt & Näther (2010); Wriedt *et al.* (2009). For structures of bimetallic compounds based on potassium formate, see: Antsyshkina *et al.* (1983); Leontiev *et al.* (1988). For a description of the Cambridge Structural Database, see: Allen (2002).



Experimental

Crystal data

$[CoK(CHO_2)_3]$
M_r = 233.08
Monoclinic, $C2/c$
a = 10.7244 (8) Å
b = 8.9653 (6) Å
c = 6.8742 (5) Å
β = 95.539 (6)°
V = 657.85 (8) Å^3
Z = 4
Mo $K\alpha$ radiation
μ = 3.22 mm^{-1}
T = 293 K
0.16 × 0.09 × 0.06 mm

Data collection

Stoe IPDS-2 diffractometer
Absorption correction: numerical (*X-SHAPE* and *X-RED32*; Stoe & Cie, 2008)
T_{min} = 0.711, T_{max} = 0.817
6120 measured reflections
892 independent reflections
853 reflections with $I > 2\sigma(I)$
R_{int} = 0.031

Refinement

$R[F^2 > 2\sigma(F^2)]$ = 0.020
$wR(F^2)$ = 0.046
S = 1.15
892 reflections
54 parameters
H-atom parameters constrained
$\Delta\rho_{max}$ = 0.25 e Å^{-3}
$\Delta\rho_{min}$ = −0.57 e Å^{-3}

Table 1
Selected bond lengths (Å).

K1—O1	2.7371 (10)	Co1—O1	2.0943 (10)
K1—O2^{i}	2.8193 (10)	Co1—O2^{ii}	2.1015 (10)
K1—O11^{i}	2.8507 (11)	Co1—O11^{iii}	2.1026 (9)

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

Data collection: *X-AREA* (Stoe & Cie, 2008); cell refinement: *X-AREA*; data reduction: *X-AREA*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 2008); program(s) used to refine structure: *SHELXL97* (Sheldrick, 2008); molecular graphics: *XP* in *SHELXTL* (Sheldrick, 2008) and *DIAMOND* (Brandenburg, 1999); software used to prepare material for publication: *XCIF* in *SHELXTL*.

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Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: KJ2172).

References

Allen, F. H. (2002). *Acta Cryst.* B**58**, 380–388.
Antsyshkina, A. S., Porai-Koshits, M. A., Ostrikova, V. N. & Sadikov, G. G. (1983). *Koord. Khim.* **9**, 855–864.
Boeckmann, J., Wriedt, M. & Näther, C. (2010). *Eur. J. Inorg. Chem.* pp. 1820–1828.
Brandenburg, K. (1999). *DIAMOND*. Crystal Impact GbR, Bonn, Germany.
Leontiev, A. Yu., Arion, M. D., Razdobreev, I. M., Kiosse, G. A., Yablokov, Yu. V., Malinovskii, T. I. & Popvich, G. A. (1988). *Dokl. Akad. Nauk SSSR*, **300**, 1129–1140.
Sheldrick, G. M. (2008). *Acta Cryst.* A**64**, 112–122.
Stoe & Cie (2008). *X-AREA*, *X-RED32* and *X-SHAPE*. Stoe & Cie, Darmstadt, Germany.
Wriedt, M. & Näther, C. (2010). *Z. Anorg. Allg. Chem.* **636**, 569–575.
Wriedt, M., Sellmer, S. & Näther, C. (2009). *Inorg. Chem.* **48**, 6896–6903.