

Silver europium(III) polyphosphate

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Key indicators: single-crystal X-ray study; $T = 298$ K; mean $\sigma(\text{P}-\text{O}) = 0.005$ Å; R factor = 0.042; wR factor = 0.109; data-to-parameter ratio = 12.3.

Europium(III) silver polyphosphate, $\text{AgEu}(\text{PO}_3)_4$, was prepared by the flux method. The atomic arrangement is built up by infinite $(\text{PO}_3)_n$ chains (periodicity of 4) extending along the c axis. These chains are joined to each other by EuO_8 dodecahedra. The Ag^+ cations are located in the voids of this arrangement and are surrounded by five oxygen atoms in a distorted [4+1] coordination.

Related literature

For isotypic $\text{AgNd}(\text{PO}_3)_4$, see: Trunov *et al.* (1990). For related structures, see: Yamada *et al.* (1974); Hashimoto *et al.* (1991); Horchani *et al.* (2003); Durif (1995); Averbuch-Pouchot & Bagieu-Boucher (1987); Férid (2006).

Experimental

Crystal data

$\text{AgEu}(\text{PO}_3)_4$
 $M_r = 575.72$
 Monoclinic, $P2_1/n$
 $a = 9.9654$ (3) Å
 $b = 13.1445$ (7) Å

$c = 7.2321$ (3) Å
 $\beta = 90.42$ (1)°
 $V = 947.31$ (7) Å³
 $Z = 4$
 Mo $K\alpha$ radiation

$\mu = 9.37$ mm⁻¹
 $T = 298$ (2) K

$0.19 \times 0.18 \times 0.17$ mm

Data collection

Nonius KappaCCD diffractometer
 Absorption correction: multi-scan
 (*SADABS*; Sheldrick, 1996)
 $T_{\min} = 0.167$, $T_{\max} = 0.201$

3371 measured reflections
 2019 independent reflections
 1704 reflections with $I > 2\sigma(I)$
 $R_{\text{int}} = 0.042$

Refinement

$R[F^2 > 2\sigma(F^2)] = 0.042$
 $wR(F^2) = 0.109$
 $S = 1.03$
 2019 reflections

164 parameters
 $\Delta\rho_{\text{max}} = 2.43$ e Å⁻³
 $\Delta\rho_{\text{min}} = -2.06$ e Å⁻³

Data collection: *COLLECT* (Nonius, 2001); cell refinement: *DENZO/SCALEPACK* (Otwinowski & Minor, 1997); data reduction: *DENZO/SCALEPACK*; program(s) used to solve structure: *SHELXS97* (Sheldrick, 2008); program(s) used to refine structure: *SHELXL97* (Sheldrick, 2008); molecular graphics: *DIAMOND* (Brandenburg, 1998); software used to prepare material for publication: *SHELXL97*.

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Supplementary data and figures for this paper are available from the IUCr electronic archives (Reference: BR2089).

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