

# Embreyite

# $\text{Pb}_5(\text{PO}_4)_2(\text{CrO}_4)_2 \cdot \text{H}_2\text{O}$

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**Crystal Data:** Monoclinic, pseudorhombic. *Point Group:*  $2/m$  (probable). Minute tabular crystals, pseudorhombic, with apparent  $\{10\bar{1}1\}$  and  $\{0001\}$ , in drusy botryoidal crusts. *Twinning:* Multiple twinning and  $60^\circ$  sector zoning observed optically.

**Physical Properties:** *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = 3.5  
D(meas.) = 6.45(12) D(calc.) = 6.41

**Optical Properties:** Translucent to transparent. *Color:* Dull orange, red-violet, dark red, reddish brown; orange in thin section. *Streak:* Yellow. *Luster:* Vitreous, resinous, dull. *Optical Class:* Biaxial (-). *Pleochroism:* X = honey-yellow; Y = Z = amber. *Orientation:* Y = b. *Dispersion:* Low.  $\alpha = 2.20(4)$   $\beta = 2.36(4)$   $\gamma = 2.36(4)$   $2V(\text{meas.}) = 0^\circ\text{--}11^\circ$

**Cell Data:** *Space Group:*  $[A2/m]$  (probable; by analogy to cassedanneite).  $a = 7.135(3)$   
 $b = 5.636(3)$   $c = 9.599(3)$   $\beta = 115.15(2)^\circ$   $Z = 1$

**X-ray Powder Pattern:** Beresovsk, Russia.  
3.167 (100), 4.751 (60), 2.818 (60), 1.917 (45), 3.563 (32), 2.213 (32), 2.187 (31)

Chemistry:	(1)	(2)
CrO <sub>3</sub>	13.46	13.55
P <sub>2</sub> O <sub>5</sub>	9.13	9.62
Fe <sub>2</sub> O <sub>3</sub>	0.02	
CuO	1.71	
ZnO	0.04	
PbO	74.73	75.61
H <sub>2</sub> O	0.91	1.22
Total	[100.00]	100.00

(1) Beresovsk, Russia; by electron microprobe and AA, average of five analyses, H<sub>2</sub>O by TGA; corresponds to  $\text{Pb}_{4.97}(\text{PO}_4)_{1.91}(\text{CrO}_4)_{2.00} \cdot 0.75\text{H}_2\text{O}$ . (2)  $\text{Pb}_5(\text{PO}_4)_2(\text{CrO}_4)_2 \cdot \text{H}_2\text{O}$ .

**Occurrence:** On museum samples from the oxidized zone of gold-bearing quartz veins (Beresovsk, Russia).

**Association:** Crocoite, phoenicochroite, vauquelinite, cassedanneite, cerussite (Beresovsk, Russia); crocoite, vauquelinite, fornacite, pyromorphite, mimetite, cerussite (Callenberg mine, Germany).

**Distribution:** From the Beresovsk gold deposit, near Yekaterinburg (Sverdlovsk), Middle Ural Mountains, Russia. At the Argent Pb–Zn mines, about 100 km east of Johannesburg, Transvaal, South Africa. In the Callenberg mine, near Hohenstein-Ernstthal, Saxony, Germany.

**Name:** To honor Peter Godwin Embrey (1929– ), English mineralogist, British Museum (Natural History), London, England.

**Type Material:** The Natural History Museum, London, England, 39316.

**References:** (1) Williams, S.A. (1972) Embreyite, a new mineral from Berezov, Siberia. *Mineral. Mag.*, 38, 790–793. (2) (1973) *Amer. Mineral.*, 58, 806 (abs. ref. 1). (3) Cesbron, F., R. Giraud, F. Pillard, and J.-F. Poullen (1988) La cassedanneite, nouveau chromo-vanadate de plomb de Beresovsk (Oural). *Compt. Rendus Acad. Sci. Paris*, 306, 125–127 (in French with English abs.).