

Raygrantite**Pb₁₀Zn(SO₄)₆(SiO₄)₂(OH)₂**

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. *Twinning:* Pervasive fish-tail type on (12 $\bar{1}$). As bladed crystals elongated to 0.30 mm and striated along [001].

Physical Properties: *Cleavage:* Good on {120}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = ~ 3 D(meas.) = n.d. D(calc.) = 6.374

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (+). $\alpha = 1.915(7)$ $\beta = 1.981(7)$ $\gamma = 2.068(9)$ $2V(\text{meas.}) = 76(2)^\circ$ $2V(\text{calc.}) = 85^\circ$ *Dispersion:* $r > v$, strong. *Absorption:* $Z > Y > X$.

Cell Data: *Space Group:* $P\bar{1}$. $a = 9.3175(4)$ $b = 11.1973(5)$ $c = 10.8318(5)$ $\alpha = 120.374(2)^\circ$ $\beta = 90.511(2)^\circ$ $\gamma = 56.471(2)^\circ$ $Z = 1$

X-ray Powder Pattern: Evening Star mine, Big Horn Mountains, Maricopa County, Arizona, USA. 3.102 (100), 3.267 (63), 4.753 (56), 2.851 (35), 4.288 (32), 2.783 (31), 2.707 (31)

Chemistry:	(1)
SiO ₂	4.30
SO ₃	16.49
PbO	74.91
ZnO	2.59
H ₂ O	[0.62]
Total	98.81

(1) Evening Star mine, Big Horn Mountains, Maricopa County, Arizona, USA; average of 18 electron microprobe analyses supplemented by Raman spectroscopy, H₂O calculated from structure; corresponds to Pb_{9.81}Zn_{0.93}(S_{1.00}O₄)₆(Si_{1.05}O₄)₂(OH)₂.

Mineral Group: Iranite group.

Occurrence: By alteration of sulfides in a hydrothermal quartz-galena-pyrite-chalcopyrite vein.

Association: Galena, anglesite, cerussite, lanarkite, leadhillite, mattheddleite, alamosite, hydrocerussite, caledonite, diaboileite, fornacite, iranite, phoenicochroite, cerussite, murdochite.

Distribution: From the Evening Star mine (previously called Old Queen Group or Silver Queen mine), Big Horn Mountains, Maricopa County, Arizona, USA.

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Type Material: Mineral Museum, University of Arizona (#19345) and in the collection of the RRUFF Project (R120151), Tucson, Arizona, USA.

References: (1) Yang, H., M.B. Andrade, R.T. Downs, R.B. Gibbs, and R.A. Jenkins (2016) Raygrantite, Pb₁₀Zn(SO₄)₆(SiO₄)₂(OH)₂, a new mineral isostructural with iranite, from the Big Horn Mountains, Maricopa County, Arizona, USA. *Can. Mineral.*, 54(3), 625-634. (2) (2017) *Amer. Mineral.*, 102, 1966 (abs. ref. 1).