

**Zincostrunzite****ZnFe<sup>3+</sup><sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>2</sub>·6.5H<sub>2</sub>O**

**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . Prismatic crystals display {010} and {1 $\bar{1}$ 0} in bundles to 2 mm or as needles to ~ 5 mm, elongated on [001] and with poorly formed terminations, probably {001}. As rims on strunzite crystals. *Twining:* Ubiquitous by 180° rotation on [010].

**Physical Properties:** *Cleavage:* Perfect || [001], probably either on {1 $\bar{1}$ 0} or {100}.  
*Tenacity:* Brittle. *Fracture:* Irregular, splintery. Hardness = 2.5 D(meas.) = 2.66(1)  
 D(calc.) = 2.679 Dissolves slowly in dilute HCl.

**Optical Properties:** Transparent. *Color:* Light brownish yellow to silvery white. *Streak:* White.  
*Luster:* Vitreous to silky.  
*Optical Class:* Biaxial (-).  $\alpha = 1.620(2)$   $\beta = 1.672(2)$   $\gamma = 1.720(2)$  2V(meas.) = 89.5(5)°  
 2V(calc.) = 85.1° *Orientation:*  $Z \wedge c = 3^\circ$ ,  $X \approx a^*$ . *Pleochroism:* X = nearly colorless, Y = light brownish yellow, Z = darker brownish yellow. *Absorption:*  $X < Y < Z$ .

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 10.1736(6)$   $b = 9.7999(5)$   $c = 7.3296(2)$   $\alpha = 91.325(4)^\circ$   
 $\beta = 97.895(6)^\circ$   $\gamma = 116.948(4)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Sitio do Castelo mine, Folgoso, Gouveia, Guarda District, Portugal.  
 8.87 (100), 5.32 (95), 3.220 (75), 4.287 (41), 1.6222 (32), 4.457 (30), 3.310 (29)

<b>Chemistry:</b>	(1)	(2)	(3)
ZnO	12.07	15.13	15.71
MnO	3.28	3.74	
Fe <sub>2</sub> O <sub>3</sub>	32.00	29.23	30.82
P <sub>2</sub> O <sub>5</sub>	28.53	28.24	27.40
H <sub>2</sub> O	[27.30]	[27.02]	26.08
Total	103.18	103.39	100.00

(1) Sitio do Castelo mine, Portugal; average of 9 electron microprobe analyses, H<sub>2</sub>O calculated from structural analysis; corresponds to (Zn<sub>0.74</sub>Mn<sup>2+</sup><sub>0.23</sub>) $\Sigma=0.97$ Fe<sup>3+</sup><sub>1.99</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>2</sub>·6.5H<sub>2</sub>O. (2) Hagendorf South, Bavaria, Germany; average of 4 electron microprobe analyses, H<sub>2</sub>O calculated from structural analysis; corresponds to (Zn<sub>0.93</sub>Mn<sup>2+</sup><sub>0.08</sub>) $\Sigma=1.01$ (Fe<sup>3+</sup><sub>1.84</sub>Mn<sup>2+</sup><sub>0.19</sub>) $\Sigma=2.03$ (PO<sub>4</sub>)<sub>2</sub>(OH)<sub>2</sub>·6.5H<sub>2</sub>O.  
 (3) ZnFe<sup>3+</sup><sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>2</sub>·6.5H<sub>2</sub>O.

**Occurrence:** In zoned phosphatic granitic pegmatite (Hagendorf). In vugs in a secondary phosphate assemblage from altered triplite-zwieselite in wolframite-bearing quartz lens (Sitio do Castelo).

**Association:** Triplite-zwieselite, fluorapatite, cryptomelane, cacoxenite, plimerite, strengite, strunzite, isokite (Sitio do Castelo); in a former triphylite nodule replaced by phosphophyllite and apatite (Hagendorf).

**Distribution:** From the 67-meter level, Cornelia Mine Open Cut, Hagendorf South, Oberpfalz, Bavaria, Germany. From the Sitio do Castelo mine, Folgoso, Gouveia, Guarda District, Portugal.

**Name:** As the Zn analogue of *strunzite*.

**Type Material:** Mineral Sciences Department, Natural History Museum of Los Angeles County, Los Angeles, CA, USA (65646 and 65647) and the Geosciences Collection, Museum Victoria, Melbourne, Victoria, Australia (M53585).

**References:** (1) Kampf, A.R., I.E. Grey, P. Alves, S.J. Mills, B.P. Nash, C.M. MacRae, and E. Keck (2017) Zincostrunzite, ZnFe<sup>3+</sup><sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>(OH)<sub>2</sub>·6.5H<sub>2</sub>O, a new mineral from the Sitio do Castelo mine, Portugal, and the Hagendorf-Süd pegmatite, Germany. *Eur. J. Mineral.*, 29(2), 315-322. (2) (2018) *Amer. Mineral.*, 103, 663 (abs. ref. 1).