

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Crystals acicular to elongated on [001], bladed or prismatic, to 0.5 mm, with dominant forms {100}, {010}, 001}; as hemispherical radiating sprays, to 3 mm.

Physical Properties: *Cleavage:* Perfect on {100} and {010}, distinct on {001}.
Fracture: Uneven. *Tenacity:* Brittle. Hardness = 3.5-4 D(meas.) = 3.67(5) D(calc.) = 3.62

Optical Properties: Translucent. *Color:* Pale olive-green to dark green, almost black; pale green to dark olive-green as aggregates. *Streak:* Pale grayish-green. *Luster:* Vitreous.
Optical Class: Biaxial (-). $a = 1.765(5)$ $\beta = 1.764(4)$ $\gamma = 1.767(4)$ $2V(\text{calc.}) = -63^\circ$
Orientation: $X = c$; $Y = a$; $Z = b$. *Pleochroism:* X = pale greenish-brown; Y = pale brown; Z = pale bluish-green. *Absorption:* $Z > X > Y$.

Cell Data: *Space Group:* $Bbmm$. $a = 13.811(3)$ $b = 16.718(3)$ $c = 5.141(10)$ $Z = 4$

X-ray Powder Pattern: Broken Hill, western New South Wales, Australia.
3.168 (100), 2.575 (90), 2.414 (75), 2.753 (60), 3.369 (55), 4.638 (50), 3.388 (50)

| Chemistry: | (1) | (2) |
|-------------------------|-------|--------|
| P_2O_5 | 32.37 | 32.32 |
| As_2O_5 | 0.09 | |
| Al_2O_3 | 4.48 | |
| Fe_2O_3 | 29.82 | 48.49 |
| FeO | 2.98 | |
| MnO | 0.02 | |
| MgO | 0.00 | |
| CaO | 0.17 | |
| CuO | 0.00 | |
| ZnO | 20.17 | 12.35 |
| PbO | 0.36 | |
| H_2O | 6.84 | 6.84 |
| Total | 97.30 | 100.00 |

(1) Broken Hill, western New South Wales, Australia; electron microprobe analysis, H_2O assigned from structure analysis, $\text{Fe}^{3+}/\text{Fe}^{2+}$ by Mössbauer spectroscopy, corresponding to $\text{Fe}^{3+}_{2.53}\text{Zn}_{1.68}\text{Al}_{0.60}\text{Fe}^{2+}_{0.28}\text{Ca}_{0.02}\text{Pb}_{0.01}\text{P}_{3.09}\text{As}_{0.01}\text{O}_{17}\text{H}_{5.15}$. (2) $\text{ZnFe}^{3+}_4(\text{PO}_4)_3(\text{OH})_5$.

Occurrence: A secondary mineral in the weathering zone in seams and cavities of a quartz-garnet-goethite-rich rock.

Association: Hinsdalite-plumbogummite, calcian pyromorphite, libethenite, brochantite, malachite, tsumebite, strengite (Broken Hill); scholzite, parahopeite, collinsite-hillite, zincian eosporite (Reaphook Hill).

Distribution: Block 14 Opencut, Broken Hill, western New South Wales, and Reaphook Hill, Flinders Range, South Australia, Australia.

Name: Honors Ian Plimer, Professor of Mining Geology, the University of Adelaide and Emeritus Professor of Earth Sciences, University of Melbourne, for his contributions to the geology of ore deposits, in particular the Broken Hill deposit.

Type Material: Department of Mineralogy, South Australian Museum, Adelaide, South Australia (catalog no. G32005).

References: (1) Elliott, P., U. Kolitsch, G. Giester, E. Libowitzky, C. McCammon, A. Pring, W.D. Birch, and J. Brugger (2009) Description and crystal structure of a new mineral—plimerite, $\text{ZnFe}^{3+}_4(\text{PO}_4)_3(\text{OH})_5$ - the Zn-analogue of rockbridgeite and frondelite, from Broken Hill, New South Wales, Australia. *Mineral. Mag.*, 73, 131–148. (2) (2010) *Amer. Mineral.*, 95, 206-207 (abs. ref. 1).