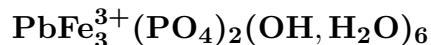


**Kintoreite**

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**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3} 2/m$ . Crystals are rhombohedral,  $\{11\bar{2}2\}$ , to 2 mm; as hemispheres and globular crusts.

**Physical Properties:** *Cleavage:* Good on  $\{0001\}$ . *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 4 D(meas.) = > 4.2 D(calc.) = 4.34

**Optical Properties:** Transparent to translucent. *Color:* Cream to yellowish green. *Streak:* Pale yellowish green. *Luster:* Vitreous to adamantine (crystals); greasy to waxy (aggregates). *Optical Class:* Uniaxial (-). *Pleochroism:* Light yellowish green to medium yellow.  $n = 1.935\text{--}1.955$

**Cell Data:** *Space Group:*  $[R\bar{3}m]$  (by analogy to crandallite).  $a = 7.3310(7)$   $c = 16.885(2)$   $Z = 3$

**X-ray Powder Pattern:** Kintore open cut, Broken Hill, Australia. 3.07 (100), 5.96 (90), 3.67 (60), 2.538 (50), 2.257 (50), 1.979 (50), 2.971 (40)

**Chemistry:**

	(1)
SO <sub>3</sub>	2.02
P <sub>2</sub> O <sub>5</sub>	13.30
As <sub>2</sub> O <sub>5</sub>	6.43
CO <sub>2</sub>	0.73
Al <sub>2</sub> O <sub>3</sub>	0.02
Fe <sub>2</sub> O <sub>3</sub>	34.01
CuO	0.25
ZnO	1.58
PbO	31.37
BaO	0.09
H <sub>2</sub> O	9.0
Total	[98.80]

(1) Kintore open cut, Broken Hill, Australia; by electron microprobe, average of six analyses, original total given as 98.90%, total Fe as Fe<sub>2</sub>O<sub>3</sub>, H<sub>2</sub>O and CO<sub>2</sub> by CHN analyzer; corresponding to Pb<sub>0.97</sub>(Fe<sub>2.95</sub>Zn<sub>0.13</sub>Cu<sub>0.02</sub>)<sub>Σ=3.10</sub>[(PO<sub>4</sub>)<sub>1.30</sub>(AsO<sub>4</sub>)<sub>0.39</sub>(SO<sub>4</sub>)<sub>0.18</sub>(CO<sub>3</sub>)<sub>0.11</sub>]<sub>Σ=1.98</sub>(OH)<sub>5.45</sub>•0.74H<sub>2</sub>O.

**Mineral Group:** Crandallite group.

**Occurrence:** A rare secondary mineral in the oxidized zone of a Pb–Zn deposit.

**Association:** Segnitite, pyromorphite, mimetite, libethenite, hinsdalite, rockbridgeite–dufrénite, apatite, goethite.

**Distribution:** In Australia, from the Kintore and Block 14 open cuts, Broken Hill, New South Wales. In Germany, from the Clara mine, near Oberwolfach, and the Igelschlatt mine, near Grafenhausen, Black Forest.

**Name:** For the site from which the best specimens were first collected, the Kintore open cut, Broken Hill, Australia.

**Type Material:** The South Australia Museum, Adelaide, G14354; Museum Victoria, Melbourne, Australia, M42891.

**References:** (1) Pring, A., W.D. Birch, J. Dawe, M. Taylor, M. Deliens, and K. Walenta (1995) Kintoreite, PbFe<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>(OH, H<sub>2</sub>O)<sub>6</sub>, a new mineral of the jarosite-alunite family, and lusungite discredited. *Mineral. Mag.*, 59, 143–148. (2) (1995) *Amer. Mineral.*, 80, 1073–1074 (abs. ref. 1). (3) Kharisun, M.R. Taylor, and D.J.M. Bevan (1997) The crystal structure of kintoreite, PbFe<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>(OH, H<sub>2</sub>O)<sub>6</sub>. *Mineral. Mag.*, 61, 123–129.

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