

Kingite

$\text{Al}_3(\text{PO}_4)_2(\text{OH}, \text{F})_3 \cdot 9\text{H}_2\text{O}$

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$ or 1. As platelets or irregular fragments, to 1 μm , aggregated in nodules; as crusts of intergrown spheroids resembling fish roe.

Physical Properties: Hardness = n.d. $D(\text{meas.}) = 2.21\text{--}2.30$ $D(\text{calc.}) = 2.465$

Optical Properties: Translucent. *Color:* White, colorless, greenish yellow. *Luster:* Vitreous to dull.

Optical Class: Biaxial. $n = 1.514$

Cell Data: *Space Group:* $P\bar{1}$ or $P1$. $a = 9.15(1)$ $b = 10.00(1)$ $c = 7.24(2)$
 $\alpha = 98.6(1)^\circ$ $\beta = 93.6(1)^\circ$ $\gamma = 93.2(1)^\circ$ $Z = 2$

X-ray Powder Pattern: Near Robertstown, Australia.

9.1 (100), 3.45 (80), 3.48 (65), 5.28 (52), 3.17 (39), 3.108 (30), 5.43 (28)

Chemistry:

	(1)	(2)
P_2O_5	28.93	29.20
Al_2O_3	32.25	31.47
F	0.85	3.91
H_2O^+	38.32	37.07
$-\text{O} = \text{F}_2$	0.35	1.65
Total	[100.00]	100.00

(1) Near Robertstown, Australia; after deduction of Na 0.47% and Cl as halite impurity.

(2) $\text{Al}_3(\text{PO}_4)_2(\text{OH})_2\text{F} \cdot 9\text{H}_2\text{O}$.

Occurrence: Of secondary origin, precipitated in fractured rock by meteoric water.

Association: Halite, talc, quartz, “limonite” (near Robertstown, Australia); “opal”, sanidine (Wilson Springs mine, Arkansas, USA).

Distribution: In Australia, from the Fairview phosphate quarry, about 21 km north of Robertstown, in a quarry near Clinton, and at Tom’s quarry, near Kapunda, South Australia. In the USA, from the Wilson Springs (Potash Sulphur Springs) mine, Garland Co., Arkansas; in the Gold Quarry mine, near Carlin, Maggie Creek district, Eureka Co., Nevada. In Germany, in the Weckersdorf quarry, near Schleitz, and Ronneburg, Thuringia.

Name: Honors Mr. D. King (1926–1990), geologist, Department of Mines, Adelaide, South Australia, who collected the first specimens.

Type Material: Natural History Museum, Paris, France, 175.300; Harvard University, Cambridge, Massachusetts, 109441; National Museum of Natural History, Washington, D.C., USA, 112693.

References: (1) Norrish, K., L.E.R. Rogers, and R.E. Shapter (1957) Kingite, a new hydrated aluminum phosphate mineral from Robertstown, South Australia. *Mineral. Mag.*, 31, 351–357. (2) (1957) *Amer. Mineral.*, 42, 580–581 (abs. ref. 1). (3) Kato, T. (1970) Cell dimensions of the hydrated phosphate, kingite. *Amer. Mineral.*, 55, 515–517. (4) Howard, J.M. and D.R. Owens (1995) Minerals of the Wilson Springs vanadium mines, Potash Sulphur Springs, Arkansas. *Rocks & Minerals*, 70(3), 154–170.