Wycheproofite $NaAlZr(PO_4)_2(OH)_2 \cdot H_2O$

Crystal Data: Triclinic. *Point Group*: $P\bar{1}$. Finely fibrous anhedral crystals, to several mm, in compact masses.

Physical Properties: *Fracture*: Irregular. Hardness = 4-5 D(meas.) = 2.83 D(calc.) = 2.932

Optical Properties: Transparent. *Color*: Pale pinkish orange to pale brownish orange.
Streak: White. *Luster*: Vitreous to pearly.
Optical Class: Biaxial. $\alpha = 1.62 \perp$ fiber length. β = n.d. $\gamma = 1.64 \parallel$ fiber length. 2V(meas.) = n.d.
Orientation: Parallel extinction, length slow.

Cell Data: *Space Group*: $P\bar{1}$. $a = 5.263(1)$ $b = 9.251(2)$ $c = 9.480(2)$ $\alpha = 109.49(3)°$ $\beta = 98.57(3)°$ $\gamma = 90.09(3)°$ Z = 2

X-ray Powder Pattern: Wycheproof, Australia.
2.603 (100), 4.128 (80), 3.711 (65), 3.465 (60), 8.865 (40), 3.243 (35), 2.875 (30)

Chemistry:

	(1)	(2)		(1)	(2)
P_2O_5	35.85	37.04	CaO	0.66	
SiO_2	0.23		Na_2O	6.36	8.09
ZrO_2	32.43	32.16	K_2O	0.44	
HfO_2	1.24		Cs_2O	0.03	
Al_2O_3	12.03	13.31	F	0.34	
FeO	0.36		H_2O	9.0	9.40
MnO	0.21		$-O = F_2$	0.14	
			Total	99.04	100.00

(1) Wycheproof, Australia; by electron microprobe, average of five analyses, H_2O by CHN analyzer; corresponding to $(Na_{0.81}Ca_{0.05}K_{0.04})_{\Sigma=0.90}(Al_{0.93}Fe_{0.02}Mn_{0.01})_{\Sigma=0.96}(Zr_{1.03}Hf_{0.02})_{\Sigma=1.05}[(PO_4)_{1.99}(SiO_4)_{0.01}]_{\Sigma=2.00}[(OH)_{1.87}F_{0.07}]_{\Sigma=1.94} \cdot 1.0H_2O$. (2) $NaAlZr(PO_4)_2(OH)_2 \cdot H_2O$.

Occurrence: Filling cavities in pegmatitic veins in a granite quarry.

Association: Kosnarite, eosphorite, cyrilovite, schorl.

Distribution: From Wycheproof, Victoria, Australia.

Name: For the occurrence at *Wycheproof*, Australia.

Type Material: South Australian Museum, Adelaide, G18612; Museum Victoria, Melbourne, Australia, M42853, M42846.

References: (1) Birch, W.D., A. Pring, D.J.M. Bevan, and Kharisun (1994) Wycheproofite: a new hydrated sodium aluminium zirconium phosphate from Wycheproof, Victoria, Australia, and a new occurrence of kosnarite. Mineral. Mag., 58(4), 635-639. (2) (1995) Amer. Mineral., 80, 847 (abs. ref. 1). (3) Kolitsch, U. (2003) The crystal structure of wycheproofite, $NaAlZr(PO_4)_2(OH)_2 \cdot H_2O$. Eur. J. Mineral., 15, 1029-1034. (4) (2004) Amer. Mineral., 89, 1834 (abs. ref. 3).