

Warikahnite

Zn₃(AsO₄)₂·2H₂O

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Bladed subhedral crystals, elongated along [100] and flattened on {010}, showing {010}, {100}, {001}, {0kl}, striated, to 2 cm, in radial to subparallel aggregates.

Physical Properties: *Cleavage:* On {001}, perfect; on {100}, {010}, good. Hardness = ~2
D(meas.) = > 4.24 D(calc.) = 4.29

Optical Properties: Transparent. *Color:* Pale yellow to colorless. *Streak:* White.
Luster: Vitreous.

Optical Class: Biaxial (+). *Orientation:* $Z \wedge a = 47^\circ$ on {010}; OAP \simeq {001}. $\alpha = 1.747(4)$
 $\beta = 1.753(4)$ $\gamma = 1.768(4)$ $2V(\text{meas.}) = 75(5)^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 6.710(1)$ $b = 8.989(2)$ $c = 14.533(2)$ $\alpha = 105.59(1)^\circ$
 $\beta = 93.44(1)^\circ$ $\gamma = 108.68(1)^\circ$ $Z = 4$

X-ray Powder Pattern: Tsumeb, Namibia.

2.82 (10), 6.21 (8), 2.87 (8), 3.45 (7), 2.30 (7), 8.12 (6), 3.04 (6)

Chemistry:

	(1)	(2)
As ₂ O ₅	44.33	45.07
FeO	0.19	
MnO	0.40	
ZnO	47.85	47.87
H ₂ O	6.32	7.06
Total	99.09	100.00

(1) Tsumeb, Namibia; by electron microprobe, H₂O by TGA, IR confirms (AsO₄)³⁻ and H₂O; corresponds to (Zn_{3.01}Mn_{0.03}Fe_{0.01}) $_{\Sigma=3.05}$ (As_{0.99}O₄)₂·1.80H₂O. (2) Zn₃(AsO₄)₂·2H₂O.

Occurrence: A rare secondary mineral formed by alteration of tennantite in an oxidized zone in a dolostone-hosted hydrothermal polymetallic ore deposit.

Association: Tennantite, claudetite, ludlockite, cuprian adamite, stranskiite, tsumcorite.

Distribution: From Tsumeb, Namibia.

Name: Honoring Walter Richard KAHN (1911–), Bayersoien, Germany, dealer and collector specializing in Tsumeb minerals, for his support of research into rare secondary minerals.

Type Material: University of Stuttgart, Stuttgart, Germany, NM04; Harvard University, Cambridge, Massachusetts, 117116, 117117; National Museum of Natural History, Washington, D.C., USA, 144801, 144802, 147462.

References: (1) Keller, P., H. Hess, and P.J. Dunn (1979) Warikahnit, Zn₃[(H₂O)₂|(AsO₄)₂], ein neues Mineral aus Tsumeb, Südwestafrika. Neues Jahrb. Mineral., Monatsh., 389–395 (in German with English abs.). (2) (1980) Amer. Mineral., 65, 408 (abs. ref. 1). (3) Riffel, H., P. Keller, and H. Hess (1980) Die Kristallstruktur von Warikahnit, Zn₃[(H₂O)₂|(AsO₄)₂]. Tschermarks Mineral. Petrog. Mitt., 27, 187–199 (in German with English abs.).