

Keystoneite



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Crystal Data: Hexagonal. *Point Group:* 6/m or 6. As acicular hexagonal crystals, to 0.2 mm, in parallel aggregates and radiating sprays.

Physical Properties: *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.40

Optical Properties: Semitransparent. *Color:* Golden yellow. *Streak:* Pale yellow-green. *Luster:* Adamantine.

Optical Class: Uniaxial (+). $\omega = 1.85(1)$ $\epsilon = [1.99(1)]$

Cell Data: *Space Group:* $P6_3/m$ or $P6_3$. $a = 9.344(2)$ $c = 7.607(3)$ $Z = 2$

X-ray Powder Pattern: Keystone mine, Colorado, USA.

2.77 (10), 8.12 (9), 4.05 (8), 1.720 (6), 2.95 (5), 2.84 (5), 1.498 (5)

Chemistry:

	(1)
TeO ₂	65.5
Fe ₂ O ₃	5.1
MnO	1.0
NiO	12.7
MgO	4.3
Na ₂ O	0.3
K ₂ O	0.1
H ₂ O	[11.0]
Total	[100.0]

(1) Keystone mine, Colorado, USA; by electron microprobe, total Fe as Fe₂O₃, total Mn as MnO, H₂O calculated by difference; corresponds to $(\text{Mg}_{0.41}\text{Na}_{0.07}\text{K}_{0.02})_{\Sigma=0.50}\text{Ni}_{1.00}(\text{Fe}_{0.47}^{3+}\text{Mg}_{0.38}\text{Ni}_{0.26}\text{Mn}_{0.10}^{2+})_{\Sigma=1.21}(\text{Te}_{1.01}\text{O}_3)_3 \cdot 4.5\text{H}_2\text{O}$.

Occurrence: A rare secondary mineral formed in the oxidized zone of a complex polymetallic hydrothermal mineral deposit.

Association: Melonite, tellurium, paratellurite, magnolite, coloradoite, calaverite, gold, stibnite, pyrite, "limonite", manganese oxides, quartz.

Distribution: From the Keystone mine, Magnolia district, Boulder Co., Colorado, USA.

Name: For its occurrence at the Keystone mine, Colorado, USA.

Type Material: Canadian Museum of Nature, Ottawa, Canada, 56561.

References: (1) Back, M.E., A.C. Roberts, Y. LePage, and J.A. Mandarino (1988) Keystoneite, a new tellurite from the Keystone mine, Colorado, U.S.A. Geol. Assoc. Canada – Mineral. Assoc. Canada, Prog. Abs., 13, A4. (2) Miletich, R. (1995) Crystal chemistry of the microporous tellurite minerals zemannite and kinichilite, $\text{Mg}_{0.5}[\text{Me}^{2+}\text{Fe}^{3+}(\text{TeO}_3)_3] \cdot 4.5\text{H}_2\text{O}$, (Me²⁺ = Zn, Mn). Eur. J. Mineral., 7, 509–523.