

Obradovicite-KCu

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. Crystals are tabular, showing {100}, {110}, {011}, to 0.1 mm, {100} striated || [001]; generally, in dense aggregates.

Physical Properties: *Cleavage:* None. Hardness = 2.5 D(meas.) = 3.55(5) D(calc.) = 2.830

Optical Properties: Translucent. *Color:* Pea-green. *Streak:* Pale pea-green. *Luster:* Vitreous to subadamantine.

Optical Class: Biaxial (+). $\alpha = 1.790$ $\beta = 1.798$ $\gamma = 1.811$ $2V(\text{meas.}) = 81^\circ$ *Pleochroism:* Weak; in yellows. *Orientation:* $X = a$; $Y = b$; $Z = c$. *Dispersion:* Extreme, $r > v$. *Absorption:* $Z > X = Y$.

Cell Data: *Space Group:* Pnmb. $a = 14.848$ $b = 11.056$ $c = 15.046$ $Z = 2$

X-ray Powder Pattern: Chuquicamata mine, Antofagasta, Chile.

8.906 (10), 10.565 (8), 7.424 (8), 2.969 (6), 5.733 (5), 2.898 (5b), 2.761 (5)

Chemistry:	(1)
Na ₂ O	0.56
K ₂ O	2.48
CuO	5.85
Fe ₂ O ₃	10.12
As ₂ O ₅	8.46
MoO ₃	55.29
<u>H₂O</u>	<u>18.33</u>
Total	101.09

(1) Chuquicamata mine, Antofagasta, Chile; wet chemical analysis; corresponding to $[(\text{K}_{1.72}\text{Cu}_{0.58}\text{Na}_{0.38})_{\Sigma=2.68}(\text{H}_2\text{O})_{12.25}\text{Cu}^{2+}(\text{H}_2\text{O})_6][\text{Mo}_8\text{As}_{1.56}\text{Fe}^{3+}_{2.64}\text{O}_{31.11}(\text{OH})_{5.89}]$.

Mineral Group: Betpakdalite supergroup, obradovicite group.

Occurrence: A rare secondary mineral in the oxidized zone of a Cu-Mo porphyry deposit.

Association: Obradovicite-NaCu, jarosite, wulfenite, quartz.

Distribution: From Chuquicamata, Antofagasta, Chile [TL] and the Port Darwin mining district, Northern Territory, Australia.

Name: Honors Martin T. *Obradovic*, who provided the studied material. Two suffixes correspond to the dominant cations in the two different types of non-framework cation sites.

Type Material: Colorado School of Mines, Golden, Colorado (CSM 86-496); National Museum of Natural History, Washington, D.C. (164185), USA.

References: (1) Finney, J.J., S.A. Williams, and R.D. Hamilton (1986) Obradovicite, a new complex arsenate-molybdate from Chuquicamata, Chile. *Mineral. Mag.*, 50, 283-284. (2) (1987) *Amer. Mineral.*, 72, 1026 (abs. ref. 1). (3) Kampf, A.R., S.J. Mills, M.S. Rumsey, M. Dini, W.D. Birch, J. Spratt, J.J. Pluth, I.M. Steele, R.A. Jenkins, and W.W. Pinch (2012) The heteropolymolybdate family: structural relations, nomenclature scheme and new species. *Mineral. Mag.*, 76, 1175-1207.