

Paramendozavilite

Crystal Data: Monoclinic. *Point Group:* n.d. Crystals, in coatings. *Twinning:* Polysynthetic, observed optically || cleavage.

Physical Properties: *Cleavage:* One, perfect. Hardness = 1 D(meas.) = 3.35 D(calc.) = 2.858-2.870

Optical Properties: Semitransparent. *Color:* Pale yellow. *Streak:* Very pale yellow.

Luster: Vitreous.

Optical Class: Biaxial (-). *Pleochroism:* In pale yellows. *Orientation:* Extinction oblique to cleavage.

Absorption: $Z > Y > X$. $\alpha = 1.686$ $\beta = 1.710$ $\gamma = 1.720$ $2V(\text{meas.}) = 60^\circ$

Cell Data: *Space Group:* n.d. $a = 10.963(2)$ $b = 25.881(3)$ $c = 15.434(2)$ $\beta = 110.73(1)^\circ$ $Z = 2$

X-ray Powder Pattern: Cumobabi deposit, Mexico.

14.36 (10), 9.48 (10), 7.38 (7), 10.18 (6), 7.98 (5), 6.56 (5), 12.90 (4)

Chemistry:	(1)	(2)	(1)	(2)
Na ₂ O	0.07	0.76	TiO ₂	0.29
K ₂ O	0.72		P ₂ O ₅	11.23 10.39
CaO	0.16		MoO ₃	49.01 42.13
MgO	0.14		Cl	0.16
Fe ₂ O ₃	13.35	13.63	- O = Cl	n.d.
Al ₂ O ₃	5.70	4.97	H ₂ O	[19.20] 28.12
			Total	100.00 100.00

(1) Cumobabi deposit, Mexico; normalized electron microprobe analysis, H₂O calculated; corresponds to [(K_{0.54}Mg_{0.12}Ca_{0.10}Na_{0.09}) $\Sigma=0.85$ (Al_{3.83}Ti_{0.13}) $\Sigma=3.96$ (H₂O)_{30.15}][Mo₁₂P_{5.58}(Fe³⁺_{5.89}Al_{0.11}) $\Sigma=6.00$ O_{57.99}(OH)_{14.85}Cl_{0.16}]. (2) NaAl₄Fe₇(PO₄)₅(PMo₁₂O₄₀)(OH)₁₆·56H₂O.

Mineral Group: Betpakdalite supergroup.

Occurrence: In the oxidized zone of a molybdenum-bearing pegmatitic breccia in granodiorite.

Association: Mendozavilite, biotite, kaolinite (Cumobabi deposit, Mexico).

Distribution: From the San Judas mine, Cumobabi molybdenum deposit, southwest of Cumpas, Sonora, Mexico [TL].

Name: Prefix from the Greek *para*, for *near* and its chemical relation to *mendozavilite*.

Type Material: The Natural History Museum, London, England, 1984,476.

References: (1) Williams, S. A. (1986) Mendozavilite and paramendozavilite, two new minerals from Cumobabi, Sonora. *Boletín de Mineralogía*, 2(1), 13-19. (2) (1988) *Amer. Mineral.*, 73, 194 (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(5), 1175-1207.