

Ajoite

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As sprays of bladed prismatic crystals, to 0.4 mm; commonly fibrous.

Physical Properties: *Cleavage:* Perfect on {010}. *Hardness* = n.d. *D*(meas.) = 2.96
D(calc.) = 2.951

Optical Properties: Translucent. *Color:* Bluish green.

Optical Class: Biaxial (+). $\alpha = 1.550(1)$ $\beta = 1.583(1)$ $\gamma = 1.641(1)$ $2V(\text{meas.}) = 80(1)^\circ$
 $2V(\text{calc.}) = 76.4^\circ$ *Pleochroism:* *X* = very light bluish green; *Y* = *Z* = brilliant bluish green.
Orientation: *X* = *b*; $Z \wedge c = 15^\circ$.

Cell Data: *Space Group:* $P\bar{1}$. $a = 13.634(5)$ $b = 13.687(7)$ $c = 14.522(7)$ $\alpha = 110.83(1)^\circ$
 $\beta = 107.21(1)^\circ$ $\gamma = 105.68(1)^\circ$ $Z = 3$

X-ray Powder Pattern: Ajo, Arizona, USA.

12.25 (100), 2.455 (12), 4.08 (10), 3.061 (10), 3.381 (8), 2.832 (8), 2.258 (8)

Chemistry:	(1)
SiO ₂	41.2
Al ₂ O ₃	3.81
FeO	0.11
MnO	0.02
CuO	42.2
CaO	0.04
Na ₂ O	0.84
K ₂ O	2.50
<u>H₂O</u>	<u>8.35</u>
Total	99.07

(1) Ajo, Arizona, USA; Si, Al, and Cu by electron microprobe, corresponding to $(\text{K}_{0.70}\text{Na}_{0.36}\text{Ca}_{0.01})_{\Sigma=1.07}(\text{Cu}_{6.97}\text{Fe}_{0.02})_{\Sigma=6.99}\text{Al}_{0.98}\text{Si}_{9.00}\text{O}_{24}(\text{OH})_{6.00}\cdot 3.09\text{H}_2\text{O}$.

Occurrence: In oxidized copper-rich base-metal deposits.

Association: Shattuckite, conichalcite, quartz, muscovite, pyrite (Ajo, Arizona, USA); creaseyite, fluorite (Potter-Cramer property, Arizona, USA); shattuckite, duhamelite, sillénite (Munihuaza, Mexico); quartz, papagoite (Messina, South Africa).

Distribution: In the USA, in Arizona, from the New Cornelia mine, Ajo, Pima Co.; at the Moon Anchor mine and Potter-Cramer property, near Wickenburg, Maricopa Co.; and a prospect in Copper Creek, Pinal Co. From Munihuaza, near Alamos, Sonora, Mexico. At Messina, Transvaal, South Africa.

Name: For the type occurrence at *Ajo*, Arizona, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA (113220).

References: (1) Schaller, W.T. and A.C. Vlisidis (1958) Ajoite, a new hydrous aluminum copper silicate. *Amer. Mineral.*, 43, 1107-1111. (2) Kato, T. and Y. Miura (1976) Cell dimension of ajoite. *Mineral. J. (Japan)*, 8, 234-239. (3) (1980) *Mineral. Abs.*, 31, 415 (abs. ref. 2). (4) Chao, G.Y. (1981) Ajoite: new data. *Amer. Mineral.*, 66, 201-203. (5) Pluth, J.J. and J.V. Smith (2002) Arizona porphyry copper/hydrothermal deposits II: Crystal structure of ajoite, $(\text{K}+\text{Na})_3\text{Cu}_{20}\text{Al}_3\text{Si}_{29}\text{O}_{76}(\text{OH})_{16}\cdot \sim 8\text{H}_2\text{O}$. *Proceed. National Acad. Sci. USA*, 99, 11002-11005. (6) (2003) *Amer. Mineral.*, 88(10), 1629 (abs. ref. 5).