Apachite $Cu_9Si_{10}O_{29}\cdot 11H_2O$

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Crystal Data: Monoclinic, probable. *Point Group:* n.d. As minute, twisted or curved beaded spherules of radial fibers, composed of crystals; in seams, exhibiting a silky, fibrous structure on broken surfaces.

Physical Properties: Hardness = 2 D(meas.) = 2.80(2) D(calc.) = [3.26]

Optical Properties: Transparent to translucent. *Color:* Faïence-blue; in thin section, rich blue. *Luster:* Nonmetallic, silky.
Optical Class: Biaxial (–). *Orientation:* $Y \simeq$ length. $\alpha = 1.610$ $\beta = 1.650$ $\gamma = 1.650$ 2V(meas.) = Small.

Cell Data: *Space Group:* n.d. $a = 12.89$ $b = 6.055$ $c = 19.11$ $\beta = 90.42°$ Z = [2]

X-ray Powder Pattern: Christmas, Arizona, USA.
12.89 (100), 3.168 (70), 7.663 (50), 10.62 (40), 9.556 (40), 4.491 (40), 4.174 (40)

Chemistry:

	(1)	(2)
SiO_2	40.8	39.66
FeO	0.3	
CuO	43.6	47.26
MgO	1.7	
CaO	1.8	
H_2O	13.8	13.08
Total	102.0	100.00

(1) Christmas, Arizona, USA; average of two analyses; after recalculation to 100%, corresponds to $(Cu_{7.87}Mg_{0.61}Ca_{0.46}Fe_{0.06})_{\Sigma=9.00}Si_{9.75}O_{28.5}\cdot 11H_2O$. (2) $Cu_9Si_{10}O_{29}\cdot 11H_2O$.

Occurrence: A retrograde metamorphic or mesogene mineral, formed at the expense of a prograde calc-silicate and sulfide assemblage in tactites; typically in fractures or crackled zones cutting garnet-diopside rock, replacing both these silicates and calcite.

Association: Kinoite, gilalite, stringhamite, junitoite, clinohedrite, xonotlite, apophyllite, calcite, tobermorite.

Distribution: In the Christmas copper mine, Gila Co., Arizona, USA.

Name: For the Apache Indians who inhabit the region in Arizona, USA, where it occurs.

Type Material: University of Arizona, Tucson, Arizona, USA; The Natural History Museum, London, England, 1980,532.

References: (1) Cesbron, F.P. and S.A. Williams (1980) Apachite and gilalite, two new copper silicates from Christmas, Arizona. Mineral. Mag., 43, 639–641. (2) (1980) Amer. Mineral., 65, 1065 (abs. ref. 1).

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