

Cerchiarait-(Fe)

Crystal Data: Tetragonal. *Point Group:* 4/m 2/m 2/m. As thin prisms with square cross sections, to 2 mm, and in aggregates of matted fibers to 1 mm.

Physical Properties: *Cleavage:* None. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = ~ 4.5 D(meas.) = n.d. D(calc.) = 3.710

Optical Properties: Transparent. *Color:* Tan to brown, bluish to bluish green. *Streak:* Colorless to tan or pale green-blue. *Luster:* Vitreous. *Optical Class:* Uniaxial (+). $\omega = 1.741(2)$ $\varepsilon = 1.768(2)$ *Pleochroism:* Weak, *O* = colorless, *E* = yellow. *Absorption:* $O < E$.

Cell Data: *Space Group:* I4/mmm. $a = 14.3554(12)$ $c = 6.0065(5)$ $Z = 2$

X-ray Powder Pattern: Cerchiaro mine, La Spezia Province, Liguria, Italy. 2.595 (100), 3.016 (70), 3.327 (48), 1.4107 (43), 1.8118 (39), 2.258 (29), 1.2980 (29)

Chemistry:	(1)	(2)
Na ₂ O	0.05	0.09
BaO	40.81	41.65
CaO	0.17	0.03
MgO	0.06	0.02
Mn ₂ O ₃	0.22	6.96
Fe ₂ O ₃	19.03	13.82
Al ₂ O ₃	0.87	0.28
TiO ₂	1.51	1.02
SiO ₂	23.51	25.16
Cl	5.47	5.07
-O = Cl ₂	1.23	1.14
H ₂ O	[5.84]	[5.07]
Total	96.31	98.03

(1) Cerchiaro mine, La Spezia Province, Liguria, Italy; average of 10 electron microprobe analyses, H₂O from stoichiometry; corresponding to $(\text{Ba}_{3.82}\text{Na}_{0.02}\text{Ca}_{0.04})_{\Sigma=3.88}(\text{Fe}^{3+}_{3.42}\text{Ti}^{4+}_{0.27}\text{Al}^{3+}_{0.25}\text{Mn}^{3+}_{0.04}\text{Mg}_{0.02})_{\Sigma=4.00}\text{Si}_{5.62}\text{O}_{15.47}(\text{OH})_{9.31}\text{Cl}_{2.22}$. (2) Cerchiaro mine, La Spezia Province, Liguria, Italy; average of 8 electron microprobe analyses, H₂O from stoichiometry; corresponding to $(\text{Ba}_{3.88}\text{Na}_{0.04}\text{Ca}_{0.01})_{\Sigma=3.93}(\text{Fe}^{3+}_{2.47}\text{Mn}^{3+}_{1.26}\text{Ti}^{4+}_{0.18}\text{Al}^{3+}_{0.08}\text{Mg}_{0.01})_{\Sigma=4.00}\text{Si}_{5.98}\text{O}_{16.92}(\text{OH})_{8.04}\text{Cl}_{2.04}$.

Occurrence: Developed in small fractures and veinlets within metacherts of an ophiolitic sequence during prehnite-pumpellyite facies metamorphism.

Association: Aegirine, calcite, Mn-bearing diopside (variety schefferite), hematite, K-feldspar, norrishite, quartz (Cerchiaro mine); bazirite, diopside, muirite, pyrrhotite, Ba-rich tobermorite, traskite, witherite (Esquire No. 7 claim).

Distribution: From the Cerchiaro mine, Borghetto Vara, Vara Valley, La Spezia Province, Liguria, Italy and at the Esquire No. 7 and No. 8 claims, Big Creek, Fresno County, California, USA.

Name: For the analog of *cerchiarait* with dominant iron in the octahedral structural site.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (63517-63519).

References: (1) Kampf, A.R., A.C. Roberts, K.E. Venance, C. Carbone, D. Belmonte, G.E. Dunning, and R.E. Walstrom (2013) Cerchiarait-(Fe) and cerchiarait-(Al), two new barium cyclosilicate chlorides from Italy and California, USA. *Mineral. Mag.*, 77(1), 69-80. (2) (2016) *Amer. Mineral.*, 101, 235-236 (abs. ref. 1).