

**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 <sub>2</sub> O	0.05	0.09
BaO	40.81	41.65
CaO	0.17	0.03
MgO	0.06	0.02
Mn <sub>2</sub> O <sub>3</sub>	0.22	6.96
Fe <sub>2</sub> O <sub>3</sub>	19.03	13.82
Al <sub>2</sub> O <sub>3</sub>	0.87	0.28
TiO <sub>2</sub>	1.51	1.02
SiO <sub>2</sub>	23.51	25.16
Cl	5.47	5.07
-O = Cl <sub>2</sub>	1.23	1.14
H <sub>2</sub> O	[5.84]	[5.07]
Total	96.31	98.03

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

**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).