

**Cerchiarait-(Mn)****Ba<sub>4</sub>Mn<sub>4</sub>(Si<sub>4</sub>O<sub>12</sub>)O<sub>2</sub>(OH)<sub>4</sub>Cl<sub>2</sub>[Si<sub>2</sub>O<sub>3</sub>(OH)<sub>4</sub>]**

**Crystal Data:** Tetragonal. *Point Group:* 4/m 2/m 2/m. As prismatic to acicular crystals, to 2 mm, elongated on [001]; as radiating aggregates to 3 mm.

**Physical Properties:** *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle. *Hardness* = ~ 4.5 D(meas.) = 3.62 VHN = 296 (50 g load). D(calc.) = 3.70

**Optical Properties:** Transparent. *Color:* Deep green. *Streak:* Pale green. *Luster:* Vitreous. *Optical Class:* Uniaxial (+).  $\omega = 1.745(5)$   $\varepsilon = 1.765(5)$

**Cell Data:** *Space Group:* I4/mmm.  $a = 14.223(6)$   $c = 6.141(4)$   $Z = 2$

**X-ray Powder Pattern:** Cerchiaro mine, La Spezia Province, Liguria, Italy. 3.011 (VS), 3.319 (S), 2.619 (S), 10.15 (M), 5.63 (M), 4.417 (M), 2.577 (M)

<b>Chemistry:</b>	(1)
BaO	43.29
Mn <sub>2</sub> O <sub>3</sub>	19.57
Fe <sub>2</sub> O <sub>3</sub>	2.09
Al <sub>2</sub> O <sub>3</sub>	1.02
SiO <sub>2</sub>	26.18
Cl	3.93
-O = Cl <sub>2</sub>	0.89
H <sub>2</sub> O	[4.81]
Total	100.00

(1) Cerchiaro mine, La Spezia Province, Liguria, Italy; average of 42 electron microprobe analyses, H<sub>2</sub>O by difference; corresponding to Ba<sub>3.83</sub>(Mn<sup>3+</sup><sub>3.36</sub>Fe<sup>3+</sup><sub>0.35</sub>Al<sub>0.27</sub>)<sub>Σ=3.98</sub>Si<sub>5.91</sub>O<sub>17.26</sub>[(OH)<sub>7.24</sub>Cl<sub>1.50</sub>]<sub>Σ=8.74</sub>.

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

**Association:** Quartz, pectolite, orientite, calcite.

**Distribution:** From the Cerchiaro mine, near Faggiona village, Borghetto Vara, Vara Valley, La Spezia Province, Liguria, Italy.

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

**Type Material:** Department for the Study of the Territory and its Resources, University of Genoa, Italy.

**References:** (1) Basso, R., G. Lucchetti, L. Zefiro, A. Palenzona (2000) Cerchiarait, a new natural Ba-Mn-mixed-anion silicate chloride from the Cerchiaro mine, northern Apennines, Italy. *Neues Jahrb. Mineral. Mon.*, 373-384. (2) (2001) *Amer. Mineral.*, 86, 197 (abs. ref. 1). (3) 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, 69-80. (4) (2016) *Amer. Mineral.*, 101, 235-236 (abs. ref. 3).