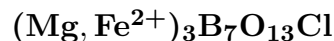


# Trembathite



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**Crystal Data:** Hexagonal. *Point Group:*  $3m$ . As pseudocubic rhombohedra, to 2 cm, isolated or in groups. *Twining:* Microscopic polysynthetic twinning typical.

**Physical Properties:** *Fracture:* Conchoidal. Hardness = 6–8 D(meas.) = 2.84–3.34 D(calc.) = 3.225

**Optical Properties:** Transparent. *Color:* Colorless to pale blue, pink; colorless in transmitted light. *Streak:* White. *Luster:* Vitreous.

*Optical Class:* Uniaxial (-).  $\omega = 1.684(2)$   $\epsilon = 1.668(2)$

**Cell Data:** *Space Group:*  $R3c$ .  $a = 8.588(2)$   $c = 21.050(6)$   $Z = 6$

**X-ray Powder Pattern:** Salt Springs deposit, Canada.

3.028 (100), 2.050 (73), 2.711 (66), 2.144 (37), 3.497 (34), 1.828 (25), 2.475 (23)

## Chemistry:

	(1)	(2)
B <sub>2</sub> O <sub>3</sub>	57.33	55.67
FeO	13.59	23.51
MnO	0.49	0.37
MgO	22.02	14.27
CaO	0.01	0.01
Cl	9.29	8.00
-O = Cl <sub>2</sub>	2.09	1.81
Total	[100.64]	100.02

(1) Salt Springs deposit, Canada; by electron microprobe, total Fe as FeO, weighted average of compositional zones, original total given as 100.63%; corresponding then to Mg<sub>2.29</sub>Fe<sub>0.79</sub>Mn<sub>0.03</sub>B<sub>6.89</sub>O<sub>12.90</sub>Cl<sub>1.10</sub>. (2) Boulby mine, England; by electron microprobe, total Fe as FeO; corresponding to (Mg<sub>1.55</sub>Fe<sub>1.43</sub>Mn<sub>0.02</sub>)<sub>Σ=3.00</sub>B<sub>7.00</sub>O<sub>13.01</sub>Cl<sub>0.99</sub>.

**Polymorphism & Series:** Dimorphous with boracite.

**Occurrence:** A rare component of marine evaporite borate deposits.

**Association:** Halite, hilgardite (Salt Springs deposit, Canada).

**Distribution:** In Canada, from the Salt Springs evaporite deposit, and in the Potash Corporation of America mine, Penobscus evaporite deposit, near Sussex, New Brunswick, Canada. Large crystals from the Boulby potash mine, northwest of Whitby, Yorkshire, England.

**Name:** Honors Dr. Lowell T. Trembath (1936–1994), Canadian mineralogist, Professor of Mineralogy, University of New Brunswick, Fredericton, Canada.

**Type Material:** Royal Ontario Museum, Toronto, Canada, M44741.

**References:** (1) Burns, P.C., F.C. Hawthorne, and J.A.R. Stirling (1992) Trembathite, (Mg, Fe)<sub>3</sub>B<sub>7</sub>O<sub>13</sub>Cl, a new borate mineral from the Salt Springs potash deposit, Sussex, New Brunswick. *Can. Mineral.*, 30, 445–448. (2) (1993) *Amer. Mineral.*, 78, 233 (abs. ref. 1). (3) Schindler, M. and F.C. Hawthorne (1998) The crystal structure of trembathite, (Mg<sub>1.55</sub>Fe<sub>1.43</sub>Mn<sub>0.02</sub>)B<sub>7</sub>O<sub>13</sub>Cl, a mineral of the boracite group: an example of the insertion of a cluster into a three-dimensional net. *Can. Mineral.*, 36, 1195–1201.