**Taramellite** $\mathbf{Ba_4(Fe^{3+},Ti,Fe^{2+},Mg)_4(B_2Si_8O_{27})O_2Cl_x}$



**Crystal Data:** Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Tabular to equidimensional crystals; as fibrous aggregates and massive.

**Physical Properties:** *Cleavage:* Perfect on {100}; parting $\perp$ {100}. Hardness = 5.5 D(meas.) = 3.92 D(calc.) = n.d.

**Optical Properties:** Semitransparent. *Color:* Reddish brown. *Luster:* Vitreous to silky. *Optical Class:* Biaxial (+). *Pleochroism:* Strong; $X = Y$ = pale pinkish to flesh-red; $Z$ = dark brown to nearly black. *Dispersion:* $r > v$, distinct. $\alpha = 1.770(3)$ $\beta = 1.774(3)$ $\gamma = 1.83(2)$ 2V(meas.) = 40(3)°

**Cell Data:** *Space Group: Pmmn.* $a = 12.05$–$12.22$ $b = 13.90$–$14.00$ $c = 7.12$–$7.14$ $Z = 2$

**X-ray Powder Pattern:** Candoglia, Italy. (ICDD 17-479).
3.01 (100), 2.584 (55), 3.83 (50), 2.480 (45), 3.30 (40), 3.16 (40), 2.783 (30)

**Chemistry:**

| | (1) | (2) | | (1) | (2) |
|---|---|---|---|---|---|
| $SiO_2$ | 33.9 | 30.29 | CaO | 1.1 | 0.15 |
| $TiO_2$ | 7.7 | | BaO | 37.5 | 33.93 |
| $B_2O_3$ | n.d. | 5.03 | $Na_2O$ | 0.8 | |
| $Fe_2O_3$ | 12.2 | 20.19 | $K_2O$ | 0.1 | |
| FeO | 3.7 | | Cl | n.d. | 1.08 |
| MnO | | 0.17 | $H_2O^+$ | 2.1 | |
| PbO | | 8.50 | $-O = Cl_2$ | | 0.24 |
| MgO | 0.8 | | Total | 99.9 | 99.10 |

(1) Candoglia, Italy; B and Cl are known to be essential to the structure. (2) Långban, Sweden; by electron and ion microprobe, $Al_2O_3$ 0.10%; corresponds to $(Ba_{3.43}Pb_{0.59})_{\Sigma=4.02}(Fe^{3+}_{3.92}Ca_{0.04}Mn_{0.04})_{\Sigma=4.00}B_{2.24}Si_{7.82}O_{29}Cl_{0.48}$.

**Polymorphism & Series:** Forms a series with titantaramellite.

**Occurrence:** In metamorphic rocks rich in barium silicates, in contact with granitic rocks (Candoglia, Italy); in a metamorphosed Fe–Mn orebody (Långban, Sweden).

**Association:** Calcite, diopside, actinolite, celsian, magnetite, chalcopyrite, pyrite (Candoglia, Italy); quartz, calcite, hematite, barylite, barite, manganoan pectolite, potassic feldspar, manganoan garnet, melanotekite, barian hedyphane, rhodonite, manganoan aegirine (Långban, Sweden).

**Distribution:** From Candoglia, Valle de Toce, Piedmont, Italy. At Långban, Värmland, Sweden.

**Name:** For Torquato Taramelli (1845–1922), Italian geologist.

**Type Material:** Natural History Museum, Paris, France, 109.1005.

**References:** (1) Dana, E.S. and W.E. Ford (1909) Dana's system of mineralogy, (6th edition), app. II, 103. (2) Mazzi, F. (1957) Riesame della taramellite. Atti. Soc. Toscana Sci. Nat., 64, 237–245 (in Italian). (3) (1959) Amer. Mineral., 44, 469–470 (abs. ref. 2). (4) Mazzi, F. and G. Rossi (1980) The crystal structure of taramellite. Amer. Mineral., 65, 123–128. (5) Alfors, J.T. and A. Pabst (1984) Titanian taramellites in western North America. Amer. Mineral., 69, 358–373. (6) Grew, E.S., M.G. Yates, D.I. Belakovskiy [Belakovskii], R.C. Rouse, S.-C. Su, and N. Marquez (1994) Hyalotekite from reedmergnerite-bearing peralkaline pegmatite, Dara-i-Pioz, Tajikistan, and from Mn skarn, Långban, Sweden: a new look at an old mineral. Mineral. Mag., 58, 285–297.