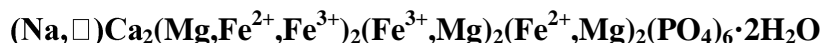


Tassieite

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As platy grains with irregular outline, to 1 mm.

Physical Properties: *Cleavage:* Perfect to good on {100} and on a second direction at 60° to the first. *Fracture:* n.d. *Tenacity:* Brittle. *Hardness =* n.d. *D(meas.) =* n.d. *D(calc.) =* 3.45

Optical Properties: Transparent. *Color:* Dark green. *Streak:* Light green. *Luster:* Vitreous. *Optical Class:* Biaxial (+). $\alpha = 1.712(2)$ $\beta = 1.713(2)$ $\gamma = 1.722(2)$ $2V(\text{meas.}) = 46(1)^\circ$ $2V(\text{calc.}) = 37^\circ$ *Dispersion:* Very weak. *Pleochroism:* Strong; *X =* dark blue, *Y =* blue, *Z =* light brown. *Absorption:* $X > Y \gg Z$.

Cell Data: *Space Group:* Pbca. $a = 12.4588(14)$ $b = 11.5974(13)$ $c = 12.7506(15)$ $Z = 4$

X-ray Powder Pattern: Stornes Peninsula, Larsemann Hills, Prydz Bay, East Antarctica. 2.735 (100), 3.000 (80), 2.895 (80), 3.497 (40), 2.091 (30), 2.545 (10), 6.40 (5)

| Chemistry: | (1) | | (1) |
|--------------------------------|---------|--------------------------------|---------------|
| SiO ₂ | 0.01 | CaO | 11.56 |
| P ₂ O ₅ | 44.54 | SrO | 0.02 |
| SO ₃ | 0.06 | Y ₂ O ₃ | 0.26 |
| MgO | 10.95 | Ce ₂ O ₃ | 0.08 |
| MnO | 0.38 | Yb ₂ O ₃ | 0.13 |
| FeO | 25.40 | UO ₂ | 0.04 |
| FeO | [14.93] | F | 0.04 |
| Fe ₂ O ₃ | [11.63] | <u>H₂O</u> | <u>[3.78]</u> |
| Na ₂ O | 1.96 | Total | 100.34 |

(1) Stornes Peninsula, Larsemann Hills, Prydz Bay, East Antarctica; average of electron microprobe analyses, Fe²⁺: Fe³⁺ and H₂O calculated from stoichiometry; corresponding to Na_{0.60}Ca_{1.96}Mg_{2.59}Mn_{0.05}Fe_{1.98}²⁺Fe_{1.39}³⁺Y_{0.02}Yb_{0.01}S_{0.01}P_{5.98}O₂₄·2H₂O.

Mineral Group: Wicksite group, with Mg-dominant in the M1 structural site.

Occurrence: A late-stage, low-temperature mineral formed by hydrothermal alteration of stornesite-(Y), wagnerite and fluorapatite in the core of a fluorapatite nodule in regionally metamorphosed and fractured gneissic rocks.

Association: Stornesite-(Y), wagnerite, fluorapatite, xenotime-(Y), melonjosephite, monazite-(Ce).

Distribution: From between Johnston Fjord and Tassie Tarn, Stornes Peninsula, Larsemann Hills, Prydz Bay, East Antarctica.

Name: For a lake, Tassie Tarn, near the site from which the first specimens were collected.

Type Material: National Museum of Natural History, Washington, D.C., USA, (NMNH 174436).

References: (1) Grew, E.S., T. Armbruster, O. Medenbach, M.G. Yates, and C.J. Carson (2007) Tassieite, (Na, □)Ca₂(Mg, Fe²⁺, Fe³⁺)₂(Fe³⁺, Mg)₂(Fe²⁺, Mg)₂(PO₄)₆·2H₂O, a new hydrothermal wicksite group mineral in fluorapatite nodules from granulite-facies paragneiss in the Larsemann Hills, Prydz Bay, East Antarctica. *Can. Mineral.*, 45, 293-305. (2) (2007) *Amer. Mineral.*, 92, 1778-1779 (abs. ref. 1).