Milarite **$(K, Na)Ca_2AlBe_2Si_{12}O_{30}\cdot H_2O$**

Crystal Data: Hexagonal. *Point Group:* $6/m\ 2/m\ 2/m$. Typically as well-formed hexagonal prisms, to 4 cm; as radial-fibrous aggregates and intergrowths.

Physical Properties: *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. Hardness = 5.5–6 D(meas.) = 2.46–2.61 D(calc.) = 2.524

Optical Properties: Transparent to translucent, opaque. *Color:* Colorless, grayish, tan, pale green, yellowish green, yellow. *Luster:* Vitreous.
Optical Class: Uniaxial (–); anomalously biaxial, sectored, with a uniaxial core. $\omega = 1.532–1.551$ $\epsilon = 1.529–1.548$

Cell Data: *Space Group:* $P6/mcc$. $a = 10.340–10.410$ $c = 13.758–13.845$ Z = 2

X-ray Powder Pattern: Val Giuv, Switzerland. (ICDD 12-450).
3.307 (100), 2.880 (90), 4.160 (65), 5.21 (45), 2.743 (45), 4.495 (35), 3.776 (25)

Chemistry:

	(1)
SiO_2	71.66
Al_2O_3	4.68
BeO	5.24
CaO	11.70
Na_2O	0.46
K_2O	4.91
H_2O^+	1.02
H_2O^-	0.05
Total	99.72

(1) Val Giuv, Switzerland; corresponds to $(K_{1.04}Na_{0.15})_{\Sigma=1.19}Ca_{2.08}Al_{0.92}Be_{2.10}Si_{11.59}O_{30}\cdot 0.60H_2O$.

Mineral Group: Milarite group.

Occurrence: In alpine and low-temperature hydrothermal veins; in aplites, syenites, and granite pegmatites.

Association: Orthoclase, albite, fluorite, beryl, phenakite, bertrandite, bavenite, minasgeraisite-(Y), quartz, calcite, muscovite, chlorite.

Distribution: In the Val Giuv, Tavetsch, Graubünden, and many other localities in Switzerland. From Věžná, Maršíkov, and Radkovice, Czech Republic. In the Habachtal, at Gasteiner, Austria. From Henneberg, Thuringia, and Tittling, Bavaria, Germany. In the Cheesewring quarry, Linkinhorne, Cornwall, England. From Kent, Kazakhstan. At Yermakorskeye, Siberia, Russia. Fine crystals from Rössing, Namibia. In the USA, on Moat Mountain, North Conway, Carroll Co., New Hampshire, and in the Foote mine, Kings Mountain, Cleveland Co., North Carolina. In Canada, at Strange Lake, Quebec. From the Valencia mine, Guanajuato, Mexico. Large crystals in the José Pinto pegmatite, at Jaguaraçú, near Coronel Fabriciano, Minas Gerais, Brazil.

Name: After a spurious type locality, the Val Milà (Milar), Switzerland [originally from the nearby Val Giuv, but later found in Val Milà also].

Type Material: Federal Institute of Technology, Zurich, Switzerland, Wi8976.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 312–313. (2) Černý, P., F.C. Hawthorne, and E. Jarosewich (1980) Crystal chemistry of milarite. Can. Mineral., 18, 41–57. (3) Hawthorne, F.C., M. Kimata, P. Černý, N. Ball, G.R. Rossman, and J.D. Grice (1991) The crystal chemistry of the milarite-group minerals. Amer. Mineral., 76, 1836–1856.