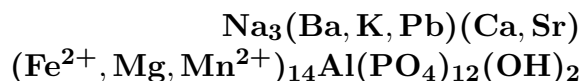


Sigismundite

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Crystal Data: Monoclinic. *Point Group:* $2/m$. Imperfect and shattered elongated crystals, to 1 cm, in massive lumps.

Physical Properties: *Cleavage:* Two, imperfect, at $\sim 110^\circ$. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.544

Optical Properties: Translucent. *Color:* Grayish green; greenish yellow in transmitted light. *Streak:* White. *Luster:* Greasy.

Optical Class: Biaxial. *Orientation:* Extinction $\sim 25^\circ$ to elongation. $n = 1.65(1)$
2V(meas.) = n.d.

Cell Data: *Space Group:* $C2/c$. $a = 16.406(5)$ $b = 9.945(3)$ $c = 24.470(5)$
 $\beta = 105.73(2)^\circ$ $Z = 4$

X-ray Powder Pattern: Near Madésimo, Italy.

3.010 (100), 3.178 (51), 2.678 (42), 2.523 (27), 2.805 (25), 4.519 (23), 2.775 (21)

Chemistry:

	(1)		(1)
P ₂ O ₅	40.50	CaO	2.09
SiO ₂	0.02	SrO	1.09
Al ₂ O ₃	2.45	BaO	5.68
FeO	27.64	Na ₂ O	4.44
MnO	0.70	K ₂ O	0.26
PbO	0.76	H ₂ O	[0.86]
MgO	10.85	Total	[97.34]

(1) Near Madésimo, Italy; average of ten analyses, total Fe as FeO, total Mn as MnO, H₂O from crystal-structure analysis; corresponds to $\text{Na}_{3.02}(\text{Ba}_{0.78}\text{K}_{0.12}\text{Pb}_{0.07}\text{Sr}_{0.02})_{\Sigma=0.99}(\text{Ca}_{0.79}\text{Sr}_{0.20})_{\Sigma=0.99}(\text{Fe}_{8.12}\text{Mg}_{5.68}\text{Mn}_{0.21})_{\Sigma=14.01}\text{Al}_{1.01}(\text{PO}_4)_{12}(\text{OH})_2$.

Occurrence: A very rare mineral in phengitic quartzite, formed probably by metamorphism of phosphatic organic matter.

Association: Quartz, apatite, iron carbonates, potassic feldspar, rutile, schorl, barite, celestine, lazulite, woodhouseite, crandallite, kaolinite, mitridatite, diaspore, svanbergite, vanadinite, albite, iron oxides.

Distribution: From near Madésimo, Spluga Valley, Lombardy, Italy.

Name: In honor of Pietro Sigismund (1874–1962), mineral collector specializing in minerals from Val Malenco, Italy.

Type Material: Civic Museum of Natural History, Morbegno, Italy.

References: (1) Demartin, F., C.M. Gramaccioli, T. Pilati, and E. Sciesa (1996) Sigismundite, $(\text{Ba, K, Pb})\text{Na}_3(\text{Ca, Sr})(\text{Fe, Mg, Mn})_{14}\text{Al}(\text{OH})_2(\text{PO}_4)_{12}$, a new Ba-rich member of the arrojadite group from Spluga Valley, Italy. *Can. Mineral.*, 34, 827–834. (2) (1997) *Amer. Mineral.*, 82, 432–433 (abs. ref. 1).