Limousinite $BaCa[Be_4P_4O_{16}]\cdot 6H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As isolated, partly corroded, prismatic crystals to 0.9 mm, showing rhombic cross sections.

Physical Properties: Cleavage: None. *Tenacity*: Brittle. *Fracture*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.58 Nonfluorescent.

Optical Properties: Transparent. *Color*: Colorless to snow-white. *Streak*: n.d. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α = 1.532(2) β = 1.553(3) γ = 1.558(2) 2V(calc.) = 18° *Orientation*: *Z* parallel to elongation.

Cell Data: *Space Group*: $P2_1/c$. a = 9.4958(4) b = 13.6758(4) c = 13.4696(4) β = 90.398(3)° Z = 4

X-ray Powder Pattern: Vilatte-Haute quarry, Chanteloube near Razès, Haute-Vienne, France. 3.89 (100), 3.01 (90), 3.75 (60), 3.09 (60), 2.058 (60), 2.219 (50), 1.879 (40)

Chemistry:

	(1)	(2)
P_2O_5	42.06	40.47
SiO_2	0.02	
Al_2O_3	0.99	
MgO	0.02	
ZnO	0.03	
FeO	0.02	
CaO	7.20	7.99
BaO	20.60	21.86
SrO	0.06	
Na_2O	0.21	
K_2O	0.47	
BeO	[14.34]	14.26
H_2O	[14.83]	15.41
Total	100.85	100.00

(1) Vilatte-Haute quarry, Chanteloube near Razès, Haute-Vienne, France; average electron microprobe analysis, BeO and H_2O calculated from structure; corresponds to $(Ba_{0.91}K_{0.07})_{\Sigma=0.98}(Ca_{0.87}Na_{0.05})_{\Sigma=0.92}[(Be_{3.87}Al_{0.13})_{\Sigma=4}P_4O_{16}]\cdot 5.56H_2O$. (2) $BaCa[Be_4P_4O_{16}]\cdot 6H_2O$.

Occurrence: In vugs in altered primary nodular Li-Fe-Mn phosphates (triplite, alluaudite, and heterosite) in beryl-bearing granitic pegmatite.

Association: Greifensteinite, black amorphous vitreous Mn-oxyhydroxide, triplite, quartz.

Distribution: From Vilatte-Haute quarry, Chanteloube near Razès, Limousin, Haute-Vienne, France.

Name: For the French historical region *Limousin* from which studied material was collected. The name Limousin is derived from Lemovices, a native first millenary BC Gaulish tribe.

Type Material: Geological Museum of Lausanne, Switzerland (MGL 093398) and the Laboratory of Mineralogy, University of Liège, Belgium (ULG 21167).

References: (1) Hatert, F., F. Dal Bo, Y. Bruni, N. Meisser, P. Vignola, A. Risplendente, F.X. Châtenet, and J. Lebocey (2020) Limousinite, $BaCa[Be_4P_4O_{16}]\cdot 6H_2O$, a new beryllophosphate mineral with a phillipsite-type framework. Can. Mineral., 58, 815-827.