

Pahasapaite

$\text{Li}_8(\text{Ca, Li, K, Na})_{11}\text{Be}_{24}(\text{PO}_4)_{24} \cdot 38\text{H}_2\text{O}$

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Crystal Data: Cubic. *Point Group:* 23. As isolated euhedral, but usually malformed crystals, to about 1 mm, displaying {110} and {111}.

Physical Properties: Hardness = ~ 4.5 D(meas.) = 2.28(4) D(calc.) = 2.24

Optical Properties: Transparent. *Color:* Colorless to pale pink. *Streak:* White. *Luster:* Vitreous.

Optical Class: Isotropic. $n = 1.523(2)$

Cell Data: *Space Group:* $I23$. $a = 13.781(4)$ $Z = 1$

X-ray Powder Pattern: Tip Top mine, South Dakota, USA.

9.60 (100), 3.684 (90), 3.248 (90), 2.935 (90), 2.702 (60), 4.35 (40), 2.237 (40)

Chemistry:

	(1)	(2)
P_2O_5	46.0	48.22
BeO	n.d.	16.99
CaO	8.5	8.73
Li_2O	4.8	4.91
Na_2O	0.2	0.17
K_2O	1.6	1.60
H_2O	18.0	19.38
Total		100.00

(1) Tip Top mine, South Dakota, USA; partial analysis by electron microprobe, H_2O by TGA, Li and presence of Be confirmed by ion microprobe. (2) $\text{Li}_8(\text{Ca}_{5.5}\text{Li}_{3.6}\text{K}_{1.2}\text{Na}_{0.2})_{\Sigma=10.5}\text{Be}_{24}(\text{PO}_4)_{24} \cdot 38\text{H}_2\text{O}$.

Mineral Group: Zeolite group.

Occurrence: A rare late-stage mineral in seams in fractured beryl crystals, within the inner-intermediate zone of a complex granite pegmatite.

Association: Englishite, roscherite, eosphorite–childrenite, tiptopite, montgomeryite.

Distribution: At the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota, USA.

Name: From *Pahasapa*, the Lakota Sioux word for the Black Hills, in allusion to the type locality.

Type Material: National Museum of Natural History, Washington, D.C., USA, 159879.

References: (1) Rouse, R.C., D.R. Peacor, P.J. Dunn, T.J. Campbell, W.L. Roberts, F.J. Wicks, and D. Newbury (1987) Pahasapaite, a beryllophosphate zeolite related to synthetic zeolite rho, from the Tip Top Pegmatite of South Dakota. *Neues Jahrb. Mineral., Monatsh.*, 433–440. (2) (1988) *Amer. Mineral.*, 73, 1496 (abs. ref. 1). (3) Rouse, R.C., D.R. Peacor, and S. Merlino (1989) Crystal structure of pahasapaite, a beryllophosphate mineral with a distorted zeolite rho framework. *Amer. Mineral.*, 74, 1195–1202.