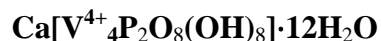


Phosphovanadylite-Ca

Crystal Data: Cubic. *Point Group:* $\bar{4}3m$. As cubes to 0.1 mm, in crusts. *Twinning:* Penetration twins on {111} common.

Physical Properties: *Cleavage:* None. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = 2
D(meas.) = 2.02(3) D(calc.) = 2.038 Gradually turns black on exposure to sunlight.

Optical Properties: Semitransparent. *Color:* Bright greenish blue. *Streak:* Very pale greenish blue. *Luster:* Vitreous.
Optical Class: Isotropic. $n = 1.559(2)$

Cell Data: Space Group: $I\bar{4}3m$. $a = 15.441(11)$ $Z = 6$

X-ray Powder Pattern: South Rasmussen mine, Soda Springs, Caribou County, Idaho, USA.
7.7881 (100), 11.04 (97), 3.1706 (46), 2.749 (32), 1.8295 (16), 2.3426 (15), 4.487 (14)

Chemistry:	(1)	(2)
Na ₂ O	0.22	
K ₂ O	0.55	
CaO	5.58	6.86
SrO	0.10	
BaO	0.21	
Al ₂ O ₃	3.27	
VO ₂	35.85	40.56
P ₂ O ₅	18.78	17.35
H ₂ O	35.44	35.24
Total	100.00	100.00

(1) South Rasmussen mine, Soda Springs, Caribou County, Idaho, USA; average of 18 electron microprobe analyses supplemented by CHN analyzer; corresponding to $(\text{Ca}_{0.75}\text{K}_{0.09}\text{Na}_{0.05}\text{Ba}_{0.01}\text{Sr}_{0.01})_{\Sigma=0.91}[(\text{V}^{4+}_{3.27}\text{Al}_{0.49})_{\Sigma=3.76}\text{P}_{2.00}\text{O}_{10.23}(\text{OH})_{5.77}]\cdot 12\text{H}_2\text{O}$. (2) $\text{Ca}[\text{V}^{4+}_4\text{P}_2\text{O}_8(\text{OH})_8]\cdot 12\text{H}_2\text{O}$.

Occurrence: Crystallized at ambient temperatures from late-stage aqueous solutions of near neutral pH under relatively reducing conditions in phosphatic black mudstone.

Association: Quartz, fluorapatite, hydroxylapatite, pyrite, sphalerite, sincosite, native Se.

Distribution: From the South Rasmussen (or South Rasmussen Ridge) phosphate mine, Soda Springs, Caribou County, Idaho, USA.

Name: As the Ca analog of phosphovanadylite, which is now renamed as phosphovanadylite-Ba.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA. (63578, 63579, 63580, 63581, and 63582).

References: (1) Kampf, A.R., B.P. Nash, and T.A. Loomis (2013) Phosphovanadylite-Ca, $\text{Ca}[\text{V}^{4+}_4\text{P}_2\text{O}_8(\text{OH})_8]\cdot 12\text{H}_2\text{O}$, the Ca analogue of phosphovanadylite-Ba. *Amer. Mineral.*, 98, 439-443.