Peatite-(Y) $Li_4Na_{12}Y_{12}(PO_4)_{12}(CO_3)_4F_8$

Crystal Data: Orthorhombic. *Point Group*: 222. As equant, well-formed, isolated or small clusters of pseudocubes to 1 mm, also as overgrowths on ramikite-(Y). Crystals display dominant {100}, {010}, and {001}, and minor {110}, {101}, and {011}; crystal faces striated parallel to the face diagonal.

Physical Properties: *Cleavage*: Very good on {100}, {010}, {001}. *Fracture*: n.d. *Tenacity*: Brittle. Hardness = ~ 3 D(meas.) = n.d. D(calc.) = 3.62(1)

Optical Properties: Translucent. *Color*: Colorless, pale pink to purple. *Streak*: White. *Luster*: Vitreous.
Optical Class: Biaxial (n.d.). α = n.d. β = 1.601(1) γ = n.d. 2V(meas.) = n.d. 2V(calc.) = n.d. *Pleochroism:* None. *Dispersion*: None.

Cell Data: *Space Group*: *P*222. a = 11.167(2) b = 11.164(2) c = 11.162(2) Z = 1

X-ray Powder Pattern: Poudrette pegmatite, Mont Saint-Hilaire, Canada.
2.63 (100), 2.99 (83), 4.56 (57), 3.95 (57), 3.54 (46), 2.149 (42), 2.71 (38)

Chemistry:

	(1)	(2)		(1)	(2)
Na_2O	12.95	12.81	ZrO_2	0.67	
CaO	1.15		ThO_2	0.37	
Y_2O_3	37.32	46.68	P_2O_5	27.29	29.35
Gd_2O_3	0.61		F	4.35	5.24
Dy_2O_3	3.08		$-O=F_2$	1.83	2.21
Ho_2O_3	0.67		CO_2	[5.79]	6.07
Er_2O_3	2.88		H_2O	[0.31]	
Tm_2O_3	0.28		Li_2O	[1.96]	2.06
Yb_2O_3	1.78		Total	99.75	100.00

(1) Poudrette pegmatite, Mont Saint-Hilaire, Canada; average of 4 electron microprobe analyses, H_2O, CO_2 and Li_2O calculated from stoichiometry and their presence confirmed by LA-ICP-MS and Raman analyses; corresponding to $Li_4Na_{12}(Y_{10.06}Na_{0.72}Ca_{0.62}Dy_{0.50}Er_{0.46}Yb_{0.28}Zr_{0.17}Ho_{0.11}Gd_{0.10}Tm_{0.04}Th_{0.04}Tb_{0.02})_{\Sigma=13.12}(PO_4)_{11.70}(CO_3)_4[F_{6.97}(OH)_{1.03}]_{\Sigma=8}$. (2) $Li_4Na_{12}Y_{12}(PO_4)_{12}(CO_3)_4F_8$.

Occurrence: A late-stage product possibly related to the in situ alteration of the pre-existing mineral assemblage present in the core of a zoned peralkaline pegmatite dike encased in a hornfels xenolith.

Association: Ramikite-(Y), albite, rhodochrosite, siderite, chabazite-Na, synchysite-(Ce), sabinaite.

Distribution: From the Poudrette pegmatite, Mont Saint-Hilaire, La Vallée-du-Richelieu, Montérégie (formerly Rouville County), Québec, Canada.

Name: Honors Cynthia Peat (1925-1999), a former X-ray technician at the Royal Ontario Museum, Toronto, Ontario, Canada, an avid mineralogist who spent decades studying and unraveling the complex mineralogy of Mont Saint-Hilaire.

Type Material: The Royal Ontario Museum, Toronto, Ontario, Canada (M53894).

References: (1) McDonald, A.M., M.E. Back, R.A. Gault, and L. Horváth (2013) Peatite-(Y) and ramikite-(Y), two new Na-Li-Y±Zr phosphate-carbonate minerals from the Poudrette pegmatite, Mont Saint-Hilaire, Quebec. Can. Mineral., 51, 569-596. (2) (2014) Amer. Mineral., 99, 2441 (abs. ref. 1).