Wopmayite $Ca_6Na_3\square Mn(PO_4)_3(PO_3OH)_4$

Crystal Data: Hexagonal. *Point Group*: 3*m*. As corroded {$10\bar{1}$ 1} rhombohedra to ~150 μm.

Physical Properties: *Cleavage*: None. *Fracture*: Irregular to subconchoidal. *Tenacity*: Brittle. *Hardness* = 5 VHN = 534 (25 g load). D(meas.) = n.d. D(calc.) = 3.027
Weak yellowish fluorescence under SW and LW UV.

Optical Properties: Transparent. *Color*: Colorless to white to pale pink. *Streak*: White. *Luster*: Vitreous.
Optical Class: Uniaxial (-). ω = 1.617(2) ε = 1.613(2)

Cell Data: *Space Group*: *R*3*c*. *a* = 10.3926(2) *c* = 37.1694(9) Z = 6

X-ray Powder Pattern: Tanco mine, Bernic Lake, Manitoba, Canada.
2.858 (100), 3.186 (88), 2.589 (68), 5.166 (33), 6.421 (32), 8.017 (31), 3.425 (29)

Chemistry:

	(1)
P_2O_5	46.40
Al_2O_3	0.38
Fe_2O_3	[0.80]
FeO	0.96
MnO	3.74
MgO	0.41
CaO	37.65
SrO	0.91
Na_2O	5.43
H_2O	[2.00]
Total	98.68

(1) Tanco mine, Bernic Lake, Manitoba, Canada; average of 14 electron microprobe analyses supplemented by IR and Raman spectroscopy, Fe_2O_3 and H_2O calculated from structure analysis; corresponding to $(Ca_{7.19}Na_{1.88}Sr_{0.09})_{\Sigma=9.16}(Mn_{0.56}Mg_{0.11}Fe^{2+}_{0.14}Fe^{3+}_{0.11}Al_{0.08})_{\Sigma=1.00}(PO_4)_{4.63}(PO_3OH)_{2.37}$.

Occurrence: A secondary mineral in a phosphate-carbonate assemblage formed after the dissolution of primary lithiophosphate by hydrothermal solutions. From a spodumene-rich boulder found in the dumps of a zoned petalite-subgroup pegmatite.

Association: Rhodochrosite, quartz, whitlockite, apatite, fairfieldite, crandallite, calcite, overite, groatite, metswitzerite, sphalerite, bismuthinite.

Distribution: At the Tanco mine, Bernic Lake, Manitoba, Canada.

Name: Honors Wilfrid Reid "Wop" May (1896-1952) who was born in Carberry, Manitoba, Canada. "Wop" May was a pioneering aviator who created the role of the bush pilot, and opened the Canadian North to mineral exploration and mining.

Type Material: Department of Natural History, Royal Ontario Museum, Toronto, Canada (M40501).

References: (1) Cooper, M.A., F.C. Hawthorne, Y.A. Abdu, N.A. Ball, R.A. Ramik, and K.T. Tait (2013) Wopmayite, ideally $Ca_6Na_3\square Mn(PO_4)_3(PO_3OH)_4$, a new phosphate mineral from the Tanco Mine, Bernic Lake, Manitoba: Description and crystal structure. Can. Mineral., 51(1), 93-106.
(2) (2015) Amer. Mineral., 100, 1332 (abs. ref. 1).