Johntomaite $BaFe^{2+}_2Fe^{3+}_2(PO_4)_3(OH)_3$

Crystal Data: Monoclinic. *Point Group:* 2/*m.* Prismatic crystals to 1 mm, display {13$\bar{1}$ }, {10$\bar{1}$ }, {001}, and {021}.

Physical Properties: *Cleavage:* Perfect on {100}. *Tenacity*: Brittle. *Fracture*: Irregular. Hardness = 4.5 D(meas.) = 4.05(1) D(calc.) = 4.084

Optical Properties: Opaque. *Color:* Greenish black. *Streak*: Dark grayish green. *Luster*: Vitreous, greasy to subadamantine. *Optical Class:* Biaxial (-). α = 1.817(3) β = 1.829(6) γ = 1.837(3) 2V(meas.) = 80-85(5)° 2V(calc.) = 78.0° *Pleochroism:* Strong, *X* = bluish green, *Y* = dark brownish green, *Z* = brownish. *Absorption: Y* > *X* ≥ *Z*. *Orientation*: *Z* = *b*. *Dispersion*: Strong, (probably) *r* ≪ *v*.

Cell Data: *Space Group: P*$2_1/m$. *a* = 9.199(9) *b* = 12.359(8) *c* = 5.004(2) β = 100.19(6)° Z = 2

X-ray Powder Pattern: Spring Creek mine, near Wilmington, South Australia, Australia. 3.159 (100), 2.983 (50), 2.749 (50b), 4.573 (40), 3.091 (40)

Chemistry:	(1)
BaO	21.96
FeO	13.34
CaO	3.28
MnO	2.67
Na_2O	0.07
MgO	0.05
CuO	0.07
ZnO	0.06
Fe_2O_3	22.62
Al_2O_3	0.25
P_2O_5	30.45
SiO_2	0.13
F	0.36
H_2O	[3.73]
- O = F	0.15
Total	98.89

(1) Spring Creek mine, near Wilmington, South Australia, Australia; average of 10 electron microprobe analyses, H_2O calculated; corresponds to $Ba_{1.00}(Fe^{2+}_{1.29}Ca_{0.41}Mn_{0.26}Na_{0.02}Mg_{0.01}Cu_{0.01}Zn_{0.01})_{\Sigma=2.01}(Fe^{3+}_{1.97}Al_{0.03})_{\Sigma=2.00}[(P_{2.98}Si_{0.02})O_4]_{3.00}[(OH)_{2.85}F_{0.13})]_{\Sigma=2.98}$.

Mineral Group: Bjarebyite group.

Occurrence: In a brecciated, low-temperature, hydrothermal vein.

Association: Quartz, libethenite, pseudomalachite, mitridatite, goethite, cuprite, copper.

Distribution: From the dumps of the Spring Creek copper mine near Wilmington, southern Flinders Ranges, South Australia, Australia.

Name: Honors Mr. John Toma (b. 1954), amateur mineralogist who first found the mineral.

Type Material: South Australian Museum, Adelaide, Australia.

References: (1) Kolitsch, U., A. Pring and E.R.T. Tiekink (2000) Johntomaite, a new member of the bjarebyite group of barium phosphates; description and structure refinement. Mineralogy and Petrology, 70(1-2), 1-14. (2) (2000) Amer. Mineral., 86, 768 (abs. ref. 1).