Britvinite $Pb_{14}Mg_9(Si_{10}O_{28})(BO_3)_4(CO_3)_2(OH)_{12}F_2$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As platelets to 0.5 mm.

Physical Properties: *Cleavage*: Perfect on {001}, mica-like. *Tenacity*: Sectile. *Fracture*: n.d. Hardness = 3 D(meas.) = n.d. D(calc.) = 5.52

Optical Properties: Transparent. *Color*: Colorless to pale yellow. *Streak*: White. *Luster*: Adamantine.
Optical Class: Biaxial (-). α = 1.896(2) β = 1.903(2) γ = 1.903(2) 2V(meas.) = 20(10)°
Orientation: $Z \approx c$. *Dispersion*: Strong, $r < v$.

Cell Data: *Space Group*: $P\bar{1}$. a = 9.3409(8) b = 9.3597(7) c = 18.8333(14) α = 80.365(6)° β = 75.816(6)° γ = 59.870(5)° Z = 2

X-Ray Diffraction Pattern: Långban, Bergslagen, Filipstad district, Värmland, Sweden. 8.1 (100), 3.02 (90), 2.698 (70), 1.766 (40), 1.519 (40), 3.39 (30), 2.275 (30)

Chemistry:

	(1)
MgO	7.95
PbO	71.92
Al_2O_3	0.41
SiO_2	12.77
H_2O	2.2
CO_2	2.1
B_2O_3	[2.67]
Total	100.02

(1) Långban, Bergslagen, Filipstad district, Värmland, Sweden; average electron microprobe analysis, H_2O by Alimarin method, CO_2 by selective sorption, B_2O_3 calculated from structure, includes 0.14% F; corresponds to $Pb_{14.75}Mg_{9.03}Si_{9.73}Al_{0.37}O_{30.76}(BO_3)_{3.51}(CO_3)_{2.18}(OH)_{11.17}F_{0.34}$.

Occurrence: In manganese ore.

Association: Calcite, barytocalcite, brucite, cerussite, hausmannite, braunite.

Distribution: From the Långban deposit, Bergslagen ore region, Filipstad district, Värmland, Sweden.

Name: Honors Russian mineralogist Sergey Nikolaevich *Britvin* (b. 1965).

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russian (3458/1).

References: (1) Chukanov, N.V., O.V. Yakubovich, I.V. Pekov, D.I. Belakovsky, and W. Massa (2007) Britvinite, $Pb_{15}Mg_9(Si_{10}O_{28})(BO_3)_4(CO_3)_2(OH)_{12}O_2$ - a new mineral from Långban, Sweden. Zap. Ross. Mineral. Obshch., 136(6), 18-25. (2) Yakubovich, O.V., W. Massa, and N.V. Chukanov (2008) Crystal structure of britvinite $[Pb_7(OH)_3F(BO_3)_2(CO_3)][Mg_{4.5}(OH)_3(Si_5O_{14})]$: A new layered silicate with an original type of silicon-oxygen networks. Crystallography Reports, 53, 206-215. (3) Kolitsch, U., S. Merlino, and D. Holtstam (2012) Molybdophyllite: crystal chemistry, crystal structure, OD character and modular relationships with britvinite. Mineral. Mag., 76(3) , 493-516.