Elasmochloite $Na_3Cu_6BiO_4(SO_4)_5$

Crystal Data: Monoclinic (pseudo-tetragonal). *Point Group*: 2/*m*. As lamellar crystals with octagonal outlines, to 0.1 mm, flattened on [001], either separate or combined into open-work clusters to 0.3 mm or interrupted crusts to 1 mm.

Physical Properties: *Cleavage*: None. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.844

Optical Properties: Transparent. *Color*: Green. S*treak*: Pale green. *Luster*: Strong vitreous. *Optical Class*: Biaxial, pseudo-uniaxial (–). $\alpha = 1.611(2)$ $\beta = \gamma = 1.698(2)$ $2V(meas.) \approx 0°$ *Pleochroism*: Strong, $Z \approx Y$ = grass-green, X = turquoise-blue. *Absorption*: $Z \approx Y > X$.

Cell Data: Space Group: $P2_1/n$. $a = 10.1273(9)$ $b = 10.1193(8)$ $c = 21.1120(16)$ $\beta = 102.272(8)°$ Z = 4

X-ray Powder Pattern: Arsenatnaya fumarole, Kamchatka Peninsula, Russia.
10.33 (100), 3.576 (24), 7.04 (18), 6.33 (14), 2.920 (14), 2.529 (14), 2.460 (14)

Chemistry:

	(1)	(2)
Na_2O	6.67	7.72
K_2O	0.82	
CuO	38.77	39.66
ZnO	0.25	
PbO	3.17	
Bi_2O_3	17.66	19.36
SO_3	32.81	33.26
Total	100.15	100.00

(1) Arsenatnaya fumarole, Kamchatka Peninsula, Russia; average of 7 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to $Na_{2.63}K_{0.21}Cu_{5.96}Zn_{0.04}Bi_{0.93}S_{5.01}O_{24}$.
(2) $Na_3Cu_6BiO_4(SO_4)_5$.

Occurrence: A sublimate on scoria around an active fumarole.

Association: Tenorite, hematite, langbeinite, aphthitalite, krasheninnikovite, johillerite.

Distribution: From the Arsenatnaya fumarole, Second scoria cone, Northern Breakthrough of the Great Fissure Eruption, Tolbachik volcano, Kamchatka Peninsula, Far-Eastern Region, Russia.

Name: From the Greek words ελασμα, meaning "lamella", and χλοη, meaning "green shoot" or "green grass", thus alluding to elasmochloite's green color and lamellar crystal habit.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (96203).

References: (1) Pekov, I.V., S.N. Britvin, A.A. Agakhanov, M.F. Vigasina, and E.G. Sidorov (2019) Elasmochloite, $Na_3Cu_6BiO_4(SO_4)_5$, a new fumarolic mineral from the Tolbachik volcano, Kamchatka, Russia. Eur. J. Mineral., 31(5-6), 1025-1032. (2) (2020) Amer. Mineral., 105(10), 1600 (abs. ref. 1).