

Ilinskite**NaCu₅O₂(Se⁴⁺O₃)₂Cl₃**

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As pointed crystals, tabular on {010}, to 0.35 mm, with many minor forms, elongated and striated along [001]; in sheaflike aggregates.

Physical Properties: *Cleavage:* {100}, perfect. *Tenacity:* Brittle. Hardness = n.d. VHN = 10 (15 g load). D(meas.) = n.d. D(calc.) = 4.08

Optical Properties: Transparent. *Color:* Emerald-green. *Streak:* Pale green. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Pleochroism:* Marked; X = Z = green; Y = yellow-green.

Orientation: X = a; Y = c; Z = b. $\alpha = 1.845(5)$ $\beta = 1.965(5)$ $\gamma = 1.975(5)$

$2V(\text{meas.}) = 20(5)^\circ$ $2V(\text{calc.}) = 31^\circ$

Cell Data: *Space Group:* $Pbnm$. $a = 10.482(1)$ $b = 17.732(2)$ $c = 6.432(1)$ $Z = 4$

X-ray Powder Pattern: Tolbachik volcano, Russia.

5.24 (100), 8.84 (60), 3.251 (40), 2.955 (27), 2.626 (25), 2.513 (12), 9.01 (10)

Chemistry:

	(1)	(2)
SeO ₂	31.27	30.27
CuO	53.54	54.26
Na ₂ O	3.76	4.23
K ₂ O	0.94	
Cl	13.93	14.51
-O = Cl ₂	3.14	3.27
Total	100.30	100.00

(1) Tolbachik volcano, Russia; by electron microprobe, average of nine analyses; corresponds to $(\text{Na}_{0.88}\text{K}_{0.14})_{\Sigma=1.02}\text{Cu}_{4.86}\text{O}_{2.16}(\text{Se}_{1.02}\text{O}_3)_2\text{Cl}_{2.84}$. (2) $\text{NaCu}_5\text{O}_2(\text{SeO}_3)_2\text{Cl}_3$.

Occurrence: A rare volcanic sublimate around fumaroles.

Association: Cotunnite, sofiite, halite, gold, tolbachite, melanothallite, chalcocyanite, burnsite, georgbokiite, chloromenite.

Distribution: From the Tolbachik fissure volcano, Kamchatka Peninsula, Russia.

Name: Honors Georgii Alekseevich Il'inskii (1927–1996), mineralogist, Saint Petersburg University, Saint Petersburg, Russia.

Type Material: Mining Institute, Saint Petersburg, 2090/1; Saint Petersburg State University, Saint Petersburg, Russia, 1/18304.

References: (1) Vergasova, L.P., T.F. Semonova, R.R. Shuvalov, S.K. Filatov, and V.V. Anan'yev (1997) Ilinskite, $\text{NaCu}_5\text{O}_2(\text{SeO}_3)_2\text{Cl}_3$ – a new mineral of volcanic exhalations. Doklady Acad. Nauk SSSR, 353, 641–644 (in Russian). (2) (1998) Amer. Mineral., 83, 186 (abs. ref. 1).