

# Urusovite



MONOCLINIC

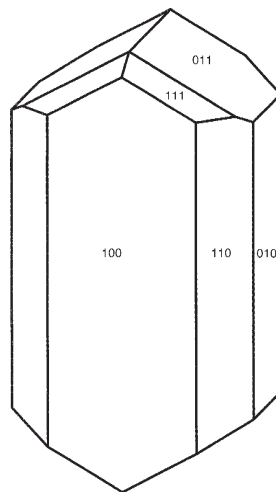
**Locality:** The North Breach of the great fissure Tolbachik eruption (1975–1976), Kamchatka Peninsula, Russia.

**Occurrence:** A product of fumarolic activity in the second cinder cone of the North Breach. Associated minerals are: ponomarevite, piypite, sylvite and lesser amounts of dolerophanite, euchlorine, tenorite, hematite and two unknown As-bearing minerals.

**General appearance:** Light green plates (up to 0.4 mm).

## Physical, chemical and crystallographic properties:

*Luster:* vitreous. *Diaphaneity:* transparent. *Color:* light green. *Streak:* white. *Luminescence:* nonfluorescent. *Hardness:*  $\text{VHN}_{10}$  378  $\text{kg}/\text{mm}^2$ . *Tenacity:* brittle. *Cleavage:* {100} perfect. *Fracture:* not mentioned. *Density:* could not be measured, 3.97  $\text{g}/\text{cm}^3$  (calc.). **Crystallography:** Monoclinic,  $P2_1/c$ ,  $a$  7.314,  $b$  10.223,  $c$  5.576 Å,  $\beta$  99.79°,  $V$  410.9 Å<sup>3</sup>,  $Z = 4$ ,  $a:b:c = 0.7154:1:0.5454$ . Morphology: {100}, {010}, {110}, {010}, {111}. Twinning: none mentioned. **X-ray powder-diffraction data:** 7.20 (100) ( $\bar{1}00$ ), 4.844 (9) (011), 4.327 (23) ( $\bar{1}11$ ), 3.604 (10) (200), 3.174 (10) (121), 3.125 (20) ( $\bar{2}11$ ), 2.458 (8) (221). **Optical data:** Biaxial (–),  $\alpha$



1.672,  $\beta$  1.718,  $\gamma$  1.722,  $2V(\text{meas.}) \sim 30^\circ$ ,  $2V(\text{calc.}) 32^\circ$ ; slight pleochroism,  $X$  colorless,  $Y$  light green,  $Z$  light green;  $X \perp c$ ,  $Y = b$ ,  $Z \wedge a \perp 10^\circ$ . **Chemical analytical data:** Mean of fifteen sets of electron-microprobe data: CuO 32.23, ZnO 0.25, Al<sub>2</sub>O<sub>3</sub> 20.89, Fe<sub>2</sub>O<sub>3</sub> 0.32, As<sub>2</sub>O<sub>5</sub> 46.02, V<sub>2</sub>O<sub>5</sub> 0.10, Total 99.81 wt.%. Empirical formula:  $(\text{Cu}_{1.00}\text{Zn}_{0.01})_{\Sigma 1.01}(\text{Al}_{1.01}\text{Fe}_{0.01})_{\Sigma 1.01}\text{As}_{0.98}\text{O}_{5.00}$ . **Relationship to other species:** None apparent.

**Name:** After Vadim Sergeevich Urusov (b. 1936), crystal chemist, Corresponding Member of the Russian Academy of Sciences and chair of the Department of Crystallography and Crystal Chemistry of Moscow State University.

**Comments:** IMA No. 1998–067. Note that the crystal structure has been solved. The crystal drawing produced here is slightly different from that given in the paper, which appears to depart slightly from the standard orientation.

VERGASOVA, L.P., FILATOV, S.K., GORSKAYA, M.G., MOLCHANOV, A.A., KRIVOVICHEV, S.V. & ANANIEV, V.V. (2000): Urusovite, Cu[AlAsO<sub>5</sub>], a new mineral from the Tolbachik volcano, Kamchatka, Russia. *European Journal of Mineralogy* **12**, 1041–1044.

KRIVOVICHEV, S.V., MOLCHANOV, A.A. & FILATOV, S.K. (2000): The crystal structure of Cu[AlAsO<sub>5</sub>]: a novel type of aluminarsenate tetrahedral polyanion. *Crystallographic Reports* (in press).