

Crystal Data: Tetragonal. *Point Group:* 4/m 2/m 2/m. As tabular crystals with prominent {001} and {111}, to 0.6 mm. As blocky aggregates to 6 mm.

Physical Properties: *Cleavage:* Perfect on {001}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 2-3 D(meas.) = n.d. D(calc.) = 3.90

Optical Properties: Transparent to translucent. *Color:* Emerald green. *Streak:* Gray to greenish gray. *Luster:* Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.636(2)$ $\beta = 1.667(3)$ $\gamma = 1.672(2)$ $2V(\text{meas.}) = < 5$
Greyish to pale yellow anomalous birefringence viewed on (001).

Cell Data: *Space Group:* I4₁/acd. $a = 10.9867(2)$ $c = 32.9271(5)$ $Z = 16$

X-ray Powder Pattern: Jáchymov district, Karlovy Vary, NW Bohemia, Czech Republic. 8.190 (100), 7.008 (43), 2.1543 (25), 3.395 (20), 5.475 (18), 2.9328 (18), 4.111 (16)

Chemistry:	(1)	(2)
Na ₂ O	0.13	
UO ₂	50.19	45.77
SiO ₂	0.12	
P ₂ O ₅	0.46	
As ₂ O ₅	38.64	38.96
SO ₃	1.95	
H ₂ O	16.41	15.27
Total	107.90	100.00

(1) Jáchymov district, NW Bohemia, Czech Republic; average of 6 electron microprobe analyses, valence of U verified by XANES spectroscopy, H₂O from structure and thermal analyses; corresponding to (U_{1.01}Na_{0.02})_{Σ=1.03}[(AsO₃OH)_{1.82}(PO₃OH)_{0.04}(SO₄)_{0.13}(SiO₄)_{0.01}]_{Σ=2.00}·4H₂O.
(2) U(AsO₃OH)₂·4H₂O.

Occurrence: A post-mining secondary mineral developed by weathering in a humid climate of a Ag-As-Bi-Co-Ni-U hydrothermal vein-type deposit.

Association: Native arsenic, arsenopyrite, pyrite, arsenolite, běhounekite, claudetite, kaatialaite, scorodite, parasymplesite, gypsum, picropharmacolite, melanterite, native sulfur.

Distribution: At the intersection of the Geschieber and Geyer veins, 10th level of the Svornost (former “Einigkeit”) mine, Jáchymov (St Joachimsthal) ore district, Krušné Hory Mountains (Erzgebirge), ~20 km north of Karlovy Vary, NW Bohemia, Czech Republic.

Name: Honors Josef Štěp (1863-1926), a Czech mining engineer who played a leading role in the development of the Jáchymov mines, and the “father” of the world’s first radioactive spa at Jáchymov.

Type Material: National Museum, Prague, Czech Republic (P1P 7/2011).

References: (1) Plášil, J., K. Fejfarová, J. Hloušek, R. Škoda, M. Novák, J. Sejkora, J. Čejka, M. Dušek, F. Veselovský, P. Ondruš, J. Majzlan, and Z. Mráek (2013) Štěpíte, U(AsO₃OH)₂·4H₂O, from Jáchymov, Czech Republic: the first natural arsenate of tetravalent uranium. *Mineral. Mag.*, 77(1), 137-152 (2) (2016) *Amer. Mineral.*, 101, 236-237 (abs. ref. 1).