Mathesiusite $K_5(UO_2)_4(SO_4)_4(VO_5)(H_2O)_4$

Crystal Data: Tetragonal. *Point Group*: 4/*m*. As prismatic to acicular crystals, to 0.2 mm, elongated along [001]; typically in radiating and fan-shaped aggregates.

Physical Properties: *Cleavage*: Perfect on {110}, less perfect on {001}. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = ~ 2 D(meas.) = n.d. D(calc.) = 4.018 Fluoresces strong yellowish green under LW and SW UV.

Optical Properties: Transparent to translucent. *Color*: Yellowish green, colorless in thin section. *Streak*: Greenish white. *Luster*: Vitreous.
Optical Class: Uniaxial (-). ω = 1.634(3) ε = 1.597(3)

Cell Data: *Space Group*: *P*4/*n*. *a* = 14.9704(10) *c* = 6.8170(5) Z = 2

X-ray Powder Pattern: Geschieber vein, Svornost mine, Jáchymov district, Czech Republic.
6.856 (100), 6.237 (85), 10.64 (76), 4.742 (37), 3.749 (27), 2.9409 (17), 7.486 (9)

Chemistry:	(1)	(2)
K_2O	12.42	12.64
SO_3	18.04	17.19
V_2O_5	4.30	4.88
UO_3	61.46	61.42
H_2O	[3.90]	3.87
Total	100.12	100.00

(1) Geschieber vein, Svornost mine, Jáchymov district, Czech Republic; average of 7 electron microprobe analyses supplemented by Raman spectroscopy, H_2O calculated from structure; corresponds to $K_{4.87}(U_{0.99}O_2)_4(S_{1.04}O_4)_4(V_{0.87}O_5)(H_2O)_4$. (2) $K_5(UO_2)_4(SO_4)_4(VO_5)(H_2O)_4$.

Occurrence: A rare post-mining, secondary mineral in the underground workings in a polymetallic hydrothermal vein type deposit.

Association: Adolfpateraite, schoepite, čejkaite, zippeite, gypsum.

Distribution: From the Geschieber vein, fifth level of the Svornost (Einigkeit) mine, Jáchymov ore district, Western Bohemia, Czech Republic.

Name: Honors Johannes Mathesius (1504-1565), Lutheran priest and theologian. Mathesius lived and served in Jáchymov, first as a teacher at the Latin lyceum, then as a pastor. His publications on mining include “Sarepta oder Bergpostil”.

Type Material: Department of Mineralogy and Petrology, National Museum, Prague, Czech Republic (P1P 7/2013).

References: (1) Plášil, J., F. Veselovský, J. Hloušek, R. Škoda, M. Novák, J. Sejkora, J. Čejka, P. Škácha, and A.V. Kasatkin (2014) Mathesiusite, $K_5(UO_2)_4(SO_4)_4(VO_5)(H_2O)_4$, a new uranyl vanadate-sulfate from Jáchymov, Czech Republic. Amer. Mineral., 99, 625-632.