Cupromakopavonite $Cu_8Pb_4Ag_3Bi_{19}S_{38}$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As inclusions in over-substituted krupkaite (bd_{56}) as homogeneous grains or in lamellar intergrowths with Cu-bearing makovickyite.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: n.d. Hardness = n.d.
D(meas.) = n.d. D(calc.) = 6.85

Optical Properties: Opaque. *Color*: Gray, grayish white in reflected light. *Streak*: Gray.
Luster: Metallic.
Optical Class: *Bireflectance*: Weak. *Anisotropism*: Moderate (air) to strong (oil), dark bluish gray to yellowish brown.
R_1-R_2: (470) 42.9-46.6, (546) 42.1-46.5, (589) 41.3-45.8, (650) 40.2-45.1

Cell Data: *Space Group*: *C*2/*m*. a = 13.380(2) b = 4.0007(6) c = 31.083(4) β = 93.064(2)° Z = 1

X-Ray Diffraction Pattern: Felbertal, Salzburg Province, Hohe Tauern, Austria.
2.834 (100), 3.457 (99), 3.607 (57), 3.436 (37), 3.340 (34), 2.874 (33), 2.256 (29)

Chemistry:

	(1)
Cu	7.29
Ag	5.48
Pb	8.84
Cd	0.39
Bi	59.90
S	17.90
Total	99.80

(1) Felbertal, Salzburg Province, Hohe Tauern, Austria; average electron microprobe analysis; corresponds to $Cu_{7.82}Ag_{3.46}Pb_{2.91}Cd_{0.24}Bi_{19.53}S_{38.05}$.

Mineral Group: Cupropavonite homologous series with N = 4.5.

Occurrence: By exsolution from an originally homogeneous high-temperature phase in quartz veins in a metamorphosed hydrothermal scheelite deposit.

Association: Makovickyite, over-substituted krupkaite (bd_{55}), hodrušite, kupčikite.

Distribution: From the K8 orebody, Felbertal, Salzburg Province, Hohe Tauern, Austria.

Name: Suffix, *cupro*, indicates dominant copper in a phase related to cupro*mako*vickyite and cupro*pavonite*.

Type Material: Reference collection, Division of Mineralogy, University of Salzburg, Austria (14955).

References: (1) Topa D., E. Makovicky, G. Ilinca, and H. Dittrich (2012) Cupromakopavonite, $Cu_8Ag_3Pb_4Bi_{19}S_{38}$, a new mineral species, its crystal structure and the cupropavonite homologous series. Can. Mineral., 50, 295-312. (2) Topa D., E. Makovicky, G. Ilinca, and H. Dittrich (2012) Cupromakopavonite, $Cu_8Ag_3Pb_4Bi_{19}S_{38}$, a new mineral species, its crystal structure and the cupropavonite homologous series: Erratum. Can. Mineral., 50, 773. (3) Borisov, S.V., S.A. Magarill, and N.V. Pervukhina (2015) Crystallographic analysis of modular structures of cupromakopavonite $Cu_8Ag_3Pb_4Bi_{19}S_{38}$ and heyrovskyite $Pb_6Bi_2S_9$ minerals. Crystallography Reports, 60(6), 791-796.