Emilite $Cu_{2.68}Pb_{2.68}Bi_{5.32}S_{12}$

Crystal Data: Orthorhombic. *Point Group*: *mm*2. As elongate crystals to 0.3 mm.

Physical Properties: *Cleavage*: Imperfect on {0*kl*}. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = 3.5-4 VHN = 242-287 (50-100 g load). D(meas.) = n.d. D(calc.) = 7.025

Optical Properties: Opaque. *Color*: Tin-white, white with a creamy tint in reflected light. *Streak*: Grayish black. *Luster*: Metallic.
Optical Class: n.d. *Anisotropism:* Moderate, greenish to grayish.
R_1-R_2: (470) 39.4-46.95, (546) 39.21-48.25, (589) 38.98-48.35, (650) 38.30-46.94

Cell Data: *Space Group*: *Pmc*2_1. a = 4.0285(8) b = 44.986(9) c = 11.599(2) Z = 1

X-ray Powder Pattern: Felbertal deposit, 10 km south of Mittersill, Salzburg Province, Austria. 3.656 (100), 2.852 (95), 3.567 (81), 3.152 (78), 3.174 (71), 4.04 (49), 3.605 (49)

Chemistry:

	(1)	(2)
Cu	7.68	7.65
Pb	25.4	24.94
Bi	49.9	50.09
S	17.59	17.32
Total	100.6	100.00

(1) Felbertal deposit, Salzburg Province, Austria; average of 5 electron microprobe analyses; corresponding to $Cu_{2.68}Pb_{2.72}Bi_{5.30}S_{12.18}$. (2) $Cu_{2.68}Pb_{2.68}Bi_{5.32}S_{12}$.

Occurrence: In quartz veins cutting a metamorphosed scheelite deposit.

Association: Bismuthinite derivatives in the range krupkaite–hammarite, Ag-bearing lillianite, makovickyite, pavonite, cosalite, galenobismutite, cannizzarite, tetradymite, native bismuth, chalcopyrite, pyrite, quartz.

Distribution: From the Felbertal deposit, 10 km south of Mittersill, Salzburg Province, Austria.

Name: Honors Professor Dr. Emil Makovicky (b. 1940) for his contributions to the crystal chemistry and modular description of diverse sulfosalts families, including those from the Felbertal deposit.

Type Material: The Mineral Reference Collection, Division of Mineralogy, University of Salzburg, Austria (# 14954) and at the Geological Institute and Museum, University of Copenhagen, Denmark.

References: (1) Balić-Žunić, T., D. Topa, and E. Makovicky (2002) The crystal structure of emilite, $Cu_{10.7}Pb_{10.7}Bi_{21.3}S_{48}$, the second 45 Å derivative of the bismuthinite–aikinite solid-solution series. Can. Mineral., 40, 239-245. (2) (2004) Amer. Mineral., 89, 1826 (abs. ref. 1). (3) Topa, D., W. H. Paar, and T. Balić-Žunić (2006) Emilite, $Cu_{10.7}Pb_{10.7}Bi_{21.3}S_{48}$, the last missing link of the bismuthinite-aikinite series? Can Mineral., 44, 459-464.