Klebelsbergite $Sb_4^{3+}O_4(SO_4)(OH)_2$

Crystal Data: Orthorhombic. *Point Group:* $mm2$. Crystals are platy, flattened on {010}, or acicular, elongated along [001], to 1 cm; rarely isolated, typically in bladed radial to tufted aggregates.

Physical Properties: *Tenacity:* Brittle. Hardness = n.d. VHN = 200 (10 g load). D(meas.) = 4.62(6) D(calc.) = 4.67–4.69 May be weakly magnetic if iron is present as an impurity.

Optical Properties: Semitransparent. *Color:* Colorless, pale yellow, yellow-orange, pink. *Streak:* White to yellow. *Luster:* Vitreous to silky.
Optical Class: Biaxial (–). *Orientation:* $X = b$; $Y = c$; $Z = a$. α = n.d. $\beta = \sim 1.95$ γ = n.d. 2V(meas.) = $\sim 70°$

Cell Data: *Space Group:* $Pc2_1b$. $a = 11.279(2)$ $b = 14.909(3)$ $c = 5.7648(6)$ Z = 4

X-ray Powder Pattern: Baia Sprie, Romania.
3.131 (vs), 6.22 (s), 3.892 (s), 3.545 (s), 3.150 (s), 2.830 (s), 2.435 (s)

Chemistry:

	(1)	(2)
SO_3	8.0	11.75
Sb_2O_5	84.8	85.60
Fe_2O_3	0.7	
H_2O		2.65
Total		100.00

(1) Baia Sprie, Romania; by electron microprobe, partial analysis, here converted from an elemental analysis, valence determination of Fe by microchemistry found $Fe^{3+} \gg Fe^{2+}$, $(OH)^{1-}$ determined present by IR. (2) $Sb_4O_4(SO_4)(OH)_2$.

Occurrence: An alteration product of stibnite in antimony deposits.

Association: Stibnite, valentinite, cervantite, kermesite, stibiconite, coquandite, peretaite, onoratoite, cetineite.

Distribution: In Romania, from Baia Sprie (Felsőbánya). In Italy, in Tuscany, at the Cetine mine, 20 km southwest of Siena; in the Pereta mine, Scansano; and at Micciano, near Larderello.

Name: Honoring Kunó Klebelsberg (1875–1932), Hungarian Minister of Education.

Type Material: Hungarian Natural History Museum, Budapest, Hungary, A85135; National Museum of Natural History, Washington, D.C., USA, R6365, B12631, B12640, B12647, 137949.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 583. (2) Nakai, I. and D.E. Appleman (1980) Klebelsbergite, $Sb_4O_4(OH)_2SO_4$: redefinition and synthesis. Amer. Mineral., 65, 499–505. (3) Cipriani, N., S. Menchetti, and C. Sabelli (1980) Klebelsbergite and another antimony mineral from Pereta, Tuscany, Italy. Neues Jahrb. Mineral., Monatsh., 223–229. (4) Menchetti, S. and C. Sabelli (1980) The crystal structure of klebelsbergite, $Sb_4O_4(OH)_2(SO_4)$. Amer. Mineral., 65, 931–935.