Kudriavite $CdBi_2S_4$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As slender platy or box-shaped skeletal crystals (usually striated along the elongation), to 400 μm, and as chaotic aggregates.

Physical Properties: *Cleavage*: None. *Fracture*: Uneven. *Tenacity*: Very brittle. Hardness = n.d. VHN = 129 (10 g load). D(meas.) = n.d. D(calc.) = 6.578

Optical Properties: Opaque. *Color*: Dark gray with a reddish tint; white with a slight yellow hue in reflected light, without internal reflections. *Streak*: Black. *Luster*: Metallic. *Optical Class*: Uniaxial (+). *Bireflectance:* Weak to distinct. *Anisotropism:* Strong. R_1-R_2: (470) 29.6-36.4, (546) 32.4-38.8, (589) 31.8-38.2, (650) 31.4-37.7

Cell Data: *Space Group*: *C 2/m*. a = 13.095(1) b = 4.0032(3) c = 14.711(1) β = 115.59(1)° Z = 4

X-ray Powder Pattern: Kudriavy volcano, Iturup Island, Kurile arc, Russia. 2.809 (100), 3.715 (97), 3.632 (95), 3.520 (83), 2.948 (83), 1.914 (40), 2.346 (39)

Chemistry:

	(1)	(2)
Cd	8.25	17.07
Pb	13.10	
Fe	0.17	
Mn	0.26	
Bi	55.37	63.46
In	2.80	
Tl	0.02	
S	17.70	19.47
Se	2.23	
Cl	0.02	.
Total	99.71	100.00

(1) Kudriavy volcano, Iturup Island, Kurile arc, Russia; average of 9 electron microprobe analyses, corresponding to $(Cd_{0.51}Pb_{0.44}Fe_{0.02}Mn_{0.03})_{\Sigma=1.00}(Bi_{1.83}In_{0.17})_{\Sigma=2.00}(S_{3.81}Se_{0.19})_{\Sigma=4.00}$. (2) $CdBi_2S_4$.

Occurrence: As high-temperature (~ 400 °C) fumarole encrustations on the inner wall of an active andesitic stratovolcanic crater.

Association: Cannizzarite, greenockite, pyrite, sulfur.

Distribution: Kudriavy volcano, Iturup Island, Kurile arc, Russia.

Name: For the volcano from which the first specimens were collected.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (3112/1).

References: (1) Chaplygin, I.V., N.N. Mozgova, L.O. Magazina, O.Yu. Kuznetsova, Y.G. Safonov, I.A. Bryzgalov, E. Makovicky, and T. Balić-Zunić (2005) Kudriavite, $(Cd,Pb)Bi_2S_4$, a new mineral species from Kudriavy volcano, Iturup Island, Kurile arc, Russia. Can. Mineral., 43, 695-701. (2) (2005) Amer. Mineral., 90, 1946-1947 (abs. ref. 1). (3) Balić-Žunić T. and E. Makovicky (2007) The crystal structure of kudriavite, $(Cd,Pb)Bi_2S_4$. Can. Mineral., 45, 437-443.