

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Crystals, up to 12 cm, stout prismatic to acicular, elongated and striated || [001]. Commonly massive with foliated or fibrous texture.

Physical Properties: *Cleavage:* {010}, perfect and easy, {100} and {110}, imperfect. *Tenacity:* Flexible, somewhat sectile. *Hardness* = 2–2.5 VHN = n.d. D(meas.) = 6.78 D(calc.) = 6.81

Optical Properties: Opaque. *Color:* Lead-gray to tin-white, with a yellowish or iridescent tarnish. *Streak:* Lead-gray. *Luster:* Metallic. *Anisotropism:* Strong, especially in oil.

R_1 – R_2 : (400) 35.7–46.2, (420) 36.4–47.2, (440) 37.2–47.9, (460) 37.7–48.3, (480) 37.7–48.8, (500) 37.6–49.4, (520) 37.3–49.6, (540) 37.1–49.1, (560) 36.9–48.7, (580) 36.8–48.3, (600) 36.6–47.8, (620) 36.4–47.3, (640) 36.3–46.8, (660) 36.1–46.3, (680) 36.0–45.8, (700) 35.9–45.4

Cell Data: *Space Group:* $Pbnm$. $a = 11.12$ $b = 11.25$ $c = 3.97$ $Z = 4$

X-ray Powder Pattern: Synthetic.

3.569 (100), 3.118 (80), 3.530 (60), 2.812 (50), 3.967 (40), 2.521 (40), 1.953 (40)

Chemistry:	(1)	(2)	(3)	(4)
Bi	76.94	79.28	79.47	81.3
Pb		1.68		
Cu		0.48	0.57	
Fe		0.74	0.17	
Te			0.94	
Se	8.80			
S	14.15	18.46	18.42	18.7
insol.			0.50	
Total	99.89	100.64	100.07	100.0

(1) Guanajuato, Mexico. (2) Jonqui re, Quebec, Canada. (3) Riddarhyttan, V stmanland, Sweden. (4) Bi₂S₃.

Mineral Group: Forms a series with stibnite.

Occurrence: Typically in low- to high-temperature hydrothermal vein deposits, in tourmaline-bearing copper deposits in granite, in some gold veins formed at high temperatures, and in recent volcanic exhalation deposits.

Association: Bismuth, aikinite, arsenopyrite, stannite, galena, pyrite, chalcopyrite, tourmaline, wolframite, cassiterite, quartz.

Distribution: Widespread. From the Llallagua, Huanuni, Tazna, and Chorolque districts, Potos , Bolivia. From Guanajuato, Mexico. In the USA, large crystals at the Victoria mine, Dolly Varden district, Elko Co.; in a number of mines in the Goldfield district, Esmeralda Co., and elsewhere in Nevada. From Moravicza and B i ta (R zsb nya), Romania. At Schneeberg and Altenberg, Saxony, Germany. From a number of mines in Cornwall, England. In the Mt. Biggenden mine, Queensland, Australia. At Fefena, Madagascar. Exceptional crystals from Spind, Farsum, Norway.

Name: From the composition.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 275–278. (2) Kup ik, V. and L. Vesel -Nov kov  (1970) Zur Kristallstruktur des Bismuthinits, Bi₂S₃. *Tschermaks Mineral. Petrog. Mitt.*, 14, 55–59 (in German). (3) Springer, All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.

G. (1971) The synthetic solid-solution series $\text{Bi}_2\text{S}_3\text{-BiCuPbS}_3$ (bismuthinite–aikinite). *Neues Jahrb. Mineral., Monatsh.*, 19–24. (4) Mumme, W.G., E. Welin, and B.J. Wuensch (1976) Crystal chemistry and proposed nomenclature for sulfosalts intermediate in the system bismuthinite–aikinite ($\text{Bi}_2\text{S}_3\text{-CuPbBiS}_3$). *Amer. Mineral.*, 61, 15–20. (5) Topa, D., E. Makovicky, and W.H. Paar (2002) Composition ranges and exsolution pairs for the members of the bismuthinite–aikinite series from Felbertal, Austria. *Can. Mineral.*, 40, 849–869. (6) (1967) NBS Mono. 25, 5, 13.