

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As prismatic to acicular crystals, deeply striated and channelled \parallel [001]; as bundles of these unterminated crystals, to 3 mm.

Physical Properties: *Cleavage:* Indistinct \perp [001]; excellent \parallel [001]. *Fracture:* Uneven to flat conchoidal. *Tenacity:* Very brittle; long needles are quite elastic. Hardness = n.d. VHN = 149–178 D(meas.) = 7.01(7) D(calc.) = 7.21

Optical Properties: Opaque. *Color:* Shiny lead-gray to steel-gray on fresh surface, tarnishes to pale iridescent grayish green to reddish brown; in polished section, pale creamy white. *Streak:* Dark greenish gray to black. *Luster:* Bright metallic. *Anisotropism:* Very weak, from bluish gray to grayish red.

R₁–R₂: (400) 35.9–45.5, (420) 36.7–44.6, (440) 37.2–45.9, (460) 37.4–46.3, (480) 37.8–46.6, (500) 38.1–46.6, (520) 37.7–46.6, (540) 37.8–46.3, (560) 37.7–46.2, (580) 37.5–46.1, (600) 37.3–45.8, (620) 36.9–45.4, (640) 36.9–45.1, (660) 36.5–44.9, (680) 36.7–44.4, (700) 36.2–44.0

Cell Data: *Space Group:* *Pbnm*. $a = 14.387(7)$ $b = 21.011(15)$ $c = 4.046(6)$ $Z = 4$

X-ray Powder Pattern: Lime Creek deposit, Canada.

3.66 (100), 3.54 (100), 4.00 (90), 3.16 (80), 2.54 (70), 1.871 (60), 1.349 (40)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
Pb	34.12	36.63	33.77	Sb	1.33	2.15	2.18
Cu	5.81	6.41	5.52	S	17.52	16.51	17.10
Bi	42.00	37.97	42.28	Total	100.78	99.67	100.85

(1) Lime Creek deposit, Canada; by electron microprobe, corresponding to Pb_{2.00}Cu_{1.17}(Bi_{0.58}Sb_{0.14}Pb_{0.11})_{Σ=0.83}Bi_{2.00}S_{7.00}. (2) Les Houches, France; by electron microprobe, average of seven analyses; corresponding to Pb_{2.00}Cu_{1.32}(Bi_{0.38}Pb_{0.32}Sb_{0.23})_{Σ=0.93}Bi_{2.00}S_{6.75}. (3) Maleevskoe, Russia; by electron microprobe, average of ten analyses; corresponding to Pb_{2.00}Cu_{1.13}(Bi_{0.62}Sb_{0.23}Pb_{0.11})_{Σ=0.96}Bi_{2.00}S_{6.91}.

Occurrence: In vugs in a small quartz vein in the Lime Creek stock (Lime Creek deposit, Canada).

Association: Molybdenite, cosalite, aikinite, pyrite, galena, sphalerite (Lime Creek, Canada); neyite, galena, tetrahedrite, chalcopyrite, sphalerite (Alaska mine, Colorado, USA).

Distribution: In Canada, from Patsy Creek, immediately south of the Lime Creek molybdenum deposit, Kitsault, near Alice Arm, British Columbia [TL], and at Izok Lake, Northwest Territories. In the Alaska mine, Poughkeepsie Gulch, San Juan Co., Colorado, USA. From the Secu Valley, Baia Boră district, Romania. In the Spissko-Gemerske Ore Mountains, eastern Slovakia. From Les Houches, Haute-Savoie, France. At Maleevskoe, Rudnyi Altai, Russia. From Akchatau, Kara Oba, and in the Ichkeul'nes skarn copper deposit, Kazakhstan.

Name: In honor of Professor Edward Wilfrid Nuffield (1914–), Canadian mineralogist of the University of Toronto, Toronto, Canada.

Type Material: Canadian Geological Survey, Ottawa, 13448; Royal Ontario Museum, Toronto, Canada.

References: (1) Kingston, P.W. (1968) Studies of mineral sulphosalts: XXI—Nuffieldite, a new species. *Can. Mineral.*, 9, 439–452. (2) (1969) *Amer. Mineral.*, 54, 574 (abs. ref. 1). (3) Mozgova, N.N., S.N. Nenasheva, Y.S. Borodaev, and M.A. Yudovskaya (1994) Nuffieldite from the Maleevskoe massive sulfide deposit, Russia. *Can. Mineral.*, 32, 359–364. (4) Moëlo, Y., A. Meerschaut, and E. Makovicky (1997) Refinement of the crystal structure of nuffieldite, Pb₂Cu_{1.4}(Pb_{0.4}Sb_{0.2})Bi₂S₇: structural relationships and genesis of complex lead sulfosalts structures. *Can. Mineral.*, 35, 1497–1508.

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