

**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.

R<sub>1</sub>–R<sub>2</sub>: (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<sub>2.00</sub>Cu<sub>1.17</sub>(Bi<sub>0.58</sub>Sb<sub>0.14</sub>Pb<sub>0.11</sub>)<sub>Σ=0.83</sub>Bi<sub>2.00</sub>S<sub>7.00</sub>. (2) Les Houches, France; by electron microprobe, average of seven analyses; corresponding to Pb<sub>2.00</sub>Cu<sub>1.32</sub>(Bi<sub>0.38</sub>Pb<sub>0.32</sub>Sb<sub>0.23</sub>)<sub>Σ=0.93</sub>Bi<sub>2.00</sub>S<sub>6.75</sub>. (3) Maleevskoe, Russia; by electron microprobe, average of ten analyses; corresponding to Pb<sub>2.00</sub>Cu<sub>1.13</sub>(Bi<sub>0.62</sub>Sb<sub>0.23</sub>Pb<sub>0.11</sub>)<sub>Σ=0.96</sub>Bi<sub>2.00</sub>S<sub>6.91</sub>.

**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, Pb<sub>2</sub>Cu<sub>1.4</sub>(Pb<sub>0.4</sub>Sb<sub>0.2</sub>)Bi<sub>2</sub>S<sub>7</sub>: structural relationships and genesis of complex lead sulfosalts structures. *Can. Mineral.*, 35, 1497–1508.

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.