

Crystal Data: Monoclinic. *Point Group:* 2, *m*, or 2/*m*. Tabular crystals heavily striated parallel to elongation. *Twinning:* Exhibits very fine twin lamellae.

Physical Properties: *Cleavage:* {100}, perfect. Hardness = n.d. VHN = 154 (50 g load). D(meas.) = n.d. D(calc.) = 5.72

Optical Properties: Opaque. *Color:* Lead-gray to black. *Streak:* Black. *Luster:* Metallic. *Pleochroism:* Strong, white to brownish gray.

R₁–R₂: n.d.

Cell Data: *Space Group:* *P*2, *Pm*, *P*2/*m*, *P*2₁ or *P*2₁/*m*. *a* = 45.4 *b* = 8.29 *c* = 21.3
β = 92°30(30)' *Z* = 4

X-ray Powder Pattern: Madoc, Canada.

3.39 (100), 3.32 (100), 2.785 (70), 2.086 (60), 3.98 (40), 3.49 (40), 2.97 (40)

Chemistry:

	(1)	(2)	(3)	(4)
Pb	51.0	47.2	50.7	48.15
Sb	28.0	28.2	26.3	31.83
As	2.4	2.8	3.3	
S	18.8	20.3	21.3	20.02
Cl		0.18		
Total	100.2	98.68	101.6	100.00

(1) Madoc, Canada; by electron microprobe, average of three analyses, corresponding to Pb_{17.32}(Sb_{16.18}As_{2.25})_{Σ=18.43}S_{41.25}. (2) Do.; by electron microprobe, corresponding to Pb_{15.46}(Sb_{15.71}As_{2.54})_{Σ=18.25}Cl_{0.34}S_{42.95}. (3) Novoye, Kyrgyzstan; by electron microprobe; corresponding to Pb_{16.12}(Sb_{14.23}As_{2.90})_{Σ=17.13}S_{45.75}. (4) Pb₁₆Sb₁₈S₄₃.

Occurrence: As masses and stringers through dolomitic and calcitic marbles. At the edges of other sulfosalt minerals, and extending into them along microscopic veinlets.

Association: Boulangerite, jamesonite, antimonian baumhauerite, zinkenite, semseyite, geocronite, robinsonite, madocite, launayite (Madoc, Canada); sphalerite, pyrite, galena, sorbyite, twinnite, guettardite, baumhauerite, realgar, orpiment, cinnabar, fluorite, quartz (Novoye, Kyrgyzstan).

Distribution: From Madoc, Ontario, Canada [TL]. At Novoye, Khaydarkan, Fergana Valley, Alai Range, Kyrgyzstan.

Name: In honor of John Playfair (1748–1819), Professor of Natural Philosophy, Edinburgh, Scotland.

Type Material: Canadian Geological Survey, Ottawa, 12168; Canadian Museum of Nature, Ottawa, Canada.

References: (1) Jambor, J.L. (1967) New lead sulfantimonides from Madoc, Ontario. Part 2 — mineral descriptions. *Can. Mineral.*, 9, 191–213. (2) (1968) *Amer. Mineral.*, 53, 1424 (abs. ref. 1). (3) Mozgova, N.N., N.S. Bortnikov, Y.S. Borodaev, and A.I. Tzépine (1982) Sur la non-stoechiométrie des sulfosels antimonieux arséniques de plomb. *Bull. Minéral.*, 105, 3–10 (in French with English abs.). (4) Jambor, J.L., J.G.H. Laflamme, and D.A. Walker (1982) A re-examination of the Madoc sulfosalts. *Mineral. Record*, 13, 93–100.