Madocite $Pb_{18}(Sb, As)_{15}S_{41}$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. Crystals are elongated and striated along [001], to 1.5 mm.

Physical Properties: *Cleavage:* Perfect on {010}. *Fracture:* Conchoidal. Hardness = n.d. VHN = 155 (50 g load). D(meas.) = n.d. D(calc.) = 5.98

Optical Properties: Opaque. *Color:* Gray-black. *Streak:* Gray-black, shining. *Luster:* Metallic. *Pleochroism:* Strong, from white to gray. *Anisotropism:* Strong. R_1–R_2: n.d.

Cell Data: *Space Group: Pbam* or *Pba*2. $a = 27.2$ $b = 34.1$ $c = 8.12$ Z = 4

X-ray Powder Pattern: Madoc, Canada.
3.396 (100), 3.355 (90), 2.720 (80), 3.67 (70), 2.925 (60), 3.87 (50), 3.110 (40)

Chemistry:

	(1)	(2)
Pb	55.0	54.5
Sb	22.8	23.1
As	3.1	2.2
S	19.9	19.3
Total	100.8	99.1

(1) Madoc, Canada; by electron microprobe, average of three analyses; corresponds to $Pb_{17.54}(Sb_{12.37}As_{2.73})_{\Sigma=15.10}S_{41.00}$. (2) Do.; by electron microprobe, corresponds to $Pb_{17.92}(Sb_{12.92}As_{2.00})_{\Sigma=14.92}S_{41.00}$.

Occurrence: In the marbles of the Precambrian Grenville Limestone, at the margin of an intrusive (Madoc, Canada); in a hydrothermal deposit in dolomitic limestones with other As–Tl minerals (Jas Roux, France).

Association: Jamesonite, boulangerite, arsnopyrite (Madoc, Canada); chabournéite, pierrotite, parapierrotite, stibnite, pyrite, sphalerite, twinnite, zinkenite, andorite, smithite, laffittite, routhierite, aktashite, wakabayashilite, realgar, orpiment (Jas Roux, France).

Distribution: From near Madoc, Huntington Township, Ontario, Canada [TL]. At the Jas Roux deposit, 10 km east of Chapelle-en-Valgaudemar, Hautes-Alpes, France. From Novoye, Khaydarkan, Fergana Valley, Alai Range, Kyrgyzstan. At Boliden, Västerbotten, Sweden. From Colquiri, Bolivia.

Name: For the locality at Madoc, Canada.

Type Material: Canadian Geological Survey, Ottawa, Canada, 12146; National Museum of Natural History, Washington, D.C., USA, 160247.

References: (1) Jambor, J.L. (1967) New lead sulfantimonides from Madoc, Ontario—Part 1. Can. Mineral., 9, 7–24. (2) (1968) Amer. Mineral., 53, 1421 (abs. ref. 1). (3) Jambor, J.L., J.G.H. Laflamme, and D.A. Walker (1982) A re-examination of the Madoc sulfosalts. Mineral. Record, 13, 93–100.