

Mattheddleite**Pb₂₀(SiO₄)₇(SO₄)₄Cl₄**

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Crystal Data: Hexagonal. *Point Group:* 6/*m*. As hexagonal prisms, up to 3 mm, forming radiating rosiform aggregates.

Physical Properties: *Cleavage:* On {0001}, or a parting. Hardness = n.d. D(meas.) = n.d. D(calc.) = 6.96 Dull yellow fluorescence under SW UV.

Optical Properties: Transparent. *Color:* Creamy white to pinkish; colorless in transmitted light. *Streak:* White. *Luster:* Adamantine.

Optical Class: Uniaxial (-). $\omega = 2.017(5)$ $\epsilon = 1.999(5)$

Cell Data: *Space Group:* P6₃/*m*. $a = 9.963(5)$ $c = 7.464(5)$ $Z = [0.5]$

X-ray Powder Pattern: Leadhills, Scotland.

2.988 (100), 4.32 (40), 4.13 (40), 2.877 (40), 3.26 (30), 3.41 (20), 2.072 (20)

Chemistry:

	(1)	(2)
SiO ₂	7.65	7.91
PbO	83.60	83.99
Cl	2.40	2.67
SO ₃	6.00	6.03
-O = Cl ₂	0.54	0.60
Total	99.11	100.00

(1) Leadhills, Scotland; by electron microprobe, average of two analyses; corresponds to Pb_{20.28}Si_{6.90}S_{4.06}O_{44.34}Cl_{3.66}. (2) Pb₂₀(SiO₄)₇(SO₄)₄Cl₄.

Occurrence: Lining cavities in quartz which contain other oxidized lead minerals.

Association: Lanarkite, cerussite, anglesite, pyromorphite, hydrocerussite, caledonite, leadhillite, susannite, macphersonite.

Distribution: From Leadhills, Lanarkshire, Scotland. In England, from the Brae Fells, Red Gill, and Roughton Gill mines, Caldbeck Fells, Cumbria. In Wales, from Dyfed, at the Esgair Hir mine, Bwlch-y-Esgair, Ceulanymaesmawr and the Darren mine, Penbont Rhydybeddau.

Name: For Matthew Forster Heddle (1828–1897), Scottish mineralogist.

Type Material: Royal Museum of Scotland, Edinburgh, Scotland, GY 721.34; The Natural History Museum, London, England, 1985,178.

References: (1) Livingstone, A., G. Ryback, E.E. Fejer, and C.J. Stanley (1987) Mattheddleite, a new mineral of the apatite group from Leadhills, Strathclyde region. *Scottish J. Geol.*, 23, 1–8. (2) (1988) *Amer. Mineral.*, 73, 929 (abs. ref. 1). (3) Cooper, M.P., D.I. Green, and R.S.W. Braithwaite (1988) The occurrence of mattheddleite in the Caldbeck Fells, Cumbria: a preliminary note. *U.K. J. Mines and Minerals*, 5, 21.