

**Mattheddleite****Pb<sub>20</sub>(SiO<sub>4</sub>)<sub>7</sub>(SO<sub>4</sub>)<sub>4</sub>Cl<sub>4</sub>**

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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:* P6<sub>3</sub>/*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 <sub>2</sub>	7.65	7.91
PbO	83.60	83.99
Cl	2.40	2.67
SO <sub>3</sub>	6.00	6.03
-O = Cl <sub>2</sub>	0.54	0.60
Total	99.11	100.00

(1) Leadhills, Scotland; by electron microprobe, average of two analyses; corresponds to Pb<sub>20.28</sub>Si<sub>6.90</sub>S<sub>4.06</sub>O<sub>44.34</sub>Cl<sub>3.66</sub>. (2) Pb<sub>20</sub>(SiO<sub>4</sub>)<sub>7</sub>(SO<sub>4</sub>)<sub>4</sub>Cl<sub>4</sub>.

**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.