

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals are elongated along [001], spear- or chisel-shaped, with {021}, {031}, {100}, {010}, rare {011}, {032}, to 3 mm, in radial and fanlike aggregates.

Physical Properties: *Cleavage:* Perfect on {100}; good on {010}. *Hardness* = ~ 2
D(meas.) = 6.37(2) D(calc.) = 6.396–6.44 May fluoresce yellow under LW UV.

Optical Properties: Transparent to translucent. *Color:* Colorless, grayish white, brown, pale yellow if included with pyromorphite. *Luster:* Adamantine to resinous, pearly on cleavages. *Optical Class:* Biaxial (+). *Orientation:* $Y = b$; $X \wedge a = 15^\circ\text{--}20^\circ$; $Z \wedge a = 4^\circ$. *Dispersion:* $r \ll v$, strong. $\alpha = 1.95\text{--}2.035$ $\beta = 2.00\text{--}2.040$ $\gamma = 2.085\text{--}2.10$ $2V(\text{meas.}) = \sim 35^\circ$
 $2V(\text{calc.}) = 37^\circ 40'$

Cell Data: *Space Group:* $P2_1/m$. $a = 4.505(2)$ $b = 5.333(2)$ $c = 6.405(2)$
 $\beta = 106.24(3)^\circ$ $Z = 2$

X-ray Powder Pattern: Leadhills, Scotland.
3.99 (10), 3.25 (8), 3.38 (7), 2.66 (7), 2.56 (5), 2.24 (5), 2.01 (5)

Chemistry:	(1)	(2)	(3)
SO ₂	19.88	17.89	22.30
PbO	77.85	79.03	77.70
Total	97.73	96.92	100.00

(1) Leadhills, Scotland; by electron microprobe, sulfite confirmed by IR and secondary ion mass spectrometry; corresponds to Pb_{1.06}S_{0.94}O_{2.94}. (2) Argentolle mine, France; by electron microprobe, corresponds to Pb_{1.16}S_{0.91}O₃. (3) PbSO₃.

Occurrence: A very rare secondary mineral, formed in the oxidized zone of hydrothermal lead deposits.

Association: Pyromorphite, anglesite, lanarkite, leadhillite, susannite, barite (Leadhills, Scotland); leadhillite, susannite, macphersonite, cerussite, pyromorphite, galena, quartz (Argentolle mine, France); mattheddleite, lanarkite, leadhillite, caledonite, galena (Roughton Gill, England).

Distribution: Found on a museum specimen labelled as coming from the Susanna mine, Leadhills, Lanarkshire, Scotland. At Roughton Gill, Caldbeck Fells, Cumbria, England. From the Argentolle mine, near Saint-Prix, Saône-et-Loire, France. In the Haus Baden mine, near Badenweiler, Black Forest, Germany. At Tsumeb, Namibia.

Name: For Scotland, within which the first specimen was found.

Type Material: University of Salzburg, Salzburg, Austria; University of Stuttgart, Stuttgart, Germany, NM13; Royal Scottish Museum, Edinburgh, Scotland; The Natural History Museum, London, England, 1982,451; Royal Ontario Museum, Toronto, Canada, M39907.

References: (1) Paar, W.H., R.S.W. Braithwaite, T.T. Chen, and P. Keller (1984) A new mineral, scotlandite (PbSO₃) from Leadhills, Scotland: the first naturally occurring sulphite. *Mineral. Mag.*, 48, 283–288. (2) (1985) *Amer. Mineral.*, 70, 876 (abs. ref. 1). (3) Sarp, H. and G. Burri (1984) Seconde occurrence du nouveau minéral scotlandite PbSO₃. *Schweiz. Mineral. Petrog. Mitt.*, 64, 317–321 (in French with English abs.). (4) Pertlik, F. and J. Zemann (1985) The crystal structure of scotlandite. *Tschermaks Mineral. Petrog. Mitt.*, 34, 289–295.