

Roebingite

$\text{Pb}_2\text{Ca}_6\text{Mn}^{2+}\text{Si}_6\text{O}_{18}(\text{SO}_4)_2(\text{OH})_2 \cdot 4\text{H}_2\text{O}$

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Crystal Data: Monoclinic. *Point Group:* $2/m$. As dense, compact masses of tiny lathlike crystals, which may be in parallel growth; as platy aggregates.

Physical Properties: *Cleavage:* Perfect on {001}. Hardness = < 3 D(meas.) = 3.433 D(calc.) = [3.44]

Optical Properties: Translucent. *Color:* White to pale pink; colorless in thin section. *Luster:* Dull to somewhat resinous.

Optical Class: Biaxial (+). *Dispersion:* $r < v$, slight. $\alpha = 1.654(1)$ $\beta = 1.660(1)$ $\gamma = 1.678(1)$ $2V(\text{meas.}) = 61(2)^\circ$ $2V(\text{calc.}) = 61^\circ$

Cell Data: *Space Group:* $C2/m$. $a = 13.208(4)$ $b = 8.287(2)$ $c = 13.089(9)$ $\beta = 106.65(6)^\circ$ $Z = 2$

X-ray Powder Pattern: Långban, Sweden. (ICDD 16-411). 3.15 (100), 4.20 (80), 3.04 (55), 2.102 (40), 6.47 (35), 6.29 (35), 2.947 (35)

Chemistry:	(1)	(2)	(3)	(4)
SiO ₂	23.58	23.57	24.6	24.62
MnO	2.48	2.49	4.4	4.84
PbO	31.03	30.04	30.7	30.48
CaO	25.95	23.12	22.6	22.98
SrO	1.40	2.79	0.7	
Na ₂ O	0.40			
K ₂ O	0.13			
H ₂ O ⁺	6.35	6.15	[6.13]	6.15
H ₂ O ⁻		0.45		
CO ₂		0.61		
SO ₂	9.0			
SO ₃		10.81	10.6	10.93
Total	100.32	100.03	99.73	100.00

(1–2) Franklin, New Jersey, USA. (3) Långban, Sweden; by electron microprobe, H₂O calculated from stoichiometry. (4) $\text{Pb}_2\text{Ca}_6\text{MnSi}_6\text{O}_{18}(\text{SO}_4)_2(\text{OH})_2 \cdot 4\text{H}_2\text{O}$.

Occurrence: As nodular masses in calcium silicate lenses containing abundant garnet (Franklin, New Jersey, USA); as fracture fillings in a metamorphosed Fe–Mn orebody (Långban, Sweden).

Association: Garnet, titanite, zircon, phlogopite, axinite, willemite, datolite, barite, calcite, arsenopyrite, sphalerite, rhodonite, rhodochrosite.

Distribution: From Franklin, Sussex Co., New Jersey, USA. At Långban, Värmland, Sweden.

Name: For Colonel Washington Augustus Roebing (1837–1926), of Trenton, New Jersey, USA, distinguished American civil engineer, mineral collector, and benefactor of American geological sciences.

Type Material: National Museum of Natural History, Washington, D.C., USA, R8824, 124351; The Natural History Museum, London, England, 1925,69.

References: (1) Dana, E.S. (1899) Dana's system of mineralogy, (6th edition), app. I, 60.

(2) Blix, R. (1931) The chemical composition of roebingite. *Amer. Mineral.*, 16, 455–469.

(3) Moore, P.B. and J. Shen (1984) Roebingite, $\text{Pb}_2\text{Ca}_6(\text{SO}_4)_2(\text{OH})_2(\text{H}_2\text{O})_4[\text{Mn}(\text{Si}_3\text{O}_9)_2]$: its crystal structure and comments on the lone pair effect. *Amer. Mineral.*, 69, 1173–1179.

(4) Dunn, P.J. (1985) The lead silicates from Franklin, New Jersey: occurrence and composition. *Mineral. Mag.*, 49, 721–727. (5) Braithwaite, R.S.W. (1985) Roebingite: a revised formula from infra-red and thermal analysis data. *Mineral. Mag.*, 49, 756–758.

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