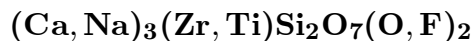


**Rosenbuschite**

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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . Crystals prismatic to acicular || [010], to 5 mm; radial fibrous, feltlike, massive.

**Physical Properties:** *Cleavage:* Perfect on {100}, poor on { $\bar{1}20$ }, {010}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 5–6 VHN = 568–708 D(meas.) = 3.30–3.315 D(calc.) = [3.38]

**Optical Properties:** Transparent to translucent. *Color:* Orange, yellow-orange, gray.

*Streak:* White. *Luster:* Vitreous.

*Optical Class:* Biaxial (+). *Pleochroism:* Weak, in shades of yellow. *Orientation:* X = c; Z  $\perp$  (001) = 28.5°. *Absorption:* Weak; Z > Y > X.  $\alpha = 1.678$   $\beta = 1.687$   $\gamma = 1.705$  2V(meas.) = 78°

**Cell Data:** *Space Group:*  $P\bar{1}$ . a = 10.12(5) b = 11.39(5) c = 7.27(3)  $\alpha = 91^\circ 20(30)'$   $\beta = 99^\circ 40(30)'$   $\gamma = 111^\circ 50(30)'$  Z = 4

**X-ray Powder Pattern:** Langesundsfjord, Norway.

2.94 (100), 3.06 (80), 1.89 (60), 3.96 (40), 2.63 (40), 2.48 (40), 1.82 (40)

**Chemistry:**

	(1)
SiO <sub>2</sub>	31.36
TiO <sub>2</sub>	6.85
ZrO <sub>2</sub>	20.10
Ce <sub>2</sub> O <sub>3</sub>	0.33
Fe <sub>2</sub> O <sub>3</sub>	1.00
MnO	1.39
CaO	24.87
Na <sub>2</sub> O	9.93
F	5.83
–O = F <sub>2</sub>	2.45
Total	99.21

(1) Langesundsfjord, Norway; corresponds to (Ca<sub>1.71</sub>Na<sub>1.23</sub>Mn<sub>0.08</sub>RE<sub>0.01</sub>)<sub>Σ=3.03</sub> (Zr<sub>0.63</sub>Ti<sub>0.33</sub>Fe<sub>0.05</sub><sup>3+</sup>)<sub>Σ=1.01</sub>Si<sub>2.01</sub>O<sub>8</sub>F<sub>1.18</sub>.

**Occurrence:** In some nepheline syenites and related pegmatites.

**Association:** Aegirine, natrolite, sodalite, zircon, l avenite, rinkite, eudialyte, leucophanite (Langesundsfjord, Norway).

**Distribution:** From Lille Ar  Island and Skudesundskjaer, near Brevik, Langesundsfjord, and Bratthagen, north of Larvik, Norway. In the Norra K arr complex, near Gr anna, Sweden. From the Los Islands, Guinea. In the USA, from Red Hill, Moultonborough, Carroll Co., New Hampshire. At Mont Saint-Hilaire, Quebec, Canada. In Russia, from the Lovozero and Khibiny massifs, Kola Peninsula, and at Zaangar'ya, Yenisei Ridge, Siberia. In the Il maussaq intrusion, southern Greenland.

**Name:** For Professor Carl Harry F. Rosenbusch (1836–1914), German geologist and mineralogist, Heidelberg, Germany.

**References:** (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 374–375. (2) Deer, W.A., R.A. Howie, and J. Zussman (1986) Rock-forming minerals, (2nd edition), v. 1B, disilicates and ring silicates, 343–347. (3) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 388–390. (4) Neumann, H. (1962) Contributions to the mineralogy of Norway. No. 13. Rosenbuschite and its relation to g tzenite. Norsk. Geol. Tidsskr., 42, 179–186. (5) Shibaeva, R.P., V.I. Simonov, and N.V. Belov (1963) Crystal structure of the Ca, Na, Zr, Ti silicate rosenbuschite, Ca<sub>3.5</sub>Na<sub>2.5</sub>Zr(Ti, Mn, Nb)[Si<sub>2</sub>O<sub>7</sub>]<sub>2</sub>F<sub>2</sub>O(F, O). Kristallografiya (Sov. Phys. Crystal.), 8, 505–516 (in Russian).

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