

Florencite-(Sm)**(Sm,Nd)Al₃(PO₄)₂(OH)₆**

Crystal Data: Hexagonal. *Point Group:* $\bar{3} 2/m$. As zones to 0.1 mm thick along rhombohedral growth sectors in crystals of florencite-(Ce).

Physical Properties: *Cleavage:* Perfect on {0001}; parting on {11 $\bar{2}$ 0}. *Fracture:* Uneven.

Tenacity: Brittle. *Hardness* = 5.5-6 *D(meas.)* = 3.60(1)

D(calc.) = 3.666 and 3.743 (for the 2 compositions given below in 'Chemistry')

Optical Properties: Transparent. *Color:* Colorless to pale pink or pale yellow. *Streak:* White.

Luster: Vitreous to greasy.

Optical Class: Uniaxial (+). ω = 1.704(2) ϵ = 1.713(2)

Cell Data: *Space Group:* $F\bar{3} m$. a = 6.972(4) c = 16.182(7) Z = 3

X-ray Powder Pattern: Svodovyi site, Maldynyrd Ridge, Subpolar Urals, Russia.

2.925 (100), 1.881(58), 2.161 (46), 5.65 (43), 3.479 (37), 2.191 (22), 1.738 (20)

Chemistry:	(1)	(2)		(1)	(2)
La ₂ O ₃	n.d.	0.62	SrO	1.91	0.71
Ce ₂ O ₃	1.92	3.29	CaO	0.77	0.35
Pr ₂ O ₃	0.16	1.05	Al ₂ O ₃	30.20	29.89
Nd ₂ O ₃	9.35	10.31	P ₂ O ₅	27.18	26.14
Sm ₂ O ₃	12.96	12.62	SO ₃	2.13	0.85
Eu ₂ O ₃	n.d.	0.41	SiO ₂	n.d.	0.09
Gd ₂ O ₃	2.55	2.30	H ₂ O	10.74	10.74
Dy ₂ O ₃	n.d.	0.13	Total	99.87	99.50

(1) Svodovyi site, Maldynyrd Ridge, Russia; average of 5 electron microprobe analyses, H₂O by TGA; corresponding to (Sm_{0.37}Nd_{0.28}Gd_{0.07}Ce_{0.06}Pr_{0.01}Sr_{0.09}Ca_{0.07}) Σ =0.95Al_{2.97}(P_{1.92}S_{0.13}) Σ =2.05O₁₄H_{5.98}.

(2) Same as above; average of 3 electron microprobe analyses; corresponding to (Sm_{0.37}Nd_{0.32}Ce_{0.10}Gd_{0.07}Pr_{0.03}La_{0.02}Eu_{0.01}Sr_{0.04}Ca_{0.03}) Σ =0.99Al_{3.02}(P_{1.90}S_{0.05}Si_{0.01}) Σ =1.96O₁₄H_{6.15}.

Mineral Group: Plumbogummite group of the alunite supergroup.

Occurrence: In quartz veins cutting quartz meta-conglomerate beds near contacts with Al-enriched metasomatites.

Association: Florencite-(Ce), xenotime-(Y), quartz, dravite.

Distribution: Svodovyi site, Maldynyrd Ridge, Subpolar Urals, Russia.

Name: As the Sm-dominant example of the *florencite* structure.

Type Material: Natural Science Museum, Ilmen State Reserve, Miass, Russia.

References: (1) Repina, S.A., V.I. Popova, E.I. Churin, E.V. Belogub, and V.V. Khiller (2010) Florencite-(Sm), (Sm,Nd)Al₃(PO₄)₂(OH)₆ - a new mineral species of the alunite-jarosite group from the Subpolar Urals. Zap. Ross. Mineral. Obsch., 139(4), 16-25 (in Russian with English abstract). Geol. Ore Deposits, 53(7), 564-574 (in English). (2) (2012) Amer. Mineral., 97, 1527-1528 (abs. ref. 1).