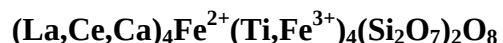


Perrierite-(La)

Crystal Data: Monoclinic. *Point Group:* 2/m. As simply terminated prismatic crystals to 1 mm, columnar along [010] or flattened on (001).

Physical Properties: *Cleavage:* Distinct on (001). *Fracture:* n.d. *Tenacity:* Brittle.
Hardness = 6 D(meas.) = n.d. D(calc.) = 4.791

Optical Properties: Translucent to nearly opaque. *Color:* Black. *Streak:* Brown.
Luster: Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.94(1)$ $\beta = 2.020(15)$ $\gamma = 2.040(15)$ $2V(\text{meas}) = 50(10)^\circ$
 $2V(\text{calc}) = 51^\circ$ *Dispersion:* Very strong, $r < v$. *Pleochroism:* Z = dark brown; Y = brown;
X = light yellow-brown. *Absorption:* Z > Y > X.

Cell Data: *Space Group:* $P2_1/a$. $a = 13.668(1)$ $b = 5.6601(6)$ $c = 11.743(1)$ $\beta = 113.64(1)^\circ$
Z = 2

X-ray Powder Pattern: Dellen quarry, near Mendig, Eifel Mts., Rhineland-Palatinate, Germany.
2.96 (100), 2.80 (50), 2.14 (50), 1.947 (50), 5.19 (40), 3.53 (40), 1.657 (40)

Chemistry:	(1)
CaO	3.26
La ₂ O ₃	22.92
Ce ₂ O ₃	19.64
Pr ₂ O ₃	0.83
Nd ₂ O ₃	2.09
MgO	0.25
MnO	2.25
FeO	3.16
Fe ₂ O ₃	5.28
Al ₂ O ₃	2.59
TiO ₂	16.13
Nb ₂ O ₅	0.75
SiO ₂	20.06
Total	99.21

(1) Dellen quarry, near Mendig, Eifel Mts., Rhineland-Palatinate, Germany; average of 7 electron microprobe analyses, Fe²⁺/Fe³⁺ ratio from structure analysis; corresponding to
(La_{1.70}Ce_{1.45}Nd_{0.15}Pr_{0.06}Ca_{0.70}) $\Sigma=4.06$ (Fe²⁺_{0.53}Mn_{0.38}Mg_{0.08}) $\Sigma=0.99$ (Ti_{2.44}Fe³⁺_{0.80}Al_{0.62}Nb_{0.07}) $\Sigma=3.93$ Si_{4.04}O₂₂.

Mineral Group: Chevkinite group.

Occurrence: In miarolitic cavities in sanidinite lava rock, probably pneumatolytic.

Association: Sanidine, phlogopite, pyrophanite, zirconoiite, jakobsite, magnetite, fluorcalciopyrochlore, zircon.

Distribution: In the Dellen quarry, near Mendig, Laacher See region, Eifel Mts., Rhineland-Palatinate (Rheinland-Pfalz), Germany.

Name: For the La-dominant member of the *perrierite* structure type.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia; 4059/1.

References: (1) Chukanov, N.V., G. Blass, I.V. Pekov, D.I. Belakovskiy, K.V. Van, R.K. Rastsvetaeva, and S.M. Aksenov, (2011) Perrierite-(La), (La,Ce,Ca)₄(Fe²⁺,Mn)(Ti,Fe³⁺,Al)₄(Si₂O₇)₂O₈ - a new mineral species from the Eifel volcanic region, Germany. Zap. Ross. Mineral. Obshch., 140(6), 34-44 (in Russian, English abstract). (2) (2013) Amer. Mineral., 98, 1081-1082 (abs. ref. 1).