

Laachite**(Ca,Mn)₂Zr₂Nb₂TiFeO₁₄**

Crystal Data: Monoclinic. *Point Group:* 2/m. Forms isolated, imperfect, prismatic to acicular crystals elongated on [100], to 0.5 mm. *Twinning:* Twin plane is (130), with 65° between the *a* axes of the twin components.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 5.417

Optical Properties: Translucent. *Color:* Deep brownish red. *Streak:* Brownish red. *Luster:* Adamantine. *Pleochroism:* Medium, red-brown to brownish red. *Absorption:* X > Y ≈ Z. *Optical Class:* n.d. *n*(calc.) = 2.26

Cell Data: *Space Group:* C2/c. *a* = 7.3119(5) *b* = 14.1790(10) *c* = 10.1700(7)
β = 90.072(2)° Z = 4

X-ray Powder Pattern: “Zieglowski” quarry, Eifel region, Rheinland-Pfalz, Germany. 2.967 (100), 2.901 (59), 1.800 (34), 2.551 (32), 1.541 (24), 1.535 (23), 1.529 (23)

Chemistry:	(1)
CaO	4.29
MnO	9.42
FeO	5.73
Y ₂ O ₃	2.56
La ₂ O ₃	2.00
Ce ₂ O ₃	6.37
Nd ₂ O ₃	2.22
Al ₂ O ₃	0.99
ThO ₂	7.75
TiO ₂	10.98
ZrO ₂	19.39
<u>Nb₂O₅</u>	<u>27.82</u>
Total	99.52

(1) “Zieglowski” quarry, Eifel region, Rheinland-Pfalz, Germany; average of 5 electron microprobe analyses, absence of H₂O, OH⁻, CO₃²⁻ confirmed by Raman spectroscopy; corresponding to (Ca_{0.66}Mn_{0.37}Th_{0.25}Y_{0.20}La_{0.11}Ce_{0.34}Nd_{0.11})(Zr_{1.36}Mn_{0.64})(Nb_{1.81}Ti_{1.19})(Fe_{0.69}Al_{0.17}Mn_{0.14})O_{14.00}.

Occurrence: In vesicular sanidinite volcanic ejectum.

Association: Sanidine, allanite-(Ce), baddeleyite, h a y ne, hedenbergite, intermediate members of the jacobsonite-magnetite series, phlogopite, rhodonite, spessartine, tephroite, thorite, zircon, a pyrochlore-group mineral.

Distribution: From the “Zieglowski” pumice quarry, 1.5 km NE of Mendig, near Laach Lake (Laacher See), Eifel volcanic region, Rheinland-Pfalz, Germany.

Name: For the locality that produced the first specimens.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4361/1).

References: (1) Chukanov, N.V., S.V. Krivovichev, A.S. Pakhomova, I.V. Pekov, C. Sch afer, M.F. Viganina, and K.V. Van (2014) Laachite, (Ca,Mn)₂Zr₂Nb₂TiFeO₁₄, a new zirconolite-related mineral from the Eifel volcanic region, Germany. *European Journal of Mineralogy*, 26(1), 103-111. (2) (2014) *Amer. Mineral.*, 99, 1809 (abs. ref. 1).