

Ferriallanite-(Ce)**CaCe(Fe³⁺AlFe²⁺)[Si₂O₇][SiO₄]O(OH)**

Crystal Data: Monoclinic. *Point Group:* 2/m. As aggregates of subhedral grains to 2 mm.

Physical Properties: *Cleavage:* None. *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. VHN = 1250 (100 g load). Hardness = 6 D(meas.) = 4.22 D(calc.) = 4.21

Optical Properties: Opaque or translucent (with red or orange-red inner reflections). *Color:* Black. *Streak:* Brown. *Luster:* Resinous.

Optical Class: Biaxial (-). $\alpha = 1.825(2)$ $\beta = 1.855(5)$ $\gamma = 1.880(5)$ $2V(\text{calc.}) = 83^\circ$

Pleochroism: Observed; Z = dark red-brown, Y = brown, X = greenish gray. *Absorption:* Z > Y > X.

Dispersion: Strong, $r < v$.

Cell Data: *Space Group:* P2₁/m. $a = 8.962(2)$ $b = 5.836(2)$ $c = 10.182(2)$ $\beta = 115.02(1)^\circ$ Z = 2

X-ray Powder Pattern: Mount Ulyn Khuren, near Kobdo, Mongolian People's Republic.

2.18 (100), 2.72 (80), 2.14 (80), 2.93 (65), 2.63 (60), 3.55 (55), 2.69 (55)

Chemistry:

| | |
|--------------------------------|---------|
| | (1) |
| CaO | 10.33 |
| FeO | [8.83] |
| Fe ₂ O ₃ | [18.99] |
| MnO | 1.34 |
| Al ₂ O ₃ | 6.26 |
| La ₂ O ₃ | 4.90 |
| Ce ₂ O ₃ | 11.66 |
| Pr ₂ O ₃ | 1.46 |
| Nd ₂ O ₃ | 4.82 |
| TiO ₂ | 1.84 |
| SiO ₂ | 28.09 |
| H ₂ O | [1.48] |
| Total | 100.01 |

(1) Mount Ulyn Khuren, near Kobdo, Mongolian People's Republic; average electron microprobe analysis supplemented by IR and Mössbauer spectroscopy and wet chemistry which gave FeO = 8.43 and Fe₂O₃ = 20.09; H₂O, FeO and Fe₂O₃ calculated; corresponding to (Ca_{1.12}Ce_{0.43}La_{0.18}Nd_{0.17}Pr_{0.05}) $\Sigma=1.96$ (Fe³⁺_{1.44}Fe²⁺_{0.75}Al_{0.59}Ti_{0.14}Mn_{0.12}) $\Sigma=3.04$ [(Si_{2.84}Al_{0.16}) $\Sigma=3.00$ O₁₁]O(OH)_{1.01}.

Mineral Group: Epidote group.

Occurrence: Of metasomatic origin in alkaline granitic pegmatite.

Association: Aegirine, β -fergusonite-(Y), Y-rich and normal ilvaite, hingganite-(Ce), Nd-rich allanite-(Ce), magnetite, fayalite, fluorite, zircon, quartz, kinosite-(Y).

Distribution: From the northern slope of Mount Ulyn Khuren (in the Khaldzan Buragtag peralkaline granite massif), 55 km north-northeast of Kobdo, Mongolian People's Republic.

Name: The prefix, *ferri*, indicates that the mineral is the Fe³⁺ analog of *allanite-(Ce)*.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (TsH-9026).

References: (1) Kartashov, P.M., G. Ferraris, G. Ivaldi, E. Sokolova, and C.A. McCammon (2002) Ferriallanite-(Ce), CaCeFe³⁺AlFe²⁺(SiO₄)(Si₂O₇)O(OH), a new member of the epidote group: description, X-ray and Mössbauer study. *Can. Mineral.*, 40, 1641-1648. (2) (2003) *Amer. Mineral.*, 88, 1626 (abs. ref. 1).