Ferriallanite-(Ce) $CaCe(Fe^{3+}AlFe^{2+})[Si_2O_7][SiO_4]O(OH)$

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(calc.) = 83°
Pleochroism: Observed; *Z* = dark red-brown, *Y* = brown, *X* = greenish gray. *Absorption*: $Z > Y > X$. *Dispersion*: Strong, $r < v$.

Cell Data: *Space Group*: $P2_1/m$. $a = 8.962(2)$ $b = 5.836(2)$ $c = 10.182(2)$ $\beta = 115.02(1)°$ 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_2O_3	[18.99]
MnO	1.34
Al_2O_3	6.26
La_2O_3	4.90
Ce_2O_3	11.66
Pr_2O_3	1.46
Nd_2O_3	4.82
TiO_2	1.84
SiO_2	28.09
H_2O	[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 Fe_2O_3 = 20.09; H_2O, FeO and Fe_2O_3 calculated; corresponding to $(Ca_{1.12}Ce_{0.43}La_{0.18}Nd_{0.17}Pr_{0.05})_{\Sigma=1.96}(Fe^{3+}_{1.44}Fe^{2+}_{0.75}Al_{0.59}Ti_{0.14}Mn_{0.12})_{\Sigma=3.04}[(Si_{2.84}Al_{0.16})_{\Sigma=3.00}O_{11}]O(OH)_{1.01}$.

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, kainosite-(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 Fe^{3+} 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), $CaCeFe^{3+}AlFe^{2+}(SiO_4)(Si_2O_7)O(OH)$, 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).