

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As acicular crystals to 0.2 mm.
Twinning: Observed.

Physical Properties: *Cleavage:* Imperfect on {010}. *Fracture:* Irregular. *Tenacity:* n.d.
Hardness = 5.5-6 VHN = 499 (50 g load). D(meas.) = n.d. D(calc.) = 2.91

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* n.d.
Optical Class: Biaxial (-). $\alpha = 1.610(2)$ $\beta = 1.6150(2)$ $\gamma = 1.619(2)$ $2V(\text{meas.}) = 80(8)^\circ$
 $2V(\text{calc.}) = 84^\circ$ *Orientation:* X = a, Y = b, Z = c. *Dispersion:* Weak, $r > v$.

Cell Data: *Space Group:* Pbnm. $a = 5.0620(1)$ $b = 11.3917(2)$ $c = 23.5180(3)$ Z = 4

X-ray Powder Pattern: Upper Chegem Caldera, Northern Caucasus, Kabardino-Balkaria, Russia.
2.531 (100), 1.905 (90), 2.718 (63), 3.013 (57), 2.991 (56), 3.636 (52), 2.832 (51)

Chemistry:	(1)	(2)
TiO ₂	0.17	0.06
SiO ₂	29.91	29.83
CaO	65.65	65.44
MgO	0.04	< 0.02
Cl	< 0.06	0.08
F	4.43	6.14
H ₂ O	0.90	0.08
<u>-O = F₂</u>	<u>1.88</u>	<u>2.60</u>
Total	99.22	99.60

(1) Upper Chegem Caldera, Northern Caucasus, Russia; average of 10 electron microprobe analyses supplemented by FTIR spectroscopy; corresponds to (Ca_{7.01}Mg_{0.01})_{Σ=7.02}(Si_{2.98}Ti⁴⁺_{0.01})_{Σ=2.99}O₁₂[F_{1.40}(OH)_{0.60}]_{Σ=2.00}. (2) Shadil-Khokh volcano, Southern Ossetia, Georgia; average of 12 electron microprobe analyses supplemented by FTIR spectroscopy; corresponding to Ca_{7.02}(Si_{2.98}Ti⁴⁺_{0.01})_{Σ=2.99}O₁₂[F_{1.94}Cl_{0.01}(OH)_{0.05}]_{Σ=2.00}.

Polymorphism & Series: Forms a series with chegemite.

Occurrence: Formed in the edgrewite-bearing zone of endoskarn (sanidinite facies) at the edge of an altered calciferous xenolith within ignimbrite.

Association: Larnite, edgrewite, wadalite, eltyubyuite, rondorfite, lakargiite, Th-kerimasite, bultfonteinite, killalaite, hillebrandite, afwillite, trabzonite, jennite (Upper Chegem Caldera); spurrite, larnite, gehlenite, merwinite, bredigite, rondorfite, srebrodolskite (Shadil-Khokh volcano).

Distribution: From the Upper Chegem Caldera, Northern Caucasus, Kabardino-Balkaria, Russian, and the Shadil-Khokh volcano, Southern Ossetia, Shida Kartli Region, Georgia.

Name: Indicates the fluorine-dominant analog of *chegemite*.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4163/1).

References: (1) Galuskina, I.O., B. Krüger, E.V. Galuskin, T. Armbruster, V.M. Gazeev, R. Włodyka, M. Dulski, and P. Dzierżanowski (2015) Fluorchegemite, Ca₇(SiO₄)₃F₂, a new mineral from the edgrewite-bearing endoskarn zone of an altered xenolith in ignimbrites from Upper Chegem caldera, Northern Caucasus, Kabardino-Balkaria, Russia: Occurrence, crystal structure, and new data on the mineral assemblages. *Can. Mineral.*, 53, 325-344. (2) (2016) *Amer. Mineral.*, 101, 1714 (abs. ref. 1).