

Crystal Data: Monoclinic. *Point Group:* 2/*m*. As subhedral crystals, rounded grains, and irregular plates. *Twining:* On {100}, simple; rarely, lamellar.

Physical Properties: *Cleavage:* Perfect on {201̄}; poor on {100} and {010}; very poor on {001}. Hardness = n.d. D(meas.) = 2.82–2.84 D(calc.) = 2.88

Optical Properties: Transparent to translucent. *Color:* White; colorless in thin section. *Luster:* Dull.

Optical Class: Biaxial (+). *Orientation:* Y = b; X ∧ c = 24°; Z ∧ a = 38°. *Dispersion:* r < v, perceptible. α = 1.605–1.617 β = 1.626–1.635 γ = 1.651–1.654 2V(meas.) = 85°–89°

Cell Data: *Space Group:* P2₁/a. a = 15.108(3) b = 10.241(1) c = 7.579(1)
β = 105.17(1)° Z = 4

X-ray Powder Pattern: Carlingford, Ireland.

3.01 (100), 3.10 (60), 1.896 (45), 2.982 (40), 2.803 (40), 2.100 (40), 3.19 (30)

Chemistry:

	(1)	(2)
SiO ₂	24.09	24.39
Al ₂ O ₃	0.61	0.23
Fe ₂ O ₃	0.12	0.08
MgO	0.43	0.21
CaO	57.75	57.01
H ₂ O	1.09	0.62
CO ₂	15.82	17.23
Total	99.91	99.77

(1) Crestmore, California, USA; corresponding to (Ca_{5.19}Al_{0.06}Mg_{0.05}Fe_{0.01}³⁺)_{Σ=5.31}Si_{2.02}O₇(C_{0.91}O₃)₂. (2) Carlingford, Ireland; corresponding to (Ca_{5.04}Mg_{0.03}Al_{0.02}Fe_{0.01}³⁺)_{Σ=5.10}Si_{2.01}O₇(C_{0.94}O₃)₂.

Occurrence: In the contact metamorphic zone between igneous rocks and limestones, formed at low pressure and high temperature.

Association: Merwinite, spurrite, gehlenite, vesuvianite, grossular, wollastonite, thaumasite, fluorite, calcite.

Distribution: At Crestmore, Riverside Co., California; on North Peak, Iron Mountains, Sierra Co., New Mexico; and near Helena, Lewis and Clark Co., Montana, USA. In Ireland, at Barnavave, near Carlingford, Co. Louth. From near Kilchoan, Ardnamurchan, Argyllshire, and Camas Mòr, Isle of Muck, also on the Isles of Skye and Rhum, Scotland. From the Güneyce-İkizdere area, Trabzon Province, Turkey. In Russia, from near Anakit Creek, at the mouth of the Lower Tunguska River, central Siberia, and several other less-well-defined localities. At Kushiro, Hiroshima Prefecture, and the Akagané mine, Iwate Prefecture, Japan. From Redcap Creek, Queensland, Australia.

Name: For Cecil Edgar Tilley (1894–1973), British petrologist, Cambridge University, Cambridge, England.

Type Material: Harvard University, Cambridge, Massachusetts, 97301; National Museum of Natural History, Washington, D.C., USA, 97246.

References: (1) Larson, E.S. and K.C. Dunham (1933) Tilleyite, a new mineral from the contact zone at Crestmore, California. *Amer. Mineral.*, 18, 469–473. (2) Deer, W.A., R.A. Howie, and J. Zussman (1986) *Rock-forming minerals*, (2nd edition), v. 1B, disilicates and ring silicates, 278–284. (3) Harker, I. (1959) The synthesis and stability of tilleyite, Ca₅Si₂O₇(CO₃)₂. *Amer. J. Sci.*, 257, 656–667. (4) Louissathan, S.J. and J.V. Smith (1970) Crystal structure of tilleyite: refinement and coordination. *Zeits. Krist.*, 132, 288–306.

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