

Cebollite

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Crystal Data: Orthorhombic (?). *Point Group:* n.d. As compact masses of minute radiating fibers.**Physical Properties:** Hardness = ~5 D(meas.) = 2.96 D(calc.) = n.d.**Optical Properties:** Semitransparent. *Color:* Colorless, white to greenish gray, reddish brown; colorless in thin section. *Luster:* Dull.*Optical Class:* Biaxial (+). *Dispersion:* $r > v$, weak. $\alpha = 1.592\text{--}1.595$ $\beta = 1.597\text{--}1.60$
 $\gamma = 1.628\text{--}1.630$ $2V(\text{meas.}) = \sim 58^\circ$ **Cell Data:** *Space Group:* n.d. $Z = \text{n.d.}$ **X-ray Powder Pattern:** Cebolla Creek, Colorado, USA. (ICDD 16-695).
2.73 (100), 2.88 (90), 2.59 (70), 1.62 (60), 3.01 (50), 2.90 (40), 2.45 (40)

| Chemistry: | (1) | (2) | (3) | | (1) | (2) | (3) |
|--------------------------------|-------|-------|-------|-------------------|--------------|-----------------|-----------------|
| SiO ₂ | 27.06 | 33.05 | 31.07 | CaO | 29.27 | 35.75 | 41.06 |
| Al ₂ O ₃ | 11.49 | 14.03 | 18.48 | Na ₂ O | 2.10 | 2.57 | 0.28 |
| Fe ₂ O ₃ | 2.81 | 3.43 | | K ₂ O | trace | | |
| FeO | 0.17 | 0.21 | 1.36 | H ₂ O | 5.13 | 6.27 | [7.75] |
| MgO | 3.84 | 4.69 | | insol. | 18.05 | | |
| | | | | Total | 99.92 | [100.00] | [100.00] |

(1) Cebolla Creek, Colorado, USA. (2) Do.; recalculated to 100%, computed free of insolubles, taken as diopside, garnet, vesuvianite, etc., corresponds to $(\text{Ca}_{3.79}\text{Mg}_{0.69}\text{Na}_{0.24}\text{Fe}_{0.02}^{2+})_{\Sigma=4.74}(\text{Al}_{1.64}\text{Fe}_{0.36}^{3+})_{\Sigma=2.00}\text{Si}_{3.26}\text{O}_{12.08}(\text{OH})_{4.12}$. (3) Tokatoka, New Zealand; by electron microprobe, H₂O by difference; corresponds to $(\text{Ca}_{4.77}\text{Fe}_{0.12}^{2+}\text{Na}_{0.06})_{\Sigma=4.95}\text{Al}_{2.36}\text{Si}_{3.37}\text{O}_{12.40}(\text{OH})_{5.60}$.

Occurrence: An alteration product of melilite in a carbonatite (Iron Hill, Colorado, USA); along a diabase-chalk contact (Scawt Hill, Ireland); in zeolitized plagioclase-rich gneiss, amphibolite, and basalt xenoliths (Letseng-La-Terai kimberlite, Lesotho); a late-stage primary igneous mineral (Kimberley, South Africa).**Association:** Melilite, natrolite, calcite, phlogopite, vesuvianite, garnet, diopside.**Distribution:** On Iron Hill and in Cebolla Creek, near Powderhorn, Gunnison Co., Colorado, USA. From Scawt Hill, near Larne, Co. Antrim, Ireland. In the Gardiner complex, beyond the head of Kangerdlugssuaq Fjord, Greenland. In the Letseng-La-Terai kimberlite, Lesotho. From the De Beers diamond mine, Kimberley, Cape Province, South Africa. In the Tokatoka district, about 150 km north of Auckland, New Zealand.**Name:** For Cebolla Creek, Colorado, in the drainage of which the mineral was first collected.**Type Material:** The Natural History Museum, London, England, 1923,1022; Harvard University, Cambridge, Massachusetts, 85726; National Museum of Natural History, Washington, D.C., USA, 87530, C3217, R6451.**References:** (1) Larsen, E.S. and W.T. Schaller (1914) Cebollite, a new mineral. Wash. Acad. Sci. IV, No. 16, 480–482. (2) Larsen, E.S. and E.A. Goranson (1932) The deuteric and later alterations of the uncomphagrite of Iron Hill, Colorado. Amer. Mineral., 17, 343–356. (3) Kruger, F.J. (1980) The occurrence of cebollite in kimberlite and included zeolitized crustal xenoliths. Mineral. Mag., 43, 583–586. (4) Baker, C.K. and P.M. Black (1980) Assimilation and metamorphism at a basalt-limestone contact, Tokatoka, New Zealand. Mineral. Mag., 43, 797–807.

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