

Monticellite

CaMgSiO₄

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As well-formed prismatic crystals, to 5 cm; massive, granular. *Twinning:* On {031}, producing six-pointed star-shaped forms.

Physical Properties: *Cleavage:* Poor on {010}. *Fracture:* Subconchoidal to uneven. *Tenacity:* Brittle. Hardness = 5–5.5 D(meas.) = 3.03–3.27 D(calc.) = 3.058

Optical Properties: Transparent to translucent. *Color:* Colorless, whitish, pale greenish gray, yellowish gray; colorless in thin section. *Streak:* White. *Luster:* Vitreous, slightly resinous when massive.

Optical Class: Biaxial (-). *Orientation:* $X = b; Y = c; Z = a$. *Dispersion:* $r > v$, distinct. $\alpha = 1.638\text{--}1.654$ $\beta = 1.646\text{--}1.664$ $\gamma = 1.650\text{--}1.674$ $2V(\text{meas.}) = 72^\circ\text{--}82^\circ$

Cell Data: *Space Group:* $Pbnm$. $a = 4.815$ $b = 11.08$ $c = 6.37$ $Z = 4$

X-ray Powder Pattern: San Bernardino Co., California, USA. 2.666 (100), 3.637 (40), 2.586 (40), 4.185 (35), 2.935 (35), 2.543 (30), 1.818 (30)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO ₂	37.46	37.13	38.40	MnO	0.52	0.45	
TiO ₂		< 0.05		ZnO		0.10	
Al ₂ O ₃		< 0.05		MgO	22.78	23.61	25.76
Fe ₂ O ₃		0.00		CaO	35.20	35.15	35.84
FeO	3.98	3.99		H ₂ O	0.15		
				Total	100.09	100.43	100.00

(1) Crestmore, California, USA. (2) Cascade Lake, New York, USA; by electron microprobe. (3) CaMgSiO₄.

Polymorphism & Series: Forms a series with kirschsteinite.

Occurrence: Formed during metamorphism of siliceous dolostones; in contact metamorphic deposits between limestones and olivine gabbros; in skarns at granite-dolomitic limestone contacts; rarely in kimberlites.

Association: Gehlenite, spinel, calcite, merwinite, åkermanite, vesuvianite, apatite, cuspidine.

Distribution: Some localities for crystals or studied material follow. From Monte Somma and Vesuvius, Campania, Italy. At Camas Mòr, Isle of Muck, Scotland. From Scawt Hill, near Larne, Co. Antrim, Ireland. In the USA, at Crestmore, Riverside Co., California; on Cascade Mountain, Essex Co., New York; at Magnet Cove, Hot Spring Co., Arkansas. In Canada, at Isle Cadieux and Oka, Quebec; on Somerset Island, Northwest Territories. From Congo (Zaire), at Mt. Shaheru, Kivu Province. On Dupezeh Mountain, near Hero Town, Qala-Diza region, Iraq. In Russia, in the Kovdor massif, Kola Peninsula, and numerous other localities.

Name: For the Italian mineralogist Teodoro Monticelli (1759–1845).

Type Material: University of Naples, Naples, Italy, 22111.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 449–450. (2) Deer, W.A., R.A. Howie, and J. Zussman (1982) Rock-forming minerals, (2nd edition), v. 1A, orthosilicates, 352–375. (3) Moehlman, R.S. and F.A. Gonyer (1934) Monticellite from Crestmore, California. Amer. Mineral., 19, 474–475. (4) Onken, H. (1965) Verfeinerung der Kristallstruktur von Monticellit. Tschermaks Mineral. Petrog. Mitt., 10, 34–44 (in German). (5) Valley, J.W. and E.J. Essene (1980) Åkermanite in the Cascade Slide xenolith and its significance for regional metamorphism in the Adirondacks. Contr. Mineral. Petrol., 74, 143–152.

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