

Crystal Data: Hexagonal. *Point Group:* 3. As tabular and prismatic crystals, showing {0001}, {10 $\bar{1}$ 1}, {20 $\bar{2}$ 5}, {02 $\bar{2}$ 1}, to 2.5 cm; more commonly subhedral to anhedral, and as irregular to rounded grains.

Physical Properties: *Cleavage:* {10 $\bar{1}$ 1}. *Fracture:* Conchoidal to subconchoidal. Hardness = 5–6 D(meas.) = 3.79–4.2 D(calc.) = 3.895

Optical Properties: Opaque to translucent. *Color:* Black, less commonly ruby-red; in transmitted light, brownish to purplish red; gray in reflected light, with red internal reflections. *Streak:* Purplish brown. *Luster:* Submetallic.

Optical Class: Uniaxial (-). *Pleochroism:* Moderate to weak; *O* = pinkish red; *E* = brownish to purplish red. *Absorption:* Weak; *E* > *O*. $\omega = 2.31\text{--}2.35$ $\epsilon = 1.95\text{--}1.98$ *Anisotropism:* Strong. *R*₁–*R*₂: (400) 17.7–13.9, (420) 17.2–13.5, (440) 16.8–13.1, (460) 16.4–12.8, (480) 16.1–12.4, (500) 15.8–12.2, (520) 15.5–12.0, (540) 15.4–11.8, (560) 15.3–11.8, (580) 15.2–11.8, (600) 15.2–11.7, (620) 15.2–11.8, (640) 15.3–11.8, (660) 15.3–11.8, (680) 15.4–11.8, (700) 15.4–11.8

Cell Data: *Space Group:* R3(synthetic). *a* = 5.05478(26) *c* = 13.8992(7) *Z* = 6

X-ray Powder Pattern: Synthetic.

2.722 (100), 2.218 (70), 2.527 (55), 1.708 (55), 3.703 (45), 1.852 (40), 1.4592 (40)

Chemistry:	(1)	(2)	(3)	(1)	(2)	(3)
SiO ₂		0.4		FeO	3.81	18.9
TiO ₂	67.74	58.5	66.46	MnO		1.52
Fe ₂ O ₃		2.0		MgO	28.73	18.3
Cr ₂ O ₃		0.04		CaO		0.01
				Total	100.28	99.7
						100.00

(1) Sri Lanka. (2) Bergell zone, Switzerland/Italy; by electron microprobe; Fe²⁺:Fe³⁺ calculated from stoichiometry; corresponding to Mg_{0.60}Fe_{0.35}²⁺Mn_{0.03}Fe_{0.03}³⁺Ti_{0.98}Si_{0.01}O₃. (3) MgTiO₃.

Polymorphism & Series: Forms a series with ilmenite.

Mineral Group: Ilmenite group.

Occurrence: Forms during contact metamorphism of impure magnesian limestones. Also in carbonatites, kimberlites, serpentinized ultramafic rocks, and in gem-bearing placer deposits.

Association: Rutile, spinel, clinohumite, perovskite, diopside, serpentine, forsterite, brucite, hydroxalcite, chlorite, calcite.

Distribution: From the Rakwana and Balangoda districts, Sri Lanka. At Baltistan, Kashmir, Pakistan. In the USA, from the Crestmore quarry, Riverside Co. and in the Santa Lucia Mountains, Monterey Co., California; large crystals in Skeleton Canyon, Cochise Co., Arizona. At the Maxwell quarry, near Wakefield, Quebec, Canada. From the Fiskensæset complex, western Greenland. In the Bergell contact aureole, Central Alps, Switzerland/Italy. From the Naataniemi serpentinite massif, Kuhmo greenstone belt, Finland. In Russia, on Mount Jemorakly-Tube, North Caucasus Mountains; in the Camel Mountains, Southern Ural Mountains; in the Tazheran alkalic massif, west of Lake Baikal, Siberia. At Kimberley, Cape Province, South Africa. From north of the Mahogany mine, Hartley district, Zimbabwe. Several other localities are known.

Name: In honor of Sir Archibald Geikie (1835–1924), Scottish geologist and Director-General of the Geological Survey of Great Britain.

Type Material: The Natural History Museum, London, England, 69078–69079.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 534–541. (2) Gieré, R. (1987) Titanian clinohumite and geikielite in marbles from the Bergell contact aureole. *Contr. Mineral. Petrol.*, 96, 496–502. (3) Wechsler, B.A. and R.B. Von Dreele (1989) Structure refinements of Mg₂TiO₄, MgTiO₃ and MgTi₂O₅ by time-of-flight neutron powder diffraction. *Acta Cryst.*, 45, 542–549. (4) (1955) NBS Circ. 539, 5, 43.

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