

Musgravite



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Crystal Data: Hexagonal. *Point Group:* $\bar{3} 2/m, 3m$, or 32 . Crystals platy on {0001}, to 0.5 mm; massive.

Physical Properties: *Cleavage:* Perfect, {0001}, or a parting; another, {10 $\bar{1}$ 1}, less perfect. Hardness = [8–8.5] (by analogy to taaffeite). $D(\text{meas.}) = 3.68(2)$ $D(\text{calc.}) = 3.69$

Optical Properties: Semitransparent. *Color:* Pale olive-green; in thin section, nearly colorless.

Optical Class: Uniaxial (-). $\omega = 1.739(2)$ $\epsilon = 1.735(2)$

Cell Data: *Space Group:* $R\bar{3}m, R3m$, or $R32$. $a = 5.682(1)$ $c = 41.13(1)$ $Z = 6$

X-ray Powder Pattern: Musgrave Ranges, Australia.

2.408 (100), 1.4189 (80), 2.052 (70), 2.658 (55), 4.57 (40), 1.4868 (40), 2.271 (35b)

Chemistry:	(1)	(2)	(1)	(2)
SiO ₂	0.30		ZnO	5.18
TiO ₂	0.02		BeO	5.50 [5.50]
Al ₂ O ₃	71.44	68.45	MgO	15.76 10.64
Fe ₂ O ₃	0.40		CaO	0.00 0.09
Cr ₂ O ₃		0.01	K ₂ O	0.04
FeO	6.78	9.69	P ₂ O ₅	0.02
MnO	0.02	0.01	<hr/>	
			Total	100.24 [99.61]

(1) Musgrave Ranges, Australia; Be by colorimetric methods, corresponds to $(\text{Mg}_{1.66}\text{Fe}_{0.40}^{2+})_{\Sigma=2.06}(\text{Al}_{5.95}\text{Si}_{0.02}\text{Fe}_{0.02}^{3+})_{\Sigma=5.99}\text{Be}_{0.93}\text{O}_{12}$. (2) Enderby Land, Antarctica; by electron microprobe; Be assumed from (1), total Fe as FeO, original total given as 99.62%; corresponds to $(\text{Mg}_{1.17}\text{Fe}_{0.60}\text{Zn}_{0.28})_{\Sigma=2.05}\text{Al}_{5.97}\text{Be}_{0.98}\text{O}_{12}$.

Polymorphism & Series: 9R, 18R polytypoids.

Occurrence: In a nodule, perhaps formerly a corundum crystal, in high-grade metapyroxenite, associated with metaperidotites and granulites (Musgrave Ranges, Australia); in pegmatite cutting granulite (Enderby Land, Antarctica).

Association: Spinel, sapphirine, phlogopite (Musgrave Ranges, Australia); quartz, sillimanite, garnet, biotite, surinamite, sapphirine (Enderby Land, Antarctica).

Distribution: From 16 km north-northeast of Ernabella Mission, Musgrave Ranges, South Australia. Along Casey Bay, Enderby Land, Antarctica. Found at Dove Bugt, northeast Greenland.

Name: For the Musgrave Ranges, South Australia, from where it was first recognized.

Type Material: Western Australian Museum, Perth, M.70.1991; University of Queensland, Brisbane, Australia, V014820; National Museum of Natural History, Washington, D.C., USA, 147436.

; musgravite = magnesiotaaffeite-6N'3S; [full list given under högböhmite];