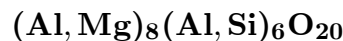


Sapphirine



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Crystal Data: Monoclinic or triclinic. *Point Group:* $2/m$ or $\bar{1}$. Crystals indistinct, tabular on {010}, to 3 cm. Commonly as disseminated grains or aggregates. *Twinning:* Repeated on {010}; uncommon.

Physical Properties: *Cleavage:* Fair on {010}, poor on {001}, {100}.
Fracture: Subconchoidal. Hardness = 7.5 D(meas.) = 3.40–3.58 D(calc.) = 3.486

Optical Properties: Transparent to translucent. *Color:* Light to dark blue or green, white, gray, pale red, yellow; in thin section, colorless to blue or pink. *Luster:* Vitreous.
Optical Class: Biaxial (+) or (–). *Pleochroism:* X = colorless, pale reddish, yellowish green, pale yellow; Y = sky-blue, lavender-blue, bluish green; Z = blue, sapphire-blue, dark blue. *Orientation:* Y = b; Z $\wedge$ c = 6°–9°. *Dispersion:* $r < v$, moderate to very strong. $\alpha = 1.701\text{--}1.726$
 $\beta = 1.703\text{--}1.728$ $\gamma = 1.705\text{--}1.734$ 2V(meas.) = 47°–114°

Cell Data: *Space Group:* $P2_1/a$ (2M) $a = 11.266(12)$ $b = 14.401(7)$ $c = 9.929(10)$
 $\beta = 125.46(5)^\circ$ Z = 4, or *Space Group:* $P\bar{1}$ (1A) $a = 9.97(1)$ $b = 10.34(1)$ $c = 8.62(1)$
 $\alpha = 107.4(1)^\circ$ $\beta = 95.2(1)^\circ$ $\gamma = 123.8(1)^\circ$ Z = 4

X-ray Powder Pattern: Fiskensæset, Greenland; closely resembles surinamite.
2.447 (100), 2.015 (90), 2.990 (65), 1.4353 (65), 1.4192 (65), 2.023 (60), 2.844 (50)

Chemistry:

	(1)
SiO ₂	12.83
Al ₂ O ₃	65.29
Fe ₂ O ₃	0.93
FeO	0.65
MgO	19.78
LOI	0.31
Total	99.79

(1) Fiskensæset, Greenland; corresponds to $(\text{Al}_{4.43}\text{Mg}_{3.42}\text{Fe}_{0.08}^{3+}\text{Fe}_{0.06}^{2+})_{\Sigma=7.99}(\text{Al}_{4.51}\text{Si}_{1.49})_{\Sigma=6.00}\text{O}_{20}$.

Polymorphism & Series: 1A, 2A, 2M, 3A, 4M, 5A polytypes.

Occurrence: In high-temperature metamorphic rocks or xenoliths with abundant aluminum and magnesium and low silicon. May occur as a primary magmatic mineral in subsilicic rocks.

Association: Sillimanite, kyanite, cordierite, kornørupine, corundum, surinamite, phlogopite, chrysoberyl, pyroxenes, spinel, garnet, calcite, quartz.

Distribution: Only a few localities are given, which have provided especially large or fine crystals, or rich material. Around Fiskensæset, Greenland. In the USA, in the Cortland complex, Westchester Co., New York. In Canada, at Wilson Lake, Labrador, Newfoundland. At Sakana, Vorokafotra, Bekily, Anjamiary, and Betroka, Madagascar. Large crystals from Blinkwater, near Messina, Transvaal, South Africa. In Tanzania, at Mautia Hill. From Waldheim, Saxony, Germany. At Naxos, Greece. From Finero, Val Viggezo, Piedmont, Italy. In the Harts Range, Northern Territory, Australia. From the Napier complex, Casey Bay, Enderby Land, Antarctica.

Name: For its typical sapphire-blue color.

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