

Tuperssuatsiaite

Na(Fe³⁺, Mn²⁺)₃Si₈O₂₀(OH)₂·4H₂O

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Crystal Data: Monoclinic. *Point Group:* 2/m or *m*. As needles and blades elongated || [001], to 2 cm; typically in radiating aggregates of fine fibers. *Twinning:* With {100} as both twin and composition plane, common.

Physical Properties: *Cleavage:* Good on {100}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.28

Optical Properties: Transparent. *Color:* Dark to light red-brown; in transmitted light, colorless to light yellowish brown. *Luster:* Vitreous to nearly metallic, dull in aggregate. *Optical Class:* Biaxial (+). *Pleochroism:* Slight; X = colorless; Y = colorless to light reddish brown; Z = pale yellowish brown to dark reddish brown. *Orientation:* Y = *b*; Z ∧ *c* = 5°–7°. α = 1.54 β = 1.56 γ = 1.58–1.60 2V(meas.) = n.d. 2V(calc.) = 104°

Cell Data: *Space Group:* C2/c or Cc. *a* = 13.92–13.99 *b* = 17.70–17.73 *c* = 5.30–5.31 β = 104.54°–104.78° Z = [2]

X-ray Powder Pattern: Tuperssuatsiait Bay, Greenland. 10.82 (10), 2.638 (4), 3.395 (3), 2.544 (3), 2.510 (3), 2.235 (3), 4.140 (2)

Chemistry:	(1)	(2)	(1)	(2)
SiO ₂	56.33	55.66	CaO	0.11
TiO ₂		0.18	Na ₂ O	3.24
Al ₂ O ₃	0.47	0.15	K ₂ O	0.78
Fe ₂ O ₃	20.63	26.26	F	0.09
MnO	5.31	0.66	Cl	0.13
ZnO	0.81	0.11	H ₂ O	[11.39]
MgO	1.04	0.18	–O = (F ₂ , Cl ₂)	[9.77]
				[0.07]
			Total	[100.00]
				[100.00]

(1) Tuperssuatsiait Bay, Greenland; by electron microprobe, average of seven analyses; original analysis given as elements, here recalculated to oxides, H₂O by difference; corresponds to (Na_{0.88}K_{0.14})_{Σ=1.02}(Fe_{2.18}³⁺Mn_{0.63}²⁺Mg_{0.22}Zn_{0.08})_{Σ=3.11}(Si_{7.92}Al_{0.08})_{Σ=8.00}O₂₀(OH)_{1.38}·4.39H₂O. (2) Windhoek, Namibia; by electron microprobe, average of 10 analyses, original analysis given as elements, here converted to oxides, H₂O by difference; corresponds to (Na_{1.85}K_{0.01})_{Σ=1.86}(Fe_{2.83}³⁺Mn_{0.08}²⁺Mg_{0.04}Ca_{0.02}Zn_{0.02})_{Σ=2.99}(Si_{7.96}Al_{0.03}Ti_{0.02})_{Σ=8.01}O₂₀[(OH)_{2.47}F_{0.04}Cl_{0.03}]_{Σ=2.54}·3.90H₂O.

Occurrence: A late-stage, low-temperature, hydrothermal mineral in veins cutting nepheline syenite and in sodalite-nepheline syenite pegmatite (Tuperssuatsiait Bay, Greenland); in miarolitic cavities in phonolite (Windhoek, Namibia).

Association: Natrolite, albite, orthoclase, aegirine, sodalite, steenstrupine (Tuperssuatsiait Bay, Greenland); microcline, aegirine, natrolite, eudialyte, bastnäsité, makatite, villiaumite, titanite, apophyllite, analcime, aragonite (Windhoek, Namibia).

Distribution: In the Ilímaussaq intrusion, at Tuperssuatsiait Bay, Kangerdluarssuk Fjord, and the north shore of Tunugdliarfik Fjord, southern Greenland. From the Aris quarry, about 25 km south of Windhoek, Namibia. In Canada, from near Saint-Amable, Quebec.

Name: For Tuperssuatsiait Bay, Greenland.

Type Material: University of Copenhagen, Copenhagen, Denmark; National Museum of Natural History, Washington, D.C., USA, 162402.

References: (1) Karup-Møller, S. and O.V. Petersen (1984) Tuperssuatsiaite, a new mineral species from the Ilímaussaq intrusion in South Greenland. *Neues Jahrb. Mineral., Monatsh.*, 501–512. (2) (1985) *Amer. Mineral.*, 70, 1332 (abs. ref. 1). (3) von Knorring, O., O.V. Petersen, S. Karup-Møller, E.S. Leonardsen, and E. Condliffe (1992) Tuperssuatsiaite, from Aris phonolite, Windhoek, Namibia. *Neues Jahrb. Mineral., Monatsh.*, 145–152.

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