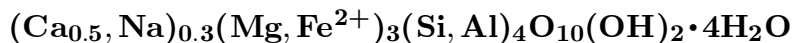


Saponite



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Crystal Data: Monoclinic. *Point Group:* n.d. Crystals minute, pseudo-hexagonal, tabular || {001}; bladed, fibrous, flaky, or subparallel aggregates; nodular, fine-grained, massive.

Physical Properties: *Cleavage:* {001}, perfect. *Tenacity:* Plastic when hydrated, brittle when dry. Hardness = < 1–2 D(meas.) = 2.24–2.30 D(calc.) = n.d. Positive identification of minerals in the smectite group may need data from DTA curves, dehydration curves, and X-ray powder patterns before and after treatment by heating and with organic liquids.

Optical Properties: Translucent. *Color:* White, yellow, gray, blue, green, reddish, brown. *Luster:* Greasy.

Optical Class: Biaxial (-). *Pleochroism:* X = colorless, light yellow to green-brown; Y = Z = colorless, greenish brown to dark brown. *Orientation:* X ⊥ {001}; Z || elongation.

Absorption: Y ≈ Z > X. α = 1.48–1.54 β = 1.50–1.58 γ = 1.50–1.58 2V(meas.) = 0°–40°

Cell Data: *Space Group:* n.d. a = 5.3 b = 9.14 c = 16.9 β = ~97° Z = n.d.

X-ray Powder Pattern: Synthetic Na_{0.33}Mg_{3.00}(Si_{0.67}Al_{3.67})_{Σ=4.00}O₁₀(OH)₂, glycolated; very close to stevensite.

17.0 (100), 3.37 (80), 1.535 (70), 8.5 (50), 4.58 (50), 5.69 (40), 2.58 (40)

Chemistry:	(1)	(2)	(1)	(2)	
SiO ₂	40.46	51.26	MgO	20.71	23.54
TiO ₂		0.09	CaO	1.94	1.25
Al ₂ O ₃	10.15	4.42	Na ₂ O	0.25	1.14
Fe ₂ O ₃	3.56	1.14	K ₂ O	0.32	0.18
FeO	4.89		H ₂ O ⁺	4.24	6.58
MnO	0.24	0.03	H ₂ O ⁻	13.33	10.08
NiO		0.04	P ₂ O ₅	0.14	
			Total	100.23	99.75

(1) Āslav, Czech Republic; corresponds to (Ca_{0.16}Mg_{0.05}Na_{0.04}K_{0.03})_{Σ=0.28}(Mg_{2.37}Fe_{0.32}Fe_{0.21}Al_{0.10})_{Σ=3.00}(Si_{3.16}Al_{0.84})_{Σ=4.00}O₁₀(OH)₂•0.98H₂O. (2) Ballarat, California, USA; by XRF, Na by AA, H₂O by TGA; corresponds to (Ca_{0.19}Na_{0.16}K_{0.02})_{Σ=0.37}(Mg_{2.61}Al_{0.15}Fe_{0.06})_{Σ=2.82}(Si_{3.77}Al_{0.23})_{Σ=4.00}O₁₀(OH)₂•nH₂O.

Mineral Group: Smectite group.

Occurrence: Hydrothermally deposited in mineralized veins and in vesicles in basalt. Formed in fissures cutting calc-silicates, iron-rich skarns, amphibolites, and serpentinites.

Association: Celadonite, chlorite, copper, epidote, orthoclase, dolomite, calcite, quartz.

Distribution: Many localities; a few for well-studied material follow. At The Lizard, Cornwall, England. From Allt Ribhein, Fiskavaig Bay, Isle of Skye, Scotland. At Svärdsjö, Kopparberg, Sweden. From Āslav, Czech Republic. In Poland, at Frankenstein, Silesia. At Krugersdorp, Transvaal, South Africa. In the USA, in the Kearsarge and Ahmeek mines, Keweenaw Peninsula, Houghton Co., Michigan; between Pigeon Point and Fond du Lac, north shore of Lake Superior, Cook Co., Minnesota; from near Milford, Beaver Co., Utah; at Ballarat, Inyo Co., California; in the Toughnut mine, Tombstone, Cochise Co., Arizona. From Thunder Bay, Ontario, Canada.

Name: From the Latin for *soap*, which it resembles.

Type Material: Mining Academy, Freiberg, Germany, 44591.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 682–683.

(2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 3, sheet silicates, 226–245. (3) Ames, L.L. and L.B. Sands (1958) Factors affecting maximum hydrothermal stability in montmorillonites. Amer. Mineral., 43, 641–648. (4) Post, J.L. (1984) Saponite from Ballarat, California. Clays and Clay Minerals, 32, 147–153.

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