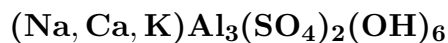


# Minamiite



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**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3} 2/m$ . Flat hexagonal plates, to 0.2 mm.

**Physical Properties:** Hardness = [3.5–4] (by analogy to the alunite group).  
D(meas.) = n.d. D(calc.) = 2.81

**Optical Properties:** Semitransparent. *Color:* White.  
*Optical Class:* Uniaxial.  $\omega$  = n.d.  $\epsilon$  = n.d.

**Cell Data:** *Space Group:*  $R\bar{3}m$ .  $a = 6.981(2)$   $c = 33.490(14)$   $Z = 6$

**X-ray Powder Pattern:** Okumanza, Japan.  
2.964 (100), 4.906 (80), 2.792 (80), 2.225 (65), 5.591 (60), 1.8968 (45), 1.8607 (40)

**Chemistry:**

	(1)
SO <sub>3</sub>	38.09
Al <sub>2</sub> O <sub>3</sub>	37.74
CaO	1.94
Na <sub>2</sub> O	3.37
K <sub>2</sub> O	2.17
H <sub>2</sub> O <sup>+</sup>	12.22
rem.	4.28
Total	99.81

(1) Okumanza, Japan; remnant, all considered due to impurities, consists of P<sub>2</sub>O<sub>5</sub> 0.18%, V<sub>2</sub>O<sub>3</sub> 0.02%, SiO<sub>2</sub> 3.58%, Fe<sub>2</sub>O<sub>3</sub> 0.03%, TiO<sub>2</sub> 0.45%, H<sub>2</sub>O<sup>-</sup> 0.02%; corresponds then to (Na<sub>0.46</sub>Ca<sub>0.29</sub>K<sub>0.19</sub>)<sub>Σ=0.94</sub>Al<sub>3.11</sub>(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>5.70</sub>.

**Mineral Group:** Alunite group.

**Occurrence:** In a hydrothermally altered labradorite andesite (Okumanza, Japan); deposited from fumarolic gasses (Mt. Rainier, Washington, USA); in volcanic-hosted argillic alteration (Barton Peninsula, Antarctica).

**Association:** Alunite, natroalunite, huangite, quartz (Okumanza, Japan); natroalunite, woodhouseite (Mt. Rainier, Washington, USA); pyrophyllite, pyrite, sulfur, zunyite, rutile, chalcedonic silica (Barton Peninsula, Antarctica).

**Distribution:** From Okumanza, near the Kusatsu-Shirane volcano, Gumma Prefecture, Japan. On Mt. Rainier, Pierce Co., Washington, USA. In the Quechisla district, Bolivia. From the El Indio mine, El Indio-Tambo district, east of La Serena, Coquimbo, Chile. In the Fancel-Lařuřna caldera, Gurghui Mountains, Romania. On Barton Peninsula, King George Island, Antarctica.

**Name:** In honor of Dr. A.E. Minami (1899–1977), who studied the hot springs around the Kusatsu-Shirane volcano, Japan.

**Type Material:** National Science Museum, Tokyo, Japan.

**References:** (1) Otsuka, J., J.-I. Hirabayashi, K. Okada, and R. Kobayashi (1982) Crystal structure of minamiite, a new mineral of the alunite group. *Amer. Mineral.*, 67, 114–119. (2) Otsuka, J., N. Otsuka, J.-I. Hirabayashi, K. Okada, and H. Soga (1987) Synthesis of minamiite, Ca<sub>0.5</sub>Al<sub>3</sub>(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>. *Neues Jahrb. Mineral., Monatsh.*, 49–63. (3) Li, G., D.R. Peacor, E.J. Essene, D.R. Brosnahan, and R.E. Beane (1992) Walthierite, Ba<sub>0.5</sub>□<sub>0.5</sub>Al<sub>3</sub>(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>, and huangite, Ca<sub>0.5</sub>□<sub>0.5</sub>Al<sub>3</sub>(SO<sub>4</sub>)<sub>2</sub>(OH)<sub>6</sub>, two new minerals of the alunite group from the Coquimbo region, Chile. *Amer. Mineral.*, 77, 1275–1284 [IMA definition of minamiite].

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