

**Crystal Data:** Tetragonal. *Point Group:*  $4/m\ 2/m\ 2/m$ . Crystals, to 10 cm, dipyrmidal {111}, with {001} and {114}; commonly granular, massive. *Twinning:* On {011}.

**Physical Properties:** *Cleavage:* {001}, perfect; {011}, distinct. Hardness = 3.5–4  
D(meas.) = 2.994–3.005 D(calc.) = 2.998

**Optical Properties:** Transparent to translucent. *Color:* Nearly colorless to snow-white; colorless in transmitted light. *Luster:* Vitreous, pearly on the basal cleavage.  
*Optical Class:* Uniaxial (–).  $\omega = 1.3486$   $\epsilon = 1.3424$

**Cell Data:** *Space Group:*  $P4/mnc$ .  $a = 7.00$ – $7.01$   $c = 10.39$ – $10.41$   $Z = 2$

**X-ray Powder Pattern:** Synthetic; composite pattern. (ICDD 2-749).  
2.91 (100), 5.18 (80), 2.32 (70), 1.99 (70), 1.79 (70), 1.75 (70), 1.55 (70)

Chemistry:	(1)	(2)	(3)
Na	24.97	24.79	24.89
Al	17.66	17.54	17.53
F	57.30	57.81	57.58
H <sub>2</sub> O <sup>–</sup>		0.23	
Total	99.93	100.37	100.00

(1) Miass, Russia. (2) Ivigtut, Greenland. (3) Na<sub>5</sub>Al<sub>3</sub>F<sub>14</sub>.

**Occurrence:** In some granite pegmatites.

**Association:** Topaz, phenakite, fluorite, cryolithionite, thomsenolite (Miass, Russia); cryolite, elpasolite, pachnolite, thomsenolite, ralstonite (Amelia, Virginia, USA).

**Distribution:** At Miass, Ilmen Mountains, Southern Ural Mountains, Russia. From the Ivigtut cryolite deposit, southwestern Greenland. In the USA, in the Morefield pegmatite mine, Amelia, Amelia Co., Virginia.

**Name:** From the Greek for *snow* and *stone*, as compared to *cryolite*, *ice-stone*.

**Type Material:** Vernadsky State Geological Museum, Moscow, Russia, 18270, 18271.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 123–124. (2) Jacobini, C., A. Leble, and J.J. Rosseau (1981) Détermination précise de la structure de la chiolite Na<sub>5</sub>Al<sub>3</sub>F<sub>14</sub> et étude par R.P.E. de Na<sub>5</sub>Al<sub>3</sub>F<sub>14</sub>:Cr<sup>3+</sup>. J. Solid State Chem., 36, 297–304 (in French with English abs.). (3) Dirken, P.J., J.B.H. Jansen, and R.D. Schuiling (1992) Influence of octahedral polymerization on <sup>23</sup>Na and <sup>27</sup>Al MAS NMR in alkali fluoroaluminates. Amer. Mineral., 77, 718–724.