

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Equant crystals display {001}, {31 $\bar{1}$ }, {11 $\bar{1}$ } and {110} to 1 mm. *Twining:* Common by 180° rotation around [102].

**Physical Properties:** *Cleavage:* None. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = 2-2.5 D(meas.) = 3.10(1) D(calc.) = 3.05

**Optical Properties:** Transparent to translucent. *Color:* Orange. *Streak:* Pale orange. *Luster:* Vitreous to resinous. *Optical Class:* Biaxial (-).  $\alpha = 1.760(5)$   $\beta = 1.795(5)$   $\gamma = 1.800(5)$   $2V(\text{meas.}) = 43(2)^\circ$   $2V(\text{calc.}) = 40.7^\circ$  *Dispersion:* Strong,  $r < v$ . *Pleochroism:* Pronounced; Z = pale orange, Y = medium orange, X = colorless. *Absorption:*  $X < Z \ll Y$ . *Orientation:*  $X \approx c$ ,  $Y \approx a^*$ ,  $Z \approx b$ .

**Cell Data:** *Space Group:* C2/m.  $a = 15.3444(3)$   $b = 9.4158(2)$   $c = 11.2858(4)$   $\beta = 118.632(1)^\circ$  Z = 2

**X-ray Powder Pattern:** AS Granit larvikite quarry, Tvedalen, Larvik, Vestfold, Norway. 2.9260 (100), 9.8977 (82), 7.1026 (63), 7.7104 (42), 7.4689 (39), 3.3007 (38), 3.4102 (30)

Chemistry:	(1)	(2)
Nb <sub>2</sub> O <sub>5</sub>	56.8	59.80
SiO <sub>2</sub>	0.11	
MnO	21.5	21.28
FeO	0.6	
CaO	0.21	
Na <sub>2</sub> O	0.07	
H <sub>2</sub> O	[18.87]	18.92
Total	98.16	100.00

(1) AS Granit larvikite quarry, Tvedalen, Larvik, Vestfold, Norway; average of 4 electron microprobe analyses supplemented by TGA, H<sub>2</sub>O from stoichiometry; corresponding to (Mn<sub>3.92</sub>Ca<sub>0.05</sub>Na<sub>0.03</sub>) $\Sigma=4.01$ (Nb<sub>5.71</sub>Mn<sub>0.13</sub>Fe<sub>0.12</sub>Si<sub>0.03</sub>) $\Sigma=5.99$ O<sub>18.57</sub>·14H<sub>2</sub>O. (2) Mn<sub>4</sub>Nb<sub>6</sub>O<sub>19</sub>·14H<sub>2</sub>O.

**Occurrence:** Formed at the hydrothermal stage on fracture surfaces and in tiny vugs in the center of a miaskitic pegmatite dike within the larvikites of a plutonic complex.

**Association:** Analcime, fluorapophyllite-(K), arsenopyrite, behoite, bertrandite, calcite, chiavennite, chlorite, epididymite, Mn<sup>2+</sup>-rich fayalite, fluorite, galena, gonnardite, hambergite, luinaite-(OH), molybdenite, natrolite, neotocite.

**Distribution:** From the AS Granit larvikite (quarry level 4), Tvedalen, Larvik, Vestfold, Norway.

**Name:** Honors Peter Andresen (b. 1971), the mineral collector who first found the mineral.

**Type Material:** Natural History Museum, University of Oslo, Norway (43490) and the Natural History Museum of Los Angeles County, Los Angeles, California, USA (64008).

**References:** (1) Friis, H., A.O. Larsen, A.R. Kampf, R.J. Evans, R.S. Selbekk, A.A. Sánchez, and J. Kihle (2014) Peterandresenite, Mn<sub>4</sub>Nb<sub>6</sub>O<sub>19</sub>·14H<sub>2</sub>O, a new mineral containing the Lindqvist ion from a syenite pegmatite of the Larvik Plutonic Complex, southern Norway. *Eur. J. Mineral.*, 26(4), 567-576. (2) (2016) *Amer. Mineral.*, 101, 1494-1495 (abs. ref. 1).