

**Åskagenite-(Nd)****Mn<sup>2+</sup>NdAl<sub>2</sub>Fe<sup>3+</sup>(Si<sub>2</sub>O<sub>7</sub>)(SiO<sub>4</sub>)O<sub>2</sub>**

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Crystals prismatic, sometimes flattened with rectangular cross-sections, to 4 cm.

**Physical Properties:** *Cleavage:* None. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 6 D(meas.) = 3.737(5) (for metamict material) D(calc.) = 4.375 (sample heated at 600°C) Slightly radioactive.

**Optical Properties:** Translucent. *Color:* Black, brown in thin fragments. *Streak:* Brown. *Luster:* Resinous. *Optical Class:* Isotropic. *n* = 1.712(2)

**Cell Data:** *Space Group:* P2<sub>1</sub>/m. *a* = 8.78(1) *b* = 5.710(6) *c* = 10.02(1) *β* = 114.6(2)° *Z* = 2

**X-ray Powder Pattern:** Near Åskagen quarry, Sweden. (amorphous until heated to 600°C) 2.897 (100), 2.850 (73), 2.687 (73), 1.630 (59), 3.22 (50), 2.121 (48), 3.50 (46)

Chemistry:	(1)		(1)
CaO	0.27	ThO <sub>2</sub>	0.72
Y <sub>2</sub> O <sub>3</sub>	2.27	MnO	7.98
La <sub>2</sub> O <sub>3</sub>	0.44	FeO	[7.75]
Ce <sub>2</sub> O <sub>3</sub>	7.99	Fe <sub>2</sub> O <sub>3</sub>	[9.16]
Pr <sub>2</sub> O <sub>3</sub>	1.76	Al <sub>2</sub> O <sub>3</sub>	15.85
Nd <sub>2</sub> O <sub>3</sub>	11.21	SiO <sub>2</sub>	29.51
Sm <sub>2</sub> O <sub>3</sub>	3.01	<u>H<sub>2</sub>O</u>	<u>0.55</u>
Yb <sub>2</sub> O <sub>3</sub>	0.21	Total	98.75

(1) Near Åskagen quarry, Värmland, Sweden; average of 4 electron microprobe analyses, H<sub>2</sub>O by the Alimarin method, Fe<sup>+3</sup>/Fe<sup>+2</sup> calculated from Mössbauer spectrum, Mn<sup>+2</sup> confirmed by XANES spectroscopy; corresponding to (Mn<sup>2+</sup><sub>0.69</sub>Fe<sup>2+</sup><sub>0.26</sub>Ca<sub>0.03</sub>)<sub>Σ=0.98</sub>(Nd<sub>0.41</sub>Ce<sub>0.30</sub>Y<sub>0.12</sub>Sm<sub>0.10</sub>Pr<sub>0.07</sub>La<sub>0.02</sub>Th<sub>0.02</sub>Yb<sub>0.01</sub>)<sub>Σ=1.05</sub>(Al<sub>1.90</sub>Fe<sup>3+</sup><sub>0.70</sub>Fe<sup>2+</sup><sub>0.40</sub>)<sub>Σ=3.00</sub>Si<sub>2.99</sub>O<sub>12.63</sub>(OH)<sub>0.37</sub>.

**Mineral Group:** Epidote group.

**Occurrence:** In a granite pegmatite.

**Association:** Potassic feldspar, quartz, bastnäsite, thorite, Nd-dominant analogue of allanite-(Ce), brookite, gadolinite-(Y), allophane.

**Distribution:** Near Åskagen quarry, mining village Torskebäcken, about 12 km east of Filipstad, Värmland, Sweden.

**Name:** For the quarry that produced the first specimen and indicating the predominance of Nd over other REE in the A2 structural site.

**Type Material:** Technische Universität, Bergakademie, Freiberg, Germany (82194 and 82218).

**References:** (1) Chukanov, N.V., J. Göttlicher, S. Möckel, Z. Sofer, K.V. Van, and D.I. Belakovskiy (2010) Åskagenite-(Nd), Mn<sup>2+</sup>NdAl<sub>2</sub>Fe<sup>3+</sup>(Si<sub>2</sub>O<sub>7</sub>)(SiO<sub>4</sub>)O<sub>2</sub>, a new mineral of the epidote supergroup. *Novye dannye o mineralakh*, 45, 17-22 (in Russian). New data on minerals, 45, 17-22 (in English). (2) (2012) *Amer. Mineral.*, 97, 1524 (abs. ref. 1).