

Aeschnynite-(Nd)**(Nd, Ce, Ca)(Ti, Nb)₂(O, OH)₆**

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Crystal Data: Orthorhombic; metamict. *Point Group:* [2/m 2/m 2/m probable] [by analogy to aeschnynite-(Ce)]. As tabular and prismatic crystals, to several mm, and as equigranular and radiating clusters, massive.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. *Hardness* = 5–6
D(meas.) = 4.60–5.04 D(calc.) = n.d. Radioactive.

Optical Properties: Semitransparent. *Color:* Dark to pale brown, brownish black; yellowish orange to reddish orange in thin section; dark gray in reflected light. *Streak:* Pale yellowish brown. *Luster:* Adamantine.

Optical Class: Isotropic to biaxial. *Pleochroism:* Weak to distinct. *Dispersion:* Weak to strong. $n = 2.1\text{--}2.4$ (metamict). $2V(\text{meas.}) = 78^\circ\text{--}82^\circ$

Cell Data: *Space Group:* n.d. $Z = \text{n.d.}$

X-ray Powder Pattern: Bayan Obo, China; nearly metamict, with only one line, at 2.03 Å, before heating; after heating at 800 °C gives an aeschnynite pattern. 2.93 (10), 3.00 (9), 1.575 (7b), 1.95 (6), 1.53 (6b), 5.45 (5), 2.64 (5)

Chemistry:	(1)	(2)	(1)	(2)
U ₃ O ₈		0.06	FeO	trace
Nb ₂ O ₅	30.16	21.40	MnO	0.06
Ta ₂ O ₅	0.04	1.24	MgO	0.44
SiO ₂	0.65	0.04	CaO	2.96
TiO ₂	22.46	28.65	Na ₂ O	0.42
ThO ₂	1.33	7.72	K ₂ O	trace
Al ₂ O ₃	0.54	0.64	H ₂ O ⁺	0.96
RE ₂ O ₃	37.99	36.54	H ₂ O ⁻	0.10
Fe ₂ O ₃	1.99	1.36		
			Total	100.00
				100.17

(1) Bayan Obo, China; RE₂O₃ = La₂O₃ 2.30%, CeO₂ 13.16%, Pr₆O₁₁ 2.67%, Nd₂O₃ 13.71%, Sm₂O₃ 2.32%, (Eu, Gd)₂O₃ 1.87%, Y₂O₃ 1.26%, Dy₂O₃ 0.70%; corresponds to [Nd_{0.30}Ce_{0.29}Ca_{0.19}Pr_{0.06}La_{0.05}Sm_{0.05}Na_{0.05}(Eu, Gd)_{0.04}Mg_{0.04}Y_{0.03}Dy_{0.02}Th_{0.02}]_{Σ=1.14}(Ti_{1.00}Nb_{0.82}Fe³⁺_{0.09}Al_{0.04}Si_{0.04})_{Σ=1.99}[O_{5.62}(OH)_{0.38}]_{Σ=6.00}. (2) Do.; RE₂O₃ = CeO₂ 7.23%, Pr₆O₁₁ 2.63%, Nd₂O₃ 18.45%, Sm₂O₃ 4.46%, Eu₂O₃ 0.62%, Gd₂O₃ 1.39%, Tb₂O₃ 2.11%, Y₂O₃ 0.73%, Dy₂O₃ 0.48%, Er₂O₃ 0.29%, Yb₂O₃ 0.22%; corresponds to (Nd_{0.40}Ce_{0.16}Th_{0.11}Sm_{0.10}Pr_{0.06}Ca_{0.05}Y_{0.04}Gd_{0.03}Mg_{0.03}Na_{0.01}Eu_{0.01})_{Σ=1.00}(Ti_{1.29}Nb_{0.58}Fe³⁺_{0.06}Al_{0.05}Ta_{0.02})_{Σ=2.00}[O_{5.45}(OH)_{0.55}]_{Σ=6.00}.

Occurrence: In veins in slate and metamorphosed dolostone.

Association: Aegirine, riebeckite, barite, fluorite, albite, phlogopite, magnetite.

Distribution: From the Bayan Obo Fe–Nb–RE deposit, 130 km north of Baotou, Inner Mongolia, China.

Name: For similarity to *aeschnynite-(Ce)*, with *neodymium* as the dominant rare-earth element.

Type Material: n.d.

References: (1) Zhang Peishan and Tao Kejie (1982) Aeschnynite-(Nd). *Scientia Geologica Sinica*, 4, 424–428 (in Chinese with English abs.). (2) (1984) *Amer. Mineral.*, 69, 565 (abs. ref. 1).