

Retzian-(Nd)**(Mn²⁺, Mg)₂(Nd, La, Ce)(AsO₄)(OH)₄**

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Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. Crystals, to 3 mm, elongated along [100], showing principally {010}, {001}, {110}, {201}, {130}; commonly in parallel aggregates. *Twining:* Radial, spokelike, trillings or sixlings, rare.

Physical Properties: *Fracture:* Uneven. Hardness = 3–4 D(meas.) = > 4.2
D(calc.) = 4.45

Optical Properties: Semitransparent. *Color:* Pinkish brown to reddish brown, zoned darker in the center. *Streak:* Very pale brown. *Luster:* Vitreous to dull.

Optical Class: Biaxial (+). *Pleochroism:* X = yellow; Y = reddish brown; Z = brown.
Orientation: X = c; Y = b; Z = a. *Dispersion:* r < v, weak. *Absorption:* Z > Y ≫ X.
α = 1.774(2) β = 1.782(2) γ = 1.798(2) 2V(meas.) = 69(1)° 2V(calc.) = 71°

Cell Data: *Space Group:* Pban. a = 5.690(5) b = 12.12(1) c = 4.874(3) Z = 2

X-ray Powder Pattern: Sterling Hill, New Jersey, USA; very similar to retzian-(Ce) and retzian-(La).

2.726 (100), 3.534 (60), 4.89 (30), 1.857 (30), 6.05 (20), 1.625 (20), 1.463(20)

Chemistry:

	(1)		(1)
As ₂ O ₅	26.9	Gd ₂ O ₃	1.9
Y ₂ O ₃	1.6	FeO	0.4
La ₂ O ₃	7.6	MnO	25.9
Ce ₂ O ₃	7.8	ZnO	1.8
Pr ₂ O ₃	4.2	MgO	2.0
Nd ₂ O ₃	10.9	CaO	0.0
Sm ₂ O ₃	2.4	H ₂ O	[8.3]
Eu ₂ O ₃	0.9	<u>Total</u>	<u>[102.6]</u>

(1) Sterling Hill, New Jersey, USA; by electron microprobe, total Mn as MnO, H₂O by DTA-TGA on a separate sample of retzian-(Ce); corresponds to (Mn_{1.63}Mg_{0.22}Zn_{0.10}Fe_{0.03})_{Σ=1.98}(Nd_{0.29}La_{0.21}Ce_{0.21}Pr_{0.11}Sm_{0.07}Y_{0.06}Gd_{0.05}Eu_{0.02})_{Σ=1.02}(AsO₄)_{1.04}(OH)_{3.90}.

Occurrence: A very rare late phase in fractures in a metamorphosed stratiform zinc orebody.

Association: Rhodochrosite, kraisslite, sonolite, zincite, sphalerite, chlorophoenicite, willemite, franklinite, calcite, barite.

Distribution: From Sterling Hill, Ogdensburg, Sussex Co., New Jersey, USA.

Name: For its dominant rare earth, *neodymium*, and relation to *retzian*-(Ce).

Type Material: The Natural History Museum, London, England, 1983,238; Geological Survey of Canada, Ottawa; Royal Ontario Museum, Toronto, Canada; American Museum of Natural History, New York City, New York; Harvard University, Cambridge, Massachusetts, 119000; National Museum of Natural History, Washington, D.C., USA, 143762.

References: (1) Dunn, P.J. and B.D. Sturman (1982) Retzian-(Nd), a new mineral from Sterling Hill, New Jersey and a redefinition of retzian. *Amer. Mineral.*, 67, 841–845. (2) Moore, P.B. (1967) Crystal chemistry of the basic manganese arsenate minerals 1. The crystal structures of flinkite, Mn₂²⁺Mn³⁺(OH)₄(AsO₄) and retzian, Mn₂²⁺Y³⁺(OH)₄(AsO₄). *Amer. Mineral.*, 52, 1603–1613.