$\frac{(Mn^{2+},Mg)_2(La,Ce,Nd)(AsO_4)(OH)_4}{(c) 2001-2005 \text{ Mineral Data Publishing, version 1}}$

Crystal Data: Orthorhombic. Point Group: 2/m 2/m. Crystals are pseudohexagonal. flattened on [001], showing large $\{001\}$, $\{110\}$, $\{010\}$, small $\{150\}$, to 0.5 mm.

Physical Properties: Fracture: Even. Hardness = 3-4 D(meas.) = > 4.2 D(calc.) = 4.49

Optical Properties: Transparent. *Color:* Dark reddish brown. *Streak:* Pale brown. Luster: Vitreous on $\{010\}$ and fractures, otherwise dull. Optical Class: Biaxial (+). Pleochroism: Very weak; pale brown to pale violet-brown. Orientation: X = c; Y = b; Z = a. Dispersion: r > v, strong. Absorption: Z > Y > X. $\alpha = 1.766(5) \quad \beta = 1.773(5) \quad \gamma = 1.788(5) \quad 2V(\text{meas.}) = 82(9)^{\circ} \quad 2V(\text{calc.}) = 69^{\circ}$

Cell Data: Space Group: Pban. a = 5.670(7) b = 12.01(1) c = 4.869(8) Z = 2

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

2.715(100), 3.51(80), 1.848(50), 1.456(40), 5.98(30), 4.84(30), 1.615(30)

Chemistry:

	(1)
As_2O_5	26.5
Y_2O_3	2.5
La_2O_3	10.6
Ce_2O_3	8.8
Pr_2O_3	5.1
Nd_2O_3	8.2
Sm_2O_3	2.2
MnO	25.2
ZnO	1.2
MgO	3.7
H_2O	[7.7]
Total	[101.7]

(1) Sterling Hill, New Jersey, USA; by electron microprobe, total Mn as MnO, H₂O calculated from stoichiometry; corresponds to $(Mn_{1.54}Mg_{0.40}Zn_{0.06})_{\Sigma=2.00}(La_{0.28}Ce_{0.23}Nd_{0.21}Pr_{0.13})_{\Sigma=2.00}$ $Y_{0.10}Sm_{0.05})_{\Sigma=1.00}(AsO_4)_{1.04}(OH)_{3.70}$

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

Association: Willemite, franklinite, calcite, todorokite.

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

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

Type Material: National Museum of Natural History, Washington, D.C., USA, 160290.

References: (1) Dunn, P.J., D.R. Peacor, and W.B. Simmons (1984) Retzian-(La), a new mineral from Sterling Hill, Sussex Co., New Jersey. Mineral. Mag., 48, 533-535. (2) (1985) Amer. Mineral., 70, 1332 (abs. ref. 1). (3) Moore, P.B. (1967) Crystal chemistry of the basic manganese arsenate minerals 1. The crystal structures of flinkite, $Mn_2^{2+}Mn^{3+}(OH)_4(AsO_4)$ and retzian, $Mn_2^{2+}Y^{3+}(OH)_4(AsO_4)$. Amer. Mineral., 52, 1603–1613.