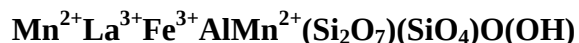


**Ferriandrosite-(La)**

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As prismatic crystals elongated along [010] to 150  $\mu\text{m}$ .

**Physical Properties:** *Cleavage:* Imperfect on {001}. *Fracture:* n.d. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.23

**Optical Properties:** Translucent. *Color:* Dark brown. *Streak:* n.d. *Luster:* Vitreous. *Optical Class:* n.d.

**Cell Data:** *Space Group:*  $P2_1/m$ .  $a = 8.8779(1)$   $b = 5.73995(1)$   $c = 10.0875(2)$   $\beta = 113.899(1)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Calculated pattern.

2.900 (100), 2.615 (53), 3.510 (46), 2.870 (40), 2.710 (35), 2.706 (35), 2.573 (26)

| <b>Chemistry:</b>              | (1)    | (2)   |                                | (1)    | (2)    |
|--------------------------------|--------|-------|--------------------------------|--------|--------|
| SiO <sub>2</sub>               | 29.25  | 28.85 | Y <sub>2</sub> O <sub>3</sub>  | 0.01   |        |
| TiO <sub>2</sub>               | 0.86   |       | La <sub>2</sub> O <sub>3</sub> | 12.97  | 26.07  |
| Al <sub>2</sub> O <sub>3</sub> | 9.61   | 8.16  | Ce <sub>2</sub> O <sub>3</sub> | 5.25   |        |
| Cr <sub>2</sub> O <sub>3</sub> | 0.08   |       | Pr <sub>2</sub> O <sub>3</sub> | 2.05   |        |
| V <sub>2</sub> O <sub>3</sub>  | 3.40   |       | Nd <sub>2</sub> O <sub>3</sub> | 5.16   |        |
| Fe <sub>2</sub> O <sub>3</sub> | [5.48] | 12.78 | Gd <sub>2</sub> O <sub>3</sub> | 0.48   |        |
| FeO                            | [5.23] |       | Er <sub>2</sub> O <sub>3</sub> | 0.01   |        |
| MnO                            | 12.05  | 22.70 | F                              | 0.28   |        |
| NiO                            | 0.02   |       | –O = F <sub>2</sub>            | 0.12   |        |
| MgO                            | 0.65   |       | H <sub>2</sub> O               | [3.01] | 1.44   |
| CaO                            | 4.26   |       | Total                          | 100.00 | 100.00 |
| SrO                            | 0.04   |       |                                |        |        |

(1) Shobu area, Ise City, Mie Prefecture, Japan; average of 3 electron microprobe analyses, FeO and Fe<sub>2</sub>O<sub>3</sub> calculated for charge balance, H<sub>2</sub>O by difference; corresponding to <sup>Al</sup>(Mn<sup>2+</sup><sub>0.56</sub>Ca<sub>0.44</sub>)<sup>A2</sup>[(La<sub>0.49</sub>Ce<sub>0.20</sub>Pr<sub>0.08</sub>Nd<sub>0.19</sub>Gd<sub>0.02</sub>)<sub>Σ=0.97</sub>Ca<sub>0.03</sub>]<sup>MI</sup>(Fe<sup>3+</sup><sub>0.40</sub>V<sup>3+</sup><sub>0.28</sub>Al<sub>0.20</sub>Fe<sup>2+</sup><sub>0.05</sub>Ti<sup>4+</sup><sub>0.07</sub>)<sup>M2</sup>(Al<sub>0.97</sub>Fe<sup>3+</sup><sub>0.03</sub>)<sup>M3</sup>(Mn<sup>2+</sup><sub>0.50</sub>Fe<sup>2+</sup><sub>0.40</sub>Mg<sub>0.10</sub>)(SiO<sub>4</sub>)(Si<sub>2</sub>O<sub>7</sub>)O(OH). (2) Mn<sup>2+</sup>La<sup>3+</sup>Fe<sup>3+</sup>AlMn<sup>2+</sup>(Si<sub>2</sub>O<sub>7</sub>)(SiO<sub>4</sub>)O(OH).

**Mineral Group:** Epidote supergroup, allanite group.

**Occurrence:** In tephroite-calcite veinlets cutting a stratiform ferromanganese deposit.

**Association:** Ferriakasaite-(La), rhodochrosite, bementite, allanite-group minerals.

**Distribution:** From the Shobu area, Ise City, Mie Prefecture, Japan.

**Name:** For a member of the allanite group with dominant Mn<sup>2+</sup> in the *Al* site and Fe<sup>3+</sup> in the *M1* site, and a suffix for the dominant rare earth element.

**Type Material:** National Museum of Nature and Science, Tokyo, Japan (NSM M-43919, M-43920).

**References:** (1) Nagashima, M., D. Nishio-Hamane, N. Tomita, T. Minakawa, and S. Inaba (2015) Ferriakasaite-(La) and ferriandrosite-(La): New epidote supergroup minerals from Ise, Mie Prefecture, Japan. *Mineral. Mag.*, 79(3), 735-753. (2) (2016) *Amer. Mineral.*, 101, 1712 (abs. ref. 1).