

Crystal Data: Tetragonal. *Point Group:* 4/m 2/m 2/m. As platy, prismatic, or rounded crystals to 10 μm; in aggregates <0.1 mm.

Physical Properties: *Cleavage:* n.d. *Tenacity:* n.d. *Fracture:* n.d. *Hardness =* n.d. *D(calc.) =* 4.782

Optical Properties: Transparent. *Color:* Colorless or slightly reddish pink in thin section; dark gray under reflected light. *Streak:* n.d. *Luster:* n.d.

Optical Class: n.d. Weak reflection pleochroism and anisotropy.

Cell Data: *Space Group:* I4₁/amd. *a =* 7.338(16) *c =* 6.509(19) *Z =* 4

X-ray Powder Pattern: Arase deposit, Kochi Prefecture, Shikoku Island, Japan. 3.67 (100), 2.74 (51), 4.84 (27), 1.89 (25), 2.09 (14), 2.60 (11), 2.29 (9)

| Chemistry: | (1) | (2) |
|--------------------------------|-------|--------|
| V ₂ O ₅ | 35.25 | 35.09 |
| As ₂ O ₅ | 0.93 | |
| SiO ₂ | 0.14 | |
| MnO | 1.45 | |
| Fe ₂ O ₃ | 0.41 | |
| Y ₂ O ₃ | 2.87 | |
| La ₂ O ₃ | 7.61 | |
| Ce ₂ O ₃ | 7.37 | |
| Pr ₂ O ₃ | 6.04 | |
| Nd ₂ O ₃ | 26.79 | 64.91 |
| Sm ₂ O ₃ | 4.41 | |
| Eu ₂ O ₃ | 1.36 | |
| Gd ₂ O ₃ | 3.41 | |
| Tb ₂ O ₃ | 0.22 | |
| Dy ₂ O ₃ | 1.41 | |
| Er ₂ O ₃ | 0.10 | |
| Total | 99.77 | 100.00 |

(1) Arase deposit, Kochi Prefecture, Shikoku Island, Japan; average electron microprobe analysis supplemented by Raman spectroscopy; corresponds to (Nd_{0.403}La_{0.118}Ce_{0.114}Pr_{0.093}Y_{0.064}Sm_{0.064}Mn_{0.052}Gd_{0.048}Eu_{0.020}Dy_{0.019}Fe_{0.013}Tb_{0.003}Er_{0.001})_{Σ=1.012}(V_{0.981}As_{0.020}Si_{0.006})_{Σ=1.007}O₄. (2) NdVO₄.

Occurrence: From metamorphism-induced recrystallization and dehydration of Fe- and Mn-oxyhydroxide in a stratiform ferromanganese deposit. Hydrothermal in rhyolitic ash flow tuff.

Association: Hematite, caryopilite, rhodochrosite, calcite (Japan); rhodochrosite, calcite, cerite-(Ce), a Mn silicate (caryopilite?), monazite, magnetite, ilmenite, quartz (USA).

Distribution: From the Arase stratiform ferromanganese deposit in Kochi Prefecture, Shikoku Island, Japan [TL]. In the Joe Lott Tuff, southwestern Utah, USA.

Name: Indicates the Nd-dominant analogue of wakefieldite-(Y) and wakefieldite-(Ce).

Type Material: Geological Museum, Geological Survey of Japan, AIST, Tsukuba, Japan (GSJ D39505 and M41500).

References: (1) Moriyama, T., R. Miyawaki, K. Yokoyama, S. Matsubara, H. Hirano, H. Murakami, and Y. Watanabe (2010) Wakefieldite-(Nd), a new neodymium vanadate mineral in the Arase Stratiform Ferromanganese Deposit, Kochi Prefecture, Japan. *Resource Geology*, 61, 101-110. (2) Bagiński, B., R. Macdonald, H.E. Belkin, J. Kotowski, P. Jokubauskas, and B. Marciniak-Maliszewska (2020) The occurrence of wakefieldite, a rare earth element vanadate, in the rhyolitic Joe Lott Tuff, Utah, USA. *Mineral. Mag.*, 84, 109-116.