

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. In subhedral to anhedral grains, to 0.1 mm, in monomineralic aggregates, to cm size.

Physical Properties: Hardness = 6–6.5 VHN = 681–772 (100 g load). D(meas.) = 4.85 D(calc.) = 4.89 Strongly magnetic.

Optical Properties: Opaque. *Color:* Greenish black; light olive-gray in reflected light.

Streak: Black. *Luster:* Metallic.

Optical Class: Uniaxial. *Anisotropism:* Moderate; yellowish to brownish gray.

R_1 – R_2 : (420) 20.0–19.4, (440) 19.9–19.3, (460) 20.3–19.5, (480) 20.4–19.6, (500) 20.8–19.8, (520) 21.2–20.1, (540) 21.4–20.3, (560) 21.3–20.4, (580) 21.2–20.1, (600) 21.0–20.0, (620) 20.9–19.7, (640) 20.5–19.6, (660) 20.4–19.2, (680) 20.2–19.1

Cell Data: *Space Group:* $I4_1/amd$. $a = 6.025(1)$ $c = 8.539(1)$ $Z = 4$

X-ray Powder Pattern: Gozaisho mine, Japan.

2.570 (100), 3.016 (40), 1.506 (40), 1.509 (35), 4.929 (30), 1.640 (30), 2.135 (16)

Chemistry:

	(1)
SiO ₂	0.47
TiO ₂	0.30
Al ₂ O ₃	0.32
Fe ₂ O ₃	44.42
Mn ₂ O ₃	22.70
MnO	30.34
MgO	0.61
SrO	0.04
Na ₂ O	0.02
K ₂ O	0.02
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Total	99.24

(1) Gozaisho mine, Japan; corresponds to $(\text{Mn}_{0.98}^{2+}\text{Mg}_{0.04})_{\Sigma=1.02}(\text{Fe}_{1.28}^{3+}\text{Mn}_{0.66}^{3+}\text{Si}_{0.02}\text{Al}_{0.01}\text{Ti}_{0.01})_{\Sigma=1.98}\text{O}_4$.

Polymorphism & Series: Dimorphous with jacobsite.

Occurrence: In a regionally metamorphosed bedded manganese deposit.

Association: Rhodonite, braunite, rhodochrosite, hematite, spessartine, quartz.

Distribution: From the Gozaisho mine, Iwaki, Fukushima Prefecture, Japan.

Name: For its occurrence near Iwaki, Japan.

Type Material: National Science Museum, Tokyo, Japan, M21865; National Museum of Natural History, Washington, D.C., USA, 132923.

References: (1) Matsubara, S., A. Kato, and K. Nagashima (1979) Iwakiite, $\text{Mn}^{2+}(\text{Fe}^{3+}, \text{Mn}^{3+})_2\text{O}_4$, a new tetragonal spinelloid mineral from the Gozaisho mine, Fukushima Prefecture, Japan. *Mineral. J. (Japan)*, 9, 383–391. (2) (1980) *Amer. Mineral.*, 65, 406 (abs. ref. 1). (3) Jarosch, D. (1988) Crystal structure of iwakiite. *Zeits. Krist.*, 185, 605.