Vittinkiite $MnMn_3MnSi_5O_{15}$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As massive aggregates of tabular grains to 2 mm.

Physical Properties: *Cleavage*: Perfect on {201}, good on {021} and {210}. *Tenacity*: Brittle. *Fracture*: n.d. Hardness = n.d. D(meas.) = 3.68(2) D(calc.) = 3.737

Optical Properties: Transparent to translucent. *Color*: Pink to light pink. *Streak*: White. *Luster*: Vitreous.
Optical Class: Biaxial (+). α = 1.725(4) β = 1.733(4) γ = 1.745(5) 2V(meas.) = 75(10)° 2V(calc.) = 79° *Orientation*: $Y \wedge b$ = 22°. *Dispersion*: Weak, $r < v$.

Cell Data: *Space Group*: $P\bar{1}$. a = 6.6980(3) b = 7.6203(3) c = 11.8473(5) α = 105.663(3)° β = 92.400(3)° γ = 94.309(3)° Z = 2

X-Ray Diffraction Pattern: Vittinki mines, Isokyrö, Western and Inner Finland Region, Finland. 2.749 (100), 2.935 (95), 2.958 (79), 3.138 (61), 3.332 (42), 2.180 (40), 2.226 (32)

Chemistry:

	(1)
MgO	0.52
CaO,	0.93
MnO	51.82
FeO	1.26
ZnO	0.11
SiO_2	46.48
Total	101.12

(1) Vittinki mines, Isokyrö, Western and Inner Finland Region, Finland; average electron microprobe analysis supplemented by IR spectroscopy; corresponds to $Mn_{4.71}Ca_{0.11}Fe_{0.11}Mg_{0.08}Zn_{0.01}Si_{4.99}O_{15}$.

Mineral Group: Rhodonite group.

Occurrence: n.d.

Association: Quartz, rhodonite, tephroite, pyroxmangite, Mn oxides.

Distribution: From the Vittinki (Vittinge) mines, Isokyrö, Western and Inner Finland Region, Finland [TL]. Other confirmed localities include the New England Range, New South Wales, Australia; the Ridder Mine (now Leninogorskiy Mine), NW Altai, Kazakhstan; Sultanuizdag, Uzbekistan; Nozhiy Lake, Aginsk district, Zabaikal'sky Krai, Russia; and Tsang-Ping, Hebei, China.

Name: For the *Vittinki* iron mines, Isokyrö, Western and Inner Finland Region, Finland, from where the studied material was collected (Fersman Museum #15061).

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (15061).

References: (1) Shchipalkina, N.V., I.V. Pekov, N.V. Chukanov, N.V. Zubkova, D.I. Belakovskiy, S.N. Britvin, and N.N. Koshlyakova (2020) Vittinkiite, $MnMn_4[Si_5O_{15}]$, a member of the rhodonite group with a long history: definition as a mineral species. Mineral. Mag., 84, 869-880.
(2) Shchipalkina, N.V., I.V. Pekov, N.V. Chukanov,, C. Biagioni, and M. Pasero (2019) Crystal chemistry and nomenclature of rhodonite-group minerals. Mineral. Mag., 83, 829-835.