

Vuorelainenite



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Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. As imperfect crystals, granular, massive, along grain boundaries of other minerals, to 80 μm .

Physical Properties: Hardness = n.d. VHN = 900 (50 g load). D(meas.) = n.d.
D(calc.) = 4.64

Optical Properties: Opaque. *Color:* Brownish gray in reflected light.

Optical Class: Isotropic.

R: (470) 15.7, (546) 15.4, (589) 15.6, (650) 16.2

Cell Data: *Space Group:* $[Fd\bar{3}m]$ (by analogy to spinel). $a = 8.48(5)$ $Z = 8$

X-ray Powder Pattern: Sätra mine, Sweden.

2.559 (10), 1.633 (8), 1.502 (8), 2.985 (4), 2.118 (3), 4.90 (2), 2.442 (2)

Chemistry:

	(1)	(2)
TiO ₂	0.1	
V ₂ O ₃	47.4	63.3
Cr ₂ O ₃	19.5	4.7
FeO	5.7	7.6
MnO	26.4	22.0
ZnO	0.8	[2.4]
MgO	0.1	
Total	100.0	[100.0]

(1) Sätra mine, Sweden; by electron microprobe, total Fe as FeO; corresponds to $(\text{Mn}_{0.83}\text{Fe}_{0.18}\text{Zn}_{0.02}\text{Mg}_{0.01})_{\Sigma=1.04}(\text{V}_{1.41}\text{Cr}_{0.57})_{\Sigma=1.98}\text{O}_4$. (2) Outokumpu, Finland; by electron microprobe, total Fe as FeO, ZnO by difference; corresponds to $(\text{Mn}_{0.69}\text{Fe}_{0.23}\text{Zn}_{0.06})_{\Sigma=0.98}(\text{V}_{1.87}\text{Cr}_{0.14})_{\Sigma=2.01}\text{O}_4$.

Polymorphism & Series: Forms a series with manganochromite.

Mineral Group: Spinel group.

Occurrence: In a metamorphosed iron sulfide deposit associated with submarine felsic volcanism (Sätra mine, Sweden); in quartzite schists (Ol'khon Gate Straits, Lake Baikal, Russia).

Association: Pyrrhotite, rutile, pyrophanite, manganoan sphalerite, chalcopyrite, alabandite (Sätra mine, Sweden); rutile, eskolaite, karelianite, schreyerite, olkhonskite (Ol'khon Gate Straits, Lake Baikal, Russia).

Distribution: In the Sätra mine, Doverstorp, Bergslagen metallic province, Sweden. From Outokumpu, Finland. Found 4.5 km south of the Ol'khon Gate Strait, on the western shore of Lake Baikal, Siberia, Russia.

Name: To honor Yrjö Vuorelainen (1922–), Finnish exploration geologist, formerly with the Outokumpu Company, Finland.

Type Material: Institute of Earth Sciences, Free University of Amsterdam, Amsterdam, The Netherlands, 153A4.

References: (1) Zakrzewski, M.A., E.A.J. Burke, and W.J. Lustenhouwer (1982) Vuorelainenite, a new spinel, and associated minerals from the Sätra (Doverstorp) pyrite deposit, central Sweden. *Can. Mineral.*, 20, 281–290. (2) (1983) *Amer. Mineral.*, 68, 472–473 (abs. ref. 1).