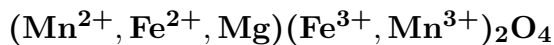


Jacobsite



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Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. Rarely in octahedral crystals, to 4 mm, which may exhibit exsolved hausmannite or galaxite; coarse to fine granular, massive. *Twinning:* On {111} as both twin and composition plane, the spinel law, flattened on {111} or lamellar.

Physical Properties: *Cleavage:* {111}, probably a parting. Hardness = 5.5–6.5 VHN = 665–707 (100 g load). D(meas.) = 4.76 D(calc.) = 5.03 Weakly magnetic.

Optical Properties: Opaque, translucent on thin edges. *Color:* Black to brownish black; grayish white with olive tint in reflected light, with brown internal reflections. *Streak:* Brown. *Luster:* Metallic, splendent to semimetallic, dull.

Optical Class: Isotropic. $n = \sim 2.3$
R: (400) 19.0, (420) 18.8, (440) 18.6, (460) 18.4, (480) 18.2, (500) 18.1, (520) 18.0, (540) 17.8, (560) 17.6, (580) 17.4, (600) 17.2, (620) 17.0, (640) 16.8, (660) 16.6, (680) 16.5, (700) 16.4

Cell Data: *Space Group:* $Fd\bar{3}m$ (synthetic MnFe_2O_4). $a = 8.499$ $Z = 8$

X-ray Powder Pattern: Synthetic MnFe_2O_4 .
2.563 (100), 1.5031 (40), 3.005 (35), 1.6355 (35), 1.1063 (30), 2.124 (25), 4.906 (20)

Chemistry:	(1)	(2)
TiO ₂	0.09	0.38
Al ₂ O ₃		8.14
Fe ₂ O ₃	73.96	59.5
FeO	2.57	0.5
MnO	13.94	32.1
MgO	9.26	0.03
Total	99.82	100.6

(1) Jakobsberg, Sweden. (2) Bald Knob, North Carolina, USA; by electron microprobe, Fe²⁺:Fe³⁺ calculated from stoichiometry; corresponds to $(\text{Mn}_{0.99}^{2+}\text{Fe}_{0.02}^{2+}\text{Mg}_{0.01})_{\Sigma=1.02}(\text{Fe}_{1.62}^{3+}\text{Al}_{0.35}\text{Ti}_{0.01})_{\Sigma=1.98}\text{O}_4$.

Polymorphism & Series: Forms a series with magnetite, dimorphous with iwakiite.

Mineral Group: Spinel group.

Occurrence: A primary mineral or an alteration product of other manganese-bearing minerals in some metamorphosed manganese deposits.

Association: Hausmannite, galaxite, braunite, pyrolusite, coronadite, hematite, magnetite.

Distribution: In Sweden, from Jakobsberg and Långban, Värmland, and Väster Silberg, Dalarna; and in the Sjö mine, near Grythyttan, Örebro. From the Benallt mine, near Rhw, Lley Peninsula, Wales. In the Kombat Cu–Pb–Ag mine, 49 km south of Tsumeb, and from the Otjiwarongo district, Namibia. At the N'Chwaning mine, near Kuruman, Cape Province, South Africa, in crystals large for the species. From Broken Hill, New South Wales, and at the Iron Monarch quarry, Iron Knob, South Australia. From mines around Kodur, Andhra Pradesh, India. In Japan, from the Kiuragi mine, Saga Prefecture, the Noda-Tamagawa mine, Iwate Prefecture, the Kunimiyama mine, Kochi Prefecture, and many others. From the Urandi district, Bahia, Brazil. In the USA, from Bald Knob, near Sparta, Alleghany Co., North Carolina. A few additional localities are known.

Name: For its original occurrence at Jakobsberg (formerly Jacobsberg), Sweden.

Type Material: Swedish Museum of Natural History, Stockholm, Sweden.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 698–707. (2) Wickman, F.E. (1947) A redetermination of the space-group of jacobsite. Geol. Fören. Förhandl. Stockholm, 69, 363–365. (3) Essene, E.J. and D.R. Peacor (1983) Crystal chemistry and petrology of coexisting galaxite and jacobsite and other spinel solutions and solvi. Amer. Mineral., 68, 449–455. (4) (1960) NBS Circ. 539, 9, 36.

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