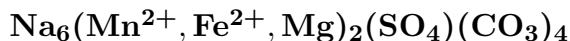


# Manganotychite



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**Crystal Data:** Cubic. *Point Group:*  $2/m\bar{3}$ . As irregular grains, to 1 cm, and in massive aggregates.

**Physical Properties:** *Fracture:* Conchoidal. Hardness = 4 D(meas.) = 2.70(5)  
D(calc.) = 2.79 Weakly magnetic; slightly soluble in H<sub>2</sub>O, forming a brown coating.

**Optical Properties:** Semitransparent. *Color:* Pale pink, white. *Luster:* Vitreous to dull.  
*Optical Class:* Isotropic.  $n = 1.544(2)$

**Cell Data:** *Space Group:*  $Fd\bar{3}$ .  $a = 13.9951(8)$   $Z = 8$

**X-ray Powder Pattern:** Mt. Alluaiv, Kola Peninsula, Russia.  
2.695 (100), 4.22 (76), 2.474 (70), 1.959 (28), 1.616 (28), 2.366 (27), 1.605 (25)

Chemistry:	(1)	(2)
SO <sub>3</sub>	14.13	13.71
CO <sub>2</sub>	30.68	30.15
FeO	6.00	
MnO	15.00	24.30
MgO	1.98	
Na <sub>2</sub> O	32.21	31.84
Total	[100.00]	100.00

(1) Mt. Alluaiv, Kola Peninsula, Russia; (CO<sub>3</sub>)<sup>2-</sup> and (SO<sub>4</sub>)<sup>2-</sup> confirmed by IR, recalculated to 100% from an original total of 99.34%, after deduction of CO<sub>2</sub> 1.65%, CaO 1.49%, Na<sub>2</sub>O 0.77% as shortite [Na<sub>2</sub>Ca<sub>2</sub>(CO<sub>3</sub>)<sub>3</sub>], corresponds to Na<sub>5.99</sub>(Mn<sub>1.22</sub><sup>2+</sup>Fe<sub>0.48</sub><sup>2+</sup>Mg<sub>0.28</sub>)<sub>Σ=1.98</sub>(SO<sub>4</sub>)<sub>1.04</sub>(CO<sub>3</sub>)<sub>4.02</sub>.  
(2) Na<sub>6</sub>Mn<sub>2</sub>(SO<sub>4</sub>)(CO<sub>3</sub>)<sub>4</sub>.

**Occurrence:** An uncommon mineral formed in pegmatite veins in a differentiated alkalic massif (Mt. Alluaiv, Kola Peninsula, Russia).

**Association:** Shortite, pirssonite, sidorenkite, kogarkoite, many other species (Mt. Alluaiv, Kola Peninsula, Russia); trona, shortite, petersenite-(Y), reederite-(Y), catapleite, analcime (Mont Saint-Hilaire, Canada).

**Distribution:** On Mt. Alluaiv, Lovozero massif, Kola Peninsula, Russia. At Mont Saint-Hilaire, Quebec, Canada.

**Name:** As the *manganese* analog of *tychite*.

**Type Material:** Mining Institute, St. Petersburg, 2023/1; Geology Museum, Kola Branch, Academy of Sciences, Apatity; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, p545/2.

**References:** (1) Khomyakov, A.P., A.Y. Bakhchisaraitsev, A.V. Martynova, and T.M. Parashchenko (1990) Manganotychite Na<sub>6</sub>Mn<sub>2</sub>(SO<sub>4</sub>)(CO<sub>3</sub>)<sub>4</sub> – a new mineral. Zap. Vses. Mineral. Obshch., 119(5), 46–49 (in Russian). (2) (1992) Amer. Mineral., 77, 448 (abs. ref. 1).