

Mcgillite



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Crystal Data: Monoclinic, pseudohexagonal. *Point Group:* $2/m$. Massive.

Twinning: Universal, repeated about monoclinic $[110]$ and $[\bar{1}10]$, composition plane $\{001\}$, giving pseudorhombohedral symmetry.

Physical Properties: *Cleavage:* Good on $\{0001\}$; fair on $\{10\bar{1}1\}$. Hardness = [4]
VHN = 278–330 (15 g load). $D(\text{meas.}) = 2.98(4)$ $D(\text{calc.}) = 3.071$

Optical Properties: Transparent to translucent. *Color:* Light to dark pink. *Luster:* Pearly on cleavage surfaces.

Optical Class: Biaxial (–); nearly uniaxial. $\epsilon = 1.640\text{--}1.643$ $\omega = 1.667\text{--}1.670$
 $2V(\text{meas.}) = \text{n.d.}$

Cell Data: *Space Group:* $C2/m$. $a = 23.312(16)$ $b = 13.459(9)$ $c = 7.423(7)$
 $\beta = 105.17(2)^\circ$ $Z = [4]$

X-ray Powder Pattern: Sullivan mine, Canada; nearly identical with friedelite.
2.560 (100), 7.16 (70), 2.888 (60), 3.570 (40), 2.112 (40), 1.683 (40), 11.67 (20)

Chemistry:

	(1)
SiO ₂	34.54
As ₂ O ₃	< 0.1
FeO	4.85
MnO	47.76
ZnO	< 0.1
MgO	1.62
CaO	< 0.05
Cl	6.36
H ₂ O	[7.16]
–O = Cl ₂	1.44
Total	[100.85]

(1) Sullivan mine, Canada; by electron microprobe, $\text{Fe}^{2+}:\text{Fe}^{3+}$ by charge balance; H_2O calculated from stoichiometry; corresponding to $(\text{Mn}_{6.95}^{2+}\text{Fe}_{0.63}^{2+}\text{Mg}_{0.42})_{\Sigma=8.00}(\text{Si}_{5.93}\text{Fe}_{0.07}^{3+})_{\Sigma=6.00}[\text{O}_{14.94}(\text{OH})_{8.21}\text{Cl}_{1.85}]_{\Sigma=25.00}$.

Occurrence: As open-space fracture fillings in a manganese-rich section of quartzite and argillite in a metamorphosed Pb–Zn orebody (Sullivan mine, Canada).

Association: Sphalerite, boulangerite, galena, jamesonite, quartz (Sullivan mine, Canada).

Distribution: In the Sullivan mine, Kimberley, Kootenay district, British Columbia, Canada. From the Kyurazawa mine, Tochigi Prefecture, Japan.

Name: For McGill University, Montreal, Quebec, Canada.

Type Material: McGill University, Montreal, RMNS3100; Royal Ontario Museum, Toronto, Canada.

References: (1) Donnay, G., M. Bétournay, and G. Hamill (1980) McGillite, a new manganous hydroxychlorosilicate. *Can. Mineral.*, 18, 31–36. (2) (1981) *Amer. Mineral.*, 66, 1270. (3) Ozawa, T., Y. Takéuchi, T. Takahata, G. Donnay, and J.D.H. Donnay (1983) The pyrosmalite group of minerals. II. The layer structure of mcgillite and friedelite. *Can. Mineral.*, 21, 7–17.