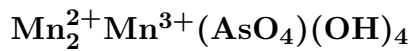


Flinkite



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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Rarely as individual crystals, to 3 mm, bladed, thin tabular {001}, elongated along [010], showing forms {001}, {010}, {110}, {101}, {111}; typically rounded in the zone [100], with {001} striated || [100]. Commonly as rosettes or featherlike aggregates.

Physical Properties: *Tenacity:* Brittle. Hardness = 4.5 D(meas.) = 3.87 D(calc.) = 3.73

Optical Properties: Transparent. *Color:* Greenish brown, dark green, dark yellow-brown; brownish yellowish green in transmitted light. *Luster:* Vitreous, resinous to somewhat greasy. *Optical Class:* Biaxial (+). *Pleochroism:* X = pale brownish green; Y = yellow-green; Z = orange-brown. *Orientation:* X = b; Y = c; Z = a. *Dispersion:* $r > v$, weak. $\alpha = 1.783(3)$ $\beta = 1.801(3)$ $\gamma = 1.834(3)$ $2V(\text{meas.}) = \text{Large}$.

Cell Data: *Space Group:* $Pnma$. $a = 9.55$ $b = 13.11$ $c = 5.25$ $Z = 4$

X-ray Powder Pattern: Harstigen mine, Sweden.
4.733 (100), 4.386 (100b), 2.662 (100), 3.179 (80), 3.815 (30), 2.506 (30), 1.538 (20)

Chemistry:	(1)	(2)	(3)
As ₂ O ₅	29.1	29.3	30.91
Sb ₂ O ₅	2.5		
Fe ₂ O ₃		0.4	
(Fe, Al) ₂ O ₃	1.5		
Al ₂ O ₃		0.8	
Mn ₂ O ₃	20.2	22.4	21.23
MnO	35.8	33.9	38.17
ZnO		0.6	
MgO	1.7	3.2	
CaO	0.4	0.3	
H ₂ O	9.9	[9.1]	9.69
Total	101.1	[100.0]	100.00

(1) Harstigen mine, Sweden; corresponds to $(\text{Mn}_{1.85}^{2+}\text{Mg}_{0.15}\text{Ca}_{0.03})_{\Sigma=2.03}[\text{Mn}_{0.93}^{3+}(\text{Fe, Al})_{0.08}]_{\Sigma=1.01}[(\text{As}_{0.94}\text{Sb}_{0.05})_{\Sigma=0.99}\text{O}_4](\text{OH})_{4.01}$. (2) Franklin, New Jersey, USA; by electron microprobe, total Fe as Fe₂O₃, Mn²⁺:Mn³⁺ from stoichiometry, H₂O by difference. (3) Mn₂²⁺Mn³⁺(AsO₄)(OH)₄.

Occurrence: Very rare, in veinlets in magnetite ore (Harstigen mine, Sweden); in a metamorphosed stratiform zinc orebody (Franklin, New Jersey, USA).

Association: Sarkinite, brandtite, caryopilite, nadorite, lead, manganooan calcite, barite (Harstigen mine, Sweden); cahnite, jarosewichite, franklinite, hausmannite, andradite (Franklin, New Jersey, USA).

Distribution: From the Harstigen mine, near Persberg, and at Långban, Värmland, Sweden. At Franklin, Sussex Co., New Jersey, USA.

Name: To honor Gustav Flink (1849–1931), Swedish mineralogist and collector.

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

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 793–794. (2) Culver, K.B. and L.G. Berry (1963) Flinkite and atelestite. *Can. Mineral.*, 7, 547–553. (3) Moore, P.B. (1967) Crystal chemistry of the basic manganese arsenate minerals 1. The crystal structures of flinkite, Mn₂²⁺Mn³⁺(OH)₄(AsO₄) and retzian, Mn₂²⁺Y³⁺(OH)₄(AsO₄). *Amer. Mineral.*, 52, 1603–1613. (4) Dunn, P.J. (1995) Franklin and Sterling Hill, New Jersey. No publisher, n.p., 654, 668.

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