Ferrotochilinite $6FeS \cdot 5Fe(OH)_2$

Crystal Data: Monoclinic. *Point Group*: 2/*m*, 2 or *m*. Crystals flattened on [001] mostly split and curved, prismatic to elongated lamellar, or curved ribbon-like, to 3.2 mm; striations on {001} across elongation; as fan- and rosette-like clusters, or chaotic aggregates to 6.5 mm.

Physical Properties: *Cleavage*: Perfect on {001}. *Fracture*: n.d. *Tenacity*: Flexible, inelastic. Hardness = < 1 VHN = 13 (2 g load). D(meas.) = n.d. D(calc.) = 3.467

Optical Properties: Opaque. *Color*: Dark bronze (fresh), to nearly black; in reflected light, gray with a bluish to pale beige tint. *Streak*: Black. *Luster*: Metallic (fresh), dull, or tarnishes to iridescent purplish or golden-brown.
Optical Class: n.d. *Bireflectance:* Distinct. *Anisotropism:* Distinct, gray-bluish to yellowish beige.
R_1-R_2: (470) 11.4-11.6, (546) 11.2-12.4, (589) 11.1-13.6, (650) 11.0-15.5

Cell Data: *Space Group:* *C*2/*m*, *Cm*, or *C*2. a = 5.463(5) b = 15.865(17) c = 10.825(12) β = 93.7(1)° Z = 2

X-ray Powder Pattern: Oktyabr'skiy mine, Norilsk district, Krasnoyarskiy Kray, Russia.
5.392 (100), 10.83 (13), 2.696 (12), 2.524 (12), 1.837 (11), 2.152 (8), 3.281 (7)

Chemistry:

	(1)
Mg	0.02
Fe	61.92
Ni	0.03
Cu	0.09
S	19.45
O	16.3
H	[1.03]
Total	98.84

(1) Oktyabr'skiy mine, Norilsk district, Krasnoyarskiy Kray, Russia; average of 9 electron microprobe analyses, Fe^{2+}/Fe^{3+} calculated for charge balance, H calculated as if present only as OH, presence of OH and absence of H_2O confirmed by IR spectroscopy; corresponding to $(Fe_{5.98}Cu_{0.015}Ni_{0.005})_{\Sigma=6.00}S_6(Fe^{2+}_{4.89}Mg_{0.01})_{\Sigma=4.90}(OH)_{9.80}Fe^{3+}_{0.09}(OH)_{0.27}$.

Occurrence: Of low-temperature hydrothermal origin coating cavities in pentlandite-mooihoekite-cubanite ore with minor magnetite and chalcopyrite.

Association: Ferrovalleriite, magnetite, an Fe-rich chlorite-type phyllosilicate.

Distribution: From Shaft no 1, Oktyabr'skiy mine, Oktyabr'skoye Cu-Ni-PGM deposit, Talnakh, Norilsk district, Krasnoyarskiy Kray, Siberia, Russia.

Name: As the structural analogue (based on chemical, X-ray, and IR data similarities) of *tochilinite* with essential *ferrous iron*.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia (4058/1).

References: (1) Pekov, I.V., E.V. Sereda, Yu.S. Polekhovsky, S.N. Britvin, N.V. Chukanov, V.O. Yapaskurt, and I.A. Bryzgalov (2012) Ferrotochilinite, $6FeS \cdot 5Fe(OH)_2$, a new mineral from Oktyabr'skoye ore deposit (Norilsk ore district, Siberia, Russia). Zap. Ross. Mineral. Obshch., 141(4), 1-11 (in Russian, with English abstract). (2) (2014) Amer. Mineral., 99, 242-243 (abs. ref. 1).