Talnakhite $Cu_9(Fe,Ni)_8S_{16}$

Crystal Data: Cubic. *Point Group:* $\bar{4}3m$. As narrow laths, to 2 mm; typically in massive intergrowths with other Cu–Fe sulfides.

Physical Properties: Hardness = n.d. VHN = 261–277 (50 g load). D(meas.) = 4.29 D(calc.) = 4.36

Optical Properties: Opaque. *Color:* Chalcopyrite-yellow, tarnishes rapidly to hues of pink and brown.
R: (400) —, (420) —, (440) —, (460) 22.4, (480) 24.7, (500) 30.0, (520) 32.7, (540) 35.4, (560) 37.5, (580) 38.8, (600) 39.8, (620) 39.6, (640) 40.8, (660) 41.1, (680) 41.8, (700) 41.6

Cell Data: *Space Group:* $I\bar{4}3m$ (probable). $a = 10.59(1)$ $Z = 2$

X-ray Powder Pattern: Talnakh area, Russia.
3.06 (100), 1.873 (90), 1.599 (70), 1.079 (60), 2.64 (50), 1.213 (50), 1.019 (50)

Chemistry:

	(1)	(2)
Cu	37.15	36.8
Fe	29.1	29.8
Ni	0.75	0.7
S	33.31	34.0
Total	100.31	101.3

(1) Talnakh area, Russia; by electron microprobe, average of five analyses; corresponds to $Cu_{9.00}(Fe_{8.03}Ni_{0.20})_{\Sigma=8.20}S_{16.00}$. (2) Noril'sk, Russia; by electron microprobe, corresponds to $Cu_{8.74}(Fe_{8.05}Ni_{0.16})_{\Sigma=8.21}S_{16.00}$.

Occurrence: In concentrations of up to 70% in zones to 12 m thick, in hydrothermal ores (Talnakh area, Russia); in the layered ultramafic Stillwater complex (Nye, Montana, USA); a component of undersea black smokers.

Association: Chalcopyrite, cubanite, djerfisherite, pentlandite, valleriite or mackinawite, magnetite, Ag–Au alloy, Pd–Pb alloy (Talnakh area, Russia).

Distribution: In Russia, from the Norilsk-I [TL] and Talnakh deposits [TL], Talnakh area, Noril'sk region, western Siberia. At Strachimir, Bulgaria. From the Filizchai deposit, Azerbaijan. In the Axial Rift Valley, Red Sea. At Nye, Stillwater Co., Montana, USA. In the Horoman peridotite, Hokkaido, Japan. From the Zhilingtou Au–Ag deposit, Zhejiang Province, China.

Name: For the Talnakh area, Russia, where it occurs.

Type Material: Mining Institute, St. Petersburg, 103a/1–5; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 69836–69839; Canadian Museum of Nature, Ottawa; Royal Ontario Museum, Toronto, Canada, M29419; National Museum of Natural History, Washington, D.C., USA, 121944.

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