Murunskite $K_2Cu_3FeS_4$

Crystal Data: Tetragonal. *Point Group:* $\bar{4}2m$, $4mm$, 422, or $4/m\ 2/m\ 2/m$. As very tiny grains, to 1 μm, and in aggregates.

Physical Properties: *Cleavage:* Imperfect. *Tenacity:* Brittle. Hardness = Soft. VHN = 92–123, 109 average (10 g load). D(meas.) = n.d. D(calc.) = [3.86]

Optical Properties: Opaque. *Color:* Copper-red to pinchbeck-brown, iridescent; grayish orange-cream in reflected light; a fresh surface oxidizes to a sooty black film. *Luster:* Metallic. *Anisotropism:* Moderate, gray to brownish gray with a bluish tint.
R: (400) — , (420) — , (440) 15.0, (460) 15.6, (480) 16.6, (500) 17.4, (520) 18.2, (540) 19.2, (560) 20.0, (580) 21.0, (600) 21.8, (620) 22.6, (640) 23.3, (660) 24.0, (680) 24.6, (700) 25.4

Cell Data: *Space Group:* $I\bar{4}m2$, $I\bar{4}2m$, $I4mm$, $I422$, or $I4/mmm$. $a = 3.88(1)$ $c = 13.10(5)$ $Z = 1$

X-ray Powder Pattern: Murun massif, Russia.
6.52 (10), 2.53 (8), 2.90 (6), 1.940 (5), 1.715 (4), 2.10 (3), 3.29 (2)

Chemistry:

	(1)	(2)
K	14.57	17.27
Cu	44.38	42.09
Fe	12.07	12.33
S	28.14	28.31
Total	99.16	100.00

(1) Murun massif, Russia; by electron microprobe, corresponding to $K_{1.72}Cu_{3.23}Fe_{1.09}S_{4.05}$.
(2) $K_2Cu_3FeS_4$.

Occurrence: In rocks that have undergone intensive potassium metasomatism.

Association: Charoite, acmite, potassium feldspar.

Distribution: From the Murun alkalic massif, near Olekminsk, Sakha, Russia.

Name: For the locality in the Murun massif, Russia.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 81604.

References: (1) Dobrovolskaya, M.G., A.I. Tsepin, T.L. Evstigneeva, L.N. Vyal'sov, and A.O. Zaozerina (1981) Murunskite, $K_2Cu_3FeS_4$, a new sulfide of potassium, copper, and iron. Zap. Vses. Mineral. Obshch., 110, 468–473 (in Russian). (2) (1982) Amer. Mineral., 67, 624 (abs. ref. 1).