Khatyrkite $(Cu, Zn)Al_2$

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Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. As prismatic crystals, to 400 μm, and intimately intergrown with cupalite in small grains.

Physical Properties: *Cleavage:* {100}, distinct. *Tenacity:* Malleable. Hardness = 5.5 VHN = 511–568 (100 g load). D(meas.) = n.d. D(calc.) = 4.42

Optical Properties: Opaque. *Color:* Steel-gray yellow; in reflected light, isotropic sections are pale blue, anisotropic sections are blue to creamy pink. *Luster:* Metallic. *Anisotropism:* Distinct, grayish yellow to brownish red.
R_1–R_2: (400) — , (420) — , (440) 70.1–75.8, (460) 70.3–75.6, (480) 71.5–75.9, (500) 73.0–76.5, (520) 74.5–76.4, (540) 76.1–76.1, (560) 77.4–75.3, (580) 78.4–74.3, (600) 79.2–73.2, (620) 79.7–72.0 (640) 79.8–70.7, (660) 79.9–69.5, (680) 79.8–68.5 (700) 79.5–67.5

Cell Data: *Space Group:* $I4/mcm$. a = 6.07(1) c = 4.89(1) Z = 4

X-ray Powder Pattern: Listvenitovyi Stream, Russia.
4.27 (10), 2.119 (8), 2.372 (7), 1.920 (7), 3.04 (5), 1.894 (4), 2.156 (2)

Chemistry:

	(1)
Cu	53.93
Zn	1.28
Al	45.11
Total	100.32

(1) Listvenitovii Stream, Russia; by electron microprobe, average of analyses on nine grains; corresponding to $(Cu_{1.02}Zn_{0.02})_{\Sigma=1.04}Al_{2.00}$.

Occurrence: In black slick washed from greenish gray cover weathering from serpentine.

Association: Cupalite, two unnamed zinc aluminides.

Distribution: From near the Listvenitovyi Stream, Khatyrka ultramafic zone of the Koryak–Kamchata fold area, Koryak Mountains, Magadan district, Russia [TL].

Name: For the occurrence in the Khatyrka ultramafic zone, Russia.

Type Material: Mining Institute, St. Petersburg, Russia, 1687/1.

References: (1) Razin, L.V., N.S. Rudashevskii, and L.N. Vyal'sov (1985) New natural intermetallic compounds of aluminum, copper and zinc – khatyrkite $CuAl_2$, cupalite CuAl and zinc aluminides – from hyperbasites of dunite–harzburgite formation. Zap. Vses. Mineral. Obshch., 114, 90–100 (in Russian). (2) (1986) Amer. Mineral., 71, 1278 (abs. ref. 1). (3) Friauf, J.B. (1927) The crystal structures of two intermetallic compounds [Cu_2Mg and $CuAl_2$]. J. Amer. Chem. Soc., 49(2), 3107–3114. (4) Havinga, E.E., H. Damsma, and P. Hokkeling (1972) Compounds and pseudo-binary alloys with the $CuAl_2(C16)$−type structure. I. Preparation and X-ray results. J. Less-Common Metals, 27, 169–186.

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