

**Crystal Data:** Orthorhombic. *Point Group:* n.d. Myrmekitic and dendritic drop-like grains up to 35  $\mu\text{m}$  within first-generation khatyrkite, and as rounded or irregular grains to 20  $\mu\text{m}$  in cracks and interstices in second-generation khatyrkite.

**Physical Properties:** Hardness = n.d. VHN = 272–318 (20 and 50 g loads).  
D(meas.) = n.d. D(calc.) = 5.12

**Optical Properties:** Opaque. *Color:* Steel-yellow. *Luster:* Metallic. *Anisotropism:* Very weak, from light gray to gray.

R: (400) —, (420) —, (440) 66.8, (460) 66.1, (480) 65.3, (500) 64.5, (520) 63.7, (540) 62.9, (560) 62.1, (580) 61.3, (600) 60.4, (620) 59.7, (640) 58.9, (660) 58.2, (680) 57.7, (700) 57.2

**Cell Data:** *Space Group:* n.d.  $a = 6.95(1)$   $b = 4.16(1)$   $c = 10.04(1)$   $Z = 10$

**X-ray Powder Pattern:** Listvenitovii stream, USSR.  
5.07 (10), 4.12 (8), 3.59 (2), 2.83 (1), 2.607 (1), 2.316 (1), 2.023 (1)

**Chemistry:**

	(1)
Cu	59.9 – 61.7
Zn	7.66 – 9.35
Al	29.3 – 30.4
Total	

(1) Listvenitovii stream, USSR; by electron microprobe, ranges of analyses on nine grains, corresponding to (Cu, Zn)Al.

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

**Association:** Khatyrkite, two unnamed zinc aluminides.

**Distribution:** Near the Listvenitovii stream, Khatirskii ultramafic zone of the Koryak–Kamchata fold area, Koryak Mountains, USSR.

**Name:** For the composition.

**Type Material:** Mining Museum, Leningrad Mining Institute, Leningrad, USSR.

**References:** (1) Razin, L.V., N.S. Rudashevskii, and L.N. Vyal'sov (1985) New natural intermetallic compounds of aluminum, copper and zinc — khatyrkite  $\text{CuAl}_2$ , cupalite  $\text{CuAl}$  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).