Kharaelakhite $(Cu, Pt, Pb, Fe, Ni)_9S_8$

Crystal Data: Orthorhombic (?). *Point Group:* 222, $mm2$, or $2/m\ 2/m\ 2/m$. As elongated crystals, to 120 μm, and thin rims on braggite–cooperite.

Physical Properties: Hardness = n.d. VHN = n.d. D(meas.) = n.d. D(calc.) = 7.78

Optical Properties: Opaque. *Color:* In reflected light, grayish with a brownish lilac tint. *Luster:* n.d. *Anisotropism:* Distinct, from pink-lilac to bluish. *Bireflectance:* Weak.
R_1–R_2: (400) — , (420) — , (440) 37.1–39.6, (460) 36.8–40.3, (480) 36.6–40.9, (500) 36.6–41.4, (520) 36.8–41.8, (540) 37.1–42.2, (560) 37.1–42.2, (580) 37.9–42.8, (600) 38.3–43.0, (620) 38.6–43.3, (640) 38.8–43.7, (660) 39.0–44.4, (680) 39.0–44.4, (700) 38.1–44.8

Cell Data: *Space Group:* $P222$, $Pmm2$, or $Pmmm$. $a = 9.713(5)$ $b = 8.333(5)$ $c = 14.50(1)$ $Z = 4$

X-ray Powder Pattern: Talnakh deposit, Russia.
3.03 (10), 1.854 (8), 1.591 (6), 1.077 (6), 1.865 (4), 1.205 (3), 1.069 (3)

Chemistry:

	(1)
Pt	34.00
Pd	0.19
Cu	12.55
Pb	24.28
Fe	5.59
Ni	4.21
S	19.18
Total	100.00

(1) Talnakh deposit, Russia; by electron microprobe, average of four analyses; corresponds to $(Cu_{2.64}Pt_{2.33}Pb_{1.57}Fe_{1.34}Ni_{0.96}Pd_{0.02})_{\Sigma=8.86}S_{8.00}$.

Occurrence: In hydrothermal chalcopyrite ores.

Association: Braggite–cooperite, chalcopyrite, bornite, millerite.

Distribution: From the Komsomol'skii mine, Talnakh deposit, Noril'sk region, western Siberia, Russia [TL].

Name: For the Kharaelakh Plateau, Noril'sk region, Russia.

Type Material: Institute of Geology of Ore Deposits, Petrography, Mineralogy, and Geochemistry, Moscow; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 84282.

References: (1) Genkin, A.D., T.L. Evstigneeva, L.N. Vyalsov, and I.P. Laputina (1985) Kharaelakhite $(Pt, Cu, Pb, Fe, Ni)_9S_8$ – a new sulfide of platinum, copper and lead. Mineral. Zhurnal, 7, 78–83 (in Russian with English abs.). (2) (1989) Amer. Mineral., 74, 1215–1216 (abs. ref. 1).