

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Needles, to 3.5 cm in length, and in irregular masses.

Physical Properties: *Cleavage:* In three directions. Hardness = 3–3.5 VHN = n.d.
D(meas.) = 5.96–6.05 D(calc.) = 6.14

Optical Properties: Opaque. *Color:* Black; in polished section, bright cream parallel to elongation, stronger yellowish cream perpendicular, dulls on exposure. *Anisotropism:* Strong, distinctly colored.

R_1 – R_2 : (400) 34.0–35.4, (420) 33.7–34.6, (440) 33.4–33.8, (460) 33.2–33.3, (480) 32.9–33.0, (500) 32.8–32.6, (520) 32.6–32.3, (540) 32.5–32.1, (560) 32.3–32.0, (580) 32.0–31.8, (600) 31.8–31.8, (620) 31.6–31.9, (640) 31.4–32.2, (660) 31.4–32.4, (680) 31.2–32.4, (700) 31.2–32.4

Cell Data: *Space Group:* *Immm*. $a = 14.67$ $b = 22.80$ $c = 3.85$ $Z = 4$

X-ray Powder Pattern: Dzhezkazgan, Kazakhstan.

1.832 (100), 2.93 (90), 3.08 (80), 1.946 (70), 1.766 (70), 2.35 (60), 2.01 (60)

Chemistry:

	(1)	(2)
Cu	61.39	58.88
Pb	19.20	17.47
Ag		0.79
Fe	1.83	2.81
S	17.25	20.16
Total	99.67	100.11

(1) Mansfeld, Germany. (2) Dzhezkazgan, Kazakhstan.

Occurrence: In veins cutting the black cupriferous shale (Mansfeld, Germany).

Association: Bornite, chalcocite, chalcopyrite, galena, silver, celestine, anhydrite, calcite.

Distribution: In Germany, in the Mansfeld Kupferschiefer at Eisleben, Saxony-Anhalt [TL], and at Waschenbach, Odenwald, Germany. In the Radka deposit, Pazardzhik, and the Propada deposit, Malko-Tarnovo district, Bulgaria. From near Lairg, Sutherlandshire, Scotland. On the Mürtschenalp, Switzerland. From Långban, Värmland, Sweden. In the Bulancak deposit, Giresun, Turkey. At Tsumeb, Namibia. Rich specimens from Kipushi, 28 km southwest of Lubumbashi, Katanga Province, Congo (Shaba Province, Zaire). At the St. Cloud mine, Sierra Co., New Mexico, USA. In the La Leona mine, Santa Cruz Province, Argentina. At the Yoshino mine, Yamagata Prefecture, Japan. From Mt. Lyell, Tasmania, Australia. Richly crystallized at Dzhezkazgan, Kazakhstan. Probably yet to be recognized in many other mineral deposits.

Name: For Anatolii Georgievich Betekhtin (1897–1962), Russian mineralogist and economic geologist.

Type Material: Mineral Museum, Humboldt University, Berlin, Germany.

References: (1) Schüller, A. and E. Wohlmann (1955) Betehtinit, ein neues Blei-Kupfer-Sulfid aus dem Mansfelder Rücken. *Geologie*, 4, 535–555 (in German). (2) (1956) *Amer. Mineral.*, 41, 371–372 (abs. ref. 1). (3) Dornberger-Schiff, K. von and E. Höhne (1959) Die Kristallstruktur des Betehtinit $\text{Pb}_2(\text{Cu, Fe})_{21}\text{S}_{15}$. *Acta Cryst.*, 12, 646–651 (in German). (4) Schüller, A. (1960) Zur Kenntnis des Betehtinit, $(\text{Cu, Fe})_{10}\text{PbS}_{>6}$. *Neues Jahrb. Mineral., Monatsh.*, 121–131 (in German).