

**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . Fine-grained, as intergrowths with novákite.

**Physical Properties:** *Tenacity:* Malleable. Hardness =  $\sim 4.5$  VHN = 237–270 (25 g load). D(meas.) = 8.38(7) (synthetic). D(calc.) = 8.400

**Optical Properties:** Opaque. *Color:* Silvery gray; in polished section, grayish white to pale blue-gray. *Luster:* Metallic.

R: (400) 49.6, (420) 48.8, (440) 48.0, (460) 46.8, (480) 45.6, (500) 44.5, (520) 43.5, (540) 42.6, (560) 42.0, (580) 41.4, (600) 41.1, (620) 40.8, (640) 40.5, (660) 40.4, (680) 40.5, (700) 40.9

**Cell Data:** *Space Group:*  $Pm\bar{3}m$ .  $a = 11.78079(2)$  (synthetic).  $Z = 4$

**X-ray Powder Pattern:** Černý Důl mine, Czech Republic. 2.259 (100), 2.078 (100), 2.702 (90), 2.398 (80), 1.991 (70), 1.959 (70), 1.776 (70)

Chemistry:	(1)	(2)	(3)
Cu	43.68	43.89	43.16
Ag	31.63	31.63	31.40
As	25.16	24.26	25.44
Total	100.47	99.78	100.00

(1) Černý Důl mine, Czech Republic; by electron microprobe. (2) Wasserfall, France; by electron microprobe. (3) Cu<sub>14</sub>Ag<sub>6</sub>As<sub>7</sub>.

**Occurrence:** In carbonate-rich hydrothermal veins (Černý Důl mine, Czech Republic).

**Association:** Novákite, koutekite, paxite, arsenolamprite, löllingite (Černý Důl mine, Czech Republic); allargentum, koutekite, domeykite (Wasserfall, France); koutekite, domeykite (Meskani, Iran); paxite, lautite, arsenic, silver, löllingite, proustite (Niederbeerbach, Germany).

**Distribution:** From the Černý Důl mine, Krkonoše (Giant Mountains), Czech Republic [TL]. At Wasserfall, about 20 km northwest of Belfort, Haute-Saône, France. From Mühlthal, Niederbeerbach, Odenwald, Hesse, Germany. At the Meskani mine, Anarak district, Iran. In the East Arm area, Great Slave Lake, Northwest Territories, Canada.

**Name:** For Dr. Jan Kutina (1924–), Lecturer at the Charles University, Prague, Czech Republic.

**Type Material:** Charles University, Prague, Czech Republic, 14428; Yale University, New Haven, Connecticut, USA.

**References:** (1) Hak, J., Z. Johan, and B.J. Skinner (1970) Kutinaite, a new copper–silver arsenide mineral from Černý Důl, Czechoslovakia. *Amer. Mineral.*, 55, 1083–1087. (2) Picot, P. and F. Ruhlmann (1978) Présence d'arséniures de cuivre de haute température dans le granite des Ballons (Vosges méridionales). *Bull. Minéral.*, 101, 563–569 (in French with English abs.). (3) Makovicky, M. and Z. Johan (1978) Reflectivity and microhardness of synthetic and natural koutekite, kutinaite and beta-domeykite. *Neues Jahrb. Mineral., Monatsh.*, 421–432. (4) Johan, Z. (1985) The Černý Důl deposit (Czechoslovakia): an example of Ni-, Fe-, Ag-, Cu-arsenide mineralization with extremely high activity of arsenic; new data on paxite, novakite and kutinaite. *Tschermaks Mineral. Petrog. Mitt.*, 34, 167–182. (5) Karanović, L., D. Poleti, E. Mackovicky, T. Balić-Žunić, and M. Makovicky (2002) The crystal structure of synthetic kutinaite, Cu<sub>14</sub>Ag<sub>6</sub>As<sub>7</sub>. *Can. Mineral.*, 40, 1437–1449.