Berzelianite Cu_2Se

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. As thin dendritic crusts; fine grained and disseminated as powdery inclusions.

Physical Properties: *Fracture:* Uneven. *Tenacity:* Somewhat malleable. Hardness = 2.7 VHN = 21–24 (100 g load). D(meas.) = 6.71 D(calc.) = [7.28]

Optical Properties: Opaque. *Color:* Silver-white, tarnishing. *Streak:* Shining. *Luster:* Metallic. *Anisotropism:* Isotropic, may be slightly anisotropic.
R: (400) 25.8, (420) 28.9, (440) 30.0, (460) 30.7, (480) 31.1, (500) 31.0, (520) 30.2, (540) 28.7, (560) 27.0, (580) 25.5, (600) 24.1, (620) 22.9, (640) 21.8, (660) 20.7, (680) 19.7, (700) 18.7

Cell Data: *Space Group:* $Fm3m$ (synthetic). $a = 5.694(7)$ $Z = 4$

X-ray Powder Pattern: Skrikerum, Sweden.
2.03 (100), 3.33 (90), 1.729 (80), 1.171 (40), 1.434 (30), 1.317 (20), 1.105 (20)

Chemistry:

	(1)	(2)
Cu	57.21	61.62
Ag	3.51	
Se	39.22	38.38
Total	99.94	100.00

(1) Skrikerum, Sweden. (2) Cu_2Se.

Polymorphism & Series: Dimorphous with bellidoite.

Occurrence: With other selenides in hydrothermal veinlets in dolostone (Clausthal, Germany); in iron ores (Lerbach, Germany); with other selenides in calcite veins in serpentine (Skrikerum, Sweden); in a gold-quartz-orthoclase deposit (Redjang-Lebong, Sumatra).

Association: Eucairite, clausthalite, tiemannite, umangite, klockmannite, aguilarite, crookesite, athabascaite, stromeyerite, polybasite, pearceite, gold, uraninite, pyrite, marcasite, calcite.

Distribution: At Skrikerum, near Tryserum, Kalmar, Sweden [TL]. From Lerbach, Tilkerode, Zorge, Clausthal, and St. Andreasberg, Harz Mountains; at Niederschlema, Saxony; and the Mullenbach uranium deposit, Black Forest, Germany. In the Czech Republic, in the Habrí and Bukov mines, near Tisnova; at the Petrovice uranium deposit, near Ždăr; and the Předbořice uranium deposit, near Krásna Hora. From the Kyzylalmasay gold deposit, [??where in?? or drop] Uzbekistan. In the Sierra de Umango, and at Tuminico, Sierra de Cacho, La Rioja Province, Argentina. From the Elefante prospect, near the Serra Pelada Au–Pd–Pt deposit, Pará, Brazil. At Redjang-Lebong, Sumatra. From Kalgoorlie and in the Copper Hills prospect, East Pilbara region, Western Australia, and at El Sharana, Northern Territory, Australia. In the Pinky Fault uranium deposit, Lake Athabasca, Saskatchewan, Canada. From the Durant vein, Aurora district, Mineral Co., Nevada, USA.

Name: For Jöns Jacob Berzelius (1779–1848), Swedish chemist, who discovered selenium.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 182–183. (2) Earley, J.W. (1950) Description and synthesis of the selenide minerals. Amer. Mineral., 35, 337–364. (3) Yamamoto, K. and S. Kashida. (1991) X-ray study of the average structures of Cu_2Se and $Cu_{1.8}S$ in the room temperature and the high temperature phases. J. Solid State Chem., 93, 202–211. (4) Sindeeva, N.D. (1964) Mineralogy and types of deposits of selenium and tellurium, 65–67. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 44.