Djurleite $Cu_{31}S_{16}$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals are short, prismatic and thick tabular, as large as 1.5 cm; massive compact. *Twinning:* Common by rotation of 60° around [100].

Physical Properties: Hardness = 2.5–3 VHN = 65–85 (100 g load). D(meas.) = n.d. D(calc.) = 5.749

Optical Properties: Opaque. *Color:* Black; gray in reflected light. *Luster:* Metallic. *Anisotropism:* Weak.
R_1–R_2: (400) 36.1–37.3, (420) 36.2–37.1, (440) 36.0–36.8, (460) 35.7–36.4, (480) 35.1–35.7, (500) 34.2–34.8, (520) 33.1–33.9, (540) 32.1–33.0, (560) 31.0–32.1, (580) 30.0–31.3, (600) 29.0–30.6, (620) 28.1–29.9, (640) 27.4–29.3, (660) 26.6–28.8, (680) 25.9–28.4, (700) 25.3–28.0

Cell Data: *Space Group:* $P2_1/n$. $a = 26.897(6)$ $b = 15.745(3)$ $c = 13.565(2)$ $\beta = 90.13(3)°$ $Z = 8$

X-ray Powder Pattern: Butte, Montana, USA (close to chalcocite).
1.871 (100), 2.387 (90), 1.964 (90), 1.957 (90), 3.386 (50), 3.282 (30), 3.192 (30)

Chemistry:

	(1)	(2)
Cu	78.6	79.34
Ag	0.1	
Fe	0.1	
S	20.2	20.66
Total	99.0	100.00

(1) Seathwaite Tarn, England; by electron microprobe. (2) $Cu_{31}S_{16}$.

Occurrence: With other secondary copper sulfides in enriched zones.

Association: Digenite, bornite, chalcocite, chalcopyrite, anilite, pyrite.

Distribution: In Mexico, in Chihuahua, from Barranca de Cobre [TL] and at the Salvadora mine, Milpillas. In the USA, in many of the porphyry copper deposits of the Western Cordillera including Butte, Silver Bow Co., Montana; from Bisbee, Cochise Co., Globe-Miami, Gila Co., and the Magma mine, Superior, Pinal Co., Arizona; in large isolated crystals from the Gem mine, San Benito Co., California. In Peru, from Morococha. At Tsumeb, Namibia. In the Philippine Islands, at Bagacay, Samar Island. In Japan, from the Ani, Osarizawa, and other mines, Akita Prefecture, and elsewhere. At the Mt. Gunson mine, South Australia. In England, from Seathwaite Tarn, near Coniston, Cumbria; at Wheal Owles and the Dean quarry, Cornwall; in the Merehead and Cannington Park quarries, Somerset; and at Gipsy Lane, Leicester. From Bandaksli, Norway. A relatively common mineral, now identified at a number of other localities.

Name: For Dr. Seved Djurle (1918–), Swedish chemist, who first synthesized the compound later found in nature.

Type Material: Royal Ontario Museum, Toronto, Canada, M25369; National Museum of Natural History, Washington, D.C., USA, 92349.

References: (1) Roseboom, E.H., Jr. (1962) Djurleite, $Cu_{1.96}S$, a new mineral. Amer. Mineral., 47, 1181–1184. (2) Morimoto, N. (1962) Djurleite, a new copper sulfide mineral. Mineral. J. (Japan), 3, 338–344. (3) (1963) Amer. Mineral., 48, 215 (abs. ref. 2). (4) Evans, H.T., Jr (1979) The crystal structures of low chalcocite and djurleite. Zeits. Krist., 150, 299–320. (5) Pósfai, M. and P.R. Busek (1994) Djurelite, digenite, and chalcocite: intergrowths and transformations. Amer. Mineral., 79, 308–315. (6) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 143.