Roxbyite Cu_9S_5

Crystal Data: Monoclinic, pseudohexagonal. *Point Group:* $2/m$, m, or 2. As single crystals, to 0.01 mm, epitaxially intergrown with djurleite; in powdery mixtures with djurleite.

Physical Properties: *Cleavage:* Poor on {100}. Hardness = n.d. VHN = 83 (50 g load). D(meas.) = n.d. D(calc.) = 5.49

Optical Properties: Opaque. *Color:* Blue-black; in reflected light, white to off-white with a blue tinge. *Anisotropism:* Very weak.
R_1–R_2: n.d.

Cell Data: *Space Group:* $C2/m$, Cm, or $C2$. $a = 53.79$ $b = 30.90$ $c = 13.36$ $\beta = 90.0°$ Z = 512

X-ray Powder Pattern: Olympic Dam, Australia.
1.933 (100), 2.375 (90), 1.857 (80), 2.86 (70), 2.630 (50), 1.673 (25), 1.626 (20)

Chemistry:

	(1)	(2)	(3)
Cu	77.25	79.47	78.10
Fe	0.77	0.07	
S	22.19	21.94	21.90
Total	100.21	101.48	100.00

(1) Olympic Dam, Australia; by electron microprobe, corresponding to $(Cu_{8.80}Fe_{0.10})_{\Sigma=8.90}S_{5.00}$. (2) Do.; by electron microprobe, corresponding to $Cu_{9.15}S_{5.00}$. (3) Cu_9S_5.

Occurrence: A low-temperature alteration product of djurleite, in a complex polymetallic hydrothermal deposit (Olympic Dam, Australia); in a porphyry copper deposit (El Teniente mine, Chile).

Association: Djurleite, bornite, pyrite, chalcopyrite, hematite (Olympic Dam, Australia); djurleite (El Teniente mine, Chile).

Distribution: From the Olympic Dam Cu–Au–U deposit, Roxby Downs Station, near Woomera, South Australia [TL]. In the El Teniente mine, 67 km west of Rancagua, O'Higgins Province, Chile.

Name: For its occurrence at Roxby Downs, South Australia.

Type Material: Museum Victoria, Melbourne, Australia, M37924; The Natural History Museum, London, England, 1988,28.

References: (1) Mumme, W.G., G.J. Sparrow, and G.S. Walker (1988) Roxbyite, a new copper sulphide mineral from the Olympic Dam deposit, Roxby Downs, South Australia. Mineral. Mag., 52, 323-330. (2) (1989) Amer. Mineral., 74, 947 (abs. ref. 1).