Alloclasite $(Co, Fe)AsS$

Crystal Data: Monoclinic. *Point Group:* 2. Crystals are prismatic ‖ [010], to 5 mm, in columnar to radiating aggregates; commonly massive.

Physical Properties: *Cleavage:* Perfect on {101}, distinct on {010}. *Fracture:* Uneven to subconchoidal. *Tenacity:* Brittle. Hardness = 5 VHN = 818–940 (100 g load). D(meas.) = 5.91–5.95 D(calc.) = 6.188

Optical Properties: Opaque. *Color:* Steel-gray to silver-white. *Streak:* Nearly black. *Luster:* Bright metallic.
R_1–R_2: (400) 49.5–48.2, (420) 48.7–48.3, (440) 48.2–48.6, (460) 47.8–48.8, (480) 47.6–49.2, (500) 47.6–49.7, (520) 47.8–50.1, (540) 48.0–50.4, (560) 48.1–50.5, (580) 48.4–50.6, (600) 48.6–50.7, (620) 48.8–50.7, (640) 49.0–50.5, (660) 49.1–50.3, (680) 49.1–50.1, (700) 49.2–49.9

Cell Data: *Space Group:* $P2_1$. $a = 4.661$ $b = 5.602$ $c = 3.411$ $\beta = 90°2(5)'$ Z = 2

X-ray Powder Pattern: Oraviţa, Romania.
2.750 (100), 2.469 (90), 1.817 (70), 2.401 (50), 3.58 (30), 2.802 (30), 1.707 (30)

Chemistry:

	(1)	(2)	(3)
Co	25.1	23.6	23.3
Fe	6.7	9.1	7.7
Ni	1.0		
As	47.5	45.5	47.3
S	19.9	20.9	20.7
Total	100.2	99.1	99.0

(1) Elizabeth mine, Romania; by electron microprobe, corresponding to $(Co_{0.76}Fe_{0.21}Ni_{0.03})_{\Sigma=1.00}As_{1.13}S_{1.11}$. (2) North Rhine-Westphalia, Germany; by electron microprobe, corresponding to $(Co_{0.71}Fe_{0.29})_{\Sigma=1.00}As_{1.08}S_{1.15}$. (3) Dogatani mine, Japan; by electron microprobe, corresponding to $(Co_{0.74}Fe_{0.26})_{\Sigma=1.00}As_{1.20}S_{1.23}$.

Polymorphism & Series: Dimorphous with glaucodot.

Occurrence: In calcite or quartz veins of apparently low-temperature, late-stage hydrothermal origin. Also in silicified, recrystallized metamorphic rock.

Association: Gold, silver, glaucodot, cobaltite, cobaltian arsenopyrite, emplectite, bismuthinite, sphalerite, calcite, quartz.

Distribution: In Romania, from Oraviţa (Oravicza)[TL], as in the Elizabeth mine. At Bieber, near Hanau, Hesse, Germany. From the San Juan de Plan mine, Gistain Valley, Huesca, Spain. In the Silverfields mine, Cobalt, and the Siscoe Metals mine, Miller Lake, Gowganda, Ontario, Canada. In the USA, in the Kibblehouse quarry, Perkiomenville, Montgomery Co., Pennsylvania. From Bou Azzer, Morocco. At the Scar Crag mine, Braithwaite, Cumbria, England. In the Lautaret Pass, Hautes-Alpes, France. From the Dogatani mine, [??Prefecture-ck Min Japan], Japan. In Australia, at Mount Isa, Queensland, and in the Moonta mines, Yorke Peninsula, South Australia.

Name: From the Greek for *other*, and *to break*, because its cleavage was believed to be different from marcasite, which it resembles.

Type Material: n.d.

References: (1) Kingston, P.W. (1971) On alloclasite, a Co–Fe sulpharsenide. Can. Mineral., 10, 838–846. (2) (1972) Amer. Mineral., 57, 1561 (abs. ref. 1). (3) Scott, J.D. and W. Nowacki (1976) The crystal structure of alloclasite, CoAsS, and the alloclasite–cobaltite transformation. Can. Mineral., 14, 561–566. (4) Petruk, W., D.C. Harris, and J.M. Stewart (1971) Characteristics of the arsenides, sulpharsenides and antimonides. Can. Mineral., 11, 149–186. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 9.