Caswellsilverite $NaCrS_2$

Crystal Data: Hexagonal. *Point Group:* $\overline{3}\ 2/m$. As anhedral grains, to 1 mm. *Twinning:* The lamellar twinning observed may be the result of pressure-induced deformation.

Physical Properties: Hardness = Very soft. VHN = 17–45 (15 g load) (synthetic). D(meas.) = 3.21 (synthetic). D(calc.) = [3.23]

Optical Properties: Opaque. *Color:* Yellow-gray to pale gray in reflected light. *Luster:* Metallic. *Pleochroism:* Distinct, pale yellow to gray in air, pale yellow with a greenish tint to gray in oil.
R_1–R_2: (400) 19.3–26.7, (420) 20.1–26.2, (440) 21.9–26.3, (460) 21.5–27.4, (480) 21.7–30.0, (500) 22.0–31.6, (520) 22.0–32.3, (540) 21.8–32.8, (560) 21.7–33.0, (580) 21.3–32.5, (600) 20.8–32.2, (620) 20.5–31.4, (640) 20.5–30.7, (660) 20.1–29.4, (680) 18.1–26.7, (700) 18.0–28.8

Cell Data: *Space Group:* $R\overline{3}m$. $a = 3.55$ $c = 19.5$ $Z = 3$

X-ray Powder Pattern: Norton County meteorite.
2.60 (100), 2.07 (80), 1.910 (80), 1.779 (80), 6.49 (70), 1.465 (60), 1.134 (60)

Chemistry:

	(1)	(2)	(3)
Na	15.7	15.5	16.53
Cr	37.4	37.6	37.38
Fe		0.86	
Zn		0.0	
Ca		0.13	
Mg		0.10	
Mn	0.08	0.10	
Ti	0.18	0.0	
S	46.3	46.0	46.09
Total	99.66	100.29	100.00

(1) Norton County meteorite; by electron microprobe. (2) Qingzhen meteorite; by electron microprobe, average of three analyses. (3) $NaCrS_2$.

Occurrence: As inclusions in enstatite crystals and in the brecciated matrix of a meteorite (Norton County meteorite); between coarse pyroxene grains in chondrules in a meteorite (Qingzhen meteorite).

Association: Enstatite, cronusite, daubréelite, titanoan troilite, ferromagnesian alabandite, oldhamite, kamacite, perryite, schollhornite (Norton County meteorite); troilite, kamacite, oldhamite (Qingzhen meteorite).

Distribution: Found in the Norton County enstatite achondrite [TL] and the Qingzhen enstatite chondrite meteorites.

Name: To honor Dr. Caswell Silver (1916–), American geologist associated with the University of New Mexico, Institute of Meteoritics, Albuquerque, New Mexico, USA.

Type Material: n.d.

References: (1) Okada, A. and K. Keil (1982) Caswellsilverite, $NaCrS_2$: a new mineral in the Norton County enstatite achondrite. Amer. Mineral., 67, 132–136. (2) Grossman, J.N., A.E. Rubin, E.R. Rambaldi, R.S. Rajan, and J.T. Wasson (1985) Chondrules in the Qingzhen type-3 enstatite chondrite: possible precursor components and comparison to ordinary chondrite chondrules. Geochim. Cosmochim. Acta, 49, 1781–1795. (3) Rüdorff, W. and K. Stegemann (1943) Kristallstruktur und magnetisches Verhalten der Alkalithiochromite. Z. Anorg. Allg. Chem., 251, 376–395 (in German).