Freboldite CoSe

Crystal Data: Hexagonal. *Point Group:* $6/m\ 2/m\ 2/m$. Massive; as embedded grains.

Physical Properties: Hardness = < 6, much softer than trogtalite and hastite.
VHN = n.d. D(meas.) = n.d. D(calc.) = 7.70

Optical Properties: Opaque. *Color:* Similar to nickeline, but more intense violet in oil.
Anisotropism: Less anisotropic than nickeline.
R_1–R_2: n.d.

Cell Data: *Space Group:* $P6_3/mmc$. a = 3.61 $c = 5.28$ Z = 2

X-ray Powder Pattern: Steinbruch, Germany.
2.05 (100), 1.066 (100), 0.963 (100), 2.4 (50), 1.71 (50), 1.08 (50), 0.992 (50)

Chemistry: Composition established by analogy to synthetic material.

Mineral Group: Nickeline group.

Occurrence: In dolostone veinlets (Steinbruch, Germany).

Association: Clausthalite, nickeline, guanajuatite, hastite, trogtalite, bornhardtite, chalcopyrite, millerite, sphalerite, hematite.

Distribution: In Germany, in the Harz Mountains, from the Trogtal quarry, Steinbruch [TL], and at Rote Berg, St. Andreasberg; also from Hartenstein, Saxony. In the Pinky Fault uranium deposit, Saskatchewan, Canada. At Temple Mountain, Emery Co., Utah, USA.

Name: In honor of Professor Georg Frebold (1891–?) of Hannover, Germany.

Type Material: n.d.

References: (1) Ramdohr, P. and Schmitt, M. (1955) Vier neue natüraliche kobaltselenide von Steinbruch Trogtal bei Lautenthal im Harz. Neues Jahrb. Mineral., Monatsh., 133–142 (in German). (2) (1956) Amer. Mineral., 41, 164–165 (abs. ref. 1). (3) Strunz, H. (1957) Mineralogische Tabellen (3rd edition), 98 (in German). (4) (1959) Amer. Mineral., 44, 907 (abs. ref. 3). (5) Goldschmidt Skr.Norske Vid.-Akad. Oslo, I: Mat. Naturv. Kl. 1926 (8), 45–?? (str - Strunz??)