Nordströmite $Pb_3CuBi_7(S,Se)_{14}$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Fibrous, to 3.5 mm.

Physical Properties: *Cleavage:* Good, parallel to crystal elongation. Hardness = 2–2.5 VHN = 130–143 (25 g load). D(meas.) = n.d. D(calc.) = 7.12

Optical Properties: Opaque, presumably. *Color:* Lead-gray; white with a gray tint in reflected light. *Anisotropism:* Dark gray to brown.
R_1–R_2: n.d.

Cell Data: *Space Group:* $P2_1/m$. $a = 17.97(8)$ $b = 4.11(2)$ $c = 17.62(8)$ $\beta = 94.3(2)°$ $Z = 2$

X-ray Powder Pattern: Falun, Sweden.
3.066 (10), 2.242 (7), 3.583 (5), 3.882 (3b), 3.484 (3), 3.427 (3), 3.012 (3)

Chemistry:

	(1)
Pb	21.73
Cu	2.04
Bi	51.95
Se	11.16
S	10.88
Total	[97.76]

(1) Falun, Sweden; by electron microprobe, original total given as 97.75%; corresponding to $Pb_{3.06}Cu_{0.94}Bi_{7.24}(S_{9.88}Se_{4.12})_{\Sigma=14.00}$.

Occurrence: Of hydrothermal origin.

Association: Wittite, friedrichite, bismuthinite (Falun, Sweden); gold, chalcopyrite, neyite, quartz (Johnny Lyon Hills, Arizona, USA).

Distribution: From Falun, Kopparberg, Sweden [TL]. In the Johnny Lyon Hills, north of Benson, Cochise Co., Arizona, USA.

Name: To honor T. Nordström (1843–1920), Swedish mining engineer who first studied the sulfosalts from Falun.

Type Material: Royal Ontario Museum, Toronto, Canada, M12992.

References: (1) Mumme, W.G. (1980) Seleniferous lead–bismuth sulphosalts from Falun, Sweden: weibullite, wittite, and nordströmite. Amer. Mineral., 65, 789–796. (2) Mumme, W.G. (1980) The crystal structure of nordströmite $CuPb_3Bi_7(S,Se)_{14}$, from Falun, Sweden: a member of the junoite homologous series. Can. Mineral., 18, 343–352.