Violarite $Fe^{2+}Ni_2^{3+}S_4$

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. As nodules up to 0.5 cm and massive.

Physical Properties: *Cleavage:* Perfect on {001}. *Tenacity:* Brittle. Hardness = 4.5–5.5 VHN = 455–493 (100 g load). D(meas.) = n.d. D(calc.) = 4.79

Optical Properties: Opaque. *Color:* Violet-gray; distinctly violet in reflected light. *Luster:* Metallic.

R: (400) 39.0, (420) 39.6, (440) 40.2, (460) 40.6, (480) 41.0, (500) 41.4, (520) 41.9, (540) 42.5, (560) 43.1, (580) 43.8, (600) 44.3, (620) 44.8, (640) 45.4, (660) 45.8, (680) 46.2, (700) 46.6

Cell Data: *Space Group:* $Fd3m$. a = 9.51 Z = 8

X-ray Powder Pattern: Vermilion mine, Sudbury, Canada.
2.85 (100), 1.674 (80), 1.820 (60), 2.36 (50), 1.059 (50), 1.183 (40), 1.115 (40)

Chemistry:

	(1)	(2)	(3)
Fe	17.01	19.33	18.52
Ni	38.68	33.94	38.94
Co	1.05	2.50	
Cu	1.12	1.05	
S	41.68	42.17	42.54
insol.	0.40	1.31	
Total	99.94	100.30	100.00

(1) Vermilion mine, Sudbury, Canada; contains trace chalcopyrite. (2) Friday mine, Julian, California, USA; contains trace chalcopyrite. (3) $FeNi_2S_4$.

Mineral Group: Linnaeite group.

Occurrence: Of hydrothermal origin, with other sulfides.

Association: Pyrrhotite, millerite, chalcopyrite, pentlandite.

Distribution: In the USA, from the Friday mine, Julian, San Diego Co., California; the Key West mine, Clark Co., Nevada; the Copper King mine, Gold Hill district, Boulder Co., Colorado; the Lick Fork deposit, Floyd Co., Virginia; and the Gap Nickel mine, Lancaster Co., Pennsylvania. In Canada, from the Vermilion, Levack, and Worthington mines, Sudbury, Ontario; at the Marbridge mine, Malartic, Quebec; in the Rottenstone mine, Saskatchewan; and from a number of other minor occurrences. At the Madziwa (Dry Nickel) mine, Bindura, Zimbabwe. From the Praborna mine, St. Marcel, Valle d'Aosta, Piedmont, Italy. At Kambalda, 56 km south of Kalgoorlie, and Kalgoorlie, Western Australia, and near Mount Colin, Queensland, Australia. Known from a few other localities.

Name: From the Latin for *violet*, its color on a polished surface.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 262–265. (2) Berry, L.G. and R.M. Thompson (1962) X-ray powder data for the ore minerals. Geol. Soc. Amer. Mem. 85, 77–78.