Taenite γ–(Fe, Ni)

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. As small plates and grains, fine scales, and large ellipsoidal masses, to 40 kg (terrestrial); in intergrowths with, or narrow selvages around, kamacite in meteorites.

Physical Properties: *Tenacity:* Malleable, flexible. Hardness = 5–5.5 VHN = n.d. D(meas.) = 7.8–8.22 D(calc.) = 8.29 (ordered). Strongly magnetic.

Optical Properties: Opaque. *Color:* Silver-white to grayish white. *Luster:* Metallic.
R: n.d.

Cell Data: *Space Group:* $Fm3m$. a = 7.146 Z = 32

X-ray Powder Pattern: Linville ataxite meteorite - ordered structure.
3.340 (100), 2.879 (80), 2.526 (80), 4.239 (60), 2.279 (10), 2.187 (10), 2.070 (10)

Chemistry:

	(1)	(2)	(3)
Fe	68.13	74.78	25.24
Ni	30.85	24.32	74.17
Co	0.69	0.33	0.46
Cu	0.33		
P			0.04
S			0.09
C		0.50	
Total	100.00	99.93	100.00

(1) Cañon Diablo meteorite. (2) Welland meteorite. (3) Josephine Co., Oregon, USA (terrestrial).

Occurrence: In massive serpentine bodies, as particles in placer sands, and as loose, detached masses which give few clues as to their ultimate origin, which was most likely hydrothermal, igneous, or metamorphic. Important in meteorites.

Association: Kamacite, graphite, cohenite, moissanite, schreibersite, troilite, daubréelite, oldhamite, other meteorite minerals.

Distribution: From Gorge River, South Island, New Zealand [TL]. In the USA, in Josephine and Jackson Cos., Oregon; and in California, near South Fork, Smith River, Del Norte Co. In Canada, on the Fraser River, Lillooet district, British Columbia. Taenite is found in all octahedrite meteorites which exhibit Widmannstätten structures as well as in some nickel-rich ataxites.

Name: From the Greek for *band* or *strip*, in allusion to its platy structure.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 117–119 ["nickel-iron"]. (2) Ramsden, A.R. and E.N. Cameron (1966) Kamacite and taenite superstructures and a metastable tetragonal phase in iron meteorites. Amer. Mineral., 51, 37–55. (3) Albertsen, J.F., G.B. Jensen, and J.M. Knudsen (1978) Structure of taenite in two iron meteorites. Nature, 273, 453–454. (3) Ramdohr, P. (1969) The ore minerals and their intergrowths, (3rd edition), 360–361.