

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As lamellar crystals to 0.4 mm, flattened on (001) with dominant {001} and probable {110} and {100}; pseudo-monoclinic habit. As rounded nodules to 0.5 mm. *Twinning:* Common, with possible composition plane {110}.

Physical Properties: *Cleavage:* None. *Fracture:* n.d. *Tenacity:* Very brittle. Hardness = 5-6 VHN = n.d. D(meas.) = n.d. D(calc.) = 6.729 (Israel); 7.10 (meteorite)

Optical Properties: Opaque. *Color:* Light straw-yellow, steel-gray; creamy white in reflected light. *Streak:* n.d. *Luster:* Bright metallic.

Optical Class: n.d. *Anisotropism:* Distinct, light to dark cream. R₁-R₂: (440) 48.4-37.2, (460) 46.7-36.8, (480) 47.0-37.6, (500) 47.5-38.1, (520) 47.6-38.8, (540) 48.2-39.2, (560) 49.0-39.9, (580) 49.6-40.7, (600) 50.1-41.6, (620) 50.5-41.9, (640) 51.9-43.0, (660) 52.3-44.3, (680) 53.3-45.0, (700) 54.4-46.2

Cell Data: *Space Group:* Pnma. *a* = 5.792(7) *b* = 3.564(4) *c* = 6.691(8) *Z* = 4

X-ray Powder Pattern: Onello iron meteorite. 2.238 (100), 2.120 (80), 2.073 (70), 1.884 (50), 1.843 (40), 1.788 (40), 1.774 (40)

Chemistry:	(1)	(2)
Fe	57.7	76.24
Ni	20.7	1.64
Co	1.4	0.19
Mo		0.33
P	20.4	21.58
Total	100.2	100.00

(1) Onello iron meteorite; average of nine electron microprobe analyses; corresponds to (Fe_{1.51}Ni_{0.50}Co_{0.03})_{Σ=2.04}P_{0.96}. (2) Halamish Wadi, Hatrurim Basin, Israel; electron microprobe analysis; corresponds to (Fe_{1.95}Ni_{0.04}Co_{0.005}Mo_{0.005})_{Σ=2.00}P_{1.00}.

Polymorphism & Series: High pressure polymorph of barringerite.

Occurrence: A primary phase in nickel-rich ataxite meteorites. In surficial terrestrial pyrometamorphic rocks, possibly formed by transformation from barringerite.

Association: Nickelphosphide, schreibersite, awaruite, graphite; barringerite, diopside (Israel).

Distribution: From from the Onello iron meteorite (Ni-rich ataxite) [TL] and the Barbianello and Santa Catharina meteorites. In the Halamish Wadi (Nahal Halamish), Hatrurim Basin, Israel.

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Type Material: Mineralogical Museum, Department of Mineralogy, St. Petersburg State University, Russia (1/18632).

References: (1) Britvin, S.N., N.S. Rudashevsky, S.V. Krivovichev, P.C. Burns, and Y.S. Polekhovskiy (2002) Allabogdanite, (Fe,Ni)₂P, a new mineral from the Onello meteorite: The occurrence and crystal structure. *Amer. Mineral.*, 87, 1245-1249. (2) Britvin, S.N., V.V. Shilovskikh, R. Pagano, N.S. Vlasenko, A.N. Zaitsev, M.G. Krzhizhanovskaya, M.S. Lozhkin, A.A. Zolotarev, and V.V. Gurzhiy (2019) Allabogdanite, the high-pressure polymorph of (Fe,Ni)₂P, a stishovite-grade indicator of impact processes in the Fe-Ni-P system. *Scientific Reports*, 9, 1047. (3) Britvin, S.N., O.S. Vereshchagin, V.V. Shilovskikh, M.G. Krzhizhanovskaya, L.A. Gorelova, N.S. Vlasenko, A.S. Pakhomova, A.N. Zaitsev, A.A. Zolotarev, M. Bykov, M.S. Lozhkin, and F. Nestola (2021) Discovery of terrestrial allabogdanite (Fe,Ni)₂P, and the effect of Ni and Mo substitution on the barringerite-allabogdanite high-pressure transition. *Amer. Mineral.*, 106, 944-952.