Nickolayite FeMoP

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. As irregularly shaped grains to 80 μm.

Physical Properties: *Cleavage*: None. *Tenacity*: Ductile. *Fracture*: n.d. Hardness = 5-6
VHN = 490-588, 538 average (50 g load). D(meas.) = n.d. D(calc.) = 7.819

Optical Properties: Opaque. *Color*: Light gray to grayish white, white in reflected light.
Streak: n.d. *Luster*: Metallic.
Optical Class: Very weak anisotropy. No bireflectance or pleochroism.
R_1-R_2: (470) 48.5-46.5, (546) 50.5-48.5, (589) 51.8-49.9, (650) 53.9-52.0

Cell Data: *Space Group: Pnma*. *a* = 5.9519(5) *b* = 3.7070(3) *c* = 6.8465(6) Z = 4

X-Ray Diffraction Pattern: Jizah District, Amman Governorate, Jordan.
2.298 (100), 2.181 (89), 2.113 (26), 3.238 (21), 1.838 (18), 1.927 (14), 1.388 (13)

Chemistry:

	(1)
Fe	32.21
Mo	47.06
Ni	3.69
Co	0.13
P	17.45
Total	100.54

(1) Jizah District, Amman Governorate, average electron microprobe analysis; corresponds to $Fe_{1.00}(Mo_{0.87}Ni_{0.11}Fe_{0.02})_{\Sigma=1.00}P_{1.00}$.

Mineral Group: Fe-analogue of monipite.

Occurrence: An accessory phase in fused clinopyroxene-plagioclase rocks. Probably connected to co-reduction of molybdenum- and phosphorus-bearing minerals during high-temperature pyrometamorphism.

Association: Baryte, tridymite, chromite, hematite, pyrrhotite, fluorapatite, titanite, powellite.

Distribution From the Jizah District, Amman Governorate, Jordan.

Name: Honors Dieter *Nickolay* (b. 1941), German mineral collector and mineralogist, for his contributions to systematic mineralogy.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (5290/1).

References: (1) Murashko, M.N., S.N. Britvin, Y. Vapnik, Y.S. Polekhovsky, V.V. Shilovskikh, A.N. Zaitsev, and O.S. Vereshchagin (2022) Nickolayite, FeMoP, a new natural molybdenum phosphide. Mineral. Mag., 86, 749-757.