Johanngeorgenstadtite $Ni^{2+}_{4.5}(AsO_4)_3$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. In sugary aggregates of irregular, rounded grains or prismatic crystals to ~70 μm

Physical Properties: Cleavage: On {010}, {110} and {1$\bar{1}$ 0}. *Tenacity*: Brittle. *Fracture*: Curved and stepped. Hardness = ~5 D(meas.) = n.d. D(calc.) = 4.801 Nonfluorescent.

Optical Properties: Transparent. *Color*: Pink-orange. *Streak*: Pale pink. *Luster*: Resinous to subadamantine.
Optical Class: Biaxial (-). α = 1.83(1) β = 1.86(1) γ = 1.88(1) 2V(meas.) = 78(1)°
2V(calc.) = 77.3° *Pleochroism*: Distinct, *X* = violet, *Y* = light olive, *Z* = yellow.
Absorption: *X* > *Y* > *Z*.

Cell Data: *Space Group*: *C*2/*c*. *a* = 11.993(3) *b* = 12.753(3) *c* = 6.696(2) β = 113.302(8)° Z = 4

X-ray Powder Pattern: Johanngeorgenstadt, Erzgebirgskreis, Saxony, Germany.
2.748 (100), 3.215 (48), 1.661 (28), 2.623 (20), 3.076 (18), 1.948 (17), 3.514 (16)

Chemistry:

	(1)	(2)
NiO	39.12	49.37
CoO	8.23	
CuO	1.54	
As_2O_5	51.12	50.63
Total	100.01	100.00

(1) Johanngeorgenstadt, Erzgebirgskreis, Saxony, Germany; average electron microprobe and Raman spectroscopic analyses; corresponds to $(Ni^{2+}_{3.56}Co^{2+}_{0.75}Cu^{2+}_{0.13})_{\Sigma=4.44}As_{3.02}O_{12}$.
(2) $Ni^{2+}_{4.5}(AsO_4)_3$.

Polymorphism & Series: Dimorph of niasite.

Mineral Group: Alluaudite supergroup.

Occurrence: Secondary, likely formed from the breakdown of primary nickeline under dry (low relative humidity) and oxidizing (high oxygen fugacity) conditions.

Association: Niasite, aerugite, bunsenite, quartz, rooseveltite, xanthiosite.

Distribution: From Johanngeorgenstadt, Erzgebirgskreis, Saxony, Germany.

Name: For the locality, *Johanngeorgenstadt*, Germany.

Type Material: American Museum of Natural History, New York, New York, USA (17956).

References: (1) Kampf, A.R., B.P. Nash, J. Plášil, J.B. Smith, and M.N. Feinglos (2020) Niasite and johanngeorgenstadtite, $Ni^{2+}_{4.5}(AsO_4)_3$ dimorphs from Johanngeorgenstadt, Germany. Eur. J. Mineral., 32(3), 373-385.