Ankinovichite $(Ni,Zn)Al_4(VO_3)_2(OH)_{12}•2H_2O$

Crystal Data: Monoclinic. *Point Group:* 2/*m*. As prismatic to bladed crystals to 0.5 mm. V-shaped twins noted.

Physical Properties: *Cleavage:* Perfect (010). *Fracture:* n.d. *Tenacity:* Brittle. Hardness = 2.5-3 VHN = 68 D(meas.) = 2.48(2) D(calc.) = 2.476

Optical Properties: Transparent. *Color:* Colorless to bluish light green. *Streak:* n.d. *Luster:* Vitreous.
Optical Class: Biaxial (+). α = 1.653(2) β = 1.677(2) γ = 1.706(3) 2V(meas.) = 86(2)° 2V(calc.) = 86° *Dispersion:* Strong, $r < v$. *Pleochroism:* None.

Cell Data: Space Group: $P2_1/n$. a = 17.8098(8) b = 5.1228(2) c = 8.8665(4) β = 92.141(1)° Z = 2

X-ray Powder Pattern: Mount Kara-Chagyr, Krygyzstan.
8.89 (100), 7.83 (100), 1.970 (80), 1.904 (70), 3.266 (50), 1.605 (50), 3.354 (40)

Chemistry:

	(1)
Al_2O_3	33.82
SiO_2	0.59
V_2O_5	28.41
FeO	0.14
NiO	8.43
CuO	0.27
ZnO	2.24
H_2O	23.30
Total	97.20

(1) Mount Kara-Chagyr, Krygyzstan; electron microprobe analysis, H_2O by Penfield method, VO_4 confirmed by IR spectroscopy, corresponding to $(Ni_{0.68}Zn_{0.17}Cu_{0.02}Fe_{0.01})_{\Sigma=0.88}Al_4(VO_3)_{1.88}Si_{0.06}(OH)_{12.12}(H_2O)_{2.67}$.

Occurrence: A low-temperature hydrothermal or weathering-derived mineral. As overgrowths on alvanite in vanadium-bearing schists (Kurumsak); also occurs in fractures and as cement in schist fragments within a serpentinite matrix (Mount Kara-Chagyr).

Association: Alvanite, volborthite, carnotite, goethite (Kurumsak); allophone, kolovratite, volborthite, nickelalumite, metatyuyamunite, roscoelite, tangeite, gypsum (Mount Kara-Chagyr).

Distribution: Kurumsak, Chemkent Oblast, Kara-Tau Range, southern Kazakhstan, and Mount Kara-Chagyr, Isfayramsay River, Osh Oblast, Krygyzstan.

Name: Honors mineralogist Ekaterina Aleksandrovna Ankinovich (1911-1991) and geologist Stepan Gerasimovich Ankinovich (1912-1985).

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Science, Moscow, Russia; 6798.

References: (1) Karpenko, V.Yu., L.A. Pautov, E.V. Sokolova, F.G. Hawthorne, A.A. Agakhanov, T.V. Dikaya, and G.K. Bekenova (2004) Ankinovichite, the nickel analogue of alvanite, a new mineral from Kurumsak (Kazakhstan) and Kara-Chagyr (Krygyzstan). Zapiski Vseross. Mineral. Obshch. 133(2), 59-70 (in Russian, English abstract). (2) (2005) Amer. Mineral., 90, 1951-1952 (abs. ref. 1).