Dymkovite $Ni(UO_2)_2(As^{3+}O_3)_2 \cdot 7H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As prismatic, lath-shaped to acicular crystals, to 0.5 mm, elongated on [010]; also as sprays or divergent groups to 1.5 mm, or as crusts.

Physical Properties: *Cleavage*: None. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = ~ 3 D(meas.) = n.d. D(calc.) = 3.806 Radioactive.

Optical Properties: Transparent. *Color*: Bright yellow. *Streak*: Pale yellow. *Luster*: Vitreous. *Optical Class*: Biaxial (-). $\alpha = 1.625(2)$ $\beta = 1.735(5)$ $\gamma = 1.745(3)$ 2V(meas.) = 20(10)° 2V(calc.) = 32° *Dispersion*: Strong, $r > v$. *Pleochroism*: Strong, X = very pale yellowish-green, $Y = Z$ = light greenish yellow. *Absorption*: $Z > Y > X$.

Cell Data: *Space Group*: *C*2/*m*. $a = 17.91(2)$ $b = 6.985(9)$ $c = 6.594(9)$ $\beta = 99.89(2)°$ $Z = 2$

X-ray Powder Pattern: Belorechenskoye deposit, Northern Caucasus, Russia.
8.93 (100), 4.463 (34), 2.846 (27), 3.008 (26), 3.523 (23), 3.276 (21), 4.883 (17)

Chemistry:

	(1)	(2)
MgO	1.11	
FeO	0.24	
NiO	5.40	7.70
ZnO	0.23	
As_2O_3	19.57	20.38
P_2O_5	0.58	
UO_3	59.43	58.93
H_2O	[13.44]	12.99
Total	100.00	100.00

(1) Belorechenskoye deposit, Northern Caucasus, Russia; average of 12 electron microprobe analyses, H_2O by difference, presence of H_2O, PO_4, UO_2, $As^{3+}O_4$ groups confirmed by IR spectroscopy; corresponding to $(Ni_{0.69}Mg_{0.26}Fe_{0.03}Zn_{0.03})_{\Sigma=1.01}U_{1.97}(As^{3+}_{1.88}P_{0.08})_{\Sigma=1.96}O_{9.94} \cdot 7.06H_2O$.
(2) $Ni(UO_2)_2(As^{3+}O_3)_2 \cdot 7H_2O$.

Mineral Group: Autunite group.

Occurrence: A secondary mineral found in small cavities and cracks in slightly oxidized uraninite-bearing dolomite veins.

Association: Rauchite, uraninite, nickeline, gersdorffite, limonite, annabergite.

Distribution: From adit #1, Belorechenskoye deposit, Belaya River basin, 60 km south of Maikop city, Adygea Republic, Northern Caucasus, Russia.

Name: Honors Russian mineralogist, Yuriy Maksimovich Dymkov (b. 1926), a specialist in the mineralogy and geology of uranium deposits.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4065/1).

References: (1) Pekov, I.V., V.V. Levitskiy, S.V. Krivovichev, A.A. Zolotarev, N.V. Chukanov, I.A. Bryzgalov, and A.E. Zadov (2012) New nickel-uranium-arsenic mineral species from the oxidation zone of the Belorechenskoye deposit, Northern Caucasus, Russia: II. Dymkovite, $Ni(UO_2)_2(As^{3+}O_3)_2 \cdot 7H_2O$, a seelite-related arsenite. European Journal of Mineralogy, 24(5), 923-930. (2) (2015) Amer. Mineral., 100, 336-338 (abs. ref. 1).