Satpaevite $Al_{12}V_2^{4+}V_6^{5+}O_{37}\cdot 30H_2O$

Crystal Data: Orthorhombic (?). *Point Group:* n.d. Crystals, to 0.1 mm, platy with hexagonal to rounded outlines, in fine granular aggregates, may be foliated.

Physical Properties: *Cleavage:* One direction, perfect, pinacoidal. Hardness = 1.5 in aggregates. D(meas.) = 2.4 D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* Canary-yellow to saffron-yellow; in transmitted light, greenish yellow to pale olive. *Luster:* Pearly on the cleavage; dull when fine-grained. *Optical Class:* Isotropic to biaxial (+). *Pleochroism:* Weak. *Orientation:* Extinction parallel. *Absorption:* $Z > X$. $\alpha = 1.676$ (α') β = n.d. $\gamma = 1.690$ (γ') 2V(meas.) = $\sim 70°$

Cell Data: *Space Group:* n.d. Z = n.d.

X-ray Powder Pattern: Kara-Tau Mountains, Kazakhstan.
1.918 (10), 2.330 (9), 1.471 (8), 3.905 (7), 5.86 (6), 1.554 (5), 4.425 (4)

Chemistry:

	(1)	(2)	(3)
V_2O_5	27.70	27.66	29.28
V_2O_4	7.40	7.30	8.90
SiO_2	1.40		
Al_2O_3	32.00	30.80	32.82
Fe_2O_3	0.25		
MgO	1.20		
CaO	1.70		
H_2O^+	22.80		
H_2O^-	4.10		
H_2O			29.00
Total	98.55		100.00

(1) Kara-Tau Mountains, Kazakhstan; spectrographic analysis shows Zn 0.5%, Cu 0.2%, Ni 0.1%, Cr 0.03%, Ba 0.01%. (2) Do.; partial reanalysis. (3) $Al_{12}V_2^{4+}V_6^{5+}O_{37}\cdot 30H_2O$.

Occurrence: In the oxidation zone of a vanadiferous clay-anthraxolite horizon.

Association: Steigerite, vanalite, hewettite, delvauxite, gypsum.

Distribution: In the Kurumsak and Balasauskandyk vanadium deposits, northwest Kara-Tau Mountains, southern Kazakhstan. northwestern Kara-Tau Mountains, Kazakhstan.

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Type Material: Mning Institute, St. Petersburg, 1251/1; Vernadsky Geological Museum, Moscow, 49850; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 62760.

References: (1) Ankinovich, E.A. (1959) New vanadium minerals – satpaevite and al'vanite [alvanite]. Zap. Vses. Mineral. Obshch., 88, 157–164 (in Russian). (2) (1959) Amer. Mineral., 44, 1325–1326 (abs. ref. 1).