Sodium uranospinite $(Na_2, Ca)(UO_2)_2(AsO_4)_2 \cdot 5H_2O$

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Imperfect lathlike to fibrous elongated crystals, to 2 cm, in divergent or irregular aggregates, and as incrustations.

Physical Properties: *Cleavage:* On {001}, perfect; on {010}, distinct. Hardness = 2.5 D(meas.) = 3.846 D(calc.) = [3.66] Fluoresces bright yellowish green under UV. Radioactive.

Optical Properties: Semitransparent. *Color:* Yellow-green, lemon-yellow, straw-yellow. *Luster:* Vitreous, pearly on cleavages.
Optical Class: Uniaxial (–), commonly anomalously biaxial (–). *Pleochroism:* Faint; X = colorless; $Y = Z$ = yellow. $\omega = 1.612$ $\epsilon = 1.585$ 2V(meas.) = Small.

Cell Data: *Space Group:* $[P4/nmm]$ (by analogy to meta-autunite). $a = 7.12$ $c = 8.61$ Z = 1

X-ray Powder Pattern: Bota-Burum deposit, Kazakhstan.
8.48 (10), 3.68 (10), 3.292 (9), 1.837 (9), 1.987 (8), 1.634 (8), 5.45 (7)

Chemistry:

	(1)
UO_3	58.29
P_2O_5	1.65
As_2O_5	20.84
SiO_2	2.39
Al_2O_3	0.91
Fe_2O_3	0.57
MgO	trace
CaO	1.87
Na_2O	3.91
K_2O	0.00
H_2O^+	3.49
H_2O^-	6.00
Total	99.92

(1) Bota-Burum deposit, Kazakhstan; neglecting Si, Al, Fe as impurities, corresponds to $(Na_{1.26}Ca_{0.34})_{\Sigma=1.60}(UO_2)_{2.04}[(AsO_4)_{1.82}(PO_4)_{0.22}]_{\Sigma=2.04} \cdot 5.27H_2O$.

Mineral Group: Meta-autunite group.

Occurrence: In the oxidized zone of a uranium–sulfide deposit in felsite porphyry and sodium-bearing tuffaceous breccias (Bota-Burum deposit, Kazakhstan).

Association: Realgar, orpiment, scorodite, mansfieldite, trögerite, arseniosiderite, metatorbernite, metazeunerite, uranophane, uraninite, arsenopyrite, pyrite, galena (Bota-Burum deposit, Kazakhstan).

Distribution: In the Bota-Burum uranium deposit, 15 km southwest of Alakol Lake, Chu-Ili Mountains, southwestern Balkhash district, Kazakhstan. At the Buhlskopf mine, near Ellweiler, Rhineland-Palatinate, Germany. On the Clyde Long property, Elk Park, San Juan Co., Colorado, USA.

Name: For its dominant *sodium* content and relation to *uranospinite*.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 72124–74126.

References: (1) Kopchenova, E.V. and K.V. Skvortsova (1957) Sodium uranospinite. Doklady Acad. Nauk SSSR, 114, 634–636 (in Russian). (2) (1958) Amer. Mineral., 43, 383–384 (abs. ref. 1). (3) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union, 191.