Rinkite-(Y) $Na_2Ca_4YTi(Si_2O_7)_2OF_3$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As aggregates (to 1.5 cm) of acicular crystals to 1.0 mm, and as separate elongated columnar, flattened-prismatic crystals to 1 cm with rectangular or rhombic sections.

Physical Properties: *Cleavage*: Very good on {100}. *Tenacity*: Brittle. *Fracture*: Uneven, conchoidal. VHN = 547-659, 569 average (100 g load). Hardness = ~5 D(meas.) = 3.44(2) D(calc.) = 3.475

Optical Properties: Transparent. *Color*: Colorless, white. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (+). α = 1.662(2) β = 1.666(2) γ = 1.685(5) 2V(meas.) = 50(3)° 2V(calc.) = 49.7° *Dispersion*: Medium, $v > r$. Nonpleochroic.

Cell Data: *Space Group*: $P2_1/c$. a = 7.3934(5) b = 5.6347(4) c = 18.713(1) β = 101.415(2)° Z = 2

X-Ray Diffraction Pattern: Darai-Pioz alkaline massif, Tien Shan mountains, Tajikistan. 3.057 (100), 2.688 (28), 9.18 (24), 2.929 (17), 3.559 (15), 2.293 (15), 2.783 (14)

Chemistry:

	(1)		(1)
WO_3	0.41	Pr_2O_3	0.61
Ta_2O_5	0.15	Ce_2O_3	3.18
Nb_2O_5	2.74	La_2O_3	0.56
UO_2	0.22	Y_2O_3	6.82
TiO_2	8.32	SrO	0.35
SiO_2	29.51	MnO	0.28
Dy_2O_3	1.35	CaO	25.53
Gd_2O_3	1.58	Na_2O	7.98
Sm_2O_3	0.99	F	6.02
Nd_2O_3	3.34	-O = F	2.53
		Total	97.41

(1) Darai-Pioz alkaline massif, Tien Shan mountains, Tajikistan; average electron microprobe analysis supplemented by IR spectroscopy; corresponds to $Na_{2.11}(Ca_{3.74}Sr_{0.03}Mn_{0.03})_{\Sigma=3.80}(Y_{0.50}Nd_{0.16}Ce_{0.16}Gd_{0.07}Dy_{0.06}Sm_{0.05}Pr_{0.03}La_{0.03}U^{4+}_{0.01})_{\Sigma=1.07}(Ti_{0.85}Nb_{0.17}W^{6+}_{0.01}Ta_{0.01})_{\Sigma=1.04}(Si_{4.03}O_{14})O_{1.40}F_{2.60}$.

Mineral Group: Seidozerite supergroup, rinkite group.

Occurrence: In a pegmatite fragment from an alkaline massif collected from the moraine of the Darai-Pioz glacier.

Association: Quartz, aegirine, microcline, neptunite, pectolite, calcite, eudialyte-group minerals, fluorite, titanite, turkestanite, kupletskite, galena, albite, pyrochlore-group minerals.

Distribution: From the Darai-Pioz alkaline massif, Tien Shan mountains, Tajikistan.

Name: Identifies the Y-analog of *rinkite*-(Ce).

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (5043/1).

References: (1) Pautov, L.A., A.A. Agakhanov, V.Y. Karpenko, Y.A. Uvarova, E. Sokolova, and F.C. Hawthorne (2019) Rinkite-(Y), $Na_2Ca_4YTi(Si_2O_7)_2OF_3$, a seidozerite-supergroup TS-block mineral from the Darai-Pioz alkaline massif, Tien-Shan mountains, Tajikistan: Description and crystal structure. Mineral. Mag., 83, 373-380.