

Saryarkite-(Y)**Ca(Y, Th)Al₅(SiO₄)₂(PO₄, SO₄)₂(OH)₇•6H₂O**

©2001 Mineral Data Publishing, version 1.2

Crystal Data: Tetragonal. *Point Group:* 422. Crystals needlelike, minute; massive.**Physical Properties:** Hardness = 3.5–4 D(meas.) = 3.07–3.15 D(calc.) = 3.35 Slightly magnetic.**Optical Properties:** Semitransparent. *Color:* White. *Luster:* Dull to greasy.
Optical Class: Uniaxial (+). $\omega = 1.606$ $\epsilon = 1.620$ **Cell Data:** *Space Group:* $P4_21_2$ or $P4_22_12$. $a = 8.213(2)$ $c = 6.55(1)$ $Z = 4$ **X-ray Powder Pattern:** [Sary-Arka, Kazakhstan].

3.01 (100), 2.827 (100), 1.854 (100), 3.45 (90), 2.143 (90), 1.312 (80), 2.564 (50)

Chemistry:	(1)	(2)		(1)	(2)
SiO ₂	14.80	14.24	K ₂ O	0.44	0.32
ZrO ₂	trace	trace	F	0.00	0.00
ThO ₂	7.78	9.07	Cl	0.00	0.00
Al ₂ O ₃	28.72	26.61	H ₂ O [−]	2.39	1.72
RE ₂ O ₃	11.02	10.79	CO ₂	0.00	0.00
Fe ₂ O ₃	1.40	2.21	P ₂ O ₅	11.88	12.18
MgO	0.00		SO ₃	2.88	3.41
CaO	6.02	6.59	LOI	12.36	12.30
Na ₂ O	0.79	0.75	Total	100.48	100.19

(1–2) [Sary-Arka, Kazakhstan]; average of two spectrographic determinations of RE₂O₃ = Y₂O₃ 53.5%; La₂O₃ 5.35%, Ce₂O₃ 7.95%, Nd₂O₃ 14.6%, Sm₂O₃ 0.00%, Gd₂O₃ 4.76%, Tb₂O₃ 0.52%, Dy₂O₃ 0.81%, Ho₂O₃ 1.34%, Er₂O₃ 4.23%, Tm₂O₃ 0.52%, Yb₂O₃ 5.35%, Lu₂O₃ 1.15%; after deduction of Fe₂O₃, the average corresponds to Al₅(Ca_{0.96}Y_{0.40}RE_{0.36}Th_{0.28})_{Σ=2.00} [(SiO₄)_{2.16}(PO₄)_{1.52}(SO₄)_{0.32}]_{Σ=4.00}(OH)_{6.6}•5.6H₂O.

Occurrence: In Devonian propylitized felsic effusives and in altered granitic rocks associated with quartzites.**Association:** Mica, alunite, andalusite, huttonite, barite, molybdenite, pyrite, hematite, hydrous iron oxides.**Distribution:** From the Akkuduk rare-metal deposit, near the Mointy railway station, central Kazakhstan.**Name:** From *Saryarka*, Kazakh name for the steppes area of central Kazakhstan, and for its high *yttrium* content.**Type Material:** Mining Institute, St. Petersburg, 978/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 72018, 72019.**References:** (1) Krol, O.F., V.I. Chernov, Y.V. Shipovalov, and G.A. Khan (1964) Saryarkite, a new mineral. Zap. Vses. Mineral. Obshch., 93, 147–155 (in Russian). (2) (1964) Amer. Mineral., 49, 1775–1776 (abs. ref. 1).