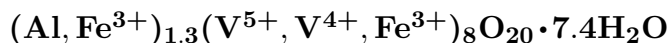


Bokite

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Crystal Data: Monoclinic, probable. *Point Group:* n.d. Platy to columnar or wedge-shaped grains, to 0.3 mm long, in reniform crusts with radiating structure; in veinlets.

Physical Properties: *Cleavage:* One direction, perfect \parallel elongation, another fair \perp to first. Hardness = ~ 3 D(meas.) = 2.97–3.10 D(calc.) = [3.41]

Optical Properties: Opaque, translucent in thinnest fragments. *Color:* Black; pale gray in reflected light. *Streak:* Black, may be brownish black. *Luster:* Semimetallic to dull. *Optical Class:* Biaxial. *Pleochroism:* Strong; dirty olive-green to deep reddish brown. *Absorption:* $X > Z$. $\alpha = 2.01(5)$ (α') $\beta = \text{n.d.}$ $\gamma = 2.06(5)$ (γ') 2V(meas.) = n.d. *Anisotropism:* Strong; brownish yellow to gray-blue.

Cell Data: *Space Group:* n.d. $a = 11.838(5)$ $b = 3.643(1)$ $c = 11.142(5)$
 $\beta = 110.58(4)^\circ$ $Z = [1]$

X-ray Powder Pattern: Kurumsak area, Kazakhstan.
10.47 (100), 3.452 (30), 2.907 (12), 2.592 (12), 1.8208 (11), 3.177 (9), 2.760 (9)

Chemistry:	(1)	(2)		(1)	(2)
V ₂ O ₅	50.30	49.70	BaO	trace	trace
V ₂ O ₄	14.10	14.00	Na ₂ O	trace	trace
SiO ₂	trace	trace	K ₂ O	0.00	1.50
Al ₂ O ₃	3.90	4.40	H ₂ O ⁺	7.70	7.80
Fe ₂ O ₃	15.30	15.40	H ₂ O [−]	6.60	6.60
MgO	trace	trace	SO ₃	0.00	0.60
CaO	trace	trace			
			Total	[97.90]	100.00

(1) Kurumsak area, Kazakhstan; original total given as 98.20%; corresponds to $(\text{Al}_{0.72}\text{Fe}_{0.60})_{\Sigma=1.32}(\text{V}_{6.80}\text{Fe}_{1.20})_{\Sigma=8.00}\text{O}_{20} \cdot 7.46\text{H}_2\text{O}$. (2) Do.; with jarosite impurity, corresponds to $\text{K}_{0.26}(\text{Al}_{0.80}\text{Fe}_{0.46})_{\Sigma=1.26}(\text{V}_{6.74}\text{Fe}_{1.26})_{\Sigma=8.00}\text{O}_{20} \cdot 7.44\text{H}_2\text{O}$.

Occurrence: In carbonaceous vanadiferous shales (Kurumsak area, Kazakhstan); in rich U–V ore in Triassic stream channels and impregnating sandstone (Monument No. 2 mine, Arizona, USA).

Association: Jarosite, kazakhstanite (Kurumsak area, Kazakhstan); navajoite (Monument No. 2 mine, Arizona, USA).

Distribution: From the Balasauskandyk and nearby Kurumsak and Ran districts, northwestern Kara-Tau Mountains, and in the Dzhebagly Mountains, Talass Alatau Range, Kazakhstan. In the USA, in the Monument No. 2 mine, Apache Co., Arizona; at The Fish, Eureka Co., and near Cockalorum Wash, Nye Co., Nevada; and from the Wilson Springs (Potash Sulphur Springs) mine, Garland Co., Arkansas.

Name: For Ivan Ivanovich Bok (1898–1983), Kazakh geologist, Institute of Geosciences, Alma-Ata, Kazakhstan.

Type Material: National Museum of Natural History, Washington, D.C., USA, 139767.

References: (1) Ankinovich, E.A. (1963) A new vanadium mineral – bokite. Zap. Vses. Mineral. Obshch., 92, 51–59 (in Russian). (2) (1963) Amer. Mineral., 48, 1180–1181 (abs. ref. 1). (3) Evans, H.T., Jr. and J.M. Hughes (1990) Crystal chemistry of the natural vanadium bronzes. Amer. Mineral., 75, 508–521, esp. 515, 517.