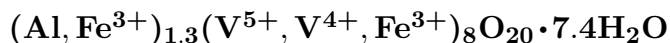


**Bokite**

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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 || elongation, another fair  $\perp$  to first. Hardness =  $\sim 3$  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:*  $X > Z$ .  $\alpha = 2.01(5)$  ( $\alpha'$ )  $\beta = \text{n.d.}$   $\gamma = 2.06(5)$  ( $\gamma'$ ) 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 <sub>2</sub> O <sub>5</sub>	50.30	49.70	BaO	trace	trace	trace	trace
V <sub>2</sub> O <sub>4</sub>	14.10	14.00	Na <sub>2</sub> O	trace	trace	trace	trace	
SiO <sub>2</sub>	trace	trace	K <sub>2</sub> O	0.00	1.50	0.00	1.50	
Al <sub>2</sub> O <sub>3</sub>	3.90	4.40	H <sub>2</sub> O <sup>+</sup>	7.70	7.80	7.70	7.80	
Fe <sub>2</sub> O <sub>3</sub>	15.30	15.40	H <sub>2</sub> O <sup>-</sup>	6.60	6.60	6.60	6.60	
MgO	trace	trace	SO <sub>3</sub>	0.00	0.60	0.00	0.60	
CaO	trace	trace	Total	[97.90]	100.00	[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.