Bokite  \((\text{Al}, \text{Fe}^{3+})_{1.3}(\text{V}^{5+}, \text{V}^{4+}, \text{Fe}^{3+})_{8}\text{O}_{20} \cdot 7.4\text{H}_{2}\text{O}\)

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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 ⊥ 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:** \(X > Z\).  
- \(\alpha^\prime = 2.01(5)\) \(\beta = \text{n.d.}\) \(\gamma^\prime = 2.06(5)\) \(2V(\text{meas.}) = \text{n.d.}\)

**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:**  
\[
\begin{array}{c|c|c|c}
\text{Component} & (1) & (2) & (1) \\
\hline
\text{V}_2\text{O}_5 & 50.30 & 49.70 & \text{BaO} \\
\text{V}_2\text{O}_4 & 14.10 & 14.00 & \text{Na}_2\text{O} \\
\text{SiO}_2 & \text{trace} & \text{trace} & \text{K}_2\text{O} \\
\text{Al}_2\text{O}_3 & 3.90 & 4.40 & \text{H}_2\text{O}^+ \\
\text{Fe}_2\text{O}_3 & 15.30 & 15.40 & \text{H}_2\text{O}^- \\
\text{MgO} & \text{trace} & \text{trace} & \text{SO}_3 \\
\text{CaO} & \text{trace} & \text{trace} & \text{Total}
\end{array}
\]

(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:**  