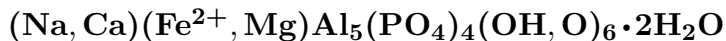


**Burangaite**

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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . Crystals are prismatic, bladed, elongated along [010], bounded by  $\{h0l\}$  forms, and complexly terminated by  $\{311\}$  and  $\{22\bar{3}\}$ ; may be fibrous.

**Physical Properties:** *Cleavage:* On  $\{100\}$ , perfect. Hardness = 5 D(meas.) = 3.05 D(calc.) = 3.00

**Optical Properties:** Semitransparent. *Color:* Bluish to blue-green; commonly shows a zoned hourglass structure, centrally blue with colorless margins. *Streak:* Pale blue.

*Optical Class:* Biaxial (-). *Pleochroism:* Strong;  $X$  = light blue;  $Y$  = dark blue;  $Z$  = colorless. *Orientation:*  $Z = b$ ;  $X \wedge c = 11^\circ$ . *Dispersion:*  $r > v$ . *Absorption:*  $Y > X > Z$ .  $\alpha = 1.611(2)$   $\beta = 1.635(2)$   $\gamma = 1.643(1)$   $2V(\text{meas.}) = 58^\circ$   $2V(\text{calc.}) = 60^\circ$

**Cell Data:** *Space Group:*  $C2/c$ .  $a = 25.099(2)$   $b = 5.0491(7)$   $c = 13.438(1)$   $\beta = 110.88(1)^\circ$   $Z = 4$

**X-ray Powder Pattern:** Buranga pegmatite, Rwanda.

11.71 (100), 3.081 (90), 3.115 (70), 4.86 (41), 3.318 (39), 2.044 (32), 1.6746 (28)

**Chemistry:**

	(1)	(2)
P <sub>2</sub> O <sub>5</sub>	37.65	39.38
Al <sub>2</sub> O <sub>3</sub>	34.35	34.11
Fe <sub>2</sub> O <sub>3</sub>	1.14	1.15
FeO	6.26	5.36
MnO	0.40	0.16
MgO	2.00	1.82
CaO	1.88	0.00
Na <sub>2</sub> O	2.93	4.05
H <sub>2</sub> O <sup>+</sup>	11.60	12.32
insol.	2.06	
Total	100.27	98.35

(1) Buranga pegmatite, Rwanda; corresponds to  $(\text{Na}_{0.70}\text{Ca}_{0.25})_{\Sigma=0.95}(\text{Fe}_{0.65}^{2+}\text{Mg}_{0.37}\text{Mn}_{0.04})_{\Sigma=1.06}(\text{Al}_{5.01}\text{Fe}_{0.11}^{3+})_{\Sigma=5.12}(\text{PO}_4)_{3.95}[(\text{OH})_{5.58}\text{O}_{0.62}]_{\Sigma=6.20} \cdot 2\text{H}_2\text{O}$ . (2) Do.; by electron microprobe,  $\text{Fe}^{2+}:\text{Fe}^{3+}$  from  $\text{O}^{2-}$  excess over FeO, total Mn as MnO, H<sub>2</sub>O from stoichiometry; corresponds to  $\text{Na}_{0.96}(\text{Fe}_{0.55}^{2+}\text{Mg}_{0.33}\text{Fe}_{0.10}^{3+}\text{Mn}_{0.02})_{\Sigma=1.00}\text{Al}_{4.89}(\text{PO}_4)_{4.06}(\text{OH})_6 \cdot 2\text{H}_2\text{O}$ .

**Occurrence:** In corroded aggregates of other phosphates in a zoned granite pegmatite (Buranga pegmatite, Rwanda).

**Association:** Scorzalite, bjarebyite, bertossaite, trolleite, samuelsonite, gatumbaite, wardite, brazilianite, apatite, quartz (Buranga pegmatite, Rwanda); berlinite, lazulite, scorzalite, augelite, gatumbaite, trölleite, rutile (Hålsjöberg, Sweden).

**Distribution:** In the Buranga pegmatite, near Gatumba, Rwanda. At Hålsjöberg, Värmland, Sweden. From the Gold Quarry mine, near Carlin, Maggie Creek district, Eureka Co., Nevada, USA.

**Name:** For the initial occurrence in the Buranga pegmatite, Rwanda.

**Type Material:** n.d.

**References:** (1) von Knorring, O., M. Lehtinen, and T.G. Sahama (1977) Burangaite, a new phosphate mineral from Rwanda. Bull. Geol. Soc. Finland, 49, 33–36. (2) (1978) Amer. Mineral., 63, 793 (abs. ref. 1). (3) Selway, J.B., M.A. Cooper, and F.C. Hawthorne (1997) Refinement of the crystal structure of burangaite. Can. Mineral., 35, 1515–1522.

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