

# Burpalite

# Na<sub>2</sub>CaZrSi<sub>2</sub>O<sub>7</sub>F<sub>2</sub>

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**Crystal Data:** Monoclinic, pseudo-orthorhombic. *Point Group:* 2/*m*. As tablets, elongated along [001] and flattened on {010}, to 5 mm. In fan-shaped aggregates, commonly intimately intergrown with l avenite.

**Physical Properties:** *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 5–6  
D(meas.) = 3.33(15) D(calc.) = 3.27 Weak yellow-orange fluorescence in X-rays.

**Optical Properties:** Transparent to translucent. *Color:* Colorless, yellowish. *Streak:* White.  
*Luster:* Vitreous.

*Optical Class:* Biaxial (-). *Orientation:* X = b; Y = c; Z = a. *Dispersion:* r < v, weak.  
 $\alpha = 1.627(2)$   $\beta = 1.634(2)$   $\gamma = 1.639(2)$   $2V(\text{meas.}) = 82.1^\circ$   $2V(\text{calc.}) = 80.1^\circ$

**Cell Data:** *Space Group:* P2<sub>1</sub>/a. a = 10.1173(8) b = 10.4446(6) c = 7.2555(3)  
 $\beta = 90.039(7)^\circ$  Z = 4

**X-ray Powder Pattern:** Burpala massif, Russia; by Gandolfi camera to exclude l avenite domains.

2.962 (vs), 1.886 (ms), 1.556 (ms), 1.787 (s), 3.035 (m), 3.306 (m), 1.678 (m)

## Chemistry:

	(1)
SiO <sub>2</sub>	31.82
TiO <sub>2</sub>	1.06
ZrO <sub>2</sub>	31.11
Y <sub>2</sub> O <sub>3</sub>	0.32
Nb <sub>2</sub> O <sub>5</sub>	0.22
FeO	0.43
MnO	0.60
CaO	14.52
Na <sub>2</sub> O	13.86
F	8.1
H <sub>2</sub> O	1.23
-O = F <sub>2</sub>	3.41
Total	99.86

(1) Burpala massif, Russia; by electron microprobe, average of four analyses, H<sub>2</sub>O by Penfield method; corresponds to (Na<sub>1.69</sub>Mn<sub>0.03</sub>Fe<sub>0.02</sub>Y<sub>0.01</sub>)<sub>Σ=1.75</sub>Ca<sub>0.98</sub>(Zr<sub>0.96</sub>Ti<sub>0.05</sub>Nb<sub>0.01</sub>)<sub>Σ=1.02</sub>Si<sub>2.00</sub>O<sub>7</sub>[F<sub>1.61</sub>(OH)<sub>0.26</sub>]<sub>Σ=1.87</sub>•0.13H<sub>2</sub>O.

**Polymorphism & Series:** Dimorphous with l avenite.

**Occurrence:** In a fenitized hornfelsic sandstone in the contact zone of an alkalic intrusive.

**Association:** L avenite, albite, nepheline, aegirine, alkalic amphibole, biotite, catapleiite, astrophyllite, fluorite, loparite.

**Distribution:** In the Burpala massif, about 120 km north of Lake Baikal, eastern Siberia, Russia.

**Name:** For its occurrence in the Burpala massif, Russia.

**Type Material:** A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, p300; Museum of Natural History, University of Pisa, Pisa, Italy; The Natural History Museum, London, England, 1994,5.

**References:** (1) Khomyakov, A.P., D.Y. Pushcharovskii, I.M. Kulikova, and V.I. Kuz'min (1988) New representative of the hiortdahlite-lavenite mineralogical group. *Vestnik Mosk. Univ. Geol.*, 43(1), 87–92 (English trans. of Russian). (2) (1990) *Amer. Mineral.*, 75, 436–437 (abs. ref. 1). (3) Merlino, S., N. Perchiazzi, A.P. Khomyakhov [Khomyakov], D.Y. Pushcharovskii, I.M. Kulikova, and V.I. Kuzmin (1990) Burpalite, a new mineral from the Burpalinskii massif, North Transbaikal [Transbaikal], USSR: its crystal structure and OD character. *Eur. J. Mineral.*, 2, 177–185.

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