Burpalite

\[ \text{Na}_2\text{CaZrSi}_2\text{O}_7\text{F}_2 \]

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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 lavenite.

\( D(\text{meas.}) = 3.33(15) \quad D(\text{calc.}) = 3.27 \) Weak yellow-orange fluorescence in X-rays.

Optical Class: Biaxial (−

Cell Data: Space Group: \( P2_1/a \). \( a = 10.1173(8) \quad b = 10.4446(6) \quad c = 7.2555(3) \)

\( \beta = 90.039(7)° \quad Z = 4 \)

X-ray Powder Pattern: Burpala massif, Russia; by Gandolfi camera to exclude lavenite domains.

\( 2.962 \text{ (vs)}, 1.886 \text{ (ms)}, 1.556 \text{ (ms)}, 1.787 \text{ (s)}, 3.035 \text{ (m)}, 3.306 \text{ (m)}, 1.678 \text{ (m)} \)

Chemistry:

\[ \begin{align*}
\text{SiO}_2 & \quad 31.82 \\
\text{TiO}_2 & \quad 1.06 \\
\text{ZrO}_2 & \quad 31.11 \\
\text{Y}_2\text{O}_3 & \quad 0.32 \\
\text{Nb}_2\text{O}_5 & \quad 0.22 \\
\text{FeO} & \quad 0.43 \\
\text{MnO} & \quad 0.60 \\
\text{CaO} & \quad 14.52 \\
\text{Na}_2\text{O} & \quad 13.86 \\
\text{F} & \quad 8.1 \\
\text{H}_2\text{O} & \quad 1.23 \\
\text{−O} = \text{F}_2 & \quad 3.41 \\
\text{Total} & \quad 99.86
\end{align*} \]

(1) Burpala massif, Russia; by electron microprobe, average of four analyses, \( \text{H}_2\text{O} \) by Penfield method; corresponds to \( \text{(Na}_{1.69}\text{Mn}_{0.03}\text{Fe}_{0.02}\text{Y}_{0.01})\text{Na}_{1.75}\text{Ca}_{0.98}\text{(Zr}_{0.96}\text{T}_{0.05}\text{Nb}_{0.01})\text{Si}_{2.00}\text{O}_7\text{F}_{1.61}(\text{OH})_{0.26}\text{−}1.87\cdot1.13\text{H}_2\text{O} \).

Polymorphism & Series: Dimorphous with lavenite.

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

Association: Lavenite, 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.


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