Charoite \( (K, \text{Sr, Ba, Mn})_{15-16}(\text{Ca, Na})_{32}[\text{Si}_70(\text{O, OH})_{180}](\text{OH, F})_4 \cdot n\text{H}_2\text{O} \)

Crystal Data: Monoclinic. Point Group: \( 2/m \). Fibrous, massive.


Optical Properties: Semitransparent. Color: Shades of deep lilac to violet; colorless in thin section. Optical Class: Biaxial (+). \( \alpha = 1.550(2) \quad \beta = 1.553(2) \quad \gamma = 1.559(2) \quad 2V(\text{meas.}) = 28^\circ-30^\circ \) Pleochroism: \( X = \text{rose}; Z = \text{colorless, in thick fragments. Orientation: } X = b, Z \wedge c = 5^\circ. \)

Cell Data: Space Group: \( P2_1/m \). \( a = 31.96(6) \quad b = 19.64(4) \quad c = 7.09(1) \quad \beta = 90.0(1)^\circ \) \( Z = 1 \)

X-ray Powder Pattern: Murun massif, Russia. 3.348 (100), 3.134 (85), 12.5 (70), 2.79 (50), 2.71 (35), 3.90 (30), 2.97 (30)

Chemistry:

\[
\begin{align*}
\text{SiO}_2 & \quad 56.88 & \quad 58.5 \\
\text{Al}_2\text{O}_3 & \quad 0.07 \\
\text{Fe}_2\text{O}_3 & \quad 0.12 \\
\text{FeO} & \quad 0.01 \\
\text{MnO} & \quad 0.07 \\
\text{CaO} & \quad 20.95 & \quad 20.5 \\
\text{SrO} & \quad 0.90 & \quad 0.5 \\
\text{BaO} & \quad 2.52 & \quad 2.9 \\
\text{Na}_2\text{O} & \quad 3.77 & \quad 1.8 \\
\text{K}_2\text{O} & \quad 10.36 & \quad 8.9 \\
\text{F} & \quad 0.92 & \quad 0.7 \\
\text{H}_2\text{O}^+ & \quad 4.40 & \quad 4.7 \\
\text{O} = \text{F}_2 & \quad 0.39 & \quad [0.15] \\
\text{Total} & \quad 100.43 & \quad 98.5
\end{align*}
\]

(1) Murun massif, Russia; corresponds to (K\( _{0.93}\)Ba\( _{0.07}\)Sr\( _{0.03}\))\( \Sigma =1.03 \) (Ca\( _{1.57}\)Na\( _{0.51}\))\( \Sigma =2.08 \)Si\( _4 \)O\( _{10} \) 
[[OH]\( _{0.58}\)F\( _{0.28} \)]\( \Sigma =0.86\)0.72H\( _2 \)O. (2) Do.; by electron microprobe, H\( _2 \)O by TGA; corresponds to 
(K\( _{0.88}\)Ba\( _{0.09}\)Sr\( _{0.02}\))\( \Sigma =0.99 \) (Ca\( _{1.71}\)Na\( _{0.28}\))\( \Sigma =1.99 \)Si\( _{4.55} \)O\( _{10} \)((OH)\( _{0.78}\)F\( _{0.18} \)]\( \Sigma =0.96\)0.82H\( _2 \)O.

Occurrence: In potassic feldspar metasomatites at the contact of nepheline and aegirine syenites with limestones.

Association: Canasite, tinaksite.

Distribution: In the Murun massif, between the Chara and Olekma Rivers, southwest of Olekminsk, Yakutia, Russia.

Name: For the Chara River, Russia, near which the studied material was discovered.

Type Material: University of Rome, Rome, Italy (24352); A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.