Caryochroite  
(Na, Sr)₃(Fe³⁺, Mg)₁₀Ti₂Si₁₂O₃₇(H₂O, O, OH)₁₇

Crystal Data: Monoclinic.  
**Point Group:** n.d.  
Forms centimetric crusts of submicrometric {001} lamellae, elongate along [010], in spheroidal masses.

Physical Properties:  
**Cleavage:** Good on {001}.  
**Tenacity:** Brittle, aggregates are ductile.  
**Fracture:** Conchoidal.  
**Hardness:** 2.5  
D(meas.) = 2.990(5)  
D(calc.) = 3.076

Optical Properties:  
**Cleavage:** Good on {001}.  
**Tenacity:** Brittle, aggregates are ductile.  
**Fracture:** Conchoidal.  
**Hardness:** = 2.5

Optical Class: Biaxial (-)  
α < 1.700  
β = 1.745(5)  
γ = 1.775(5)  
2V(meas.) = 75(10)°

Pleochroism:  
Z = brown, X = Y = dark brown.  
Absorption: X > Y > Z.

Cell Data:  
**Space Group:** n.d.  
a = 16.47(2)  
b = 5.303(6)  
c = 24.39(3)  
β = 93.5(2)°  
Z = 2

X-Ray Diffraction Pattern:  
Umbozero mine, Mt Alluaiv, Lovozero massif, Kola Peninsula, Russia.
12.1 (100), 13.3 (30), 14.1 (20), 2.631 (13), 2.692 (12), 4.38 (10), 2.968 (8)

Chemistry:  
<table>
<thead>
<tr>
<th>Element</th>
<th>Formula</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>SiO₂</td>
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</tr>
<tr>
<td>TiO₂</td>
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<tr>
<td>Al₂O₃</td>
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<tr>
<td>Fe₂O₃</td>
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<tr>
<td>FeO</td>
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<td>MgO</td>
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<td>MnO</td>
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<td>H₂O</td>
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<tr>
<td>Total</td>
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</tbody>
</table>

(1) Umbozero mine, Mount Alluaiv, Lovozero massif, Kola Peninsula, Russia; average electron microprobe analysis supplemented by Mössbauer and IR spectroscopy, H₂O by TGA; corresponds to (Na₁.₁₉Sr₀.₆₂Ca₀.₄₁Mn₀.₄₃K₀.₂₆)≥₂₁.₇₈Fe³⁺(Fe²⁺)₀.₇₉Mg₁.₁₅Mn₁.₄₉Fe²⁺₁.₃₈(Al₁.₈₇Fe³⁺₀.₁₃)≥₄₂.₀₀(Ti₁.₈₇Fe²⁺)≥₁₂.₀₀O₅₄.₁₀H₂₀.₄₀.

Occurrence: Product of the supergene alteration of an unidentified Fe²⁺-rich protophase in cavities in the albite zone of a pegmatite.

Association: Albite, elpidite, epididymite, quartz, natrolite, pyrite, galena, sphalerite, bitumen.

Distribution: From dumps of the Umbozero mine, Mount Alluaiv, Lovozero massif, Kola Peninsula, Russia.

Name: From the Greek for “nut” and “color” in allusion to its hazel-brown color.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (3313/1).

References:  
Caryochroite, a new heterophyllosilicate mineral species related to nafertisite, from the Lovozero massif, Kola Peninsula, Russia.  