Pezzottaite

\[ \text{Cs(Be}_2\text{Li)}\text{Al}_2\text{Si}_6\text{O}_{18} \]

Crystal Data: Hexagonal.  
Point Group: \( \bar{3} \) \( \text{2/m} \).  
As hexagonal tabular crystals to 10 cm, or equant to elongated flat crystals.  
Well-formed crystals display dominant \{001\} and subordinate \{100\} and \{101\}.  
Also as subparallel or interpenetrant crystal aggregates.

Physical Properties: Cleavage: Imperfect on \{001\}.  
Tenacity: Brittle.  
Fracture: Conchoidal to irregular.  
Hardness = 8  
D(meas.) = 2.97-3.14 (variable with Cs content)  
D(calc.) = 3.06

Optical Properties: 
Transparent to translucent.  
Color: Raspberry-red to pink.  
Streak: Colorless to white.  
Luster: Vitreous.  
Some specimens display chatoyancy.  
Optical Class: Uniaxial (-).  
\( \varepsilon = 1.611 \quad \omega = 1.620 \)  
Pleochroism: Strong, \( E = \) Orange-red, \( O = \) Purple-violet.

Cell Data: Space Group: \( \overline{R}3 \) \( c \).  
\[ a = 15.946(4) \quad c = 27.803(8) \quad Z = 18 \]

X-ray Powder Pattern: 
Sakavalana pegmatite, Fianarantsoa province, central Madagascar.  
3.271 (100), 2.871 (52), 3.027 (41), 3.019 (29), 2.215 (14), 1.636 (14), 2.229 (12), 1.749 (12)

Chemistry:  
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO(_2)</td>
<td>54.58</td>
<td>Rb(_2)O</td>
</tr>
<tr>
<td>TiO(_2)</td>
<td>0.01</td>
<td>Cs(_5)O</td>
</tr>
<tr>
<td>Al(_2)O(_3)</td>
<td>16.88</td>
<td>Li(_2)O</td>
</tr>
<tr>
<td>FeO</td>
<td>0.02</td>
<td>BeO</td>
</tr>
<tr>
<td>MnO</td>
<td>0.02</td>
<td>H(_2)O</td>
</tr>
<tr>
<td>CaO</td>
<td>0.22</td>
<td>Total</td>
</tr>
<tr>
<td>Na(_2)O</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>K(_2)O</td>
<td>0.14</td>
<td></td>
</tr>
</tbody>
</table>

(1) Sakavalana pegmatite, Fianarantsoa province, central Madagascar; laser ablation ICP mass spectroscopic analysis, IR spectroscopy confirms H\(_2\)O; corresponds to 
(C\(_{0.83}\)Rb\(_{0.03}\)Na\(_{0.10}\)K\(_{0.02}\)Ca\(_{0.02}\)\(_{2}\))\(_{1.00}\)(Be\(_{2.10}\)Li\(_{0.92}\))Al\(_2\)Si\(_5\)O\(_{18}\).

Occurrence: A late-stage hydrothermal mineral in miarolitic pockets in and near the core of a differentiated, rare-element, granitic pegmatite dike.

Association: Smoky quartz, K-feldspar (‘amazonite’), albite (‘cleavelandite’), tourmaline-group minerals, spodumene, lithian muscovite, danburite.

Distribution: From the Sakavalana pegmatite, Ampandramaka-Malakialina pegmatite district, a few kilometers northwest of Ambatovita village, Fianarantsoa province, central Madagascar. Also reported from Afghanistan and Myanmar.

Name: Honors Federico Pezzotta (b. 1965), mineralogist at the Natural History Museum, Milan, Italy, in recognition of his contributions to Madagascar mineralogy.


References:  
(4) Gatta, G. Diego, I. Adamo, M. Meven, and E. Lambruschi (2012) A single-crystal neutron and X-ray diffraction study of pezzottaite, Cs(Be\(_2\)Li)Al\(_2\)Si\(_5\)O\(_{18}\).  