Vigezzite  

\[(\text{Ca, Ce})(\text{Nb, Ta, Ti})_2\text{O}_6\]

\(\text{Crystal Data:}\)  Orthorhombic.  \textit{Point Group:} 2/m 2/m 2/m.  Euhedral prismatic crystals, elongated along [010], and flattened and striated || [001] on \{100\}, terminated by \{010\}, to 3 mm.

\textbf{Physical Properties:}  
- Hardness = 4.5–5  VHN = 396 (50 g load).  D(meas.) = n.d.  D(calc.) = 5.54

\textbf{Optical Properties:}  
- Transparent.  \textit{Color:} Bright yellow-orange; yellow in transmitted light.  
- \textit{Optical Class:} Biaxial.  \textit{Orientation:} \(X = c; Y = b; Z = a.\)  \textit{Dispersion:} Extreme.  
  \(\alpha = [2.14(2)]\)  \(\beta = \text{n.d.}\)  \(\gamma = [2.315(2)]\)  2V(meas.) = Large.

\textbf{Cell Data:}  
- \textit{Space Group:} Pnmb.  
  \(a = 11.065(2)\)  \(b = 7.527(1)\)  \(c = 5.343(1)\)  \(Z = 4\)

\textbf{X-ray Powder Pattern:}  
- Orcesco, Italy.  
  3.036 (100), 2.974 (100), 4.821 (90), 3.784 (80), 1.6018 (70), 1.7128 (60), 2.864 (40)

\textbf{Chemistry:}  

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nb_2O_5</td>
<td>31.0</td>
<td>73.8</td>
</tr>
<tr>
<td>Ta_2O_5</td>
<td>36.0</td>
<td>6.4</td>
</tr>
<tr>
<td>TiO_2</td>
<td>10.5</td>
<td>4.2</td>
</tr>
<tr>
<td>La_2O_3</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Ce_2O_3</td>
<td>10.5</td>
<td>0.6</td>
</tr>
<tr>
<td>FeO</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>CaO</td>
<td>12.0</td>
<td>14.2</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>99.8</td>
</tr>
</tbody>
</table>

(1) Orcesco, Italy; by electron microprobe, average of 12 analyses; corresponds to \((\text{Ca}_{0.82}\text{Ce}_{0.24})\Sigma=1.06(\text{Nb}_{0.98}\text{Ta}_{0.02}\text{Ti}_{0.05})\Sigma=2.02\text{O}_6\).  (2) Kola Peninsula, Russia; by electron microprobe, average of three analyses; corresponding to \((\text{Ca}_{0.83}\text{Fe}_{0.02}\text{La}_{0.01})\Sigma=0.86(\text{Nb}_{1.82}\text{Ti}_{0.17}\text{Ta}_{0.09})\Sigma=2.08\text{O}_6\).

\textbf{Occurrence:}  
- In miarolitic cavities in an albitized pegmatite in amphibolite and biotite gneiss (Orcesco, Italy).

\textbf{Association:}  
- Pyrochlore, columbite, fersmite (Orcesco, Italy).

\textbf{Distribution:}  
- From near Orcesco, on Alpe Rosso, Val Vigezzo, Piedmont, Italy.  At the Kovdor massif, Kola Peninsula, Russia.

\textbf{Name:}  
- For Val Vigezzo, Italy, where the mineral occurs.

\textbf{Type Material:}  
- Mineralogical Institute, University of Basel, Basel; Natural History Museum, Basel, Switzerland, MB27:336.

\textbf{References:}  