Celadonite  

$K(Mg^{2+})(Fe^{3+}, Al)Si_4O_{10}(OH)_2$

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Crystal Data:  
Monoclinic.  
Point Group:  $2/m$ or 2.  
As minute micaceous scales or earthy aggregates.

Physical Properties:  
Cleavage:  {001}, perfect.  
Tenacity:  Friable to unctuous.  
Hardness = ~2  
$D$(meas.) = 2.95–3.05  
$D$(calc.) = 3.00

Optical Properties:  
Semitransparent.  
Color:  Blue-green, olive-green, apple-green.  
Luster:  Dull.  
Optical Class:  Biaxial (−).  
Pleochroism:  Yellow-green, blue-green.  
$\alpha = 1.606–1.625$.  
$\beta = n.d.$  
$\gamma = 1.579–1.661$.  
$2V$(meas.) = 5°–8°

Cell Data:  
Space Group:  $C2/m$ or $C2$.  
$a = 5.23(2)$  
b = 9.06(1)  
c = 10.13(2)  
$\beta = 100^\circ55(10)^\gamma$.  
$Z = 2$

X-ray Powder Pattern:  
Wind River area, Washington, USA.  
2.580 (100), 4.53 (85), 3.635 (80), 3.087 (80), 2.678 (75), 2.402 (75), 3.318 (70)

Chemistry:  

<table>
<thead>
<tr>
<th>Element</th>
<th>Formula</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO$_2$</td>
<td>55.61</td>
<td></td>
</tr>
<tr>
<td>Al$_2$O$_3$</td>
<td>0.79</td>
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<tr>
<td>Fe$_2$O$_3$</td>
<td>17.19</td>
<td></td>
</tr>
<tr>
<td>FeO</td>
<td>4.02</td>
<td></td>
</tr>
<tr>
<td>MnO</td>
<td>0.09</td>
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<tr>
<td>MgO</td>
<td>7.26</td>
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</tr>
<tr>
<td>CaO</td>
<td>0.21</td>
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</tr>
<tr>
<td>Na$_2$O</td>
<td>0.19</td>
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<tr>
<td>K$_2$O</td>
<td>10.03</td>
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</tr>
<tr>
<td>H$_2$O</td>
<td>4.88</td>
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</tr>
</tbody>
</table>

Total 100.27

(1) 37 km east of Reno, Storey Co., Nevada, USA; corresponds to ($K_{0.92}Na_{0.03}Ca_{0.02}$)$_{\Sigma=0.97}$$\Sigma=1.02$($Fe^{3+}_{0.93}Al_{0.07}$)$_{\Sigma=1.00}$Si$_{4.00}$O$_{10}$(OH)$_2$.

Polymorphism & Series:  
1M polytype.

Mineral Group:  
Mica group.

Occurrence:  
Replaces primary ferromagnesian silicate minerals in altered intermediate to mafic volcanic rocks, developed under low-grade zeolite facies metamorphism; as amygdale fillings in basalts or andesites.

Association:  
Montmorillonite, clinoptilolite, heulandite, laumontite, prehnite, chlorite, quartz, calcite.

Distribution:  
Many localities; a few for well-characterized material include: on Mt. Baldo, near Verona, Vicenza, and at Val di Fassa, Trentino-Alto Adige, Italy. In the Zillertal, Tirol, Austria. In Scotland, at Scuri Mohr. From Streymoy and Suduroy, Faeroe Islands. In the USA, in the John Day Formation, Grant Co., Oregon; in Mt. Rainier National Park, Pierce Co., Washington; and from Red Rock Canyon, Kern Co., California. In the Pearl Islands, off Nicaragua. In the Hosokura mine, Miyagi Prefecture; at Toyoura, Yamagata Prefecture; Nishikata, Tochigi Prefecture; Kamogawa, Chiba Prefecture; and many other places in Japan.

Name:  
From the French celadon, for sea green, its color.

References:  
(1) Dana, E.S. (1892) Dana’s system of mineralogy, (6th edition), 683.  
Mineral. Zhurnal, 8(3), 32–40 (in Russian with English abs.).

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