Juanitaite (Cu, Ca, Fe)$_{10}$Bi(AsO$_4$)$_4$(OH)$_{11}$·2H$_2$O

Crystal Data: Tetragonal.  
Point Group: 4/m 2/m 2/m.  
As square plates with ‘rounded’ corners, flattened on {001}, to 150 μm, in sheaflike aggregates and rosettes.

Physical Properties: Cleavage: Perfect on {001} and {110}, good on {100}.  
Tenacity: Flexible.  
Hardness = ~ 1  
D(meas.) = 3.61(5)  
D(calc.) = 3.56

Optical Properties: Translucent.  
Color: Olive-green to grass-green.  
Streak: Pale greenish yellow.  
Luster: Resinous to dull; reflections from {001} often appear bronzy.  
Optical Class: Uniaxial (-).  
$\omega = 1.785(5)$  
$\epsilon = 1.705(5)$  
Pleochroism: $O =$ olive-brown,  
$E =$ olive-green.  
Subparallel aggregates are biaxial with $2V$(meas.) $= \sim 20^\circ$.

$\ a = 9.961(3)$  
$\ c = 29.19(2)$  
$Z = 4$

X-ray Powder Pattern: Gold Hill mine, Tooele County, Utah, USA.  
14.6 (100), 6.34 (70), 3.146 (60), 7.04 (50), 5.07 (50), 2.535 (50), 3.518 (40)

Chemistry: (1) (2)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CaO</td>
<td>8.64</td>
<td>8.65</td>
</tr>
<tr>
<td>FeO</td>
<td>2.32</td>
<td>2.30</td>
</tr>
<tr>
<td>CuO</td>
<td>35.97</td>
<td>36.09</td>
</tr>
<tr>
<td>Bi$_2$O$_3$</td>
<td>14.82</td>
<td>14.91</td>
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<tr>
<td>As$_2$O$_5$</td>
<td>29.35</td>
<td>29.41</td>
</tr>
<tr>
<td>H$_2$O</td>
<td>[8.90]</td>
<td>8.65</td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Gold Hill mine, Tooele County, Utah, USA; average of 7 electron microprobe analyses supplemented by IR spectroscopy, H$_2$O by difference; corresponds to (Cu$_{7.03}$Ca$_{2.39}$Fe$_{0.50}$)$_2$·9.92Bi$_{0.99}$(AsO$_4$)$_{3.97}$(OH)$_{10.90}$·2.22H$_2$O.  
(2) (Cu$_{7.09}$Ca$_{2.41}$Fe$_{0.50}$)$_2$·10.00(AsO$_4$)$_{4}$(OH)$_{11}$·2H$_2$O.

Occurrence: A secondary mineral from the oxidation of tennantite, chalcopyrite, and pyrite in quartz veins.

Association: Mixite, conichalcite, connellite, tyrolite, azurite, gold, quartz.

Distribution: From the 30 and 150 foot levels, Gold Hill mine, western Tooele County, Utah, USA.

Name: Honors Juanita Curtis, the mineral collector, who found the mineral.

Type Material: Los Angeles County Museum of Natural History, Los Angeles, California, USA (45266 and 45267).