Kadyrelite

Hg$_6$$^+$H(Br, Cl)$_3$O$_2$

Crystal Data: Cubic. Point Group: 4/m 3 2/m. In grains, to 0.5 mm.

VHN = 143–192, 175 average (25 g load). D(meas.) = n.d. D(calc.) = 8.79

Optical Properties: Transparent. Color: Bright to dull orange; bright yellow-orange in
transmitted light; grayish white in reflected light, with intense orange internal reflections,
tarnishing to bluish then brownish. Streak: Yellow-orange. Luster: Vitreous to adamantine.

Optical Class: Isotropic. n = > 2

Cell Data: Space Group: [Ia3d] (by analogy to eglestonite). a = 16.22 Z = [16]

X-ray Powder Pattern: Kadyrel deposit, Russia.
3.32 (100), 1.912 (85), 2.57 (65), 4.06 (30), 2.63 (20), 2.344 (20), 1.731 (20)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hg</td>
<td>84.36</td>
<td>85.39</td>
</tr>
<tr>
<td>O</td>
<td>[1.70]</td>
<td>1.70</td>
</tr>
<tr>
<td>Cl</td>
<td>2.93</td>
<td>3.77</td>
</tr>
<tr>
<td>Br</td>
<td>10.19</td>
<td>8.50</td>
</tr>
<tr>
<td>I</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>H$_2$O</td>
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<td>0.64</td>
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<tr>
<td>Total</td>
<td>[99.19]</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Kadyrel deposit, Russia; by electron microprobe, average of five analyses.
(2) Hg$_6$H(Br, Cl)$_3$O$_2$ with Br:Cl = 1:1.

Polymorphism & Series: Forms a series with eglestonite.

Occurrence: In cavities in carbonate veins in a mercury deposit.

Association: Eglestonite, calomel, kuzminite, corderoite, lavrentievite.

Distribution: In the Kadyrel mercury deposit, Pii-Khem district, right bank of the
Oorash-Khem River Valley, Tuva, Siberia, Russia [TL].

Name: For the Kadyrel deposit, Russia, where it occurs.

Type Material: Central Siberian Geological Museum, Siberian Division, Academy of Sciences,
Novosibirsk, VI-29/1; Mining Institute, St. Petersburg, Russia, 1992/1–2.

References: (1) Vasil’ev, V.I. (1987) Kadyrelite Hg$_4$(Br, Cl)$_2$O – a new oxyhalide of mercury
(2) (1989) Amer. Mineral., 74, 503 (abs. ref. 1). (3) Mereiter, K., J. Zeeman, and A.W. Hewat
(1992) Eglestonite, [Hg$_2$]$_3$Cl$_4$O$_2$H: confirmation of the chemical formula by neutron powder