Mcbirneyite

**Crystal Data:** Triclinic. **Point Group:** 1. As anhedral crystals, to 200 µm.

**Physical Properties:** Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.50

**Optical Properties:** Opaque. **Color:** Black; medium gray in reflected light. **Optical Class:** Biaxial. **Luster:** Metallic.

**Cell Data:** Space Group: $P\overline{1}$. $a = 5.3418(9)$, $b = 6.5100(8)$, $c = 5.1798(7)$, $\alpha = 88.61(1)^\circ$, $\beta = 68.11(1)^\circ$, $\gamma = 69.22(1)^\circ$, $Z = 1$

**X-ray Powder Pattern:** Izalco Volcano, El Salvador.
3.12 (100), 2.82 (100), 4.01 (80), 2.641 (80), 2.428 (80), 4.25 (60), 2.572 (60)

**Chemistry:**

<table>
<thead>
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<th>(1)</th>
<th>(2)</th>
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<tbody>
<tr>
<td>$V_2O_5$</td>
<td>41.44</td>
<td>43.25</td>
</tr>
<tr>
<td>CuO</td>
<td>56.82</td>
<td>56.75</td>
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<tr>
<td>Total</td>
<td>98.26</td>
<td>100.00</td>
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</table>

(1) Izalco Volcano, El Salvador; by electron microprobe, average of six analyses of three crystals; corresponds to $\text{Cu}_{3.08}(\text{VO}_4)_{1.97}$. (2) $\text{Cu}_3(\text{VO}_4)_2$.

**Occurrence:** Very rare in the sulfate zone of sublimates around a fumarole in a composite volcano, likely formed between 100 °C–200 °C.

**Association:** Fingerite, thenardite, euchlorine.

**Distribution:** From fumarole “Y”, Izalco Volcano, El Salvador.

**Name:** Honors Professor Alexander Robert McBirney (1924– ), Volcanologist, University of Oregon, Corvallis, Oregon, USA.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 163183.